City of Mississauga
Agenda

MISSISSAUGA

POST-MEETING
Planning and Development Committee

Date: May 29, 2023
Time: 6:00 PM
Location: Council Chambers, Civic Centre, 2nd Floor
300 City Centre Drive, Mississauga, Ontario, L5B 3C1

Members

Mayor Bonnie Crombie	
Councillor Stephen Dasko	Ward 1 (Chair)
Councillor Alvin Tedjo	Ward 2
Councillor Chris Fonseca	Ward 3
Councillor John Kovac	Ward 4
Councillor Carolyn Parrish	Ward 5
Councillor Joe Horneck	Ward 6
Councillor Dipika Damerla	Ward 7
Councillor Matt Mahoney	Ward 8
Councillor Martin Reid	Ward 9
Councillor Sue McFadden	Ward 10
Councillor Brad Butt	Ward 11

Participate Virtually, Telephone OR In Person
Advance registration is required to participate and/or make a comment in the meeting virtually. Advance registration is preferred to participate and/or make a comment in the meeting in-person. Presentation Materials must be provided in an advance of the meeting. Comments submitted will be considered as public information and entered into public record.

To register, please email deputations.presentations@mississauga.ca and for Residents without access to the internet can register by calling Angie Melo at 905-615-3200 ext. 5423 no later than Friday, May 26, 2023 at 4:00 PM. Directions on how to participate will be provided.
An asterisk (*) symbol indicates an Item that has been either Revised or Added.

Find it Online
https://www.mississauga.ca/council/committees/planning-and-development-committee/
Meetings of Council are streamed live at Mississauga.ca/videos

Contact
Angie Melo, Legislative Coordinator, Legislative Services
905-615-3200 ext. 5423 | Email: angie.melo@mississauga.ca

PUBLIC MEETING STATEMENT:

In accordance with the Ontario Planning Act, if you do not make a verbal submission to the Committee or Council, or make a written submission prior to City Council making a decision on the proposal, you will not be entitled to appeal the decision of the City of Mississauga to the Ontario Land Tribunal (OLT), and may not be added as a party to the hearing of an appeal before the OLT.

Send written submissions or request notification of future meetings to:
Mississauga City Council Att: Development Assistant
c/o Planning and Building Department – 6th Floor
300 City Centre Drive, Mississauga, ON, L5B 3C1
Or Email: application.info@mississauga.ca

1. CALL TO ORDER

2. INDIGENOUS LAND STATEMENT

We acknowledge the lands which constitute the present-day City of Mississauga as being part of the Treaty and Traditional Territory of the Mississaugas of the Credit First Nation, The Haudenosaunee Confederacy the Huron-Wendat and Wyandotte Nations. We recognize these peoples and their ancestors as peoples who inhabited these lands since time immemorial. The City of Mississauga is home to many global Indigenous Peoples.

As a municipality, the City of Mississauga is actively working towards reconciliation by confronting our past and our present, providing space for Indigenous peoples within their territory, to recognize and uphold their Treaty Rights and to support Indigenous Peoples. We formally recognize the Anishinaabe origins of our name and continue to make Mississauga a safe space for all Indigenous peoples.

3. APPROVAL OF THE AGENDA

4. DECLARATION OF CONFLICT OF INTEREST

5. MINUTES OF PREVIOUS MEETING

5.1 Planning and Development Committee Draft Minutes - May 8, 2023

5.2 Planning and Development Committee Draft Minutes - May 15, 2023

6. MATTERS TO BE CONSIDERED

6.1 RECOMMENDATION REPORT (WARD 5)

Sign Variance Application to permit one billboard sign with one electronic changing copy sign face
455 Gibraltar Drive
Applicant: Gilda Collins
File: SGNBLD 22-6232 VAR (W5)

6.2 PUBLIC MEETING RECOMMENDATION REPORT (WARD 3)

Temporary Rezoning application to permit a transportation facility for 106 commercial motor vehicles for a period of three years
1075 Canadian Place, south of Eglinton Avenue East, east of Tomken Road
Owner: 2415054 Ontario Inc.
File: T-OZ 21-6 W3

Pre-Bill 109

6.3 PUBLIC MEETING INFORMATION REPORT (WARD 8)

Official Plan Amendment and Rezoning applications to permit five condominium apartment buildings of 11, 8, 7, 7 and 6 storeys with commercial uses at grade and seven blocks of stacked townhouses containing a total of 703 units
4099 Erin Mills Parkway, southeast corner of Erin Mills Parkway and Folkway Drive
Owner: Queenscorp (Erin Mills) Inc.
File: OZ/OPA 22-25 W8

Pre-Bill 109

*6.4 PUBLIC MEETING RECOMMENDATION REPORT (WARD 1) - REVISED APPENDIX 1

Official Plan Amendment and Rezoning applications to permit a 38 storey apartment building with ground floor commercial space
70 Park Street East, 23, 25, 29 and 31 Helene Street North, 53 Queen Street East, north of Park Street East of Helene Street North
Owner: 70 Park Street East Inc.
File: OZ/OPA 23-3 W1
Bill 109

6.5 PUBLIC MEETING INFORMATION REPORT (WARD 5)

Official Plan Amendment and Rezoning applications to permit 16, three storey back to back townhouse units
5, 7, 9 Beverley Street, north of Derry Road East, west of Airport Road
Owner: 2862505 Ontario Limited
File: OZ/OPA 22-27 W5

Pre-Bill 109

6.6 INFORMATION & RECOMMENDATION REPORT (WARD 2) - Clarkson Transit Station Area Study Update: Air Quality Study Findings and Next Steps

6.7 PUBLIC MEETING RECOMMENDATION REPORT (WARD 1) - Lakeview Innovation District Community Improvement Plan

7. ADJOURNMENT

City of Mississauga
Corporate Report

MISSISSAUGA

Date: May 5, 2023

To: Chair and Members of Planning and Development Committee

From: Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Originator's file: SGNBLD 22-6232 VAR (W5)

Meeting date: May 29, 2023

Subject

RECOMMENDATION REPORT (WARD 5)

Sign Variance Application to permit one billboard sign with one electronic changing copy sign face
455 Gibraltar Drive
Applicant: Gilda Collins
File: SGNBLD 22-6232 VAR (W5)

Recommendation

1. That the sign variance application under file SGNBLD 22-6232 VAR (W5), Gilda Collins, 455 Gibraltar Drive, to permit one billboard sign with one electronic changing copy sign face (electronic billboard sign) be refused, as outlined in the corporate report dated May 5, 2023 from the Commissioner of Planning and Building.

Background

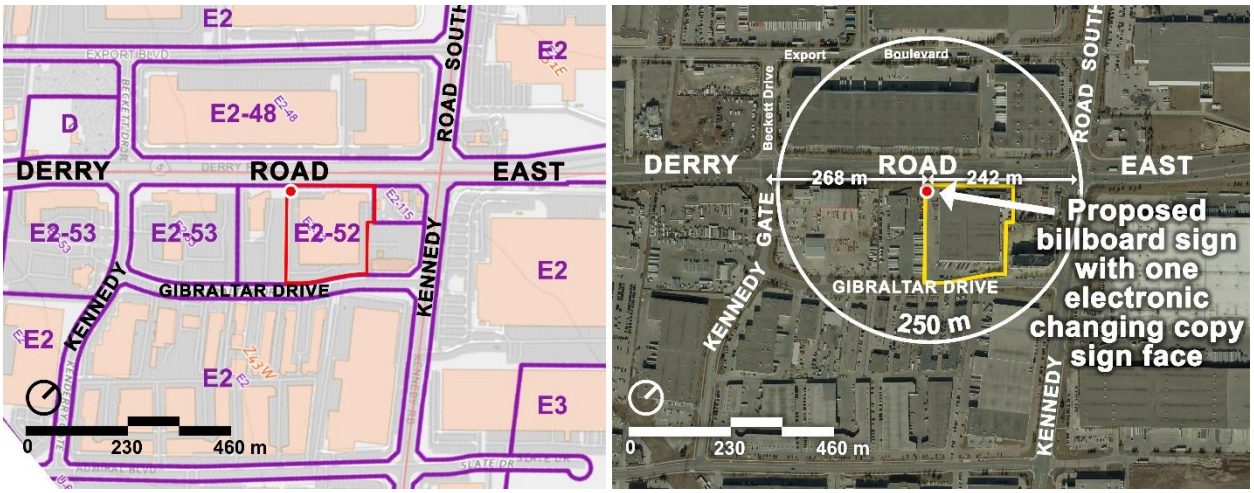
The applicant has requested a variance to the Sign By-law to permit one billboard sign with one electronic changing copy sign face (Appendix 2). Planning and Building Department staff do not support the variance as proposed. In accordance with Recommendation PDC-0065-2017, all proposed billboard signs with electronic changing copy are to be evaluated in accordance with the Guidelines for the Review of Sign Variance Applications for Billboard Signs with Electronic Changing Copy (Guidelines) and brought to Planning and Development Committee (PDC) for consideration.

This report provides background information regarding the application and the rationale for the staff recommendation.

Comments

Site Location

The site is located on the south side of Derry Road East, 242 m (794.0 ft.), distant from the nearest intersection at Kennedy Road South and Derry Road East.



Zoning map and an aerial image of the subject property and the surrounding context

Context and Surrounding Land Uses

The subject property is zoned **E2** (Employment), which allows for various business employment operations in accordance with Zoning By-law 0225-2007. The site is surrounded by properties zoned **E2**. No residential or other sensitive land uses are located within 250 m (820.2 ft.) of the subject property.

Other Similar Sign Variance Applications Previously Approved

On November 21, 2022, another similar sign variance application submitted by a different applicant under file SGNBLD 22-2141 VAR (W5) at 1900 Derry Road East for an electronic billboard with a larger sign face area of 26.2 m^2 (282.0 ft^2) (31% larger than the maximum permitted area) was approved by the Planning and Development Committee (PDC-0084-2022).

History

A previous sign variance application, SGNBLD 22-743 VAR (W5), on this property for an electronic billboard sign with a face area of 20.7 m^2 (222.8 ft^2) was approved by the Planning and Development Committee (PDC-0091-2022) on December 5, 2022. Subsequent to the approval of SGNBLD 22-2141 VAR (W5) at 1900 Derry Road East, the applicant submitted this application for an electronic billboard with a sign face area 47.5% larger than the maximum permitted.

Proposal

The proposed billboard is located at the northwest corner of the subject property with a 7.5 m (24.6 ft.) setback from the street line. The billboard has one electronic changing copy sign face, facing the westbound traffic on Derry Road East.

The dimension of the sign face is 7.68 m x 3.84 m (25.2 ft. x 12.6 ft.), has a sign face area of 29.5 m^2 (317.5 ft^2), and the height of the billboard is 7.5 m (24.6 ft.) (Appendix 2).

The location of the proposed billboard

Images of the existing condition

Application Assessment

The application does not comply with some of the Guidelines (Appendix 1). The sign face area of the proposed billboard is 29.5 m^2 (317.5 ft^2), which is 47.5% over the maximum permitted area (20 m^2 (215.3 ft^2)) identified in the Guidelines. We anticipate negative visual impacts due to this large sign face area.

Financial Impact

The recommendation contained herein has no financial impact on the City of Mississauga.

Conclusion

The requested sign variance to permit one billboard sign with one electronic changing copy sign face should be refused as it does not comply with some of the Guidelines for the Review of Billboard Signs with Electronic Changing Copy.

Attachments

Appendix 1: Sign Variance Application Assessment Table
Appendix 2: Applicant's Proposal

A. Whittemore

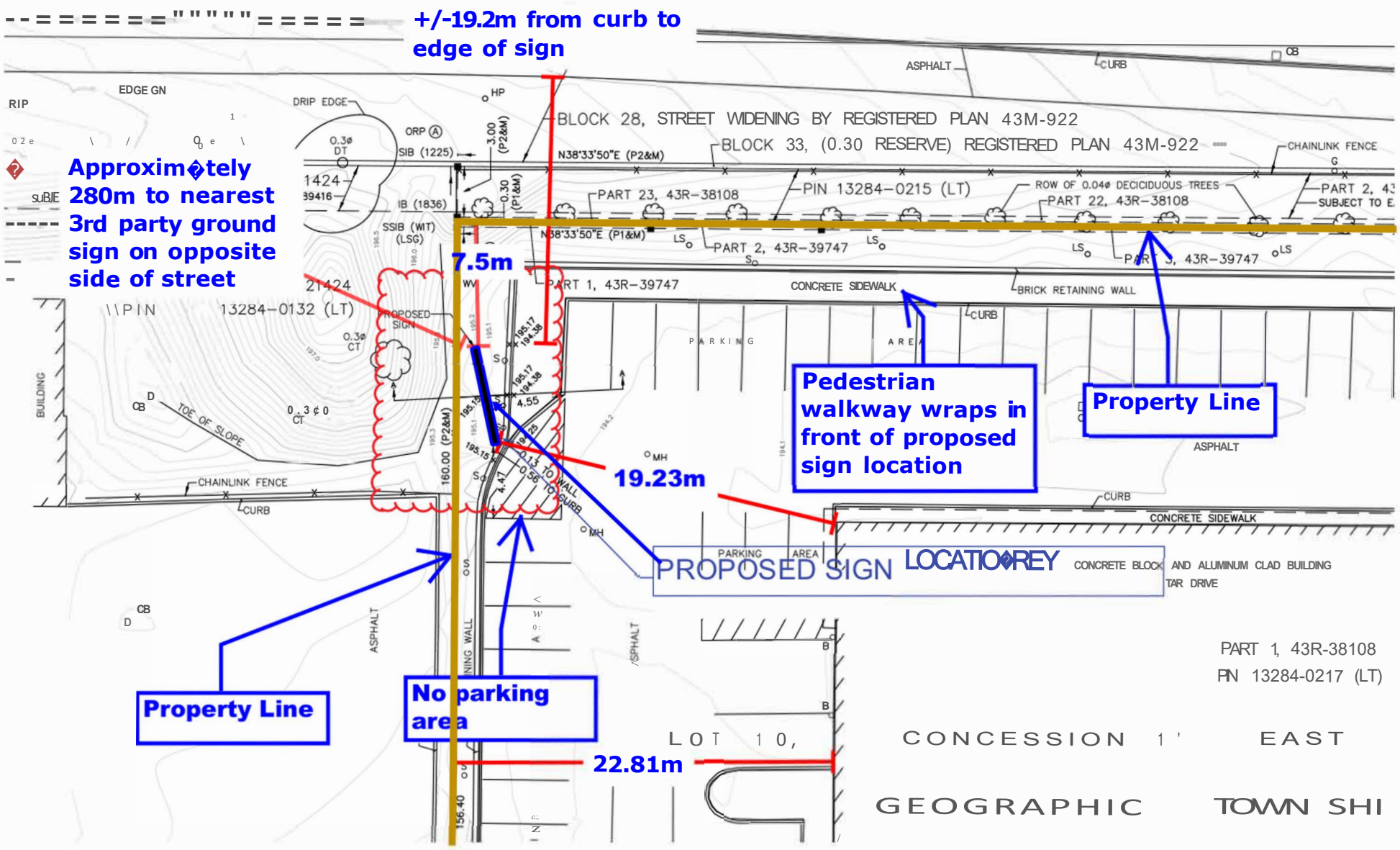
Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

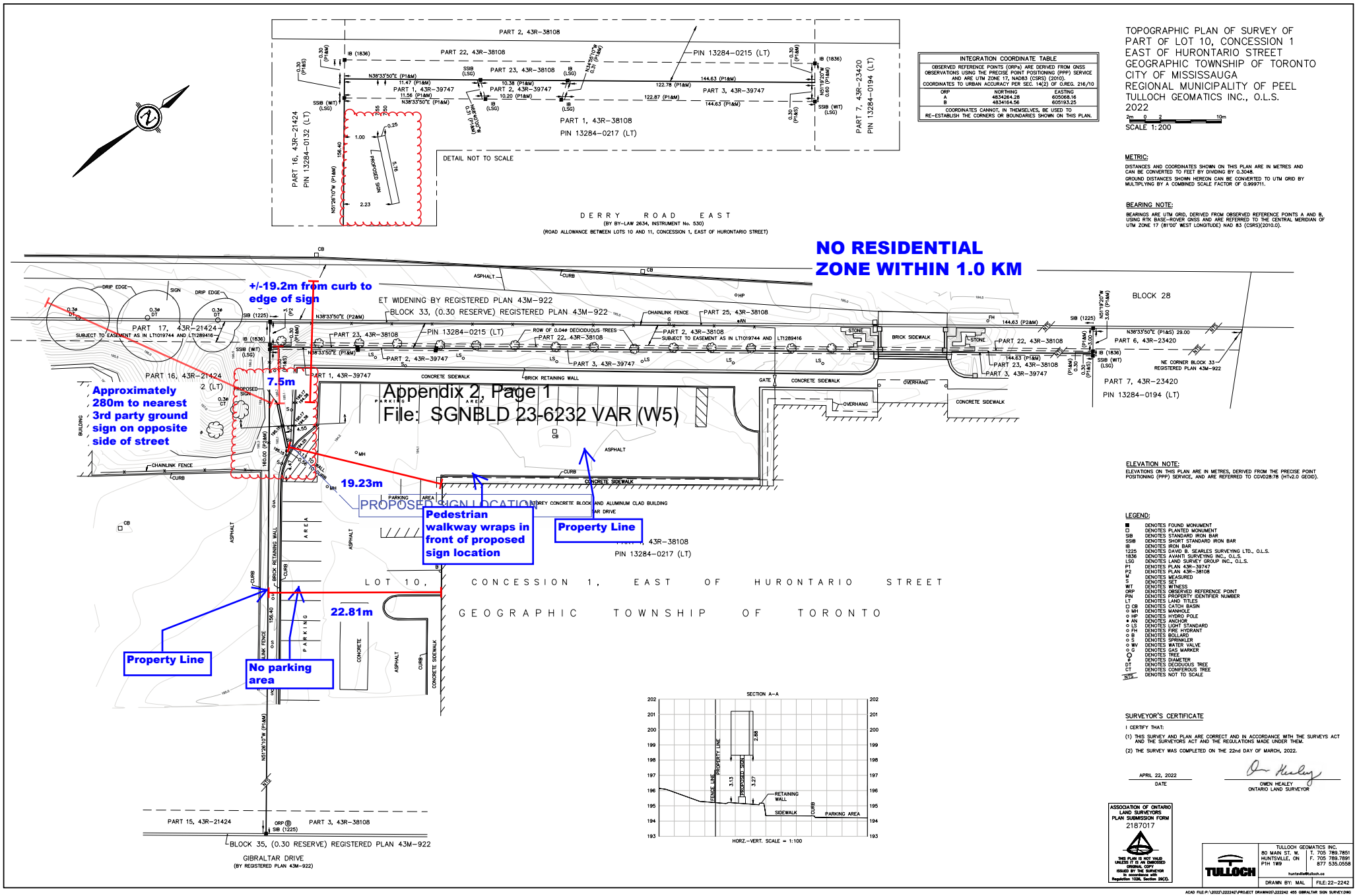
Prepared by: Amr Merdan, Urban Designer

Sign Variance Application Assessment Table

The table below shows the Council approved *Guidelines for the Review of Sign Variance Applications for Billboard Signs with Electronic Changing Copy* (Guidelines) or the sections of the Sign By-Law 54-02 that the applicant's proposal has addressed or has not addressed satisfactorily.

The Sign By-law or Guidelines	Applicant's proposal	Meet (✓) Not Meet (X)
Location: Table (4) in Sign By-law states that billboard sign is permitted n the following areas of the city: • Public Squares in the Downtown Core. • Public Squares within the Cooksville 4 Corners. • Public Squares within Major Nodes. • The city deems specific areas to be the locations in which electronic billboard signs are seen as key elements that contribute to the character and vibrancy of the area.	The subject property is zoned E2 and surrounded by properties zoned E2, which is an employment zone that allows for a variety of business operations. We do not anticipate any negative impact on the surrounding context due to the proposed electronic billboard sign.	✓
Maximum height: 7.6 m (25.0 ft.)	7.5 m (24.6 ft.)	✓
Setback from the street line: 7.5 m (24.6 ft.)	7.5 m (24.6 ft.)	✓
Number of faces: No part of a billboard shall be a multi-faced	One billboard with two electronic copy faces	✓
Maximum sign area per face: 20 m^2 (215.3 ft^2)	The proposed sign face area is **29.5 m^2** (317.5 ft^2). We anticipate negative visual impacts of this large sign face area, which is **47.5%** over the maximum area in the Guidelines.	X
Minimum distance from another billboard sign on the same side of the street: 250 m (820.2 ft.)	No electronic billboards are located within 250 m (820.2 ft.) of the subject property on the same side of the street.	✓
Minimum distance from a residential zone: 250 m (820.2 ft.)	No residential properties are located within the proposed sign's 250 m (820.2 ft.).	✓
Minimum distance to the closest traffic control device: 120 m (393.7 ft.) from a major traffic sign or driver decision point, where the posted speed limit on a road is less than 80 km/hr	The existing posted speed limit is 70 km/h. The distance from the proposed billboard to the nearest intersection at Kennedy Road South and Derry Road East is 242 m (794.0 ft).	✓
Specifications: sections 3.7, 3.8, 3.9, 3.10, 3.11, and 3.12 of the Guidelines state the required specifications for a proposed billboard sign, including the minimum message display duration, the transition between successive displays, message sequencing and amount of information displayed, sign animation, and the sign brightness and luminance	The proposed billboard sign satisfactorily addresses all the technical required specifications in the Guidelines.	✓


+/-19.2m from curb to edge of sign
Approximately 280m to nearest 3rd party ground sign on opposite side of street
7.5m
19.23m
22.81m
Pedestrian walkway wraps in front of proposed sign location
Property Line
Property Line
No parking area
PROPOSED SIGN LOCATION KEY
BLOCK 28, STREET WIDENING BY REGISTERED PLAN 43M-922
BLOCK 33, (0.30 RESERVE) REGISTERED PLAN 43M-922
PART 23, 43R-38108
PART 22, 43R-38108
PART 2, 43R-39747
PART 1, 43R-39747
PIN 13284-0215 (LT)
PIN 13284-0132 (LT)
CONCRETE SIDEWALK
BRICK RETAINING WALL
CHAINLINK FENCE
ASPHALT
CURB
PARKING AREA
BUILDING
CONCRETE BLOCK AND ALUMINUM CLAD BUILDING
PART 1, 43R-38108
PIN 13284-0217 (LT)
LOT 10, CONCESSION 1' EAST
GEOGRAPHIC TOWN SHI



Appendix 2, Page 1
File: SGNBLD 23-6232 VAR (W5)

INTEGRATION COORDINATE TABLE		
OBSERVED REFERENCE POINTS (ORPs) ARE DERIVED FROM GNSS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE AND ARE UTM ZONE 17, NAD83 (CSRS) (2010). COORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O.REG. 216/10		
ORP	NORTHING	EASTING
A	4834264.28	605068.16
B	4834164.56	605193.25
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH THE CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

TOPOGRAPHIC PLAN OF SURVEY OF
PART OF LOT 10, CONCESSION 1
EAST OF HURONTARIO STREET
GEOGRAPHIC TOWNSHIP OF TORONTO
CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL
TULLOCH GEOMATICS INC., O.L.S.
2022

2m 0 2 10m
SCALE 1:200

METRIC:
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.
GROUND DISTANCES SHOWN HEREON CAN BE CONVERTED TO UTM GRID BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.999711.

BEARING NOTE:
BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, USING RTN BASE-ROVER GNSS AND ARE REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 17 (81°00' WEST LONGITUDE) NAD 83 (CSRS)(2010.0).

ELEVATION NOTE:
ELEVATIONS ON THIS PLAN ARE IN METRES, DERIVED FROM THE PRECISE POINT POSITIONING (PPP) SERVICE, AND ARE REFERRED TO CGVD28:78 (HTv2.0 GEOID).

LEGEND:

■	DENOTES FOUND MONUMENT
□	DENOTES PLANTED MONUMENT
SIB	DENOTES STANDARD IRON BAR
SSIB	DENOTES SHORT STANDARD IRON BAR
IB	DENOTES IRON BAR
1225	DENOTES DAVID B. SEARLES SURVEYING LTD., O.L.S.
1836	DENOTES AVANTI SURVEYING INC., O.L.S.
LSG	DENOTES LAND SURVEY GROUP INC., O.L.S.
P1	DENOTES PLAN 43R-39747
P2	DENOTES PLAN 43R-38108
M	DENOTES MEASURED
S	DENOTES SET
WT	DENOTES WITNESS
ORP	DENOTES OBSERVED REFERENCE POINT
PIN	DENOTES PROPERTY IDENTIFIER NUMBER
LT	DENOTES LAND TITLES
□ CB	DENOTES CATCH BASIN
○ MH	DENOTES MANHOLE
○ HP	DENOTES HYDRO POLE
● AN	DENOTES ANCHOR
○ LS	DENOTES LIGHT STANDARD
○ FH	DENOTES FIRE HYDRANT
⊙ B	DENOTES BOLLARD
○ S	DENOTES SPRINKLER
○ WV	DENOTES WATER VALVE
○ G	DENOTES GAS MARKER
○	DENOTES TREE
ø	DENOTES DIAMETER
DT	DENOTES DECIDUOUS TREE
CT	DENOTES CONIFEROUS TREE
NTS	DENOTES NOT TO SCALE

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

(1) THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT AND THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.

(2) THE SURVEY WAS COMPLETED ON THE 22nd DAY OF MARCH, 2022.

APRIL 22, 2022
DATE

OWEN HEALEY
ONTARIO LAND SURVEYOR

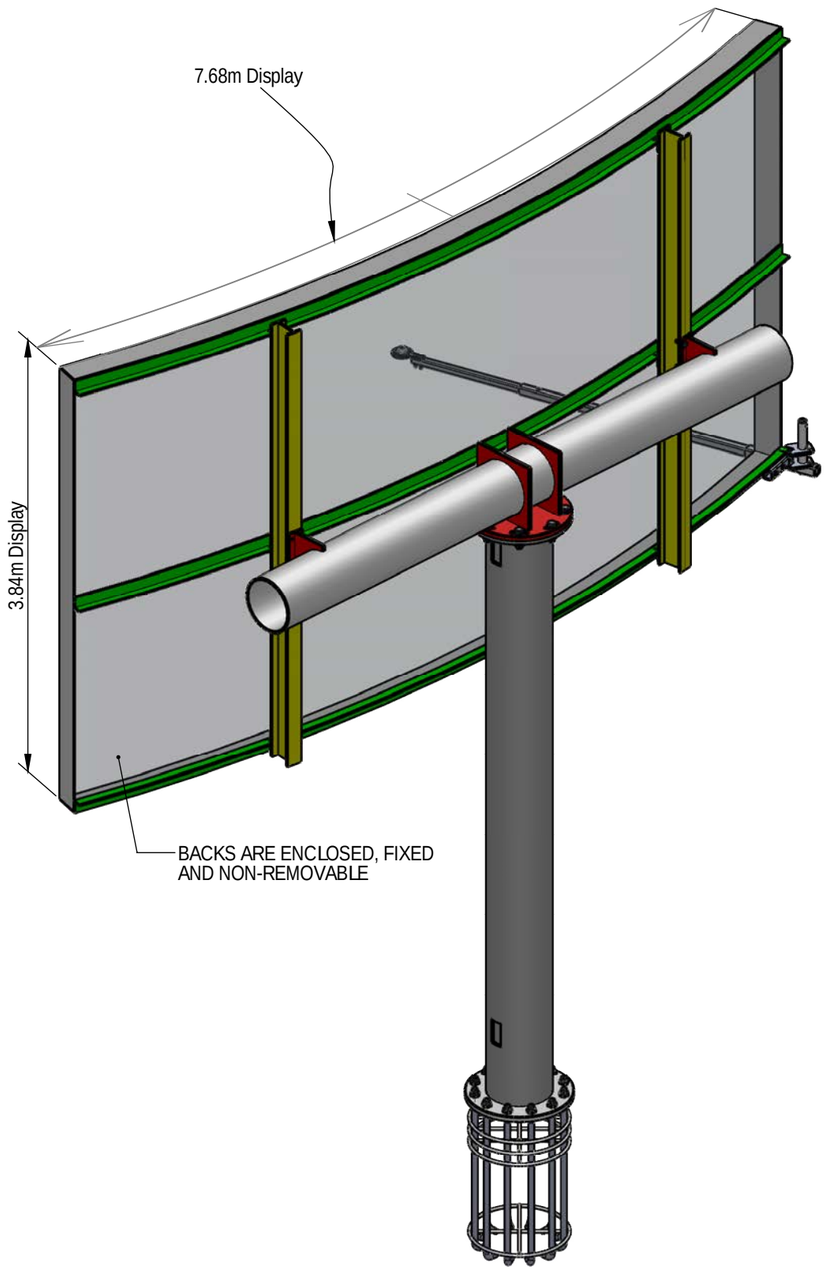
ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2187017

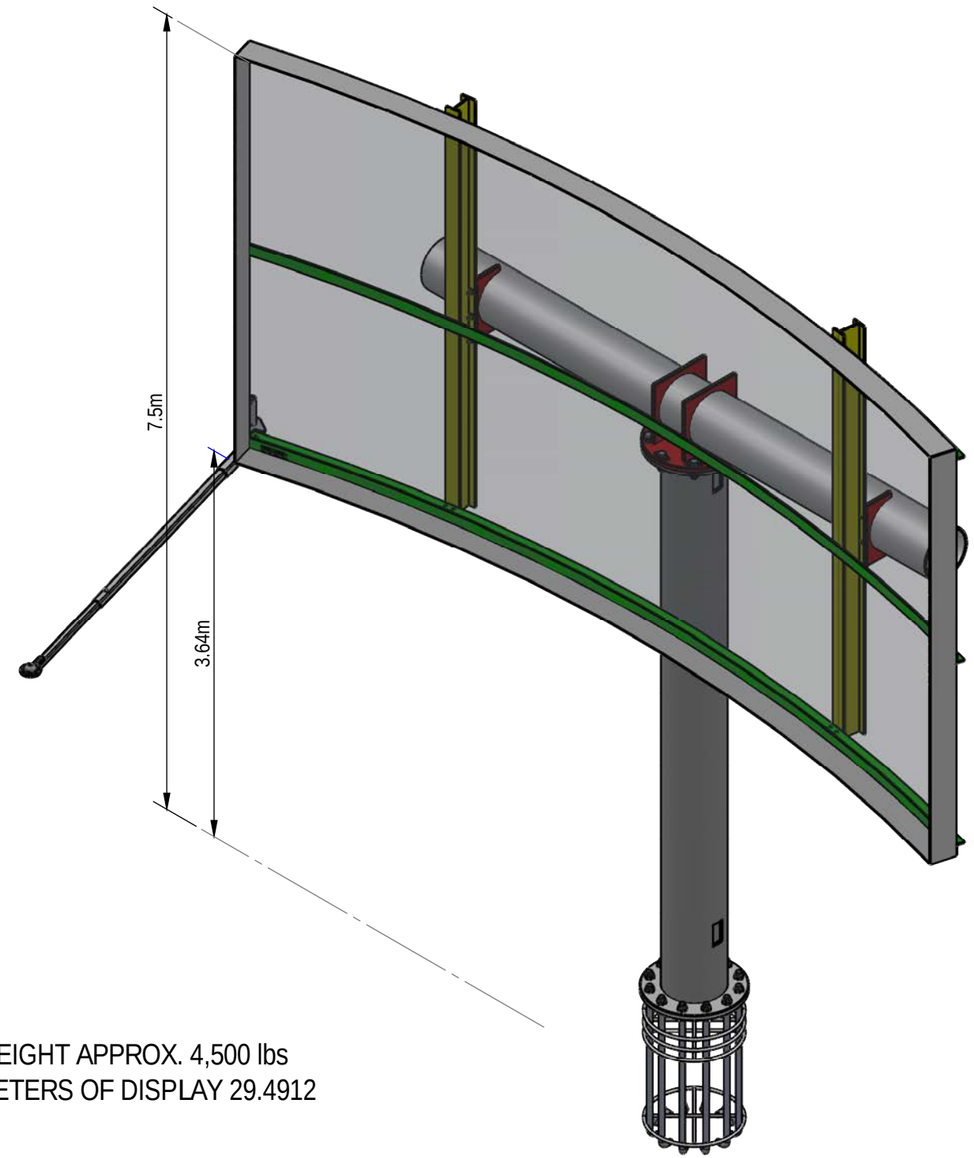
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR in accordance with Regulation 1026, Section 29(3).

TULLOCH GEOMATICS INC.
80 MAIN ST. W.
HUNTSVILLE, ON
P1H 1W9
T: 705 789.7851
F: 705 789.7891
877 535.0558
huntsville@tulloch.ca

DRAWN BY: MAL FILE: 22-2242

ACAD FILE:P:\2022\222242\PROJECT DRAWINGS\222242 455 GIBRALTAR SIGN SURVEY.DWG





DISPLAY WEIGHT APPROX. 4,500 lbs
SQUARE METERS OF DISPLAY 29.4912

UNLESS OTHERWISE SPECIFIED
DO NOT SCALE DRAWING
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994
DIMENSIONS ARE IN INCHES
TOLERANCES APPLY AS SHOWN BELOW

0 PL DEC	± 0.2
1 PL DEC	± 0.1
2 PL DEC	± 0.01
3 PL DEC	± 0.005
ANGLES	± .1°
SURFACE ROUGHNESS	32 µ in

NOTES:
1. MATERIAL :
2. FINISH:
3. COATING:

mediaresources ...solutions for the sign industry.

CUSTOMER: LEADING OUTDOOR
PROJECT: 13.3mm 12H x 24W RGB SF Curved Display

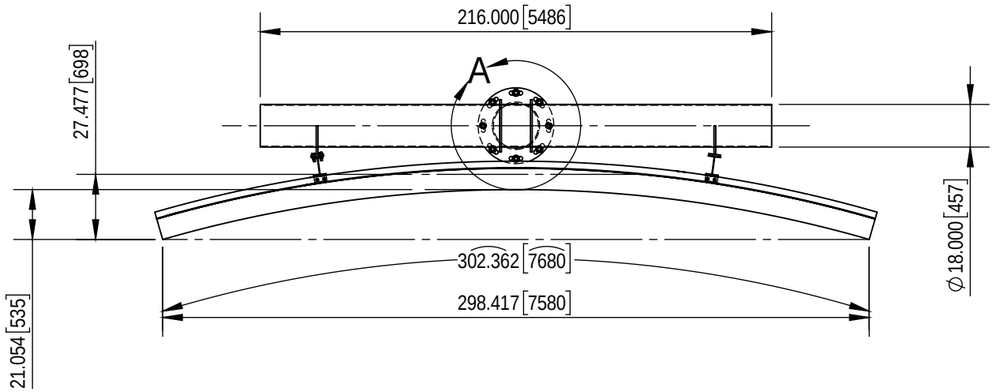
DRAWN BY	K.SUN	DATE 2023-01-18
CHECKED BY	T.MACAVELIA	DATE 2023-01-19
APPROVED	T.MACAVELIA	DATE 2023-01-19

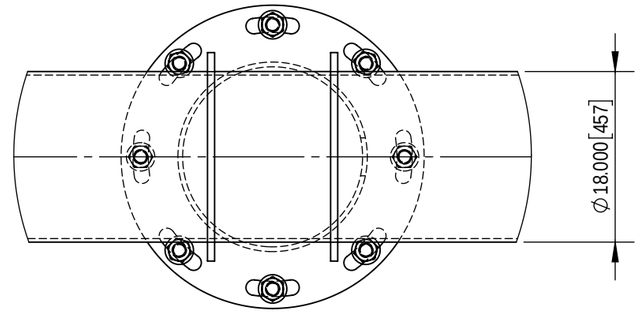
MEDIA RESOURCES INTERNATIONAL
1387 CORNWALL ROAD OAKVILLE ONTARIO
TEL: 1.800.667.4554 FAX: 1.905.337.9531

TITLE
CENTER MOUNT STRUCTURE
12H x 24W 320mm Series

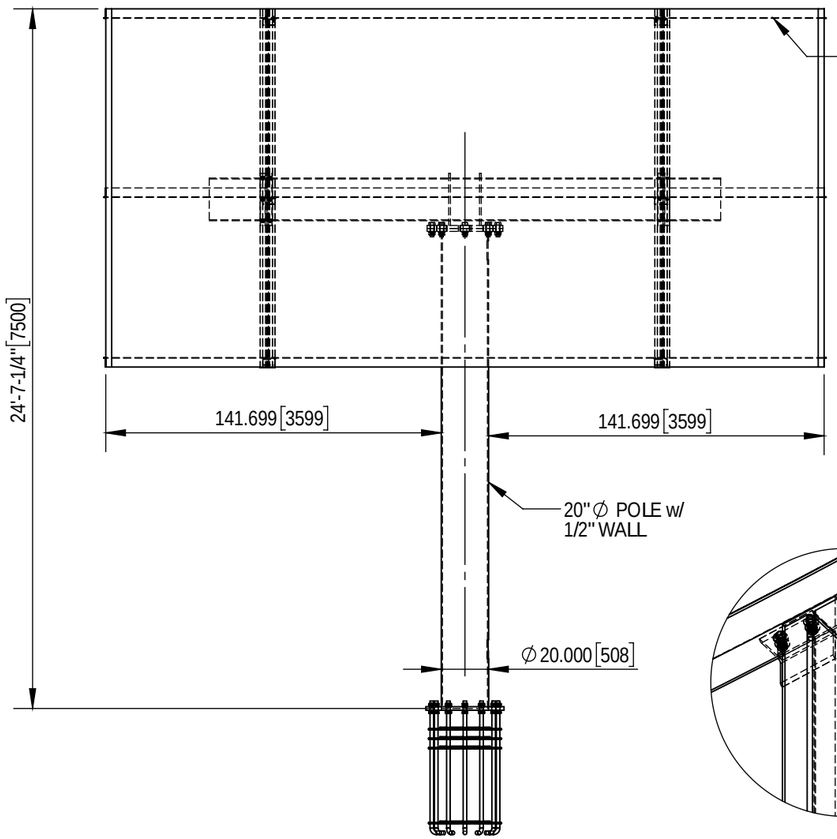
SIZE	DRAWING NO	REVISION
B	12H24WLOCM_STRU-001	

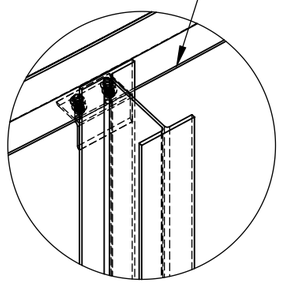
WORK ORDER NO	SCALE	WEIGHT	
	1:46	lbs	SHEET 1 OF 10

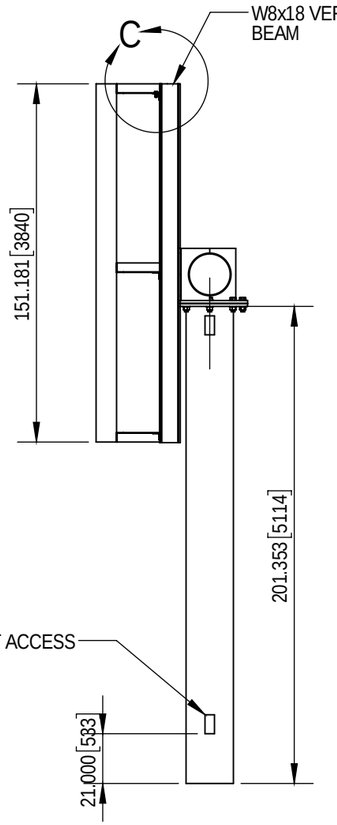


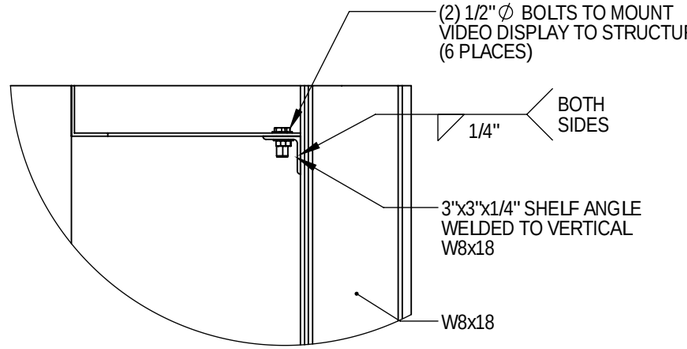


DETAIL A
SCALE 1 : 16









DETAIL C
SCALE 1 : 12

UNLESS OTHERWISE SPECIFIED

DO NOT SCALE DRAWING

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994

DIMENSIONS ARE IN INCHES

TOLERANCES APPLY AS SHOWN BELOW

0 PL DEC	± 0.2
1 PL DEC	± 0.1
2 PL DEC	± 0.01
3 PL DEC	± 0.005
ANGLES	± .1°
SURFACE ROUGHNESS	32 µ in

NOTES:

1. MATERIAL :
2. FINISH:
3. COATING:

mediaresources ...solutions for the sign industry.

CUSTOMER: LEADING OUTDOOR

PROJECT: 13.3mm 12H x 24W RGB SF Curved Display

DRAWN BY	K.SUN	DATE 2023-01-18
CHECKED BY	T.MACAVELIA	DATE 2023-01-19
APPROVED	T.MACAVELIA	DATE 2023-01-19

MEDIA RESOURCES INTERNATIONAL
1387 CORNWALL ROAD OAKVILLE ONTARIO
TEL: 1.800.667.4554 FAX: 1.905.337.9531

TITLE

CENTER MOUNT STRUCTURE
12H x 24W 320mm Series

SIZE	DRAWING NO	REVISION
B	12H24WLOCM_STRU-001	

WORK ORDER NO	SCALE	WEIGHT	
	1:64	lbs	SHEET 2 OF 10

Permit World

March 27, 2023

City of Mississauga
Planning and Building Department
Development and Design Division
300 City Centre Drive
Mississauga, ON L5B 3C1

Attention: Nathan de Sousa

Re: Sign by-law 54-05 Variance Rationale for 455 Gibraltar Dr., Mississauga, ON SGNBLD 23-6232

Dear Sir,

By way of this letter, we are formally making an application for a sign variance in conjunction with the above noted location. It should be noted that a previous application was made for a billboard ground sign with electronic static copy in the same location on this property. That application was approved for a sign face area of 20 sq m. Due to some design and structural changes to the sign itself and the construction of the individual panels making up the sign, it was determined that a larger sign face area is required and a new application was submitted after consultation with the ward Councillor.

The property is located at 455 Gibraltar Drive Road, is owned by 2209449 Ontario Inc. and is zoned E2. Permit World, on behalf of the owner, is requesting approval to install one single-sided billboard sign with electronic static changeable copy on the above property.

The subject property is located on the south side of Derry Road E. The digital board is proposed to be oriented facing westbound traffic on Derry Road E. with the intention to provide maximum safe visibility to westbound traffic only.

The sign variance application is to permit one billboard sign with one electronic changing copy sign face. The variances being sought under Sign By-law 54-05 are as follows:

(a) Table 4 billboard signs permitted on Vacant Industrial property – the subject property is zoned Single Tenant Industrial E2
(b) Table 4 billboard signs are permitted 20.0 sq m maximum sign face area. The proposed billboard has a sign face area of 29.49 sq m

While the by-law as it relates to billboard signs requires a property to be vacant industrial, the subject property is fully surrounded by a variety of industrial and commercial operations zoned E2 which is an Employment zone. There are no residential or other sensitive uses visible from or within the surrounding

context of the subject property. The addition of a billboard sign with static electronic changing copy in this immediate area is appropriate and will not adversely affect any of the surrounding properties.

For the above reasons, we are asking for your approval of the requested variances which we feel is in keeping with previously approved billboard signs with electronic changing copy within the City and that this sign will make an important contribution to business owners and the City alike.

Yours sincerely,

Gilda Collins
Senior Project Manager – Special Projects

Permit World Consulting Services Inc.
57 William St. West | Waterloo, ON | N2L 1J6
519-585-1201 x 102 | gcollins@permitworld.ca
www.permitworld.ca

Permit World

March 27, 2023

City of Mississauga
Planning and Building Department
Development and Design Division
300 City Centre Drive
Mississauga, ON L5 3C1

Re: Urban Design Impact Study – SGNBLD 23-6232 - Sign Variance 455 Gibraltar Drive

Dear Sir:

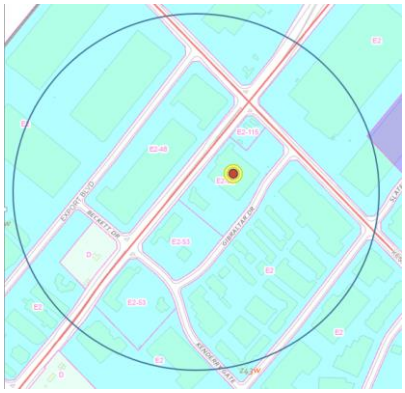
The following submission is our Design Impact Assessment Study as it relates to our sign variance submission for the property known as 455 Gibraltar Drive.

The variance being requested are to permit one single-sided electronic billboard sign with a static electronic changing copy face and the sign will be installed facing westbound traffic on the Derry Road East frontage of the property.

Physically, the property is located between Gibraltar Drive to the south and Derry Road East to the north, with Kennedy Road S. to the immediate east and Kenderry Gate to the west. Highway 410 is also to the east and the subject premise is within the MTO regulated area. The MTO have approved the sign and do not require a permit for it. Confirmation has been uploaded to the City of Mississauga website.

Derry Road E. is a Peel Region road and we have obtained approval from the region to install the sign. Email confirmation has been uploaded to the City of Mississauga website.

The property is zoned single tenant industrial, E2-Employment. The property frontage along Derry Road E. is 144.63m with an overall depth of 156.70m. The property is operating as Galaxy Furniture and there are no permanent ground signs. Properties on all sides are zoned E2-Employment with no residential units within 500m of the proposed sign location. The image below shows the property location and properties within 500 m of the proposed sign.



The following assessment of our application will be completed in conjunction with the document titled "Guidelines for the Review of Sign Variance Applications for Billboard Signs with Electronic Changing Copy". Our analysis will be compared to the "Guideline" excerpt:

"The purpose of this document is to establish a set of criteria by which sign variance applications for billboard signs with electronic changing copy will be evaluated. Municipalities generally establish controls to mitigate the impacts of electronic billboard signs on traffic safety, sensitive land uses and on the visual image of the communities in which they are located."

The guidelines contained in that document and their criteria will be applied in this review and submission for our request to install billboard featuring electronic changing copy. The single face of the board will be oriented towards west bound traffic on Derry Road East.

3.1 Waiver

A waiver releasing the City and Road Authority from liability and committing to indemnifying the City and Road Authority against any claim, action or process for damage and/or injury as a result of the installation or existing of the billboard sign has been submitted to the city.

3.2 Location

Billboard signs with electronic changing copy shall only be considered wherever billboard signs are permitted in accordance with Sign by-Law 54-02 (see Table 4, page 19) and in the following areas of the City:

- Public Squares in the Downtown Core
- Public Squares within the Cooksville 4 Corners
- Public Squares within Major Nodes
- Specific areas of the City, deemed by the City to be locations in which electronic billboard signs are seen as key elements that contribute to the character and vibrancy of the area.

The property at 455 Gibraltar Drive is ideally located for this type of sign.

The property and proposed sign location is approximately 950m west of Hwy 410 and 650m from the on-ramp to the highway. The sign sided sign will face westbound traffic along Derry Road E. Derry Road E. at this point is three lanes in either direction. The area is zoned Employment with no residential within 500m radius. There are no other sensitive uses which could be impacted by the proposed sign. There is a signalized intersection approximately 230 m to the east of the property at the intersection of Derry Road E. and Kennedy Road S. Westbound traffic stationary at this intersection is approximately 270m from the proposed billboard sign location. There is also a signalized intersection to the west at Derry Road E. and Kenderry Gate. The proposed billboard sign will have no impact on either of that intersection.

3.3 Urban Design Impact Assessment

Each sign variance application package for a billboard sign with electronic changing copy shall include an urban design impact assessment of the proposed sign on the views, visual quality and character of the existing and planned surrounding context (see Appendix C for Terms of Reference).

A contextual plan/site plan is attached to this submission as per the criteria contained in Appendix C of the Guidelines.

3.4 Sign By-law 54-02

As per Table 4 and Sec. 20 of the Sign By-law 54-02 the proposed billboard featuring electronic changing copy will abide by all the criteria as set out on Page 20 of the Sign By-law 54-02.

3.5 Separation Distances, Heights, Setbacks, Maximum Sign Area

Billboard signs with electronic changing copy shall be positioned relative to one another such that not more than one electronic billboard display shall be visible to an approaching driver at the same time. Except for 2(a) and 2(b), the provisions of the Sign By-law 54-02 Sec. 20 shall also apply to billboard signs with electronic changing copy. No part of a billboard sign with electronic changing copy shall:

- Exceed 7.62 m in height (240-07)
- Be located closer than 7.5 m to the street line (240-07)
- Be multi-faced
- The maximum sign area of a billboard shall be 20 m2 per sign face (240-07)

The proposed sign will not exceed 7.62 m in height.
The proposed sign will be set back not less than 7.5 m from the property line
The proposed sign will have a sign face area per face of 29.49 square metres which is 9.49 sq m over the maximum allowable. This is due to the design of the sign and the panels to be used for display.

Notwithstanding the provisions of Sign By-law 54-02, Section 20, 2(a) and 2(b), no part of a billboard sign with electronic changing copy shall be:

- Located closer than 250 m from another billboard on the same side of the street but this does not apply to billboard signs on opposite sides of grade separated by railway crossings.
- Located closer than 250 m measured in a straight line from a residential Zone.

There are no existing billboard signs within 250m of the proposed billboard location.

3.6 Location of billboard signs with electronic changing copy, relative to traffic control devices and important driver decision points

Where the posted speed limit on a road is less than 80 km/hr, a billboard sign with electronic changing copy shall not be erected within 120 m of a major traffic sign or driver decision point.

The proposed billboard sign will be located approximately 50.0 m from the controlled intersection at Kennedy Road South for eastbound traffic, which will have no visibility to the sign. The sign will face east and have visibility to westbound traffic. The traffic lights at Derry Road E. and Kennedy Road S. are approximately 270m from the proposed sign location, well outside the minimum 120m. This separation satisfies the Sign by-laws for setback for a static image billboard.

Driver decision points include intersections, on ramps, interchanges, merge areas, right/left turn lanes and close to traffic signals, toll plaza, pedestrian crossings, rail crossings, work zones, where the cognitive demands on drivers are greatest.

There are no other important driver decision points for westbound traffic which could be impacted by the proposed billboard sign.

3.7 Minimum Message Display Duration

Generally, bright lights and visual changes, both of which are associated with electronic billboards, can draw the eye to a stimulus that is brighter than its surroundings. Bright lights and visual change can also draw the eye to a stimulus that exhibits movement or apparent movement. In addition, the Zeigarnik Effect (the increased memory recall of an incomplete task/message) suggests that drivers will focus longer on a display in which the message changes, in an effort to complete the viewing experience. Ideally, the dwell time for an individual message should be set so that drivers will see no more than one complete message, thus reducing any possible distracting effects of trying to complete the viewing experience.

The minimum dwell time of the proposed billboard with electronic changing copy shall be 10 seconds.

3.8 Transition between successive displays

The transition time between successive displays on a billboard sign with electronic changing copy shall appear seamless and imperceptible to approaching drivers.

- The maximum interval between successive displays on a billboard sign with electronic changing copy shall be 0.1 seconds.
- There shall be no visual effects or animation of any kind, including but not limited to, fading, dissolving, blinking or the illusion of such effects, during the message transition or interval between successive displays.

The proposed billboard will only display static images which will change on 10 second intervals. There will be no visual effects or animation of any kind as described above. The maximum transition interval between successive displays on the proposed sign will adhere to 0.1 seconds.

3.9 Message Sequencing

When a single message or advertisement is divided into segments and presented over two or more successive display phases on a single electronic billboard or across two or more billboards, it is described as Message Sequencing. The objective of this type of advertising is to capture and hold the viewers' attention throughout the time or distance required to complete the message.

The proposed billboard with electronic changing copy will not use message sequencing or text scrolling of any kind, over successive display phases on a single billboard or across multiple billboards.

3.10 Amount of information displayed

It takes approximately one second for a road user to read one word. The number of words displayed on a billboard sign with electronic changing copy shall not be greater than the number of seconds required for

the duration of the message display. The height of each character on the message display shall be sufficient to ensure that the message is clearly legible over the entire viewing distance.

The proposed billboard will adhere to the maximums above.

Interactive billboard messages that permit, support or encourage interactive communication with drivers in real time shall not be permitted. These include billboard signs with electronic changing copy that respond to text messages, phone calls or emails from passing drivers or that request immediate response by text, phone, email, etc. The proposed billboard will only display static images which meet the criteria above and will include no interactive communication whatsoever.

3.11 Sign Animation

Animation refers to any motion in the advertisement, including video, special effects within a single frame and transition, movement and rotation between successive frames.

There shall be no animation, flashing movement or appearance of movement on a billboard with electronic changing copy, except where the billboard sign with electronic changing copy is not visible from any vehicular roadway.

The proposed electronic changing copy billboard will provide only static images and those images will change in 10 second intervals. In addition, there will be no video, or animation or flashing as well as those criteria mentioned above and to as "*Transition between successive displays*".

3.12 Sign Brightness and Luminance

Brightness is the perceived intensity of a source of light. It is the appearance of light to the viewer. Luminance is the amount of light leaving a surface in a particular direction or the amount of light that is deflected off a surface. Sign brightness is a function of sign luminance, the background against which the sign is viewed, the driver's age, level of adaptation to the eyes, and atmospheric conditions, such as fog.

Brightness can be measured as luminance, in candelas per square m (cd/m2) or illuminance in foot candles (fc). Luminance is the amount of light that is emitted from a surface, while illumination is the amount of light falling upon a surface. The human eye is drawn to the brightest objects in a field of view and this is generally referred to as the "moth effect". A brightly illuminated electronic billboard sign could draw a driver's attention away from the road, other vehicles and traffic devices. This is of particular concern at nighttime, dusk or dawn and during periods of inclement weather. The maximum luminance level for a billboard sign with electronic changing copy shall be:

- 5000cd/m2 from sunrise to sunset (One nit = One Candela per m2 [cd/m2])
- 300cd/m2 from sunset to sunrise (One nit = One candela per m2 [cd/m2])
- The maximum illumination level for a billboard sign with electronic changing copy shall be 0.3 lux above ambient light levels (One lux = 0.093 foot-candles [fc])
- All billboard signs with electronic changing copy shall be equipped with ambient light sensors and automatic dimmers that control the light output relative to ambient conditions
- Electronic billboard signs shall be illuminated between the hours of 5:00 am and 12 midnight only each day.

To measure illumination, the International Sign Association (2011) has provided the following equation to determine the distance away from the billboard sign at which the measurement shall be taken:

Measurement distance = Square Root of (Sign Area [m2] x 100)

The proposed billboard will adhere to the proposed criteria of 5,000 nits during the day and powering down to 300 nits during the night. This is typical for many other municipalities in Ontario. Preferred illumination of the boards is continuous with no shut-down time.

Conclusion

It is important to remember that these are guidelines only and are not contained in any municipal law. The intent is to allow for applications of this type to be reviewed on a case by case basis by staff and decided through Council.

As stated in the introduction, the property location and proposed billboard with electronic changing copy are ideally suited to this particular location. From every perspective, this is an extremely safe location. The sign meets all of the criteria identified in the by-law.

We respectfully request your support for this applications.

Yours sincerely,

Gilda Collins
Senior Project Manager – Special Projects

Permit World Consulting Services Inc.
57 William St. West | Waterloo, ON | N2L 1J6
519-585-1201 x 102 | gcollins@permitworld.ca
www.permitworld.ca

City of Mississauga
Corporate Report

MISSISSAUGA

Date: May 5, 2023

To: Chair and Members of Planning and Development Committee

From: Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Originator's file:
T-OZ 21-6 W3

Meeting date:
May 29, 2023

Subject

PUBLIC MEETING RECOMMENDATION REPORT (WARD 3)

Temporary Rezoning application to permit a transportation facility for 106 commercial motor vehicles for a period of three years
1075 Canadian Place, south of Eglinton Avenue East, east of Tomken Road
Owner: 2415054 Ontario Inc.
File: T-OZ 21-6 W3

Pre-Bill 109

Recommendation

1. That the application under File T-OZ 21-6 W3, 2415054 Ontario Inc., 1075 Canadian Place to temporarily change the zoning to **D - exception** (Development – Exception) to permit a transportation facility for 106 commercial motor vehicles for a period of three years, be approved, in conformity with the provisions outlined in Appendix 2 of the staff report dated May 5, 2023 from the Commissioner of Planning and Building.

2. That the applicant agree to satisfy all the requirements of the City and any other external agency concerned with the development

3. That the decision of Council for approval of the temporary rezoning application be considered null and void, and a new development application be required unless a zoning by-law is passed within 18 months of the Council decision.

Executive Summary

- The application is to change the zoning on a temporary basis to permit a transportation facility for 106 commercial motor vehicles for a period of three years
- The applicant has made minor revisions to the proposal to address issues raised at the Public Meeting including the addition of five spaces for the drivers to park personal vehicles; provide a fence along the northerly property line and an upgrade to the proposed surface material to minimize dust and loose gravel tracking on to the public road
- It has been concluded that the proposed development is supportable from a planning perspective
- Staff are satisfied with the changes to the proposal and find them to be acceptable from a planning standpoint, and recommend that the applications be approved

Background

A public meeting was held by the Planning and Development Committee on May 30, 2022, at which time an Information Report (https://pub-mississauga.escribemeetings.com/filestream.ashx?DocumentId=26003) was received for information. Recommendation PDC-0045-2022 was then adopted by Council on June 8, 2022.

1. That the report dated May 6, 2022, from the Commissioner of Planning and Building regarding the application by 2415054 Ontario Inc. to permit a [transportation facility] parking lot for 106 commercial motor vehicles for a period of three years, under File T-OZ 21-6 W3, 1075 Canadian Place, be received for information.

2. That 1 oral submission be received.

There were some technical matters that needed to be resolved before the Planning and Building Department could make a recommendation on the application. Given the amount of time since the public meeting, full notification was provided.

Aerial Image of 1075 Canadian Place

Comments

REVISED DEVELOPMENT PROPOSAL

The applicant has made some minor modifications to the proposed concept plan including:

- The number of commercial motor vehicle spots has been reduced from 135 to 106
- Five passenger car spaces have been added to the layout to allow drivers to park their personal vehicles on-site while using their trucks
- A fence is proposed along the northerly property line
- Larger stone gravel material is proposed to prevent dust and gravel tracking on to the public road.

COMMUNITY ENGAGEMENT

Notice signs were placed on the subject lands advising of the proposed official zoning change. All property owners within 120 m (393 ft.) were notified of the application on September 3, 2021. Supporting studies were posted on the City's website at http://www.mississauga.ca/portal/residents/development-applications.

The public meeting was held on May 30, 2022. A consultant representing a neighbouring property made a deputation regarding the application. Responses to the issues raised at the public meeting and from correspondence received can be found in Appendix 2.

PLANNING ANALYSIS SUMMARY

The *Planning Act* allows any property owner within the Province of Ontario the ability to make a development application to their respective municipality in order to accommodate a particular development proposal on their site. Upon the submission of mandated technical information, the municipality is obligated under the *Planning Act* to process and consider the application within the rules set out in the Act.

The Province identifies through its *Provincial Policy Statement* matters that are of provincial interest, which require the development of efficient land use patterns and sustainability in urban areas that already exist. The Province has also set out the *Growth Plan for the Greater Golden Horseshoe*, which is designed to promote economic growth, increase housing supply and build communities that are affordable and safe, among other items. The Growth Plan requires municipalities to manage growth within already existing built up areas to take advantage of existing services to achieve this mandate. In order to meet required housing supply projections, the *Planning Act* instructs municipalities to make planning decisions that are consistent with the *Provincial Policy Statement* and the Growth Plan.

A detailed Planning Analysis is found in Appendix 2. The application is for a temporary use and is consistent with the *Provincial Policy Statement* and conforms to the *Growth Plan for the Greater Golden Horseshoe*, the Region of Peel Official Plan and Mississauga Official Plan.

The site is currently vacant and is being proposed to be used to permit parking for up to 106 commercial motor vehicles and accessory passenger vehicles. The use is proposed to be permitted for a maximum of three years.

Strategic Plan

The application is consistent with the Prosper pillar of the Strategic Plan by contributing to employment opportunities in the City.

Financial Impact

All fees paid by developers are strictly governed by legislation, regulation and City by-laws. Fees are required to be paid prior to application approval, except where otherwise may be prescribed. These include those due to the City of Mississauga as well as any other external agency.

Conclusion

In summary, the proposed development is a temporary parking lot for commercial motor vehicles and the approved site plan has been designed to minimize negative impacts on

neighbouring lands and to protect the natural environment. The proposed temporary zoning is acceptable from a planning standpoint and should be approved.

Attachments

Appendix 1: Information Report
Appendix 2: Detailed Planning Analysis

A. Whittemore

Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Prepared by: Andrea Dear MCIP, RPP, Development Planner

City of Mississauga

Corporate Report

MISSISSAUGA

Date: May 6, 2022 To: Chair and Members of Planning and Development Committee From: Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building	Originator's file: T-OZ 21-6 W3 Meeting date: May 30, 2022

Subject

PUBLIC MEETING INFORMATION REPORT (WARD 3)

Temporary Rezoning application to permit a parking lot for 135 commercial motor vehicles for a period of three years
1075 Canadian Place (east of Tomken Road and south of Eglinton Avenue)
Owner: 2415054 Ontario Inc.
File: T-OZ 21-6 W3

Recommendation

That the report dated May 6, 2022, from the Commissioner of Planning and Building regarding the application by 2415054 Ontario Inc. to permit a parking lot for 135 commercial motor vehicles for a period of three years, under File T-OZ 21-6 W3, 1075 Canadian Place, be received for information.

Background

The application has been deemed complete and circulated for technical comments. The purpose of this report is to provide preliminary information on the application and to seek comments from the community. The report consists of two parts, a high level overview of the application and a detailed information and preliminary planning analysis (Appendix 1).

PROPOSAL

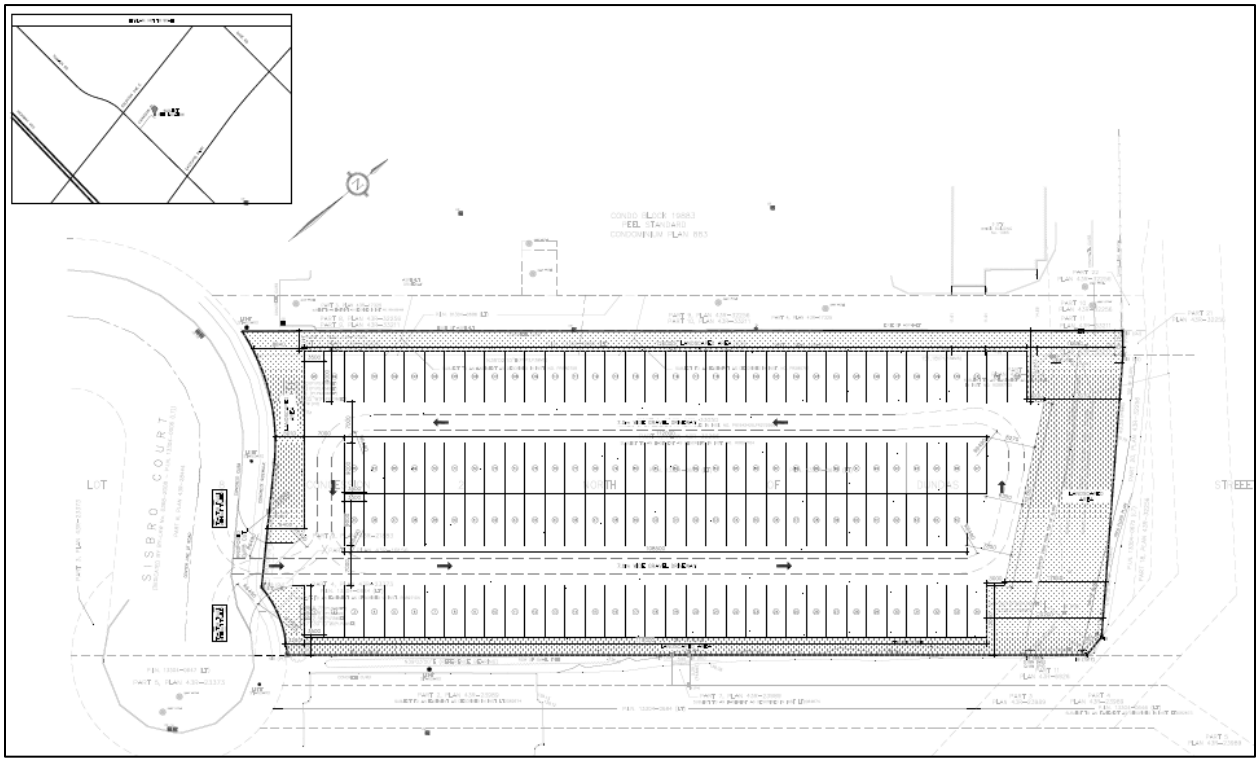
The temporary rezoning application is required to permit a parking lot for 135 commercial motor vehicles for a period of three years. The zoning by-law needs to be temporarily amended from **D** (Development) and **E2** (Employment) to **D-Exception** (Development) and **E2-Exception** (Employment) to implement this land use proposal.

During the ongoing review of this application, staff may recommend different land use designations and zoning categories to implement the proposal.

Comments

The property is located at the east end of Canadian Place (east of Tomken Road and south of Eglinton Avenue) within the Northeast Employment Area. The site is currently vacant.

Aerial Photo



Applicant's Concept Site Layout

LAND USE POLICIES AND REGULATIONS

The *Planning Act* allows any person within the Province of Ontario to submit development applications to the local municipality to build or change the use of any property. Upon submitting all required technical information, the municipality is obligated under the *Planning Act* to process and consider these applications within the rules set out in the Act.

The *Provincial Policy Statement* (PPS) establishes the overall policy directions on matters of provincial interest related to land use planning and development within Ontario. It sets out province-wide direction on matters related to the efficient use and management of land and infrastructure; the provision of housing; the protection of the environment, resources and water; and, economic development.

The *Growth Plan for the Greater Golden Horseshoe* (Growth Plan) builds upon the policy framework established by the PPS and provides more specific land use planning policies which support the achievement of complete communities, a thriving economy, a clean and healthy environment and social equity. The Growth Plan establishes minimum intensification targets and requires municipalities to direct growth to existing built-up areas and strategic growth areas to make efficient use of land, infrastructure and transit.

The *Greenbelt Plan* works together with the Growth Plan to build upon the policy of the PPS to protect the natural environment and determine where and how growth should be

accommodated. The City of Mississauga is not located within the Greenbelt Plan area and, as such, the Greenbelt Act does not apply. However, the Credit River and Etobicoke Creek flow through Mississauga and connect natural heritage systems within the Greenbelt to Lake Ontario. The *Greenbelt Plan* provides direction to municipalities for the long term protection and enhancement of these external connections.

The *Planning Act* requires that municipalities' decisions regarding planning matters be consistent with the PPS and conform with the applicable provincial plans and the Region of Peel Official Plan (ROP). Mississauga Official Plan is generally consistent with the PPS and conforms with the Growth Plan, the *Greenbelt Plan*, the *Parkway Belt West Plan* and the ROP.

Conformity of this proposal with the policies of Mississauga Official Plan is under review.

Additional information and details are found in Appendix 1, Section 4.

AGENCY AND CITY DEPARTMENT COMMENTS

Agency and department comments are summarized in Appendix 1, Section 6.

Engagement and Consultation

A community meeting was not held for this application given its location in an Employment Area. Comments have been made by the community and are summarized in Appendix 1, Section 5.

Financial Impact

All fees paid by developers are strictly governed by legislation, regulation and City by-laws. Fees are required to be paid prior to application approval, except where otherwise may be prescribed. These include those due to the City of Mississauga as well as any other external agency.

Conclusion

All agency and City department comments have been received. The Planning and Building Department will make a recommendation on this project after the public meeting has been held and the issues have been resolved. The matters to be addressed include: provision of additional technical information, review of reduced parking standards, ensuring compatibility of the temporary use and community consultation and input.

Attachments

Appendix 1: Detailed Information and Preliminary Planning Analysis

Originator's file: T-OZ 21-6 W3

Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Prepared by: Andrea Dear MCIP, RPP, Development Planner

Detailed Information and Preliminary Planning Analysis

Owner: 2415054 Ontario Inc.

1075 Canadian Place

Table of Contents

1. Proposed Development

The applicant proposes to permit a parking lot for 135 commercial motor vehicles for a period of three years. A temporary rezoning application is required to permit the proposed temporary use (refer to Section 4 for details concerning the proposed amendments).

Development Proposal		
Application submitted:	Received: June 3, 2021 Deemed complete: July 13, 2021	
Developer/ Owner:	2415054 Ontario Inc.	
Applicant:	Land & Building Experts	
Number of units:	n/a	
Existing Gross Floor Area:	vacant	
Proposed Gross Floor Area:	n/a	
Height:	n/a	
Lot Coverage:	n/a	
Floor Space Index:	n/a	
Landscaped Area:	23%	
Net Density:	n/a	
Road Type:	Public Road	
Anticipated Population:	n/a	
Parking:	Required: n/a	Provided: 135
Green Initiatives:	n/a	

Supporting Studies and Plans

The applicant has submitted the following information in support of the applications which can be viewed at http://www.mississauga.ca/portal/residents/development-applications:

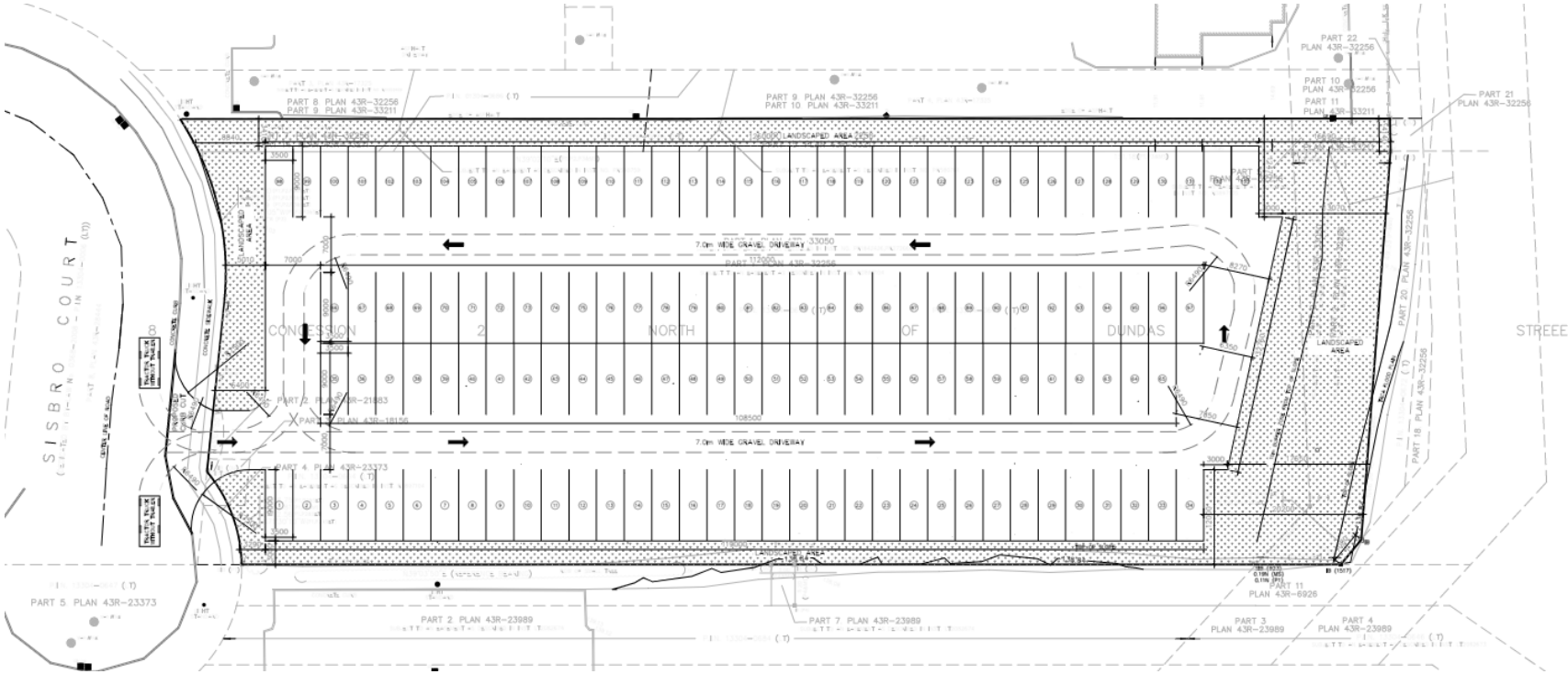
- Planning Justification Report
- Concept Site Plan
- Draft Zoning By-law
- Arborist Report
- Environmental Impact Study
- Slope Stability Report
- Stormwater Management Brief
- Functional Servicing Notes
- Grading and Servicing Plans

The application is not subject to review by the Urban Design Advisory Panel.

Application Status

Upon deeming the application complete, the supporting studies and plans were circulated to City departments and external agencies for review and comment. These comments are summarized in Section 6 of this appendix and are to be addressed in future resubmissions of the application.

No pre-application community meeting was held, but correspondence by the public has been received. Refer to Section 5 of this appendix for a summary of written submissions received about the application.



Concept Site Layout

2. Site Description

Site Information

The property is located at the east end of Canadian Place which is located south of Eglinton Avenue East and east of Tomken Road within the Northeast Employment Area. The site is currently vacant.

Property Size and Use	
Frontages:	53 m (173.8 ft.)
Depth:	151 m (495.4 ft.)
Gross Lot Area:	0.82 ha (2.0 acres)
Existing Uses:	vacant

Aerial of subject site

Street view of subject site facing east from Canadian Place

Site History

- 1995 – Committee of Adjustment application to permit an outdoor driving range and batting cage in an **M1** (Industrial 1) zone
- June 20, 2007 – Zoning By-law 0225-2007 came into force. The subject lands were zoned **D** (Development) and **E2** (Employment 2). The **D** zone permits the existing non-conforming uses to remain, but not expand
- November 14, 2012 – Mississauga Official Plan came into force designating **Business Employment** and **Greenlands** in the Northeast Employment Area
- 2017 – Preliminary application (PAM) to permit a dome over the driving range (no formal application submitted)
- 2019 – Preliminary application (PAM) to permit a commercial parking lot (no formal application submitted)

3. Site Context

Surrounding Land Uses

The subject site is rectangular in shape and located on the northeast side of Canadian Place. To the north is an Industrial plaza with a range of uses including restaurant and take out restaurant, medical and dental office, personal service and other office uses. To the east is Little Etobicoke Creek. To the immediate south is a vacant parcel of land and beyond that is Philip Pocock Catholic Secondary School. To the west is Canadian Place and a vacant lot, beyond which are industrial buildings.

The surrounding land uses are:

North: Industrial Plaza
East: Little Etobicoke Creek
South: Vacant Land, Philip Pocock Catholic Secondary School
West: Canadian Place, vacant land and industrial buildings

Neighbourhood Context

The subject property is located in the Northeast Employment Area, where development began in the early 2000s and continues to develop today. The surrounding neighbourhood contains commercial and employment uses located on Eglinton Avenue East and Tomken Road.

North of the site is Eglinton Avenue East, which is identified as a Corridor in Mississauga Official Plan. The corridor has a variety of commercial and employment uses.

Aerial photo of 1075 Canadian Place

Demographics

Based on the 2016 census, the existing population of the Northeast Employment Area (West) area is 215 (due to Tyndall Retirement and Nursing Home) with a median age of this area being 85 (compared to the City's median age of 40). 10% of the neighbourhood population are of working age (15 to 64 years of age), with 2% children (0-14 years) and 88% seniors (65 years and over). By 2031 and 2041, the population for this area is forecasted to be 300 and 300 respectively. The average household size is 2 persons with 0% of people living in apartments in buildings that are five storeys or more. The mix of housing tenure for the area is 0 units (0%) owned and 0 units (0%) rented with a vacancy rate of approximately 0.9%*. In addition, the number of jobs within this Character Area is 87,199. Total employment combined with the population results in a PPJ for Northeast Employment Area (West) of 31 persons plus jobs per ha.

*Please note that vacancy rate data does not come from the census. This information comes from CMHC which demarcates three geographic areas of Mississauga (Northeast, Northwest, and South). This specific Character Area is located within the Northeast geography. Please also note that the vacancy rate published by CMHC is ONLY for apartments.

Other Development Applications

The following development applications are in process or were recently approved in the immediate vicinity of the subject property:

- File SP 22-59 W3 – 1060 Eglinton Avenue East – application submitted for an 8 storey long term care building
- File SP 19-70 W3 – 1030 Canadian Place – application in process for a one storey building with 3 take out restaurants
- File OZ 19-2 W3 – 900 Eglinton Avenue East – application in process for a place of religious assembly.
- File SPM 18-29 W3 – 1010-1022 Eglinton Avenue E – application in process for a 2 storey office building
- File OZ 17-7 W3 – 1108 and 1094 Eglinton Avenue East – application in process for two storey building containing retail commercial uses including motor vehicles

Community and Transportation Services

This application will have minimal impact on existing services in the community.

In comments dated October 21, 2021, Community Services notes that the subject site is adjacent to a City owned Park, which has an area of 12.8 hectares (31.8 ac.), is zoned **G1** (greenlands) and falls within a natural heritage system. Prior to zoning by-law approval, a buffer with a **G2-Exception** (greenlands) zone is to be applied between the City owned Greenbelt lands and the temporary parking lot. Details of the buffer based on the staking of the limits of the natural heritage system will be determined through an Environmental Impact Study (EIS). When the appropriate limits have been established, the lands will be gratuitously dedicated to the City.

The following major MiWay bus routes currently service the site:

- Route 51 – Tomken Road
- Routes 7 - Airport

- Route 35 – Eglinton – Ninth Line
- Route 87 – Meadowvale Skymark
- Route 302 - Philip Pocock – Bloor West
- Route 307 - Philip Pocock – Bloor East

4. Summary of Applicable Policies, Regulations and Proposed Amendments

The *Planning Act* requires that Mississauga Official Plan be consistent with the Provincial Policy Statement and conform with the applicable provincial plans and Regional Official Plan. The policy and regulatory documents that affect this application has been reviewed and summarized in the table below. Only key policies relevant to the application have been included. The table should be considered a general summary of the intent of the policies and should not be considered exhaustive. In the sub-section that follows, the relevant policies of Mississauga Official Plan are summarized. The development application will be evaluated based on these policies in the subsequent recommendation report.

Policy Document	Legislative Authority/Applicability	Key Policies
Provincial Policy Statement **(PPS)**	The fundamental principles set out in the PPS apply throughout Ontario. (PPS Part IV) Decisions of the council of a municipality shall be consistent with PPS. (PPS 4.1) The Official Plan is the most important vehicle for implementation of the Provincial Policy Statement (PPS 4.6)	Natural features and areas shall be protected for the long term. (PPS 2.1.1) Development shall generally be directed to areas outside of hazardous lands. (PPS 3.1.1) Sites with contaminants in land or water shall be assessed and remediated. (PPS 3.2.2)
Growth Plan for the Greater Golden Horseshoe **(Growth Plan)**	The Growth Plan applies to the area designated as the Greater Golden Horseshoe growth plan area. All decisions made on or after May 16, 2019 in respect of the exercise of any authority that affects a planning matter will conform with this Plan, subject to any legislative or regulatory provisions providing otherwise. (Growth Plan 1.2.2)	Municipalities will continue to protect any natural heritage features and areas in a manner that is consistent with the PPS and may continue to identify new systems in a manner that is consistent with the PPS. (Growth Plan 4.2.2.6)
Region of Peel Official Plan (ROP)	The Region of Peel approved MOP on September 22, 2011, which is the primary instrument used to evaluate development applications. The proposed development applications were circulated to the Region who has advised that in its current state,	The ROP identifies the subject lands as being located within Peel's Urban System. The portions of the lands associated with Little Etobicoke Creek are considered Regional Core Greenlands. General objectives of ROP, as outlined in Section 5.3, include conserving the

Policy Document	Legislative Authority/Applicability	Key Policies
	the applications meet the requirements for exemption from Regional approval. Local official plan amendments are generally exempt from approval where they have had regard for the *Provincial Policy Statement* and applicable Provincial Plans, where the City Clerk has certified that processing was completed in accordance with the *Planning Act* and where the Region has advised that no Regional official plan amendment is required to accommodate the local official plan amendment. The Region provided additional comments which are discussed in Section 8 of this Appendix.	environment, achieving sustainable development, establishing healthy complete communities, achieving intensified and compact form and mix of land uses in appropriate areas that efficiently use land, services, infrastructure and public finances, while taking into account the characteristics of existing communities and services, and achieving an urban form and densities that are pedestrian-friendly and transit supportive. Identify, protect and support the restoration and rehabilitation of the Greenlands System in Peel. (ROP 2.3.1) Development and site alteration within the Core Areas of the Greenlands System are prohibited, with the exception of limited wildlife management, conservation, and passive recreational type uses. (ROP 2.3.2.6) More detailed mapping of the Core Areas of the Greenlands System will be provided in the area municipal official plans and will be further determined on a site specific basis through studies, as may be required by the area municipalities through the local planning approval process, in consultation with the Region and relevant agencies. An amendment to the Plan is not required for minor boundary adjustments to the Core Areas of the Greenlands System. (ROP 7.2.2.3)

Mississauga Official Plan

The policies of Mississauga Official Plan (MOP) implement provincial directions for growth. MOP is generally consistent with the PPS and conforms with the Growth Plan, Greenbelt Plan, PBWP and ROP. An update to MOP is currently underway to ensure MOP is consistent with and conform to changes resulting from the recently released Growth Plan, 2019 and Amendment No. 1 (2020).

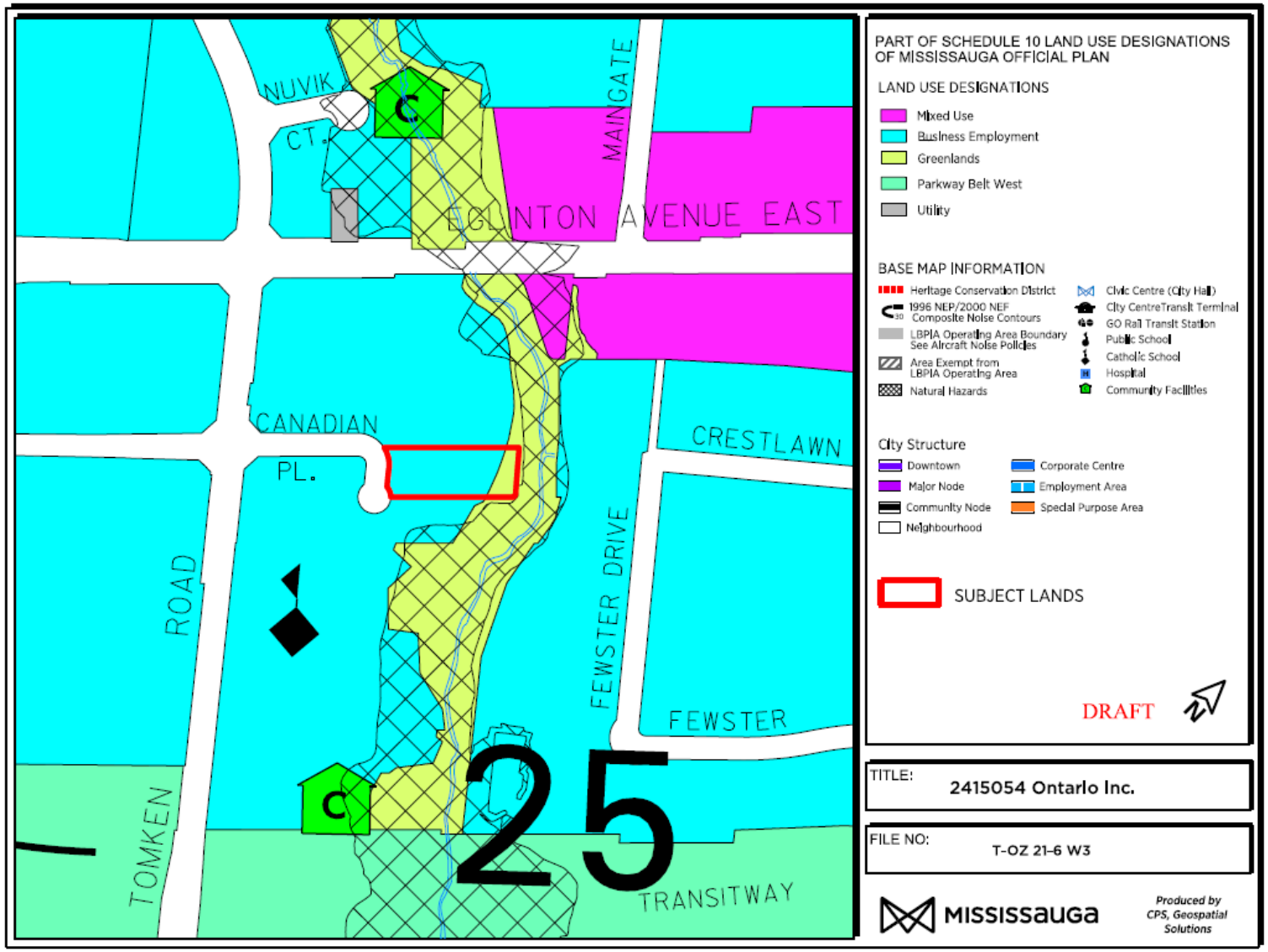
Existing Designation

The lands are located within the Northeast Employment Area and are designated **Business Employment** and **Greenlands**. The **Business Employment** designation permits a variety of employment uses including, but not limited to, banquet hall, commercial parking facility, commercial school, financial institution, manufacturing, motor vehicle body repair, overnight accommodation, restaurant, and transportation facilities. The portion of the lands designated **Greenlands** are not proposed to be altered as part of this application and a 10 meter buffer will be required. An Environmental Impact Study (EIS) was submitted in support of this application and the limits of the required buffer will be determined through the review and acceptance of the EIS.

The subject property is within 600 m (1,968.5 ft.) of the Tomken-403 BRT Station and, therefore, may be located within a “planned” Major Transit Station Area (MTSA) as defined by the Region of Peel. The boundaries for the MTSA will be delineated through a future municipal comprehensive review process, to be undertaken by the Region of Peel. Link for MTSA information: https://mississauga.maps.arcgis.com/apps/dashboards/dc8aa0db74ef49949e76a3330fe77016)

Proposed Designation

The applicant is not proposing to change the Business Employment designation.



Excerpt of Northeast Employment Area

Relevant Mississauga Official Plan Policies

The following policies are applicable in the review of this application. In some cases the description of the general intent summarizes multiple policies.

	General Intent
Chapter 5 Direct Growth	Mississauga will establish strategies that protect, enhance and expand the Green System. (Section 5.2.1 Development will be sensitive to the existing and planned context and will include appropriate transition in use, built form, density and scale. (Section 5.3.5.6)
Chapter 6 Value The Environment	Mississauga will ensure land use compatibility (Section 6.1.1 e.) Buffers are vegetated protection areas that provide a physical separation of development from the limits of natural heritage features and Natural Hazard Lands. Buffers will be determined on a site specific basis as part of an Environmental Impact Study to the satisfaction of the City and conservation authority. (Section 6.3.7 and Section 6.3.8) The exact limit of components of the Natural Heritage System will be determined through site specific studies such as an Environmental Impact Study. (Section 6.3.10) The Natural Heritage System will be protected, enhanced, restored and expanded by ensuring that development in or adjacent to the Natural Heritage System protects and maintains natural heritage features and their ecological functions and placing those areas into public ownership. (Section 6.3.24.a & b) Lands identified as or meeting the criteria of a Significant Natural Area, as well as their associated buffers will be designated Greenlands and zoned to ensure their long term protection. (Section 6.3.26) Development and site alteration will not be permitted within erosion hazards associated with valleylands and watercourse features. In addition, development and site alteration must provide appropriate buffer to erosion hazards, as established to the satisfaction of the City and conservation authority. (Section 6.3.47)
Chapter 9 Build A Desirable Urban Form	Mississauga will develop an urban form based on the urban system and the hierarchy identified in the city structure as shown on Schedule 1: Urban System. (Section 9.1.1) Development proposals will demonstrate compatibility and integration with surrounding land uses and the public realm by ensuring adequate privacy, sunlight and sky views are maintained. (Section 9.5.1.9) Noise will be mitigated through appropriate built form and site design. Mitigation techniques such as fencing and berms will be discouraged. (Section 9.5.1.12)

	General Intent
	Site development will be required to incorporate stormwater best management practices, protect the environment, preserve significant trees, incorporate techniques to minimize urban heat island effects and provide landscape that beautifies the site. (Section 9.5.2.11) Where surface parking is permitted, the parking should incorporate stormwater best management practices, provide safe and legible raised walkways, incorporate universal design standards. The parking should be configured to allow future development, provide appropriate landscape treatment to provide shading of parking areas and a landscape buffer at the street edge. (Section 9.5.5.3)
Chapter 10	Mississauga will encourage a range of employment opportunities reflective of the skills of the resident labour force. (Section 10.1.1) Mississauga will identify and protect lands for a diversity of employment uses to meet current and future needs. (Section 10.1.2) Mississauga will facilitate the operation and where appropriate, the expansion of existing businesses as permitted by this Plan. In some locations, alternative land uses may be identified to encourage the relocation of existing businesses to allow the lands to redevelop in accordance with the planning vision for the area. Development proponents may be required to submit satisfactory studies prior to development. (Section 10.1.6)
Chapter 11 General Land Use Designations	Lands designated Greenlands are associated with natural hazards and/or natural areas where development is restricted. (Section 11.2.3.1) Permitted uses on Greenlands include conservation related uses, including flood control and/or erosion management, passive recreational uses are also permitted. (Section 11.2.3.2)
Chapter 19 Implementation	City Council may pass by-laws to authorize the temporary use of land for a purpose that is otherwise prohibited by the zoning by-law, as permitted by the provisions of the Planning Act (Section 19.9.1) A temporary use which conforms to this Plan may be permitted by a temporary use by-law to allow (Section 19.9.2): a. an unfamiliar use on a trial basis; b. the use of an available building until the rehabilitation or redevelopment of the building for a use permitted by this Plan is warranted by future market conditions; or **c. the use of vacant land for a parking lot that would otherwise not be permitted.** 19.9.3 The following conditions will apply to all uses permitted by a temporary use by-law (Section 19.9.3): a. extensions of the period of temporary use may be permitted by subsequent by-laws but should generally not continue for more than a total of ten years for a temporary use of a garden suite and three years in all other cases as per the Planning Act; b. no new buildings or expansion of buildings, except for temporary or movable structures, will be permitted; c. the temporary use permitted must be compatible with adjacent land uses, or measures to mitigate any adverse impacts must be applied; d. no adverse impacts on traffic or transportation facilities in the area may result, and sufficient parking must be provided on-site; e. no adverse impact on community infrastructure; f. no adverse impacts on the assessment base; g. the temporary use will not jeopardize the eventual planned land use; and h. temporary buildings must conform to the property standards by-law.

Mississauga Zoning By-law

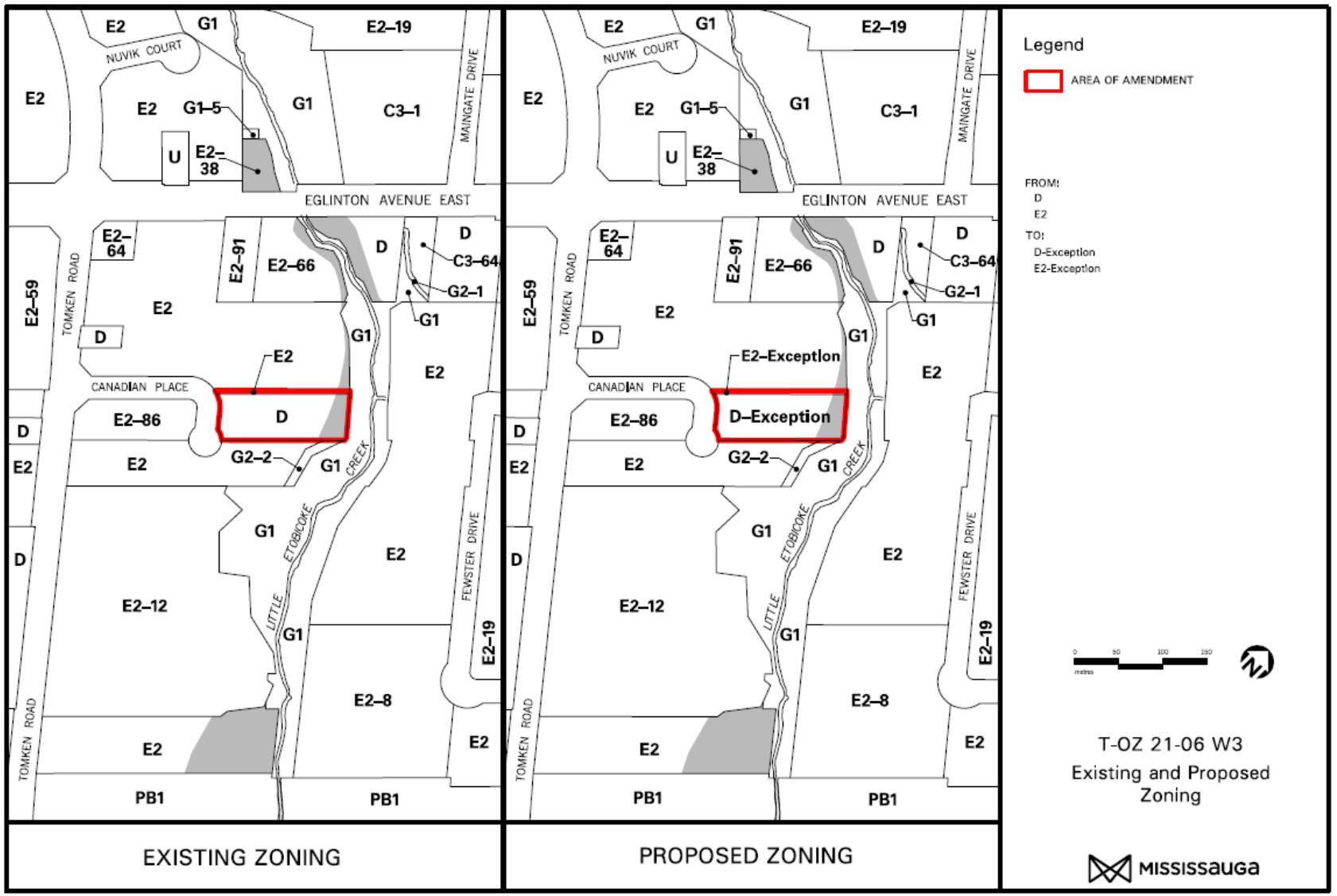
Existing Zoning

The portion of the site proposed for the temporary use is currently zoned **D** (Development), which permits only the legally existing structures and uses to remain and **E2** (Employment), which permits a range of employment and commercial uses.

Proposed Zoning

The applicant is proposing to temporarily zone the property to permit to permit a parking lot for 135 commercial vehicles for a period of three years.

Through the processing of the application staff may recommend a more appropriate zone category for the development in the Recommendation Report.



Excerpt of Zoning Map 27

Proposed Zoning Regulations

Zone Regulations	E2 (Employment 2) Zone Regulations	D (Development) Zone Regulations	Proposed E2 – Exception (Temporary) and D-Exception (Temporary) Zone Regulations
Permitted Uses	A range of employment uses including but not limited to **manufacturing facility**, **truck terminal**, **warehouse distribution facility**, **restaurant**, **veterinary clinic**, **overnight accommodation**, **truck fuel dispensary facility**, and **parking lot**.	A **building** or **structure** legally **existing** on the date of passing of this By-law and the **existing** legal **use** of such **building** or **structure**	A **parking lot** for 135 **commercial motor vehicles**
Regulations	Minimum landscape buffer to a street – 4.5 m (14.7 ft.) Minimum landscape buffer abutting an Employment Zone – 0.0 m (0.0 ft.) Minimum landscape buffer abutting a Greenbelt Zone – 4.5 m (14.7 ft.)	The erection of new **buildings** or **structures** and the enlargement or replacement of **existing buildings** and **structures** shall not be permitted	The **use** be permitted on a temporary basis for a period not longer than 3 years from the date of approval Minimum landscape buffer to a street – 3.29 m (10.8 ft.) Minimum landscape buffer abutting an Employment Zone – 3.5 m (11.5 ft.) Minimum landscape buffer abutting a

Zone Regulations	E2 (Employment 2) Zone Regulations	D (Development) Zone Regulations	Proposed E2 – Exception (Temporary) and D-Exception (Temporary) Zone Regulations
			Greenbelt Zone – 13.1m (42.9 ft.)
	Parking, Loading and Stacking Lane Regulations All parking areas, driveways and loading areas shall have a minimum overall vertical depth of 15.0 cm comprised of a stable surface such as asphalt, concrete, pervious materials or other hard-surfaced material. (0212-2015)	**Parking, Loading and Stacking Lane Regulations** All parking areas, driveways and loading areas shall have a minimum overall vertical depth of 15.0 cm comprised of a stable surface such as asphalt, concrete, pervious materials or other hard-surfaced material. (0212-2015)	Shall not apply

5. Community Questions and Comments

A pre-application community meeting was not held, however, Notice of Complete Application was issued and signage posted on the site. A number of written comments have been received by area business owners.

The following comments made by the community as well as any others raised at the public meeting will be addressed in the Recommendation Report, which will come at a later date.

Neighbouring business owners/operators raised concerns about the truck traffic, pedestrian vehicular safety, public health

due to exhaust and damage to the existing road network.

One comment was received claiming that these lands are encumbered as they are intended for parking required by the neighbouring commercial development. Staff have reviewed this claim and are unable to find evidence of this.

6. Development Issues

The following is a summary of comments from agencies and departments regarding the application:

Agency / Comment Date	Comments
Toronto and Region Conservation Authority (October 12, 2021)	TRCA staff have completed their review of the submitted materials and is satisfied that the proposed development is located sufficiently outside of the adjacent features and hazards on the property. Staff provided several comments relating to stormwater management and buffer plantings that will need to be addressed as part of future site plan application or TRCA permitting stages. Some of the items to be dealt with include quality of runoff, erosion sediment control and planting restoration.
City Community Services Department – Park Planning Section (October 21, 2021)	CS staff notes that the subject site is adjacent to a City owned Park identified as Park (P-259), which has an area of 12.87 hectares (31.8 ac.), zoned G1 and is within a natural heritage system. Prior to zoning by-law approval, a buffer with a G2-Exception zone is to be applied between the City owned Greenbelt lands and the temporary parking lot. Details of the buffer based on the staking of the limits of the natural heritage system will be determined through the Environmental Impact Study. Once the appropriate buffer is established, the lands will be required to be gratuitously dedicated to the City.
City Transportation and Works Department (April 6, 2022)	Technical reports and drawings have been submitted and are under review to ensure that engineering matters related grading, servicing, stormwater management, traffic and environmental compliance can be satisfactorily addressed to confirm the feasibility of the project, in accordance with City requirements. Based on a review of the materials submitted to date, the owner has been requested to provide additional technical details and revisions prior to the City making a recommendation on the application. **Stormwater** A Stormwater Management (SWM) Brief, prepared by Land & Building Experts, dated April 29th, 2021, was submitted in support of the proposed development. The purpose of the report is to evaluate the proposed development impact on the municipal drainage system (e.g. storm sewers, etc.) and to mitigate the quality and quantity impacts of stormwater run-off generated from the site. Mitigation measures may include improvements to existing stormwater servicing infrastructure, new infrastructure and/or on-site stormwater management controls. A proposed gravel lot is being proposed with no storm outlet, the catch basins are proposed to be directed to an underground stormwater chamber. The applicant is to clarify how runoff drainage is to be accommodated, confirm capacity and maintenance related to the proposed infiltration chambers. Approval of the proposed plan is also required from the

Agency / Comment Date	Comments
	Toronto and Region Conservation Authority. The applicant is required to provide further technical information to: • demonstrate the feasibility of the proposed storm system and clarify the proposed outlet, and, • demonstrate that there will be no impact on the City's existing drainage system **Traffic** Although there are no new buildings proposed for the subject lands, additional traffic information has been requested to be submitted and reviewed as part of the next submission. This requested information is to include the expected vehicular activity on site, turning templates for ingress and egress to Canadian Place and turning movement diagrams depicting internal site circulation. **Environmental Compliance** An Environmental Site Screening Questionnaire and Declaration (ESSQD) form, dated March 1, 2021, was submitted in support of the proposed use of the vacant lot as a temporary commercial parking lot. As staff has observed the presence of fill materials for the surfacing of the property, a written document, prepared by a Qualified Person as specified in Section 5 of Ontario Regulation 153/04 as amended, must be provided to the satisfaction of the Transportation and Works Department. The document must reference all applicable guidelines and regulations and provide a statement regarding the fill material located on-site is geotechnically and environmentally suitable, or will otherwise be or has been removed. **Noise** The proposal is for a temporary parking lot and is not considered a noise sensitive land use under the definitions outlined in the provincial Environmental Noise Guideline-NPC-300. Should the proposal change or the rezoning is not proposed as 'temporary' and allow all Business Employment uses (including overnight accommodations, funeral establishment, financial institution, commercial school, etc.) a noise report will be required to evaluate the potential impact both to and from the proposed development and recommend mitigation measures to reduce any negative impacts. **Engineering Plans and other information** The applicant has submitted a number of technical plans and drawings (i.e. Grading and Servicing Plans), which need to be revised as part of subsequent submissions.
Other City Departments and External Agencies	The following City Departments and external agencies offered no objection to these applications provided that all technical matters are addressed in a satisfactory manner: - Alectra - Arborist (City Property and Private Property) - Region of Peel - Transit - Fire - Imperial Oil - Sun-Canada Pipeline

Development Requirements

There are engineering matters including: grading, environmental, servicing and stormwater management that will require the applicant to enter into agreements with the City. Prior to any development proceeding on-site, the City will require the submission and review of an application for site plan approval.

7. Section 37 Community Benefits (Bonus Zoning)

Section 37 community benefits (bonus zoning) is not considered applicable for the current proposal as no official plan amendment is required and the net increase in height and density above existing zoning permissions does not meet the eligibility requirements of Corporate Policy 07-03-01 – Bonus Zoning.

8 Next Steps

Based on the comments received and the applicable Mississauga Official Plan policies, the following matters will have to be addressed:

- Is the proposed temporary use compatible with the existing and planned character of the area?

Upon satisfying the requirements of various City departments and external agencies, the Planning and Building Department will bring forward a recommendation report to a future Planning and Development Committee meeting. It is at this meeting that the members of the Committee will make a decision on the applications.

File tag save this document to K:\PLAN\DEVCONTL\GROUP\WPDATA\PDC Information Report Appendix

Recommendation Report
Detailed Planning Analysis

Owner: 2415054 Ontario Inc.

1075 Canadian Place

Table of Contents

1. Community Comments

Comments from the public were generally directed towards concerns regarding truck traffic, safety and general nuisance. Below is a summary and response to the specific comments heard.

Comment
The neighbouring property has a number of medical and convenience businesses and are concerned about the impact of truck traffic.

Response
The subject property is located in the Northeast Employment Area and truck use is to be expected.

Comment
The neighbouring property expressed concern that users of the transportation facility (parking lot) will trespass and leave their personal vehicles on their property and then access the subject lands.

Response
The subject application has been amended to include delineated spaces for passenger cars.

Comment
The neighbouring property representative raised concern at the unsightliness of litter that may come from the subject site.

Response
While no litter is anticipated to be generated by this facility, the application has been amended to include a fence along the north property line to partially screen the facility.

2. Updated Agency and City Department Comments

UPDATED AGENCY AND CITY DEPARTMENT COMMENTS

Stormwater
The Stormwater Management (SWM) Brief prepared by Land & Building Experts, dated January 5, 2023, indicates that an increase in stormwater runoff will occur with the development of the site. In order to mitigate the change in impervious area from the proposed development and/or impact to the receiving municipal drainage system, on-site stormwater management controls for the post development discharge is required. The applicant has demonstrated a satisfactory stormwater servicing concept. Infiltration trenches on site are being proposed to mitigate increased runoff.

Environmental
An Environmental Site Screening Questionnaire and Declaration form, dated March 1, 2021, and a letter titled “Sampling of gravel fill, 1075 Canadian Place – Mississauga”, dated February 21, 2023 and prepared by Maat Environmental Engineering Corp., were submitted in support of the proposed use of the vacant lot as a temporary transportation facility with suitable fill materials from an environmental perspective.

Traffic
As there are no buildings proposed for the subject site, the Traffic Planning Section has no concern with the temporary use by-law to permit a transportation facility for commercial motor vehicles.

Noise
The proposal is for a temporary transportation facility, which is not considered a noise sensitive land use as defined by the Provincial Environmental Noise Guideline-NPC-300, therefore, a Noise Report was not required for review.

Other information
Upon receipt of a rezoning application for a permanent use, additional technical details will be required to facilitate a permanent use which may require a development agreement and new site plan.

3. *Provincial Policy Statement*, 2020 (PPS) and the *Growth Plan for the Greater Golden Horseshoe* (Growth Plan) 2019 and Amendment No. 1 (2020)

The *Provincial Policy Statement* (PPS) and the *Growth Plan for the Greater Golden Horseshoe* (Growth Plan) provide policy direction on matters of provincial interest related to land use planning and development and directs the provincial government's plan for growth and development that supports economic prosperity, protects the environment and helps communities achieve a high quality of life.

Both the PPS and the Growth Plan recognize that the official plan is the most important vehicle for implementation of these policies as "comprehensive, integrated and long-term planning is best achieved through official plans".

Under the *Planning Act*, all planning decisions must be consistent with the PPS and conform to the Growth Plan.

4. Consistency with PPS

The Public Meeting Report dated May 30, 2022 (Appendix 1) provides an overview of relevant policies found in the PPS. The PPS includes policies that allow for a range of intensification opportunities and appropriate development standards, including:

Section 2.2.1 of the PPS states that natural features should be protected for the long term.

The subject site and proposal is for the temporary use of the lands for a transportation facility (parking lot).Through the approved site plan and temporary use by-law, the property’s natural features are being protected. As outlined in this report, the proposed development supports the general intent of the PPS.

5. Conformity with Growth Plan

The Growth Plan was updated May 16, 2019, in order to support the "More Homes, More Choice" government action plan that addresses the needs of the region's growing population.

Section 4.2.2.6 of the Growth Plan states that municipalities will continue to protect any natural heritage features and areas in a manner that is consistent with the PPS and may continue to identify new systems in a manner that is consistent with the PPS.

The proposed development conforms to the Growth Plan as it provides an appropriate buffer to the natural heritage features.

6. Region of Peel Official Plan

As summarized in the public meeting report dated May 30, 2022 (Appendix 1), the proposed development does not require an amendment to the Region of Peel Official Plan. The subject property is located within the Urban System of the Region of Peel. Portions of the subject property associated with Little Etobicoke Creek, are considered Regional Core Greenlands. General Objectives in Section 2 and General Policies in Section 2.3.1 direct municipalities to protect and support the restoration and rehabilitation of the Greenlands System in Peel.

The proposed development conforms to ROP as it is an appropriate temporary use of land where all uses and activities will be located outside of the delineated Greenlands.

When a formal application for a permanent use on the lands is received, the City will require that the Greenlands be rehabilitated and/or restored and be dedicated to the City.

7. Mississauga Official Plan (MOP)

The proposal does not require an amendment to the Mississauga Official Plan.

Section 19.9 of Mississauga Official Plan, does however, contemplate temporary use by-laws and sets out a criteria by which an application is to be evaluated. Planning staff have undertaken an evaluation of the relevant policies of the PPS, Growth Plan and MOP, including those found in Section 19.9 against this proposed development application.

The following is an analysis of the key policies and criteria:

Section 19.9.2 states that a temporary use which conforms to MOP may be permitted by a temporary use by-law to allow:

- An unfamiliar use on a trial basis
- The use of an available building until the rehabilitation or redevelopment of the building for a use permitted by MOP is warranted by future market conditions; or
- The use of vacant land for a parking lot that would otherwise not be permitted.

The subject site is designated **Business Employment,** which permits a banquet hall, commercial parking facility, commercial school, financial institution, manufacturing, motor vehicle body repair, overnight accommodation, restaurant, and transportation facilities, but is zoned **D** (Development) and **E2** (Employment) which does not permit a transportation facility.

Section 19.9.3 of MOP provides conditions that will apply to all uses permitted by a temporary use by-law, including:

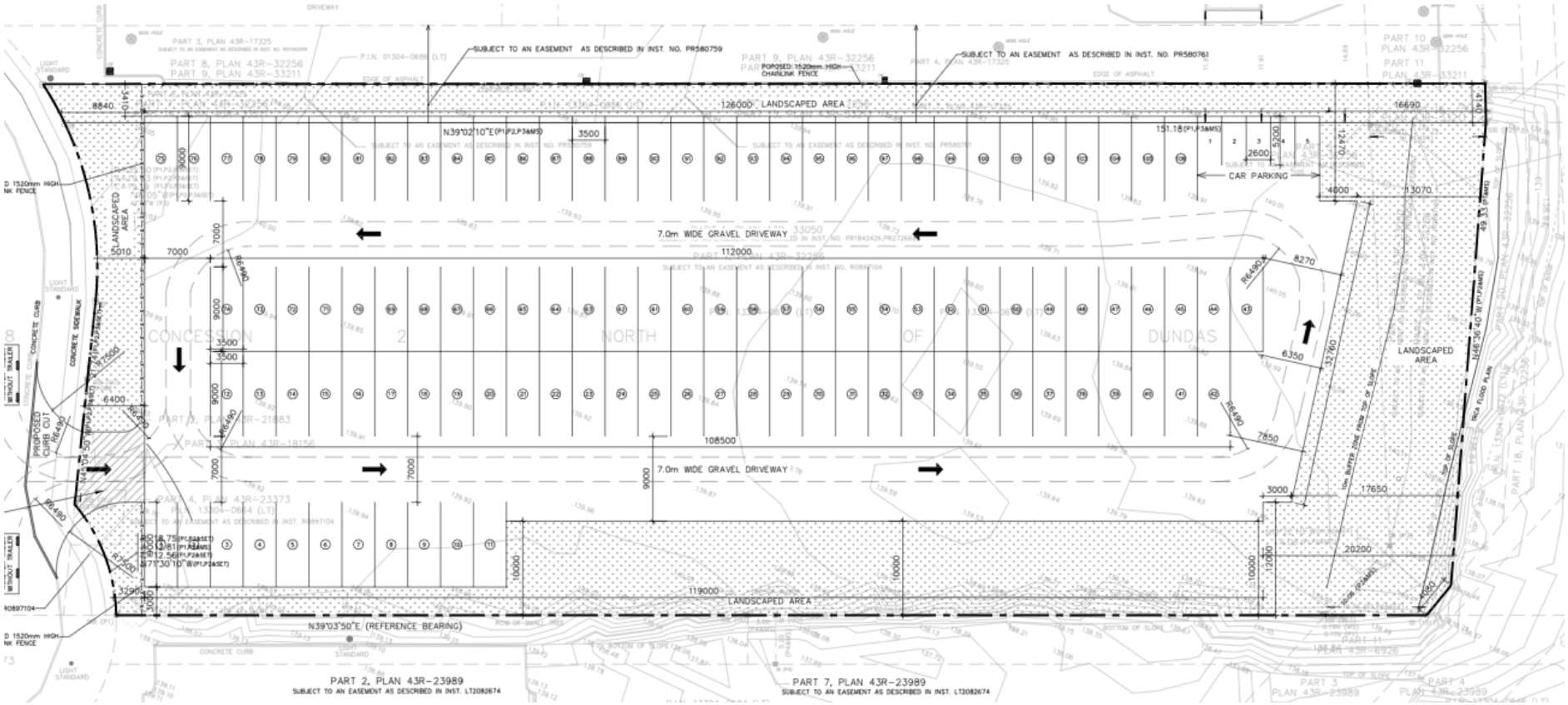
- extensions of the period of temporary use may be permitted by subsequent by-laws but should generally not continue for more than a total of ten years for a temporary use of a garden suite and three years in all other cases as per the Planning Act;
- no new buildings or expansion of buildings, except for temporary or movable structures, will be permitted;
- the temporary use permitted must be compatible with adjacent land uses, or measures to mitigate any adverse impacts must be applied;
- no adverse impacts on traffic or transportation facilities in the area may result, and sufficient parking must be provided on-site;
- no adverse impact on community infrastructure;
- no adverse impacts on the assessment base;
- the temporary use will not jeopardize the eventual planned land use; and
- temporary buildings must conform to the property standards by-law.

The proposed transportation facility will allow for the parking of 106 commercial motor vehicles. This use is permitted in the Business Employment designation in MOP, and is not anticipated to cause any adverse impacts on the surrounding area. No permanent buildings are proposed and, as described in Section 8 of this report, mitigation measures will be implemented to contain any possible nuisances on abutting lands. Further, the proposed use is not anticipated to impact any future development potential of this site or the surrounding area.

8. Revised Site Plan

The applicant has provided a revised site plan which incorporates the following changes:

- The number of commercial motor vehicle spaces has been reduced from 135 to 106
- Five passenger car spaces have been added to allow drivers to park their personal vehicles on-site while using their trucks
- A fence is proposed along the northerly property line
- Larger stone gravel material is proposed to prevent dust and spillover on to the public road



Proposed Site Plan

9. Zoning

The proposed **D - Exception** (Development) **zone** is appropriate to accommodate the proposed temporary parking lot for 106 commercial motor vehicles and associated passenger vehicles.

Below is an updated summary of the proposed site specific zoning provisions:

Proposed Zoning Regulations

Zone Regulations	E2 (Employment 2)	D (Development)	Proposed D2 – Exception and E2 Exception
Permitted Uses			
	A range of employment uses including but not limited to **manufacturing facility**, **truck terminal**, **warehouse distribution facility**, **restaurant**, **veterinary clinic**, **overnight accommodation**, **truck fuel dispensary facility**, and **parking lot**	A **building** or **structure** legally **existing** on the date of passing of this By-law and the **existing** legal **use** of such **building** or **structure**	A **transportation facility** for 106 **commercial motor vehicles** (and **accessory passenger vehicles**)
Regulations			
Minimum **landscape buffer** abutting a **street**	4.5 m (14.8 ft.)	n/a	3.5 m (11.5 ft.)
Minimum **landscape buffer** abutting an **Employment Zone**	0.0 m (0.0 ft.)	n/a	3.5 m (11.5 ft.)
Minimum **landscape buffer** abutting a **Greenbelt Zone**	4.5 m (14.8 ft.)	n/a	13.0 m (43 ft.)

Zone Regulations	E2 (Employment 2)	D (Development)	Proposed D2 – Exception and E2 Exception
Parking, Loading and **Stacking Lane**	All parking areas, driveways and loading areas shall have a minimum overall vertical depth of 15.0 cm comprised of a stable surface such as asphalt, concrete, pervious materials or other hard-surfaced material. (0212-2015)	All parking areas, driveways and loading areas shall have a minimum overall vertical depth of 15.0 cm comprised of a stable surface such as asphalt, concrete, pervious materials or other hard-surfaced material. (0212-2015)	Shall not apply

10. Site Plan

The applicant has received site plan approval under City file SPAX 22-90 W3. Although site plan approval is typically obtained after zoning is in force and in effect, the temporary nature of the proposed use, the fact that no buildings are proposed and the relatively minor scope of the site plan application are such that staff were comfortable processing the temporary rezoning and site plan applications concurrently.

11. Conclusions

In conclusion, City staff has evaluated the application to permit a transportation facility for 106 commercial motor vehicles for a period of three years against the *Provincial Policy Statement*, the *Growth Plan for the Greater Golden Horseshoe*, Region of Peel Official Plan and Mississauga Official Plan, and find that the proposed temporary use is appropriate.

T-OZ 21-6 W3
1075 Canadian Place

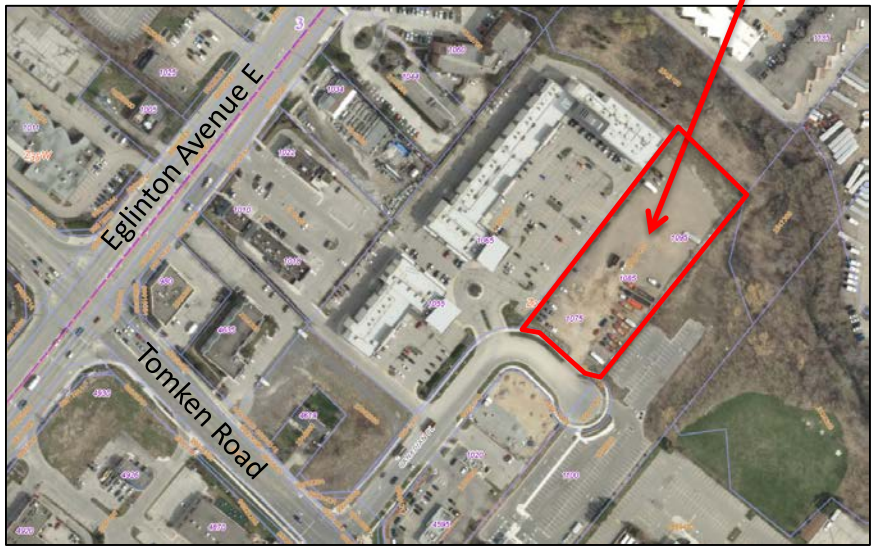
Recommendation Report
Planning and Building Department
2415054 Ontario Inc.

MISSISSAUGA

Application Timeline:

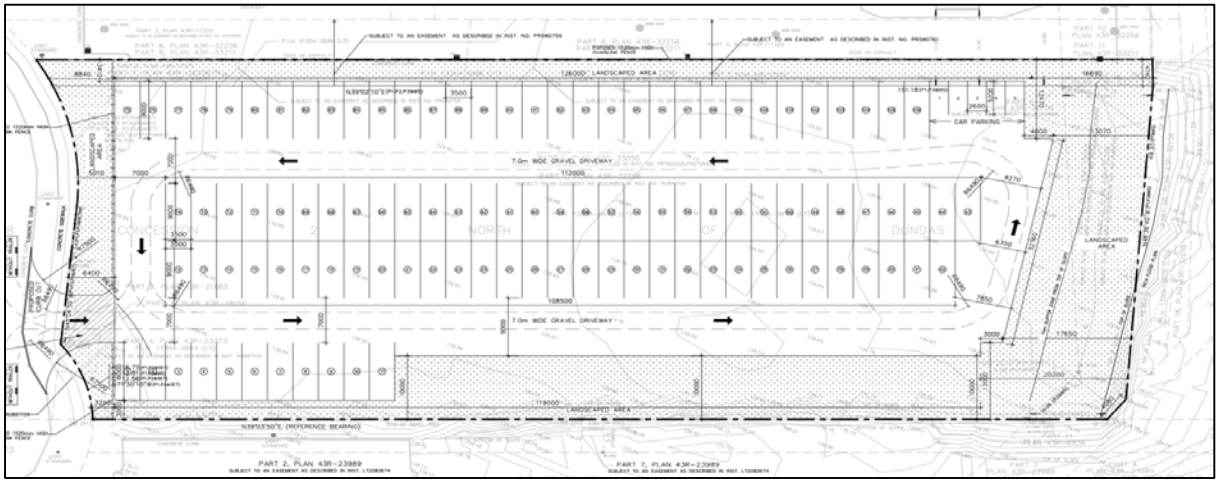
July 13, 2021 – Application Deemed Complete
July 28, 2021 – Notice of the Application
May 30, 2022 – Public Meeting – Information Report
May 29, 2023 – Public Meeting – Recommendation Report

Subject Lands



Development Proposal

- Transportation Facility
- 106 Commercial Vehicle Parking Spaces
- 5 Passenger Vehicle Parking Spaces
- For a period of 3 years



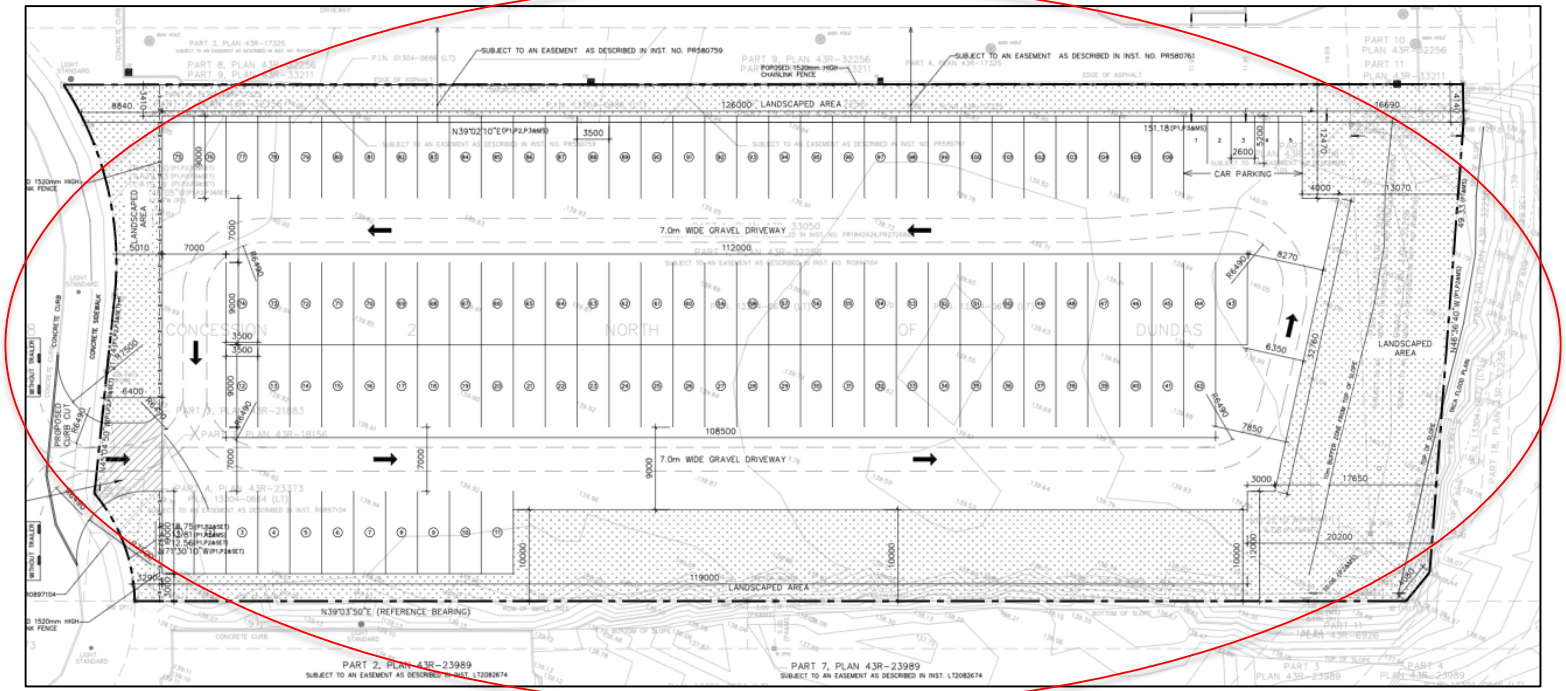
Amendments requested:

- An Official Plan Amendment is not required
- A Temporary Zoning By-law Amendment is required from the current **D** and **E2** zone to the Temporary **D-6**
- Section 19.9 of Mississauga Official Plan, contemplates temporary use by-laws and sets out a criteria by which an application is to be evaluated.

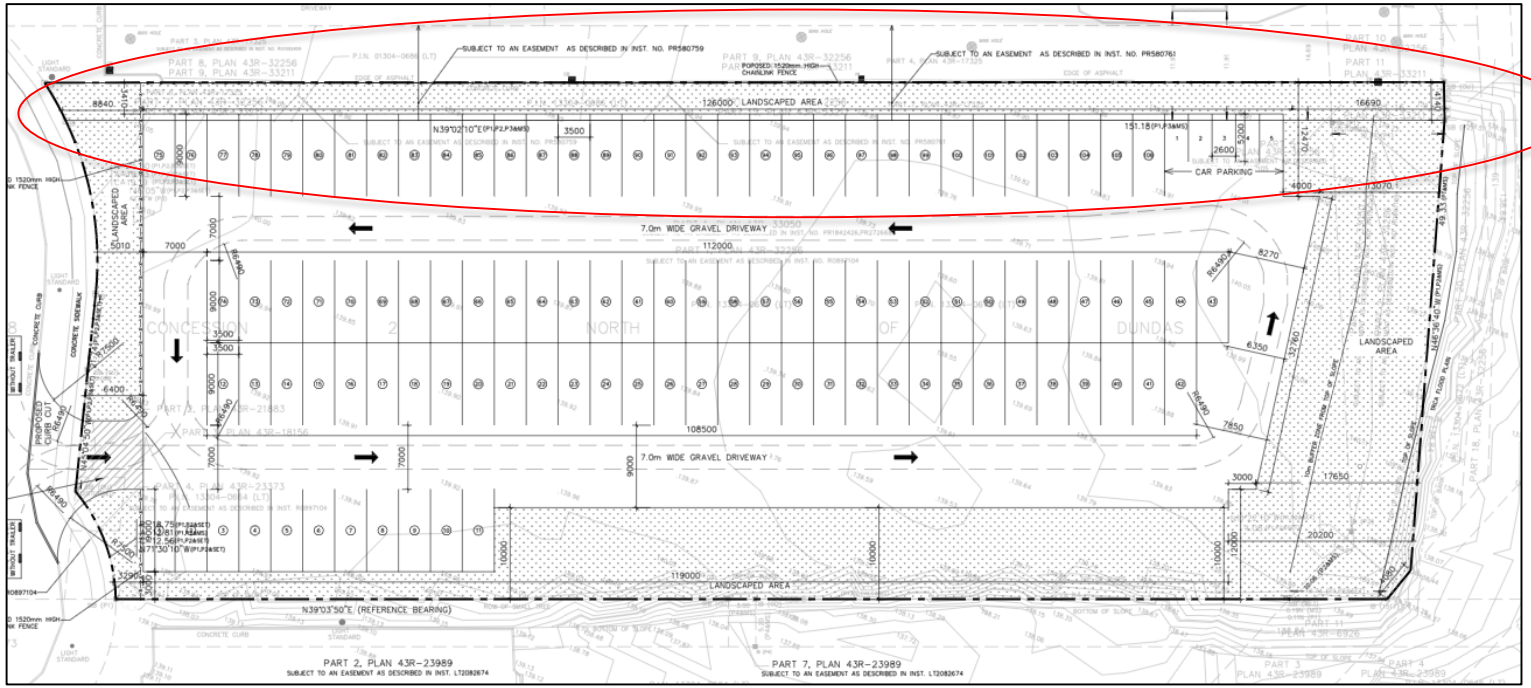
Mississauga Official Plan:

- extensions require subsequent by-laws up to a max of 10 years;
- no new buildings or expansion of buildings will be permitted;
- the temporary use must be compatible with adjacent land uses, or mitigation measures must be applied;
- no adverse impacts on traffic in the area may result, and sufficient parking must be provided on-site;
- the temporary use will not jeopardize the eventual planned land use; and
- temporary buildings must conform to the property standards by-law.

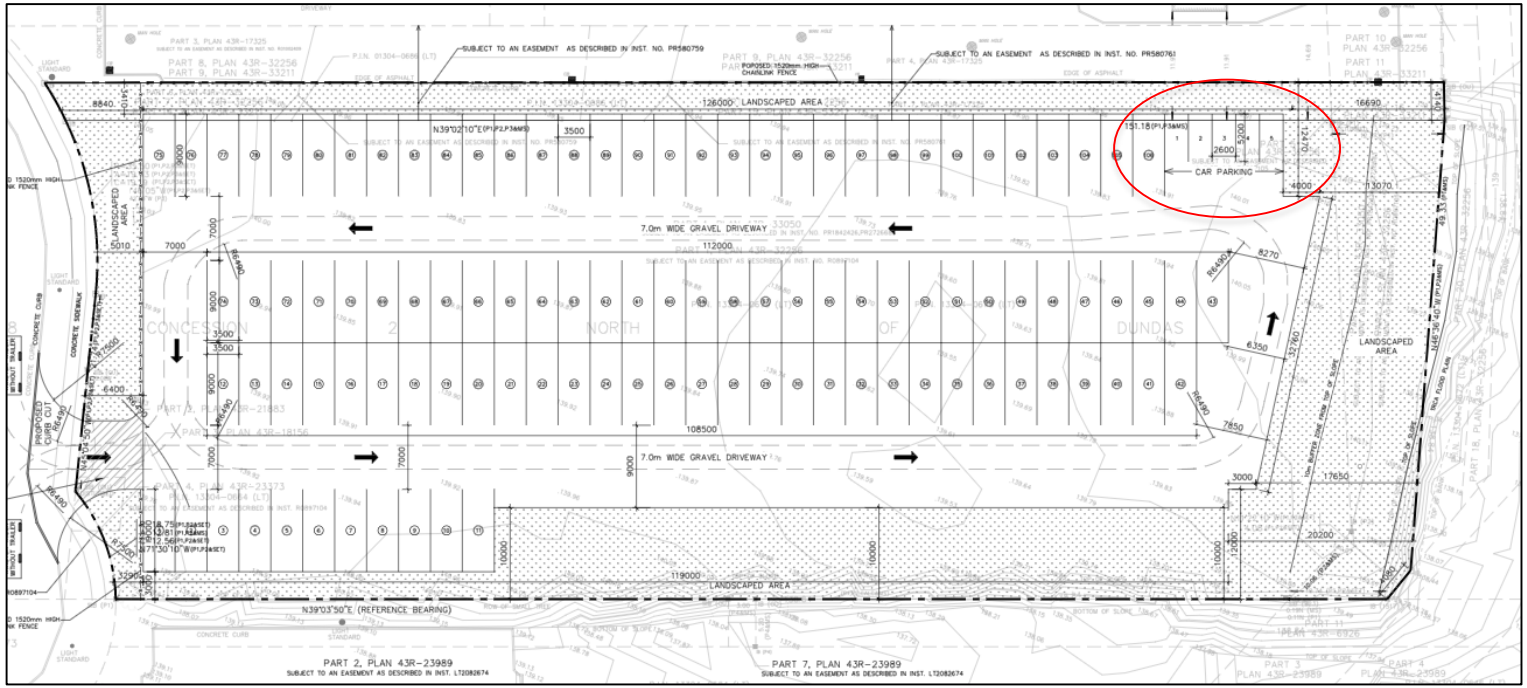
Mitigation Measures



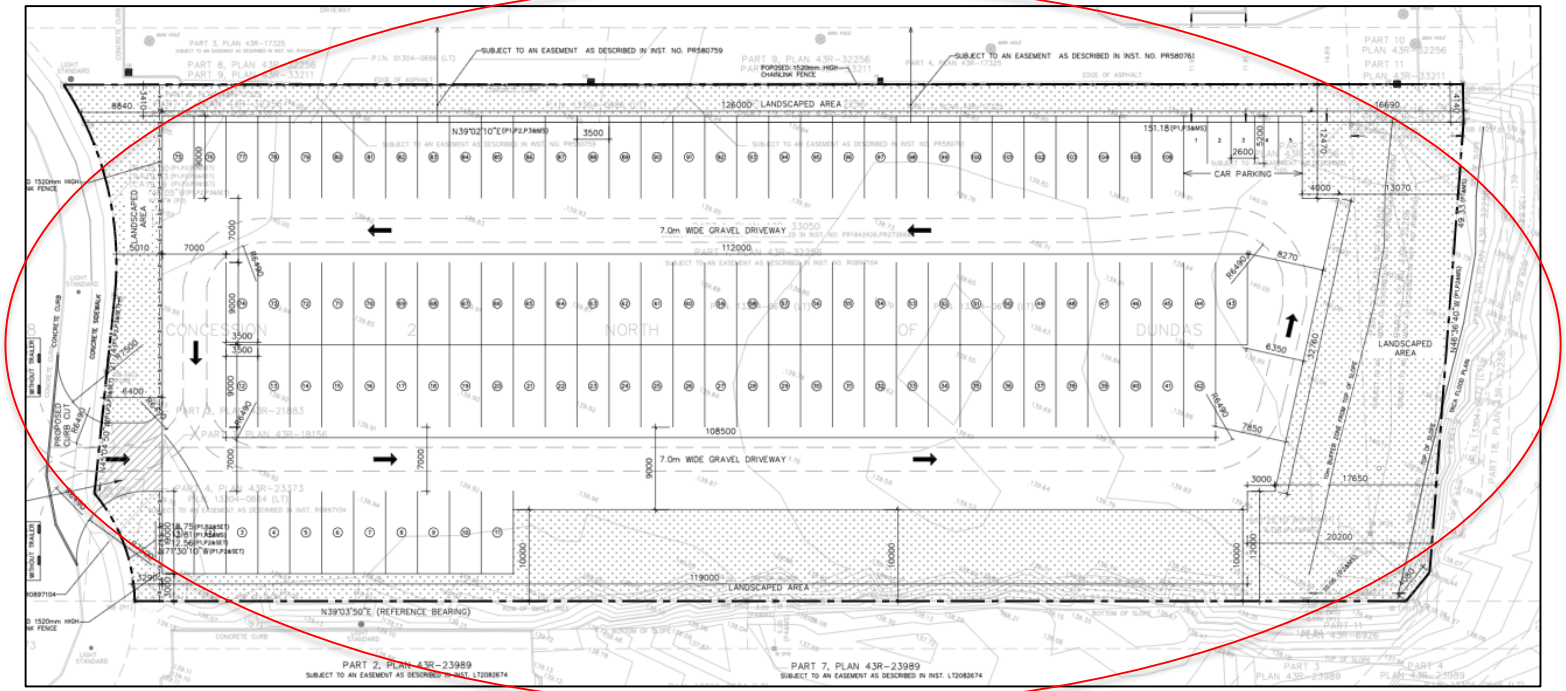
Mitigation Measures



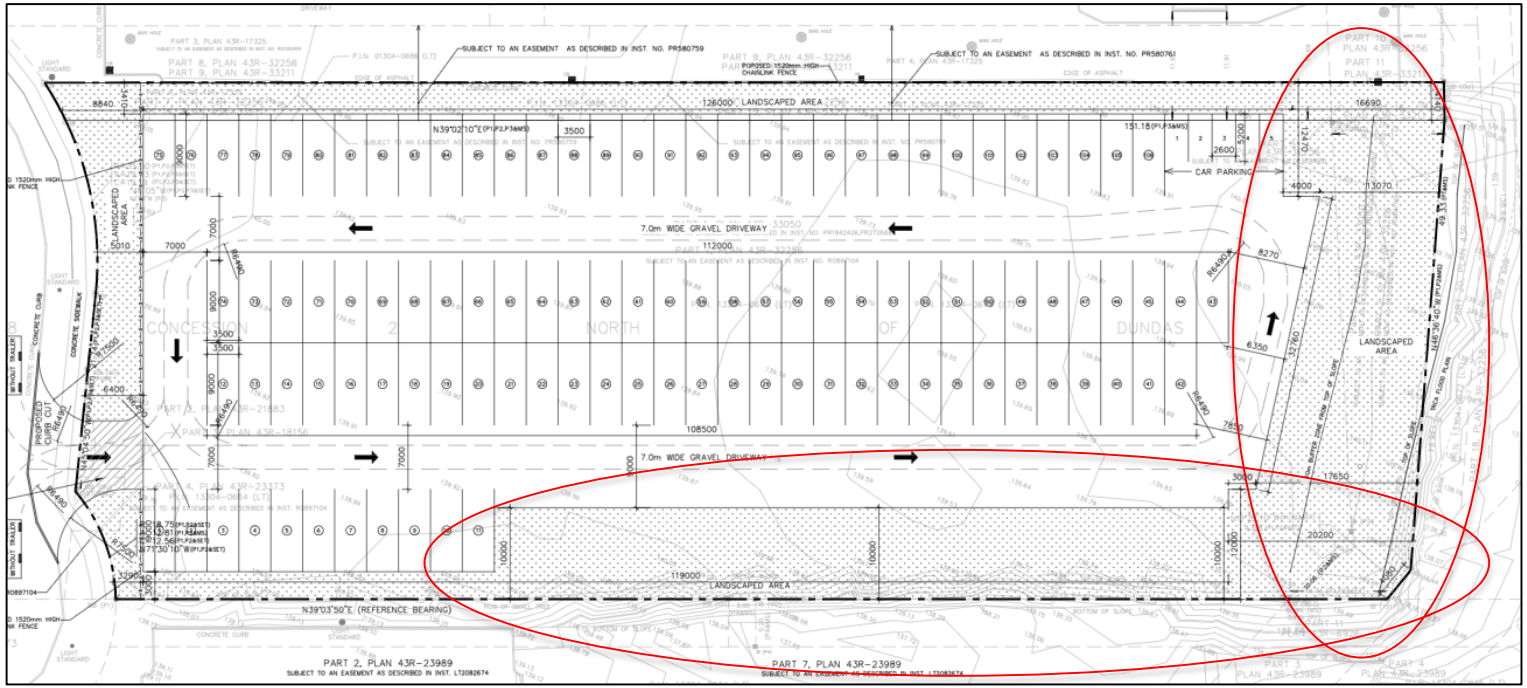
Mitigation Measures



Mitigation Measures



Mitigation Measures



Zoning By-law:

- The majority of the site is currently zoned **D** which only permits the previously existing non-conforming uses and **E2** which permits a variety of employment uses

- The temporary zoning will allow the use for a period of three years

Conclusion:

- The proposed development is a temporary parking lot for commercial motor vehicles and the approved site plan has been designed to minimize negative impacts on neighbouring lands and to protect the natural environment. The proposed temporary zoning is acceptable from a planning standpoint and should be approved.

Recommendations

1. That the application under File T-OZ 21-6 W3, 2415054 Ontario Inc., 1075 Canadian Place to temporarily change the zoning to D - exception (Development – Exception) to permit a transportation facility for 135 commercial motor vehicles for a period of three years, be approved, in conformity with the provisions outlined in Appendix 2 of the staff report dated May 5, 2023 from the Commissioner of Planning and Building.

City of Mississauga
Corporate Report

MISSISSAUGA

Date: May 5, 2023

To: Chair and Members of Planning and Development Committee

From: Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Originator's file:
OZ/OPA 22-25 W8

Meeting date:
May 29, 2023

Subject

PUBLIC MEETING INFORMATION REPORT (WARD 8)

Official Plan Amendment and Rezoning applications to permit five condominium apartment buildings of 11, 8, 7, 7 and 6 storeys with commercial uses at grade and seven blocks of stacked townhouses containing a total of 703 units
4099 Erin Mills Parkway, southeast corner of Erin Mills Parkway and Folkway Drive
Owner: Queenscorp (Erin Mills) Inc.
File: OZ/OPA 22-25 W8

Pre-Bill 109

Recommendation

That the report dated May 5, 2023, from the Commissioner of Planning and Building regarding the applications by Queenscorp (Erin Mills) Inc. to permit five condominium apartment buildings of 11, 8, 7, 7 and 6 storeys with commercial uses at grade and seven blocks of stacked townhouses containing a total of 703 units, under File OZ/OPA 22-25 W8, 4099 Erin Mills Parkway, be received for information.

Background

The applications have been deemed complete and circulated for technical comments. The purpose of this report is to provide preliminary information on the applications and to seek comments from the community. The report consists of two parts, a high level overview of the applications and a detailed information and preliminary planning analysis (Appendix 1).

PROPOSAL

The official plan amendment and rezoning applications are required to permit five condominium apartment buildings of 11, 8, 7, 7 and 6 storeys with commercial uses at grade for two of the buildings and seven blocks of stacked townhouses containing a total of 703 units (591 units within the condominium apartment buildings and 112 units within the stacked townhouses). The

development includes a private road with access proposed on Erin Mills Parkway, Sawmill Valley Drive and Folkway Drive. Following the review of the applications, Zoning Services has confirmed that the proposed mezzanines for Buildings A, B and E (condominium apartment buildings) meet the definition of a "storey" under Zoning By-law 0225-2007. The resulting number of storeys proposed for Buildings A, B and E increases from 10 to 11 storeys (Building A), and 6 to 7 storeys (Buildings B and E) however, the proposed building heights measured in metres remain unchanged. The applicant is proposing to amend the designation of the property from **Mixed Use** to **Residential High Density**. The zoning by-law will also need to be amended from **C2** (Neighbourhood Commercial) to **RA3-XX** (Apartments - Exception) to implement this development proposal.

During the ongoing review of these applications, staff may recommend different land use designations and zoning categories to implement the proposal.

Comments

The property is located at the southeast corner of Erin Mills Parkway and Folkway Drive within the Erin Mills Neighbourhood Character Area. The site is currently occupied by a commercial building primarily containing retail and services uses and surface parking.

Aerial image of 4099 Erin Mills Parkway

Applicant's rendering of the proposed condominium apartment buildings and stacked townhouses

LAND USE POLICIES AND REGULATIONS

The *Planning Act* allows any person within the Province of Ontario to submit development applications to the local municipality to build or change the use of any property. Upon submitting all required technical information, the municipality is obligated under the *Planning Act* to process and consider these applications within the rules set out in the Act.

The *Provincial Policy Statement* (PPS) establishes the overall policy directions on matters of provincial interest related to land use planning and development within Ontario. It sets out province-wide direction on matters related to the efficient use and management of land and infrastructure; the provision of housing; the protection of the environment, resources and water; and, economic development.

The *Growth Plan for the Greater Golden Horseshoe* (Growth Plan) builds upon the policy framework established by the PPS and provides more specific land use planning policies which support the achievement of complete communities, a thriving economy, a clean and healthy environment and social equity. The Growth Plan establishes minimum intensification targets and requires municipalities to direct growth to existing built-up areas and strategic growth areas to make efficient use of land, infrastructure and transit.

The *Planning Act* requires that municipalities' decisions regarding planning matters be consistent with the PPS and conform with the applicable provincial plans and the Region of Peel Official Plan (ROP). Mississauga Official Plan is generally consistent with the PPS and conforms with the Growth Plan, the *Greenbelt Plan*, the *Parkway Belt West Plan* and the ROP.

Conformity of this proposal with the policies of Mississauga Official Plan is under review.

Additional information and details are found in Appendix 1, Section 4.

AGENCY AND CITY DEPARTMENT COMMENTS

Agency and department comments are summarized in Appendix 1, Section 7.

Financial Impact

All fees paid by developers are strictly governed by legislation, regulation and City by-laws. Fees are required to be paid prior to application approval, except where otherwise may be prescribed. These include those due to the City of Mississauga as well as any other external agency.

Conclusion

All agency and City department comments have been received. The Planning and Building Department will make a recommendation on this project after the public meeting has been held and the issues have been resolved. The matters to be addressed include: provision of additional technical information including noise feasibility and road and signal operations, provision of

satisfactory commercial gross floor area, review of reduced parking standards, ensuring compatibility of new buildings including sun/shadow and wind conditions, and community consultation and input.

Attachments

Appendix 1: Detailed Information and Preliminary Planning Analysis

A. Whittemore

Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Prepared by: Michael Franzolini, MCIP, RPP, Development Planner

Detailed Information and Preliminary Planning Analysis

Owner: Queenscorp (Erin Mills) Inc.

4099 Erin Mills Parkway

Table of Contents

1. Proposed Development

The applicant proposes to develop five condominium apartment buildings of 11, 8, 7, 7 and 6 storeys with commercial uses at grade for two of the buildings and seven blocks of stacked townhouses. The proposed development contains 591 units within the condominium apartment buildings and 112 units within the stacked townhouses. Official plan amendment and rezoning applications are required to permit the proposed development (refer to Section 4 for details concerning the proposed amendments).

Development Proposal	
Applications submitted:	Received: November 15, 2022 Deemed complete: December 8, 2022
Developer/ Owner:	Queenscorp (Erin Mills) Inc.
Applicant:	Glen Schnarr and Associates Inc.
Number of units:	703 units (total) 591 units (condominium apartment) 112 units (stacked townhouse)
Existing Gross Floor Area:	To be determined
Proposed Gross Floor Area:	59 024 m^2 (635,329 ft^2)
Height:	A – 11 storeys / 33.6 m (110.2 ft.) B – 7 storeys / 21.2 m (69.6 ft.) C – 6 storeys / 21.2 m (69.6 ft.) D – 8 storeys / 26.0 m (85.3 ft.) E – 7 storeys / 21.9 m (71.9 ft.) Stacked townhouses – 4 storeys / 13.9 m (45.6 ft.)
Lot Coverage:	42.7%
Floor Space Index:	2.2 FSI
Landscaped Area:	38.6%

Development Proposal		
Road Type:	Private road	
Anticipated Population:	1,650*/** *Average household sizes for all units (by type) based on the 2016 Census **PPU values for Erin Mills Neighbourhood from the 2021 Census are not currently available	
Parking: Resident spaces Retail and visitor spaces Total	Required 818 spaces 146 spaces (with sharing) 964 spaces	Provided 773 spaces 141 spaces (with sharing) 914 spaces
Green Initiatives:	• EV parking supply • Cycling infrastructure • Rainwater harvesting system (Full list provided on Active Development webpage)	

Supporting Studies and Plans

The applicant has submitted the following information in support of the applications which can be viewed at http://www.mississauga.ca/portal/residents/development-applications:

- Planning Justification Report
- Context Plan
- Site Plan
- Statistics
- Survey
- Underground Parking Plans
- Floor Plans and Roof Plan
- Elevations and Sections

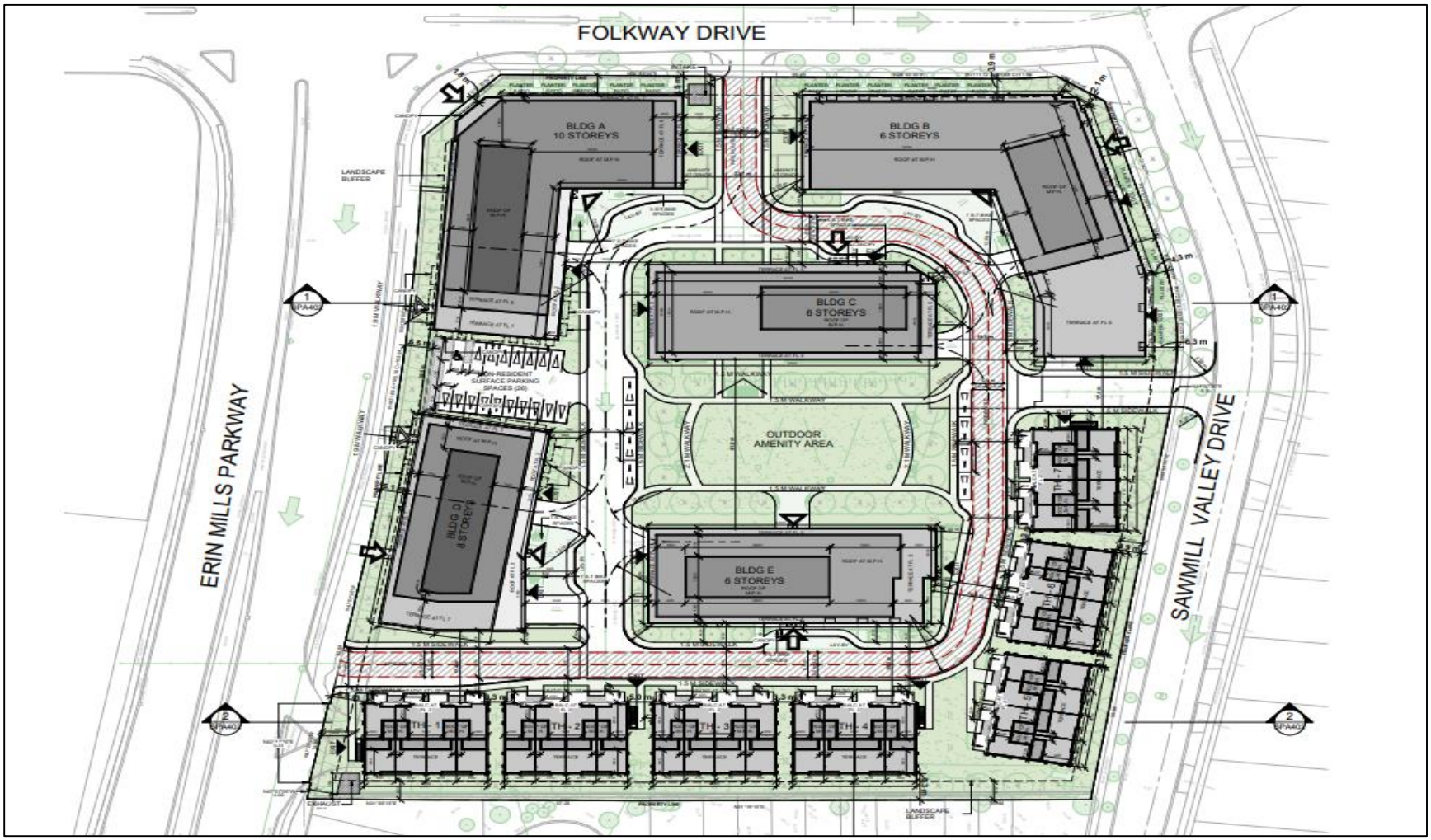
- Renderings
- Servicing, Grading, Erosion Sediment Control and Utility Plans
- Landscape Plan and Details
- Pre and Post Development Drainage Plans
- Tree Preservation Plan
- Arborist Report
- Draft Notice Sign
- Draft Official Plan and Zoning By-law Amendments
- Functional Servicing and Stormwater Management Report
- Geotechnical Investigation
- Housing Report
- Hydrogeological Assessment
- Low Impact Design Features
- Parcel Register
- Phase One Environmental Site Assessment
- Retail Market Impact Study
- Roadway Traffic Noise Feasibility Assessment
- Sun/Shadow Study
- Traffic Impact Study
- Urban Design Study
- Waste Management Plan
- Pedestrian Level Wind Study

Application Status

Upon deeming the applications complete, the supporting studies and plans were circulated to City departments and external agencies for review and comment. These comments are summarized in Section 7 of this appendix and are to be addressed in future resubmissions of the applications.

A community meeting was held by Ward 8 Councillor, Matt Mahoney, on March 1, 2023. Community focus group meetings were also held in March and April 2023 by Ward 8 Councillor, Matt Mahoney. Refer to Section 6 of this appendix for a summary of comments received at the community meeting and from written submissions received about the applications.

Site Plan, Elevations, Section and Renderings



Site Plan

Building A

Building B

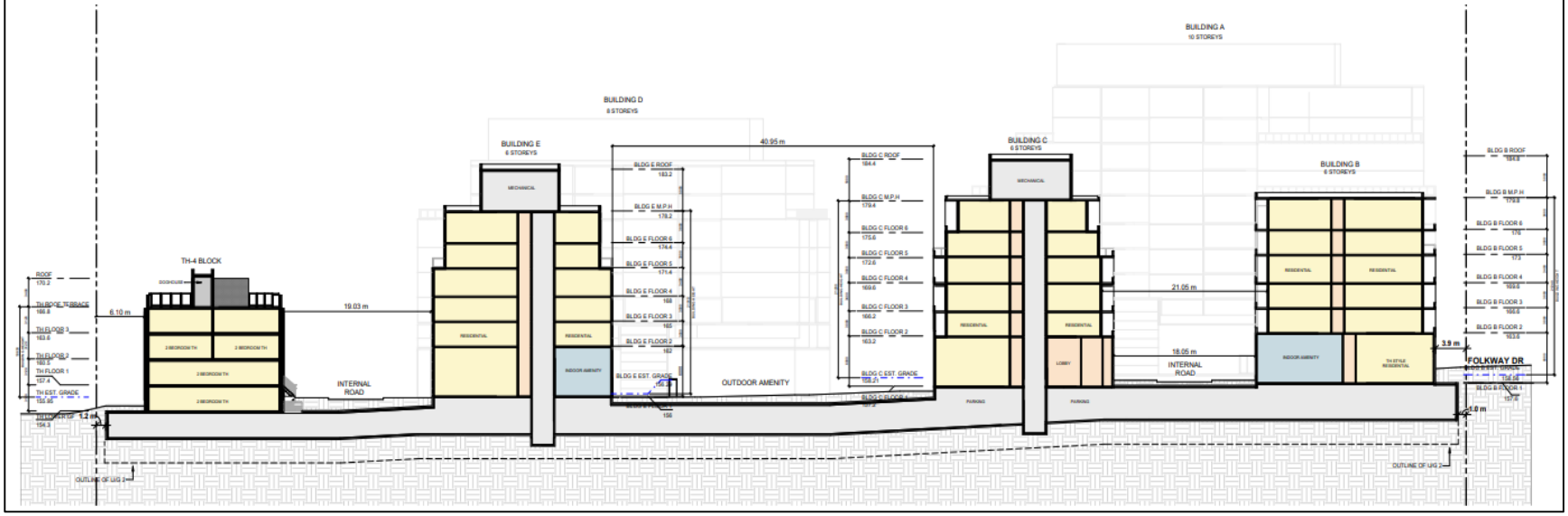
Building C

Building D

Elevations

Building E

Townhouses



Elevations and Section

Renderings

2. Site Description

Site Information

The property is located at the southeast corner of Erin Mills Parkway and Folkway Drive within the Erin Mills Neighbourhood Character Area. The site is currently occupied by a commercial building containing retail and service uses and surface parking.

Aerial photo of 4099 Erin Mills Parkway

Property Size and Use	
Frontages: Erin Mills Parkway Folkway Drive Sawmill Valley Drive	 +/- 175.4 m (575.5 ft.) +/- 127.0 m (416.7 ft.) +/- 179.3 m (588.3 ft.)
Gross Lot Area:	2.6 ha (6.4 ac.)
Existing Uses:	Retail and service uses

Image of existing condition facing south from Folkway Drive

Site History

- June 20, 2007 – Zoning By-law 0225-2007 came into force which zoned the property **C2** (Neighbourhood Commercial)
- November 14, 2012 – Mississauga Official Plan came into force which designated the property **Mixed Use**
- January 14, 2021 – Committee of Adjustment approved a minor variance application to permit a take-out restaurant less than 60 m (196.9 ft.) from a Residential Zone under Zoning By-law 0225-2007
- November 15, 2022 – Submission of official plan amendment and rezoning applications to permit five condominium apartment buildings of 11, 8, 7, 7 and 6

storeys with commercial uses at grade for two of the buildings and seven blocks of stacked townhouses containing a total of 703 units

3. Site Context

Surrounding Land Uses

The surrounding area includes low-rise residential buildings including but not limited to detached dwellings and townhomes, parkland, a place of religious assembly known as the Solel Congregation of Mississauga, a Petro-Canada gas station and a retirement building known as Sunrise of Erin Mills. The broader surrounding area includes Highway 403, parkland, apartment buildings and South Common Centre.

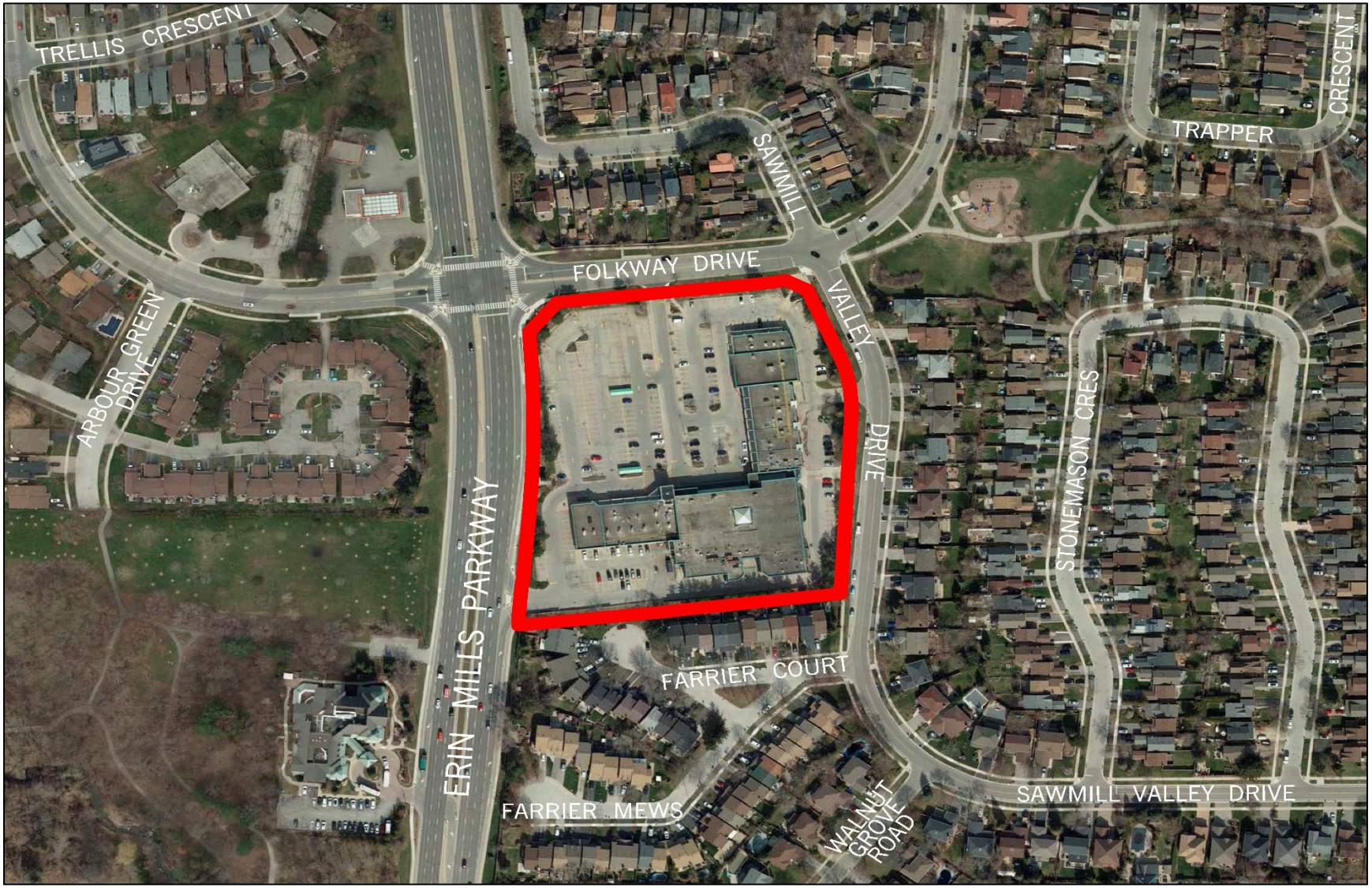
The immediate surrounding land uses are:

North: Folkway Drive, parkland and detached dwellings
East: Sawmill Valley Drive and detached dwellings
South: Farrier Court and linked dwellings
West: Erin Mills Parkway, townhomes and parkland

Neighbourhood Context

The property is located in the Erin Mills Neighbourhood Character Area. The Erin Mills Neighbourhood Character Area primarily contains residential uses in the form of low-rise residential building types including detached dwellings, semi-detached dwellings and townhomes, with higher density uses such as apartment buildings in select locations. Non-residential uses are generally located along Regional and City corridors including Erin Mills Parkway, Winston Churchill Boulevard and Burnhamthorpe Road West. South Common Centre is located approximately 600 m (1,969 ft) south of the property within the South Common Community Node Character Area.

The property is located along Erin Mills Parkway which is identified as a Corridor in Mississauga Official Plan. Existing uses in the surrounding area with frontage along Erin Mills Parkway are generally limited to South Common Centre, parkland, gas stations and Sunrise of Erin Mills.



Aerial photo of 4099 Erin Mills Parkway

Demographics

Based on the 2021 Census, the existing population of the Erin Mills Neighbourhood area is 38,320 with a median age of this area being 44 (compared to the City's median age of 40). 65% of the neighbourhood population are of working age (15 to 64 years of age), with 14% children (0-14 years) and 21% seniors (65 years and over). By 2031 and 2041, the population for this area is forecasted to be 42,790 and 42,720 respectively. The average household size is 3 persons with 7.2% of people living in apartments in buildings that are five storeys or more. The mix of housing tenure for the area is 11,330 units (86%) owned and 1,870 units (14%) rented with a vacancy rate of approximately 0.7%*. In addition, the number of jobs within this Character Area is 2,203. Total employment combined with the population results in a PPJ for Erin Mills Neighbourhood of 36 PPJ per ha.

*Please note that the vacancy rate does not come from the census. This information comes from CMHC which demarcates neighbourhood geographic areas. The Erin Mills Neighbourhood Character Area is located within the Churchill Meadows/Erin Mills neighbourhood geography. Please note that the vacancy rate published by CMHC is ONLY for apartments and is current as of October 2022.

Other Development Applications

There are no active development applications in the vicinity of the property.

Community and Transportation Services

The area is served by City facilities such as Trapper's Green Park. At a larger distance, Sawmill Creek Park and Folkway Park provide additional park options within the Erin Mills Neighbourhood.

Erin Mills Parkway is identified as a Transit Priority Corridor under Mississauga Official Plan. Transit priority measures such as queue jump lanes and transit signal priority are employed along Transit Priority Corridors. The following MiWay bus routes currently service the property:

- Route 29 – Park Royal-Homelands
- Route 48 – Erin Mills
- Route 110 – University Express

The property is also located approximately 1 km (3,280.8 ft.) south of Erin Mills Station for the Mississauga Transitway BRT and 1 km (3,280.8 ft.) north of the South Common Centre Transit Terminal.

A multi-use trail is planned along Erin Mills Parkway. Shared bicycle routes are also planned along Folkway Drive and Sawmill Valley Drive.

4. Summary of Applicable Policies, Regulations and Proposed Amendments

The *Planning Act* requires that Mississauga Official Plan be consistent with the Provincial Policy Statement and conform with the applicable provincial plans and Regional Official Plan. The policy and regulatory documents that affect these applications have been reviewed and summarized in the table below. Only key policies relevant to the applications have been included. The table should be considered a general summary of the intent of the policies and should not be considered exhaustive. In the sub-section that follows, the relevant policies of Mississauga Official Plan are summarized. The development applications will be evaluated based on these policies in the subsequent Recommendation Report.

Policy Document	Legislative Authority/Applicability	Key Policies
Provincial Policy Statement **(PPS)**	The fundamental principles set out in the PPS apply throughout Ontario. (PPS Part IV) Decisions of the council of a municipality shall be consistent with PPS. (PPS 4.1) The Official Plan is the most important vehicle for implementation of the Provincial Policy Statement (PPS 4.6)	Settlement areas shall be the focus of growth and development. (PPS 1.1.3.1) Land use patterns within settlement areas will achieve densities and a mix of uses that efficiently use land, resources, infrastructure, public service facilities and transit. (PPS 1.1.3.2.a) Planning authorities shall identify appropriate locations and promote opportunities for intensification and redevelopment. (PPS 1.1.3.3) Planning authorities shall provide for an appropriate range and mix of housing types and densities to meet projected needs of current and future residents of the regional market area. (PPS 1.4.3)
Growth Plan for the Greater Golden Horseshoe **(Growth Plan)**	The Growth Plan applies to the area designated as the Greater Golden Horseshoe growth plan area. All decisions made on or after May 16, 2019 in respect of the exercise of any authority that affects a planning matter will conform with this Plan, subject to any legislative or regulatory provisions providing otherwise. (Growth Plan 1.2.2)	Within settlement areas, growth will be focused in delineated built-up areas; strategic growth areas; locations with existing or planned transit; and, areas with existing or planned public service facilities. (Growth Plan 2.2.1.2 c) Complete communities will feature a diverse mix of land uses; improve social equity and quality of life; provide a range and mix of housing options; provide convenient access to a range of transportation options, public service facilities, open spaces and parks, and healthy, local and affordable food options; provide a more compact built form; mitigate and adapt to climate change impacts; and, integrate green infrastructure. (Growth Plan 2.2.1.4)

Policy Document	Legislative Authority/Applicability	Key Policies
		To achieve minimum intensification and density targets, municipalities will develop and implement urban design and site design official plan policies and other supporting documents that direct the development of high quality public realm and compact built form. (Growth Plan 5.2.5.6)
Region of Peel Official Plan (ROP)	The Region of Peel approved Mississauga Official Plan on September 22, 2011, which is the primary instrument used to evaluate development applications. The proposed development applications were circulated to the Region who has advised that in its current state, the applications meet the requirements for exemption from Regional approval. Local official plan amendments are generally exempt from approval where they have had regard for the *Provincial Policy Statement* and applicable Provincial Plans, where the City Clerk has certified that processing was completed in accordance with the *Planning Act* and where the Region has advised that no Regional official plan amendment is required to accommodate the local official plan amendment. The Region provided additional comments which are discussed in Section 8 of this Appendix.	The ROP identifies the subject lands as being located within Peel's Urban System. General objectives of ROP, as outlined in Section 5.3, include conserving the environment, achieving sustainable development, establishing healthy complete communities, achieving intensified and compact form and mix of land uses in appropriate areas that efficiently use land, services, infrastructure and public finances, while taking into account the characteristics of existing communities and services, and achieving an urban form and densities that are pedestrian-friendly and transit supportive.

Mississauga Official Plan

The policies of Mississauga Official Plan (MOP) implement provincial directions for growth. MOP is generally consistent with the PPS and conforms with the Growth Plan, Greenbelt Plan, PBWP and ROP. An update to MOP is currently underway to ensure MOP is consistent with and conform to changes resulting from the recently released Growth Plan, 2019 and Amendment No. 1 (2020).

Existing Designation

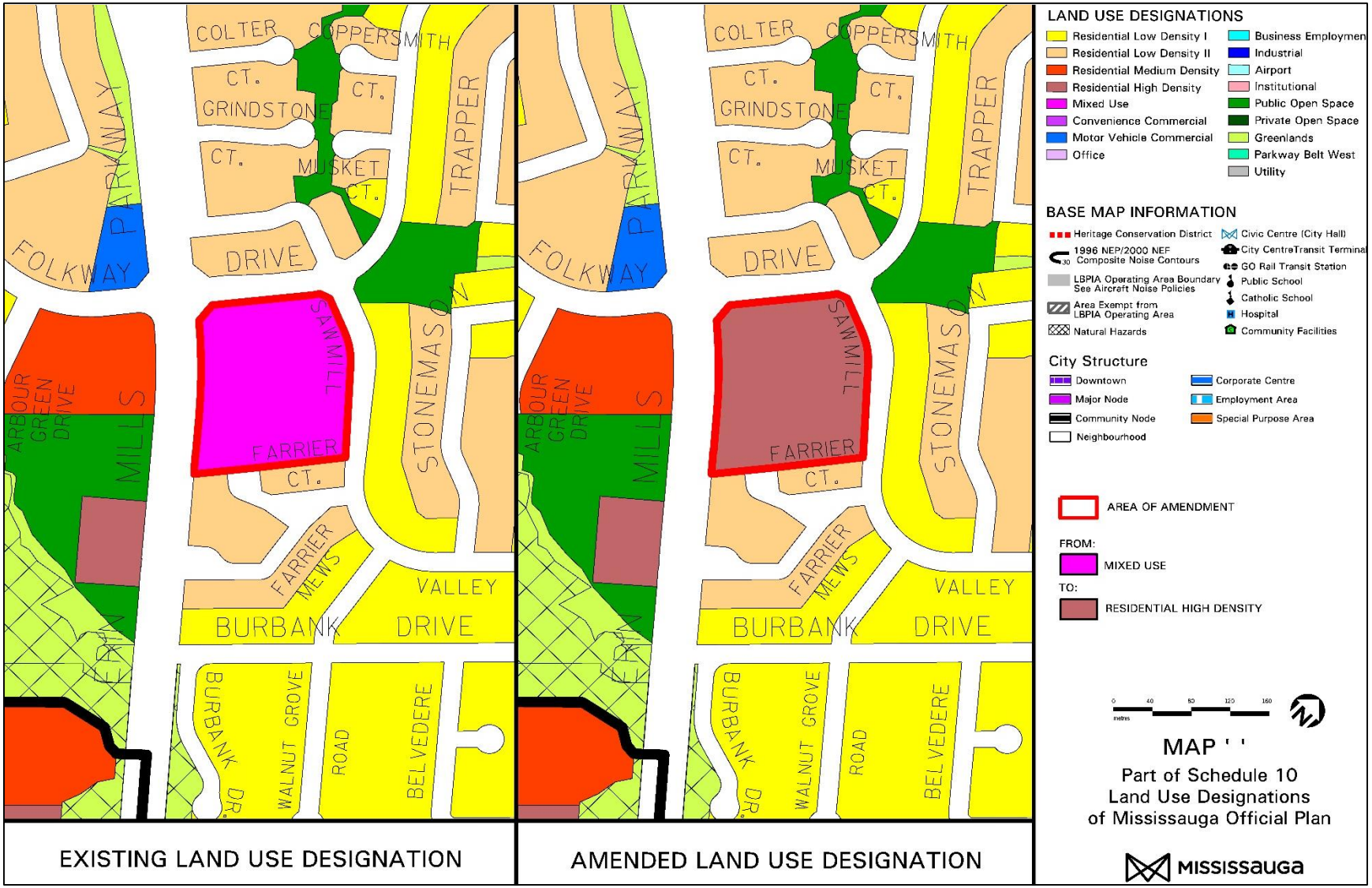
The lands are located within the Erin Mills Neighbourhood Character Area and are designated **Mixed Use**. The **Mixed Use** designation permits non-residential uses including a restaurant, retail store and secondary office, and residential uses in conjunction with non-residential uses.

The subject property is not located within a Major Transit Station Area (MTSA).

Proposed Designation

The applicant is proposing to change the designation to **Residential High Density** to permit the proposed condominium apartment buildings with commercial uses at grade and stacked townhouses. The applicant will need to demonstrate consistency with the intent of MOP and shall have regards for the appropriateness of the proposed built form in terms of compatibility with the surrounding context and character of the area. The applicant will also need to account for the property's planned function to provide a variety of retail, service and other uses to support the surrounding residents and businesses.

Through the processing of the applications, staff may recommend a more appropriate designation to reflect the proposed development in the Recommendation Report.



Excerpt of Erin Mills Neighbourhood Character Area

Relevant Mississauga Official Plan Policies

The following policies are applicable, and not exhaustive, in the review of these applications. In some cases the description of the general intent summarizes multiple policies.

	General Intent
Chapter 5 Direct Growth	Forecast growth will be directed to appropriate locations to ensure that resources and assets are managed in a sustainable manner to: a. protect ecological functions, public health and safety; b. utilize existing and proposed services and infrastructure such as transit and community infrastructure; […] (Section 5.1.3) Mississauga encourages compact, mixed use development that is transit supportive, in appropriate locations, to provide a range of local live/work opportunities. (Section 5.1.6) Mississauga will protect and conserve the character of stable residential Neighbourhoods. (Section 5.1.7) New development will not exceed the capacity of existing and planned engineering services, transit services and community infrastructure. Development proposals may be refused if existing or planned servicing and/or infrastructure are inadequate to support the additional population and employment growth that would be generated or be phased to coordinate with the provision of services and infrastructure. (Section 5.1.9) Neighbourhoods will not be the focus for intensification and should be regarded as stable residential areas where the existing character is to be preserved. (Section 5.3.5.1) Residential intensification within Neighbourhoods will generally occur through infilling and the development of existing commercial sites as mixed use areas. (Section 5.3.5.2) Where higher density uses are proposed, they should be located on sites identified by a local area review, along Corridors or in conjunction with existing apartment sites or commercial centres. (Section 5.3.5.3) Redevelopment of Mixed Use sites that result in a loss of commercial floor space will not be permitted unless it can be demonstrated that the planned function of the existing non-residential component will be maintained after redevelopment. (Section 5.3.5.4) Intensification within Neighbourhoods may be considered where the proposed development is compatible in built form and scale to surrounding development, enhances the existing or planned development and is consistent with the policies of this Plan. (Section 5.3.5.5) Development will be sensitive to the existing and planned context and will include appropriate transition in use, built form, density and scale. (Section 5.3.5.6) Development on Corridors should be compact, mixed use and transit friendly and appropriate to the context of the surrounding Neighbourhood. (Section 5.4.4)

	General Intent
	Where higher density uses within Neighbourhoods are directed to Corridors, development will be required to have regard for the character of the Neighbourhoods and provide appropriate transitions in height, built form and density to the surrounding lands. (Section 5.4.5) Corridors will be subject to a minimum building height of two storeys and the maximum building height specified in the City Structure element in which it is located, unless Character Area policies specify alternative building height requirements or until such time as alternative building heights are determined through planning studies. Except along Intensification Corridors and within Major Transit Station Areas, the minimum building height requirement will not apply to Employment Areas. (Section 5.4.8) Transit services infrastructure will utilize Corridors to connect Intensification Areas. (Section 5.4.9)
Chapter 6 Value The Environment	Mississauga will require development proposals to address the management of stormwater using stormwater best management practices. (Section 6.2.7) Mississauga will encourage the use of green technologies and design to assist in minimizing the impacts of development on the health of the environment. (Section 6.2.8) Parks should generally be accessible for residents within 800 metres of their dwelling and be located as centrally as possible within a residential area. (Section 6.3.68) Mississauga will require that development applications be supported by stormwater best management practices in accordance with relevant plans, studies, development standards and policies. Additional measures may be specified by the City based on known concerns related to storm sewer capacity, pollution prevention, flood risk and erosion, and protection of the city's Natural Heritage System, including its ecological function. Stormwater best management practices must be approved by the city, appropriate conservation authority and Provincial Government, where applicable. (Section 6.4.2.2) Residential development or development that includes outdoor living areas will not be permitted in locations where the mitigated outdoor noise levels are forecast to exceed limits specified by the applicable Provincial Government environmental noise guideline. A detailed noise impact study will be required to demonstrate that every effort has been made to achieve the sound level limits specified by the applicable Provincial Government environmental noise guideline, for an outdoor living area (55 dBA or less). Only in cases where the required noise attenuation measures are not feasible for technical, economic, aesthetic or administrative reasons would excess noise above the limit (55 dBA) be acceptable, with a warning clause to prospective purchasers, consistent with the applicable Provincial Government environmental noise guideline. In these situations, any excess noise above the limit will not be acceptable if it exceeds 60 dBA. (Section 6.10.3.2) Development with a residential component such as dwellings, or any development which includes bedrooms, sleeping quarters, living rooms or reading rooms which will be subject to high levels of traffic noise, will only be permitted if it includes structural features which result in interior noise levels that comply with the indoor standards specified by the applicable Provincial Government environmental noise guideline. (Section 6.10.3.3) Where residential and other land uses sensitive to noise are proposed within 500 m of a freeway, 250 m of a provincial highway or 100 m from other roads, development proponents will be required to submit detailed noise studies delineating mitigative noise measures required to meet Provincial Government and Region of Peel noise guidelines. The recommendations of the approved reports are to be implemented as conditions of development. (Section 6.10.3.4)

	General Intent
	A feasibility and/or detailed noise impact study prepared to analyze the impacts of road noise on a development are to incorporate the ultimate Annual Average Daily Traffic (AADT) for the road. (Section 6.10.3.6)
Chapter 7 Complete Communities	The creation of complete communities and the implications for public health will be considered by Mississauga when making planning decisions. (Section 7.1.2) In order to create a complete community and develop a built environment supportive of public health, the City will: a. encourage compact, mixed use development that reduces travel needs by integrating residential, commercial, employment, community, and recreational land uses; b. design streets that facilitate alternative modes of transportation such as public transit, cycling, and walking; c. encourage environments that foster incidental and recreational activity; and d. encourage land use planning practices conducive to good public health. (Section 7.1.3) Mississauga will ensure that the housing mix can accommodate people with diverse housing preferences and socioeconomic characteristics and needs. (Section 7.1.6) Mississauga will ensure that housing is provided in a manner that maximizes the use of community infrastructure and engineering services, while meeting the housing needs and preferences of Mississauga residents. (Section 7.2.1) Mississauga will provide opportunities for: a. the development of a range of housing choices in terms of type, tenure and price; b. the production of a variety of affordable dwelling types for both the ownership and rental markets; and c. the production of housing for those with special needs, such as housing for the elderly and shelters. (Section 7.2.2) When making planning decisions, Mississauga will ensure that housing is provided in a manner that fully implements the intent of the Provincial and Regional housing policies. (Section 7.2.3) Community infrastructure will support the creation of complete communities. (Section 7.4.1)
Chapter 8 Create a Multi-Modal City	Mississauga will ensure that transportation corridors are identified and protected to meet current and projected needs for various travel modes. (Section 8.1.9) In reviewing development applications, Mississauga will require area wide or site specific transportation studies to identify the necessary transportation improvements to minimize conflicts between transportation and land use, and to ensure that development does not precede necessary road, transit, cycling and pedestrian improvements. Transportation studies will consider all modes of transportation including auto traffic, truck traffic, transit, walking and cycling. (Section 8.1.16) Mississauga will employ transit priority measures on priority corridors shown on Schedule 6: Long Term Transit Network, such as queue jump lanes and transit signal priority, along with express services, new intelligent transportation systems (ITS), fare integration, and service coordination with GO Transit and neighbouring transit systems. (Section 8.3.2.1)

	General Intent
	Off-street parking facilities for vehicles and other modes of travel, such as bicycles, will be provided in conjunction with new development […] . (Section 8.4.1) Development within and adjacent to Neighbourhoods will mitigate parking impacts on the residential use. (Section 8.4.11)
Chapter 9 **Build A Desirable Urban Form**	Mississauga will develop an urban form based on the urban system and the hierarchy identified in the city structure as shown on Schedule 1: Urban System. (Section 9.1.1) Infill and redevelopment within Neighbourhoods will respect the existing and planned character. (Section 9.1.3) Development on Corridors will be consistent with existing or planned character, seek opportunities to enhance the Corridor and provide appropriate transitions to neighbouring uses. (Section 9.1.5) Urban form will support the creation of an efficient multi-modal transportation system that encourages a greater utilization of transit and active transportation modes. (Section 9.1.9) New development proposed on adjacent lands to existing or planned corridors and transportation facilities should be compatible with, and supportive of, the long-term purposes of the corridor and should be designed to avoid, mitigate or minimize adverse impacts on and from the corridor and transportation facilities. (Section 9.1.15) Neighbourhoods are stable areas where limited growth is anticipated. Where increases in density and a variety of land uses are considered in Neighbourhoods, they will be directed to Corridors. Appropriate transitions to adjoining areas that respect variations in scale, massing and land uses will be required. (Section 9.2.2) Heights in excess of four storeys will be required to demonstrate that an appropriate transition in height and built form that respects the surrounding context will be achieved. (Section 9.2.2.1) While new development need not mirror existing development, new development in Neighbourhoods will: a. Respect existing lotting patterns; b. Respect the continuity of front, rear and side yard setbacks; c. Respect the scale and character of the surrounding area; d. Minimize overshadowing and overlook on adjacent neighbours; e. Incorporate stormwater best management practices; f. Preserve mature high quality trees and ensure replacement of the tree canopy; and g. Be designed to respect the existing scale, massing, character and grades of the surrounding area. (Section 9.2.2.3) Development on Corridors will be encouraged to: a. Assemble small land parcels to create efficient development parcels; b. Face the street, except where predominate development patterns dictate otherwise; c. Not locate parking between the building and the street; d. Site buildings to frame the street; f. Support transit and active transportation modes;

	General Intent
	h. Provide concept plans that show how the site can be developed with surrounding lands. (Section 9.2.2.6) Streetscapes will be designed to create a sense of identity through the treatment of architectural features, forms, massing, scale, site layout, orientation, landscaping, lighting and signage. (Section 9.3.1.7) The design of developments at intersections and along major streets should be of a highly attractive urban quality, recognizing that streets are important civic spaces and linkages. (Section 9.3.1.8) Residential developments of significant size, except for freehold developments, will be required to provide common outdoor on-site amenity areas that are suitable for the intended users. (Section 9.3.5.6) Buildings and site design will be compatible with site conditions, the surrounding context and surrounding landscape of the existing or planned character of the area. (Section 9.5.1.1) Developments should be compatible and provide appropriate transition to existing and planned development by having regard for the following elements: a. Natural Heritage System; b. natural hazards (flooding and erosion); c. natural and cultural heritage features; d. street and block patterns; e. the size and configuration of properties along a street, including lot frontages and areas; f. continuity and enhancement of streetscapes; g. the size and distribution of building mass and height; h. front, side and rear yards; i. the orientation of buildings, structures and landscapes on a property; j. views, sunlight and wind conditions; k. the local vernacular and architectural character as represented by the rhythm, textures and building materials; l. privacy and overlook; and l. the function and use of buildings, structures and landscapes. (Section 9.5.1.2) Site designs and buildings will create a sense of enclosure along the street edge with heights appropriate to the surrounding context. (Section 9.5.1.3) Developments adjacent to public parkland will complement the open space and minimize negative impacts. (Section 9.5.1.7) Development proposals will demonstrate compatibility and integration with surrounding land uses and the public realm by ensuring adequate privacy, sunlight and sky views are maintained. (Section 9.5.1.9) New residential development abutting major roads should be designed with a built form that mitigates traffic noise and ensures the attractiveness of the thoroughfare. (Section 9.5.1.11)

	General Intent
	Noise will be mitigated through appropriate built form and site design. Mitigation techniques such as fencing and berms will be discouraged. (Section 9.5.1.12) Developments will be sited and massed to contribute to a safe and comfortable environment for pedestrians by: a. providing walkways that are connected to the public sidewalk, are well lit, attractive and safe; b. fronting walkways and sidewalks with doors and windows and having visible active uses inside; c. avoiding blank walls facing pedestrian areas; and d. providing opportunities for weather protection, including awnings and trees. (Section 9.5.2.2) Where direct vehicular access to development is not permitted from major roads, buildings should be designed with front doors of individual units oriented towards the major road with vehicular access provided from a side street, service road or rear laneways. (Section 9.5.2.4) Buildings must clearly address the street with principal doors and fenestrations facing the street in order to: a. ensure main building entrances and at grade uses are located and designed to be prominent, face the public realm and be clearly visible and directly accessible from the public sidewalk; b. provide strong pedestrian connections and landscape treatments that link the buildings to the street; and c. ensure public safety. (Section 9.5.3.2) An attractive and comfortable public realm will be created through the use of landscaping, the screening of unattractive views, protection from the elements, as well as the buffering of parking, loading and storage areas. (Section 9.5.4.2) Built form will relate to the width of the street right-of-way. (Section 9.5.4.5) Parking should be located underground, internal to the building or to the rear of buildings. (Section 9.5.5.1) Service, loading and garbage storage areas should be internal to the building or located at the rear of the building and screened from the public realm. (Section 9.5.5.7)
Chapter 10 Foster A Strong Economy	Retail uses may be permitted within Neighbourhoods to provide retail uses convenient to the local residents. Character Area policies or local area plans will identify appropriate locations and types of uses. (Section 10.4.3) Retail uses outside the Downtown, Major Nodes and Community Nodes will be directed to Corridors and Major Transit Station Areas or in locations as identified in Character Area policies. (Section 10.4.5)
Chapter 11 General Land Use Designations	Lands designated Residential High Density will permit the following use: a. apartment dwelling; b. uses permitted in the Residential Medium Density designation, accessory to apartment dwellings on the same property; and c. uses permitted in the Convenience Commercial designation are permitted at grade in apartment dwellings, except for commercial parking facilities, gas bars, and drive-through facilities. (Section 11.2.5.6) In addition to the Uses Permitted in all Designations, lands designated Mixed Use will also permit the following uses:

	General Intent
	a. financial institution […] b. residential, in conjunction with other permitted uses c. restaurant d. retail store […] (Section 11.2.6.1) The planned function of lands designated Mixed Use is to provide a variety of retail, service and other uses to support the surrounding residents and businesses. Development on Mixed Use sites that includes residential uses will be required to contain a mixture of permitted uses. (Section 11.2.6.2) Developments that consist primarily of residential uses, with non-residential uses at grade only, will be required to submit an Official Plan Amendment for the appropriate residential designation. (Section 11.2.6.3) Residential uses will be permitted in the same building with another permitted use but dwelling units will not be permitted on the ground floor. (Section 11.2.6.4)
Chapter 16 Neighbourhoods	For lands within Neighbourhoods, a maximum building height of four storeys will apply unless Character Area policies specify alternative building height requirements. (Section 16.1.1.1) Proposals for heights more than four storeys or different than established in the Character Area policies, will only be considered where it can be demonstrated to the City's satisfaction, that: a. an appropriate transition in heights that respects the surrounding context will be achieved; b. the development proposal enhances the existing or planned development; c. the City Structure hierarchy is maintained; and d. the development proposal is consistent with the policies of this Plan. (Section 16.1.1.2)
Chapter 19 Implementation	To provide consistent application of planning and urban design principles, all development applications will address, among other matters: a. the compatibility of the proposed development to existing or planned land uses and forms, including the transition in height, density, and built form; b. conformity with the policies in this Plan; c. the sustainability of the development to support public transit and to be oriented to pedestrians; d. in circumstances where medium and high density residential uses are in proximity to developments of a lower density, measures, such as increased setback; sensitive building location, transition and design; and landscaping, may be required to ensure compatibility with the lower density designations; e. the adequacy of engineering services; f. the adequacy of community infrastructure; g. the adequacy of the multi-modal transportation systems; h. the suitability of the site in terms of size and shape, to accommodate the necessary on site functions, parking, landscaping, and on site amenities; i. the relationship of the proposed development to the street environment and its contribution to an effective and attractive public realm; j. the impact of the height and form of development, in terms of overshadowing and amenity loss, on neighbouring residential and

	General Intent
	park uses; k. site specific opportunities and constraints; l. sustainable design strategies; and m. urban form and public health. (Section 9.4.3) This section contains criteria which requires an applicant to submit satisfactory planning reports to demonstrate the rationale for the proposed amendment as follows: a. the proposal would not adversely impact or destabilize the following: the overall intent, goals and objectives of the Official Plan; and the development and functioning of the remaining lands which have the same designation, or neighbouring lands; b. that a municipal comprehensive review of the land use designation or a five year review is not required; c. the lands are suitable for the proposed uses, and compatible with existing and future uses of surrounding lands; d. there are adequate engineering services, community infrastructure and multi-modal transportation systems to support the proposed application; e. a planning rationale with reference to Mississauga Official Plan policies, other relevant policies, good planning principles and the merits of the proposed amendment in comparison with the existing designation has been provided by the applicant. (Section 19.5.1)

Mississauga Zoning By-law

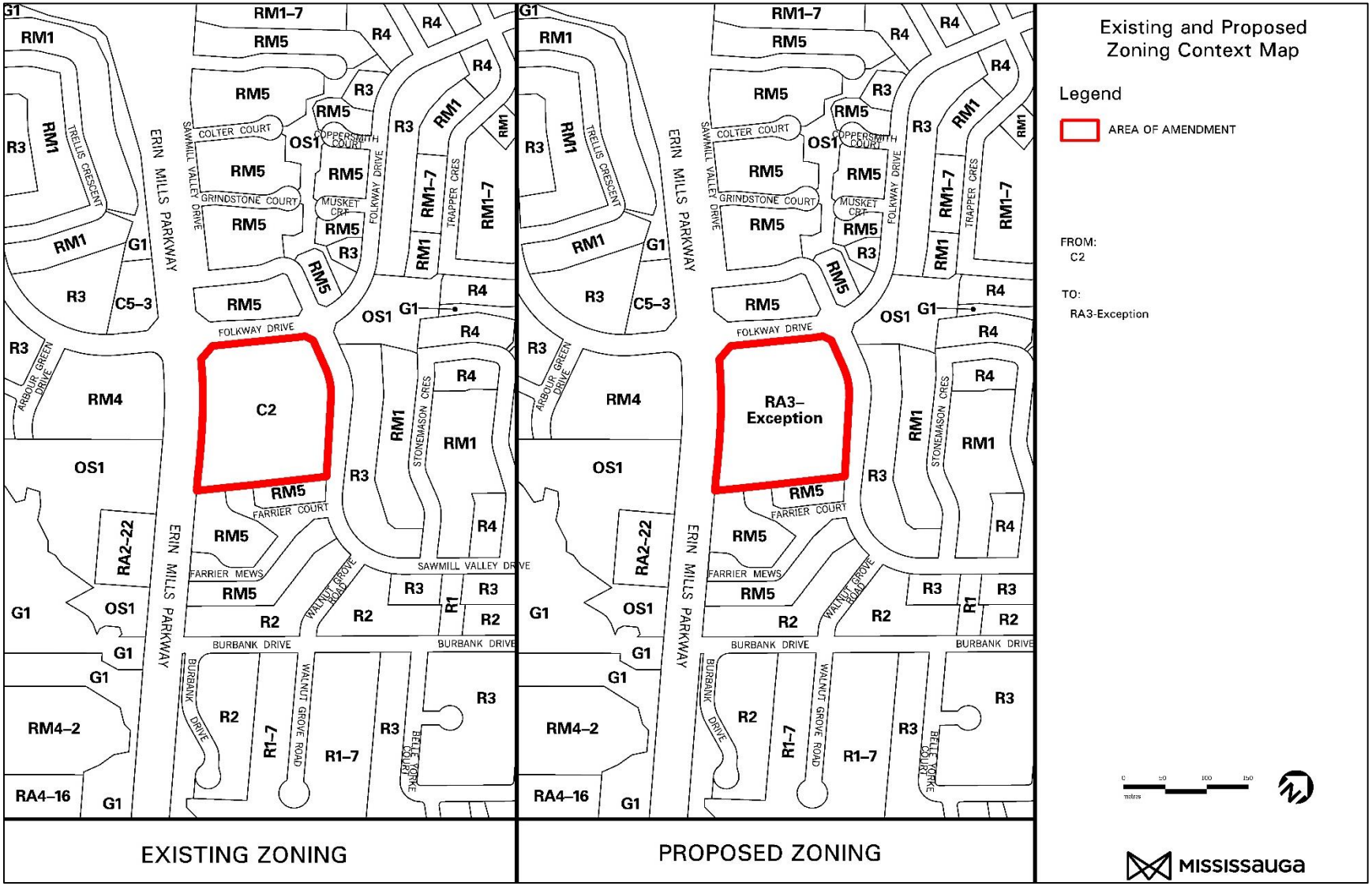
Existing Zoning

The property is currently zoned **C2** (Neighbourhood Commercial), which permits commercial uses including retail and service uses.

Proposed Zoning

The applicant is proposing to zone the property **RA3 – Exception** (Apartments – Exception) to permit five condominium apartment buildings of 11, 8, 7, 7 and 6 storeys with commercial uses at grade and seven blocks of stacked townhouses containing a total of 703 units.

Through the processing of the applications staff may recommend a more appropriate zone category for the development in the Recommendation Report.



Excerpt of Zoning Map 31

Proposed Zoning Regulations

Zone Regulations	Existing C2 Zone Regulations	RM9 Base Zone Regulations	RA3 Base Zone Regulations	Proposed RA3-Exception Zone Regulations
Permitted Uses	Commercial uses including a **retail store**, **restaurant** and **service establishment**	**Stacked townhouse**	**Apartment, Long-term care building, Retirement building** Additional accessory uses including a **retail store**, **service establishment, financial institution, office,** and **medical office - restricted**	**Stacked townhouse**, **back to back townhouse** and additional non-residential uses including but not limited to a **daycare**, **garden centre, private club, science and technology facility, restaurant**, **take-out restaurant, commercial** and **private school** and **veterinary clinic**
Maximum **Floor Space Index (FSI)**	-	-	1.0	2.3
Minimum **Rear Yard** For That Portion Of The Dwelling With A **Height** Less Than Or Equal To 13.0 m (42.7 ft.) For That Portion Of The Dwelling With A **Height** Greater Than 13.0 m (42.7 ft.) And Less Than 20.0 m (65.6 ft.)	6.0 m (19.7 ft.)	7.5 m (24.6 ft.)	7.5 m (24.6 ft.) 10.0 m (32.8 ft.)	6.3 m (20.7 ft.)

Zone Regulations	Existing C2 Zone Regulations	RM9 Base Zone Regulations	RA3 Base Zone Regulations	Proposed RA3-Exception Zone Regulations
Minimum **Front Yard** and **Exterior Side Yard** For That Portion Of The Dwelling With A **Height** Less Than Or Equal To 13.0 m (42.7 ft.) For That Portion Of The Dwelling With A **Height** Greater Than 13.0 m (42.7 ft.) And Less Than 20.0 m (65.6 ft.) For That Portion Of The Dwelling With A **Height** Greater Than 20.0 m (65.6 ft.) And Less Than 26.0 m (85.3 ft.) For That Portion Of The Dwelling With A Height Greater Than 26.0 m (85.3 ft.)	4.5 m (14.8 ft.)	7.5 m (24.6 ft.)	7.5 m (24.6 ft.) 8.5 m (27.9 ft.) 9.5 m (31.2 ft.) 10.5 m (34.4 ft.)	Erin Mills Parkway - 5.0 m (16.4 ft.) Folkway Drive - 3.9 m (12.8 ft.) Sawmill Valley Drive - 4.3 m (14.1 ft.)
Maximum **Height**	4 **storeys** and 16.5 m (54.1 ft.) for **flat roof** / 20 m (65.6 ft.) for **sloped roof**	4 **storeys** and 17.0m (55.8 ft.) for **sloped roof** / 4 **storeys** and 13.0 m (42.7 ft.) for **flat roof**	12 **storeys** and 38 m (124.7 ft.)	**Apartment** building A - 11 **storeys** / 33.6 m (110.2 ft.) **Apartment** building B - 7 **storeys** / 21.2 m (69.6 ft.)

Zone Regulations	Existing C2 Zone Regulations	RM9 Base Zone Regulations	RA3 Base Zone Regulations	Proposed RA3-Exception Zone Regulations
				Apartment building C - 6 **storeys** / 21.2 m (69.6 ft.) **Apartment** building D - 8 **storeys** / 26.0 m (85.3 ft.) **Apartment** building E - 7 **storeys** / 21.9 m (71.9 ft.) **Stacked townhouses** - 4 **storeys** / 14.0 m (45.9 ft.) for **flat roof** and 4 **storeys** / 17.0 m (55.8 ft.) for **sloped roof**
Minimum **Parking** Spaces	5 spaces per 100 m^2 (1,076.4 ft^2) (**retail store**) – 39 spaces	1.5 resident spaces per unit – 168 spaces 0.25 visitor spaces per unit – 28 spaces	1.1 resident spaces per unit (condominium **apartment**) – 650 spaces 0.2 visitor spaces per unit (condominium **apartment**) – 118 spaces	1.1 resident spaces per unit (condominium **apartment**) – 650 spaces 0.2 visitor spaces per unit (condominium **apartment**) – 118 spaces 1.1 resident spaces per unit (**stacked**

Zone Regulations	Existing C2 Zone Regulations	RM9 Base Zone Regulations	RA3 Base Zone Regulations	Proposed RA3-Exception Zone Regulations
				townhouse) – 123 spaces 0.2 visitor spaces per unit (**stacked townhouse**) – 22 spaces 5 spaces per 100 m^2 (1,076.4 ft^2) – 39 spaces A shared parking arrangement is being pursued for the visitor and retail **parking** spaces
Minimum **Loading Spaces**	1 space for non – residential uses containing 250 m^2 (2,691 ft^2) to 2 350 m^2 (25,295.2 ft^2) of **gross floor area**	-	1 space per **apartment** building	1 space per **apartment** building A shared loading arranged is being pursued for the residential and non-residential uses
Minimum Setback From A **Parking Structure** Above Or Partially Above Finished Grade To Any **Lot Line**	-	6.0 m (19.7 ft.)	7.5 m (24.6 ft.)	Deleted
Minimum Setback From A **Parking Structure**	-	3.0 m (9.8 ft.)	3.0 m (9.8 ft.)	0.5 m (1.6 ft.)

Zone Regulations	Existing C2 Zone Regulations	RM9 Base Zone Regulations	RA3 Base Zone Regulations	Proposed RA3-Exception Zone Regulations
Completely Below Finished Grade, Inclusive Of External Stairwells, To Any **Lot Line**				
Minimum **Landscaped Area**	-	40% of the **lot area**	40% of the **lot area**	35% of the **lot area**
Minimum Depth Of A **Landscaped Buffer** From A **Lot Line** That Is A **Street Line and** Abutting a Residential Zone	4.5 m (14. 8 ft.)	3.0 m (9.8 ft.)	4.5 m (14.8 ft.)	Folkway Drive – 3.5 m (11.5 ft.) Sawmill Valley Drive – 4.2 m (13.8 ft.) Erin Mills Parkway – 4.5 m (14.8 ft.) Rear Yard – 4.5 m (14.8 ft.)
Minimum Internal Setbacks	-		-	
From The Front Wall Of A **Building** To A **Condominium Road**, Sidewalk, Walkway Or **Parking Space** Not Located On A **Driveway**		4.5 m (14.8 ft.)		3.4 m (11.2 ft.)
From A Side Wall Of A **Building** To A Side Wall Of Another **Building** On The Same Lot		3.0 m (9.8 ft.)		2.3 m (7.5 ft.)

Zone Regulations	Existing C2 Zone Regulations	RM9 Base Zone Regulations	RA3 Base Zone Regulations	Proposed RA3-Exception Zone Regulations
Maximum **Height** Exemption	-	Calculation of maximum **height** shall be exclusive of **structures** for rooftop access, provided that the **structure** complies with the following: 3.0 m (9.8 ft.) maximum **height,** 20.0 m^2 (215.3 ft^2) maximum **floor area,** and 3.0 m (9.8 ft.) minimum setback from edge of **building**	-	Calculation of maximum **height** shall be exclusive of **structures** for rooftop access, provided that the **structure** complies with the following: 6.0 m (19.7 ft.) maximum **height,** 20.0 m^2 (215.3 ft^2) maximum **floor area,** and 1.5 m (4.9 ft.) minimum setback from edge of **building** or 0.0 m (0.0 ft.) from the edge of a side wall
Note: The provisions listed are based on information provided by the applicant, which are subject to revisions as the applications are further refined. In addition to the regulations listed, other variations, including technical variations, to the implementing by-law are proposed or may also apply, including changes that may take place before Council adoption of the by-law, should the applications be approved.				

Affordable Housing

In October 2017 City Council approved *Making Room for the Middle – A Housing Strategy for Mississauga* which identified housing affordability issues for low and moderate incomes in the city. In accordance with the Provincial Growth Plan (2019) and Amendment No. 1 (2020), *Provincial Policy Statement* (2020), Regional Official Plan and Mississauga Official Plan (MOP), the City requests that proposed multi-unit residential developments incorporate a mix of units to accommodate a diverse range of incomes and household sizes.

Applicants proposing non-rental residential developments of 50 units or more requiring an official plan amendment or rezoning for additional height and/or density beyond as-of-right permissions will be required to demonstrate how the proposed development is consistent with/conforms to Provincial, Regional and City housing policies. The City's official plan indicates that the City will provide opportunities for the provision of a mix of housing types, tenures and at varying price points to accommodate households. The City's annual housing targets by type are contained in the Region of Peel Housing and Homelessness Plan 2018-2028 https://www.peelregion.ca/housing/housinghomelessness/pdf/plan-2018-2028.pdf.

To achieve these targets, the City is requesting that a minimum of 10% of new ownership units be affordable. The 10% contribution rate will not be applied to the first 50 units of a development. The contribution may be in the form of on-site or off-site units, land dedication, or financial contributions to affordable housing elsewhere in the City.

5. School Accommodation

The Peel District School Board

Student Yield	School Accommodation		
63 Kindergarten to Grade 6 20 Grade 7 to Grade 8 15 Grade 9 to Grade 12	Sawmill Valley Public School	Erin Mills Middle School	Erindale Secondary School
	Enrolment: 374 Capacity: 436 Portables: 1	Enrolment: 415 Capacity: 522 Portables: 0	Enrolment: 930 Capacity: 1,317 Portables: 0

The Dufferin-Peel Catholic District School Board

Student Yield	School Accommodation	
18 Kindergarten to Grade 8 15 Grade 9 to Grade 12	St. Mark Elementary School	Loyola Catholic Secondary School
	Enrolment: 341 Capacity: 567 Portables: 0	Enrolment: 1,033 Capacity: 1,089 Portables: 0

6. Community Questions and Comments

A community meeting was held by Ward 8 Councillor, Matt Mahoney, on March 1, 2023. More than 400 people attended the community meeting and multiple written submissions have been received. Ward 8 Councillor, Matt Mahoney has also held multiple community focus group meetings in March and April 2023. The community focus group has also provided multiple written submissions regarding concerns with the proposed development.

The following comments made by the community as well as any others raised at the public meeting will be addressed in the Recommendation Report, which will come at a later date.

- The property is not an appropriate location for the proposed intensification
- The proposal deviates from the original Erin Mills Plan
- The proposed development will result in adverse impacts to existing road and signal operations including access from Sawmill Valley Drive
- The proposed density is excessive for the neighbourhood

- The proposed building heights and massing are excessive and will result in adverse impacts to adjacent properties such as overshadowing
- Existing infrastructure including sanitary, water, internet and electricity cannot support the proposed development and the neighbourhood
- The proposed development does not provide sufficient amenity areas for the residents
- The parking supply is not sufficient to support the proposed development
- The proposed development does not provide sufficient commercial gross floor area to maintain the planned function of the property as a walkable, neighbourhood commercial destination
- Emergency response times will not be adequate as a result of the proposed development
- The proposed development does not provide value to the neighbourhood
- Waste collection and storage will adversely impact adjacent properties
- There is not sufficient parkland to support the neighbourhood and the proposed development
- The proposed development does not provide affordable housing
- What measures will be taken to mitigate construction impacts on surrounding residents?
- Schools do not have the capacity to support the proposed development
- Will the proposed development be phased?
- Adequate public transit is not available to support the proposed and existing residents
- The proposed development will reduce the walkability of the neighbourhood
- The proposed development does not provide an appropriate unit mix of one, two and three bedroom units

7. Development Issues

The following is a summary of comments from agencies and departments regarding the applications:

Agency / Comment Date	Comments
Region of Peel (January 2023)	An existing 300 mm (1 ft.) diameter water main is located on Erin Mills Parkway. An existing 1050 mm (3.4 ft.) diameter water main is located on Erin Mills Parkway. An existing 1500 mm (3.4 ft.) diameter water main is located on Erin Mills Parkway. An existing 300 mm (1 ft.) diameter water main is located on Folkway Drive. An existing 200 mm (0.7 ft.) diameter water main is located on Sawmill Valley Drive An existing 50/100 mm (0.2/0.3 ft.) diameter water main is located on Farrier Court. Due

Agency / Comment Date	Comments
	to the size and function of the 1050 mm (3.4 ft.) and 1500 mm (3.4 ft.) water mains on Erin Mills Parkway, connection will not be permitted. An existing 250 mm (0.8 ft.) diameter sanitary sewer is located on Sawmill Valley Drive. An existing 250 mm (0.8 ft.) diameter sanitary sewer is located on Farrier Court. An existing 2400 mm (7.9 ft.) diameter sanitary sewer is located on Erin Mills Parkway. Due to the size and function of the 2400 mm (7.9 ft.) diameter sanitary sewer on Erin Mills Parkway, connection will not be permitted. A satisfactory Functional Servicing Report is required. Completion and submission of a multi-use demand table to fulfil modelling requirements and determine the proposals impact to the existing system is required. The development requires a water system looped to municipal water, to provide a redundant water supply. Additional information is required regarding design flow calculations. Servicing of the property may require municipal and/or private easements and the construction, extension, twinning and/or upgrading of municipal services. All works associated with the servicing of this property will be at the applicant's expense. The applicant will also be responsible for the payment of applicable fees, development charges, legal costs and all other costs associated with the development. Confirmation that the City will permit shared servicing is required prior to approval. Prior to Regional site servicing connection approval, fire prevention approval from the City is required. Prior to the City issuing full building permit, Regional site servicing connection approvals are required. Any changes to the underground servicing will require review by Regional servicing connections. The Region will provide front-end collection of garbage and recyclable materials. Additional information is required to confirm the proposed development meets the Waste Collection Design Standards. Additional flows and new connections are not permitted to be made to Regional roads. All development flows are to be directed to the City's storm sewer system or watercourses, to the satisfaction of the Region and all relevant Departments and agencies. Alternatively, flows can be mitigated using low impact development technologies. No grading will be permitted within any Regional right-of-way to support adjacent developments. Modifications can be made to provide additional bicycle parking and access to support sustainable modes of commuting. For example, a 2 m (6.6 ft.) sidewalk can be provided along the frontage of high-density residential buildings. Modifications can also be made to promote public health in communities including considering age friendly design guidelines.

Agency / Comment Date	Comments
	Private servicing easements may be required prior to Regional site servicing connection approval. The applicant is encouraged to review opportunities to increase the proportion of two plus den and three-bedroom units, where feasible, while still making these larger units more affordable to larger moderate-income households. The applicant may consider a contribution of units to the Region and/or a non-profit housing provider to be used for affordable housing. Regional staff would be interested in working with the applicant to establish terms of such a contribution involving the Region and/or connecting the applicant with a non-profit housing provider. Regional staff would also be willing to discuss other potential options with the applicant and the City, such as off-site contributions or financial contributions through applicable housing initiatives, to support affordable housing. The applicant is encouraged to explore opportunities to incorporate purpose-built rental apartment units into this design, where possible. The Region is in support of the right-in/right-out access off of Erin Mills Parkway. Additional information has been requested regarding the Traffic Impact Study. The Region requests the gratuitous dedication of lands to meet the Regional Official Plan requirement for Erin Mills Parkway which has a right of way of 50.5 m (165.7 ft.), 25.25 m (82.8 ft.) from the centreline of the road allowance, within 245 m (803.8 ft.) of intersections to protect for the provision of but not limited to utilities, sidewalks, multiuse pathways and transit bay/shelters; The Region will require the gratuitous dedication of a 15 m (49.2 ft.) x 15 m (49.2 ft.) daylight triangle at the intersection of Erin Mills Parkway and Folkway Drive. The Region will require the gratuitous dedication of a 0.3 m (1 ft.) reserve along the frontage of Erin Mills Parkway behind the property line and daylight triangle, except at any approved access point. The applicant is required to gratuitously dedicate these lands to the Region, free and clear of all encumbrances. All costs associated with the transfer are the responsibility of the applicant. The applicant must provide the Region with the necessary title documents and reference plan(s) to confirm the Region's right-of-way. A draft reference plan will be required for review and approval. Landscaping, signs, fences, cranes, gateway features or any other encroachments are not permitted within the Region's easements and/or right of way limits. Cranes will not be permitted to swing over a Regional road unless a crane swing licence has been granted.
Dufferin-Peel Catholic District School Board (December 2022)	Based on the Dufferin-Peel Catholic District School Board's School Accommodation Criteria, the Board is satisfied with the current provision of educational facilities for the catchment area in which the proposed development is located. The City's school accommodation condition need not be applied. The applicant shall agree in the Development and/or Subdivision Agreement to include the following warning clauses in all offers of purchase and sale of residential lots: a. Whereas, despite the best efforts of the Dufferin-Peel Catholic District School Board, sufficient accommodation may not be available for all anticipated students from the area, you are hereby notified that students may be

Agency / Comment Date	Comments
	accommodated in temporary facilities and/or bussed to a school outside of the neighbourhood, and further, that students may later be transferred to the neighbourhood school; and b. That the purchasers agree that for the purpose of transportation to school, the residents of the subdivision shall agree that children will meet the bus on roads presently in existence or at another place designated by the Board.
Peel District School Board (December 2022)	Prior to final approval, the City of Mississauga shall be advised that satisfactory arrangements regarding the provision and distribution of educational facilities have been made between the developer/applicant and the Peel District School Board for this plan. The Peel District School Board requires that the following clauses be placed in any agreement of purchase and sale and entered into with respect to any lots on this plan, within a period of five years from the date of registration of the development agreement: a. Whereas, despite the efforts of the Peel District School Board, sufficient accommodation may not be available for all anticipated students in the neighbourhood schools, you are hereby notified that some students may be accommodated in temporary facilities or bused to schools outside of the area, according to the Board's Transportation Policy. You are advised to contact the School Accommodation department of the Peel District School Board to determine the exact schools; and b. The purchaser agrees that for the purposes of transportation to school the residents of the development shall agree that the children will meet the school bus on roads presently in existence or at another designated place convenient to the Board. The developer shall agree to erect and maintain signs at the entrances to the development which shall advise prospective purchasers that due to present school facilities, some of the children from the development may have to be accommodated in temporary facilities or bused to schools, according to the Board's Transportation Policy.
City Community Services Department – Park Planning Section (February 2023)	The property is located in the Erin Mills Neighbourhood Character Area and as established in the 2022 Parks Plan, the parkland provision standard of 1.2 ha (3.0 ac.) per 1000 people is achieved. The property is also located in close proximity to Trapper's Green (P-175), zoned Open Space (**OS1**). The City-owned park is within 25 m (75 ft.) of the development and is 0.8 ha (2.0 ac.) in size. Trapper's Green includes a neighbourhood play structure, open space, picnic area and trail network, which will serve the future residents on the property. Trapper's Green also connects to other surrounding City-owned parks and open space such as Coppersmith Grove (P-177), located within a walking distance of 150 m (450 ft.). Given the Erin Mills Neighbourhood Character Area meets the parkland provision standard and the proximity of the development to City-owned parkland, public parkland on this property is not required. Park Planning staff agrees that the property would benefit from the proposed centrally located private amenity space to serve daily recreational needs of future residents. A cash contribution for street tree paintings for public street frontages and cash-in-lieu for park or other public recreational purposes is required pursuant to Section 42 of the Planning Act (R.S.O. 1990, c. P. 13, as amended) and in accordance with City Policies and By-laws.

Agency / Comment Date	Comments
City Transportation and Works Department (February 2023)	Technical reports and drawings have been submitted and are under review to ensure that engineering matters related to noise, grading, servicing, stormwater management, traffic and environmental compliance can be satisfactorily addressed to confirm the feasibility of the project, in accordance with City requirements. Based on a review of the materials submitted to date, the owner has been requested to provide additional technical details and revisions prior to the City making a recommendation on the applications, as follows: **Traffic** A traffic impact study (TIS), prepared by BA Group dated September 2022, was submitted in support of the proposed development and a full review and audit was completed by Transportation and Works staff. Based on the information provided to date, staff are not satisfied with the study and require further clarification on the information provided. The applicant is required to provide the following information as part of subsequent submissions, to the satisfaction of the Transportation and Works Department: • Provide an updated Traffic Impact Study addressing all staff comments; • Provide turning movement diagrams to evaluate the internal site circulation and access points; • Review the driveway access to ensure adjacent municipal roads and the internal driveway can operate efficiently; and • Address any traffic concerns form the community related to the proposed development. **Stormwater** A Functional Servicing Report (FSR), prepared by IBI Group dated August 2022, was submitted in support of the proposed development. The purpose of the report is to evaluate the proposed development impact on the municipal drainage system (e.g. storm sewers, watercourses, etc.) and to mitigate the quality and quantity impacts of stormwater run-off generated from the property. Mitigation measures may include improvements to existing stormwater servicing infrastructure, new infrastructure and/or on-site stormwater management controls. The applicant is proposing to construct a new internal storm sewer to service the development lands, with an outlet to the existing 600 mm (2 ft.) diameter storm sewer system located on Farrier Court, as well as on-site stormwater management controls for the post development discharge. The applicant is required to provide further technical information to demonstrate that there will be no impact on the City's existing drainage system including how groundwater will be managed on-site. **Environmental Compliance** A Phase One ESA report, prepared by Pinchin Ltd. dated February 2022, was submitted in support of the proposed development. The report indicates a further Environmental Site Assessment is required; therefore the following is to be submitted for further review:

Agency / Comment Date	Comments
	• A letter of reliance for the Phase I ESA report; • A Phase Two ESA prepared in accordance with O.Reg 153/04 (as amended); • A written document, prepared by a Qualified Person (QP) that includes a statement regarding the fill material located on-site is geotechnically and environmentally suitable, or will otherwise be or has been removed; • A written document, prepared by a Professional Engineer (P. Eng.) that includes a plan to decommission the wells or proof of decommissioning; • A written document, prepared by a P. Eng. that includes a plan to decommission the underground/aboveground storage tank (UST/AST) or proof of decommissioning; • As the land use is changing from a less sensitive to a more sensitive use, a Record of Site Condition (RSC) is required to be filed in accordance with O. Reg. 153/04 prior to enactment of the rezoning by-law. A copy of the RSC and all supporting documentation must be provided to the City once it has been acknowledged by the Ontario Ministry of the Environment, Conservation and Parks; • If lands are to be dedicated to the City, a letter certified by a QP, stating that land to be dedicated to the City is environmentally suitable for the proposed use; and • A Temporary Discharge to Storm Sewer Commitment Letter. **Noise** A Noise Report, prepared by Gradient Wind dated September 2022, was submitted for review. In order for a proper assessment to be made, the Noise Study needs to be revised to include the appropriate AADDT values that must be obtained for Erin Mills Parkway (from the Region of Peel) and for Folkway Drive and Sawmill Valley Drive (from the City of Mississauga). **Engineering Plans/Drawings** The applicant has also submitted a number of technical plans/drawings (i.e. grading and servicing plans) which need to be revised in accordance with City Standards and as part of subsequent resubmissions. All plans are to be revised to incorporate a pedestrian access easement requested for by our Traffic section.
City Planning Strategies – Housing (February 2023)	The applicant has not addressed any additional provisions to provide for the range of housing options as contemplated by the Housing Report Terms of Reference (ToR). The ToR outlines various options to ensure the proposed development provides a range of housing options. These include providing middle-income affordable ownership units, affordable rental units, off-site land contributions, or financial contributions to affordable middle income housing elsewhere. While it is appreciated that the anticipated unit mix includes larger family-sized two bedroom units, the applicant is encouraged to explore opportunities to include more two bedroom and three bedroom units. Information is also needed on pricing and affordability period (i.e., 25 years or more). The applicant is strongly encouraged to consider one of the above methods to contribute to the range and affordability of housing options within the proposed development.
Parking (January 2023)	The proposed parking reduction that is being requested by the applicant is a 5% parking space deficiency which equates to a total of 50 parking spaces reduced. With a parking deficiency under the 10% threshold, a satisfactory Parking Justification Letter (PJL) is required to be submitted.

Agency / Comment Date	Comments
Arborist – Private Property (January 2023)	The applicant is advised that tree removal permission is required as per the Private Tree Protection By-law 21-22 to remove one or more trees 15 cm (0.5 ft.) or greater at diameter breast height per lot per calendar year. If applicable, the applicant is to submit a completed tree removal application, arborist report, site plan and fee for the proposed removals. The application will be reviewed in conjunction with the site plan application. The approval of the tree permission application is required prior to the earliest of the demolition permit, the erosion and sediment control permit or site plan approval.
Transit Infrastructure (January 2023)	Convenient and accessible pedestrian linkages are to be provided between the existing sidewalk network and MiWay services/stops. Pedestrian walkway connections to the existing municipal sidewalk are necessary to ensure accessibility, reduce walking time and encourage transit use. There is an existing adjacent transit stop with a concrete bus pad and shelter located along Erin Mills Parkway at Folkway Drive. The function of this stop is to be maintained and shall remain in its current location. All appropriate drawings shall be amended to clearly depict the location of this bus stop/pad and shelter, and a note be added to the plan stating that the existing bus stop is to remain in its current location. All costs associated with the removal and reinstatement of existing transit shelters will be the responsibility of the proponent with the work being completed by MiWay's Shelter Contractor.
Fire Prevention Plan Examination (December 2022)	Fire has reviewed the proposed development from an emergency response perspective. Emergency response time to the site and the water supply available are acceptable, subject to hydrant flow testing. By-law 1036-81 is applicable to the proposed development. The by-law regulates the location of the fire access route with respect to exposure to, and distance from the structure. Additionally, it limits the unobstructed travel distance for a fire fighter from the edge of the fire route to the main entrance to every dwelling unit. Compliance will be assessed at the time of site plan approval. The site plan must be revised to illustrate fire hydrant locations and connections. Municipal addresses for each building must be provided.
Other City Departments and External Agencies	The following City Departments and external agencies offered no objection to these applications provided that all technical matters are addressed in a satisfactory manner: - Rogers Cable - Alectra Utilities - Public Art Coordinator
	The following City Departments and external agencies were circulated the applications but provided no comments: - Economic Development Office - Heritage Planner - Imperial Oil - Ministry of Transportation

Agency / Comment Date	Comments
	- Sun-Canada Pipeline - Trillium Health Partners - Transit Reviewer - Legal Services - Enbridge Gas Inc. - Conseil Scolaire Viamonde - Arborist – City Property - Greater Toronto Airport Authority - Canada Post Corporation

Development Requirements

There are engineering matters that might require the applicant to enter into agreements with the City. Prior to any development proceeding on-site, the City will require the submission and review of an application for site plan approval.

8. Community Benefits Charge

Schedule 17 of Bill 197, *COVID-19 Economic Recovery Act*, 2020, amended the *Planning Act*. The Section 37 Height/Density Bonus provisions are replaced with the Community Benefit Charge (CBC) provisions, implemented by a CBC By-law passed by Council. Section 37 of the *Planning Act* now allows municipalities to impose a CBC on land to fund costs related to growth. Funds collected under CBC will be to fund projects City-wide and Council will be requested at budget time each year to spend or allocate CBC funds to specific projects in accordance with the CBC Strategy and Corporate Policy.

In response to this legislative change, Council passed the City's new CBC By-law on June 22, 2022, which will be administered by the Corporate Services Department, Finance Division. The by-law specifies which types of development and redevelopment the charge applies, the amount of the charge, exemptions and timing of charge payment. The CBC is 4% of the value of the land. A land appraisal is required in order to determine the applicable CBC in each case.

As the proposal is more than 5 storeys and does contain 10 or more residential units in total, the CBC is applicable and will be payable at the time of first building permit.

9. Next Steps

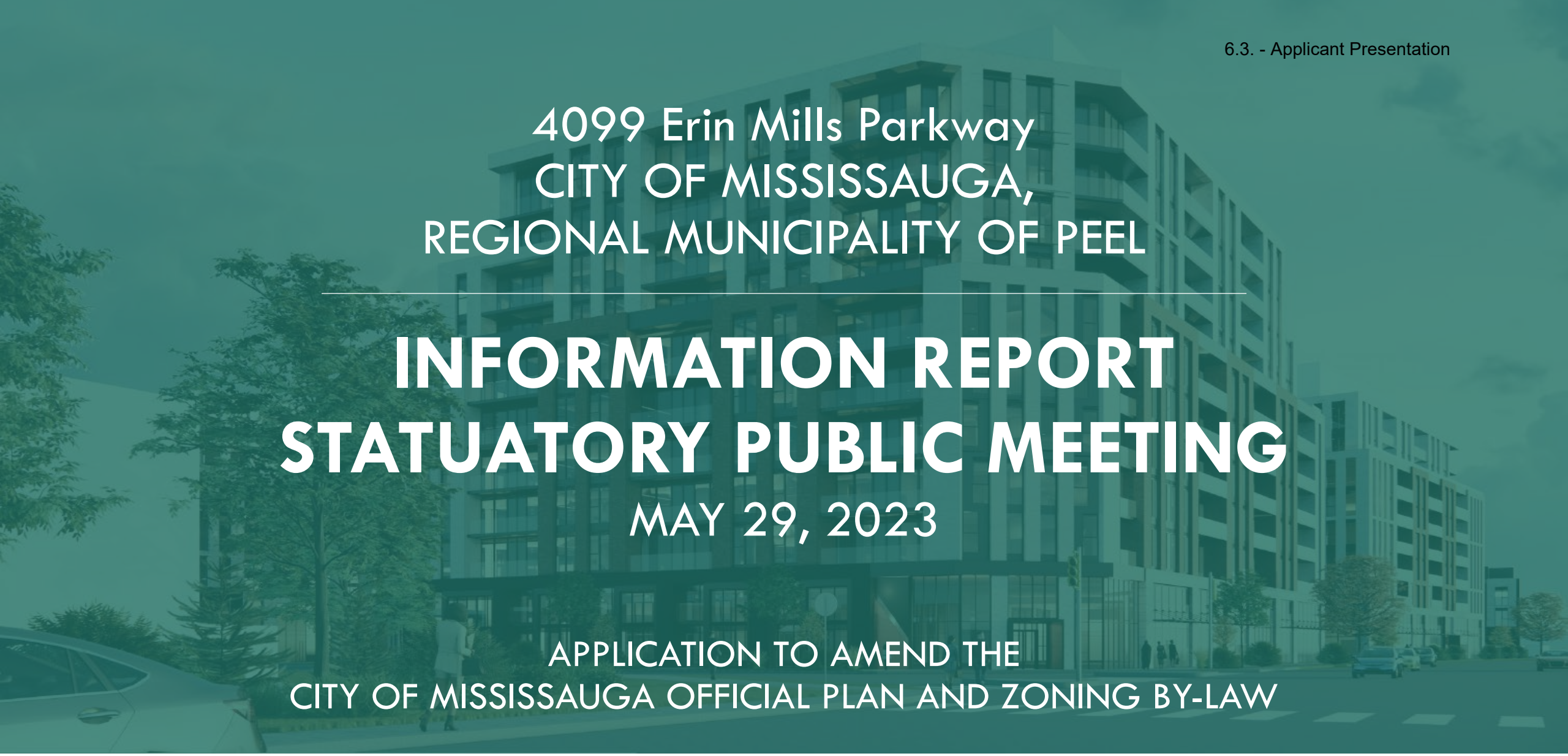
Based on the comments received and the applicable Mississauga Official Plan policies, the following matters will have to be addressed:

- Is the proposed development compatible with the existing and planned character of the area given the proposed

massing, building height, and density?

- Does the proposed commercial gross floor area maintain the planned function of the property?
- Will the proposed development result in adverse impacts to road and signal operations?
- Have supporting technical studies adequately addressed concerns?
- Are zoning by-law standards, including parking supply, appropriate?

Upon satisfying the requirements of various City departments and external agencies, the Planning and Building Department will bring forward a recommendation report to a future Planning and Development Committee meeting. It is at this meeting that the members of the Committee will make a decision on the applications.



4099 Erin Mills Parkway
CITY OF MISSISSAUGA,
REGIONAL MUNICIPALITY OF PEEL

INFORMATION REPORT
STATUATORY PUBLIC MEETING

MAY 29, 2023

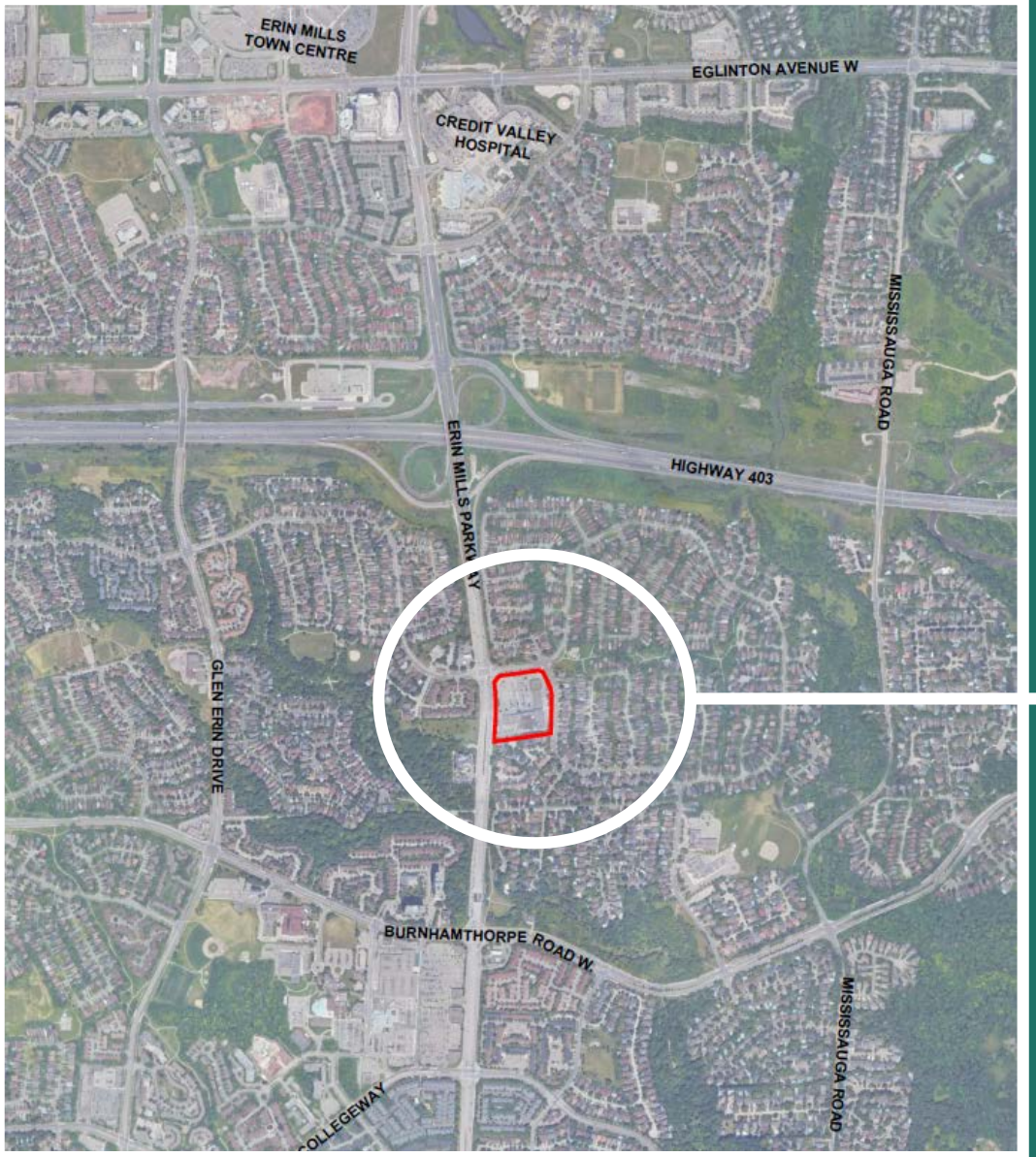
APPLICATION TO AMEND THE
CITY OF MISSISSAUGA OFFICIAL PLAN AND ZONING BY-LAW

QUEENSCORP GROUP

- Official Plan and Zoning By-law Amendment
- City FILE Number.: OZ/OPA 22-25
- May 29, 2023

GSAI
Glen Schnarr & Associates Inc.

AERIAL CONTEXT

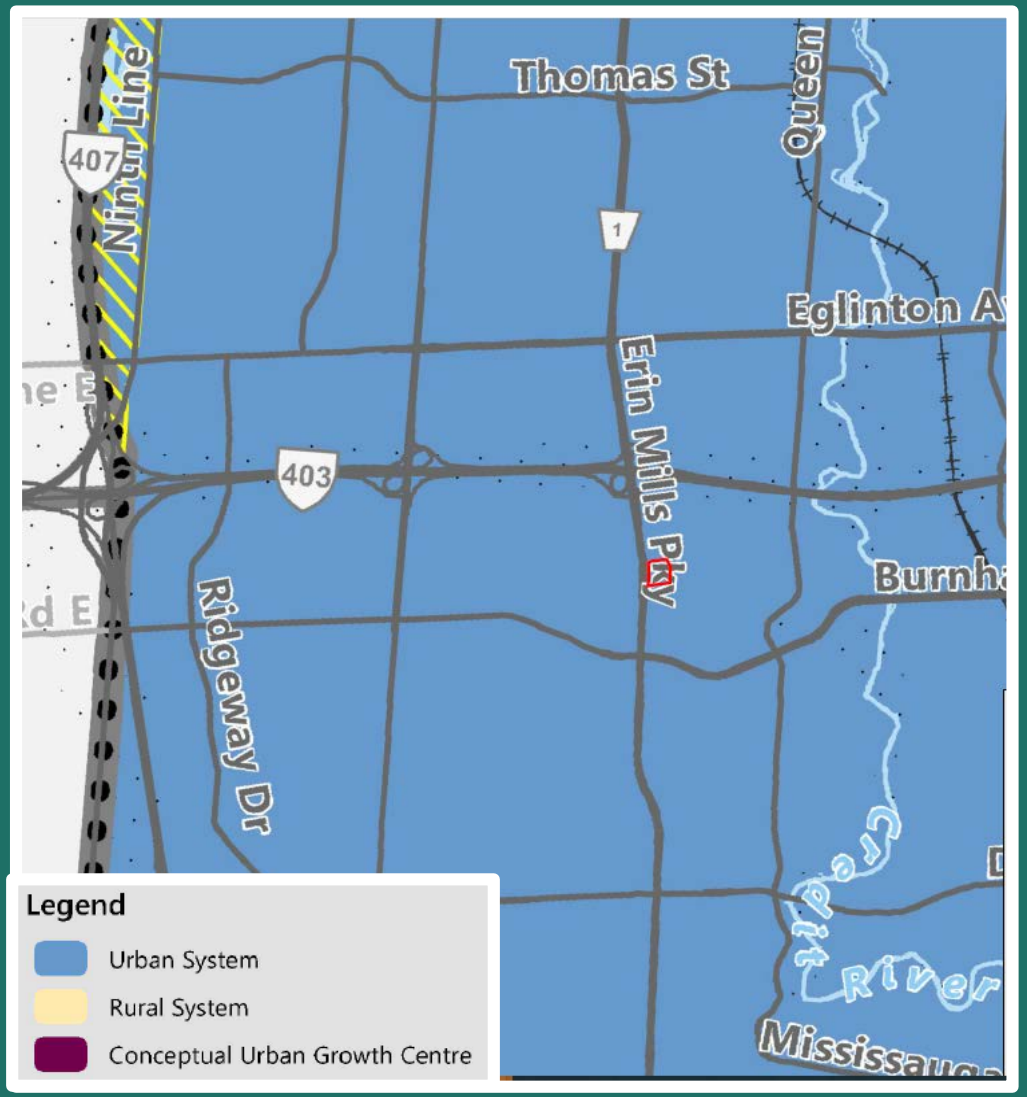


LEGEND

SUBJECT PROPERTY

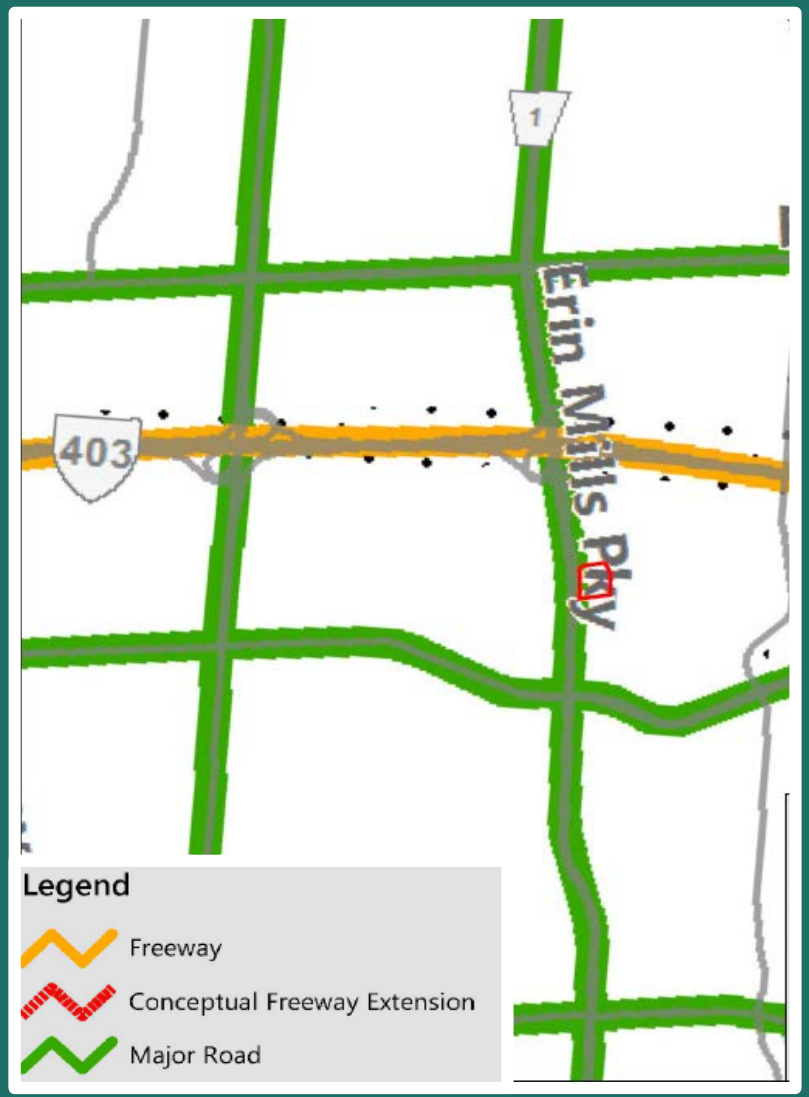
GSAI
Glen Schnarr & Associates Inc.

REGION OF PEEL OFFICIAL PLAN



REGIONAL STRUCTURE

PEEL REGION OFFICIAL PLAN – SCHEDULE 1



REGIONAL ROAD MAP

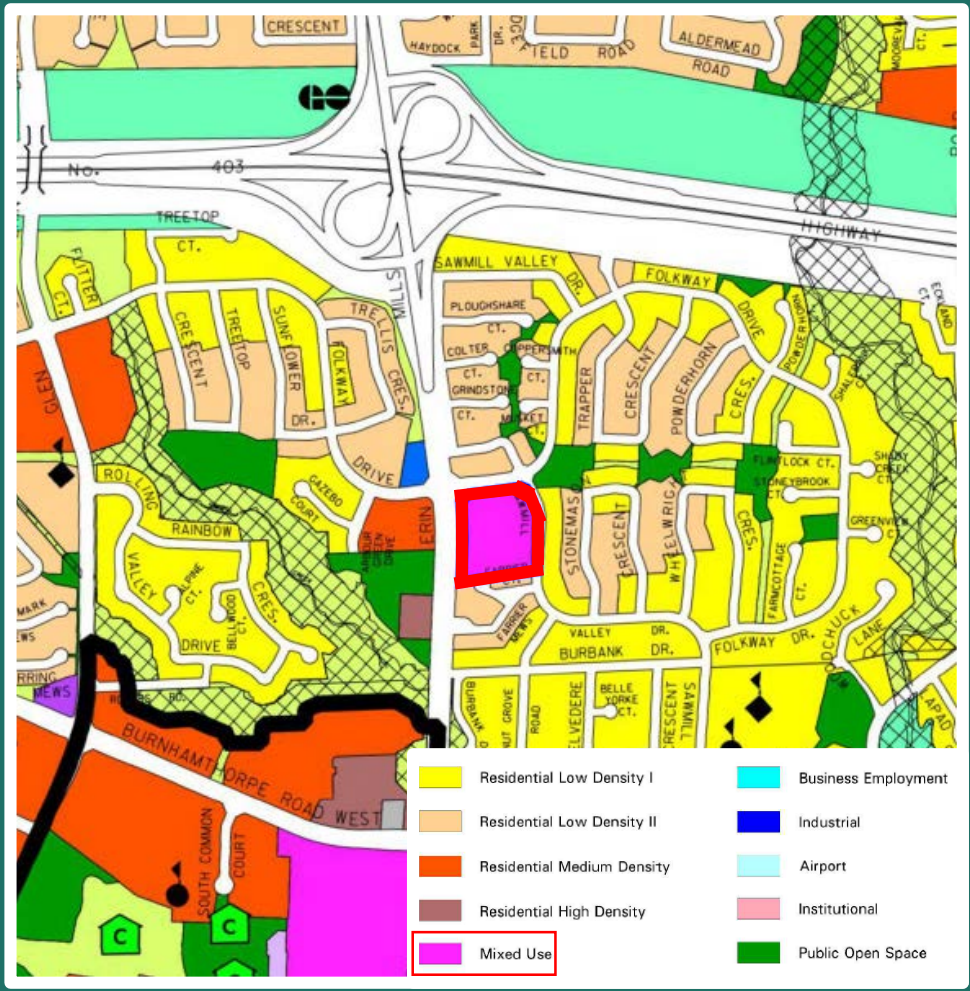
PEEL REGION OFFICIAL PLAN – SCHEDULE 3

LEGEND

SUBJECT PROPERTY

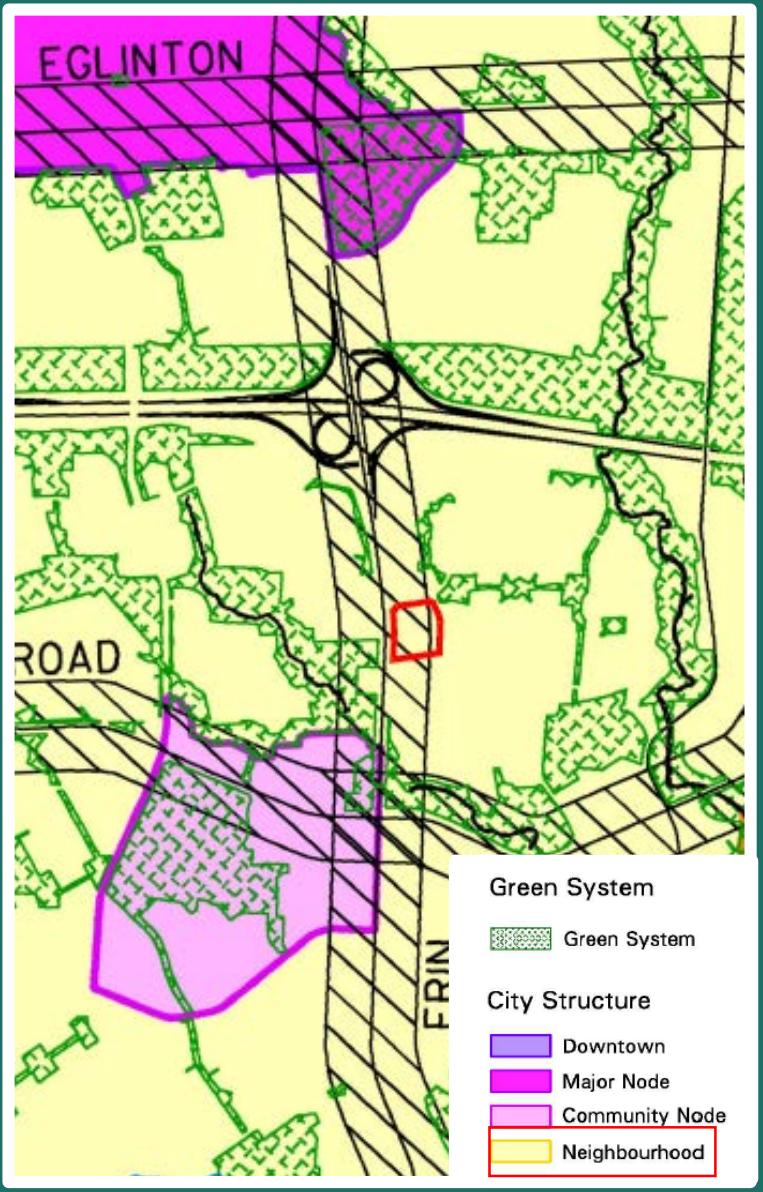
GSAI
Glen Schnarr & Associates Inc.

CITY OF MISSISSAUGA OFFICIAL PLAN



LAND USE DESIGNATIONS

CITY OF MISSISSAUGA OFFICIAL PLAN – SCHEDULE 10



URBAN SYSTEM

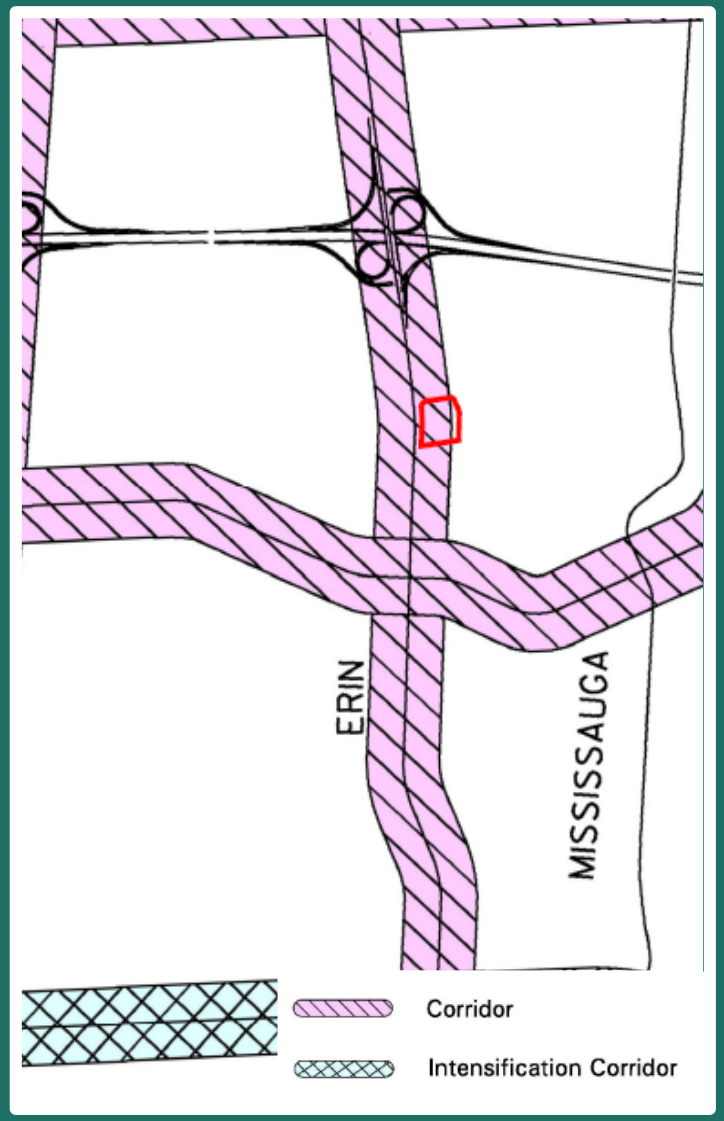
CITY OF MISSISSUGA OFFICIAL PLAN – SCHEDULE 1

LEGEND

SUBJECT PROPERTY

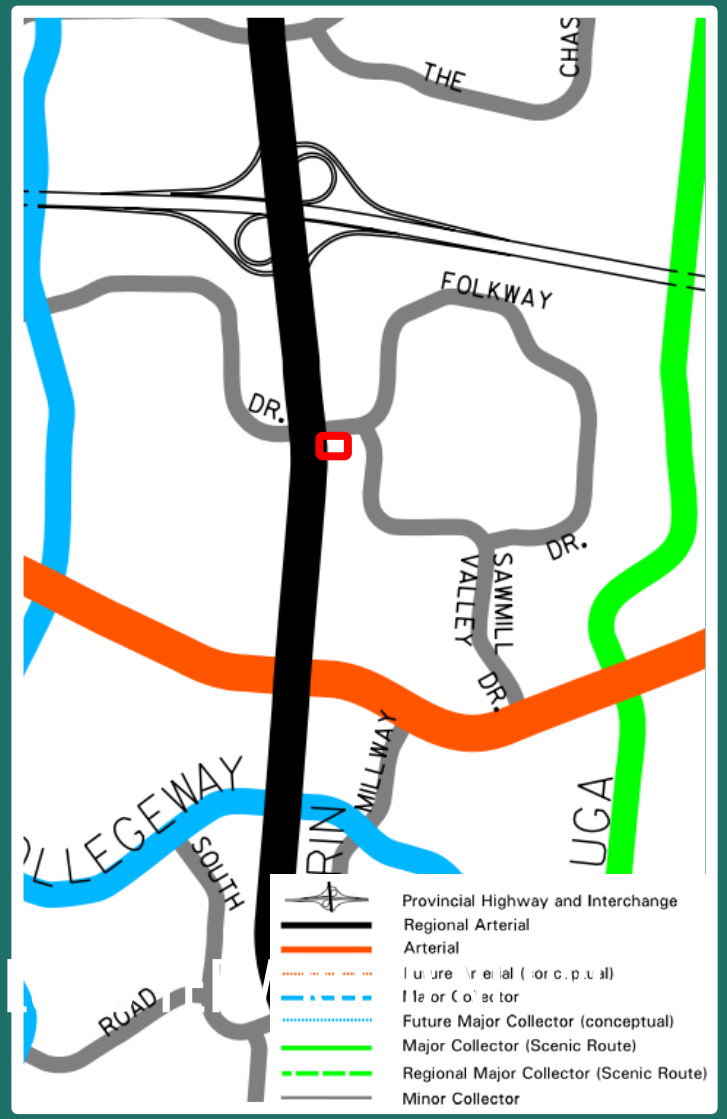
GSAI
Glen Schnarr & Associates Inc.

CITY OF MISSISSAUGA OFFICIAL PLAN



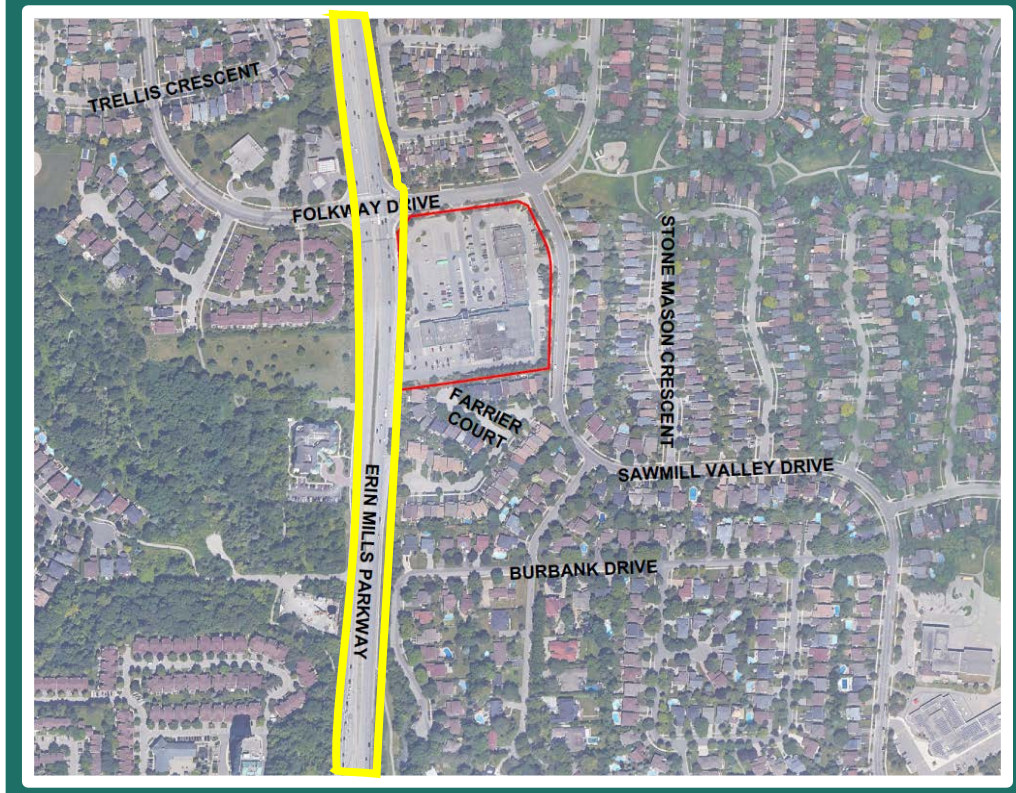
URBAN SYSTEM - CORRIDORS

CITY OF MISSISSAUGA OFFICIAL PLAN – SCHEDULE 1C



LONG TERM ROAD NETWORK

CITY OF MISSISSAUGA OFFICIAL PLAN – SCHEDULE 5

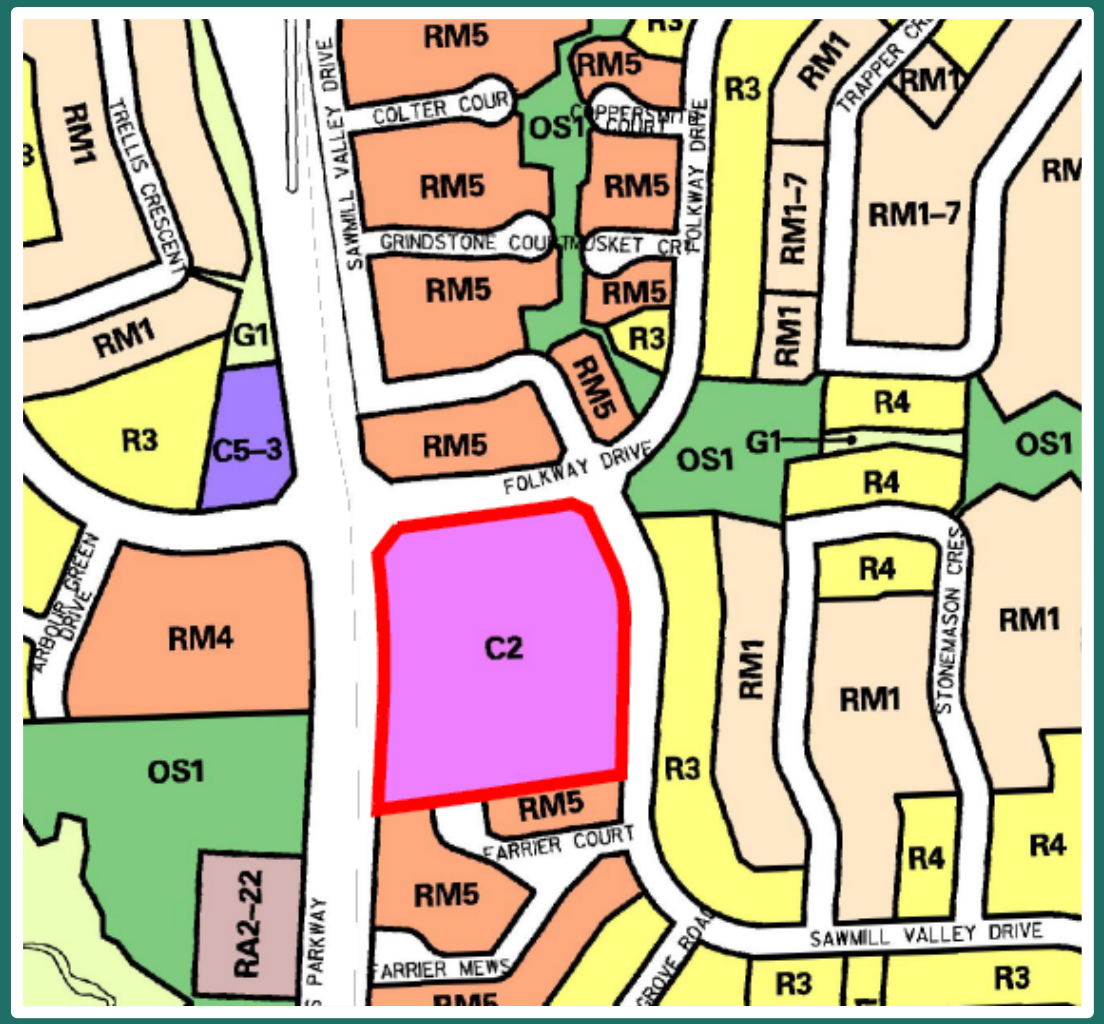


LEGEND

SUBJECT PROPERTY

GSAI
Glen Schnarr & Associates Inc.

CITY OF MISSISSAUGA ZONING BY-LAW NO. 0225-2007



EXISTING ZONING

COMMERCIAL 2 – "C2"

NEIGHBOURHOOD COMMERCIAL – C2 permits the following uses, amongst others:

- ✓ Retail
- ✓ Restaurant
- ✓ Convenience Restaurant
- ✓ Take Out Restaurant
- ✓ Banks
- ✓ Commercial School
- ✓ Office / Medical Office
- ✓ Recreational Establishment

GSAI
Glen Schnarr & Associates Inc.

CITY OF MISSISSAUGA OFFICIAL PLAN - AMENDMENT

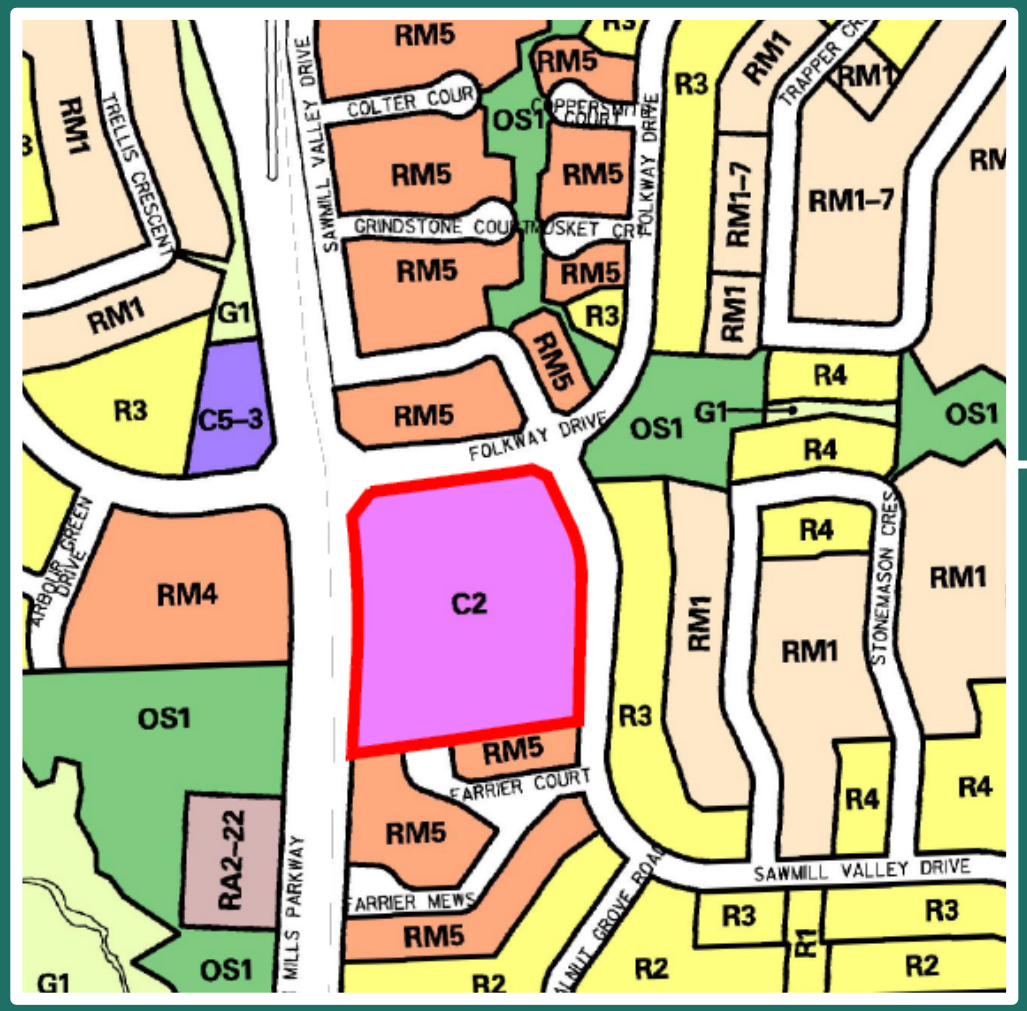
EXISTING OFFICIAL PLAN DESIGNATION
MIXED- USE

PROPOSED OFFICIAL PLAN DESIGNATION
MIXED- USE SPECIAL SITE "X"

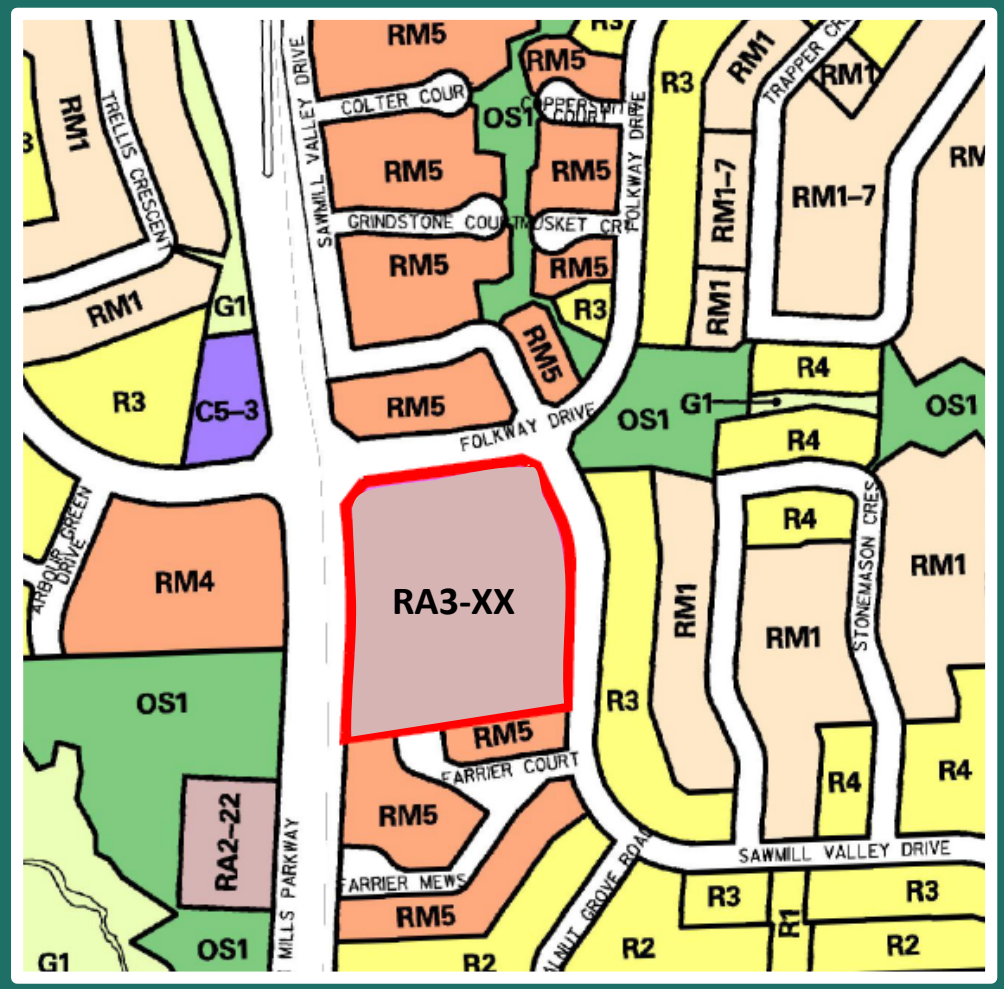
OFFICIAL PLAN AMENDMENT PROPOSES THE FOLLOWING:
- NEW SPECIAL SITE UNDER SECTION 13 (NEIGHBOOURHOOD)
- MAXIMUM FLOOR SPACE INDEX
- MAXIMUM BUILDING HEIGHT

GSAI
Glen Schnarr & Associates Inc.

CITY OF MISSISSAUGA ZONING BY-LAW NO. 0225-2007 - AMENDMENT



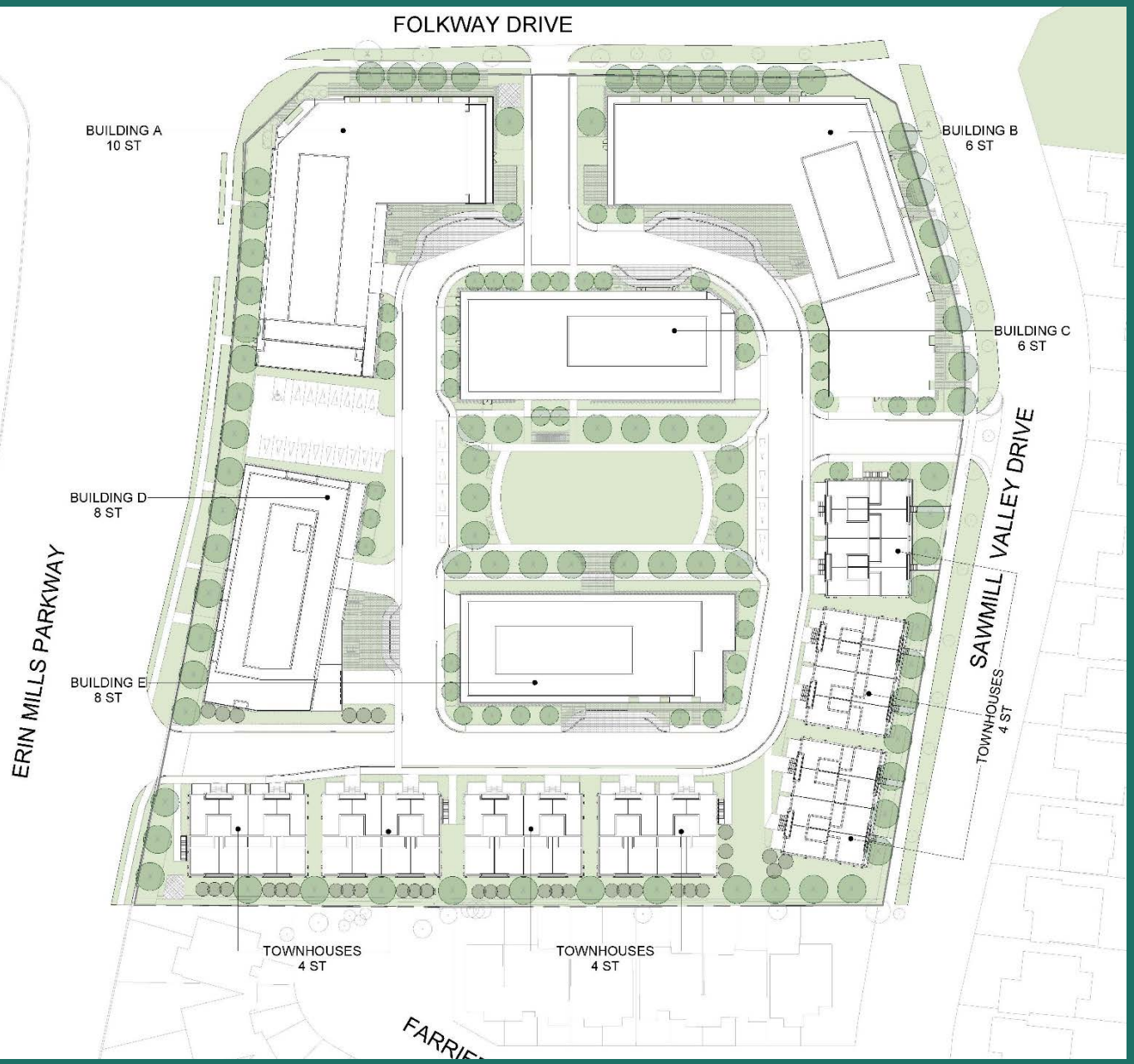
EXISTING ZONING
COMMERCIAL 2
"C2"



PROPOSED ZONING
RESIDENTIAL APARTMENT 3 SPECIAL EXCEPTION ZONE
"RA3 – XXX"

GSAI
Glen Schnarr & Associates Inc.

DEVELOPMENT PROPOSAL – CURRENT CONCEPT



KEY STATISTICS TABLE	
SITE AREA	6.52 Acres/ 2.52 Hectares
HEIGHT & # OF UNITS (RESIDENTIAL)	BLDG A – 10 storey and 197 units
	BLDG B – 6 storey and 142 units
	BLDG C– 6 storey and 80 units
	BLDG D– 6 storey and 95 units
	BLDG E– 6 storey and 77 units
	TH – 4 storey and 112 units
TOTAL # OF UNITS (RESIDENTIAL)	703
RESIDENTIAL GFA	Approximately 46, 117m2
RETAIL/NON-RESIDENTIAL GFA	Approximately 776m2
FLOOR SPACE INDEX (CUMULATIVE)	2.24
PARKING PROVIDED	RES – 1.1 spaces per unit or 773 spaces
	RES VIS – 0.2 spaces per unit or 141 spaces
	COMMERCIAL/RETAIL – 5 spaces per 100m2 of GFA or 39 spaces
	EV/BIKE – 457 spaces
AMENITY AREA	5.6m2 per unit

GSAI
Glen Schnarr & Associates Inc.

DEVELOPMENT PROPOSAL – RENDERING

GSAI
Glen Schnarr & Associates Inc.

DEVELOPMENT PROPOSAL – RENDERING

TYPICAL PLANNING APPROVALS PROCESS

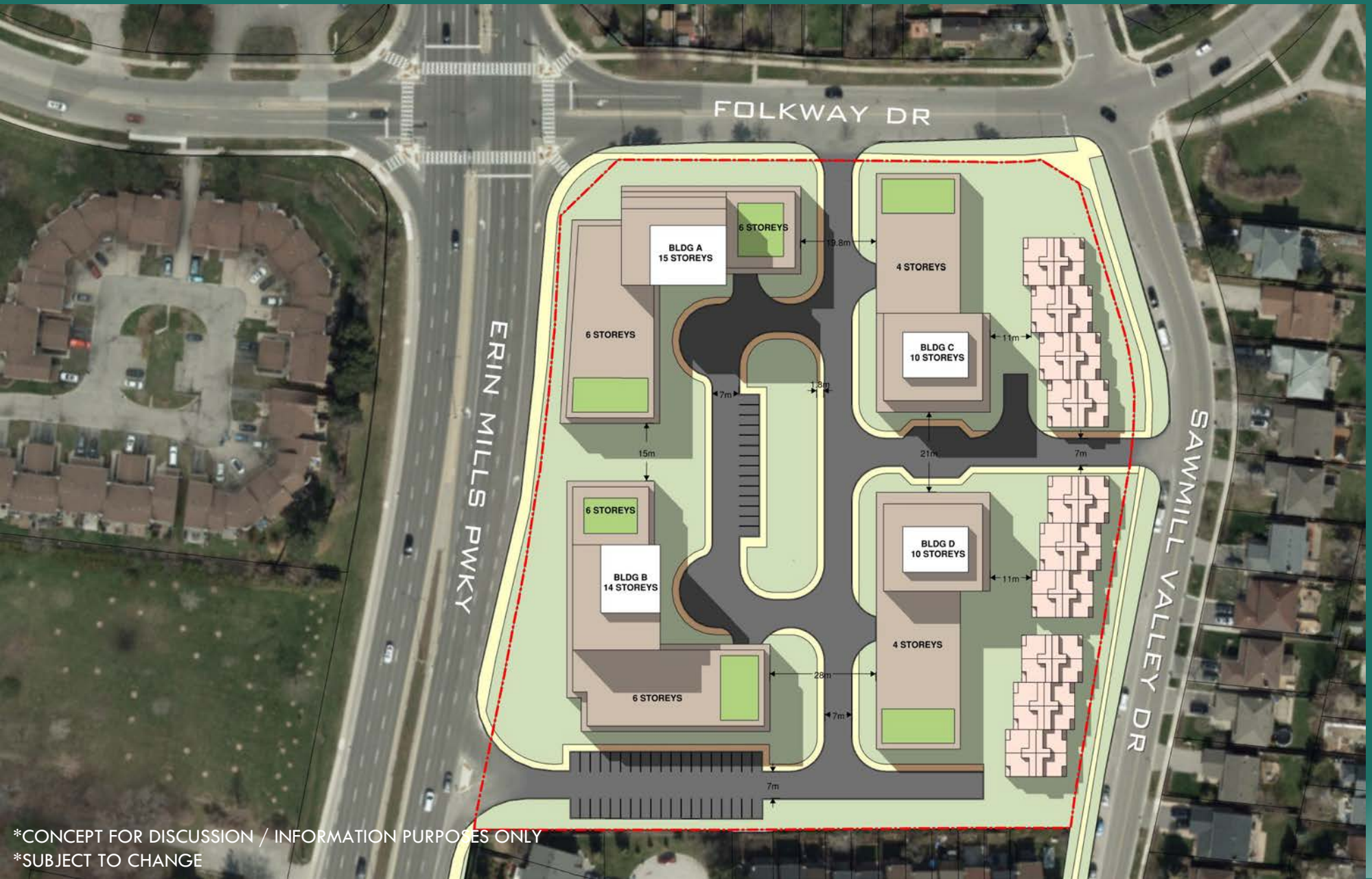
GSAI
Glen Schnarr & Associates Inc.

ONGOING COMMUNITY CONSULTATION

What we've heard....

- More retail space
- Redistribution of density (building heights)
- Vehicular access location / configuration
- Traffic Impact / Generation
- Compatibility with existing Neighbourhood
- Site programming

CONCEPTUAL SITE PLAN



*CONCEPT FOR DISCUSSION / INFORMATION PURPOSES ONLY
*SUBJECT TO CHANGE

GSAI
Glen Schnarr & Associates Inc.

TO ASK ANY FURTHER QUESTIONS OR TO PROVIDE COMMENTS,
PLEASE CONTACT EITHER
GLEN BROLL, MAURICE LUCHICH OR SARAH CLARK
OF **GLEN SCHNARR & ASSOCIATES INC.**
AT:

GLEN BROLL, MCIP, RPP
MANAGING PARTNER
905-568-8888x235
glenb@gsai.ca

MAURICE LUCHICH, MCIP, RPP
SENIOR ASSOCIATE
905-568-8888x267
mauricel@gsai.ca

SARAH CLARK, MCIP, RPP
ASSOCIATE
905-568-8888x237
sarahc@gsai.ca

GSAI
Glen Schnarr & Associates Inc.

THANK YOU

Introduction

Walkable/Liveable Neighbourhoods

Who We Are And Our Goal

- 14 Resident volunteer Advocates
- A mutually beneficial outcome
- Save and Protect our Healthy Community
- Preserve the character, culture and liveability

The Community of Sawmill Valley

- Well planned and designed
- Complete and healthy community for over 40 years
- Townhouses, semis, detached houses
- 25% buy back into the community

Liveable Community

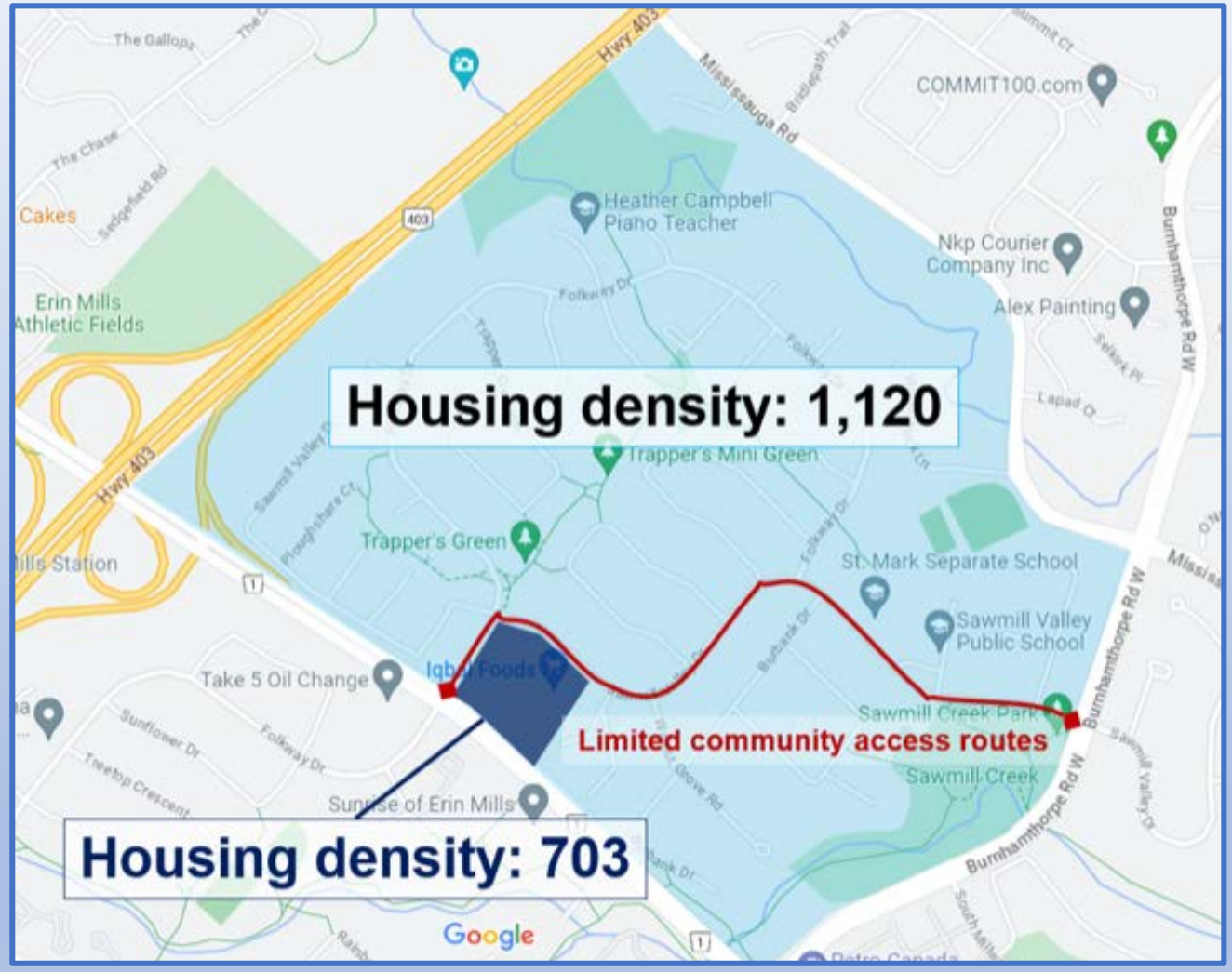
- Schools
- Vast network of bicycle and hiking trails
- Parks, playgrounds and green space
- Plaza

Walkability

- 1,500 homes within 15 minutes/800 metres from Plaza
- Elimination of 90% of retail space
- "*Stop Walking and Start Driving Community*"
- Engaged retail

The Application

- Application increases density by 63%
- Over 60% are 1 bedroom units
- Council should protect the integrity of well designed and planned communities



Official Plan
Growing Mississauga
Policy
Gentle Densification

4099 Erin Mills Parkway Proposed Development Public Meeting

Transportation and Traffic Impact Comments

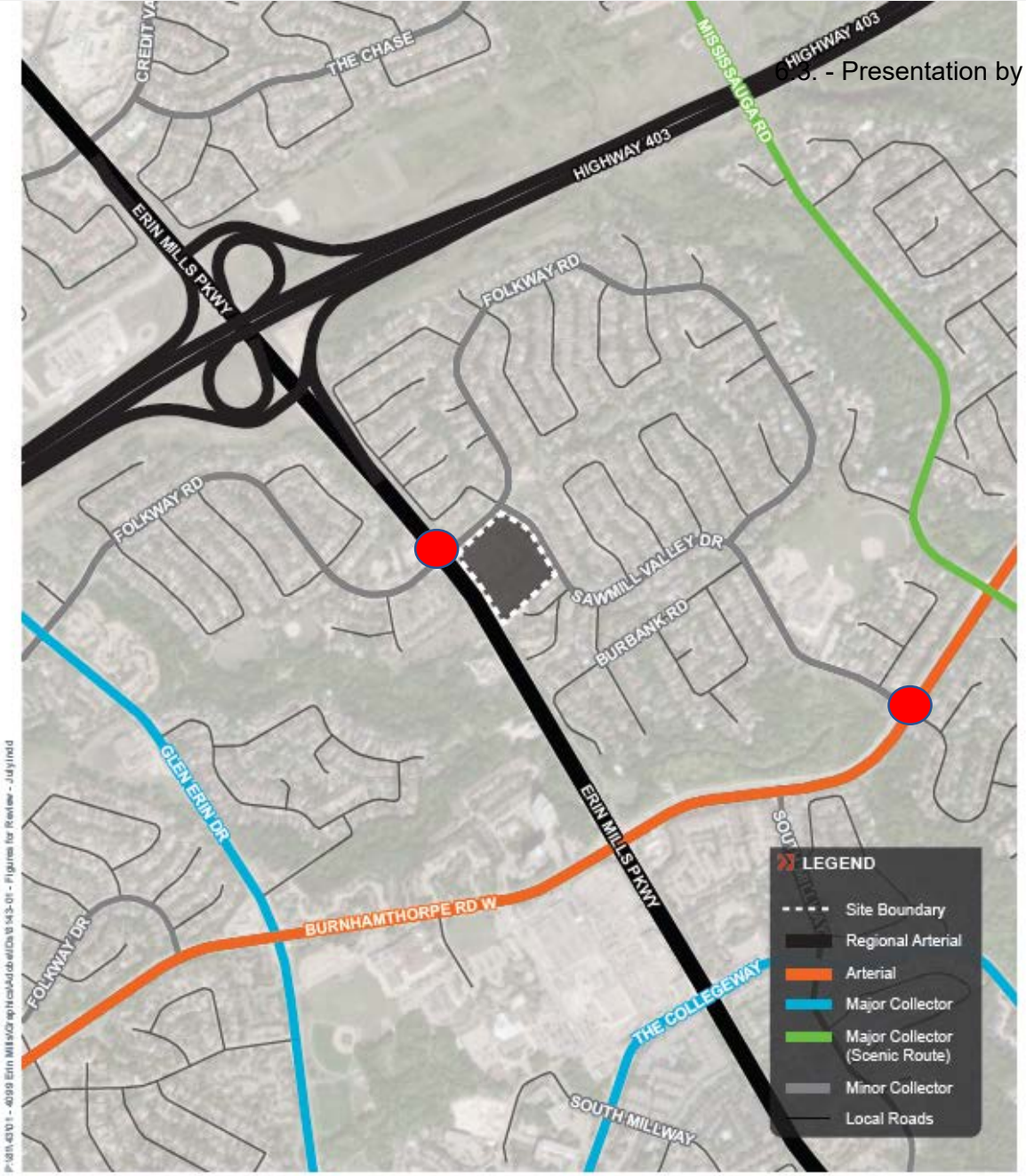


FIGURE 4 EXISTING AREA ROAD NETWORK

BA GROUP 8143-01 4099 ERIN MILLS PARKWAY

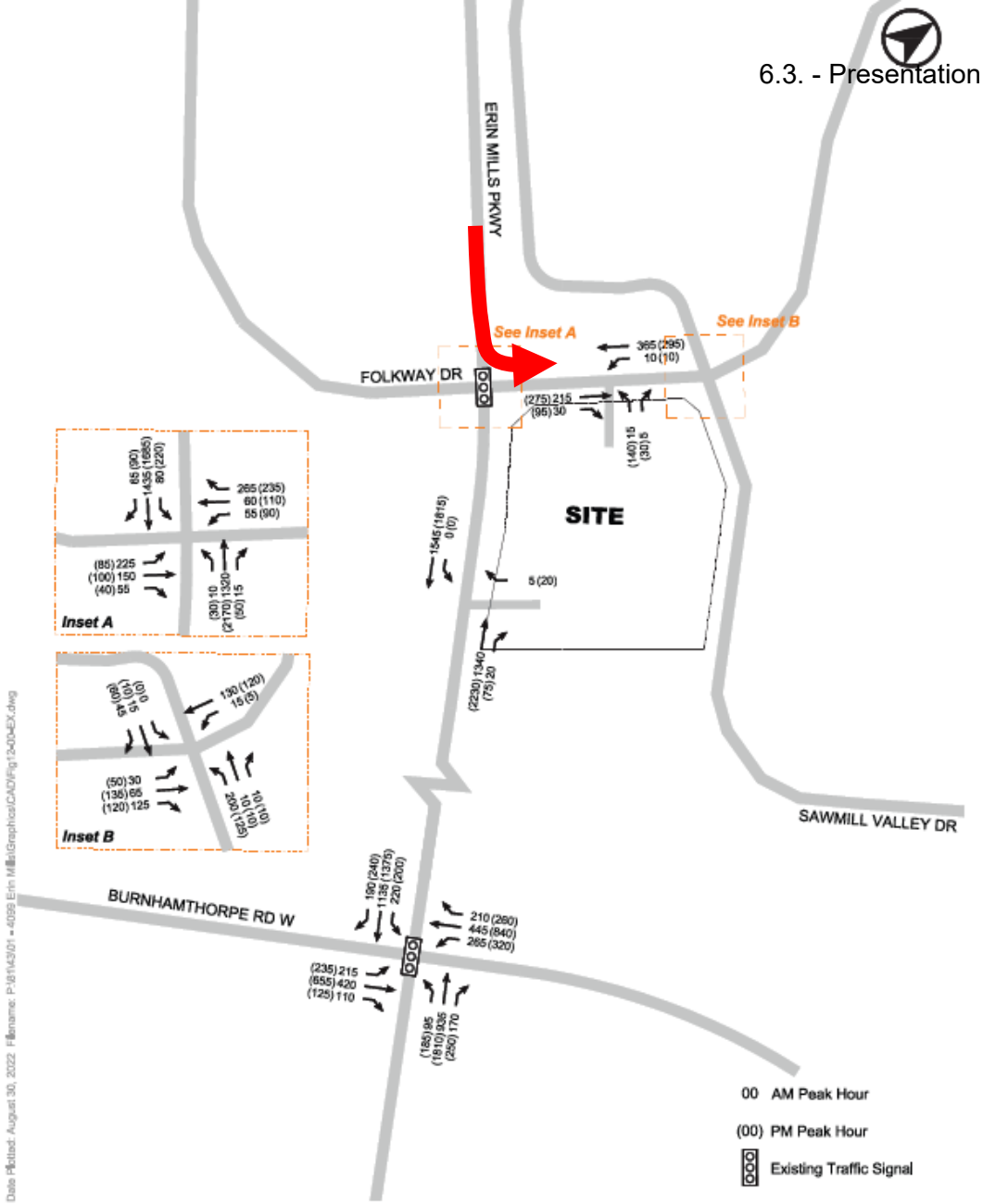


FIGURE 12 BASELINE EXISTING TRAFFIC VOLUMES

P

FIGURE 12 BASELINE EXISTING TRAFFIC VOLUMES

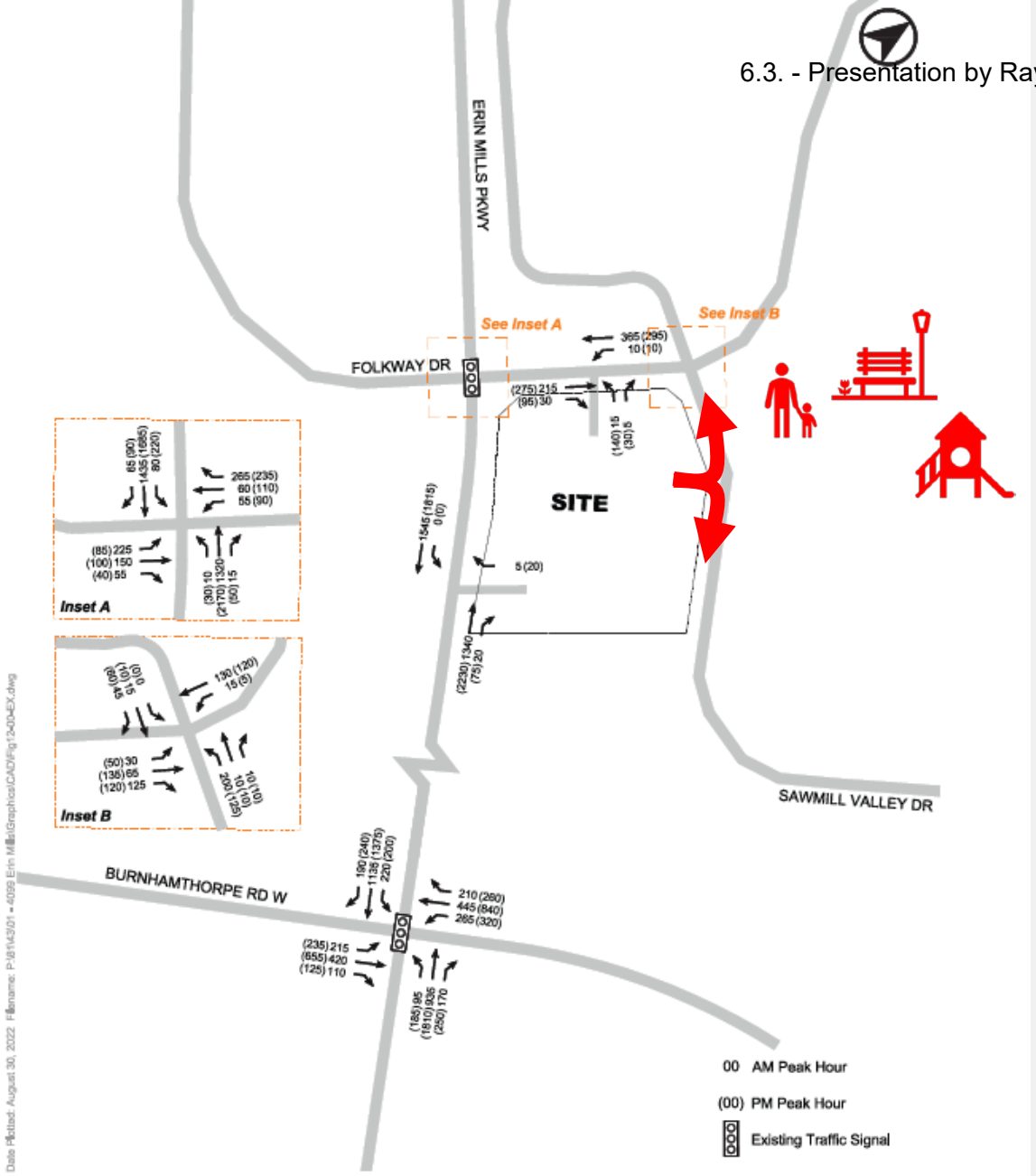


FIGURE 12 BASELINE EXISTING TRAFFIC VOLUMES

BA Group

4099 ERIN MILLS PARKWAY

ALL MANOEUVRE ACCESS - SAWMILL VALLEY DRIVE
TAC MINIMUM SIGHT LINE REVIEW
CASE B1 - LEFT TURN FROM THE MINOR ROAD

Project:	4099 ERIN MILLS PKWY
Project No.	8143-01
Date:	AUGUST 02, 2022
Revised:	AUGUST 30, 2022

Scale 1:750 (0, 15, 30m)

Drawing No. SD-02

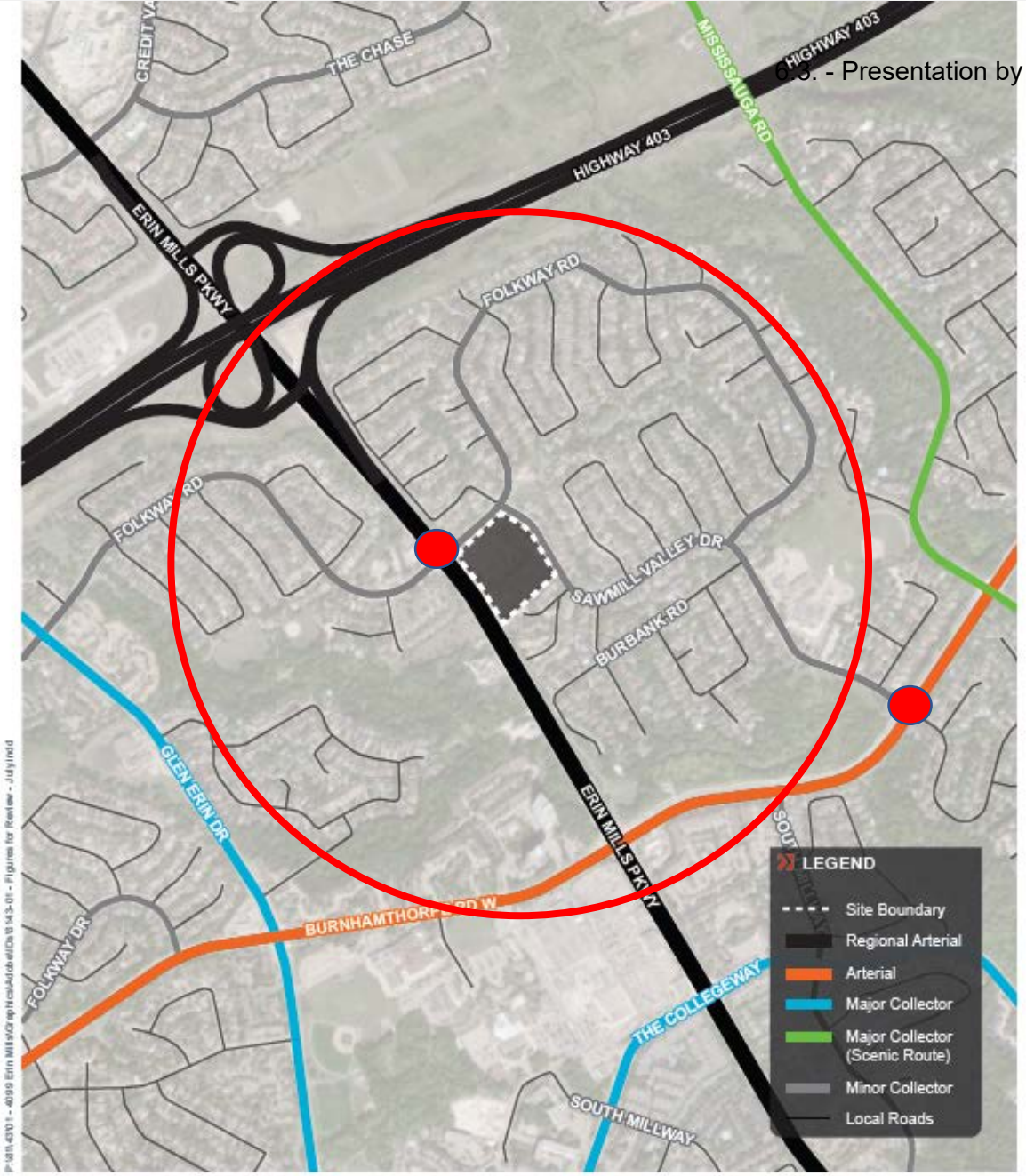


FIGURE 4 EXISTING AREA ROAD NETWORK

BA GROUP 8143-01 4099 ERIN MILLS PARKWAY

Schools and Safety

Speeding Report

Sawmill Valley Access Points

Density


30
km/h


30
km/h

6.3. - Presentation by Justin Colley

6.3. - Presentation by Justin Colley

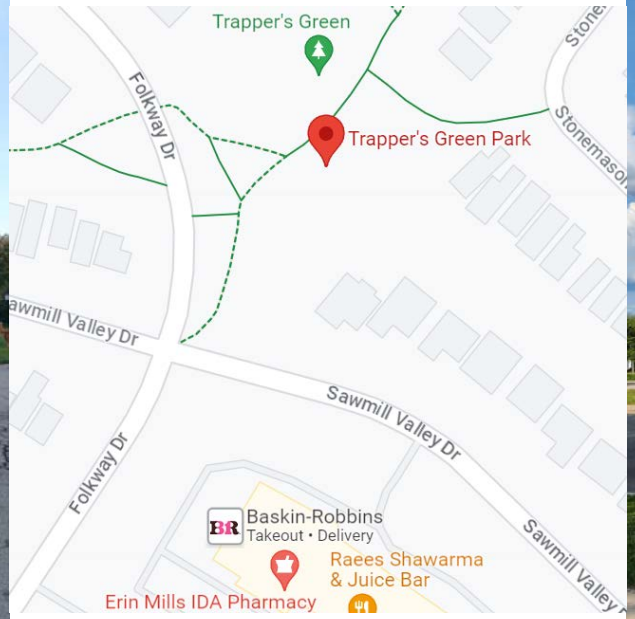

Tyvek
911

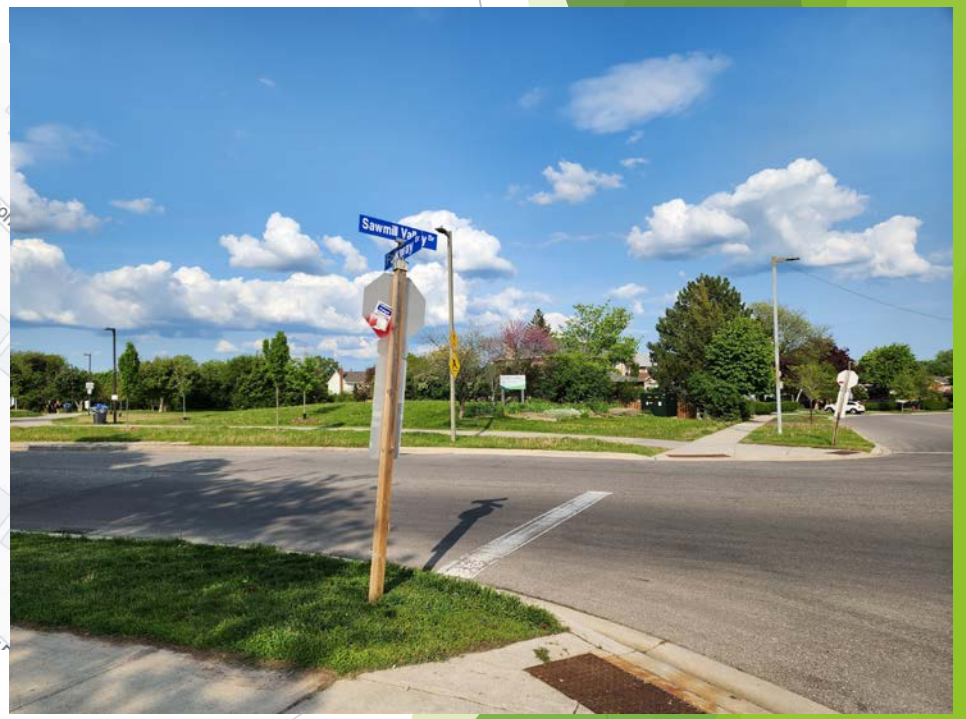
Design & Massing, Environment and Unit Types

Terry Chemij

May 2023

Trapper’s Green Park on Folkway Dr.





Community Access to Plaza:
SW Corner Folkway Dr. and Sawmill Valley Dr.

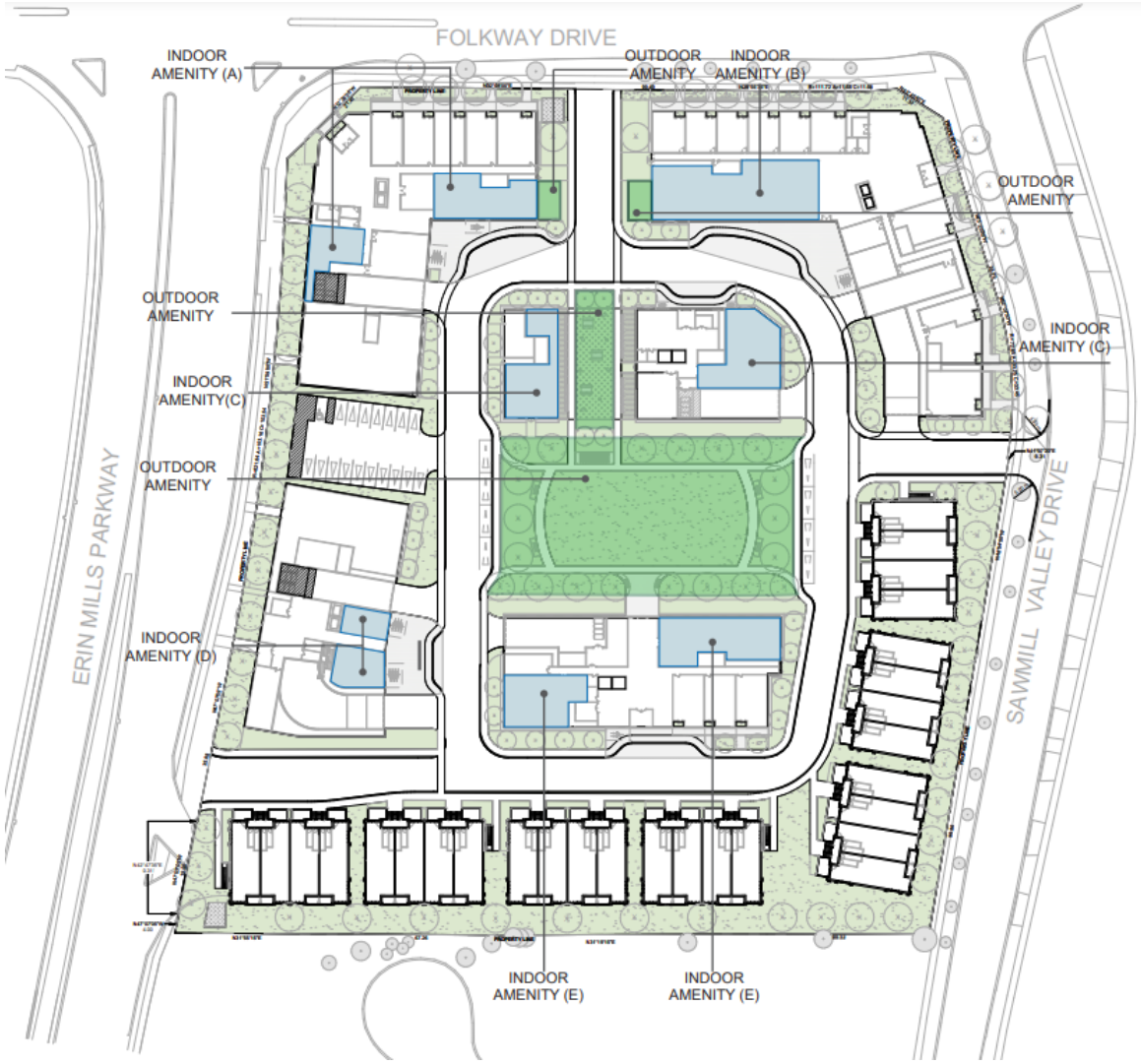
Community access point replaced with a 7-story building

Shadow impact

Sept 21- 8:35am

June 21- 7:07am

Lack of green space and environmental components



Gross Site: 6.5 acres (2.6 hectares)

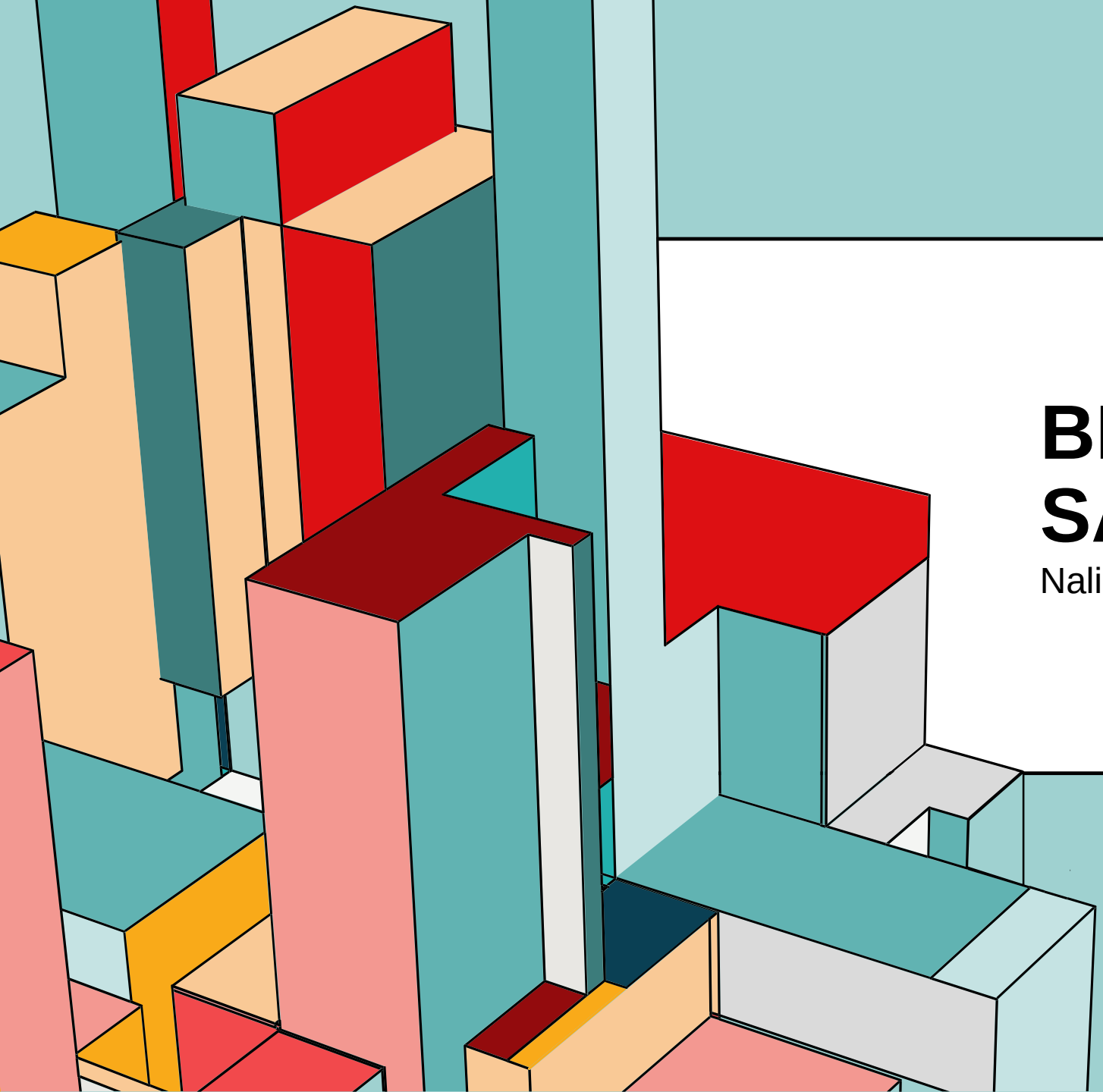
Proposed outdoor amenity space 2,330.4m^2 of which 2,018m^2 are “open” which represents less than 9% green space

Proposed Unit Types

	One Bedroom	Two Bedrooms	Two Bedrooms + Den	Three Bedrooms
# of units	384	119	57	31
% of units	65%	29.8%		5.2 %

The total number of 2 bedroom units of constructed, registered/mid-registration condo apartment buildings in Mississauga is 6,452 or **51.3%**

10% 3 bedroom units City of Toronto Growing Up guidelines



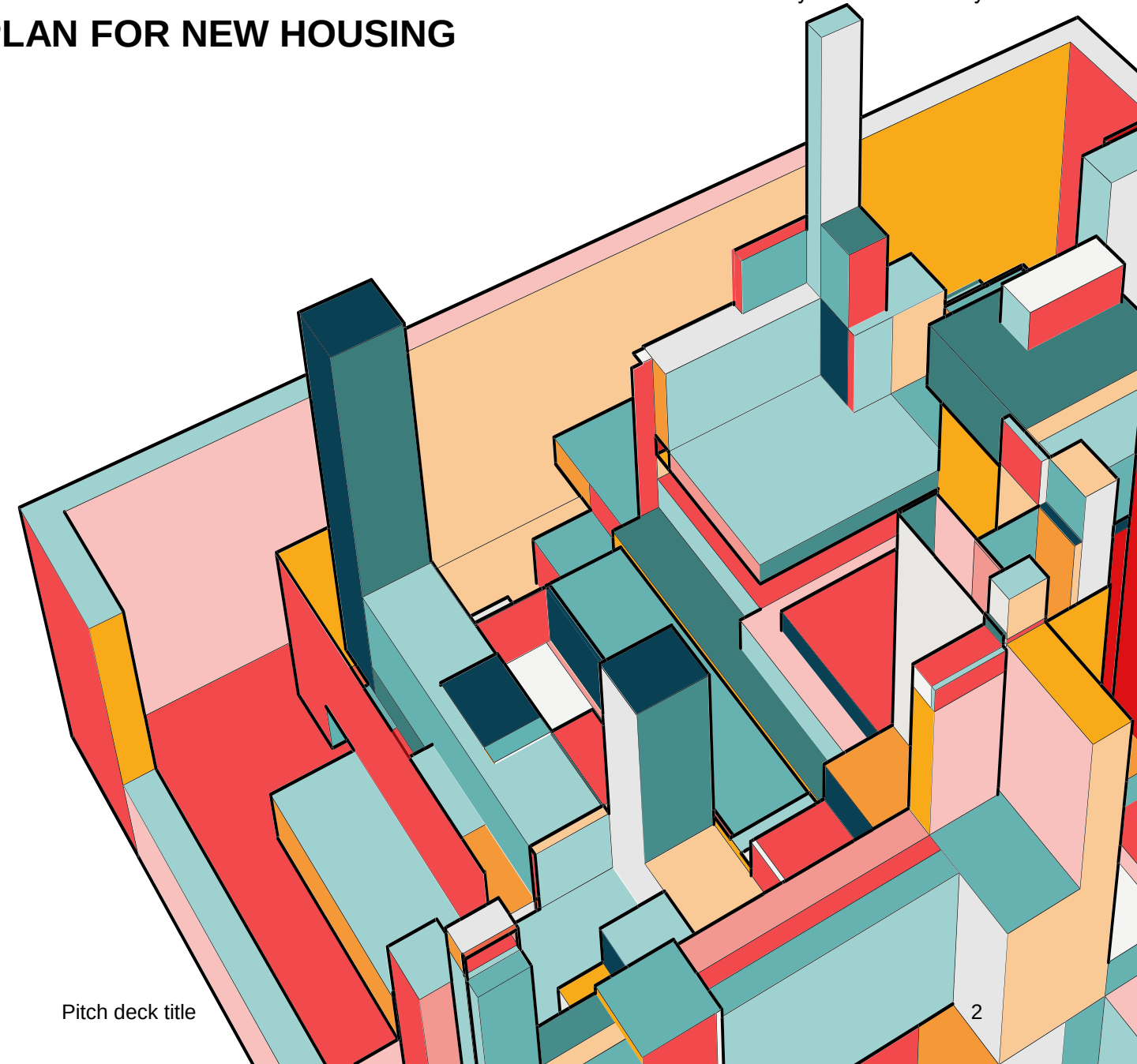
BECAUSE FORD SAID SO

Nalini Chariandy

GROWING MISSISSAUGA: AN ACTION PLAN FOR NEW HOUSING

(I.E. WHAT CITY COUNCIL TELLS US)

- Province requires 1.5M houses in 10 years
- Mississauga to produce 8% of these homes i.e., 120K homes in 10 years
- Mississauga being asked to do in 10 years what they should take 30 years to do
- Approved zoning for 80K home but only half being developed
- Housing crisis – lack of homes and affordability
- 5 goals and 23 actions to fulfill this goal, once long term federal and provincial funding is provided for infrastructure for transit, roads, fire stations etc.
- Goals: increase supply, improve affordability, streamline approvals, funding the plan, educate, engage and report



WHAT CITY COUNCIL KNOWS

(POST MEETING SPECIAL COUNCIL NOV 2022)

Loss in Revenue from Bill 23/109

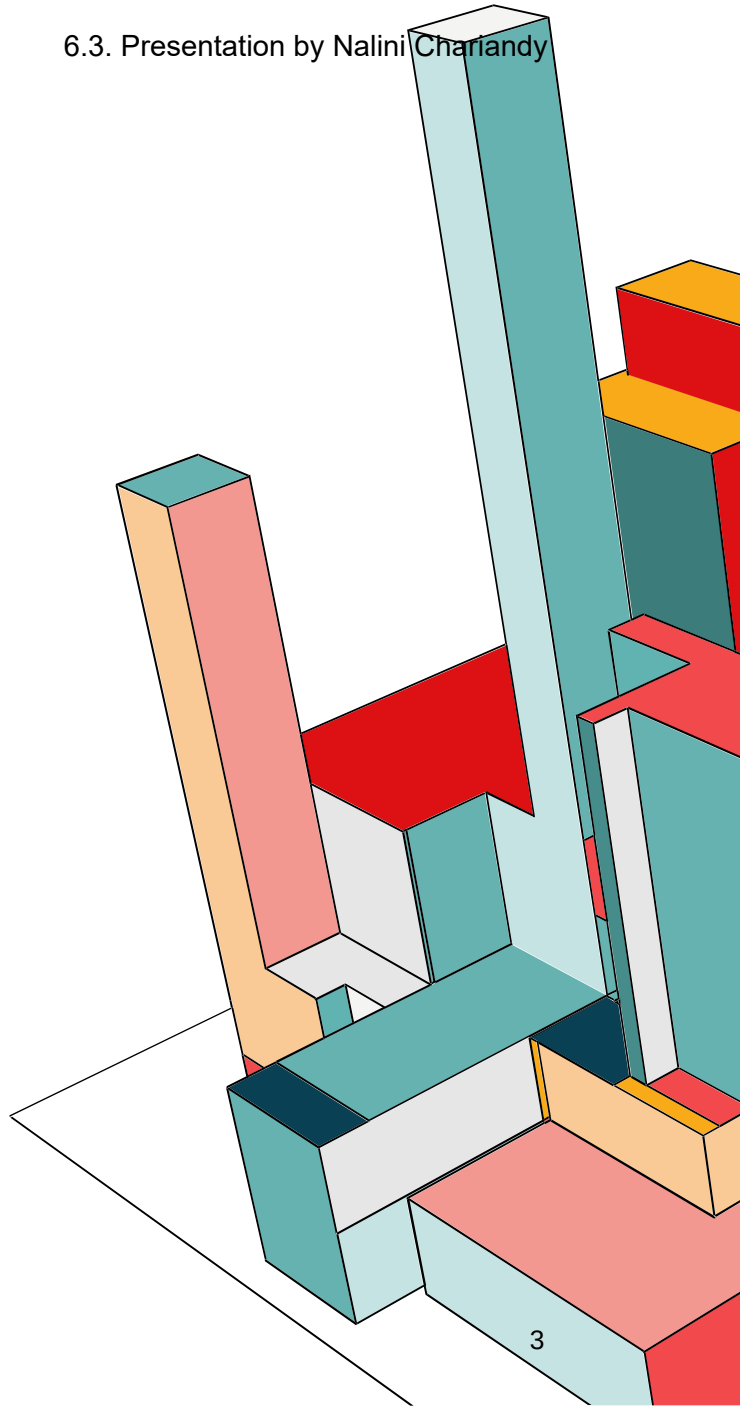
- The City will lose $900M in the next 10 years between development charges exemptions and parkland reductions
- Discounts affect the city's ability to fund infrastructure i.e. growth funding growth

Costs to residents

- Residents will have to foot the costs of infrastructure and affordable units
- **Property taxes will go through the roof unless we get provincial and federal funding**

Affordability

- Developers not required to pass on savings to purchasers ($111K based on an average priced home)
- Province's definition of affordable is 80% less than average market cost of home not based on average income
- Exempting affordable units from DC will create the incentive to build smaller units



WHAT THE DEVELOPER KNOWS

(4099 ERIN MILLS – JUSTIFICATION REPORT)

Compliance with Provincial Policy statement, Growth Plan, City of Mississauga and Peel Regional Official Plans

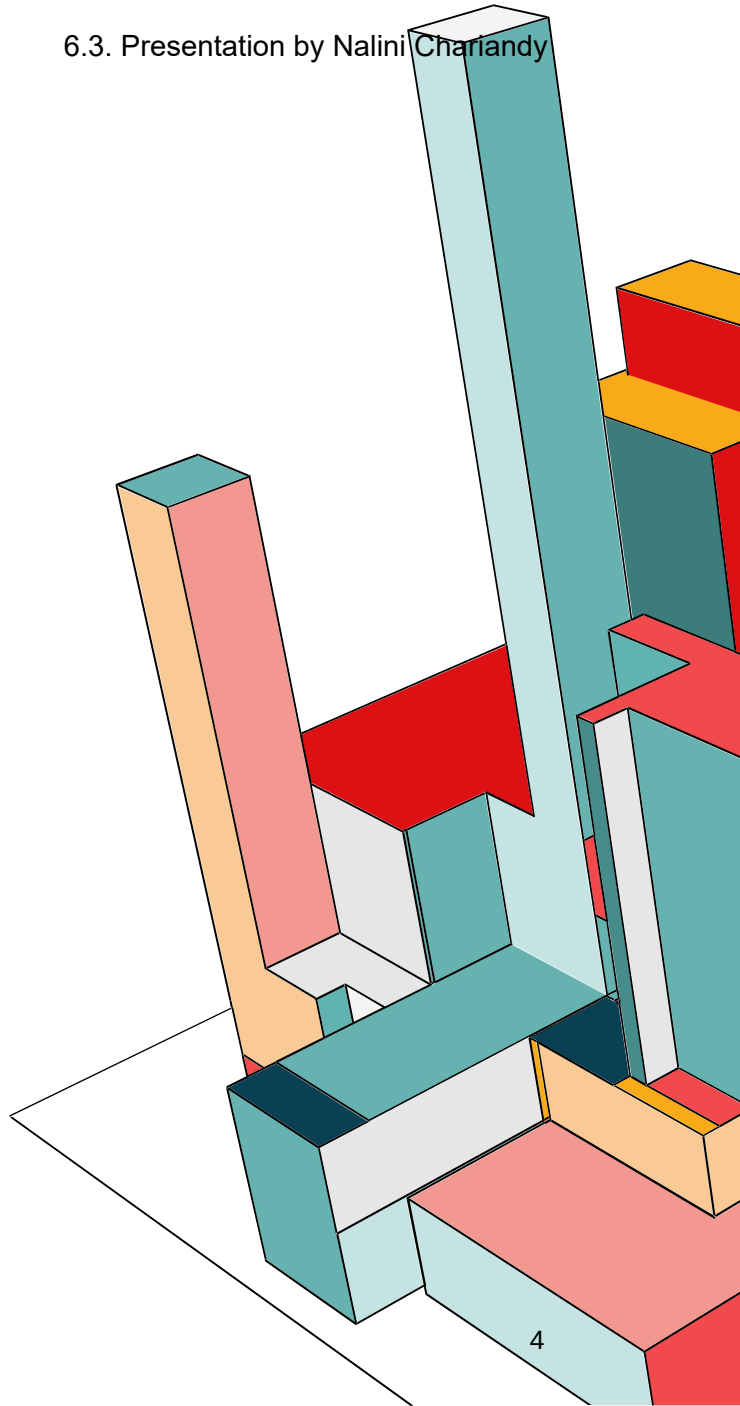
- Noise and wind studies conclude certain mitigation measures required, deficiency in meeting requirement for sun access on Folkway
- Proposed Official Plan Amendment to provide for high density use/max height for “special site 5” which pertain to all lands owned by Queenscorp Erin Mills
- Traffic study done during the pandemic
- Several of the buildings are unpermitted “Tall buildings”
- Buildings are bounded by two minor collectors
- Removes neighborhood walking access to grocery store, pharmacy, bank

Affordability

- Currently no plans for affordable housing in this development
- No information on cost of housing
- 55% of units are one bedroom, capitalizing on DC reductions and exemptions

Developer as current landlord

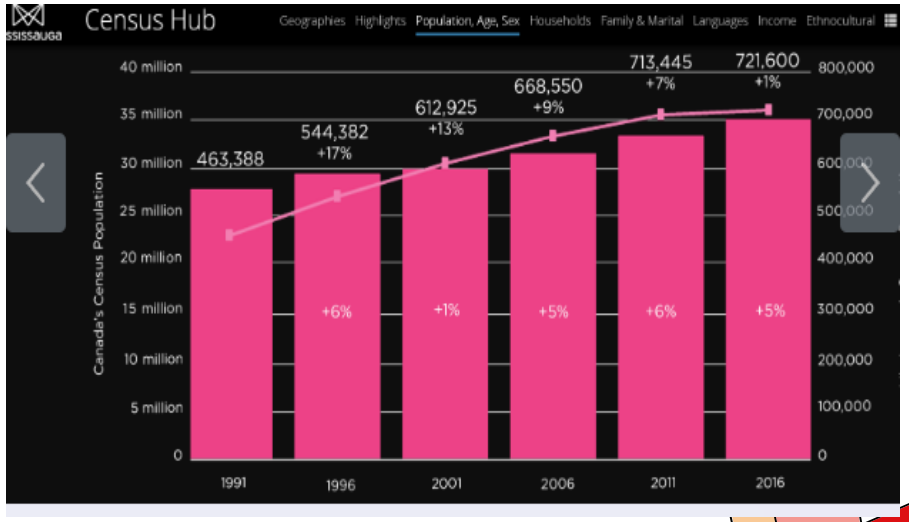
- Bins overflowing
- Increased rents
- Month to month leases
- Runs down plaza to frustrate neighborhood and tenants
- Cadet Cleaners, 18-year-old tenant forced to leave as landlord virtually doubled their rent



WHAT WE KNOW

Forecasted population growth

- Between 2011 and 2016 Mississauga grew by 0.6% in the last 5 years i.e. by 4,520 people
- Mississauga is forecasting a 57K increase between 2021 and 2031
- At 12K homes built a year, by 2031 we would have built 96.000 homes
- This means we are building:
- **1.7 homes per person NOT families**



Affordability

- Queenscorp will not be passing the DC reduction to the purchaser
- The reduction of DC are not incentivizing Developers to build, just to apply for more permits and hold on to approved lands.
- The City should introduce penalties for developers that do not develop the land in a given period and force them to reapply
- The issue is not the City holding back development, but the shortage of labour for construction

WHAT THE WE KNOW

The Immigrants are coming

- Immigrants go where they have family or jobs
- In these 5 years to 2016 the city grew by 4% and the employment ratio remained the same

- In the 2021 census,
  - Mississauga shrunk by 0.5% as compared to 2016
  - had a working age (15 to 64) population of 68%.

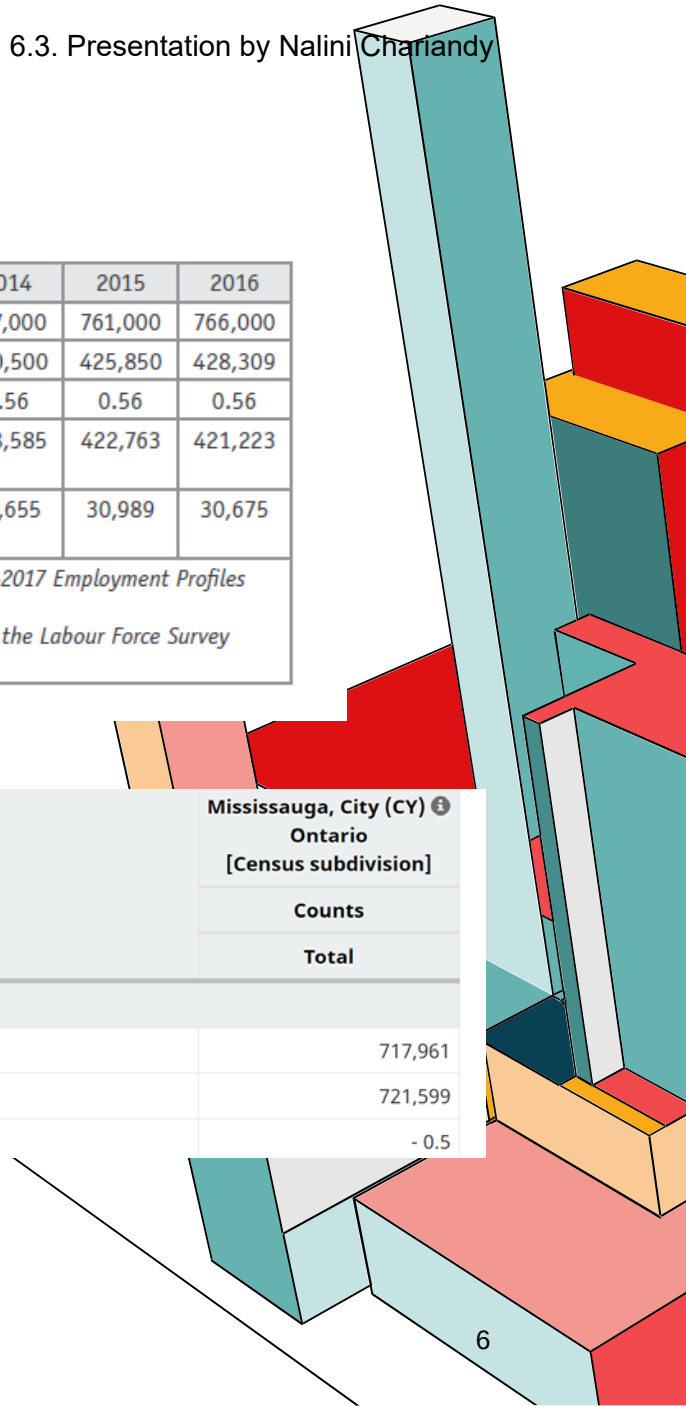
- Where are all the jobs for the influx of immigrants and working age Canadians to be able to afford all these homes?

Total Employment and Resident Labour Force

	2011	2012	2013	2014	2015	2016
Population	738,000	741,000	753,000	757,000	761,000	766,000
Total Employment	415,710	413,325	417,585	420,500	425,850	428,309
Employment Ratio (1)	0.56	0.56	0.56	0.56	0.56	0.56
Participating Resident Labour Force (2)	414,660	413,340	424,347	418,585	422,763	421,223
Labour Import (Export) (3)	35,880	34,705	26,338	36,655	30,989	30,675

Source: City of Mississauga, Planning & Building Department, 2012-2017 Employment Profiles
Notes: (1) Total employment divided by the total population
(2) Resident labour force multiplied by the participation rate from the Labour Force Survey
(3) Total employment positions minus the employed labour force

Characteristic	Mississauga, City (CY) Ontario [Census subdivision] Counts Total
Population and dwellings	
Population, 2021 [1]	717,961
Population, 2016 [1]	721,599
Population percentage change, 2016 to 2021	- 0.5

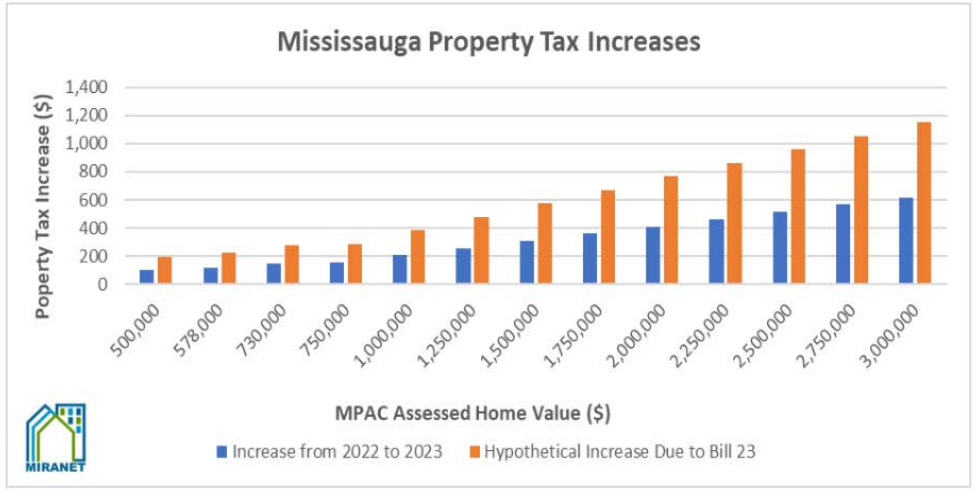


WHAT THE WE KNOW

Property taxes

- City of Mississauga has approved a 3% budget increase for 2023
- Peel region a 2.8% budget inc. for 2023
- These increases were meant to address revenue loss/expenditure due to Covid, supply chain issues and inflation
- The costs of Bill 23 as projected by MIRANET would add another 11% on to our tax bills

Figure 1: Property Tax Increases for 2023 prior to Bill 23 and for 2023 with Bill 23



Development charges

- The City currently has approved housing for 80K homes but only half are being built.
- Reducing the DC are not incentivizing developers to build, but just to apply for permits and hold on to them.
- Elimination/reduction of the DC has thrown all growth costs on to the backs of taxpayers.

Table 2: 2023 Approved Budgets for City of Mississauga and Region of Peel including Potential Impacts from Bill 23

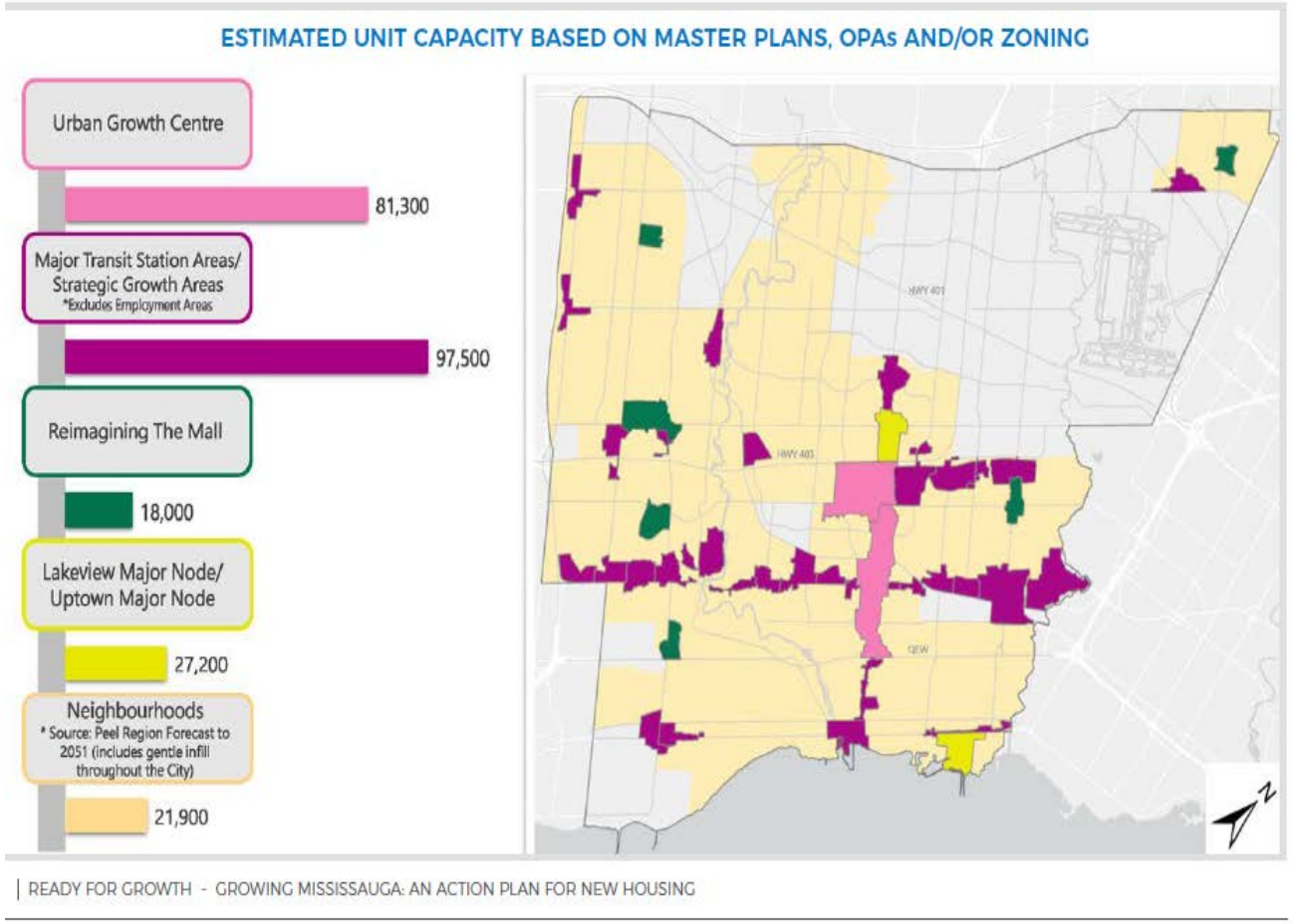
% Increase to Property Taxes	Tax Scenarios		
	2023 Budget with Potential Increases Due to Bill 23		
	2023 Approved Budget Increase Prior to Bill 23*1	Hypothetical Increase Due to Bill 23*2	Combined Impact
City Levy % Increase	3.02	5.58	8.60
Region Levy % Increase	3.07	5.73	8.80
Education Levy % Increase	0.00	0.00	0.00
Total % Increase	6.09	11.31	17.40

*1 approved City (Feb. 1, 2023) and Region (Feb.2, 2023) year-over-year budget increases;
*2 Bill 23 increases are hypothetical only and have been revised to keep the combined impacts the same as those proposed in 2022

WHAT WE KNOW

Mississauga's Action Plan

- New residential will be directed towards stratetic growth areas
- Urban growth areas, Major Transit Station Areas,Reimagine the mall etc.
- Places where people have easy access to groceries, malls and most importantly transit.
- Mississauga has identified 246,000 potential residential units for the future
- **AND** 4099 Erin Mills is **NOT** one of them.



REJECT THIS PROJECT

If this project does not meet the stake holder expectation and compliance concerns– you have to reject this project.

Mississauga City Goals

Goal 1: increase supply
Goal 2: Improving affordability
Goal 3: Streamline approvals
Goal 4: Funding the plan
Goal 5: Educate, Engage and Report

Community Concerns

1) Increase in costs/ property taxes
2) 55% one-bedroom units
3) Infrastructure costs– parking, transit, utilities,
4) Safety issues with school buses
5) Removal of ability to walk to resources like grocery and the pharmacy

Developer Compliance

1) Justification report has many exceptions i.e., tall building definition, noise/wind mitigation measures, proposed Official Plan amendment to density etc.
2) Project is not in a strategic growth area as defined by the City

REFERENCES

Forecasts
https://city-planning-data-hub-1-mississauga.hub.arcgis.com/pages/growth-forecast

0.5% drop in pop 2016 to 2021

https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=0&DGUIDlist=2021A00053521005&SearchText=mississauga

Justification W8_4099_ justification_report

https://www.mississauga.ca/wp-content/uploads/2022/12/W8_4099_Planning_Justification_Report_November_2022.pdf

Census

https://city-planning-data-hub-1-mississauga.hub.arcgis.com/pages/census

Mississauga Resident's Association Network

https://miranet.ca/2023/04/04/impacts-of-bill-23-on-municipal-and-regional-budgets-and-property-taxes/

Stats Canada 2021 census

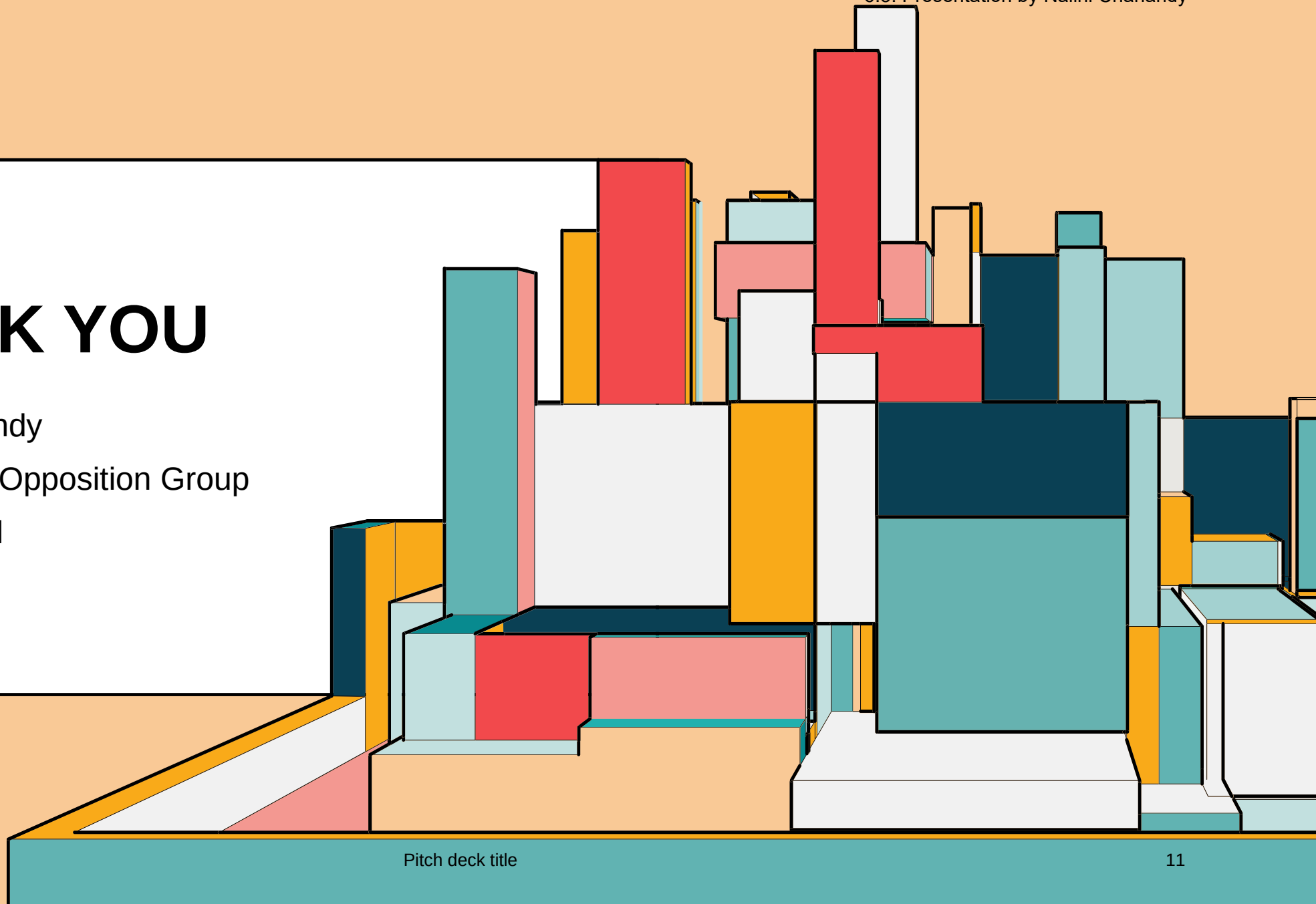
https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&GENDERlist=1&STATISTIClist=1&HEADERlist=0&DGUIDlist=2021A00053521005&SearchText=mississauga

THANK YOU

Nalini Chariandy

For the 4099 Opposition Group

Contact email



MAY 29, 2023 - PRESENTATION TO PLANNING & DEVELOPMENT COMMITTEE

Density Comparisons

Don Barker - 4099 EMP Opposition Group

Our Neighbourhood
Vs 703 Homes in the The Proposed Development

Dropping A
Small City
in the
Midst of a Village

Part 1: Comparison to Neighbouring Areas

Northeast, Southeast, Southwest, Northwest

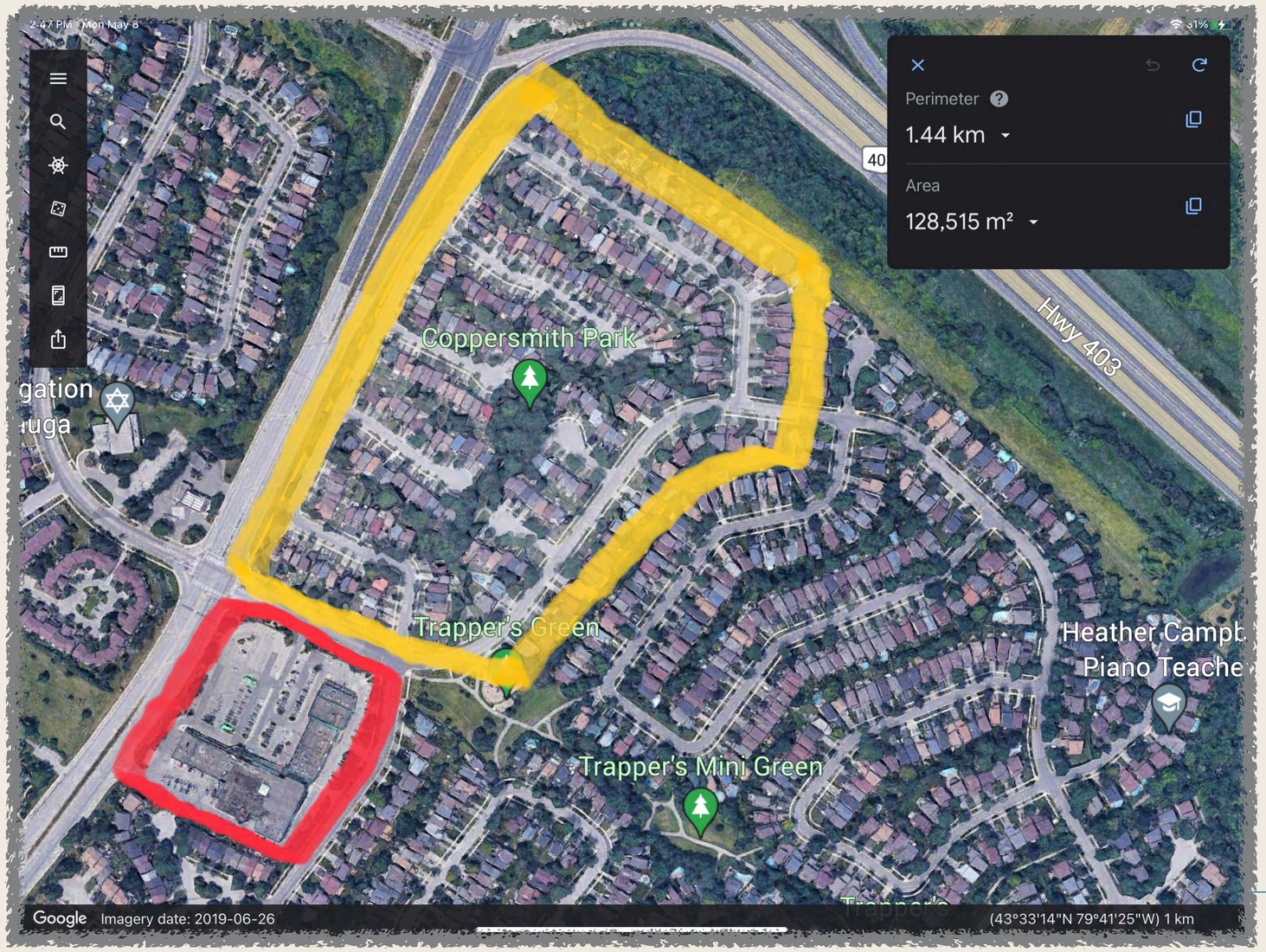
Photo credit: Turner-Fleischer Urban Design Study

Northeast Neighbours

- Residential Low density I & II per Erin Mills Neighbourhood Character Area

- Sawmill Valley Drive above Folkway
- Grindstone, Colter, Ploughshare, Coppersmith & Musket Courts
- Adjacent Folkway Drive

Northeast Neighbours



Site:

- 703 units, Area: 2.60 hectares
- Density: 270 units/hectare

Northeast Neighbours

- 235 Two-storey homes
- Area: 12.85 hectares
- Density: 18 homes/hectare

Proposal is

14.8 X

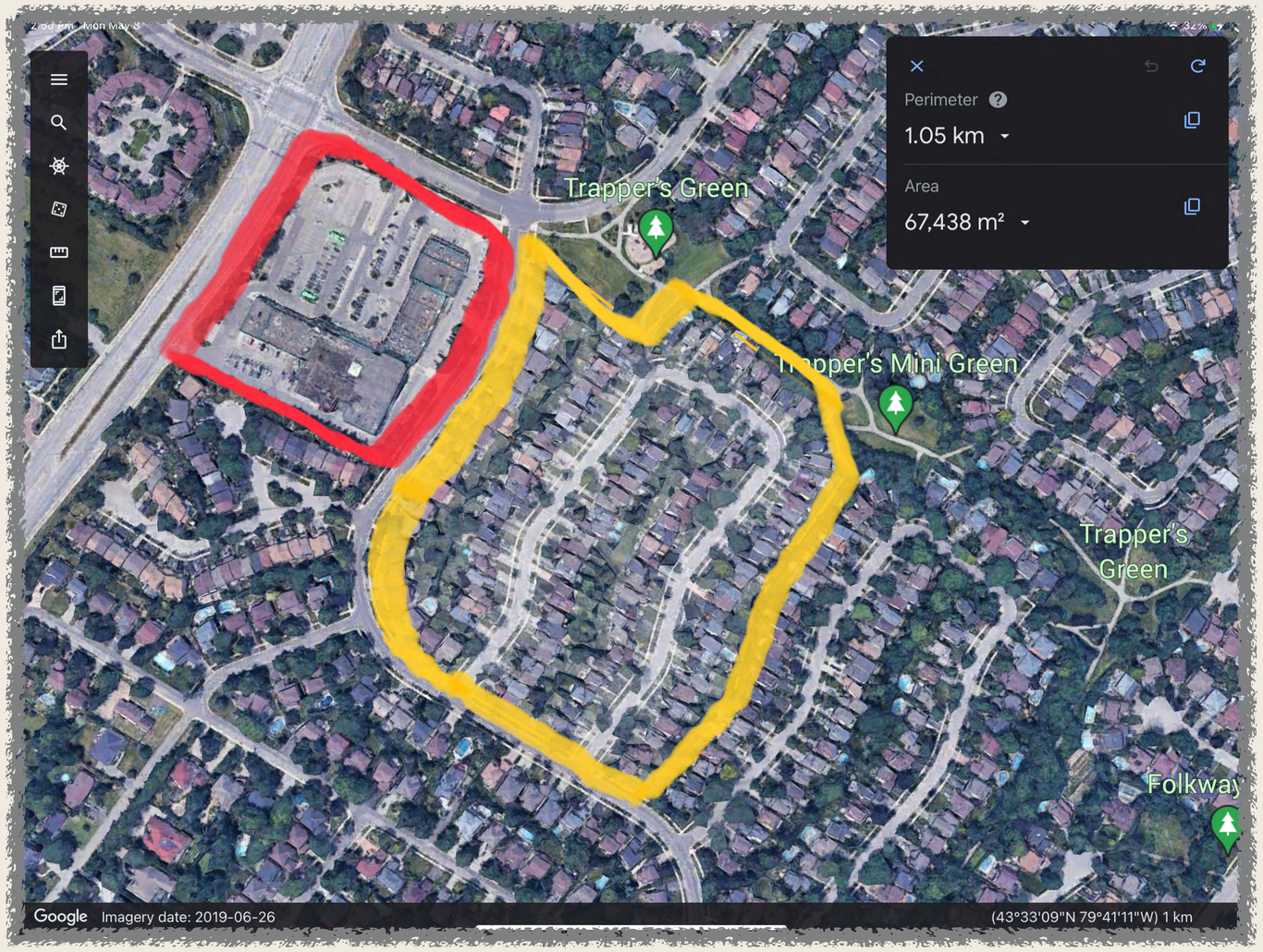
The density of the northeast neighbours

Southeast Neighbours

- Stonemason Crescent
- Adjacent Sawmill Valley Drive

- Residential Low density I & II per Erin Mills Neighbourhood Character Area

Southeast Neighbours



Site:

- 703 units, Area: 2.60 hectares
- Density: 270 units/hectare

Southeast Neighbours

- 136 Two-storey homes
- Area: 6.74 hectares
- Density: 20 homes/hectare

Proposal is

13.4 X

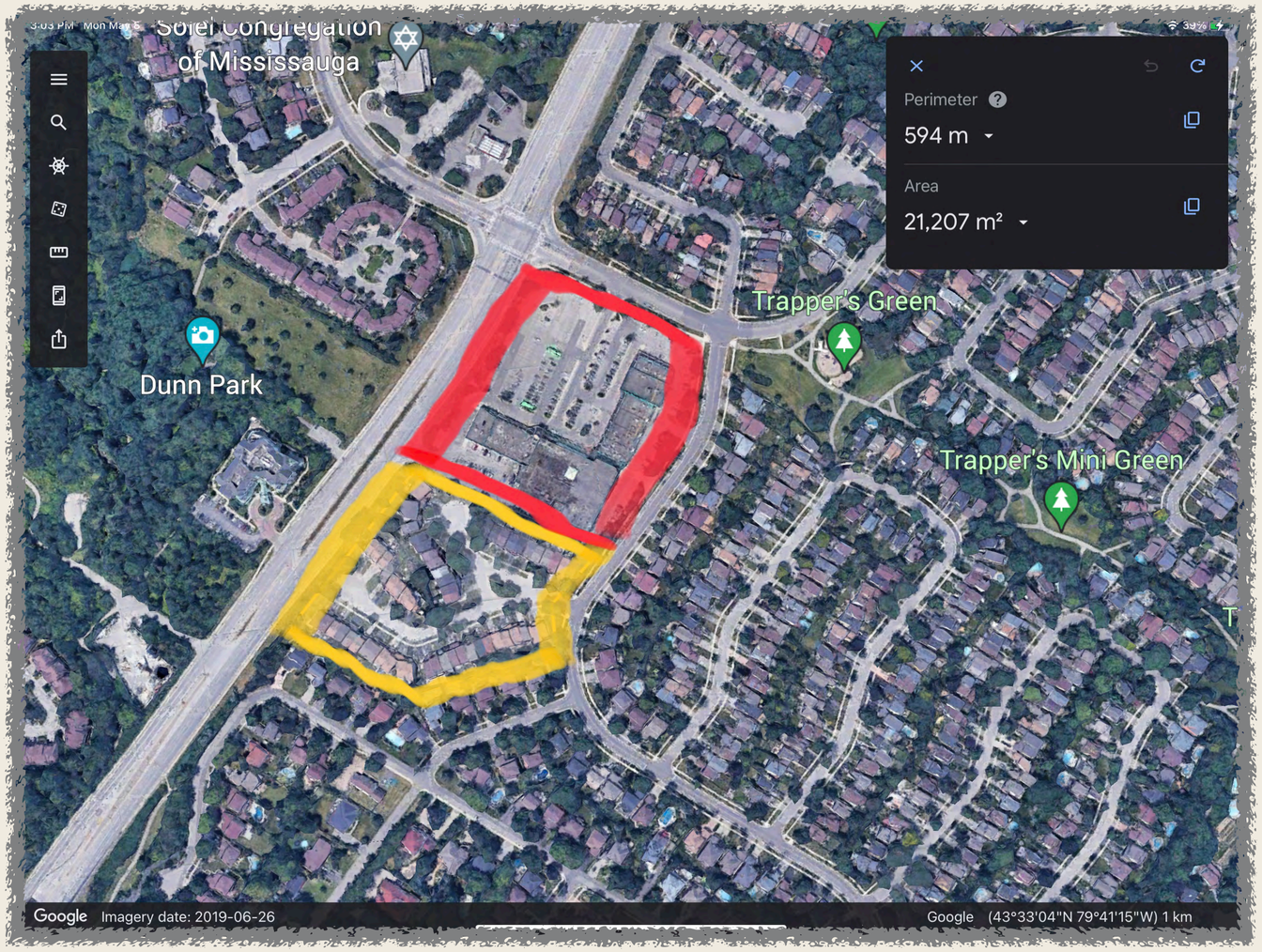
The density of the southeast neighbours

Southwest Neighbours

- Residential Low density II per Erin Mills Neighbourhood Character Area

- Farrier Court
- Farrier Mews

Southwest Neighbours



Site:

- 703 units, Area: 2.60 hectares
- Density: 270 units/hectare

Southwest Neighbours

- 59 Two-storey semi-detached homes
- Area: 2.12 hectares
- Density: 27.8 homes/hectare

Proposal is

9.7 X

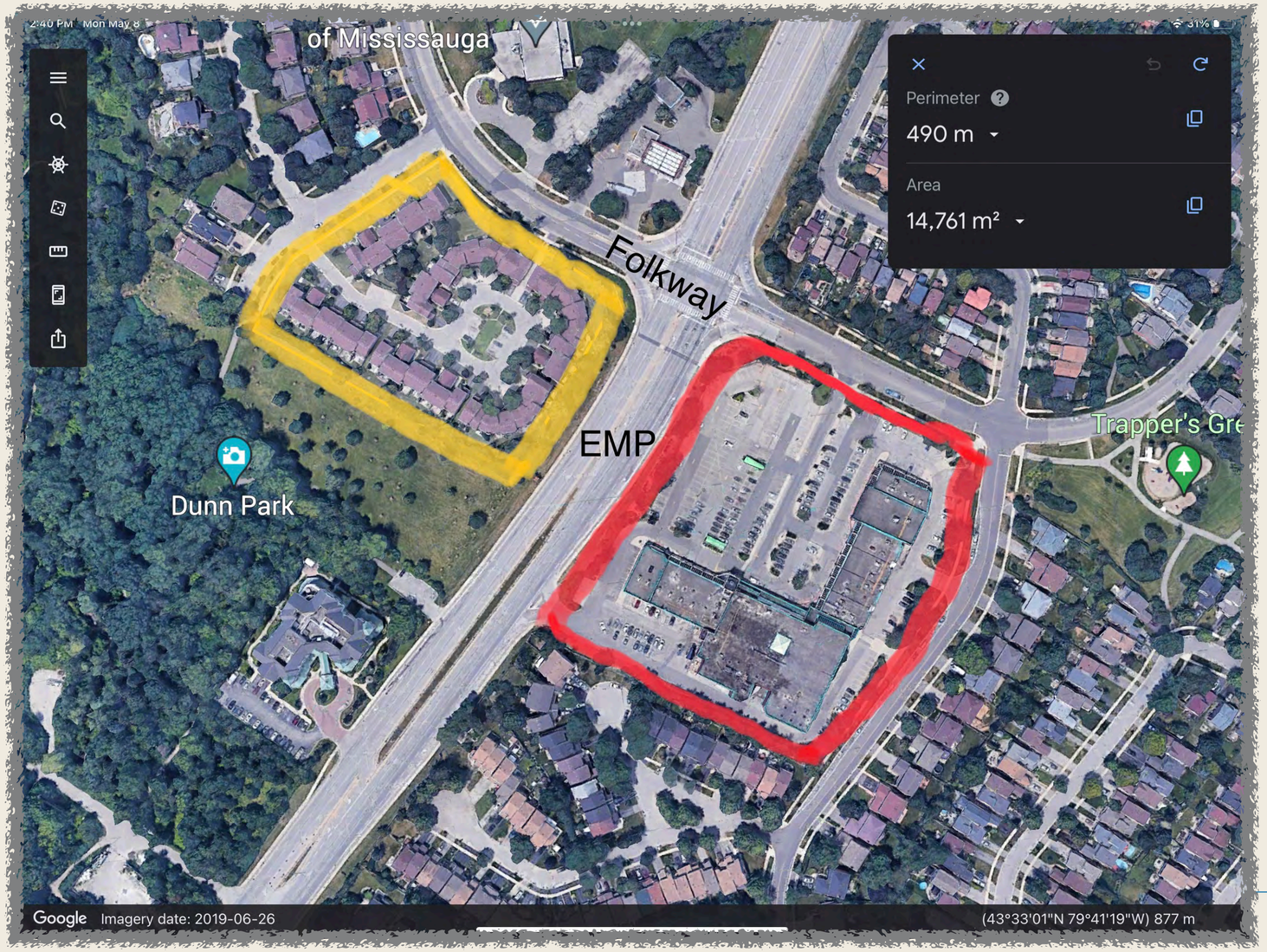
The density of the northeast neighbours

Northwest Neighbours

- Arbour Green Townhomes

- Residential Medium density per Erin Mills Neighbourhood Character Area

Northwest Neighbours



Site:

- 703 units, Area: 2.60 hectares
- Density: 270 units/hectare

Northwest Neighbours

- Two-storey townhomes
- Area: 1.48 hectares
- Density: 35.2 homes/hectare

Proposal is

7.7 X

The density of the northwest neighbours

Part 2: Comparison to Recent Developments

Three recently built developments in the greater area of the proposal

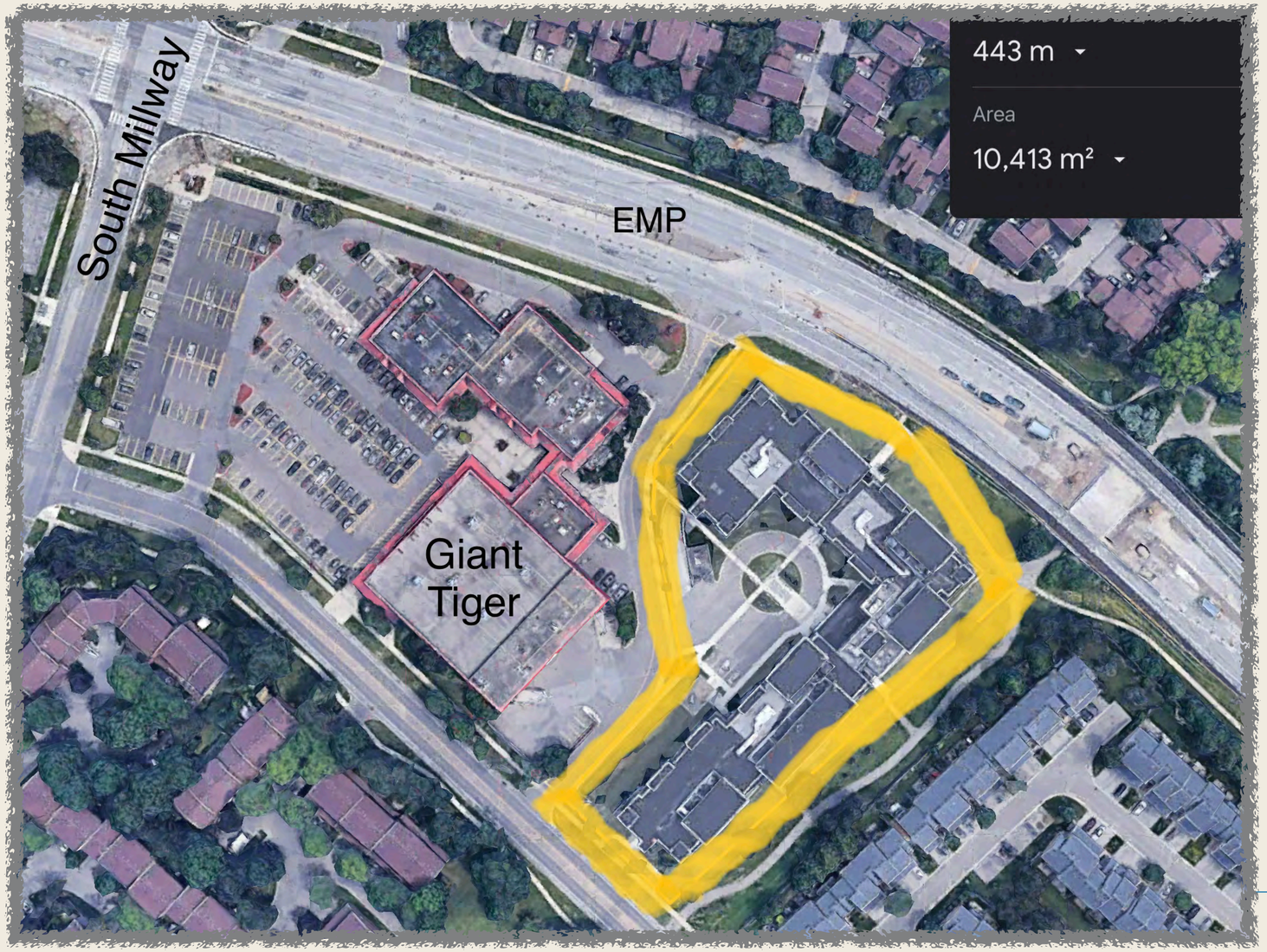
Photo credit: DonBarker

3170 Erin Mills Parkway

- Windows on the Green Condos
- Low-rise condos
- South of Giant Tiger plaza

- Two entrances:
- Right in/out at EMP
- Fifth Line West

3170 Erin Mills Parkway



Site:

- 703 units, Area: 2.60 hectares
- Density: 270 units/hectare

3170 Erin Mills Parkway

- 154 Low-rise condos
- Area: 1.04 hectares
- Density: 148 homes/hectare

Proposal is

1.8 X

The density of the 3170 EMP Condos

Collegeway / Ridgeway

- Back-to-back stacked townhomes
- Under construction

Collegeway / Ridgeway

Site:

- 703 units, Area: 2.60 hectares
- Density: 270 units/hectare

Collegeway/Ridgeway

- 380 townhomes
- Area: 2.62 hectares
- Density: 146 homes/hectare

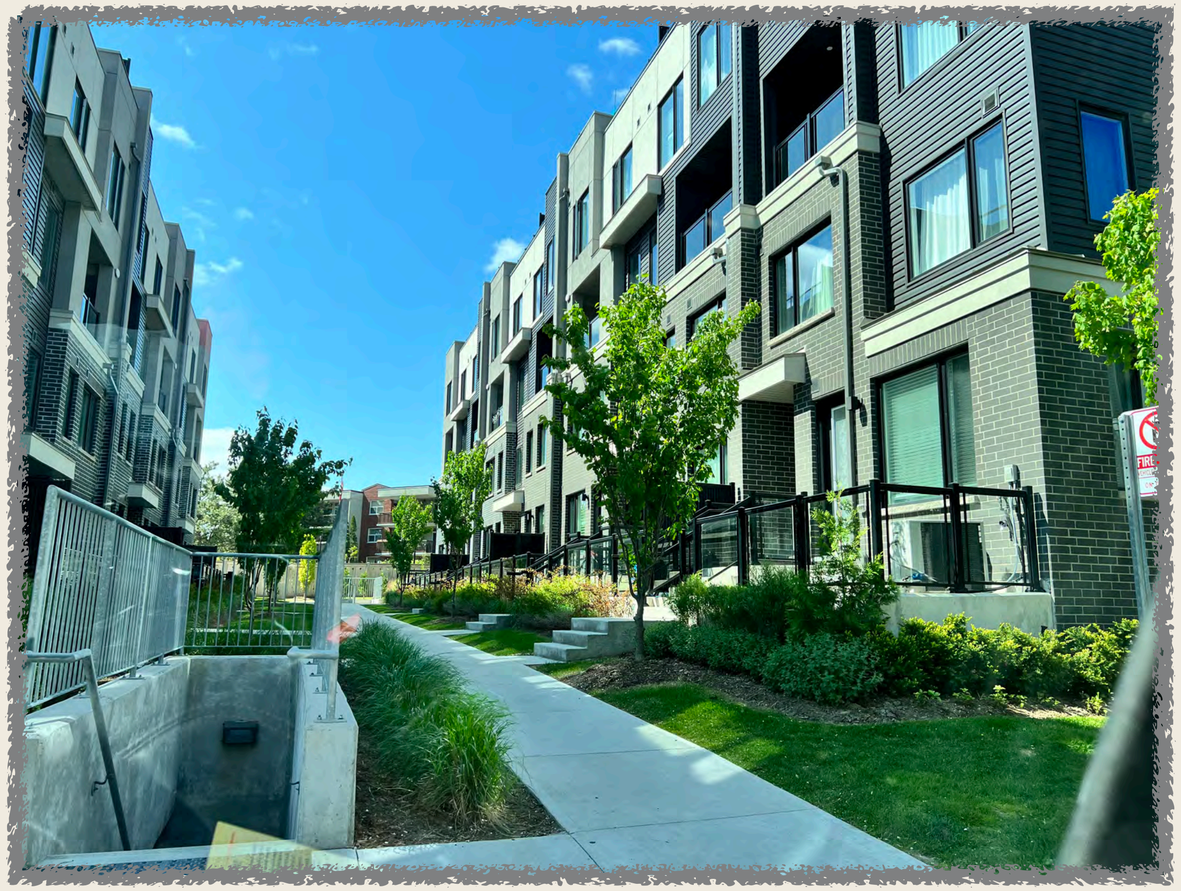
Proposal is

1.9 X

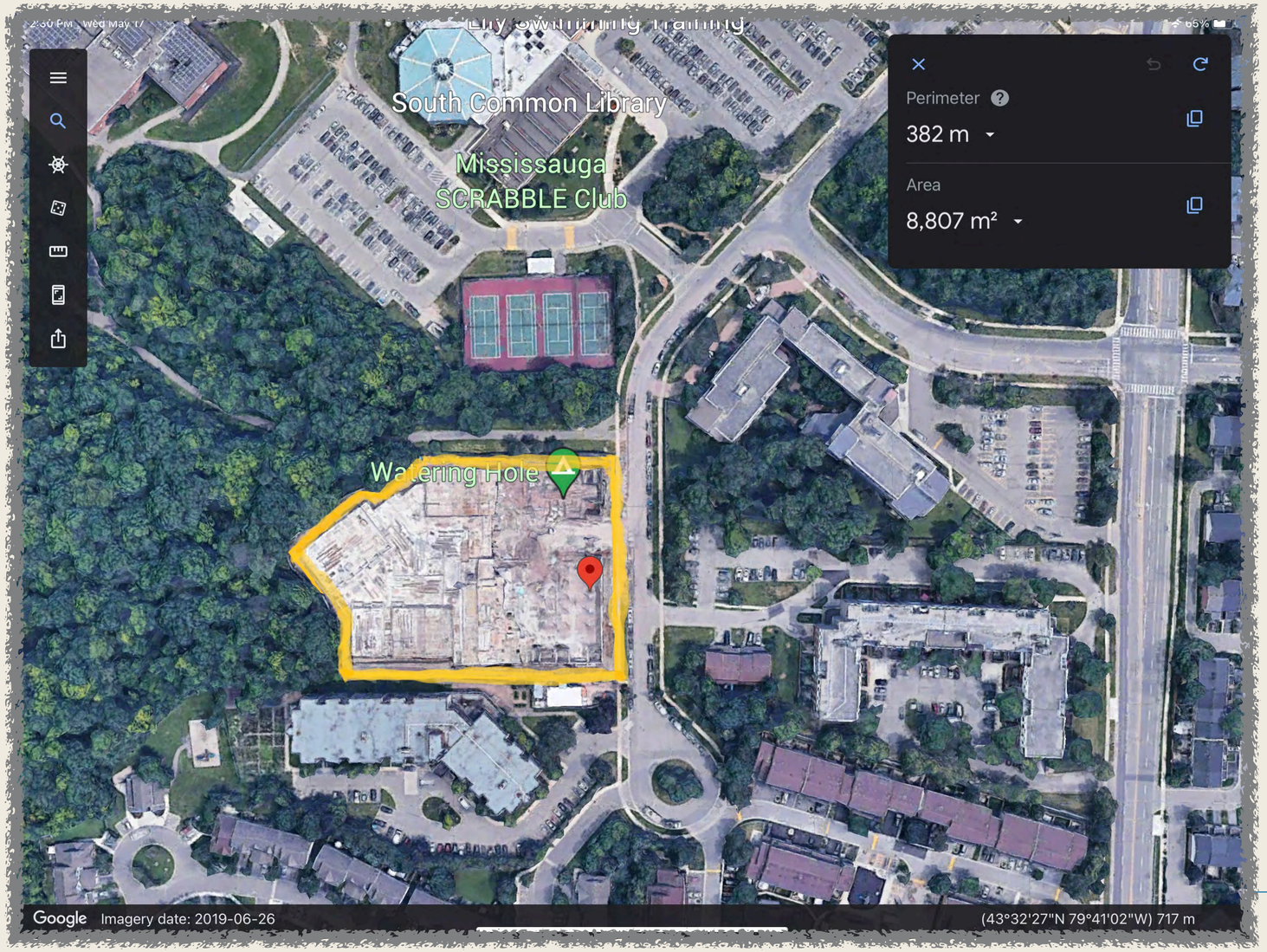
The density of Collegeway/Ridgeway towns

3472-3492 Widdicombe Way

- Back-to-back stacked townhomes
- One entrance from South Millway



3472-3492 Widdicombe Way



Site:

- 703 units, Area: 2.60 hectares
- Density: 270 units/hectare

3472-3492 Widdicombe Way

- 144 Stacked, back-to-back townhomes
- Area: 0.88 hectares
- Density: 163 homes/hectare

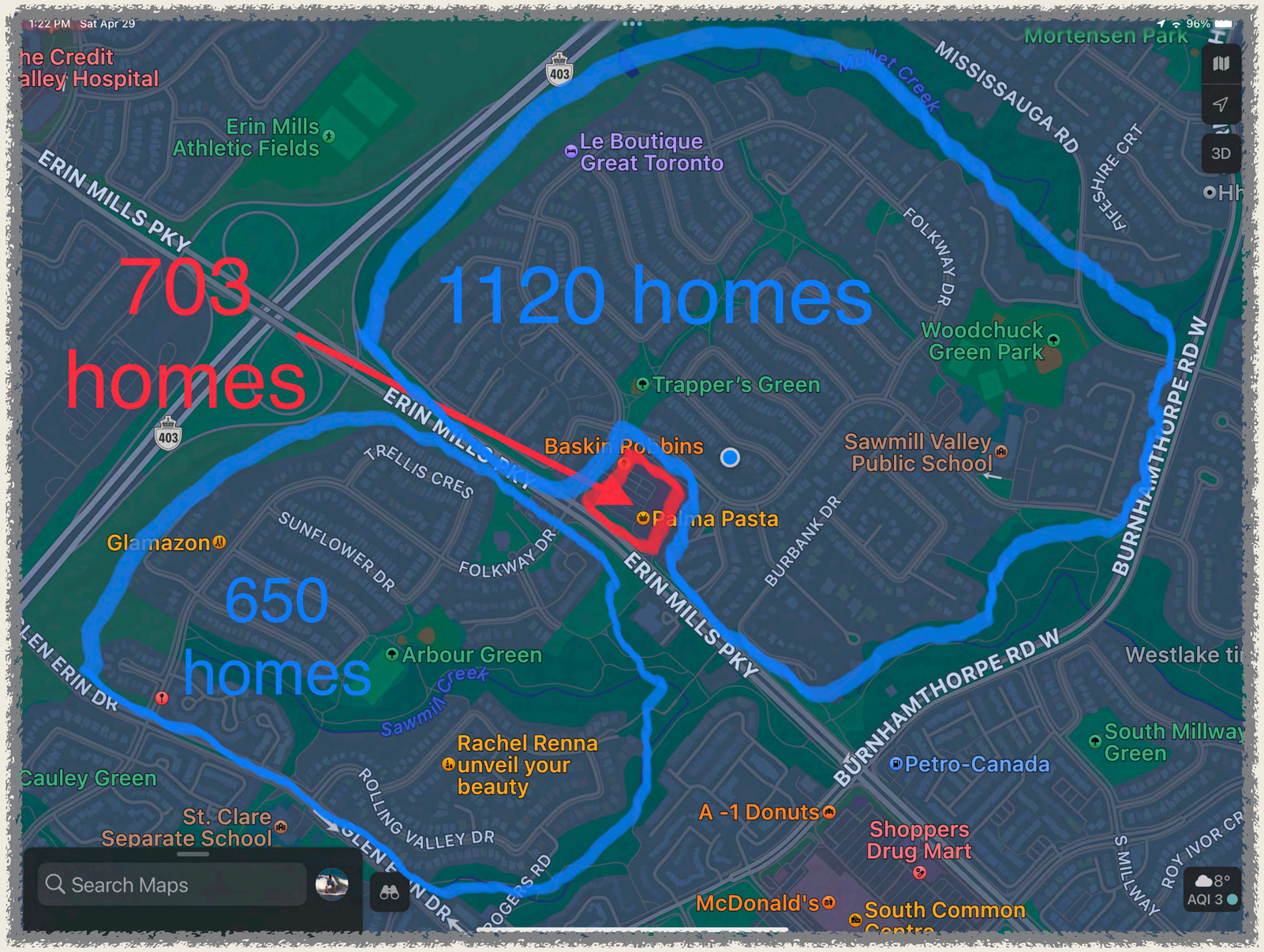
Proposal is

1.7 X

The density of the Widdicombe Way towns

Comparisons

Comparison Area	Density of proposal vs density of comparison area
NE neighbours	14.8 x
SE neighbours	13.4 x
SW neighbours	9.7 x
NW neighbours	7.7 x
3170 Erin Mills	1.8 x
Collegeway / Ridgeway	1.9 x
Widdicombe Way	1.7 x



This is NOT Gentle Densification

- *703 Units*
- *773 resident cars*
- *Plus 141 visitor/retail cars*
- *3 entrance/exits with no stop signs nor signals*
- *Up to 11 storeys tall*
- *In a "neighbourhood"*

Conclusions

The density of the proposed site is:

- Wildly out of character with the neighbouring areas
- Almost twice what exists at similar recent developments
- Overall, the 703 homes proposed for 4099 Erin Mills is ***absolutely ridiculous***

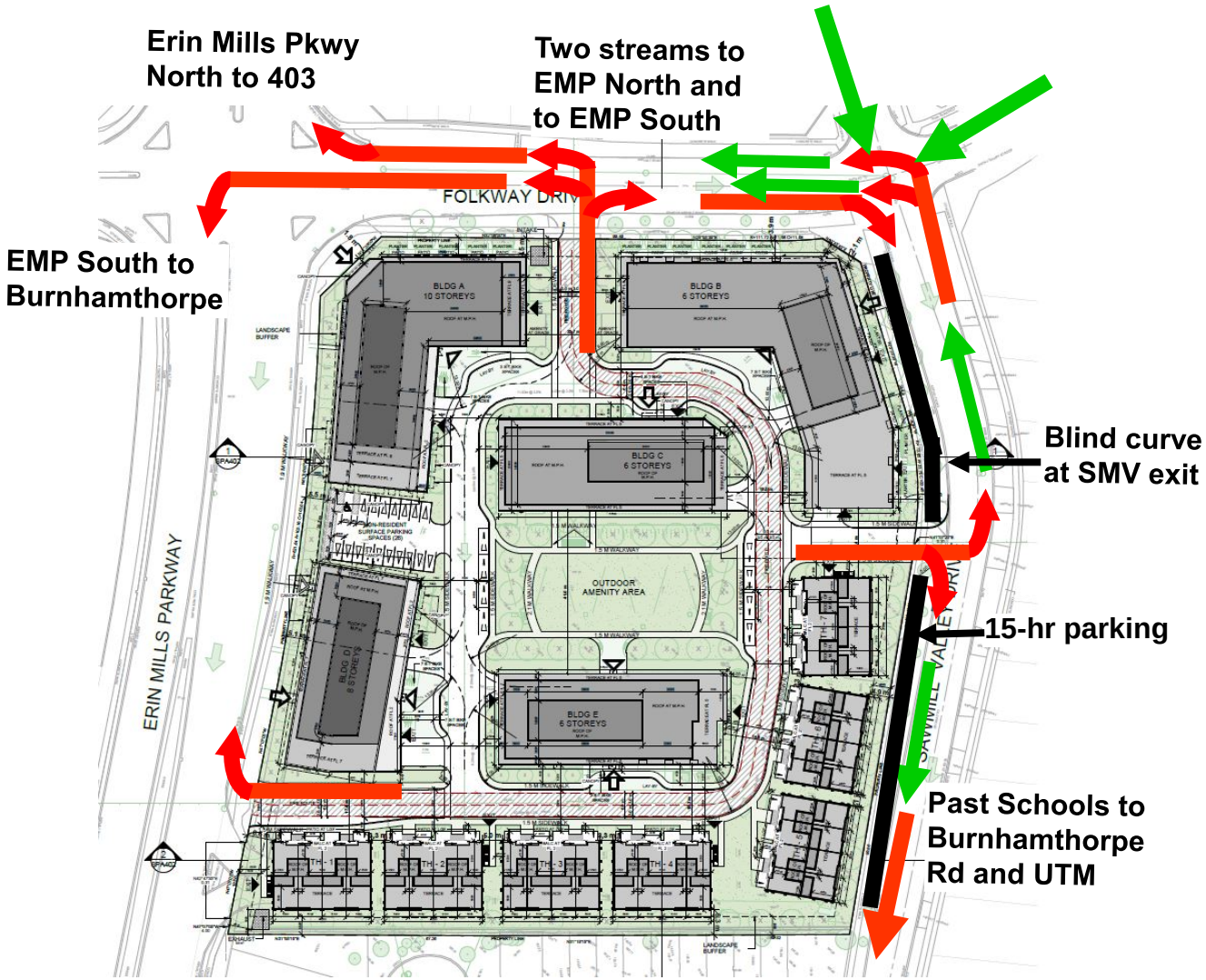
Traffic and Parking Impacts from Proposed 4099 Redevelopment

Authors: Gregory and Valeria Kovacs – Members of 4099 Erin Mills Opposition
Address: 4155 Sawmill Valley Drive
Residents: Since September 1, 1994 (29 years)
Children: Alexander, Monica, Christina
Schools: Saint Mark, Loyola Catholic Secondary School
Founder/Admin of 4099 Erin Mills Opposition on Facebook: Alexx Kovacs

Agenda:

1. Traffic Impacts
2. Parking Impacts
3. Summary / Recommendations

1.1 Traffic Impacts From 4099 Cars Exiting During Morning Rush



Assumptions:

(1) Estimate ~750-900 cars will exit 4099 Redevelopment during morning rush from 3 exits.

(2) Assume ~250-300 will exit our community on each of
- a) EMP northbound
- b) EMP southbound
- c) Sawmill Valley to Burnhamthorpe Rd.

Key Messages:

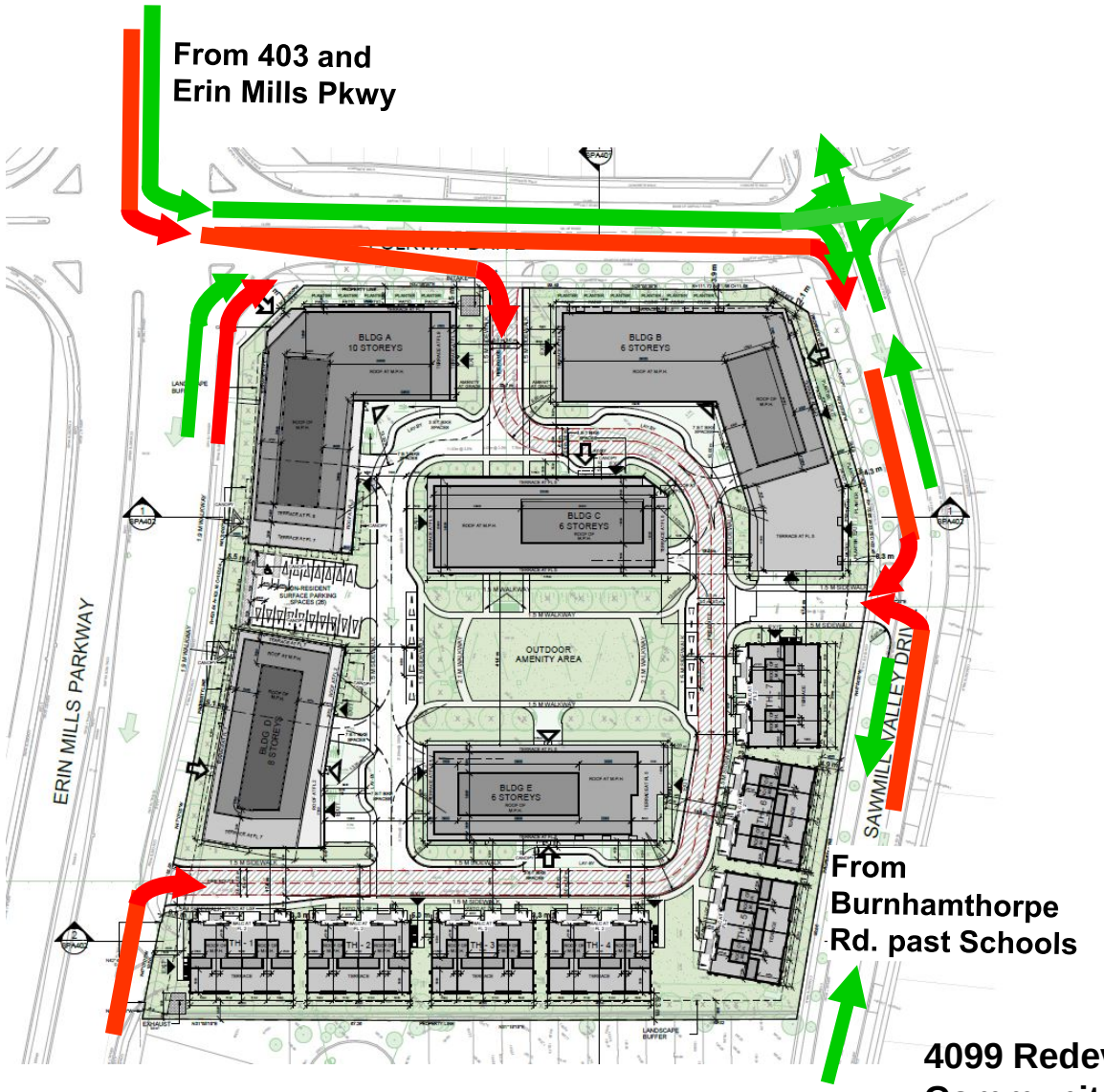
1. **All 3 4099 exits are unsignalled with no Stop signs.**
2. **All 4099 outflow will add to current community traffic to only two exits through Folkway to EMP and along Sawmill Valley to Burnhamthorpe.**
3. **4099 Folkway exiting cars will try to drive across traffic and queued south-turning cars, to get to 403.**
4. **The queueing to get to EMP could back up to block the Folkway /Sawmill Valley intersection.**
5. **15-hour parking is allowed on SMV west side both north & south of 4099 SMV exit just around a blind curve, creating a double whammy re visibility.**

4099 Redev Traffic

Community Traffic

1.2 Pictures of Potential Hazard Areas During Morning Rush

1.3 Traffic Impacts From 4099 Cars Re-entering During Evening Rush



Assumptions:

(1) Estimate ~750-900 cars will return during this time.

(2) Assume ~250-300 will enter community on each of
- a) EMP northbound
- b) Folkway Dr from EMP Southbound
- c) Sawmill Valley Dr from Burnhamthorpe Rd

Key Messages:

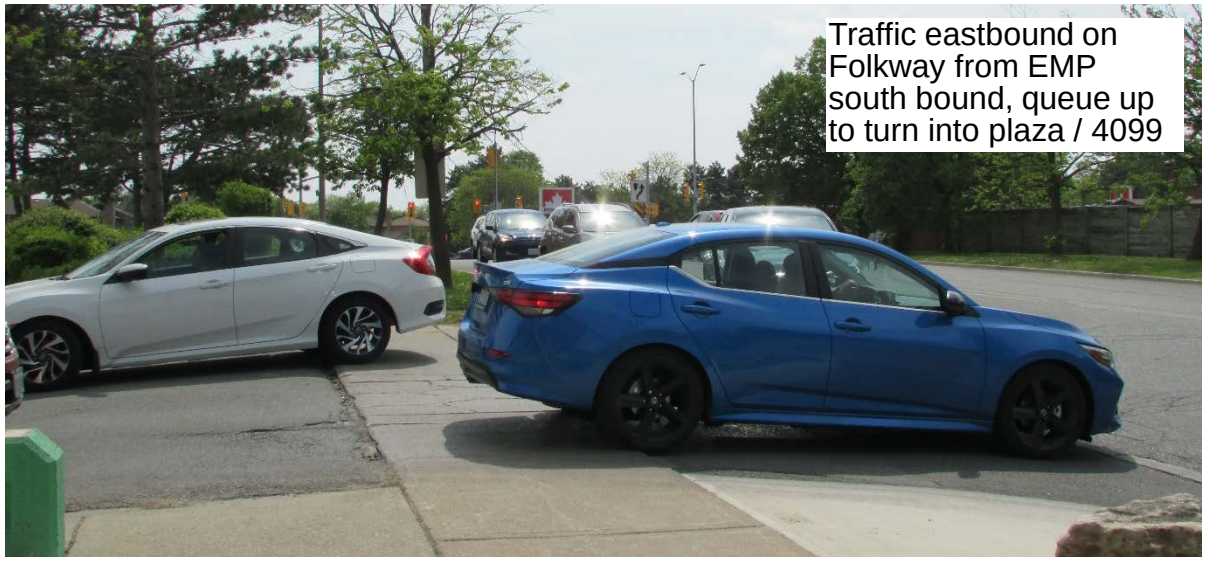
1. **All 3 entrances are unsignalled with no Stop signs.**
2. **All 4099 inflow will add to community traffic entering through two entrances from EMP along Folkway and from Burnhamthorpe along Sawmill Valley.**
3. **Folkway entrance will have 4099 cars queued on Erin Mills Pkwy southbound left turn lane along with our own community cars also queued there.**
4. **Left turn lane may not be long enough for additional 4099 cars, resulting in blockage of inside lane on EMP.**
5. **After turning cars will either enter through Folkway gate or continue on to SMV intersection, resulting in two-lane queuing both before and after the Folkway gate.**

4099 Redev Traffic

Community Traffic

1.4 Pictures of Potential Hazard Areas During Evening Rush

Southbound on EMP 11 queued to turn left onto Folkway occupy ~2/3 of turn lane



Traffic eastbound on Folkway from EMP south bound, queue up to turn into plaza / 4099

Traffic eastbound on Folkway from EMP south & north bound move on in two streams to SMV northbound intersection

1.5 Traffic Impacts From 4099 Cars on Sawmill Valley Passing Schools

Current Practice:

(1) On school days St Mark starts at 8:30 am and Sawmill Valley School starts at 8:45 am

(2) 7 to 8 school buses deliver students to St Mark and make a U-turn through drop-off lane within 10 min period

(3) 4 to 5 school buses deliver students to Sawmill Valley in similar time frame

(4) During same time parents are dropping off students from their cars

(5) School crossing guard is also escorting students and parents across Sawmill Valley Drive between the two schools

Key Messages:

1. **With 4099 Redevelopment assume additional ~250-300 cars will travel south during morning rush and pass by two elementary schools.**
2. **One impatient driver headed to work or UTM can put these children in grave danger.**

1.6 Pictures of Potential Hazard Areas on Sawmill Valley Near Schools

2.1 Additional Vehicles and Parking Needs Resulting from 4099 Proposal

Condominium Units	1B	2B	2B + Den	3B	Total
Building A	130	39	16	12	197
Building B	86	37	16	3	142
Building C	56	16	5	3	80
Building D	57	17	15	6	95
Building E	55	10	5	7	77
Subtotal	**384**	**119**	**57**	**31**	**591**
Townhome Units					
Subtotal		**112**			**112**
Total	**384**	**231**	**57**	**31**	**703**
Share	*55%*	*33%*	*8%*	*4%*	*100%*

Assumptions:

(1) Nearest grocery shopping 1-2 km
⇒ all units have at least 1 car

(2) All units are capped at 2 cars/unit

Car Spaces Desired by Buyers:	**Total**
(1) 25% of 1B occupied by couples with 2 cars ⇒	480
(2) 60% of 2B buyers have 2 cars ⇒	370
(3) 75% of 2B+Den buyers have 2 cars ⇒	100
(4) All 3B buyers have 2 cars ⇒	62
(5) Total additional vehicles from above ⇒	**1011**
(6) Parking spaces for residents to be built	773
Overflow parking spaces desired by buyers	**238**
(7) Parking spaces required by city per 2016 Census	818
Overflow parking spaces projected by city	**45**
(6b) Parking spaces with guests and retail to be built	914
(7b) Parking spaces required by city per 2016 Census	964
Overflow spaces projected with retail and guests	**50**

Key Messages:

1. **Proposal from redeveloper projected to provide inadequate underground parking for the residents and underground/surface parking for retail and guests.**
2. **Therefore overflow parking on neighboring streets would be needed for ~50 cars and perhaps for considerably more.**
3. **If proposal is accepted parking for overflow on City streets would require additional 15-hour limits on these residential streets currently subject to a 3-hour limit.**

2.2 Parking Overflow Impacts from 4099 Proposal

3.1 Summary / Recommendations

Recommendation:

Based on the following projected issues the 4099 Opposition recommends that City Council reject the 4099 Redevelopment Proposal outright without any compromise.

Projected Issues:

A. Traffic Issues:

1. **Up to 750-900 cars will exit 4099 (all 3 exits unsignalled with no stop signs) each working day along the same exit routes that the current community also uses, i.e. along Folkway to Erin Mills Parkway, North and South, and along Sawmill Valley to Burnhamthorpe. The increased traffic will cause major congestion with the following impacts:**
   a. **4099 Folkway exiting cars must drive across traffic and queued south-turning cars, to get to 403.**
   b. **The queueing to get to EMP could back up to block the Folkway /Sawmill Valley intersection.**
   c. **4099 Sawmill Valley exiting cars increasing traffic could cause major danger to school children.**
2. **When returning using the same re-entry routes as the current residents will again cause major congestion with the following impacts:**
   a. **The left turn lane on Erin Mills Parkway southbound will see major queuing at Folkway. This left turn lane may no longer be long enough, resulting in blockage of the "passing" lane on EMP.**
   b. **After turning cars will either enter through the Folkway gate or continue on still double queued to the SMV intersection. There are currently no queuing lanes for this traffic.**

B. Overflow Parking issues

1. **The planned parking for 4099 currently has a shortfall of 50 cars according to a 2016 Census. Updated estimates of the shortfall could be considerably more. Overflow parking on city streets will be needed.**
   a. **The overflow would first overrun the 15-hour parking limit on the stretch of SMV along the current plaza.**
   b. **Neighboring streets would then presumably accept the overflow as needed**
   c. **Additional 15-hour parking limits would need to be granted for these streets, which currently have 3-hour parking.**

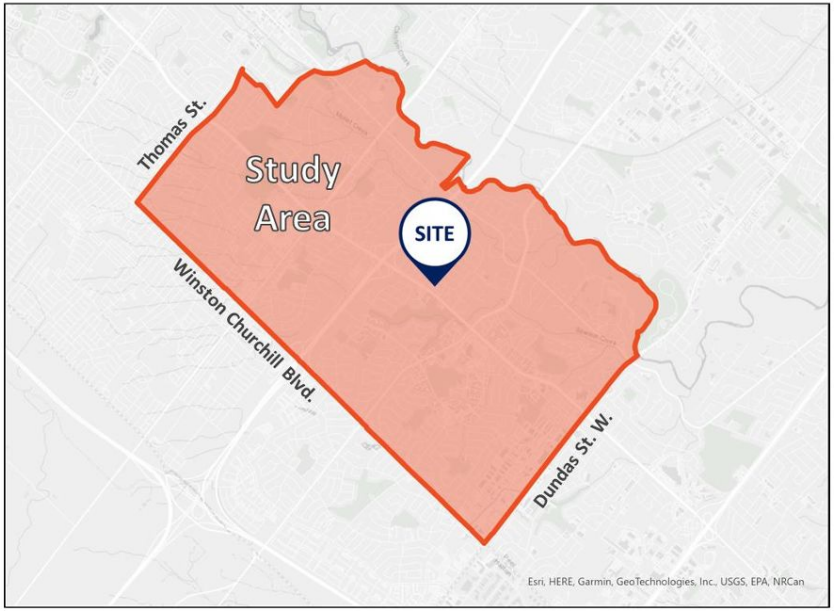
Impact on Retail

This plaza is not merely a collection of brick and mortar, absolutely not. There are human beings that represent the Canadian small business sector, which makes up 97.7% of the total number of employers in Ontario. The existing commercial units are home to many people who are able to work to provide a decent living for their families. My office alone helps keep 10 households alive by providing a decent source of income. Our plaza represents a central gathering place where generations of families and friends have come together to shop, dine, and connect. Its familiar storefronts and vibrant atmosphere have become an integral part of our identity, fostering a sense of belonging and community pride.

Policy 5.3.5.4 clearly states that redevelopment that results in a loss of commercial floorspace will not be permitted unless the existing function of the non residential development can be maintained post redevelopment. However the retail market study submitted by the applicant is fundamentally flawed and clearly biased, serving the ultimate goal of the developer in skewing the facts, and I will demonstrate a few points to clarify…

The study area upon which most of the data was collected, relies on a huge area spanning north from Thomas street all the way to Dundas street, and from Winston Churchill to Credit River on the east. This is not the logical area for comparison. If you take this similar sized area anywhere else, of course you will find more than one commercial area, this defeats the purpose of designing whole and complete communities and erases the healthy livable-walkable concept

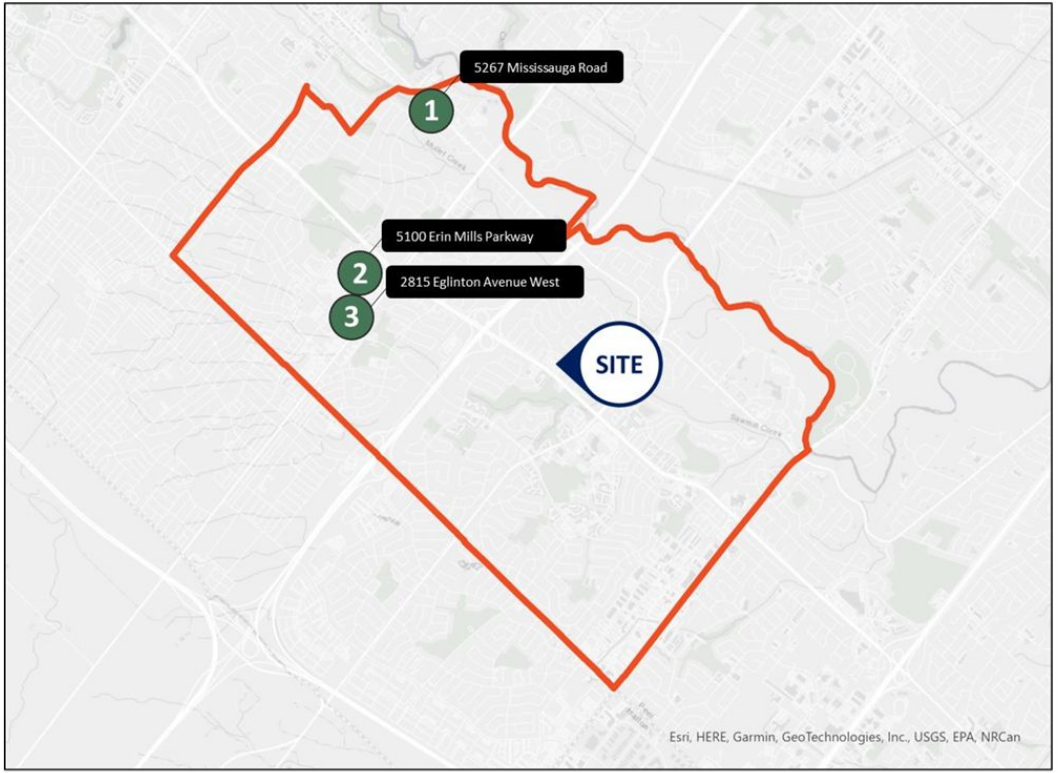
Figure 3-1: Study Area



SOURCE: urbanMetrics inc.

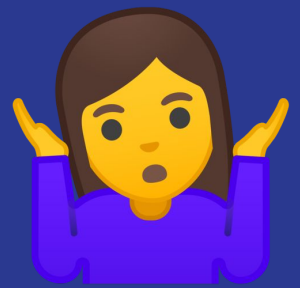
The same study suggests not to worry, there are other applications for more commercial buildings sometime in the future, which are 3km and 4 km away from the current plaza, and crossing a major highway. One of which is the expected Cineplex compound. How is that even relevant?

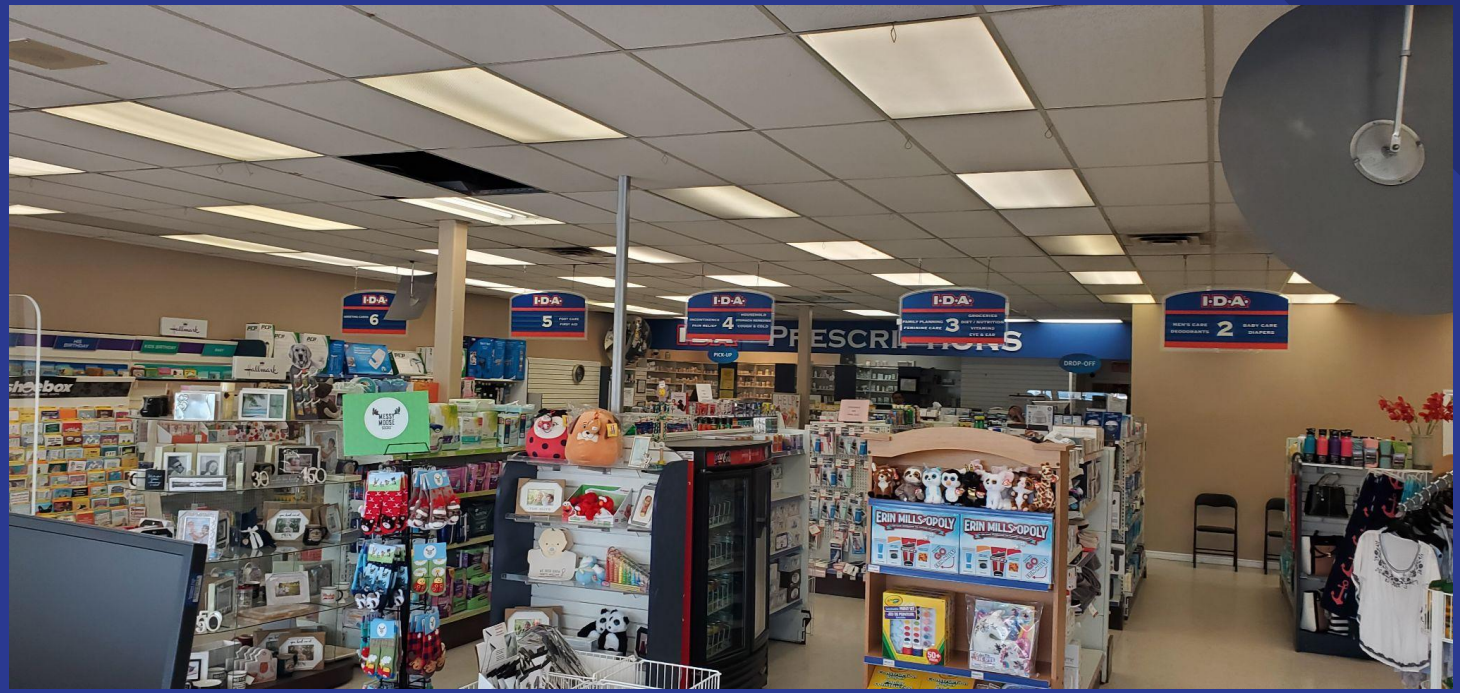
Figure 4-3: Proposed Retail/Service Commercial Space in the Study Area



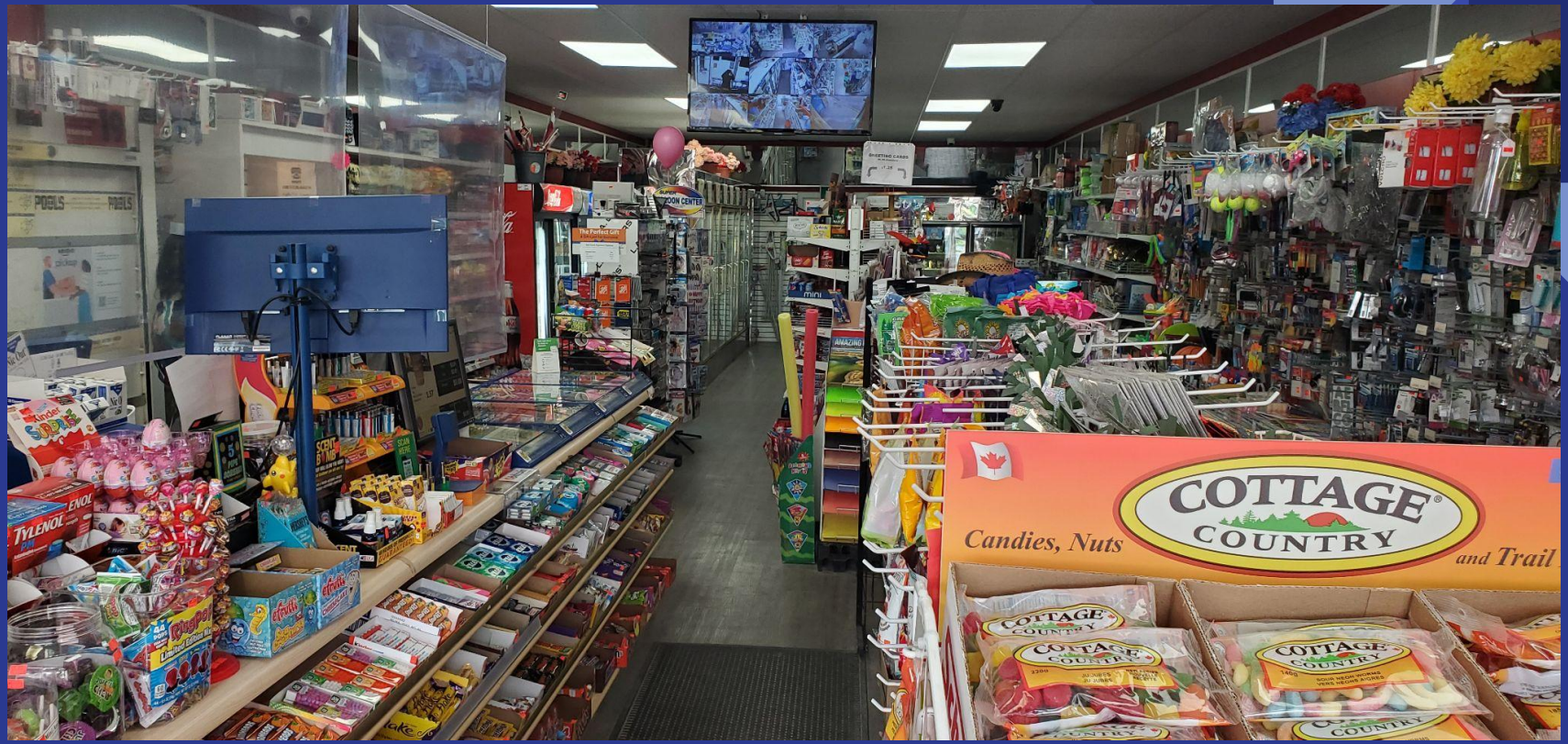
The proposal mentions how the new development will include about 10 local stores already existing in the plaza, yet when you come to do the math, it does not add up. The proposed 8,356 sq ft is basically my office and 3 others, just to give you perspective, so again, inaccurate information.

It is also interesting how they draw their conclusion at the end that eliminating this plaza will not negatively impact the needs of the community without even asking one single person residing in this community their opinion.😕





The IDA pharmacy continues to provide this essential service to its customers. We all know Amin and Louise who knew everyone's name and what they were allergic to, always going above and beyond to deliver their best, especially during the covid-19 pandemic.



The convenience store is an essential part of our plaza, always seems to get the children excited 😉😁, not to mention being a big help when you need that last minute item and everyone else is closed

Palma Pasta and Pizza Nova never failed to satisfy our craving for Italian food

Our main grocery store, Iqbal, has managed to succeed in providing high quality produce and specialty meat in our community.

Our local vet, Dr. Soliman has been an integral part of our lives, providing quality care for our furry babies alongside his wonderful staff


hairloom.ca
Hair Loom
905.820.3661


Erin Mills HEALTH & WELLNESS CENTRE
PHYSIOTHERAPY
NATUROPATH
CHIROPRACTOR
MASSAGE/OSTEOPATHY
BODY BRACES/ORTHOTICS
ACUPUNCTURE


South N' Spicy
DOSA · IDLY · PAROTTA
OPEN
South N' Spicy
SOUTH INDIAN FOOD
Fresh Pasta


MS CHUGHTAI
PROFESSIONAL CORPORATION
416 300 3525
BOOKKEEPING & TAXES
ACCOUNTING
BOOKKEEPING
TAXES

Unfortunately I don’t have enough time to talk about all the businesses, their owners, employees or customers in such a short time, but you all get the point. I am in favour of development, I am in favour of newer, better and shinier, but why does it have to come at the expense of an established pillar of our neighbourhood? Why can’t we divert our efforts to other under-utilized lands like the vast industrial zonings that if converted into residential will not have such a high detriment?

This application not only almost doubles the density of population living in this neighbourhood by adding 703 units, it would cut down their available walkable services by -90%.

Someone tell me how does this project respects the needs of our community?

In conclusion, esteemed members of the City Council, I urge you to consider the profound implications of approving this development that tears down the retail plaza. Our community's identity, economic stability, diversity, and environmental well-being are all at stake. Let us not succumb to the allure of progress at the expense of our neighborhood's character and vitality. I implore you to listen to the voices of the residents who cherish and depend on the retail plaza and make a decision that preserves our community's heart and soul.

Thank you

City of Mississauga
Corporate Report

MISSISSAUGA

Date: May 10, 2023

To: Chair and Members of Planning and Development Committee

From: Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Originator's file:
OZ/OPA 23-3 W1

Meeting date:
May 29, 2023

Subject

PUBLIC MEETING RECOMMENDATION REPORT (WARD 1)
Official Plan Amendment and Rezoning applications to permit a 38 storey apartment building with ground floor commercial space
70 Park Street East, 23, 25, 29 and 31 Helene Street North, 53 Queen Street East, north of Park Street East of Helene Street North
Owner: 70 Park Street East Inc.
File: OZ/OPA 23-3 W1

Bill 109

Recommendation

1. That the applications under File OZ/OPA 23-3 W1, 70 Park Street East Inc., 70 Park Street East, 23, 25, 29 and 31 Helene Street North, 53 Queen Street East, to amend the Mississauga Official Plan to include additional uses within the existing **Residential High Density** designation to permit a height maximum of 38 storeys and to amend the existing **RA5-27** (Apartments – Exception) zone to permit a 38 storey apartment building with ground floor commercial uses, are not acceptable in their current form and should not be approved.

2. That Planning and Development Committee authorize staff to engage with the applicant to explore potential agreement with the applicant and to bring back a report to Committee should revisions be found acceptable.

Executive Summary

- The applications are to amend the policies of the official plan and change the zoning by-law in order to allow a 38 storey apartment building with ground floor commercial space
- Staff have evaluated the proposal against the Provincial Policy Statement, the Growth Plan for Greater Golden Horseshoe, Region of Peel Official Plan and Mississauga Official Plan
- Provincial, Regional and local planning policies support intensification on the subject site, as the site's proximity to the Port Credit GO Station warrants further redevelopment
- However, it has been concluded that the proposed 38 storey apartment building is not supportable from a planning perspective for the following items:
    - The Region of Peel has stated that there is no capacity within the current waste water infrastructure to accommodate the increased density as a result of the 38 storey proposal
    - The proposal does not maintain Metrolinx's rail safety requirement of a 30.0 m (98.4 ft.) separation distance
    - The proposed 38 storey building height maximum is a significant departure from the existing and planned height context anticipated in the Port Credit Local Area Plan
    - There are additional development matters that are required to be addressed through the submission of a number of technical studies that have not properly been addressed
- Notwithstanding the outstanding technical items, staff have provided rationale for an alternative height maximum of 22 storeys for the subject site
- The applications are recommended for refusal for reasons including servicing capacity issues, compatibility with the railway corridor and excessive height, amongst other development issues

Background

Official plan amendment applications were deemed complete on February 23, 2023 and subsequently circulated for technical comments. The purpose of this report is to provide information on the applications and to provide a detailed planning analysis, including recommendations for the Planning and Development Committee's consideration.

Present Status

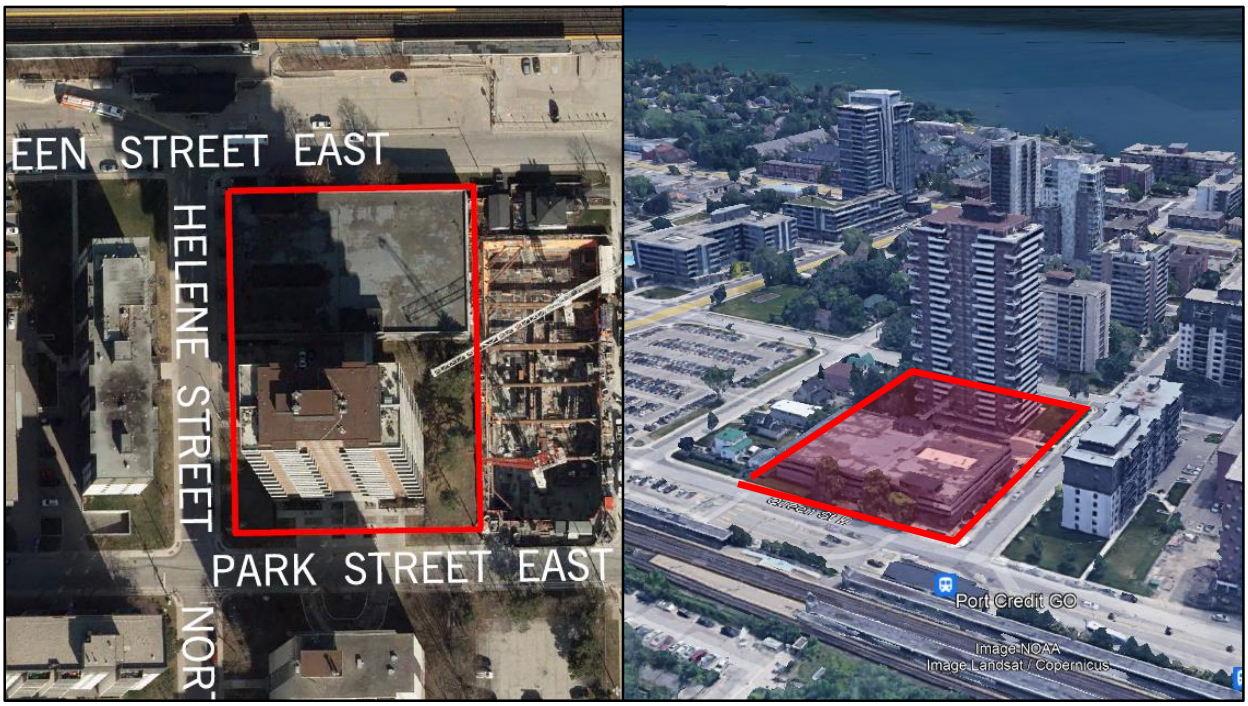
1. Site Information

(a) Site Location and Description

The site is a corner lot with frontage on Queen Street East Park Street East and Helene Street North, within the Central Residential Precinct of the Port Credit Community Node. The site is rectangular in shape and is directly across the street from the Port Credit GO

Station entrance. The properties currently contain a 27 storey apartment building along the southerly Park Street East frontage and a 3 storey parking garage along the Queen Street East frontage.

Property Size	
Frontages: Park St. E. & Queen St. E. Helene St. N.	67.0 m (219.8 ft.) approx. 93.0 m (305.1 ft.) approx.
Gross Lot Area:	0.62 ha (1.53 ac.)



Aerial Photo and 3D Photo of 70 Park Street East

Photos of Existing Site Conditions (Source: Google Maps)

(b) Site History

- January 1, 1967 – building permit issued for the existing structures on site.
- June 20, 2007 – Zoning By-law 0225-2007 came into force. The subject lands were zoned **RA5-27** (Apartments), which permits a 28 storey apartment building, subject to a total site FSI maximum.
- November 14, 2012 – Mississauga Official Plan (MOP) came into force which designates the subject site Residential High Density within the Port Credit Community Node Character Area.
- December 21, 2015 – Port Credit Local Area Plan (LAP) came into force and replaced the previous LAP with updated policies. The LAP included new policies and guidelines applicable to the site pertaining to height and built form.
- October 12, 2022 – Development Application Review Committee (DARC) meeting held with the proponent and City staff to provide submission requirements and preliminary feedback, under file DARC 22-396. At that time, the overall building height included as part of the proposal was 34 storeys.
- February 21, 2023 – A community meeting was held by Ward 1 Councillor, Stephen Dasko. The proponent presented to the community the most recent concept plan, which included a building height of 38 storeys.
- February 22, 2023 – the subject applications were deemed complete and are being processed under the City's new development application pilot project, as a response to the Province's recent legislation under Bill 109.

(c) Site Context

The property is located within the Central Residential Precinct of the Port Credit Local Area Plan. The surrounding area is characterized by a mix of apartment buildings ranging from 5 to 27 storeys, with shorter buildings found throughout the precinct.

Immediately east of the site is a recently approved and under construction 22 storey apartment building with ground floor related commercial space. To the north of the subject site is the Queen Street East right-of-way and the entrance to the Port Credit GO Station and railway tracks. West of the site is an 8 storey apartment building and further west, within the same block, is an 11 storey apartment building and lands subject to ongoing development applications for a 22 storey apartment building. To the south of the site is a 12 storey apartment building and just south-west of the site is a 14 storey apartment building.

Park Street East is an east-west local road that services the Community Node and facilitates residential traffic movement throughout the precinct. Helene Street North is a north-south local road that provides a direct connection between the Port Credit GO Station and the Lakeshore Corridor and contains mostly residential uses.

The surrounding land uses are:

North:	Port Credit GO Station, railway tracks
East:	Mixed Use
South:	Residential High Density
West:	Residential High Density

2. Surrounding Development Applications

The following development applications are in process or were recently approved in the immediate vicinity of the subject property:

- OZ/OPA 22-3 W1 – 17 and 19 Ann Street, 84 and 90 High Street and 91 Park Street East – applications in process for a 22 storey apartment building with commercial uses at grade and the retention of two historic buildings for commercial and residential uses

- OZ/OPA 22-10 W1 and T-M 22-002 W1 – 88 Park Street East – (appealed by applicant to OLT) applications in process for 42 and 40 storey apartment buildings with commercial uses on the first two storeys

- OZ 21/016 W1 – 170 Lakeshore Road East – applications in process for a 17 storey apartment building with commercial uses at grade

- OZ 20/006 W1 – 42 to 46 Park Street East and 23 Elizabeth Street – (appealed by applicant to OLT) applications in process for a 22 storey apartment building

- OZ 19/008 W1 – 78 to 80 Park Street East and 22 to 28 Ann Street – applications approved in March 2022 for a 22 storey apartment building with commercial at grade

- OZ 14/007 W1 – 6 to 10 Ann Street and 77 to 81 High Street East – applications approved for a 15 storey apartment building and two semi-detached dwellings in July 2017

- OZ/OPA 22-5 W1 – 128 Lakeshore Road East – (appealed by applicant to OLT) applications in process to permit an 11 storey apartment building with ground floor commercial space

- OZ 17/13 W1 – 21-29 Park Street East – applications approved to permit a 15 storey apartment building

3. Official Plan

The lands are located within the Port Credit Community Node Character Area and are designated **Residential High Density**. The **Residential High Density** designation permits apartment buildings, in addition to the allowance of non residential uses on the ground floor. Community Nodes are Intensification Areas in Mississauga Official Plan and it is anticipated that an appropriate degree of intensification, commensurate with Mississauga Official Plan's City Structure, is expected.

The site is also subject to the Port Credit Local Area Plan and the Port Credit Built Form Guide, which speaks to general land use, overall built form and site design, amongst other items. The local area plan contains a Height Schedule for the Community Node that looks to guide overall building heights and for the subject site, a maximum height of 15 storeys is prescribed.

Refer to Appendix 1 for the existing land use designation map.

The subject property is located within a Major Transit Station Area (MTSA) and is within 20 m (65.6 ft.) of the entrance to the Port Credit GO Station platform. In August 2022, the City adopted OPAs 143 and 144, which introduced MTSA policies relating to land use, urban design, and maximum heights as part of the City's conformity exercise. At the time of writing this report, the respective OPAs were considered at the Region of Peel Council session on February 23, 2023. At that Region Council session, the MTSA OPAs were referred back to staff and will be brought back to Region of Peel Council at a later date.

4. Zoning

The subject property is currently zoned **RA5-27** (Apartments - Exception), which permits a 28 storey apartment building subject to a maximum overall site FSI of 4, which is reflective of the built form currently existing. Refer to Appendix 1 for the Existing and Proposed Zoning Map.

5. Proposed Development

(a) Description

The applicant proposes to develop the property to add a 38 storey apartment building with ground floor commercial space and a daycare. Official plan amendment and rezoning applications are required to permit the proposed development. Refer to Appendix 1 for more details of the proposed development.

Applicant's Rendering of Proposed Development

(b) Supporting Studies

The applicant has submitted various materials and studies in support of the applications which can be viewed at: https://yoursay.mississauga.ca/development-applications-public-feedback

(c) Green Development Initiatives

The applicant has identified that the following green development initiatives will be incorporated into the development:

- Native species plant selections
- High efficiency irrigation system will be utilized to water vegetation beds
- Inclusion of EV chargers for parking spaces
- Zero-uplight exterior light fixtures

Comments

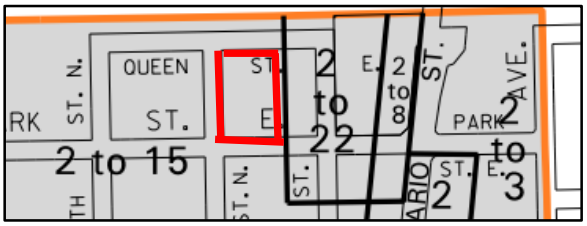
The following section summarizes the various elements that were considered in developing the Planning and Building Department's position on the applications.

1. Applications Under Consideration

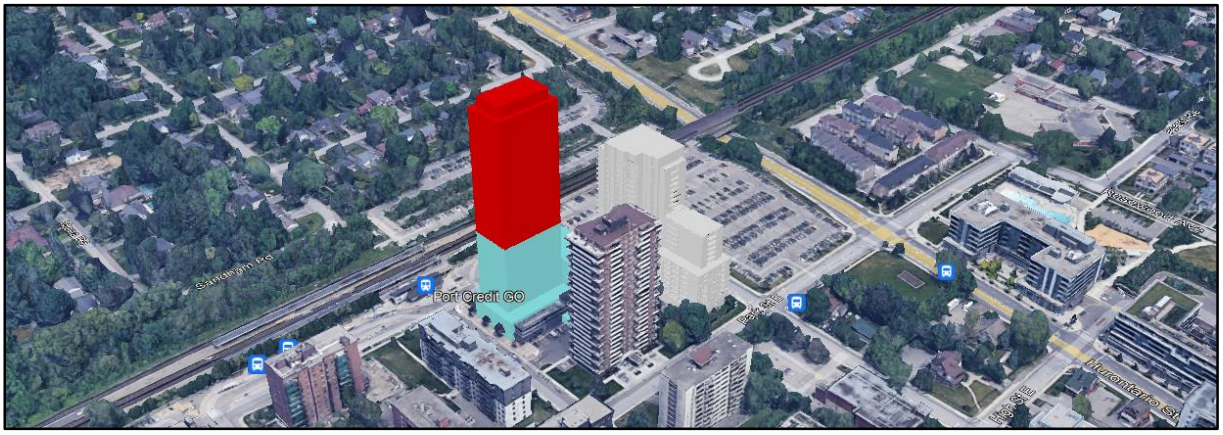
Official Plan Amendment

An amendment to Mississauga Official Plan and the Port Credit Local Area Plan is required to accommodate the proposal. The following summarizes the amendments required:

- Amend the **Residential High Density** designation to allow a daycare use
- Amend Height Schedule 2B of the Port Credit Local Area Plan to allow for a maximum building height of 38 storeys
- Amend the Port Credit Local Area Plan to add a Special Site policy



PCLAP Height Schedule – Property Outlined in Red



3D rendering depicting the proposal – red portion shows the additional height requested

Zoning By-law Amendment

An amendment to Zoning By-law 0225-2007 is required to implement the proposal. The current Zoning By-law permissions allow a 28 storey apartment building with a density range between 1 and 4 Floor Space Index (FSI). This site specific zoning reflects what is currently on the site today and the amendment is to facilitate redeveloping the portion of the site that is currently a parking lot, maintaining the existing apartment building.

The applicant has proposed amending the existing **RA5-27** (Apartments) exception zone to accommodate the following cursory items: Additional height of 38 storeys, a maximum FSI of 9.5, adding uses under the **C4** (Mainstreet Commercial) zone including a daycare, relief regarding setbacks to property lines and a reduction in in the required parking rates, landscaped areas and buffers.

Refer to Appendix 1 to view a complete list of the requested zoning amendments.

2. Policy Summary and Evaluation

The *Planning Act* allows any property owner within the Province of Ontario the ability to make a development application to their respective municipality in order to accommodate a particular development proposal on their site. Upon the submission of mandated technical information, the municipality is obligated under the *Planning Act* to process and consider the application within the rules set out in the Act.

The *Planning Act* requires that the Mississauga Official Plan be consistent with the Provincial Policy Statement and conform to the applicable provincial plans and Regional Official Plan. The policy and regulatory documents that affect these applications have been reviewed and assessed in the context of the proposed development applications. The following section summarizes how the proposed development is not consistent with the applicable policy and regulatory documents.

(a) Provincial Policy Statement and Growth Plan for the Greater Golden Horseshoe

The *Provincial Policy Statement* (PPS) and the *Growth Plan for the Greater Golden Horseshoe* (Growth Plan) provide policy direction on matters of provincial interest related to land use planning and development and directs the provincial government's plan for growth and development that supports economic prosperity, protects the environment and helps communities achieve a high quality of life.

Both the PPS and the Growth Plan recognize that the official plan is the most important vehicle for implementation of these policies as "comprehensive, integrated and long-term planning is best achieved through official plans".

Consistency with the PPS, 2020

The PPS requires that municipalities identify and promote opportunities for transit-supportive development where there is suitable existing or planned infrastructure to accommodate projected needs (1.1.3.3). The Region of Peel has advised that the proposed population for this site exceeds the forecasted growth for the area, there are downstream constraints in the existing system, and insufficient capacity to accommodate the proposal. There are plans for a future trunk sewer on Lakeshore Road, however, further analysis is required to assess the impacts of this and other development proposals in the area on the local system.

The PPS requires that planning for land uses in the vicinity of rail facilities be undertaken in a manner that appropriately buffers and/or separates them from sensitive land uses, which includes residential (1.6.9.1). Metrolinx is the Provincial Crown Agency that operates this railway and provides comments on development applications to ensure that safety, protection and functionality is preserved. In this case, the crown agency has advised that the proposed building is located within the 30 m (98.4 ft.) separation distance required by their adjacent development guidelines. A Rail Safety Report is under review by Metrolinx, but comments have not been provided within the municipal decision timeframe prescribed by the *More Homes for Everyone Act* (Bill 109).

Proposing a built form that is considered high density generally meets the PPS with respect to accommodating a market-based range of residential housing types (1.1.1), and the efficient use of land that is transit supportive (1.1.3.2). However, the proposed development at the current overall height of 38 storeys is not considered consistent with the PPS as it does not reflect appropriate development standards for intensification (as outlined in the policies of the official plan) (1.1.3.4).

Consistency with the Growth Plan, 2020

Section 2.2.4 directs municipalities to plan for Major Transit Station Areas (MTSAs) on priority transit corridors identified in the Growth Plan by delineating MTSAs and creating associated policies to meet minimum density targets and encourage efficient, compact and transit oriented development. The Growth Plan generally defines these areas as being within an approximate 500 m (1,640 ft.) to 800 m (2,624.7 ft.) radius of a transit station, representing about a 10-minute walk. The Port Credit Community Node is considered to be within the Port Credit GO Station MTSA.

The proposed development generally conforms to the Growth Plan direction pertaining to accommodating intensification within the built-up area and sites in proximity to transit as well as increasing the housing supply in these areas. The degree of proposed intensification; however, is not commensurate with the local planning framework applicable to the site and the City's strategy to achieve intensification targets, as discussed in subsequent sections of this report. The Growth Plan explicitly states that development must be governed by

appropriate standards, including scale of development. The subject proposal does not conform to the development standards in the Local Area Plan, with respect to building heights and as such, the proposed development does not conform to the Growth Plan.

The issue of the requested additional density and height is exacerbated by the lack of waste water capacity. The Growth Plan requires that available servicing in this area be consistent with the anticipated population reflective of the minimum density target in which the subject property is located (3.2.6). In this case, the Region reports that there are downstream constraints in the existing system, and insufficient capacity to accommodate the proposal. Further analysis is required to assess the impact of this and other development applications in the vicinity that exceed the Official Plan's permissions.

Proposed Provincial Policy Statement, 2023

On April 6, 2023 the Ministry of Municipal Affairs and Housing (MMAH) posted on the Environmental Registry of Ontario a document entitled *Proposed Provincial Planning Statement*. The purpose of the document is to integrate policies from *A Place to Grow: Growth Plan for the Greater Golden Horseshoe* and the *Provincial Policy Statement* to support the achievement of housing objectives and meeting the target to construct 1.5 million new homes by 2031. The document has been posted for a 60 day commenting period. The effective date has not been established, but the Province has indicated that they are targeting fall 2023. Any decision on planning matters made on or after the effective date would be subject to the new policies, unless transition regulations are built in to the final document.

Staff are reviewing the draft PPS and will be reporting back to Planning and Development Committee in the future. Notwithstanding, staff have undertaken a cursory review of the policies against the subject application and are satisfied that the recommendation of this report is consistent with the policies of the draft PPS.

(b) Regional Official Plan

General objectives of ROP, as outlined in Section 5.3, include conserving the environment, achieving sustainable development, establishing healthy complete communities, achieving intensified and compact form and mix of land uses in appropriate areas that efficiently use land, services, infrastructure and public finances, while taking into account the characteristics of existing communities and services, and achieving an urban form and densities that are pedestrian-friendly and transit supportive.

On April 28, 2022 Regional Council passed By-law 20-2022 to adopt a new official plan, which was approved with modifications by the Province on November 4, 2022. The new Regional Official Plan (ROP) includes policies related to MTSAs, including directing municipalities to delineate boundaries in their local official plans. The proposed development does not require an amendment to the Region of Peel Official Plan.

The proposed development is located within the Urban System and generally achieves many of the objectives and policies of the ROP, including: directing redevelopment to the urban system, encouraging a pattern of compact forms, providing an appropriate range of housing, support pedestrian-friendly and transit-supportive opportunities for intensification and mixed land uses (Section 5.3). However, the application does not sufficiently address the directive of taking advantage of existing servicing. While water infrastructure has capacity to accommodate the proposed density, the waste water infrastructure has been deemed to be unable to accommodate the proposal and as such, the development is unable to fit within the existing servicing infrastructure. The ROP also goes further in stating that no development can occur in instances where there is no capacity, subject to an agreement with the Region (6.5.3).

In addition, the ROP includes references to respecting, recognizing, and taking into account the characteristics of existing communities (e.g. policies 5.3.1.3, 5.3.1.4, 5.3.1.7, and 5.3.2.6). This general policy direction remains in the new ROP and is followed through in MOP and the Local Area Plan, which is the primary instrument used to asses the appropriateness of a new development.

While the applications propose a general use and built form that contributes to housing choices in the Port Credit Community Node in close proximity to higher order transit, the issue of additional height and density fails to address the fundamental built form requirement in the Local Area Plan policy framework, which is the primary instrument used to asses the proposal's overall built form compatibility. The proposal also cannot be accommodated within the available capacity by the current waste water infrastructure.

(c) Mississauga Official Plan

The proposal requires an amendment to the Mississauga Official Plan Policies and the Port Credit Local Area Plan. Section 19.5.1 of Mississauga Official Plan provides the following criteria for evaluating site specific Official Plan Amendments:

- ***Will the proposal adversely impact or destabilize the overall intent, goals and objectives of the Official Plan; and the development or functioning of the remaining lands which have the same designation, or neighbouring lands?***

- ***Are the lands suitable for the proposed uses, and are the proposed land uses compatible with existing and future uses of the surrounding lands?***

- ***Are there adequate engineering services, community infrastructure and multi-modal transportation systems to support the proposed application?***

- ***Has a planning rationale with reference to Mississauga Official Plan policies, other relevant policies, good planning principles and the merits of the proposed***

amendment in comparison with the existing designation been provided by the applicant?

Planning staff have undertaken an evaluation of the relevant policies of Mississauga Official Plan against this proposed development application.

(i) Is there adequate servicing to accommodate the proposed density?

The Direct Growth chapter of MOP indicates where and how Mississauga will accommodate intensification. The policy directive generally facilitates intensification within strategic growth areas, such as the Port Credit Community Node. The roots of this approach is found in MOPs use of the City Structure, which identifies the six "elements" or character areas that fundamentally drives the policy framework for development in each area. Using this similar approach, the City and Region sets growth forecasts as part of their respective Official Plans which feeds into projecting community infrastructure requirements. With respect to the Region, this means determining capacity requirements for servicing in order to handle anticipated population. For redevelopment to occur, the provision of services must be available to accommodate any increase in density. Mississauga Official Plan contains the following policy:

> 5.1.9 New development will not exceed the capacity of existing and planned engineering services, transit services and community infrastructure. Development proposals may be refused if existing or planned servicing and/or infrastructure are inadequate to support the additional population…

Section 19.5.1 of MOP requires that Official Plan Amendment applications demonstrate the "adequacy of engineering services" for their development.

In this instance, the Region of Peel has stated that the current waste water infrastructure does not have the capacity to accommodate the proposed flows from the development as a result of the proposed density. The comments also note that the proposed additional population for the site is beyond the forecasted growth in this area, a forecast that was recently reviewed as part of the new Region of Peel Official Plan, which was approved by the Minister of Municipal Affairs and Housing on November 4, 2022.

The Department and Agency Comments section of the report contains the Region of Peel's full comments on water and waste water.

(ii) Is the proposal compatible with the adjacent railway use?

With respect to compatibility of redevelopment in close proximity to railway corridors, MOP contains the following policy:

> 6.10.4.6 Development applications for dwellings, significant additions thereto and places of public assembly, will incorporate an appropriate safety setback as necessary to meet industry best practices and the requirements of the applicable

> rail company, to the satisfaction of the City, which takes into account safety barriers (e.g. berms, walls), topography, intervening structures and the surrounding pattern of development.

Metrolinx is a Provincial Crown Agency and is the operator of the railway. Metrolinx provides comments on adjacent development applications in order to ensure that safety, protection and sustainable functionality is preserved. At this time, Metrolinx has stated that the proposal is to maintain a 30.0 m (98.4 ft.) separation distance from the subject property to any shared property line based on their adjacent development guidelines that are applicable to this proposal. The current proposal indicates a setback of approximately 20.0 m (65.6 ft.) to the Metrolinx property line and a further 35.0 m (114.8 ft.) to the rail corridor. A Rail Safety Report is under review by Metrolinx, but comments have not been provided within the municipal decision timeframe prescribed by the *More Homes for Everyone Act* (Bill 109). Accordingly, the current configuration of the proposal cannot be supported in the absence of satisfactorily addressing Metrolinx's rail safety requirements.

Appendix 1 contains more detailed Metrolinx comments.

(iii) Does the overall building height meet the goals and objectives of the Port Credit Local Area Plan?

The subject site is located within the Port Credit Community Node Character Area and the Central Residential Precinct of the Port Credit Local Area Plan.

The following is an analysis of the key policies and criteria:

The Port Credit Local Area Plan contains criteria that is required to be met for additional height over and above what is permitted in the Port Credit Local Area Plan Height Schedule:

> Section 10.1.2 – Heights in excess of the limits identified on Schedules 2A and 2B within the Community Node …may be considered through a site specific Official Plan Amendment application, subject to demonstrating, among other matters, the following:
>
> a. The achievement of the overall intent, goals, objectives of this Plan; b. Appropriate site size and configuration; c. Appropriate built form that is compatible with the immediate context and planned character of the area; d. Appropriate transition to adjacent land uses and buildings, including built form design that will maximize sky views and minimize visual impact, overall massing, shadow and overlook; e. Measures to limit the amount of additional vehicular and traffic impacts on the Port Credit transportation network.

The below section provides an analysis of the proposal's performance with respect to the above criteria.

Will the proposed maximum height of 38 storeys impact the Port Credit Community Node's position in the City Structure?

MOP City Structure policies recognize and guide the different functions that various areas of the City perform. Land use, density and built form differ dependent on the type of City Structure element.

The following is an excerpt from MOP:

- The Downtown will contain the highest densities, tallest buildings and greatest mix of uses;
- Major Nodes will provide for a mix of population and employment uses at densities and heights less than the Downtown, but greater than elsewhere in the City;
- Community Nodes will provide for a similar mix of uses as in Major Nodes, but with lower densities and heights;

These policies direct the greatest density and building heights to the City's Downtown Character Area, with density and heights lowering from Major Node Character Areas down to Community Node Character Areas. The applications seek to amend MOP and the Local Area Plan to allow a building height that is excessive, presents a height not envisioned for Community Nodes and proposes an overall built form and density akin to that found in the Downtown Character Area.

MOP prescribes a maximum height of 25 storeys for Major Nodes and subsequently acknowledges that "Community Nodes will provide for a similar mix of uses as in Major Nodes, but with lower densities and heights". Heights within Community Nodes should be lower than heights allowed in Major Nodes. There should be a material difference in building heights in order for there to be a distinction between the elements of the City Structure, with 25 storeys for Major Nodes and 15 storeys for Community Nodes being the overarching height expectation in each element.

This direction is also incorporated into the Port Credit Local Area Plan in the following policies:

> 5.2 Community Concept - This Area Plan respects the planned function and position within the City's hierarchy, while also reflecting the existing and planned character of Port Credit.
>
> 6.0 Direct Growth – Intensification is to be consistent with the planned function as reflected by the city structure and urban hierarchy.
>
> 10.2.1.1 - The overall development of the Node will be at a scale that reflects its role in the urban hierarchy.

The Port Credit Local Area Plan generally reinforces a 15 storey height limit within the Central Residential Precinct. A 15 storey building height represents what is envisioned by MOP in Community Nodes and represents a material difference between the 25 storey height permission of Major Nodes. It is intended that the overall prevailing character of the Node fits within the area's position in the Urban Structure and the LAP seeks to ensure this direction is protected through the permissions in the Height Schedule.

Notwithstanding the above, the LAP allows additional height at a very strategic and unique location, with the maximum height being 22 storeys which is located on the lands just east of the subject site. However, staff note that the additional height permission within this unique area maintains the urban hierarchy elements regarding expected building heights, as 22 storeys is below the 25 storey height accepted in Major Nodes.

A building height of 38 storeys at this location does not maintain the overall intent of the Port Credit Local Area Plan, which is to ensure that the highest heights are adjacent to the GO and LRT Stations and that all other heights cascade down towards the Lakeshore Corridor and Credit River.

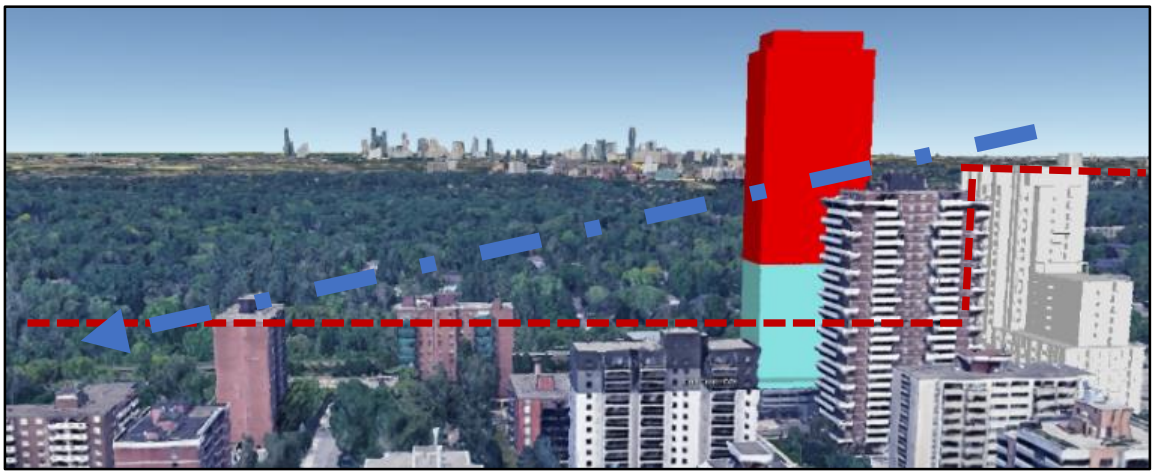
Will the proposal destabilize the intended building heights as prescribed in the Height Schedule?

The Port Credit Local Area Plan in the form of the policies, guidelines and the height schedule, looks to achieve the above, while maintaining the overall goals and objectives of MOP. The following is a policy from the MOP directive of accommodating intensification within the Community Node:

> 5.5.4 Intensification Areas will be planned to reflect their role in the City Structure hierarchy.

This approach has resulted in the following Local Area Plan policies:

> 10.2 Community Node Character Area – to ensure development will be sensitive to the existing context, heritage resources and planned character of the area.
>
> 10.2.2 – Central Residential Precinct - This precinct contains a significant concentration of apartment buildings with potential for intensification, primarily in the immediate vicinity of the GO station and will have the highest building heights in Port Credit. The existing character of the area will generally be maintained, particularly the mature trees and the well landscaped front yards.
>
> 10.2.2.1 - Building heights will generally decrease towards the east and west of the precinct, reflecting proximity of either the Credit River Valley or established residential neighbourhoods.



Rendering showing the proposed built form and the impacts to the intended prevailing heights character of the node

The LAP provides strong policy direction that heights within the Central Residential Precinct shall be lower and transition down from the unique area to the east of the subject property. This informs the current permissions in the height schedule, which is in addition to the intent of maintaining the urban hierarchy. Currently, 15 storeys is the maximum in the height schedule for the subject area, which is the intended height for the balance of the Central Residential Precinct outside of the unique area that has height permissions of 22 storeys. It is intended that the 15 storey area is to be lower than the 22 storey area and approval of 38 storeys would not only raise the height standard in the balance of the precinct, but also lend rationale for higher heights in the 22 storey area. This scenario would then alter the intended prevailing character of 15 storeys for the node.

Does the proposal fit within the existing and planned context by providing appropriate transition to the adjacent properties?

MOP includes general policies on how intensification is to be accommodated in character areas with respect to built form, building heights and overall design. The following policies speak to the considerations of intensification within Community Nodes:

> 5.3.3.11 Development in Community Nodes will be in a form and density that complements the existing character of historical Nodes or that achieves a high quality urban environment within more recently developed Nodes. The Port Credit Local Area Plan further develops the guidance of accommodating intensification within Community Nodes by providing the following policies:
>
> 5.1.5 …Intensification and development will respect the experience, identity and character of the surrounding context and Vision.

10.2.2.1 Building heights will generally decrease towards the east and west of the precinct, reflecting proximity of either the Credit River Valley or established residential neighbourhoods.

MOP policies allow for intensification within the Community Node and, in particular, on the subject property. However, the intensity of the development should fit within the surrounding context. In developing the Local Area Plan, building heights were considered in the context of the existing stock while balancing future development needs.

The proposed building height is not proportionate to the existing building stock that is located on and surrounding the site. In addition, the proposal does not respect or relate to the existing and planned building height context. The predominant character of the Community Node reflects buildings in the realm of 2 to 15 storeys in height, with one existing 27 storey apartment building (on subject property) that is comparable to 22 storeys in today's typical construction standards. While there are a few existing apartment buildings that exceed the 15 storey height limit, they are of an older era and contain lower floor to ceiling heights. Directly adjacent to the subject site is a 22 storey apartment building currently under construction.

The Port Credit Local Area Plan provides strong direction for new development within the Node to respect and relate to existing context. The way in which this is to be achieved is to ensure proposals apply the minimum standards with respect to building separation distances, floor plate size, property line setbacks and maximum building heights, amongst other directives. Overall height is part of the suite of features that is mandated by the local policy framework for high density redevelopment to appropriately fit within the Community Node.

The proposal fails to meet the criteria that requires redevelopment to maintain the goals and objectives of the Local Area Plan, as well as proposing an overall height that does not respect and provide transition to surrounding buildings.

Is additional height on the subject site appropriate?

Should the servicing and railway setback issues be resolved, staff are of the opinion that additional height can be accommodated. The unique area within the local area plan Height Schedule that allows 22 storeys can be shifted further west to incorporate the subject property and allow a total building height of 22 storeys (or equal measurement) on the site, rather than 15 storeys, for the following reasons:

- The subject property is directly adjacent to the Port Credit GO Station entrance
- The subject property is considered to have an opportunity for place making
- Allowing additional height contributes to wayfinding in the Port Credit skyline
- The subject property already has existing built form representing a modern building height of 22 storeys

(iv) Other Development Issues

In response to the direction contained in the *More Homes for Everyone Act* (Bill109), the City has undertaken a pilot review process to assess development applications within the timelines stipulated for municipalities by the Planning Act. Because of the mandated timeline, there is very little opportunity for the City to receive resubmissions and work with an applicant to address outstanding technical matters. City staff strongly encouraged the applicant to discuss technical issues in advance of filing the applications in order to resolve as many matters as possible, however the applicant declined to engage.

In addition to Appendix 1, which contains a more detailed list of departmental and agency review comments, the following highlights additional development issues:

Insufficient Parking Justification

The proposed reduced resident and visitor parking rates are not supportive of the Parking Regulations Study recommendations as outlined in the existing City of Mississauga Zoning By-Law 0225-2007, as amended, for Parking Precinct 1 (By-law 0117-2022, June 8, 2022). Additionally, the parking justification submitted by the applicant is not satisfactory as the required Parking Utilization Study was not undertaken to the requirements provided by staff and did not meet the City's Terms of Reference for parking utilization studies. At this time, staff do not support the proposed parking rates.

Building Separation Distance

The Port Credit Local Area Plan Built Form Guide requires that buildings over 6 storeys adhere to a building separation distance in order to ensure tall buildings maintain sky views and develop an elegant skyline. The podium portion of the proposed building does not meet this requirement in term of its separation distance from the building to the east, as it is more than 8 storeys.

Uncomfortable Wind Conditions

Based on the submitted Pedestrian Level Wind Study that was submitted, staff note that uncomfortable wind conditions in the winter seasons are predicted at a few locations around the front entrance. This wind condition is required to be mitigated and at this time, no acceptable mitigation plan has been proposed by the applicant.

Unacceptable Landscape Buffer along Easterly Property Line

The proposed landscape buffer along the easterly property line is unacceptable and does not support long term sustainability or provide an adequate transition to the adjacent land uses. The intent and function of landscape buffers is to protect for the long term growth and maintenance of landscaping, including high branching deciduous trees, coniferous trees, and shrubs. Additionally, the landscape buffers should be unencumbered from any utilities and obstructions, including underground parking structures. In this instance, the

applicant is proposing the underground parking structure be located within the easterly landscape buffer. As such, staff do not support an easterly landscape buffer of 2.0 m (65.6 ft.) that is largely encumbered with the underground parking garage.

Upgraded Streetscape Feasibility

Additional information with respect to the submitted Streetscape Feasibility Plan is required in order to properly determine if an appropriate streetscape, with street trees, can be accommodated. If the upgraded streetscape cannot be accommodated within the existing boulevard, an adequate building setback will need to be provided on the subject property to the street right-of-way.

(v) Services and Infrastructure

Servicing

The Region of Peel has advised that there are no concerns with respect to the proposed water demand on the existing water servicing infrastructure. However, the Region has indicated that currently there is no capacity to accommodate the proposal with respect to waste water infrastructure. The Department / Agency Comments section of this report contains further details on the Region of Peel's comment.

Parks and Community Amenity

The following community services are located in proximity to the site: Port Credit Library, Port Credit Memorial Park, Port Credit Arena, Lions Club of Credit Valley Outdoor Pool, J.C. Saddington Park and J.J. Plaus Park.

Transit

The site is located 20.0 m (65.6 ft.) from the Port Credit GO Station. The following major MiWay bus routes currently service the site: Route 23 – Lakeshore Road East, Route 19 – Hurontario Street, Route 23 – Lakeshore Road East and Route 14/14A – Lorne Park.

There is a transit stop immediately adjacent to the subject property that is operating as a Miway Bus Terminal, providing an interface with the Port Credit GO Station and facilitating the routes identified above.

(d) Community Benefit Charge

Schedule 17 of Bill 197, *COVID-19 Economic Recovery Act*, 2020, amended the *Planning Act*. The Section 37 Height/Density Bonus provisions are replaced with the Community Benefit Charge (CBC) provisions, implemented by a CBC By-law passed by Council. Section 37 of the *Planning Act* now allows municipalities to impose a CBC on land to fund costs related to growth. Funds collected under CBC will be to fund projects City-wide and Council will be requested at budget time each year to spend or allocate CBC funds to specific projects in accordance with the CBC Strategy and Corporate Policy.

In response to this legislative change, Council passed the City's new CBC By-law on June 22, 2022, which will be administered by the Corporate Services Department, Finance Division. The by-law specifies to which types of development and redevelopment the charge applies, the amount of the charge, exemptions and timing of charge payment. The CBC is 4% of the value of the land. A land appraisal is required in order to determine the applicable CBC in each case.

As the subject proposal is more than 5 storeys and does contain 10 or more residential units in total, the CBC is applicable and will be payable at the time of first building permit.

(e) "H" Holding Provision

Should this application be approved by Planning and Development Committee, staff will request an "H" Holding Provision which can be lifted upon resolution of outstanding technical matters.

3. Departmental and Agency Comments

The applications were circulated to all City departments and commenting agencies on February 23, 2023. The following section summarizes the comments received. Refer to Appendix 7 for detailed comments.

Transportation and Works Department

Comments dated April 6, 2023, state that technical reports and drawings are reviewed to ensure that engineering matters related to noise, grading, servicing, stormwater management, traffic and environmental compliance can be satisfactorily addressed to confirm the feasibility of the project, in accordance with City requirements.

Based on a review of the materials submitted to date, staff are not satisfied with the details provided in the reports, plans or studies in order to confirm the engineering feasibility of the development proposal.

The notable engineering issues that may have an impact on the overall development of the lands include:

- The proposed building encroaching into the future right of way widening on both Queen Street East and Helen Street North

- Deficiencies in the Urban Transportation Considerations Report, Environmental Site Assessments Reports, and the Noise and Vibration Feasibility Assessment Report

Additional technical details and revisions are required to comply with City requirements and to confirm feasibility of the development proposal from an engineering standpoint (see Appendix 1).

Community Services – Parks Planning

Comments dated April 14, 2023 note that this character area exceeds the parkland provision target of 1.2 ha/1000 people. Furthermore, the 2022 Parks Plan and the 2019 Future Directions Parks & Forestry Master Plan establishes a walking distance requirement of 400 m (0.25 mi) to a city owned playground for strategic growth areas, unimpeded by major pedestrian barriers. Port Credit Memorial Park (P-106) is located approximately 317 m (0.2 mi) from the subject property, zoned **OS2** (Open Space – City Park) and contains a city owned playground. Prior to the issuance of building permits for each lot or block cash-in-lieu for park or other public recreational purposes is required pursuant to Section 42 of the *Planning Act* and in accordance with City's Policies and By-laws.

The Region of Peel – Planning and Development Services

In comments dated April 19, 2023, the Region of Peel provides the following comments regarding servicing infrastructure based on a review of the submitted Functional Servicing Report (FSR):

Water:
The Region does not have any objections to the proposed water demand, although the FSR will need to be revised to demonstrate a secondary fire line for the 38-storey building, as per OBC standards, and it is recommended that this development have a looped water system. The Region will also require a hydrant flow test prior to clearing this water servicing FSR condition.

Waste Water:
The proposed population for this site is beyond the forecasted growth in this area. There are downstream constraints in the existing system and there is insufficient capacity to accommodate the proposed 15 L/s. There are plans for a future trunk sewer along Lakeshore Road West. However, the Region will need to undertake further analysis to assess impacts to the local system; the analysis will include this and other developments in the surrounding area to confirm the extent of improvements required.

The Region also has an ongoing Schedule "C" Municipal Class Environmental Assessment (EA) to develop an integrated and optimized servicing strategy to meet the needs for existing and future growth in this area. The Port Credit East Water and Wastewater Servicing Optimization Class EA was initiated in November 2020 and is anticipated to be completed in 2023. Servicing for this proposed development will need to align with the recommended strategy from this Class EA.

Until the EA and design concepts have been finalized and the recommended works are completed, there is no capacity to service the proposed development. These works will be required to be completed prior to this proposal obtaining Regional site servicing connection

approval. For more information please visit our website at https://www.peelregion.ca/public-works/environmental-assessments/mississauga/port-credit-east-wastewater.asp.

4. Affordable Housing

In October 2017 City Council approved *Making Room for the Middle – A Housing Strategy for Mississauga* which identified housing affordability issues for low and moderate incomes in the city. In accordance with the Provincial Growth Plan (2019) and Amendment No. 1 (2020), *Provincial Policy Statement* (2020), Regional Official Plan and Mississauga Official Plan (MOP), the City requests that proposed multi-unit residential developments incorporate a mix of units to accommodate a diverse range of incomes and household sizes.

Applicants proposing non-rental residential developments of 50 units or more requiring an official plan amendment or rezoning for additional height and/or density beyond as-of-right permissions will be required to demonstrate how the proposed development is consistent with/conforms to Provincial, Regional and City housing policies. The City's official plan indicates that the City will provide opportunities for the provision of a mix of housing types, tenures and at varying price points to accommodate households. The City's annual housing targets by type are contained in the Region of Peel Housing and Homelessness Plan 2018-2028 https://www.peelregion.ca/housing/housinghomelessness/pdf/plan-2018-2028.pdf.

To achieve these targets, the City is requesting that a minimum of 10% of new ownership units be affordable. The 10% contribution rate will not be applied to the first 50 units of a development. The contribution may be in the form of on-site or off-site units, land dedication, or financial contributions to affordable housing elsewhere in the city.

The applicant has indicated that the tenure of the project will most likely be rental. If the tenure pursued is ownership, then staff advise that Inclusionary Zoning is applicable in this instance and the proposal will be subject to the Inclusionary Zoning regulations outlined in table 2.1.34.2 of the Zoning By-law.

5. Next Steps

Prior to development of the lands, the applicant will be required to obtain site plan approval.

Financial Impact

All fees paid by developers are strictly governed by legislation, regulation and City by-laws. Fees are required to be paid prior to application approval, except where otherwise may be prescribed. These include those due to the City of Mississauga as well as any other external agency.

Engagement and Consultation

Community Feedback

A community meeting was held by Ward 1 Councillor, Stephen Dasko, on February 22, 2023. Approximately 60 people were in attendance at the community meeting. The following summarizes comments received on the applications:

Comment
The Port Credit Local Area Plan Height Schedule should be respected and adhered to.

Response
The Planning Analysis section of this report contains staff comments with respect to the appropriateness of the proposed overall building height.

Comment
The proposed development will create shadow impacts on the neighbouring properties.

Response
The applicant has submitted the required Shadow Study that has been reviewed by staff against the City's Terms of Reference for shadow studies. The report has concluded that the proposed development maintains the City's standards for sun and daylight access on neighbouring properties and the public realm. Staff have reviewed the study and concur with the report's findings.

However, staff note that the Shadow Study is missing information with respect to any impacts on the proposed at grade amenity areas within the subject site.

Comment
The proposed development will negatively impact traffic on the surrounding street network.

Response
In support of the applications, a Traffic Impact Study was submitted and reviewed by staff. The study concludes that all the signalized and non-signalized intersections in the vicinity are currently operating within capacity and, with the inclusion of the units specified in this proposal, are expected to continue to do so. Based on a review by staff, an updated Transportation Impact Study that addresses staff comments is still required in order to appropriately determine the full traffic impact of the proposal. Additional comments on the study are provided in Appendix 1.

Comment
Concern regarding the overall density of development that is happening in Port Credit through projects that are under construction and in the planning stages.

Response
The Port Credit Community Node is considered an intensification area within Mississauga Official Plan. The node also contains a regional transit station (Port Credit GO Station) and a future local LRT station (Hurontario LRT). Further, the Province's Growth Plan designates the Community Node as a Major Transit Station Area (MTSA) and provides a directive that encourages more housing choice and transit oriented development through intensification and sets minimum intensification targets. It is expected from a provincial and local policy standpoint that infill development will occur in Port Credit, due to existing services and amenities. The Port Credit Local Area Plan and Built Form Guidelines recognize this and contain various policies that guide how the expected infill development is to occur.

Conclusion

In conclusion, City staff has evaluated the applications to permit a 38 storey apartment building with ground floor commercial space, against the *Provincial Policy Statement*, the *Growth Plan for the Greater Golden Horseshoe*, Region of Peel Official Plan and Mississauga Official Plan.

Provincial, Regional, and local planning policies support intensification on the site. The site's proximity to the Port Credit GO Station warrants further redevelopment. However, the proposed maximum 38 storey height does not represent an overall built form that is supported by the local policy framework, nor does it function within the existing servicing capacity. Staff have provided rationale for an alternative height of a 22 storey building.

The development as currently configured is not considered acceptable from a planning stand point and should not be approved as:

- there is currently no adequate waste water servicing capacity to accommodate the proposal;
- the applicant has not addressed Metrolinx's requirements with respect to the required railway separation distance;
- it represents a building height that does not appropriately reflect the Port Credit Community Node's position in the City's urban structure;
- the proposed 38 storey maximum height is a significant departure from the existing and planned height context anticipated in the Port Credit Local Area Plan.

In addition, there are additional development matters that are required to be addressed through the submission of a number of technical studies that have not been properly addressed.

Attachments

Appendix 1: Supplementary Information

A. Whittemore

Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Prepared by: David Ferro, MCIP, RPP, Development Planner

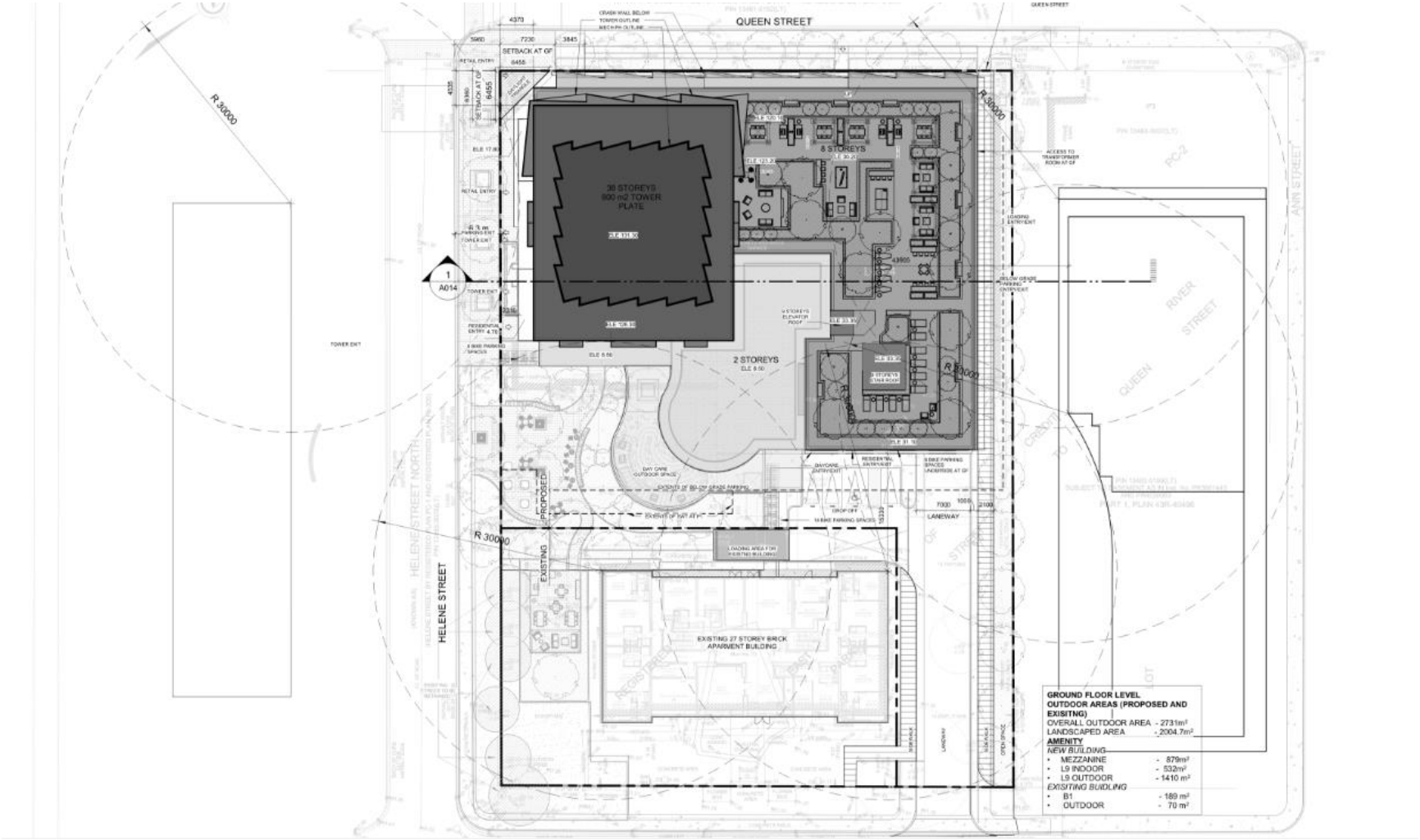
Supplementary Information

Owner: 70 Park Street East Inc

70 Park Street East, 23, 25, 29 and 31 Helene Street North, 53 Queen Street East

Table of Contents

1 Concept Plan, Elevations



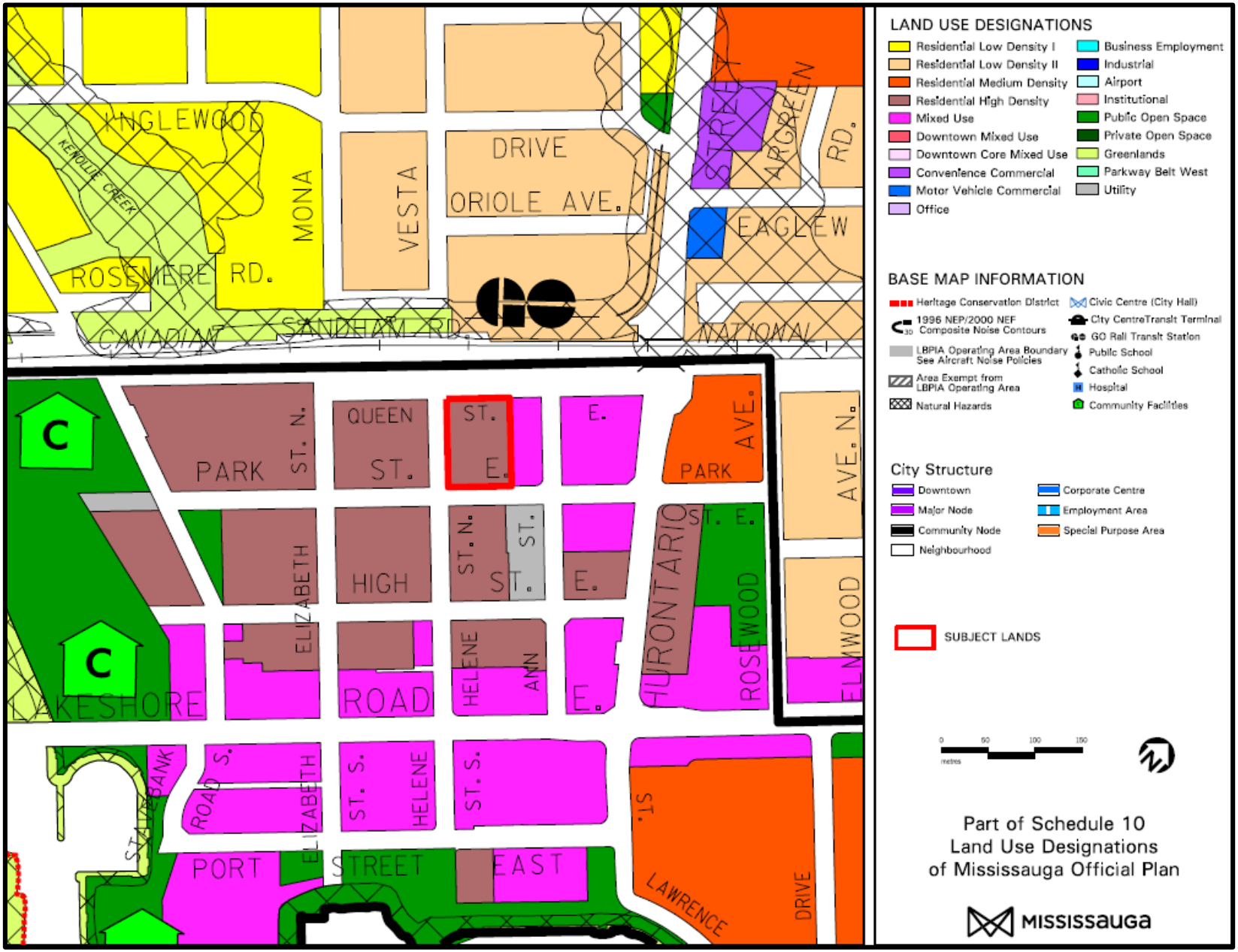
Proposed Concept Plan

Proposed Elevations

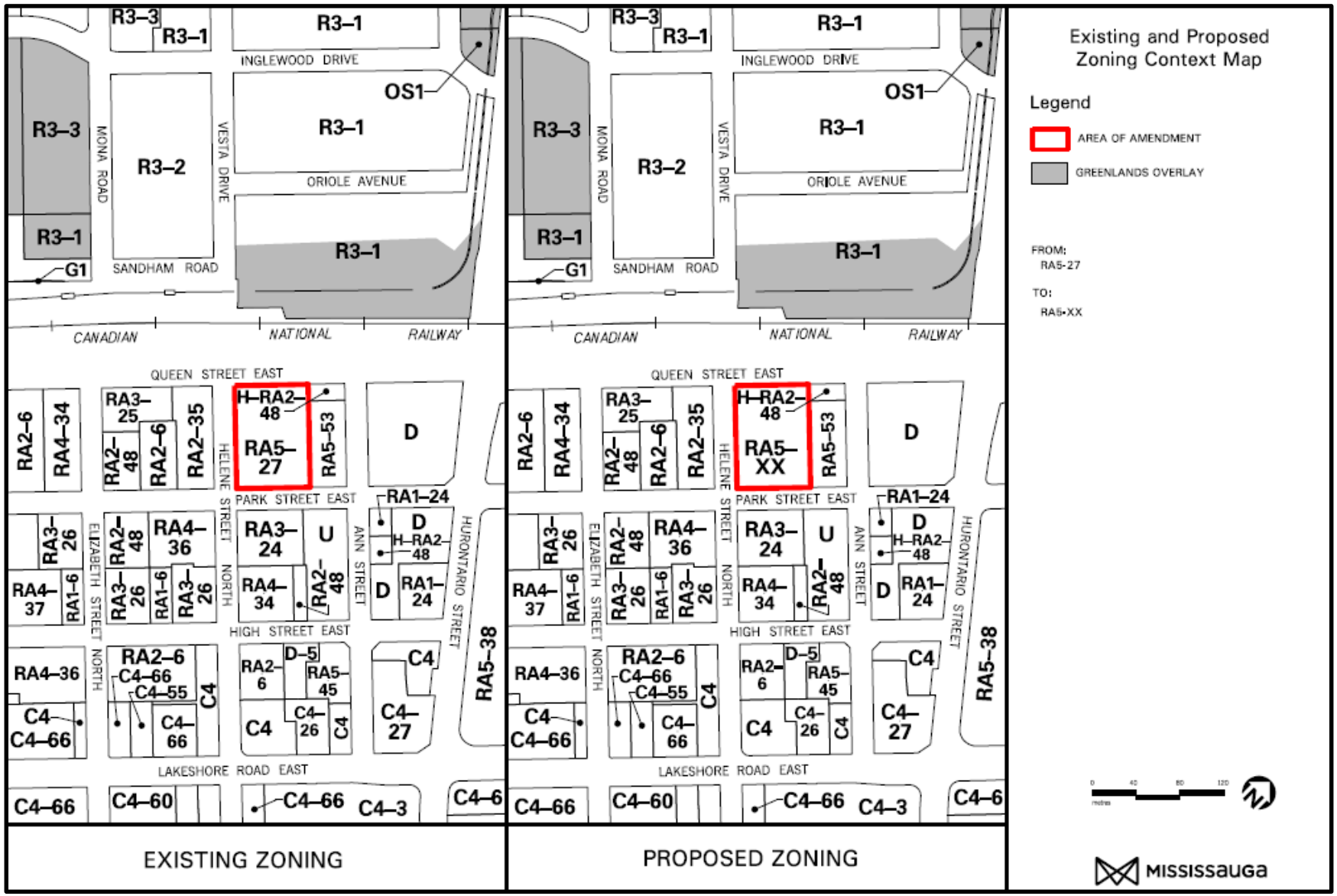
2. Development Proposal Statistics

Applications submitted:	Received: January 25, 2023 Deemed complete: February 22, 2023 120 days from complete application: June 22, 2023	
Developer/ Owner:	70 Park Street East Inc.	
Applicant:	Alex Heath, Dream Asset Management	
Existing Gross Floor Area:	23 907 m^2 (256,256.42 ft^2)	
Proposed Gross Floor Area:	35 474 m^2 (381,838 ft^2) of proposed new residential GFA, totaling 59 281 m^2 (638,187.88 ft^2) 864 m^2 (9,300 ft^2) of proposed non-residential GFA	
Floor Space Index:	9.44	
Total Number of Units:	530 units proposed, 210 units existing 740 units total on site	
Unit Mix:	86 bachelor units proposed 230 1 bedroom units proposed 114 2 bedroom units proposed 100 3 bedroom units proposed	
Height:	38 storeys / 125.4 m (411.4 ft.)	
Amenity Area (per unit):	4 m^2 (43.1 ft^2)	
Anticipated Population:	1161* (additional population) *Average household sizes for all units (by type) based on the 2016 Census	
Parking: Resident Spaces Visitor Spaces Total	Required 0.8 spaces per unit – 592 spaces 0.2 spaces per unit – 148 spaces 740 spaces	Provided 0.65 spaces per unit – 495 spaces 0.15 spaces per unit – 111 spaces 610 spaces

3. Existing and Proposed Development Official Plan Map

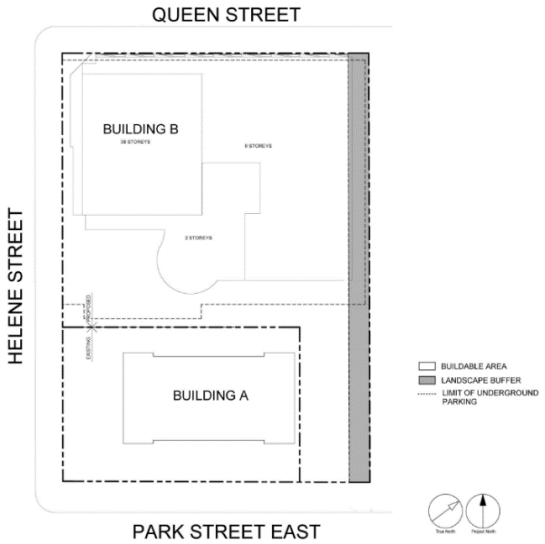


4. Existing and Proposed Development Zoning By-law Map



5. Applicant Proposed Zoning Regulations

Zone Regulations	Existing RA5-27 Exception Zone Regulations	Proposed Amended RA5-27 Exception Zone Regulations
Permitted **Uses**	Apartment Long Term Care Retirement Building	Apartment Long Term Care Retirement Building Uses permitted in a C4 zone
Maximum **Floor Space Index (FSI) – apartment zone**	4.0	9.4
Maximum **Height**	28 **storeys**	38 **storeys**
Minimum landscaped area	-	32%
Minimum depth of a **landscape buffer** abutting a lot line that is a street line and/or abutting lands with an Open Space, Greenlands and/or a Residential Zone with the exception of an Apartment Zone	4.5 m	0.00 m
Minimum **amenity area**	The greater of 5.6 m^2 per dwelling unit or 10% of the site area	4.0 m^2 per dwelling unit
Minimum **parking spaces**	0.8 residential spaces per unit 0.2 visitor spaces per unit	0.65 residential spaces per unit 0.15 visitor/commercial spaces per unit



Applicant submitted exception schedule

6. Departmental and Agency Comments

Agency / Comment Date	Comments
Region of Peel (March 22, 2023)	An existing 200 mm diameter water main is located on Queen Street East, an existing 250 mm diameter water main is located on Helene Street North, and an existing 300 mm diameter water main is located on Park Street East - please note that this proposal requires connection to a minimum municipal watermain size of 300 mm (Watermain Design Criteria 2.1). An existing 250 mm diameter sanitary sewer is located on Helene Street North & Park Street East. Private waste collection is required for daycare and retail waste. For the residential units, the Region of Peel will provide front-end collection of garbage and recyclable materials subject to Section 2.0, and 4.0 of the Waste Collection Design Standards Manual (WCDSM): https://www.peelregion.ca/pw/standards/design/waste-collection-design-manual-2016.pdf. The waste management arrangement is generally close to satisfactory, but some information is missing.
Dufferin-Peel Catholic District School Board (March 8, 2023)	Based on the Dufferin-Peel Catholic District School Board's School Accommodation Criteria, the Board is satisfied with the current provision of educational facilities for the catchment area in which the subject application is located. The City of Mississauga school accommodation condition need not be applied.
Peel District School Board (March 21, 2023)	City of Mississauga Council Resolution 152-98 applies to this application, therefore prior to final approval, the City of Mississauga shall be advised by the School Board that satisfactory arrangements regarding the provision and distribution of educational facilities have been made between the developer/applicant and the School Board for this plan
Metrolinx (March 22, 2023)	Metrolinx is in receipt of the above noted development application to redevelop the northern portion of the above noted lands with a 38-storey mixed-use building. This proposal falls within 300 meters of Metrolinx's Port Credit GO Station and carries Lakeshore West GO train services. As such it falls within our zone of influence for comment and review. • Metrolinx is in receipt of the Rail Safety Report prepared by Entuitive and dated January 2023. This report will be submitted to Metrolinx technical advisors (AECOM) for review and shall be to the satisfaction of Metrolinx and AECOM. I note the report identifies an

Agency / Comment Date	Comments
	approximate 23.75 m horizontal setback from the closest possible future track while an approximate 20.15 m setback is being proposed from the mutual property line. As identified our pre- consultation comments, Metrolinx reiterates the requirement for a 30metre setback measured from the southern-most portion of the Metrolinx property line. Further review, analysis and comments are forthcoming subsequent to AECOMs technical review of the report. • Prior to zoning approval, the crash wall design shall be reviewed to the satisfaction of Metrolinx and our technical advisors (AECOM). Metrolinx is in receipt of the functional servicing and stormwater management report prepared by Urbantech in January of 2023. The report will be reviewed and shall be to the satisfaction of Metrolinx and our Technical Advisor (AECOM). Any proposed alterations to the existing drainage pattern affecting Metrolinx property requires prior approval from Metrolinx and its Technical Advisor, AECOM. Prior to final site plan approval, the final Stormwater Management Report shall be reviewed and to the satisfaction of Metrolinx and our Technical Advisor (AECOM). Please note there are fees associated with the Technical reviews noted above payable by the proponent. Fees will be confirmed once the Level of Effort by our technical advisor has been determined.
City Arborist (March 23, 2023)	Since Queen Street will have a sodded condition, Forestry would like to seek efforts in preserving Trees #654 and #655 as noted in the Arborist Report. These trees are healthy mature Lindens which have significant tree canopy.
Transportation and Works Department (April 6, 2023)	Based on a review of the information submitted to date, staff are not satisfied that the materials submitted are in accordance with City requirements. Additional technical details and revisions are required in order to confirm the feasibility of the development proposal from an engineering standpoint, as follows: <u>Right-of-Way</u> Encroachments are not allowed within the municipal right-of-way. Revised plans are required that do not include either below or aboveground encroachments within the proposed right-of-way widening on both Queen Street East and Helene Street North.

Agency / Comment Date	Comments
	Traffic An Urban Transportation Considerations Report), prepared by BA Consulting Group Ltd. and dated January 2023, was reviewed and audited by staff. The report does not conform to City requirements and does not provide sufficient detail for staff to confirm feasibility. The report concluded that the proposed development is anticipated to generate approximately 125 (35 in, 90 out) and 130 (85 in, 45 out) two-way site trips for the weekday AM and PM peak hours in 2027, respectively. Staff require additional clarification on the traffic generated by the proposed development, the study area intersections and proposed vehicular access. In addition, the following information is required to confirm feasibility and to ensure that City requirements are satisfactorily addressed: • An updated Urban Transportation Considerations Report addressing all staff comments, • Additional turning movement diagrams to evaluate the internal site circulation and access points, • A review of the driveway access to ensure the adjacent municipal roads and the internal driveway can operate efficiently and safely, • The inclusion of the future property lines due to the required daylight triangle, and • A response matrix addressing any traffic concerns from the Community related to the proposed development. Environmental Compliance A Phase One Environmental Site Assessment (ESA) report, prepared by Pinchin Ltd. and dated December 20, 2022, identified areas of potential environmental concern on the property. The report does not conform to City requirements and does not provide sufficient detail for staff to confirm feasibility. The following information is required to confirm feasibility and to ensure that City requirements are being satisfactorily addressed: • A Phase Two ESA (and any other reports or recommendations that may be required pending a review of the results), • A Storm Sewer Use By-law Acknowledgement Form, and • A letter certified by a Qualified Person, stating that land to be dedicated to the City is environmentally suitable for the proposed use.

Agency / Comment Date	Comments
	Noise A Transportation Noise & Vibration Feasibility Assessment prepared by Gradient Wind Engineering Inc., dated January 17, 2023 evaluated the potential impact to and from the development, and recommended mitigation measures to reduce any negative impacts. Noise sources that may have an impact on this development include road traffic from Helene Street North, Queen Street East, Park Street East and rail traffic from the Canadian National Railway/GO Transit line. Noise mitigation measures will be required for this proposed development. However, the report does not conform to City requirements and does not provide sufficient detail for staff to confirm feasibility. An updated study is required to address staff comments, including compliance with MECP's NPC 300 Guidelines and identification of appropriate mitigation measures. Engineering Plans/Drawings The applicant has submitted a number of technical plans and drawings, which need to be revised in accordance with City standards. Stormwater A Functional Servicing and Stormwater Management Report, prepared by Urbantech and dated January 2023, indicates that an increase in stormwater runoff will occur with the redevelopment of the site. In order to mitigate the change in impervious area from the proposed development and/or impact to the receiving Municipal drainage system, onsite stormwater management controls for the post-development discharge is required. A Preliminary Hydrogeological Assessment, prepared by Pinchin and dated January 20, 2023, indicates ground water discharge will be required for development of this site. The report confirms that discharge rates will meet the City Storm Sewer Discharge By-law. A filtration system will be required for the proposed development to meet groundwater quality requirements. The applicant is proposing the following: • Controlling the post-development 100-year storm to the pre-development 10-year storm in accordance with City standards and the capacity of the existing storm sewers. • Onsite stormwater management controls such as a storage tank and other potential low impact development and reuse measures (i.e. landscaped areas, green roofs, etc.).

Agency / Comment Date	Comments
	• Connecting the site to the existing storm sewer on Helene Street North. • Meeting water quality objectives through this use of an oil grit separator. The applicant has demonstrated a satisfactory stormwater servicing concept. Further details related to the groundwater dewatering and potential groundwater quality treatment that may be required can be addressed prior to Site Plan approval.
Other City Departments and External Agencies	The following City Departments and external agencies offered no objection to these applications provided that all technical matters are addressed in a satisfactory manner: - Fire - Canada Post - Alectra - LRT Office - Trillium Health Partners - CS Viamone - Enbridge - Public Art
	The following City Departments and external agencies were circulated the applications but provided no comments: - CNR

7. School Accommodation Summary

The Peel District School Board

Student Yield	School Accommodation		
55 Kindergarten to Grade 5 9 Grade 6 to Grade 8 8 Grade 9 to Grade 12	Forest Avenue P.S.	Riverside P.S.	Port Credit S.S.
	Enrolment: 191 Capacity: 199 Portables: 0	Enrolment: 280 Capacity: 438 Portables: 0	Enrolment: 1314 Capacity: 1203 Portables: 7

The Dufferin-Peel Catholic District School Board

Student Yield	School Accommodation	
9 Kindergarten to Grade 8 8 Grade 9 to Grade 12	St. Luke Elementary School	Iona Catholic School
	Enrolment: 372 Capacity: 602 Portables: 0	Enrolment: 627 Capacity: 723 Portables: 5

70 Park Street East
OZ/OPA 23-3 W1
Planning and Development Meeting
May 29, 2023

PROJECT TIMELINE

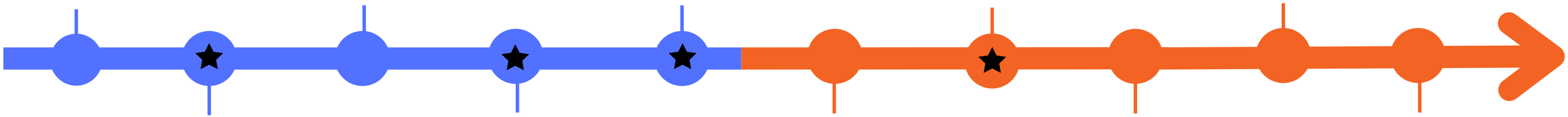
DARC
Oct 12, 2022

OPA & ZBA Applications submitted
Jan 26, 2023

Community Meeting
Feb 21, 2023

PDC
May 29, 2023

Re-submission
Date TBD



Meeting with tenants and existing residents
Jan 18/19, 2023

Town of Port Credit Association meeting
Jan 30, 2023

Meetings with staff and agencies
Mar - May, 2023

Coordination and refinement
Ongoing

Steps to be confirmed
Date TBD

Community Consultation

Steps Undertaken

Current & Next Steps

CONTEXT

- Subject Site
- GO Station
- GO Train Line
- MiWay Bus Stops
- Hazel McCallion LRT Line
- Hazel McCallion LRT Station

CONTEXT

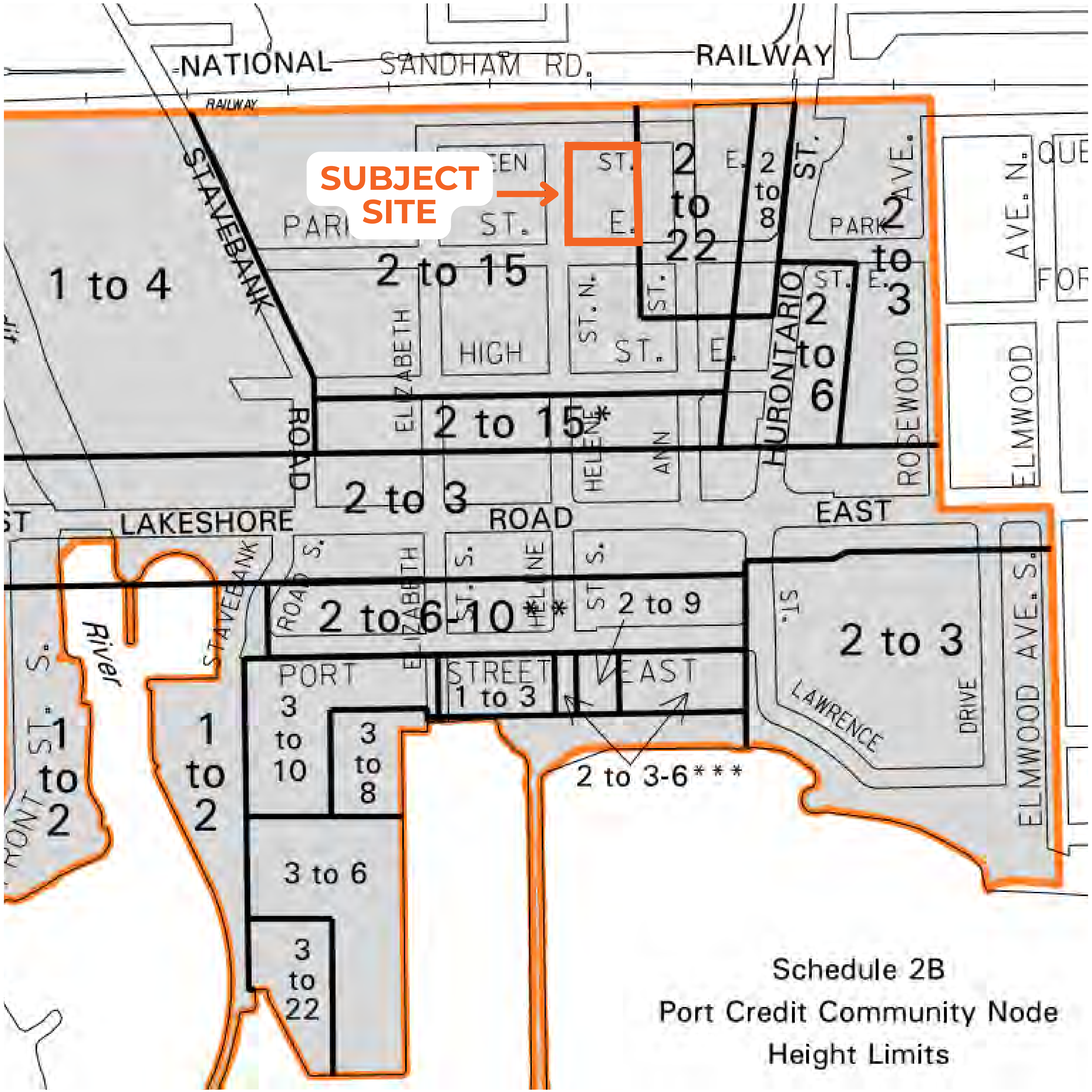
- Subject Site
- Walking Radii
- GO Station
- Hazel McCallion LRT Station
- Hazel McCallion LRT Line
- School
- Park

CONTEXT


BRAMPTON GATEWAY TERMINAL
Brampton
COUNTY COURT
RAY LAWSON
MAINTENANCE & STORAGE FACILITY
DERRY
COURTNEYPARK
BRITANNIA
MATHESON
BRISTOL
EGLINTON
CITY CENTRE
ROBERT SPECK
BURNHAMTHORPE
FAIRVIEW
COOKSVILLE GO STATION
Mississauga
DUNDAS
QUEENSWAY
NORTH SERVICE
MINEOLA
PORT CREDIT GO STATION
SUBJECT SITE
WINSTON CHURCHILL
HERITAGE
HEREFORD
MISSISSAUGA
FINANCIAL
Steeles Ave
CHINGUACOUSY
MCLAUGHLIN
MCMURCHY / MALTA
KENNEDY
RUTHERFORD / FIRST GULF
WEST DRIVE / TOMKEN
DIXIE
BRAMALEA ROAD
TORBRAM
ARGENTIA
LISGAR GO STATION
MEADOWVALE GO STATION
STREETSVILLE GO STATION
ERINDALE GO STATION
CLARKSON GO STATION
LONG BRANCH GO STATION
DIXIE GO STATION
407
410
401
403
QEW
Derry Rd
McLaughlin Rd
Kennedy Rd
Dixie Rd
Tomken Rd
Britannia Rd
Mavis Rd
Creditview Rd
Matheson Blvd
Eglinton Ave
Mississauga Rd
Burnhamthorpe Rd
Dundas St
Queensway
Lakeshore Rd
Winston Churchill Blvd
Erin Mills Pkwy
ERIN MILLS
CENTRAL PARKWAY
CAWTHRA
TOMKEN
DIXIE
TAHOE
SPECTRUM
ETOBICOKE CREEK
ORBITOR
RENFORTH


304 304


Port Credit


SUBJECT SITE
NATIONAL
SANDHAM RD.
RAILWAY
STAVEBANK
1 to 4
2 to 15
2 to 22
2 to 8
2 to 3
2 to 6
2 to 15**
2 to 3
LAKESHORE
ROAD
EAST
HURONTARIO
ROSEWOOD
ELMWOOD
HIGH
PARK
2 to 6-10**
2 to 9
PORT
STREET
EAST
1 to 3
2 to 3-6***
2 to 3
LAWRENCE
DRIVE
3 to 10
3 to 8
3 to 6
3 to 22
1 to 2
River
Schedule 2B
Port Credit Community Node
Height Limits

PLANNING PRINCIPLES

PROJECT STATISTICS

38 STOREYS

530 RESIDENTIAL UNITS

41% 2 BED+ (214 UNITS)
43% 1 BED (230 UNITS)
16% STUDIO (86 UNITS)

~5,000 SF
RETAIL AREA

~15,000 SF
OUTDOOR AMENITY SPACE

~4,300 SF
DAYCARE AREA

~15,000 SF
INDOOR AMENITY SPACE

610 PARKING STALLS
8 UNDERGROUND LEVELS

350 BICYCLE STALLS
INDOOR PARKING ON GROUND
+ MEZZANINE LEVEL


QUEEN STREET EAST
RETAIL
VEST.
BIKE ROOM
TRANSFORMER ROOM
GARBAGE ROOM
GARBAGE ROOM
RETAIL
LOADING AREA
PARCEL ROOM
EXIT STAIR
MAIL ROOM
PARKING RAMP
HELENE STREET
VEST.
RESIDENTIAL LOBBY
VEST.
RESIDENTIAL LOBBY
EXIT STAIR
VEST.
MULTI-STEM SHRUB PLANTING
SHRUB PLANTING
BUILT-IN BENCH SEATING
WOOD DECK
DAYCARE
RUBBERIZED PLAYGROUND SURFACE
CHILDREN'S PICNIC TABLE
TRELLIS
SHED
FENCE WITH GATE
VEST.
DAYCARE OUTDOOR
BIKE PARKING
DROP OFF
CONCRETE PAVING
SANDBOX
SHADE TREE
SHRUB PLANTING
LOADING AREA FOR EXISTING BUILDING
EXISTING 27 STOREY BRICK APARTMENT BUILDING
SOD
PROPERTY LINE
PROPERTY LINE
PARK STREET EAST


QUEEN STREET EAST
WASTE RECEPTACLE
BUILT-IN BBQ COUNTER
MULTI-STEM SHRUB PLANTING
CONCRETE PLANTER WALL
SHRUB PLANTING
AMENITY TERRACE PAVING
MULTI-STEM SHRUB PLANTING
PRE-FABRICATED METAL EDGING
TRELLIS
PRE-FABRICATED METAL PLANTER
DINING TABLE & CHAIRS
AMENITY TERRACE PAVING
DECORATIVE PRIVACY SCREEN
CLUSTER SEATING
BAR HEIGHT COUNTER & STOOLS
WOOD DECK
LOUNGE SEATING FURNITURE
LOUNGE SEATING FURNITURE
SINGLE SIDED GAS FIREPLACE
MULTI-STEM SHRUB PLANTING
SHRUB PLANTING
CONCRETE PLANTER WALL
SHADE TREE
INDOOR AMENITY
HELENE STREET
EXISTING 27 STOREY BRICK APARTMENT BUILDING
PARK STREET EAST

STREET VIEW LOOKING EAST TOWARDS PORT CREDIT GO STATION

STREET VIEW LOOKING SOUTH FROM PORT CREDIT GO STATION

STREET VIEW LOOKING NORTH TOWARDS GO STATION

INTERNAL VIEW LOOKING NORTH

NEXT STEPS

RESOLVE OUTSTANDING ISSUES

- SERVICING CAPACITY
- METROLINX REQUIREMENTS
- WIND MITIGATION
- BUILT FORM AND URBAN DESIGN

CONTINUE WORKING WITH CITY STAFF

THANK YOU

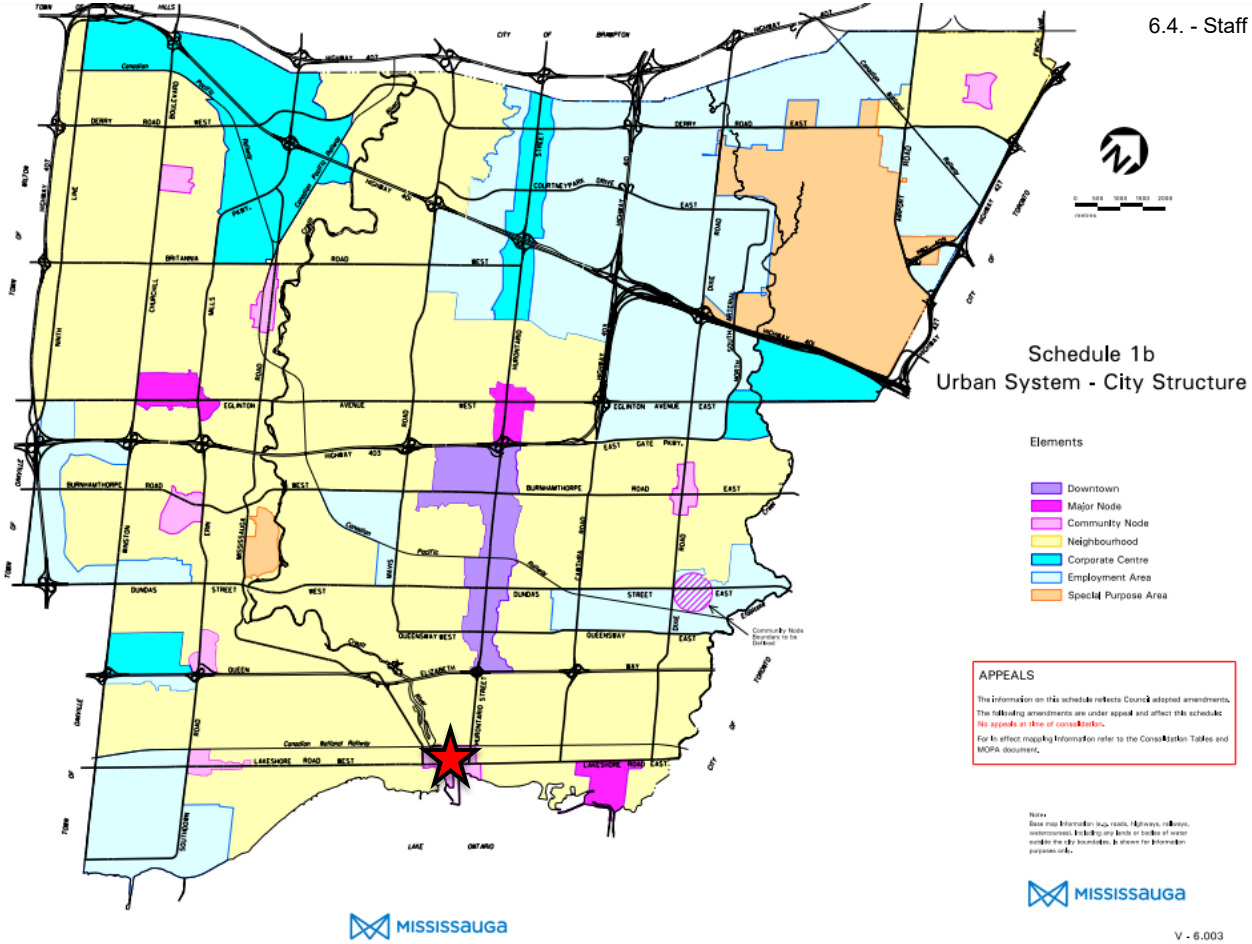
OPA/OZ 23-3 W1
70 Park St E

Information and Recommendation Report

Planning and Building Department

Bill 109 Application

MISSISSAUGA


Schedule 1b
Urban System - City Structure
Elements
Downtown
Major Node
Community Node
Neighbourhood
Corporate Centre
Employment Area
Special Purpose Area
APPEALS
The information on this schedule reflects Council adopted amendments.
The following amendments are under appeal and affect this schedule:
No appeals at time of consolidation.
For in effect mapping information refer to the Consolidation Tables and MOPA document.
MISSISSAUGA
V - 6.003

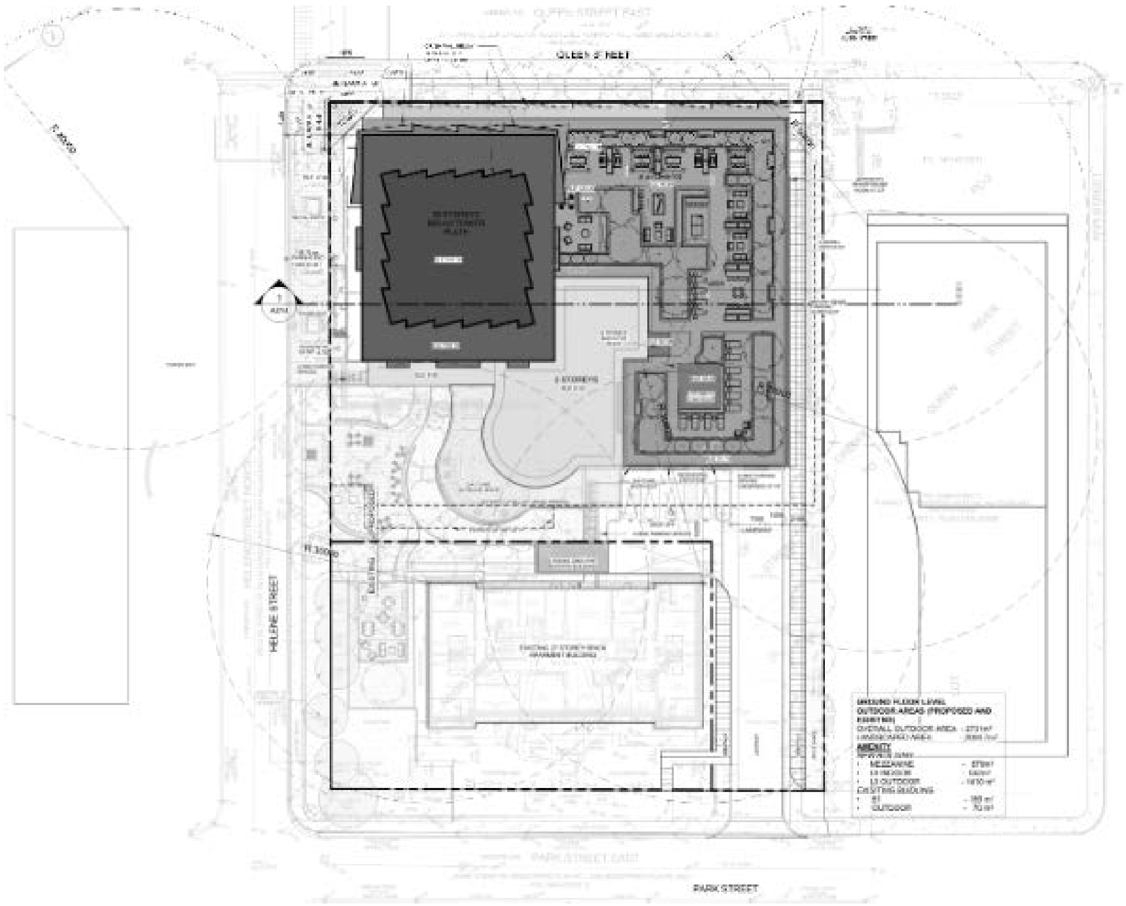

LRT
QUEEN ST S
ANN ST
PARK ST E
HURON PARK ST
HELENE ST N
HIGH ST E
ELIZABETH ST N
HELENE ST S
ELIZABETH ST S
PORT ST E
SMITH BANK RD
LAKESHORE RD E
Port Credit
FRONT ST N
ROSEWOOD AVE
ELMWOOD AVE N
ELMWOOD AVE S
OAKWOOD AVE S
COMPASS WAY
WATERSIDE DR
ST. LAWRENCE DR
CARLIS PL
TROY ST
ORIOLE AVE
INGLEWOOD DR
MONA RD
SANDHAM RD
WOODLAND AVE
MINAKI RD
MINGOLA RD W
VERONICA DR
COTTON DR
VESPA DR
ROSEMERE RD
WESTSIDE LANE
Zo8
Zo7
1


QUEEN ST E
ANN ST
ANN ST
PARK ST E
HELENE ST N
QUEEN ST E
Zo8
23
29
30
28
26
24
22
78
25
70
30
88
19
17
84
80
65
72
28
49

Applicant's Proposal:

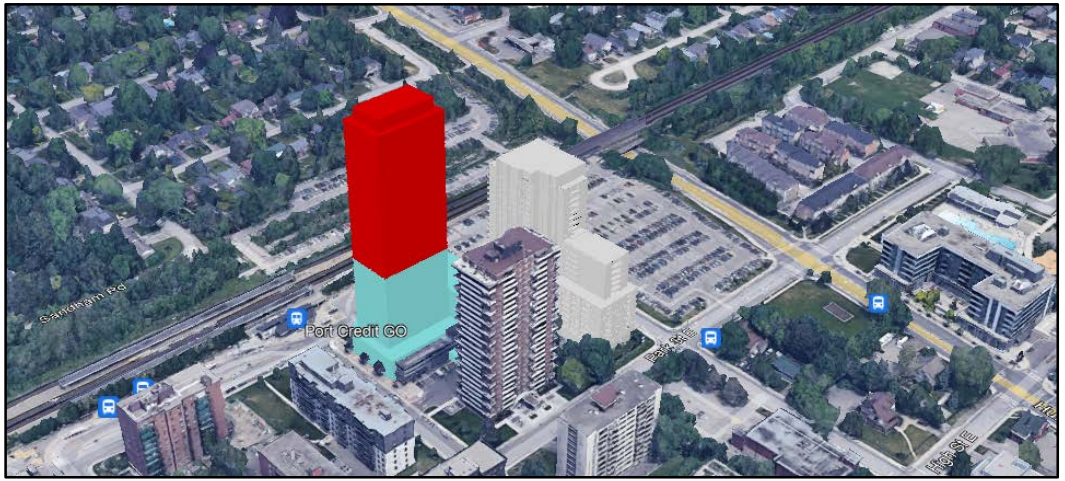
38 storey apartment building with ground floor commercial space and a daycare

Existing 27 storey apartment building to be maintained


QUEEN STREET
HELENE STREET
PARK STREET

Applications required:

- An Official Plan Amendment amendment to the PCLAP is required to allow a height of 38 storeys, whereas 15 storeys is permitted
- To amend the existing Residential High Density Use to allow for commercial and daycare uses
- A Zoning By-law Amendment to amend the current RA5-27 zone to accommodate the additional apartment building



Bill 109, More Homes For Everyone Act, 2022, received Royal Assent on April 14, 2022

- Requires municipalities to return application fees if a decision by Council has not been made within 120 days, starting July 1, 2023
- Applications that are submitted to the City post January 1, 2023 are subject to the City's new pilot for the processing of development applications

Purpose of Tonight's Meeting

- For Planning and Development Committee to make a decision on the submitted development applications in order for Council to endorse a recommendation within the 120 days legislated time frame

Application Timeline

- **October 12, 2022** – DARC Meeting – 34 storey apartment building
- **February 21, 2023** – Community Meeting held by Cllr Dasko
- **February 22, 2023** – Applications deemed complete – 28 storey apartment building
- **May 29, 2023** – Recommendation Report meeting at Planning and Development Committee
- **June 23, 2023** – conclusion of 120 days from date application deemed complete

Application Evaluation:

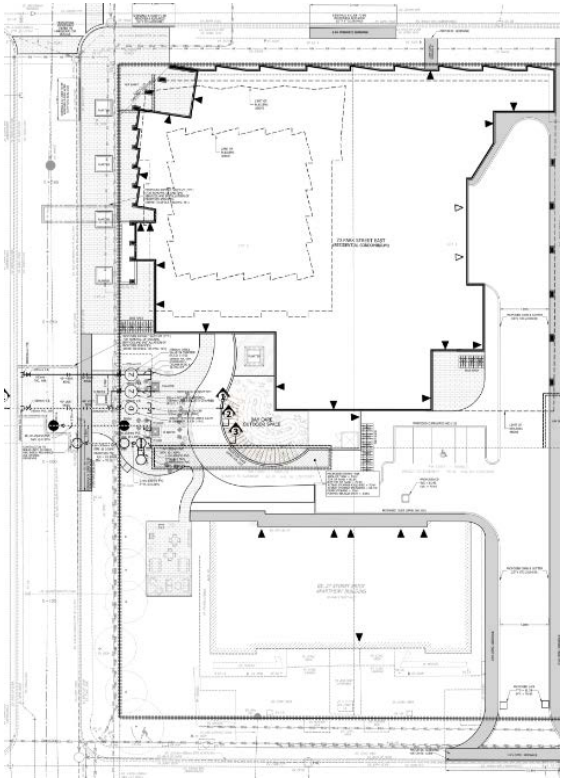
Is the proposed increase in height consistent with:

- *Provincial Policy Statement*
- *Growth Plan*
- Mississauga Official Plan/Port Credit Local Area Plan and Built Form Guidelines

Evaluation

- **The Region of Peel has identified issues with the waste water capacity as a result of the proposed increase in density from what is anticipated in the LAP**
- **The site has exceeded the forecasted growth for the area**

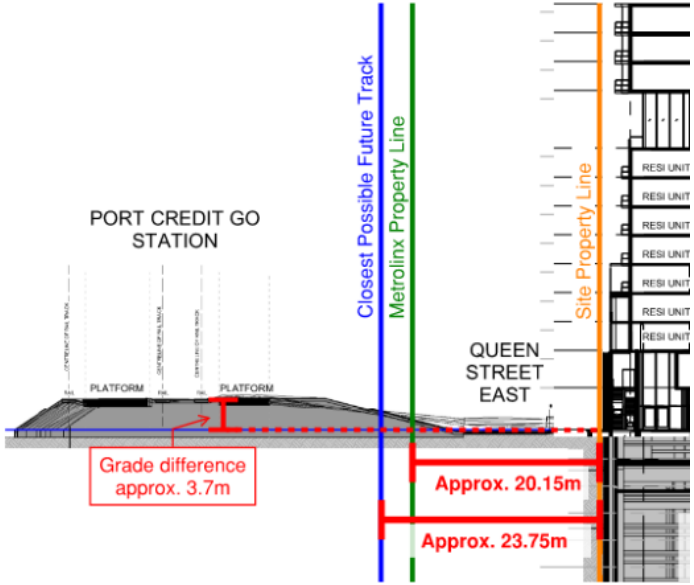
- The PPS and the GP require that municipalities identify and promote transit oriented development where there is suitable infrastructure
- The Regional Official Plan does not allow development can occur where there is no servicing capacity
- Section 19.5.1 of MOP requires that Official Plan Amendment applications demonstrate the "adequacy of engineering services" for their development and provides the policy direction of “Development proposals may be refused if existing or planned servicing and/or infrastructure are inadequate to support the additional population”



Evaluation

- **Metrolinx has indicated that the required 30.0 m rail safety setback has not been adhered to**

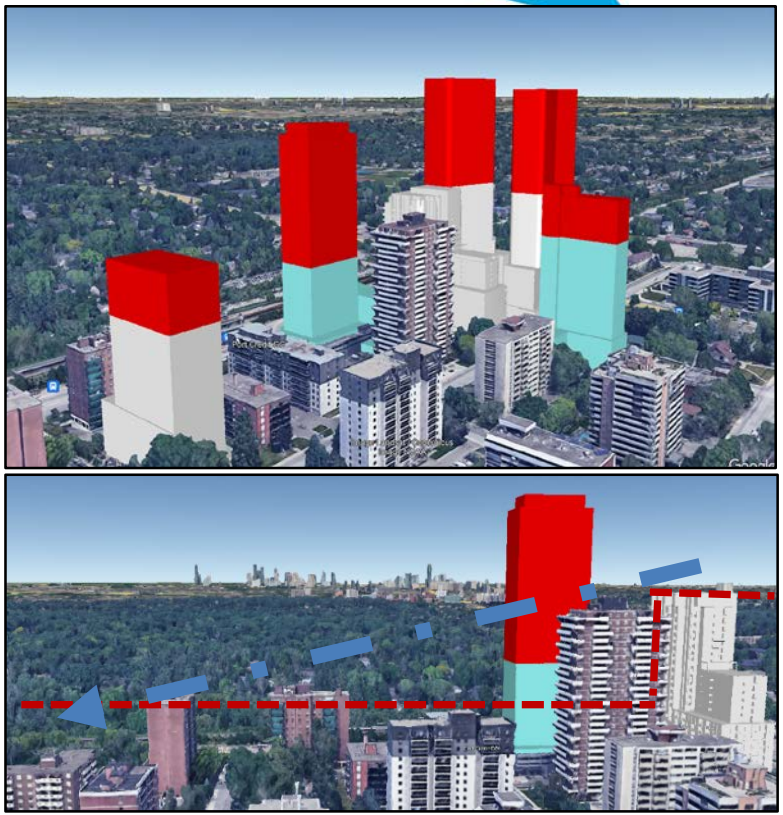
- The PPS requires that planning for land uses in the vicinity of rail facilities be undertaken in a manner where sensitive land uses be appropriately buffered
- Section 6.10.4.6 of MOP requires that development proposing sensitive land uses adjacent to rail infrastructure incorporate an a setback that is satisfactory to the City and rail operator.
- Metrolinx has not provided comments that indicate they are satisfied with the proposed 20.0 m setback to the railway



Evaluation

- **The proposed height of 38 storeys is not supportable from a planning perspective**

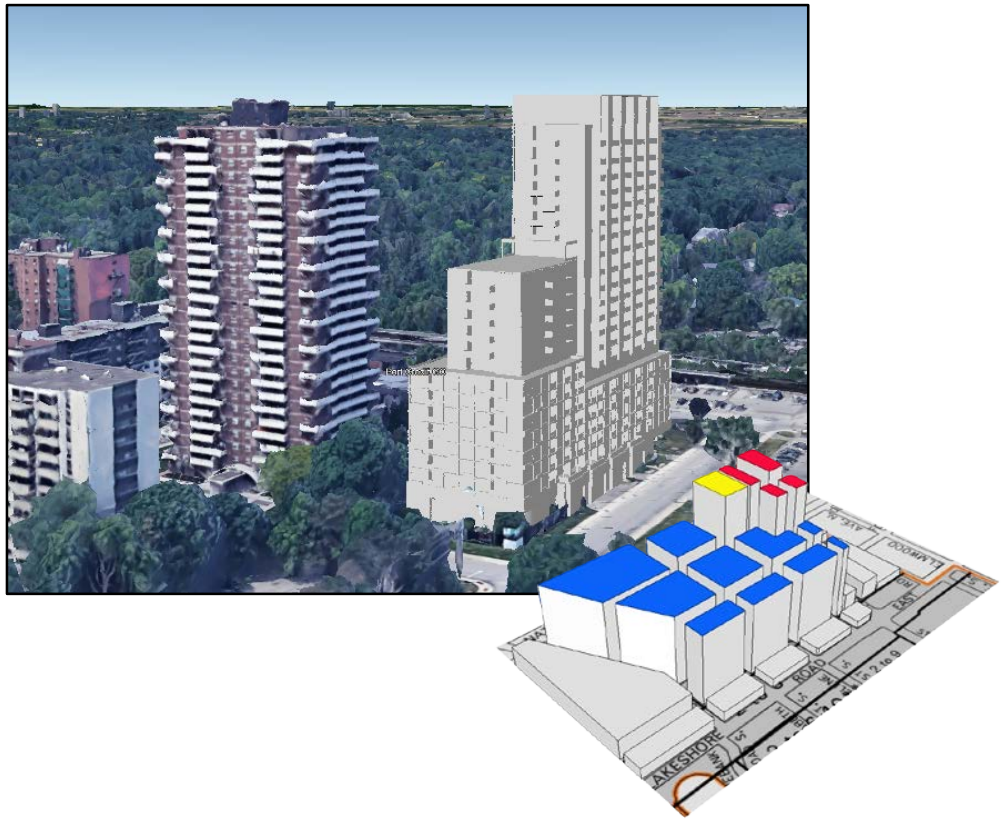
- Redevelopment of the site generally meets the PPS and GP directive of more efficient land use patterns that support transit
- The PPS and GP acknowledge that municipalities are to set the standards related to scale of development in transit station areas
- Port Credit Local Area Plan – height schedule is intent in ensuring that heights and density in the Central Residential Precinct are consistent with the City Structure and following the overall prevailing character
- The overall building height does not respect and relate to the existing and planned context and will destabilize the intended height of the node



Evaluation

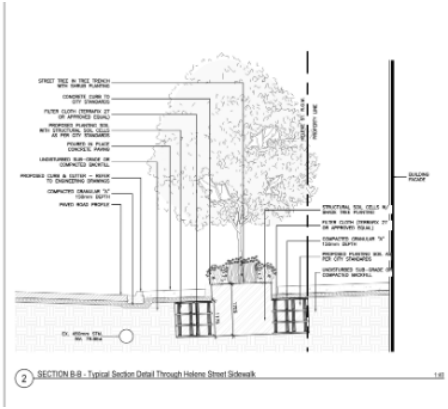
- **An alternative height of 22 storeys can be supported by staff**

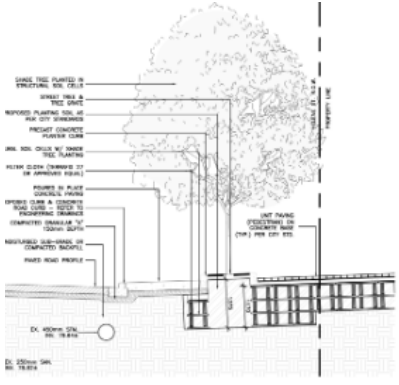
- Site is adjacent to the GO Station
- Existing 27 storey (22 storey in modern height) on site
- Additional height contributes to wayfinding within the skyline
- 22 storeys in this particular location maintains the overall intent of heights to maintain the City Structure

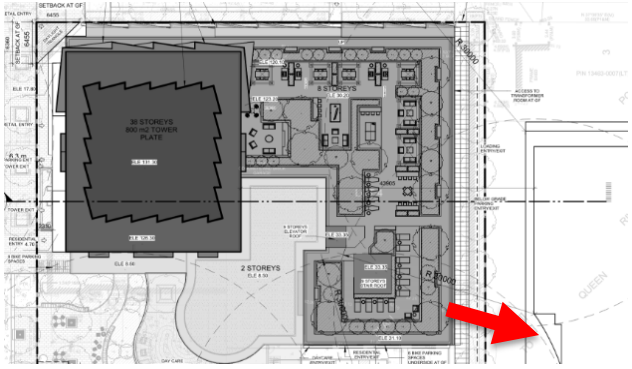


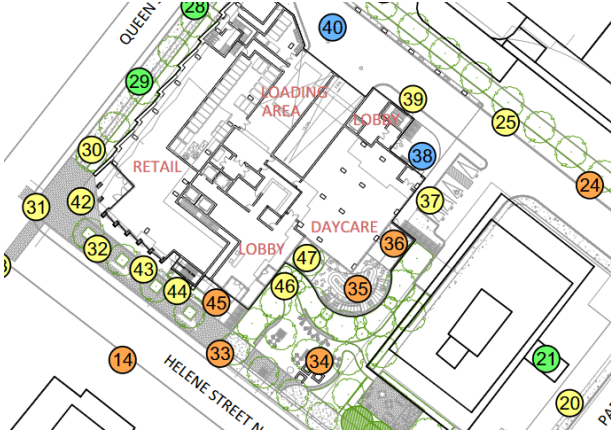
Evaluation

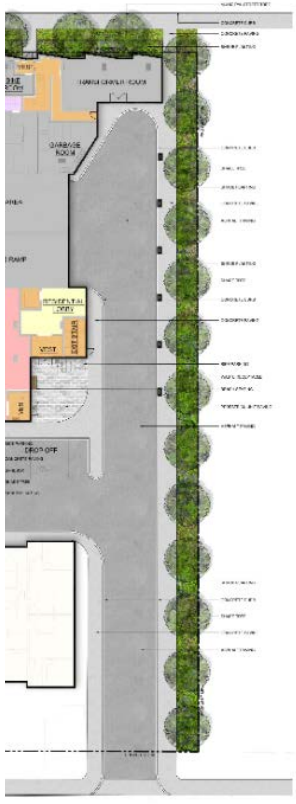
- **Other development issues**
  - Insufficient parking justification
  - Inadequate building separation distance
  - Uncomfortable wind conditions created on site
  - Unacceptable landscape buffer along easterly property line
  - Feasibility for upgraded streetscape undetermined











Conclusion:

- The Region of Peel has stated that there is no capacity within the current waste water infrastructure to accommodate the increased density as a result of the 38 storey proposal
- The proposal does not maintain Metrolinx's rail safety requirement of a 30.0 m (98.4 ft.) separation distance
- The proposed 38 storey building height maximum is a significant departure from the existing and planned height context anticipated in the Port Credit Local Area Plan
- There are additional development matters that are required to be addressed through the submission of a number of technical studies that have not properly been addressed

Recommendation:

- That Planning and Development Committee refuse the applications in their current form

City of Mississauga
Corporate Report

MISSISSAUGA

Date: May 5, 2023

To: Chair and Members of Planning and Development Committee

From: Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Originator's file:
OZ OPA 22-27 W5

Meeting date:
May 29, 2023

Subject

PUBLIC MEETING INFORMATION REPORT (WARD 5)

Official Plan Amendment and Rezoning applications to permit 16, three storey back to back townhouse units
5, 7, 9 Beverley Street, north of Derry Road East, west of Airport Road
Owner: 2862505 Ontario Limited
File: OZ/OPA 22-27 W5

Pre-Bill 109

Recommendation

That the report dated May 5, 2023, from the Commissioner of Planning and Building regarding the applications by 2862505 Ontario Limited to permit 16, three storey back to back townhouse units, under File OZ/OPA 22-027 W5, 5, 7, 9 Beverley Street, be received for information.

Background

The applications have been deemed complete and circulated for technical comments. The purpose of this report is to provide preliminary information on the applications and to seek comments from the community. The report consists of two parts, a high level overview of the applications and a detailed information and preliminary planning analysis (Appendix 1).

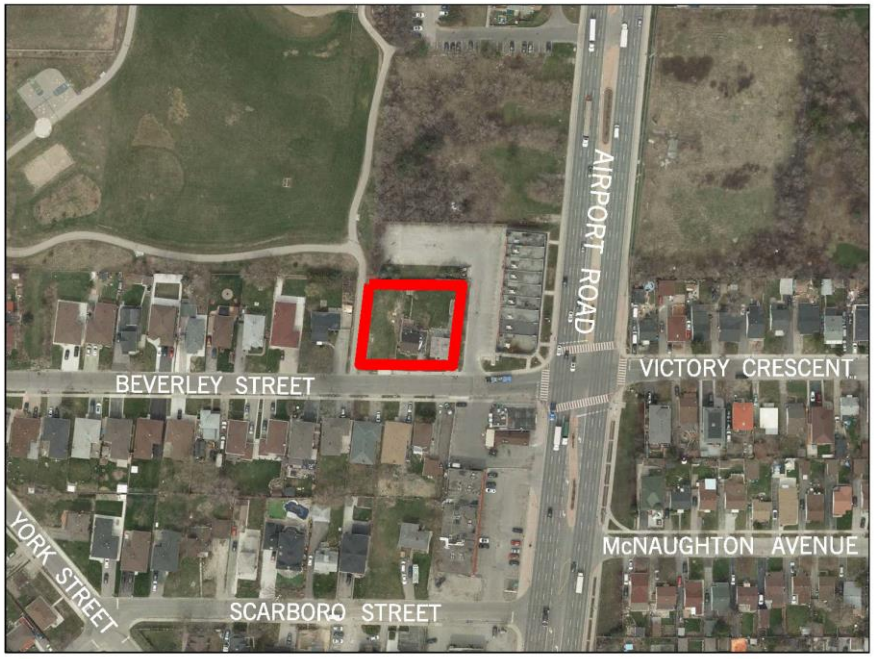
PROPOSAL

The official plan amendment and rezoning applications are required to permit 16, three storey back to back townhouse units. The applicant is proposing to amend the official plan from **Residential Low Density I** to **Residential Medium Density** to permit the proposed townhomes. The zoning by-law will also need to be amended from **R3-69** (Detached Dwelling Typical Lots – Exception) to **RM12-Exception** (back to back townhouses on a street - Exception) to implement this development proposal.

During the ongoing review of these applications, staff may recommend different land use designations and zoning categories to implement the proposal.

Comments

The properties are located north of Derry Road East, west of Airport Road within the Malton Neighbourhood Character Area. The site is comprised of two detached dwellings at 5 and 7 Beverley Street. The property at 9 Beverley Street is vacant. The immediate surrounding area includes a retail plaza, detached homes and Malton Village Park.



Aerial image of 5, 7, 9 Beverley Street

Applicant's rendering of the proposed townhomes

LAND USE POLICIES AND REGULATIONS

The *Planning Act* allows any person within the Province of Ontario to submit development applications to the local municipality to build or change the use of any property. Upon submitting all required technical information, the municipality is obligated under the *Planning Act* to process and consider these applications within the rules set out in the Act.

The *Provincial Policy Statement* (PPS) establishes the overall policy directions on matters of provincial interest related to land use planning and development within Ontario. It sets out province-wide direction on matters related to the efficient use and management of land and infrastructure; the provision of housing; the protection of the environment, resources and water; and, economic development.

The *Growth Plan for the Greater Golden Horseshoe* (Growth Plan) builds upon the policy framework established by the PPS and provides more specific land use planning policies which support the achievement of complete communities, a thriving economy, a clean and healthy environment and social equity. The Growth Plan establishes minimum intensification targets and requires municipalities to direct growth to existing built-up areas and strategic growth areas to make efficient use of land, infrastructure and transit.

The *Planning Act* requires that municipalities' decisions regarding planning matters be consistent with the PPS and conform with the applicable provincial plans and the Region of Peel Official Plan (ROP). Mississauga Official Plan is generally consistent with the PPS and conforms with the Growth Plan, the *Greenbelt Plan*, the *Parkway Belt West Plan* and the ROP.

Conformity of this proposal with the policies of Mississauga Official Plan is under review.

Additional information and details are found in Appendix 1, Section 4.

AGENCY AND CITY DEPARTMENT COMMENTS

Agency and department comments are summarized in Appendix 1, Section 7.

Financial Impact

All fees paid by developers are strictly governed by legislation, regulation and City by-laws. Fees are required to be paid prior to application approval, except where otherwise may be prescribed. These include those due to the City of Mississauga as well as any other external agency.

Conclusion

All agency and City department comments have been received. The Planning and Building Department will make a recommendation on this project after the public meeting has been held and the issues have been resolved. The matters to be addressed include: provision of

additional technical information, review of reduced parking standards, ensuring compatibility of the new building with the surrounding area and community consultation and input.

Attachments

Appendix 1: Detailed Information and Preliminary Planning Analysis

A. Whittemore

Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Prepared by: Shaesta Hussen, MCIP, RPP, Development Planner

Detailed Information and Preliminary Planning Analysis

Owner: 2862505 Ontario Limited

5, 7, 9 Beverley Street

Table of Contents

1. Proposed Development

The applicant proposes to develop the property with 16, three storey back to back townhouse units. Official plan amendment and rezoning applications are required to permit the proposed development (refer to Section 4 for details concerning the proposed amendments).

Development Proposal		
Applications submitted:	Received: December 12, 2022 Deemed Incomplete: January 13, 2023 Deemed complete: February 2, 2023	
Developer/ Owner:	2862505 Ontario Limited	
Applicant:	M. Behar Planning & Design Limited	
Number of units:	16 townhouse units	
Proposed Gross Floor Area:	1,792 m^2 (19,289 ft^2)	
Height:	Three storeys / 12.3 m (1230 ft.)	
Lot Coverage:	48%	
Floor Space Index:	1.0 FSI	
Landscaped Area:	25%	
Road Type:	Public	
Anticipated Population:	48* *Average household sizes for all units (by type) based on the 2016 Census	
Parking: resident spaces visitor spaces total	Required 31 4 35	Provided 17 2 19
Green Initiatives:	• Considering stormwater collection for onsite irrigation • Considering permeable pavement	

Supporting Studies and Plans

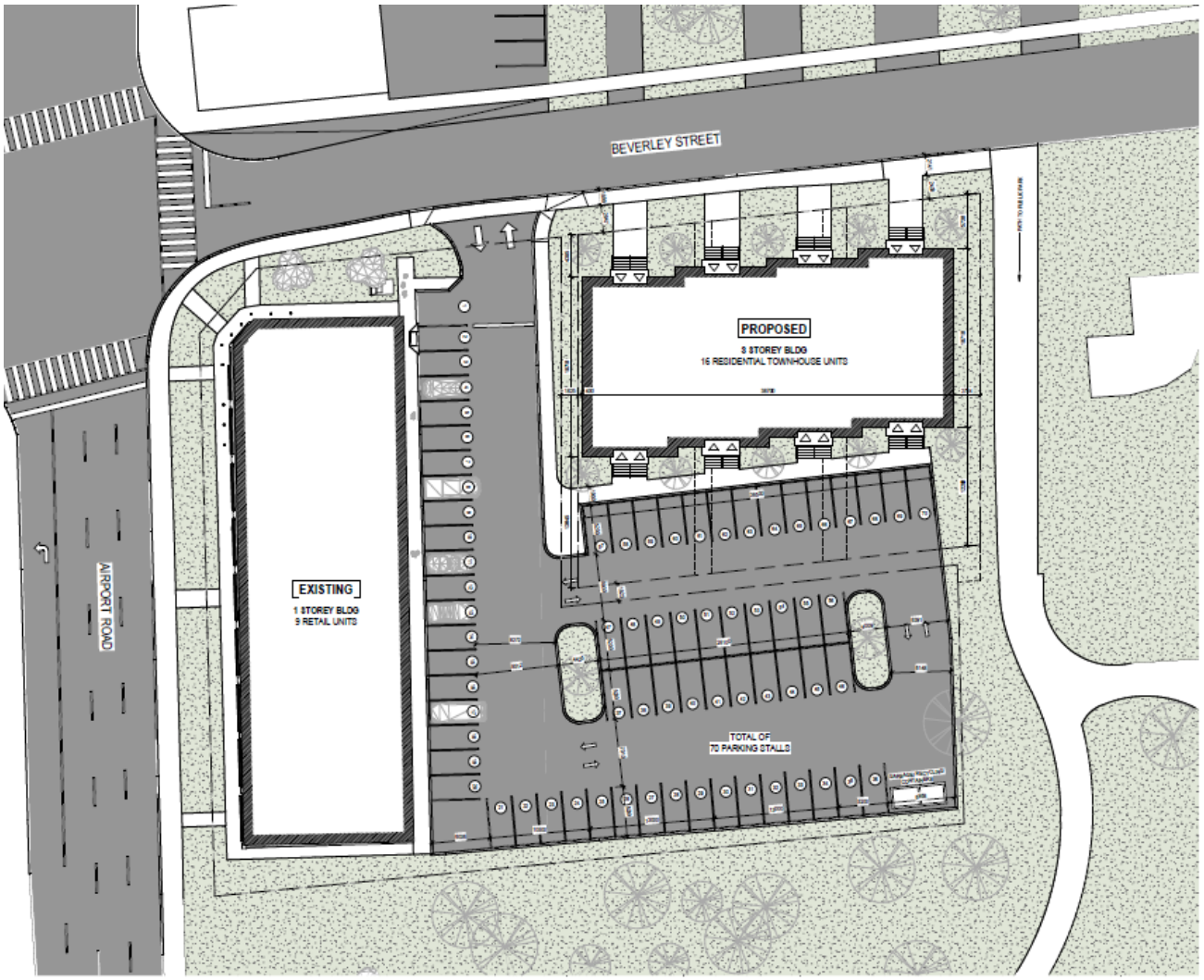
The applicant has submitted the following information in support of the applications which can be viewed at http://www.mississauga.ca/portal/residents/development-applications:

- Planning Justification Report
- Site Plan, Floor Plans, Elevations and Renderings
- Noise Feasibility Study
- Sun/Shadow Analysis
- Draft Official Plan and Zoning By-law Amendments
- Functional Servicing and Stormwater Management Report
- Transportation Impact Study
- Phase 1 Environmental Site Assessment
- Hydrogeological Investigation
- Arborist Report and Tree Preservation Plans
- Grading and Servicing Plans

Application Status

Upon deeming the applications complete, the supporting studies and plans were circulated to City departments and external agencies for review and comment. These comments are summarized in Section 7 of this appendix and are to be addressed in future resubmissions of the applications.

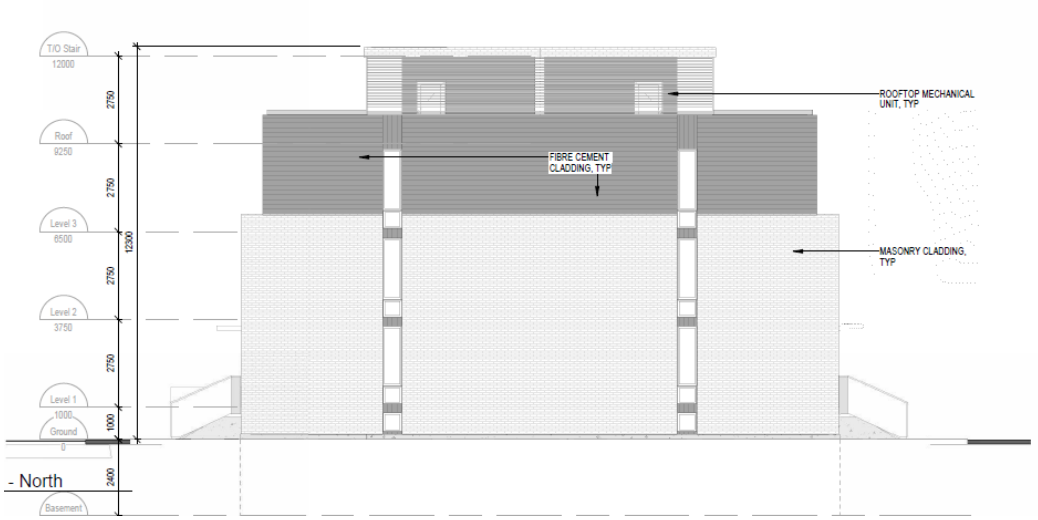
Concept Plan, Elevations and Renderings



Site Plan

East Elevation

West Elevation



North Elevation

South Elevation

Applicant's Renderings

2. Site Description

Site Information

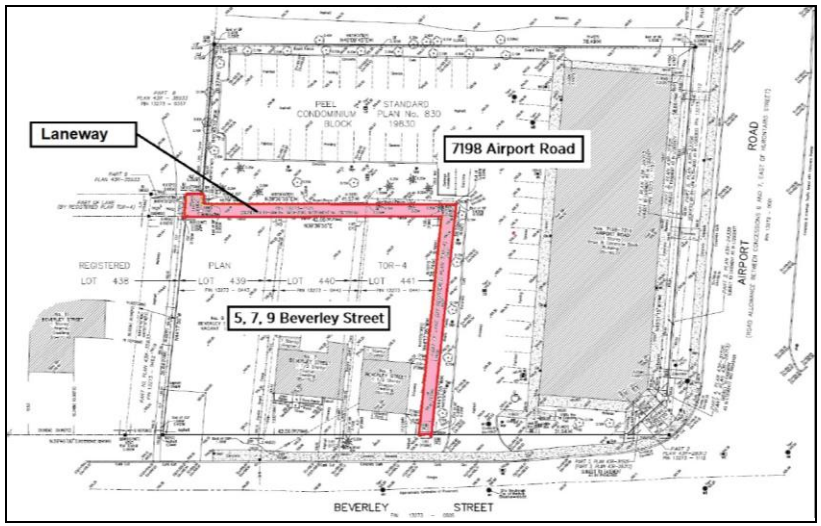
The property is located north of Derry Road East, west of Airport Road within the Malton Character Area. The area contains a mix of detached homes, apartment buildings, parkland, commercial and other community uses. The site is currently occupied by detached dwellings on 5 and 7 Beverley Street and 9 Beverley Street is vacant.

Aerial Photo of 5, 7, 9 Beverley Street

Property Size and Use	
Frontages:	43.9 m (144 ft.)
Depth:	40 m (131.2 ft.)
Gross Lot Area:	0.18 ha. (0.8 ac.)
Existing Uses:	5 – Detached dwelling 7 – Detached dwelling 9 – Vacant lot

Image of existing conditions facing northeast

There is an irregularly shaped untraveled laneway between 5, 7, 9 Beverley Street and the adjacent property at 7198 Airport Road that is owned by the City. The City passed By-law 0156-2022 on July 6, 2022 permitting the inclusion of this property in this proposed development application. The applicant is working with the City's Realty Services Department to acquire the property that was declared as surplus lands by Council in the report dated January 11, 2023.



City Owned Laneway between 5, 7, 9 Beverley Street and 7198 Airport Road

Site History

- January 28, 1980 – Zoning by-law 5500 came into force. The properties are zoned **R4** (Detached).

- May 16, 2000 – A demolition permit was issued for 9 Beverley Street. The property is now vacant.

- June 20, 2007 – Zoning By-law 0225-2007 came into force. The subject properties are zoned **R3-69** (Detached Dwellings – Typical Lots-Exception) which permits detached homes.

- November 14, 2012 – Mississauga Official Plan (MOP) came into force except for those site/policies which have been appealed. The subject properties are designated **Residential Low Density I** in the Malton Neighbourhood Character Area.

3. Site Context

Surrounding Land Uses

The neighbourhood contains a mix of housing types with detached homes located immediately to the south and west of the property.

The adjacent property located to the east (7198 Airport Road) contains a one storey multi-unit retail plaza and is also owned by the developer/owner of the Beverley Street properties. On January 20, 2023, the Committee of Adjustment approved a minor variance application (A 6/22) to permit a two storey addition above the existing plaza (9 retail units) to facilitate the development of 10 dwelling units. A shared parking arrangement is intended for the proposed development and the retail plaza.

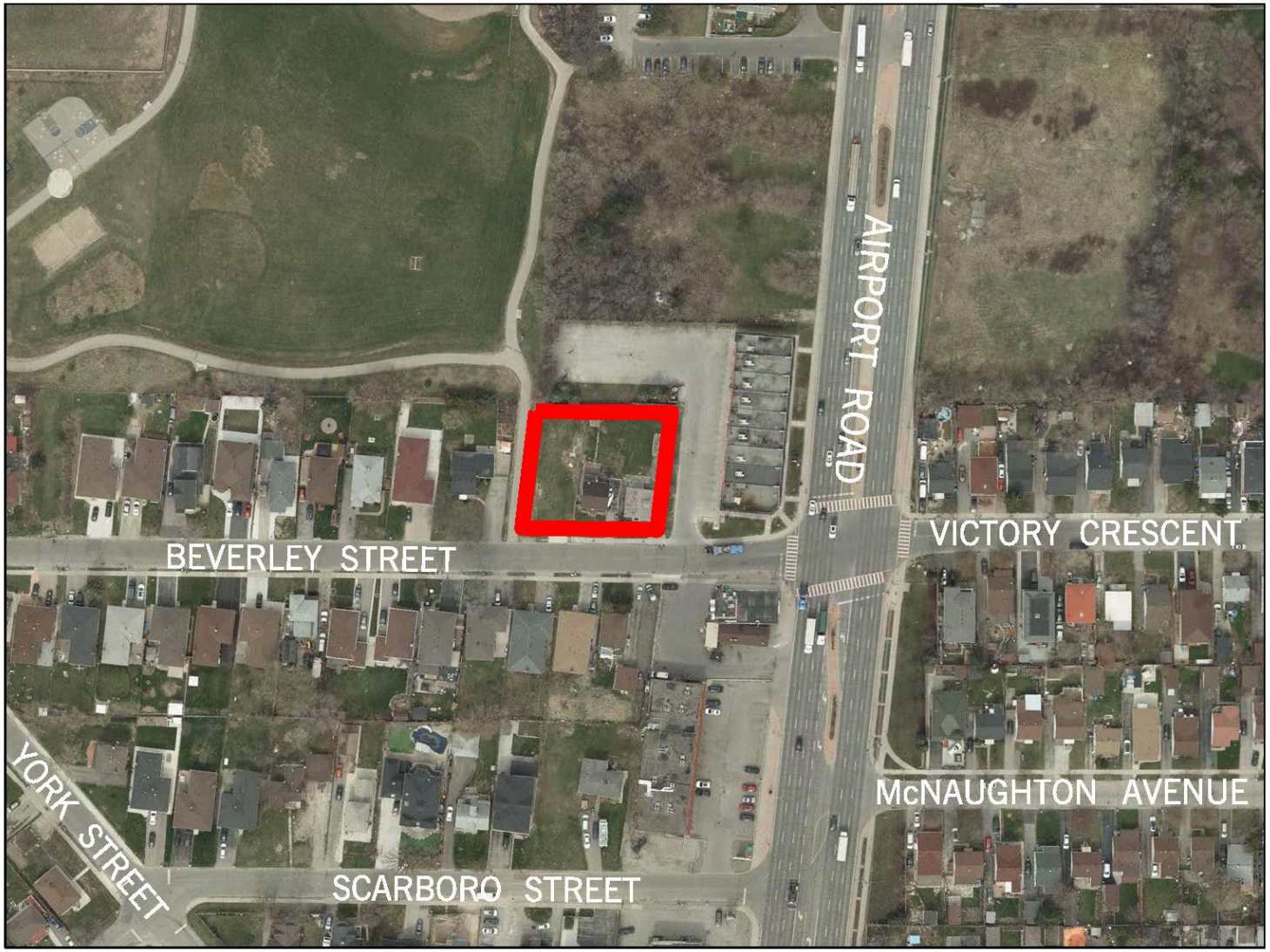
Malton Village Park is located immediately north of the properties and includes a baseball field, volleyball and tennis courts.

The surrounding land uses are:
North: Malton Village Park
East: Retail uses
South: Detached homes
West: Detached homes

Neighbourhood Context

The site is located north of Derry Road East, west of Airport Road on the north side of Beverly Street in the Malton Neighbourhood Character Area. The area was originally developed for residential and agricultural uses in the 1800s. The area was largely redeveloped during the 1950s and 1970s for residential uses.

Airport Road is identified as a Corridor in the Mississauga Official Plan (MOP). The Airport Road Corridor functions as an arterial road servicing major and minor collector roads. Section 5.4.1 of MOP defines a Corridor as including the lands on either side of the Road. Although Airport Road is classified as a Corridor, the subject properties do not have direct frontage onto Airport Road.



Aerial Photo of 5, 7, 9 Beverley Street

Demographics

Based on the 2016 census, the existing population of the Malton Neighbourhood area is 35,555 with a median age of this area being 36 (compared to the City's median age of 40). 67% of the neighbourhood population are of working age (15 to 64 years of age), with 19% children (0-14 years) and 14% seniors (65 years and over). By 2031 and 2041, the population for this area is forecasted to be 37,700 and 38,500 respectively. The average household size is 3 persons with 9% of people living in apartments in buildings that are five storeys or more. The mix of housing tenure for the area is 7,225 units (69%) owned and 3,260 units (31%) rented with a vacancy rate of approximately 0.9%*. In addition, the number of jobs within this Character Area is 1,707. Total employment combined with the population results in a PPJ for Malton Neighbourhood of 59 persons plus jobs per hectare.

*Please note that vacancy rate data does not come from the census. This information comes from CMHC which demarcates three geographic areas of Mississauga (Northeast, Northwest, and South). This specific Character Area is located within the Northeast geography. Please also note that the vacancy rate published by CMHC is ONLY for apartments.

Other Development Applications

The following development application is in process in the immediate vicinity of the subject property:

- File OZ 18/008 W5 – 7211 and 7233 Airport Road – application in process for a six storey rental apartment building (for seniors) with 128 units and ground floor retail space.

Community and Transportation Services

Malton Village Park is located directly north of the subject properties, which contains a baseball field, volleyball and tennis courts.

The subject properties are located within 300 m (984 ft.) of GO's Weston Subdivision, which carries Kitchener GO service.

The following Zum bus routes currently service the site:

- Route 5A – Bovaird West
- Route 505 – Zum Bovaird West

The following MiWay bus routes currently service the site:

- Route 24 – Northwest Route 30 – Rexdale
- Route 30 – Beverley St. at Airport Rd.

4. Summary of Applicable Policies, Regulations and Proposed Amendments

The *Planning Act* requires that Mississauga Official Plan be consistent with the Provincial Policy Statement and conform with the applicable provincial plans and Regional Official Plan. The policy and regulatory documents that affect these applications have been reviewed and summarized in the table below. Only key policies relevant to the applications have been included. The table should be considered a general summary of the intent of the policies and should not be considered exhaustive. In the sub-section that follows, the relevant policies of Mississauga Official Plan are summarized. The development application will be evaluated based on these policies in the subsequent recommendation report.

Policy Document	Legislative Authority/Applicability	Key Policies
Provincial Policy Statement **(PPS)**	The fundamental principles set out in the PPS apply throughout Ontario. (PPS Part IV) Decisions of the council of a municipality shall be consistent with PPS. (PPS 4.1) The Official Plan is the most important vehicle for implementation of the Provincial Policy Statement (PPS 4.6) On April 6, 2023 the Ministry of Municipal Affairs and Housing released the new Provincial Planning Statement for comment. The Provincial Planning Statement will replace both the Provincial Policy Statement and Growth Plan for the Greater Golden Horseshoe. At the time of writing this report, the new Provincial Planning Statement is not in force and effect.	Settlement areas shall be the focus of growth and development. (PPS 1.1.3.1) Land use patterns within settlement areas will achieve densities and a mix of uses that efficiently use land, resources, infrastructure, public service facilities and transit. (PPS 1.1.3.2.a) Planning authorities shall identify appropriate locations and promote opportunities for intensification and redevelopment. (PPS 1.1.3.3) Planning authorities shall provide for an appropriate range and mix of housing types and densities to meet projected needs of current and future residents of the regional market area. (PPS 1.4.3)
Growth Plan for the Greater Golden Horseshoe **(Growth Plan)**	The Growth Plan applies to the area designated as the Greater Golden Horseshoe growth plan area. All decisions made on or after May 16, 2019 in respect of the exercise of any authority that affects a planning matter will conform with this Plan, subject to any legislative or regulatory provisions providing otherwise. (Growth Plan 1.2.2)	Within settlement areas, growth will be focused in delineated built-up areas; strategic growth areas; locations with existing or planned transit; and, areas with existing or planned public service facilities. (Growth Plan 2.2.1.2 c) Complete communities will feature a diverse mix of land uses; improve social equity and quality of life; provide a range and mix of housing options; provide convenient access to a range of transportation options, public service facilities, open spaces and parks, and healthy, local and affordable food options; provide

Policy Document	Legislative Authority/Applicability	Key Policies
		a more compact built form; mitigate and adapt to climate change impacts; and, integrate green infrastructure. (Growth Plan 2.2.1.4) To achieve minimum intensification and density targets, municipalities will develop and implement urban design and site design official plan policies and other supporting documents that direct the development of high quality public realm and compact built form. (Growth Plan 5.2.5.6)
Region of Peel Official Plan (ROP)	With the approval from the Ministry of Municipal Affairs and Housing, the Region of Peel's new Official Plan came into effect on November 4, 2022 and will be used to evaluate the proposal. MOP is the primary instrument used to evaluate development applications. The proposed development applications were circulated to the Region who has advised that in its current state, the application meets the requirements for exemption from Regional approval. Local official plan amendments are generally exempt from approval where they have had regard for the *Provincial Policy Statement* and applicable Provincial Plans, where the City Clerk has certified that processing was completed in accordance with the *Planning Act* and where the Region has advised that no Regional official plan amendment is required to accommodate the local official plan amendment. The Region provided additional comments which are discussed in Section 8 of this Appendix.	The ROP identifies the subject lands as being located within Peel's Urban System. General objectives of ROP, as outlined in Section 5.6, include: • achieving sustainable development; • establishing healthy complete communities; • achieving intensified and compact built form and a mix of land uses in appropriate areas that efficiently use land, services, infrastructure and public finances, while taking into account the characteristics of existing communities and services; • achieving an urban form and densities that are pedestrian-friendly and transit supportive; • promoting crime prevention and improvement in the quality of life; • protecting, restoring, and enhancing the natural environment; • allowing opportunities for residents to live in their own communities as they age; • preserving and protecting lands adjacent to highways, rail corridors, rail yards and major truck terminals for employment lands and infrastructure uses, where appropriate; and, providing for a wide range of goods and services to meet the needs of those living and working in the Urban System.

Mississauga Official Plan

The policies of Mississauga Official Plan (MOP) implement provincial directions for growth. MOP is generally consistent with the PPS and conforms with the Growth Plan, Greenbelt Plan, PBWP and ROP. An update to MOP is currently underway to ensure MOP is consistent with and conform to changes resulting from the recently released Growth Plan, 2019 and Amendment No. 1 (2020).

Existing Designation

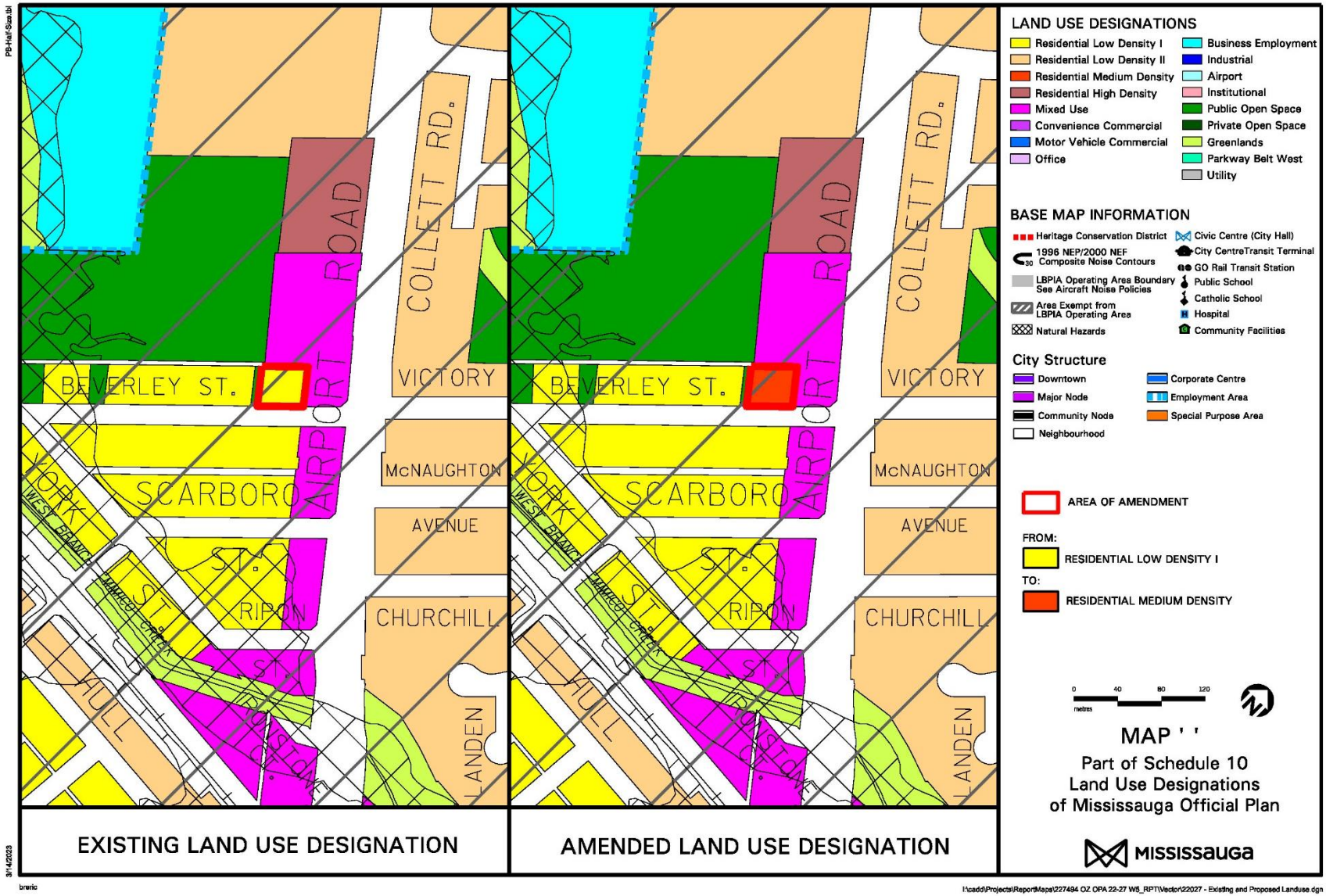
The lands are located within the Malton Neighbourood Character Area and are designated **Residential Low Density I**. The **Residential Low Density I** designation permits detached dwellings, semi-detached dwellings, and duplex dwellings.

The subject property is not located within a Major Transit Station Area (MTSA).

Proposed Designation

The applicant is proposing to change the designation to **Residential Medium Density** to permit back to back townhouses. The applicant will need to demonstrate consistency with the intent of MOP and shall have regard for the appropriateness of the proposed built form in terms of compatibility with the surrounding context and character of the area.

Through the processing of the applications, staff may recommend a more appropriate designation to reflect the proposed development in the Recommendation Report.



Excerpt of Malton Neighbourhood Character Area

Relevant Mississauga Official Plan Policies

The following policies are applicable in the review of these applications. In some cases the description of the general intent summarizes multiple policies.

	General Intent
Chapter 5 Direct Growth	Mississauga encourages compact, mixed use development that is transit supportive, in appropriate locations, to provide a range of local live/work opportunities. (Section 5.1.6) Mississauga will protect and conserve the character of stable residential Neighbourhoods. (Section 5.1.7) Mississauga will establish strategies that protect, enhance and expand the Green System. (Section 5.2.1) Neighbourhoods will not be the focus for intensification and should be regarded as stable residential areas where the existing character is to be preserved. (Section 5.3.5.1) Residential intensification within Neighbourhoods will generally occur through infilling and the development of existing commercial sites as mixed use areas (Section 5.3.5.2) Where higher density uses are proposed, they should be located on sites identified by a local area review, along Corridors or in conjunction with existing apartment sites or commercial centres. (Section 5.3.5.3) Intensification within Neighbourhoods may be considered where the proposed development is compatible in built form and scale to surrounding development, enhances the existing or planned development and is consistent with the policies of this Plan. (Section 5.3.5.5) Development will be sensitive to the existing and planned context and will include appropriate transition in use, built form, density and scale. (Section 5.3.5.6) Development on Corridors should be compact, mixed use and transit friendly and appropriate to the context of the surrounding Neighbourhood. (Section 5.4.4) Where higher density uses within Neighbourhoods are directed to Corridors, development will be required to have regard for the character of the Neighbourhoods and provide appropriate transitions in height, built form and density to the surrounding lands. (Section 5.4.5)
Chapter 6 Value The Environment	Land uses located at or above the corresponding 1996 noise exposure projection (NEP)/2000 noise exposure forecast (NEF) composite noise contour as determined by the Federal Government, will require a noise study as a condition of development. The noise study is to be undertaken by a licensed professional engineer with acoustical expertise in accordance with the applicable Provincial Government environmental noise guideline to the satisfaction of the City prior to development approval to determine appropriate acoustic design criteria. (Section 6.10.2.1)

	General Intent
	Mississauga will require tenants and purchasers to be notified when a proposed development is located at the noise exposure projection (NEP)/noise exposure forecast (NEF) composite noise contour of 25 and above. (Section 6.10.2.2) A noise warning clause will be included in agreements that are registered on title, including condominium disclosure statements and declarations. (Section 6.10.2.3) Residential and other sensitive land uses within the Airport Operating Area will not be permitted as a principal or an accessory use with the following exceptions: a. lands identified as "Exception Area", as shown on Map 6-1; and b. daycare facilities accessory to an employment use in the Corporate Centre Character Areas known as Gateway Corporate and Airport Corporate, on lands located below the 35 noise exposure projection (NEP)/noise exposure forecast (NEF) composite noise contour. (Section 6.10.2.4) Development applications for sensitive land uses including new residential dwellings, with the exception of replacement detached and semidetached dwellings, for lands where permitted within the Airport Operating Area, may be processed for approval provided that all of the following are satisfied: a. a feasibility noise impact study will be submitted as part of a complete development application to verify that mitigated indoor and outdoor noise levels would not exceed the sound level limits established by the applicable Provincial Government environmental noise guideline; b. a detailed noise impact study will be required prior to final development application approval; c. appropriate conditions relating to noise mitigation that are consistent with the findings of the detailed noise impact study, are included in the final approval; and d. an Aircraft Noise Warning Agreement between the City of Mississauga, the Greater Toronto Airports Authority (or its successor) and the Developer, are included in the approval. (Section 6.10.2.5)
Chapter 7 Complete Communities	Mississauga will ensure that the housing mix can accommodate people with diverse housing preferences and socioeconomic characteristics and needs. (Section 7.1.6) Mississauga will ensure that housing is provided in a manner that maximizes the use of community infrastructure and engineering services, while meeting the housing needs and preferences of Mississauga residents. (Section 7.2.1) Mississauga will provide opportunities for: a. the development of a range of housing choices in terms of type, tenure and price; b. the production of a variety of affordable dwelling types for both the ownership and rental markets; and c. the production of housing for those with special needs, such as housing for the elderly and shelters. (Section 7.2.2) When making planning decisions, Mississauga will ensure that housing is provided in a manner that fully implements the intent of the Provincial and Regional housing policies. (Section 7.2.3)

	General Intent
Chapter 9 Build A Desirable Urban Form	Mississauga will develop an urban form based on the urban system and the hierarchy identified in the city structure as shown on Schedule 1: Urban System. (Section 9.1.1) Infill and redevelopment within Neighbourhoods will respect the existing and planned character. (Section 9.1.3) Development on Corridors will be consistent with existing or planned character, seek opportunities to enhance the Corridor and provide appropriate transitions to neighbouring uses. (Section 9.1.5) The city vision will be supported by site development that: a. respects the urban hierarchy; b. utilizes best sustainable practices; c. demonstrates context sensitivity, including the public realm; d. promotes universal accessibility and public safety; and e. employs design excellence. (Section 9.1.10) Neighbourhoods are stable areas where limited growth is anticipated. Where increases in density and a variety of land uses are considered in Neighbourhoods, they will be directed to Corridors. Appropriate transitions to adjoining areas that respect variations in scale, massing and land uses will be required. (Section 9.2.2) While new development need not mirror existing development, new development in Neighbourhoods will: a. Respect existing lotting patterns; b. Respect the continuity of front, rear and side yard setbacks; c. Respect the scale and character of the surrounding area; d. Minimize overshadowing and overlook on adjacent neighbours; e. Incorporate stormwater best management practices; f. Preserve mature high quality trees and ensure replacement of the tree canopy; and g. Be designed to respect the existing scale, massing, character and grades of the surrounding area. (Section 9.2.2.3) Development on Corridors will be encouraged to: a. Assemble small land parcels to create efficient development parcels; b. Face the street, except where predominate development patterns dictate otherwise; c. Not locate parking between the building and the street; d. Site buildings to frame the street; f. Support transit and active transportation modes; h. Provide concept plans that show how the site can be developed with surrounding lands. (Section 9.2.2.6) Buildings and site design will be compatible with site conditions, the surrounding context and surrounding landscape of the existing or planned character of the area (Section 9.5.1.1) Noise will be mitigated through appropriate built form and site design. Mitigation techniques such as fencing and berms will be discouraged. (Section 9.5.1.12)

	General Intent
	Development proponents will be required to ensure that pedestrian circulation and connections are accessible, comfortable, safe and integrated into the overall system of trails and walkways (Section 9.5.2.3)
Chapter 11 General Land Use Designations	Lands designated Residential Low Density will permit the following uses: a. detached dwelling; b. semi-detached dwelling; and c. duplex dwelling. (Section 11.2.5.3) Lands designated Residential Medium Density will permit the following uses: a. all forms of townhouse dwellings. (Section 11.2.5.5)
Chapter 16 Neighbourhoods	For lands within Neighbourhoods, a maximum building height of four storeys will apply unless Character Area policies specify alternative building height requirements. (Section 16.1.1.1)
Chapter 19 Implementation	This section contains criteria which requires an applicant to submit satisfactory planning reports to demonstrate the rationale for the proposed amendment as follows: • the proposal would not adversely impact or destabilize the following: the overall intent, goals and objectives of the Official Plan; and the development and functioning of the remaining lands which have the same designation, or neighbouring lands; • that a municipal comprehensive review of the land use designation or a five year review is not required; • the lands are suitable for the proposed uses, and compatible with existing and future uses of surrounding lands; • there are adequate engineering services, community infrastructure and multi-modal transportation systems to support the proposed application; • a planning rationale with reference to Mississauga Official Plan policies, other relevant policies, good planning principles and the merits of the proposed amendment in comparison with the existing designation has been provided by the applicant. (Section 19.5.1)

Mississauga Zoning By-law

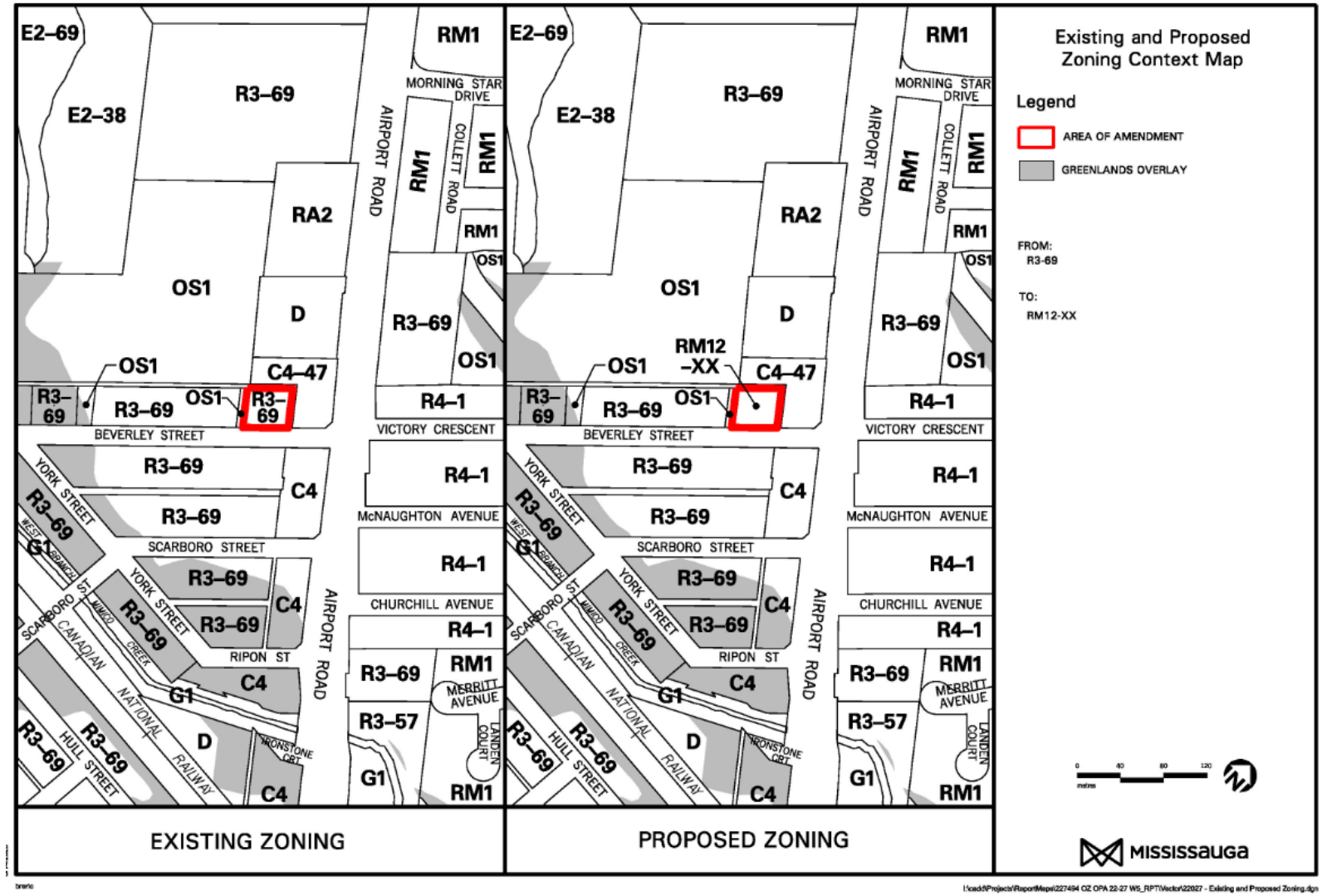
Existing Zoning

The subject properties are currently zoned **R3-69** (Detached Dwellings – Exception), which permits detached dwellings with frontages of 15.0 m (49.2 ft.).

Proposed Zoning

The applicant is proposing to zone the property **RM12 – Exception** (Back to Back Townhouses on a Street) to permit 3-storey back to back townhouses.

Through the processing of the applications staff may recommend a more appropriate zone category for the development in the Recommendation Report.



Excerpt of Zoning Map Z48W

Proposed Zoning Regulations

Zone Regulations Z48W	Existing R3-69 (Detached Dwelling – Exception) Zone Regulations	RM12 Base Zone Regulations	Proposed RM12-Exception Amended Zone Regulations
Maximum number of **Dwelling Units** in a **Back to Back Townhouse Block**	n/a	12	16
Minimum **Lot Frontage**	15.0 (49.2 ft.)	Interior Lot – 6.0 m (19.7 ft.) Corner Lot – 10.5 m (35 ft.)	--
Minimum **Front Yard**	7.5 m (24.6 ft.)	4.5 m (14.7 ft.)	4.3 m (14.1 ft.)
Minimum **Side Yard**	1.2 m (3.93 ft.) + 0.61 m (2.0 ft.) for each additional **storey** or portion thereof above one (1) **storey**	Exterior Side Yard – 4.5 m (14.7 ft.) Interior Side Yard: Attached Side – 0.0 m (0 ft.) Unattached Side – 1.5 m (4.92 ft.)	Interior Side Yard Setback for a lot with an exterior side lot line abutting a CEC Private Driveway – 0.4 m (1.31 ft.) Interior Side Yard: 2.7 m (8.8 ft.)
Maximum **gross floor area**	150 m^2 (1,614.6 sq. ft.) plus 0.2 times the **lot area**	n/a	1,792 m^2 (19,289 sq. ft.)
Maximum **height**	Sloped roof 9.0 m (26.5 ft.) Flat roof 7.5 m (24.6 ft.)	Highest Ridge – Sloped Roof – 15.0 m (49.2 ft.) and 3 storeys Flat Roof – 11.0 m (36 ft.) and 3 storeys	12.3 m (40.3 ft.) and 3 storeys
Required Number of **Parking Spaces** for rental apartment buildings	n/a		Residential: 1.04 spaces / unit Visitor: 0.14 spaces / unit
	Note: The provisions listed are based on information provided by the applicant, which is subject to revisions as the applications are further refined. In addition to the regulations listed, other minor and technical variations to the implementing by-law may also apply, including changes that may take place before Council adoption of the by-law, should the application be approved.		

5. School Accommodation

The Peel District School Board

Student Yield	School Accommodation		
3 Kindergarten to Grade 5 1 Grade 6 to Grade 8 1 Grade 9 to Grade 12	Marvin Heights Public School	Morning Star Middle School	Lincoln Alexander Secondary School
	Enrolment: 290 Capacity: 513 Portables: 0	Enrolment: 468 Capacity: 699 Portables: 0	Enrolment: 901 Capacity: 1,470 Portables: 0

The Dufferin-Peel Catholic District School Board

Student Yield	School Accommodation	
2 Kindergarten to Grade 8 1 Grade 9 to Grade 12	St. Raphael Elementary School	Ascension of Our Lord Catholic Secondary School
	Enrolment: 219 Capacity: 340 Portables: 0	Enrolment: 640 Capacity: 774 Portables: 0

6. Community Questions and Comments

No community meetings were held and no written comments were received by the Planning and Building Department.

7. Development Issues

The following is a summary of comments from agencies and departments regarding the applications:

Agency / Comment Date	Comments
Region of Peel (February 28, 2023)	A Region of Peel Official Plan Amendment is not required. An existing 200 mm (7.87 in) diameter water main is located on Beverley Street as well as an existing 300 mm (11.8 in) diameter water main is located on Airport Road. This proposal requires connection to a minimum municipal watermain size of 300mm (11.8 in), modeling will confirm if the proposal can be serviced by the 200 mm (7.87 in) diameter water main. An existing 525 mm (20.6 in) diameter sanitary sewer is located on Airport Road and an existing 250 mm (9.84 in) diameter sanitary sewer is located on Beverley Street. Servicing of this site may require municipal and/or private easements and the construction, extension, twinning and/or upgrading of municipal services. All works associated with the servicing of this site will be at the applicant's expense. The applicant will also be responsible for the payment of applicable fees, DC charges, legal costs and all other costs associated with the development of this site. Servicing for the proposed development must comply with the Local Municipality's Requirements for the Ontario Building Code and most current Region of Peel standards. The SWMR dated February 16, 2022 prepared by Jain Infrastructure Consulting/Y.Ayub P.Eng was reviewed. The Report is approved in principle. The site does not have direct frontage to a Region of Peel Right of Way (ROW). There are Regional easements on the subject property. No encroachments will be permitted.
Greater Toronto Airport Authority (GTAA) (March 7, 2023)	Airport Zoning Restrictions: According to the Airport Zoning Regulations for Toronto Pearson International Airport, development elevations on the subject property are affected by the following obstacle zoning restriction: the Outer Surface. The maximum allowable development elevation under this restriction is 219.46 metres Above Sea Level Based on the information provided by the applicant in ePlans, the proposed townhouses would be within the height limits associated with the Regulations. Noise Impacts: If the Rezoning application is approved, the GTAA requests, as a condition of approval, a noise study from a qualified noise engineer that the proposed buildings will be in compliance with all applicable Ministry of the Environment and Climate Change (MOECC) noise guidelines (Publication NPC-300). Furthermore, the GTAA requires the completion of a tripartite

Agency / Comment Date	Comments
	Aircraft Noise Warning Agreement (between the developer, City of Mississauga and the GTAA). Should the City of Mississauga's Planning and Building Department proceed with rezoning approval to permit 16 townhouse units on the subject property, it should only do so once it has been established that the conditions stated in the previous paragraph will be met. Crane Operations: Any crane or other equipment used for construction on the site would be limited to the Maximum Allowable Development Elevations. Use of a crane or other such equipment during the period of construction is also restricted by airport operations at Toronto Pearson Airport.
Dufferin-Peel Catholic District School Board and the Peel District School Board (February 7, 2023 and March 7, 2023)	The Peel District School Board and the Dufferin-Peel Catholic District School Board responded that they are satisfied with the current provision of educational facilities for the catchment area and, as such, the school accommodation condition as required by the City of Mississauga Council Resolution 152-98 pertaining to satisfactory arrangements regarding the adequate provision and distribution of educational facilities need not be applied for these development applications.
City Community Services Department – Park Planning Section (March 29, 2023)	In comments dated March 29, 2023, Park Planning Section, Community Services Department notes that the subject property is located on the north side of Beverly Street just west of Airport Road within the Malton Neighbourhood Character Area. The 2022 Parks Plan identifies a 9.0 ha (22.8 ac) parkland deficiency in this character area. The 2019 Future Directions Parks and Forestry Master Plan and the 2022 Parks Plan also establishes a walking distance requirement of 800 metres (2,624.7 ft) to a City owned playground for residential areas, unimpeded by major pedestrian barriers Although the Malton Neighbourhood Character Area is deficient in parkland, Malton Village Park (P-270) abuts the subject property, zoned **OS1** (Open Space) and contains a playground within 800 metres of the site and will service the future residents of this development. Requirement for a parkland dedication has not be imposed on this development given the site constraint to achieve unencumbered parkland and given that the subject property abuts a City park. Through future site plan application, securities for hoarding, fencing and park clean-up will be required. A street tree contribution will also be required for the installation of street trees along Beverly Street. Prior to the issuance of building permits for each lot or block cash-in-lieu for park or other public recreational purposes is required pursuant to Section 42 of the *Planning Act* and in accordance with City's Policies and By-laws.
City Transportation and Works Department (April 17, 2023)	Technical reports and drawings have been submitted and are under review to ensure that engineering matters related to noise, grading, servicing, stormwater management, traffic and environmental compliance can be satisfactorily addressed to confirm the feasibility of the project, in accordance with City requirements. Based on a review of the materials submitted to date, the owner has been requested to provide additional technical details and revisions prior to the City making a recommendation on the application, as follows:

Agency / Comment Date	Comments
	Stormwater A Functional Servicing Report, prepared by Jain Infrastructure Consultants Ltd., dated February 16, 2022, was submitted in support of the proposed development. The purpose of the report is to evaluate the proposed development impact on the municipal drainage system (e.g. storm sewers, watercourses, etc.) and to mitigate the quality and quantity impacts of stormwater run-off generated from the site. Mitigation measures may include improvements to existing stormwater servicing infrastructure, new infrastructure and/or on-site stormwater management controls. The applicant is proposing to modify an existing private storm sewer to service the development lands, with an existing outlet to a municipal storm sewer on Beverly Street, as well as on-site stormwater management controls for the post-development discharge. The applicant is required to provide further technical information to demonstrate the feasibility of the proposed storm modifications, and that there will be no impact on the City's existing drainage system. **Traffic** A Traffic Impact Study (TIS), prepared by NexTrans Consulting Engineers, dated October 5, 2022 was submitted in support of the proposed development and a full review and audit was completed. Based on the information provided to date, staff are not satisfied with the study and require further clarification on the information provided. In addition, a qualified traffic consultant was retained to conduct a peer review of the TIS report and provide additional comments that are to be addressed. The applicant is required to provide the following information as part of subsequent submissions: • an updated TIS addressing all staff comments; • review and provide confirmation that the driveway access to Beverly Street and the internal driveway can operate efficiently; and, • address any traffic concerns from the Community related to the proposed development. **Environmental Compliance** A Phase One Environmental Site Assessment (ESA) report, dated March 22, 2022, prepared by Orbit Engineering Limited was submitted in support of the proposed development. The report indicates that a further investigation is required to assess the subsurface conditions at the site. Therefore the following is to be submitted for review: • a letter of reliance for the Phase One ESA report; • a Phase Two ESA report along with a letter of reliance; • a Storm Sewer Use By-law Acknowledgement form; and, • a written documentation prepared by a Qualified Person (as defined in Section 5 of Ontario Regulation 153/04, as amended) stating the geotechnical and environmental suitability of the fill materials located on-site.

Agency / Comment Date	Comments
	Noise A Noise Feasibility Study prepared by HGC Engineering, dated February 10, 2022 was submitted for review. The Noise Report evaluates the potential impact both to and from the proposed development, and recommends mitigation measures to reduce any negative impacts. Noise sources that may have an impact on this development include road traffic from Airport Road, rail traffic on the CP Railway Line and air traffic noise from the Lester B. Pearson International Airport. Further information via a revised noise study is required to address staff comments regarding the assessment of noise levels, and to identify appropriate mitigation measures for this development. **Engineering Plans/Drawings** The applicant has submitted a number of technical plans and drawings (i.e. Grading and Servicing Plans), which are to be revised as part of subsequent submissions, in accordance with City Standards.
Other City Departments and External Agencies	The following City Departments and external agencies offered no objection to these applications provided that all technical matters are addressed in a satisfactory manner: - Alectra Utilities - Arborist – City Property - Arborist – Private Property - Canada Post Corporation - CS Viamonde - Enbridge - Rogers Cable - Mississauga Transit
	The following City Departments and external agencies were circulated the applications but provided no comments: - Arborist - Streetscape - Bell Canada - Canadian National Railway - Public Art - Trillium Health Partners

Development Requirements

There are engineering matters including: grading, environmental, aircraft noise warning agreement, land dedication, engineering, servicing and stormwater management that will require the applicant to enter into agreements with the City. Prior to any development proceeding on-site, the City will require the submission and review of an application for site plan approval.

8. Community Benefits Charge

Schedule 17 of Bill 197, *COVID-19 Economic Recovery Act*, 2020, amended the *Planning Act*. The Section 37 Height/Density Bonus provisions are replaced with the Community Benefit Charge (CBC) provisions, implemented by a CBC By-law passed by Council. Section 37 of the *Planning Act* now allows municipalities to impose a CBC on land to fund costs related to growth. Funds collected under CBC will be to fund projects City-wide and Council will be requested at budget time each year to spend or allocate CBC funds to specific projects in accordance with the CBC Strategy and Corporate Policy.

In response to this legislative change, Council passed the City's new CBC By-law on June 22, 2022, which will be administered by the Corporate Services Department, Finance Division. The by-law specifies to which types of development and redevelopment the charge applies, the amount of the charge, exemptions and timing of charge payment. The CBC is 4% of the value of the land. A land appraisal is required in order to determine the applicable CBC in each case.

As the subject proposal is not more than 5 storeys the CBC is not applicable.

9. Next Steps

Based on the comments received and the applicable Mississauga Official Plan policies, the following matters will have to be addressed:

- Are the policies and principles of Mississauga Official Plan maintained by this project?
- Is the proposed development compatible with the existing and planned character of the area given the proposed massing, building height, and lotting fabric?
- Are the transitions to the neighbouring properties appropriate?
- Is the proposed waste collection plan feasible?
- Are the proposed zoning by-law exception standards appropriate to accommodate the development?
- Are the following issues satisfactorily addressed:
    - Confirmation of property boundaries and ownership arrangements,
    - Shared access to the properties. and
    - Shared parking agreement for both parcels
- Has the surplus lands owned by the City been acquired by the owner?

Upon satisfying the requirements of various City departments and external agencies, the Planning and Building Department will bring forward a recommendation report to a future Planning

and Development Committee meeting. It is at this meeting that the members of the Committee will make a decision on the applications.

k:\plan\devcontl\group\wpdata\corporate reports to pdc\2. north reports\oz opa 22-027 w5 - 5 7 9 beverley st - sh\appendix 1 - oz opa 22-27 w5 - 5 7 9 beverley st.docx

5, 7, 9 Beverley Street

Malton - Mississauga, ON

Information Presentation

Planning & Development Committee

May 29, 2023

File No.: OZ/OPA 22-27 W5

MBPD
M. Behar Planning & Design Limited
25 Valleywood Drive, Unit 23
Markham, ON, L3R 5L9
T: 905-470-6273 www.mbpd.ca

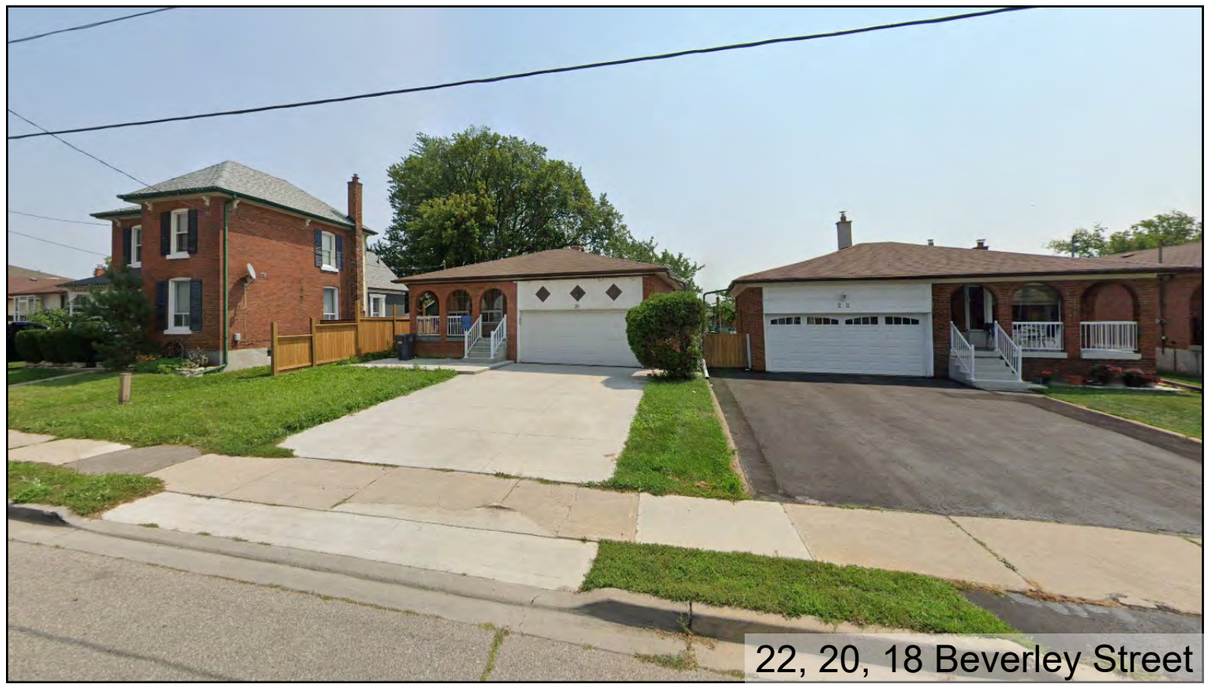
Subject Site - 5, 7, 9 Beverley Street

Existing Context

7198 Airport Road

Subject Site & 7198 Airport Road Interface

8, 8A Beverley Street

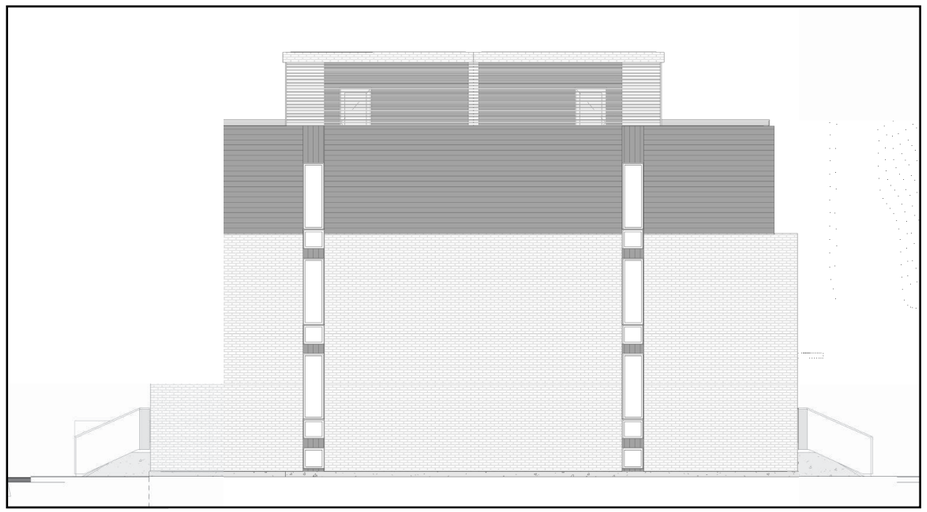


22, 20, 18 Beverley Street

Current Concept

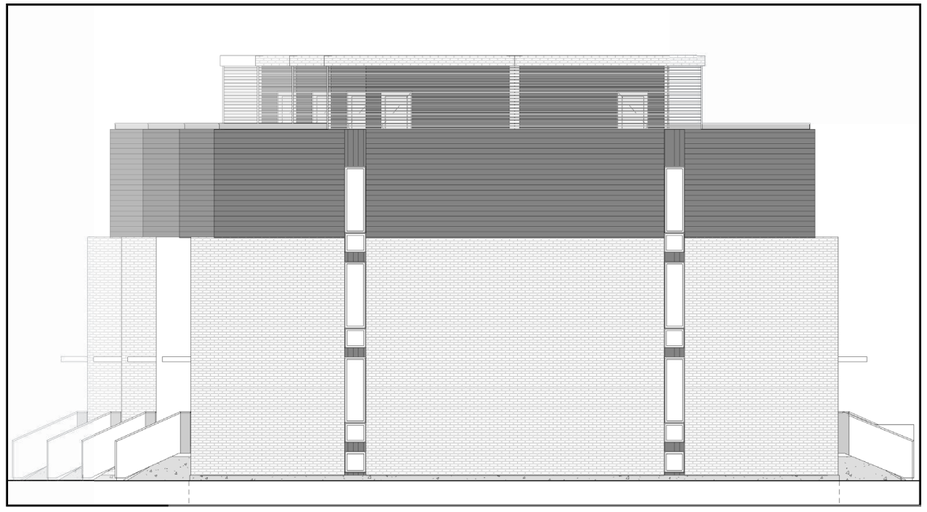
Current Concept

South Elevation - Beverley Street



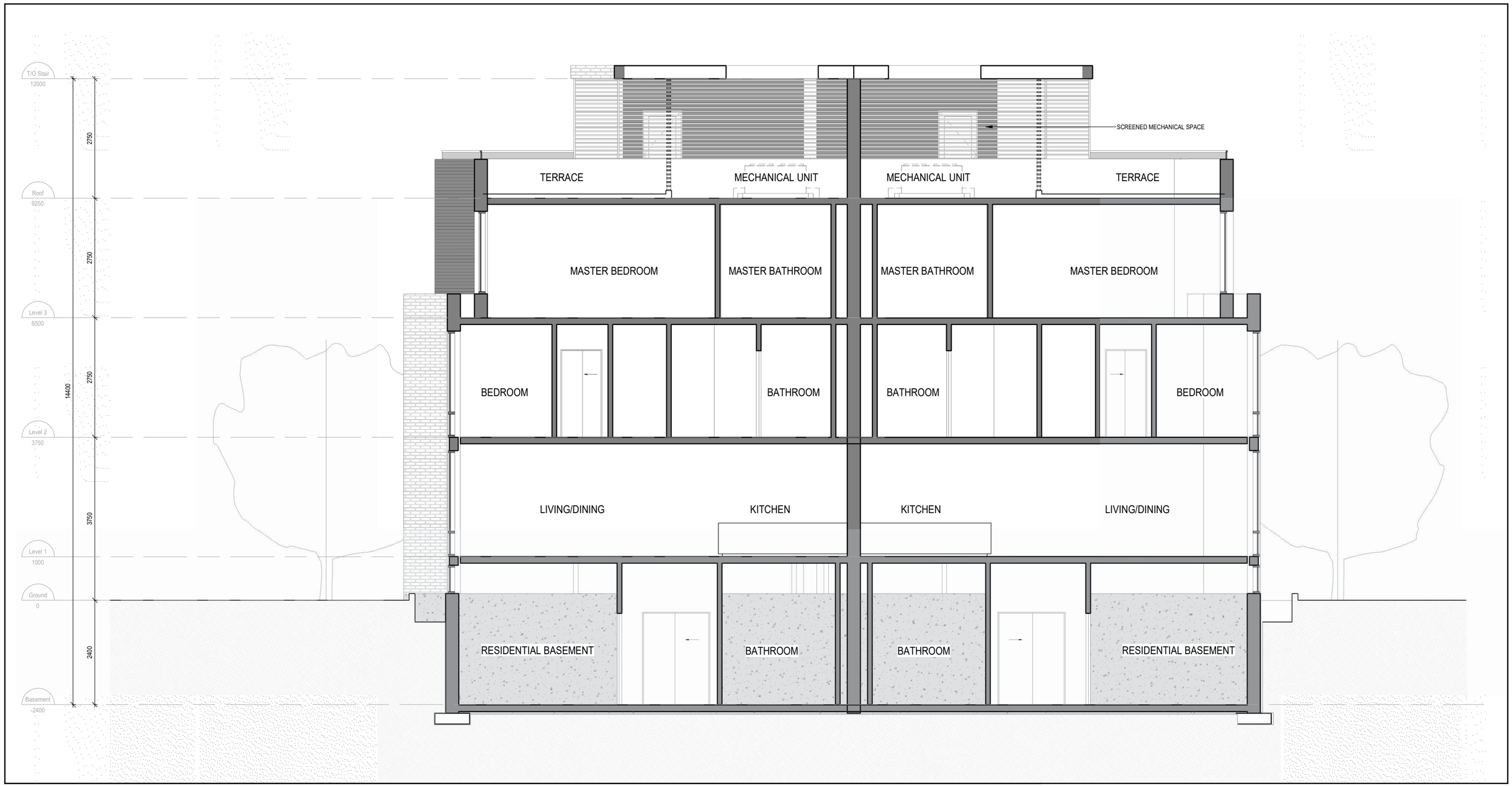
West Elevation

North Elevation - Internal



East Elevation

Current Concept



Townhouse Section

Thank you

MBPD
M. Behar Planning & Design Limited
25 Valleywood Drive, Unit 23
Markham, ON, L3R 5L9
T: 905-470-6273 www.mbpd.ca

City of Mississauga
Corporate Report

MISSISSAUGA

Date: May 5, 2023

To: Chair and Members of Planning and Development Committee

From: Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Originator's files: CD.21-CLA

Meeting date: May 29, 2023

Subject

INFORMATION & RECOMMENDATION REPORT (WARD 2) - Clarkson Transit Station Area Study Update: Air Quality Study Findings and Next Steps

Recommendation

1. That the corporate report titled "Clarkson Transit Station Area Study: Air Quality Study Findings and Next Steps" dated May 5, 2023, from the Commissioner of Planning and Building, be received for information.

2. That staff be directed to proceed with completing the master plan for the Clarkson GO Major Transit Station Area and associated implementation policies as outlined in this report.

Executive Summary

- In 2018, the Clarkson Transit Station Area Study (Clarkson TSA Study) was initiated and a consultant team was retained to help develop a vision and guiding principles for intensification around the Clarkson GO station.

- Through work on the study it was determined that an air quality study should be undertaken prior to considering the introduction of sensitive (i.e. residential) uses in the Southdown Employment Area near the Clarkson GO station.

- In 2020, Council adopted the Mississauga Official Plan Amendment 117 (MOPA 117) requiring the submission of a completed air quality study before sensitive uses can be considered on lands within the Southdown Employment Area and the Clarkson GO Major Transit Station Area (MTSA) boundary.

- The Clarkson Air Quality Study (CAQS) was conducted by WSP Canada Inc (on behalf of Slate Asset Management) and focused on the proposed redevelopment of their site located at 2077-2105 Royal Windsor Drive. The CAQS was completed to the satisfaction of Staff in March of 2023.

- A community meeting was held on March 22, 2023 to present the findings of the CAQS and verify the previously drafted vision and guiding principles for the Clarkson TSA Study. A separate meeting with industry stakeholders was also held.

- The CAQS has determined that although there are periods of poor air quality, this is not unique to the Clarkson MTSA and any potential risks to human health are no different than similar urban environments across the Greater Toronto Area (GTA) and beyond. The study concluded, air quality would not prohibit residential uses being introduced adjacent the Clarkson GO station.

- The purpose of this report is to provide a summary of the CAQS and its findings, feedback received from the community and industry meetings, and to present the recommended next steps for the overall Clarkson TSA Study. An Information and Public Meeting Report with the draft master plan and implementation policies is targeted by the end of 2023.

Background

Following City Council direction in 2017, the Clarkson TSA Study was initiated to develop a transit-supported plan for the lands located within the proposed Clarkson GO Major Transit Station Area (Clarkson GO MTSA). A consultant team was retained in 2018 to begin developing a vision and guiding principles for intensification around the Clarkson GO station.

The Growth Plan 2020 and the new Peel 2051 Official Plan requires MTSAs served by a GO Transit rail network to plan for a minimum density of 150 residents and jobs combined per hectare. This results in a minimum of approximately 6,000 additional residents and/or jobs to meet the minimum density target for the Clarkson GO MTSA.

A number of key steps in the project have been completed, such as identifying the Clarkson GO MTSA boundary, considering potential redevelopment opportunities, conducting two community meetings and stakeholder engagement (2018 to 2019), drafting of vision and guiding principles, and mandating the requirement for an air quality study.

In 2020, Council adopted an Amendment to the Mississauga Official Plan (MOPA 117) requiring the submission of a completed air quality study before sensitive uses can be considered on lands within the Southdown Employment Area and the Clarkson GO MTSA boundary.

The City retained Dillon Consulting, an air quality consultant, to prepare the terms of reference and conduct a peer review of the CAQS once complete. Staff established an Expert Review Committee comprised of representatives from the Ministry of the Environment, Conservation and Parks (the Ministry), Peel Public Health, major industry such as, Petro Canada Lubricants and CRH Cement, and the City's Environment Division. The Expert Review Committee and Dillon Consulting oversaw the execution of the CAQS and ensured it was completed in accordance with industry standards and guidelines.

Slate Asset Management (Slate), the owners of lands within the Clarkson GO MTSA at 2077-2105 Royal Windsor Drive have been interested in redeveloping their site for many years. In 2020, they initiated the Clarkson Air Quality Study (CAQS) conducted by their consultant, WSP Canada Inc, in accordance with the City's terms of reference. The study referenced a potential residential development proposal on Slate's site, referred to as the Proposed Development.

In December 2022, Slate submitted Official Plan and Rezoning Amendment applications (OZ/OPA 22-31 W2) to permit four apartment buildings of 29, 27, 25 and 23 storeys containing 1,237 dwelling units and 2,386 square metres of commercial and live/work space.

Comments

The *Clarkson Transit Station Area Air Quality Study Monitoring and Dispersion Modelling Report, dated February 2023* has been completed to the satisfaction of Staff (Appendix 1). Dillon Consulting prepared a memorandum, dated March 7, 2023, summarizing the results and findings of the CAQS (Appendix 2). Key highlights from that memorandum are included below. A community meeting was conducted to present the findings and to begin discussing the next steps of the Clarkson TSA study.

The purpose of this report is to provide:

- a summary of the CAQS and its findings,
- a summary of feedback received from community meeting #3, including a meeting with industry stakeholders,
- direction on processing Slate's Proposed Development,
- implications of Bill 97; and,
- the recommended next steps for the overall Clarkson TSA Study

CLARKSON AIR QUALITY STUDY (CAQS)

Historically, studies completed by the Ministry have concluded that air quality around the Clarkson GO station has been compromised. The suspected causes of compromised air quality were a combination of vehicle emissions, industrial emissions, and long-range transport of contaminants from outside of the Clarkson airshed. Although some air quality monitoring has

been conducted over the last decade, no current air quality data was available for pollutants of concern such as acrolein and benzene.

A preliminary land use compatibility analysis undertaken as part of the Clarkson TSA Study together with community and stakeholder feedback identified the need for an updated air quality study. The CAQS was to determine the state of current air quality and whether the introduction of additional sensitive uses in the Clarkson area would be appropriate.

The CAQS is comprised of the following three components and its findings, which were peer reviewed by Dillion Consulting on behalf of the City, are summarized below:

1. Land Use Compatibility Assessment (LUCA)
2. Air Quality Assessment (Ambient Monitoring & Dispersion Modeling)
3. Human Health Assessment (HHA)

Land Use Compatibility Assessment (LUCA)

What is a LUCA?

A LUCA was performed using the Ministry D-6 Guideline *Compatibility between Industrial Facilities* to evaluate the likelihood of nuisance impacts between industrial and sensitive uses (i.e. residential) in the Clarkson TSA Study area. The objective of the assessment was to maintain the viability of existing industrial and commercial land uses and determine if the introduction of additional residential land uses was feasible without creating potential nuisance impacts on the new residents.

LUCA Findings

Although compatibility is based on nuisance complaints which are a matter of individual perception, both the LUCA and Dillion Consulting concluded that nuisance issues resulting from incompatible uses would be unlikely in the area of the Proposed Development (2077-2105 Royal Windsor Drive).

Air Quality Assessment (Ambient Air Quality Monitoring in the Clarkson MTSA)

What is Ambient Air Quality and Air Quality Monitoring?

Ambient air quality typically refers to the concentrations of specific contaminants that may be present in the local outdoor air within a specific area. It varies widely with geography, terrain, traffic volume, presence/absence of industrial activity, wind speed and direction, temperature, the presence or absence of buildings, and numerous other factors.

Ambient air monitoring involves deploying monitoring equipment within a study area to measure and understand the levels of contaminants in outdoor ambient air, and how these levels vary over time. Outdoor ambient air measurements represent the levels of contaminants in air that a person may be exposed to (via breathing) while present in the area.

Ambient Air Quality Monitoring in the Clarkson MTSA
The ambient air monitoring program began in July 2020 and captured data on the Proposed Development site by collecting air samples during various times of day following Ministry approved methodologies. It was important for the monitoring period to capture the summer months as this is when pollution levels can be the highest. The data captured was based on common air contaminants for a typical urban setting as well as those which have historically been elevated in the Clarkson airshed.

Ambient Air Quality Monitoring Findings
Of the contaminants assessed, five (i.e., suspended particulate matter (PM2.5 and PM10), nitrogen oxide (NOx), acrolein, benzene, and benzo(a)pyrene) exceeded the relevant air quality thresholds. These contaminants are primarily related to transportation, and similar exceedances of the relevant air quality thresholds have been recorded in other urban jurisdictions of comparable size and characteristics. The Human Health Assessment discussed later in this summary, evaluated the potential health implications of these exceedances.

Air Quality Assessment (Dispersion Modeling)

What is Dispersion Modelling?
Air dispersion modelling is a computational method of predicting how contaminant emissions from sources of emissions disperse and impact specific receptor locations based on local meteorology, topography, and nearby buildings. Air dispersion modelling estimates ambient outdoor air contaminant concentrations at key identified locations (i.e., receptors) within a given area. The Ministry sets out the acceptable models to be used.

Dispersion Modeling in Clarkson MTSA
An air dispersion modelling assessment was conducted to predict the concentration of selected air contaminants at the Proposed Development. The assessment considered the major industrial sources in the area, roadway emissions resulting from vehicle traffic, railway emissions and simulated the worst possible emission and meteorological conditions that could occur.

Dispersion Modeling Findings
Of the 18 air contaminants modelled, only six contaminants (benzene, acrolein, PM2.5, PM10, NOx, and benzo(a)pyrene) were predicted to exceed the applicable air quality thresholds set by the Ministry and others. This necessitated the need for a Human Health Assessment (HHA) to be undertaken. Whenever air quality is predicted to be impacted due to exceedance of ambient air concentrations over applicable air quality criteria, a HHA is required to quantify the expected degree of risk (if any) to human health.

Human Health Assessment (HHA)

What is a HHA?

A Human Health Assessment (HHA) is used to estimate the adverse human health effects caused by exposure to environmental pollutants in a variety of media such as air, water and soil. When considering air quality, a HHA is typically required for any contaminants for which the cumulative air concentrations are predicted to exceed the relevant air quality thresholds.

Clarkson Air Quality Study HHA Findings & Mitigation Measures
Dillon's review of the Human Health Assessment (HHA) found that the methodology used was appropriate and standard for an air quality-based HHA. The HHA found that the modelled air contaminants were typical of urban areas of similar size and characteristics (i.e., in proximity of industries and major arterial roads) and were unlikely to interact with each other in a manner that would increase or otherwise exacerbate their potential health effects.

The overall conclusion of the HHA, and Dillon's review of the HHA, was that air quality in the area is expected to pose a similar level of predicted human health risk as that of other urban centers within the GTA, that are also influenced by industrial air emissions, traffic air emissions and other common sources of urban air pollutants. The level of potential risk to human health as a result of elevated pollution levels is not significantly different than what would be predicted at other comparable urban areas within the GTA. Dillon Consulting and Peel Public Health agreed with the conclusion of the HHA that noted the "level of potential human health risk related to air quality at the Proposed Development does not reach a threshold where residential development should be prohibited."

The study also concluded that mitigation measures were not a necessary requirement for residential to proceed on the Proposed Development. However it was suggested that mitigation measures such as air filters would improve indoor air quality providing residents with sensitivities to poor air quality an option to close their windows and doors during those times.

COMMENTS RECEIVED FROM COMMUNITY MEETING #3

Staff hosted a virtual community meeting on March 22, 2023 with 107 participants in attendance. A *What We Heard* report has been posted on the project website https://yoursay.mississauga.ca/clarkson. Comments received generally reflect the following themes. Staff responses are provided below each comment theme.

1. **Clarkson Air Quality Study** – Participants mentioned that Clarkson has a history of poor air quality. They asked about the distinction between automobile and truck traffic and how each contributes to air pollution in the study area. Questions were received regarding how this study area compares to municipalities in the Region and what constitutes an acceptable level of pollutants.

   Staff Response: Transportation is the main source of air pollution in the area which includes automobiles, trucks and trains from nearby transportation corridors. The study determined that certain pollutants are exceeding acceptable air quality criteria at times,

similar to other urban centres across Southern Ontario. The HHA determined that predicted human health risk from increased pollution levels does not reach a threshold where residential development should be prohibited.

2. **COVID-19 Pandemic Adjustments** – There was concern that data adjustments made as a result of the pandemic could potentially be inaccurate.

   Staff Response: Although the pandemic created some uncertainty in ambient air quality data, Dillon Consulting, was satisfied that a sufficient level of conservatism was retained in the analysis to account for the pandemic. The analysis used historical (pre-pandemic) data and corrections were made to select contaminants to account for potential emission reductions due to the pandemic. For some traffic-related contaminants (ie benzene), ambient data was combined with dispersion modeling data, both of which on their own include transportation emissions, therefore almost double counting the impact.

3. **Air Quality Study Completed by a Developer** – Concern that an air quality study completed by a developer could be skewed in their favour. How have industry interests been considered?

   Staff Response: Staff established an Expert Review Committee comprised of representatives from the Ministry, Peel Public Health, major industry such as, Petro Canada Lubricants and CRH Cement, and the City's Environment Division. The Expert Review Committee helped prepare the terms of reference and diligently guided the execution of the CAQS. This was critical in ensuring the CAQS was completed comprehensively in accordance with all regulations and standards while addressing the interests and concerns of local industry as well as protecting public health.

4. **Truck Traffic & Addition of New Warehousing/Logistics Companies** – Participants shared their concern about the volume of tractor trailer trucks in the area creating noise, dust and pollution. They also noted, further consideration needed to be given to the number and size of new warehouses being built that would add more truck traffic to the area. This could be problematic if additional residential growth occurred in an area.

   Staff Response: The Clarkson TSA Study includes a transportation analysis that will consider local truck traffic volumes, including the recent addition of logistics companies. The siting of buildings, their uses, and the design of new roads and public spaces will look to mitigate the effects of truck traffic.

5. **Road Network Improvements** – Participants discussed expanding multimodal transportation options to make the GO station more accessible to pedestrians and cyclists which would reduce automobile dependency. Suggestions were made to improve the flow of truck traffic on Winston Churchill Boulevard and Southdown Road.

Staff Response: The Clarkson TSA Study will assess how the introduction of new roads and connections can improve access and connectivity to the GO station by various modes of transportation, including cycling and walking. It will include a transportation study to consider opportunities to improve truck traffic movements and routes within the area.

6. **Underutilized Existing Surface Parking** – Comments were shared about the amount of vacant parking at the Clarkson GO Station and whether the parking could be repurposed or used by new developments.

   Staff Response: Most of the structured and surface parking at the Clarkson GO station is owned by Metrolinx. The project team will be consulting with Metrolinx on how their lands can be better utilized by accommodating future redevelopment opportunities.

MEETING WITH INDUSTRY STAKEHOLDERS

A meeting with industry representatives from CRH Cement, Petro Canada Lubricants and CertainTeed Canada was held on March 8, 2023 to discuss the results of the CAQS. Their primary concern was with the type of dispersion models used (AERMOD, SCREEN 3 and SDM). The industry indicated they are using a more advanced model (i.e. CALPUFF) for their environmental compliance approvals and requested the CAQS use the same model. This request was made after the majority of the air quality study work was completed. Dillon Consulting confirmed with the Ministry that the modeling used in the CAQS was acceptable.

REDEVELOPMENT APPLICATIONS AT 2077-2105 ROYAL WINDSOR DRIVE BY SLATE

In December 2022, Slate submitted Official Plan and Rezoning Amendment applications (OZ/OPA 22-31 W2) to permit four apartment buildings of 29, 27, 25 and 23 storeys containing 1,237 dwelling units and 2,386 square metres of commercial and live/work space. The Proposed Development is located within the Clarkson GO MTSA as delineated in the new Region of Peel Official Plan approved by the Province in November 2022.

The Clarkson GO MTSA has a minimum density target of 150 residents and jobs per hectare. The regional official plan policies for this MTSA require the completion of a city initiated planning study to introduce residential permissions within the Southdown Employment Area and the Clarkson GO MTSA. As a result, the completion of the Clarkson TSA Study is required prior to making a decision on the proposed redevelopment applications. Staff are committed to continuing to work with the applicant and will process their application concurrently with the completion of the master plan and associated policies so the two initiatives are aligned by the implementation stage of the Clarkson TSA Study.

IMPLICATIONS OF BILL 97

Bill 97 proposes a number of changes to lands within employment areas that contain commercial and retail uses. At this time it is unknown how the proposed changes may or may not impact the study process or outcome as the site is subject to Regional policies requiring a planning study be completed prior to a change in land use.

CLARKSON TRANSIT STATION AREA PROJECT NEXT STEPS

Given the results of the CAQS, staff recommend resuming the master planning work for the Clarkson TSA Study and continuing to engage with residents and local landowners to align future redevelopment interests with the broader vision for the area where appropriate.

Completing the master plan will include:

- Refining the vision and guiding principles
- Finalizing an infrastructure and servicing capacity analysis
- Confirming the location of new residential land uses based on land use compatibility
- Providing for a net increase of total jobs within the employment area and Clarkson MTSA
- Identifying how the Region of Peel MTSA target will be met
- Identifying the location and type of Parks and Open Spaces
- Identifying road network improvements and new connections (i.e. new roads)
- Improving accessibility to Clarkson GO station by all modes of transportation including cyclists and pedestrians
- Identifying appropriate built form and building heights
- Setting out phasing of development if required

In addition, it is recommended that staff proceed with drafting a policy framework to implement the vision and guiding principles for the area including developing built form standards/guidelines. If necessary, the study process will need to be revisited as a result of changes from Bill 97 or any other legislative changes that may occur. Staff would aim to complete the draft policies and master plan by the end of 2023.

Financial Impact

There are no financial impacts resulting from the recommendations in this report.

Conclusion

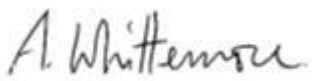
The CAQS has determined that although there are periods of poor air quality, this is not unique to the Clarkson MTSA and any potential risks to human health are no different than similar urban environments across the GTA and beyond. As a result, the level of potential human health risk related to air quality at the Proposed Development does not reach a threshold where residential uses should be prohibited.

Given these findings it is recommended that staff resume with the completion of the Clarkson TSA Study. An Information and Public Meeting Report with the draft master plan and implementation policies is targeted by the end of 2023.

Attachments

Appendix 1: Clarkson Transit Station Area Air Quality Study Monitoring and Dispersion Modelling Report, dated February 2023

Appendix 2: Executive Summary – Clarkson Residential Development Air Quality and Human Health Assessment Studies, dated March 7, 2023



Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Prepared by: Romas Juknevicius M.PL., R.P.P., Project Lead, City Planning Strategies

SLATE ASSET MANAGEMENT L.P.

CLARKSON TRANSIT STATION AREA AIR QUALITY STUDY

MONITORING AND DISPERSION MODELLING REPORT

February 16, 2023

CLARKSON TRANSIT STATION AREA AIR QUALITY STUDY

MONITORING AND DISPERSION MODELLING REPORT

SLATE ASSET MANAGEMENT L.P.

PROJECT NO.: 201-06851-00
DATE: FEBRUARY 2023

WSP
UNIT 2
126 DON HILLOCK DRIVE
AURORA, ON, CANADA L4G 0G9

T: +1 905 750-3080
F: +1 905 727-0463

Signatures

Prepared By

Stephanie Clarke, B.A.
Environmental Consultant

Katelyn Sysiuk, B. Eng., E.I.T.
Environmental Consultant

Reviewed By

Camille Taylor, P. Eng.
Director and Sr. Air Quality Engineer

WSP Canada Inc. (WSP) prepared this report solely for the use of the intended recipient, SLATE ASSET MANAGEMENT L.P. (Client), in accordance with the professional services agreement between the parties. In the event a contract has not been executed, the parties agree that the WSP General Terms for Consultant shall govern their business relationship which was provided to you prior to the preparation of this report.

The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

WSP disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

WSP makes no other representations whatsoever concerning the legal significance of its findings.

The intended recipient and the City of Mississauga are solely responsible for the disclosure of any information contained in this report. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report.

WSP has provided services to the intended recipient in accordance with the professional services agreement between the parties and in a manner consistent with that degree of care, skill and diligence normally provided by members of the same profession performing the same or comparable services in respect of projects of a similar nature in similar circumstances. It is understood and agreed by WSP and the recipient of this report that WSP provides no warranty, express or implied, of any kind. Without limiting the generality of the foregoing, it is agreed and understood by WSP and the recipient of this report that WSP makes no

representation or warranty whatsoever as to the sufficiency of its scope of work for the purpose sought by the recipient of this report.

In preparing this report, WSP has relied in good faith on information provided by others, as noted in the report. WSP has reasonably assumed that the information provided is correct and WSP is not responsible for the accuracy or completeness of such information.

WSP disclaims any responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions /or costs.

The original of this digital file will be kept by WSP for a period of not less than 10 years. As the digital file transmitted to the intended recipient is no longer under the control of WSP, its integrity cannot be assured. As such, WSP does not guarantee any modifications made to this digital file subsequent to its transmission to the intended recipient.

This limitations statement is considered an integral part of this report.

EXECUTIVE SUMMARY

The purpose of this study is to assess the air quality impacts from surrounding land uses, including industrial operations and transportation sources in the Clarkson Transit Station Area (TSA). WSP Canada Inc. (WSP) was retained by Slate Asset Management (Slate) to complete an Air Quality Study including six months of ambient monitoring and an air dispersion modelling assessment for the proposed development located at 2077, 2087, 2097, and 2105 Royal Windsor Drive in Mississauga, Ontario. The City of Mississauga (the City) requires an updated study to determine the compatibility of additional sensitive land uses within the area and will also use this report to inform their Master Plan. The City will have this final report peer reviewed. The City and their peer reviewer have been following the process since the beginning and have provided feedback on this study.

The six months of ambient air monitoring and dispersion modelling assessment were completed in accordance with the Terms of Reference provided by the City of Mississauga on June 23, 2020 (TOR). The ambient air quality monitoring was conducted at the Slate lands located at 2105 Royal Windsor Drive in Mississauga, Ontario from July 2020 to January 2021.

For baseline, the Ministry of the Environment, Conservation, and Parks (MECP) conducted an air quality study in 2007 which found elevated concentrations of various contaminants; benzene, dichloromethane (methylene chloride) and acrolein were identified as air contaminants that were greater than their respective Ambient Air Quality Criteria (AAQC). The AAQC values are not enforceable through regulatory actions, they are concentrations of individual contaminants in air that are determined to be protective against adverse effects on health and/or the environment. AAQC values are used to assess ambient air quality resulting from all sources of a contaminant to air and are commonly used to determine impacts from projects on the ambient air quality. It was expected that there was general improvement of the air quality in the area since 2007 due to improvements in vehicle emissions and industrial practices.

The COVID-19 pandemic resulted in a reduction of traffic in the area, and a reduced train frequency along the Lakeshore West corridor during the monitoring period; therefore, this report assumes that vehicular emissions from nearby parking lots and major roadways were reduced. The ambient air quality monitoring results are used in conjunction with dispersion modelling to conservatively assess the air quality impacts on the proposed development. Dispersion modelling was completed using data from prior to the COVID-19 pandemic. Historical data, including monitoring data from the Clarkson Airshed Industrial Association (CASIA) from 2012 to 2018 was also incorporated into this study for comparative purposes, where applicable. Despite the uncertainties of the effects of COVID-19 on the ambient

monitoring data WSP has confidence in the report and its findings. The following report outlines all timelines, methodologies, and relevant guidelines.

Based on the results of the ambient air quality monitoring and the dispersion modelling assessment there is no reason to exclude high density residential land use and other sensitive land uses in the study area.

Relevant results are summarized here:

- All significant contaminants included in this assessment, except for acrolein, benzene, benzo(a)pyrene, NO_X, $PM_{2.5}$, and PM_{10} were predicted to be below their respective AAQC;
- Acrolein concentrations recorded at the monitoring station had a 90th percentile concentration that was elevated compared to the 24-hour AAQC. The 90th percentile acrolein concentrations recorded during the six months of monitoring were 67 % lower than the 90th percentile recorded during the 2007 MECP study showing a downward general trend;
- The ambient baseline concentration of acrolein is significantly contributing to the AAQC exceedance for acrolein, with the modelled concentration being only 1% of the cumulative concentration. The background concentration is comparable to reported acrolein concentrations in Ontario;
- Benzo(a)pyrene was not part of the ambient monitoring program; the modelling results show concentrations elevated compared to the AAQC for both 24-hour and annual concentrations. This analysis is based on cumulative concentrations using the NAPS station located near Highway 401, which has higher concentrations given the close proximity to high volumes of vehicular traffic than in the vicinity of the Clarkson TSA;
- The ambient baseline concentration of benzo(a)pyrene is significantly contributing to the AAQC exceedance, with modelled concentration being only 1% of the cumulative concentration for the 24-hour average and 0% for the annual average. The baseline concentration is comparable to reported benzo(a)pyrene concentrations in Ontario and Canada;
- Based on the NPRI data both acrolein and benzo(a)pyrene are not emitted from the surrounding industrial facilities. The main source of anthropogenic acrolein and benzo(a)pyrene in the area is expected to be traffic and locomotive sources. Emissions are expected to decrease as older vehicles are removed from service and vehicle emission controls become more efficient as well as through eventual electrification of the Lakeshore West GO corridor; Both acrolein and benzo(a)pyrene are listed as Traffic Related Air Pollutants and are often elevated compared to the AAQC in urban areas and near highways and roadways;

- Benzene concentrations recorded at the monitoring station had a 90th percentile concentration that was elevated compared to the 24-hour AAQC. The modelled concentration of benzene only contributed 2% to the cumulative concentration. The ambient baseline concentration recorded is within the range reported in Ontario and in Canada.
- The 90th percentile 24-hour concentration of NO_2 recorded at the monitoring station was below the AAQC threshold. The cumulative concentration calculated from the dispersion modelling was above the annual Canadian Ambient Air Quality Standard (CAAQS) of 12 ppb which may be attributable to the addition of sources to the baseline ambient data which already includes the nearby sources. It should also be noted that the CAAQS is based on the average over a single calendar year of all 1-hour average concentrations, not 90th percentiles. The average of all one hour NO_2 concentrations collected at the monitoring station was 6.9 ppb.
- The modelled concentration of NO_2 and baseline concentration have similar contribution to the cumulative concentrations. The NO_2 annual cumulative concentration for the Clarkson TSA is within the range reported in Toronto and in urban areas of Canada.
- Concentrations of $PM_{2.5}$ and PM_{10} at the Site property boundary were reported as elevated compared to the annual air quality threshold and 24-hour air quality threshold respectively; however, reported concentrations have been conservatively combined with ambient air monitoring data which would have already captured $PM_{2.5}$ and PM_{10} concentrations in ambient air and the resulting cumulative concentration was not significantly altered. The cumulative impacts at the proposed development showed a minor increase from existing conditions likely as a result of expected traffic growth in the study area. The $PM_{2.5}$ annual cumulative concentrations and PM_{10} 24-hour cumulative concentration for the Clarkson TSA are within the range reported in Canadian urban cities.
- By examining receptors at various heights at the property boundary and adding the modelled concentration and the ambient concentration it was determined that for the contaminants of concern ($PM_{2.5}$, PM_{10}, NO_X, acrolein, and benzene) there are no concentrations elevated compared to the AAQC above 30.1 m except for benzo(a)pyrene.
- Background concentrations of acrolein and benzo(a)pyrene are elevated compared to the AAQC values; however, B(a)P is elevated anywhere a development were to proceed in an urban area.
- Air quality mitigation is not required at the proposed development; however, mitigation recommendations have been included to improve indoor air quality.
- If air intakes are designed to be located in each suite, then for any suites below the fourth floor (estimated at 12.9 m) filters to control particulate matter ($PM_{2.5}$ and PM_{10}) impregnated with

carbon to control benzene could be utilized to improve indoor air quality. Percent reductions required can be calculated from Table 3 attached to the memorandum located in Appendix L. Since Table 3 represents a very conservative approach then it is recommended that a method of ambient monitoring be incorporated to ensure the controls of a local air intake design are working, or even required. An alternative to filtering local air intakes and monitoring could be to have a centralized air intake system ducted from above 12.9 m for any suites located below this level.

- Based on the air quality study, air quality in the study area is not expected to adversely impact high density residential development nor the existing local industrial sites level of compliance to existing standards. Elevated concentrations of contaminants reported (i.e., above health-based thresholds) which could lead to health risks are not unique to the Clarkson TSA and are expected throughout urban areas in Ontario (i.e., Greater Toronto Area and Hamilton) and Canada. Transit-oriented development within the Clarkson TSA is expected to reduce reliance on passenger vehicle trips as the community shifts to alternative modes of transportation such as public transit and active transportation. This transition is expected to reduce emissions of TRAP contaminants within the Clarkson TSA and likely will result in improved air quality in the community.

Tables

Figures

Appendices

1 Introduction

WSP Canada Inc. (WSP) was retained by Slate Asset Management (Slate) to complete an Air Quality Study including six months of ambient monitoring and an air dispersion modelling assessment for the proposed development located at 2077, 2087, 2097, and 2105 Royal Windsor Drive in Mississauga, Ontario (the Site). The ambient air quality monitoring was conducted at the Slate lands located at 2105 Royal Windsor Drive in Mississauga, Ontario.

The six months of ambient air monitoring and dispersion modelling assessment were completed in accordance with the Terms of Reference provided by the City of Mississauga (the City) on June 23, 2020 (TOR) and completed in accordance with the Ontario Ministry of the Environment, Conservation and Parks (MECP) Operations Manual for Air Quality Monitoring in Ontario, 2018 (the Operations Manual). The monitoring was carried out to identify any potential ambient air quality effects on the proposed development area from nearby industrial sources, transit, and vehicular traffic. The parameters outlined in the TOR for monitoring were:

— Total suspended particulate (TSP);

— Volatile organic compounds (benzene, dichloromethane, and acrolein);

— Nitrogen oxides (NO_X); and

— Sulphur dioxide (SO_2).

PM_{10} and $PM_{2.5}$ were later added to the list of monitored parameters at the request of the MECP. The monitoring took place from July 8, 2020 to January 10, 2021. This report outlines the results of the monitoring program.

This report outlines the specific modelling approach and input data used to complete the air dispersion modelling for the proposed development and assesses the predicted cumulative impacts from the nearby activities on the Site.

The proposed development is located within the Clarkson Transit Station Area (TSA) and would introduce sensitive land uses. As a result, the City requires an Air Quality Assessment to be completed to assess air quality impacts on the proposed development from surrounding land uses, including industrial operations and transportation sources. The results of the dispersion modelling were combined with ambient air monitoring results to assess the predicted cumulative concentrations of each contaminant.

The Site is located on the west side of the Royal Windsor Drive and Southdown Road intersection in Mississauga, Ontario. The Site is currently zoned as employment (E2-108) and

is surrounded by residential, commercial, and employment zones. In the City of Mississauga's Official Plan, the lands are designated as Mixed Use within the Southdown Employment Area and currently do not permit residential uses. A rail corridor is located to the northwest of the Site and includes the Clarkson GO Station located at 1110 Southdown Road. Lands to the north, east, and northwest consist of predominately residential developments while lands to the west through southeast are predominately commercial and industrial developments. The location of the Slate proposed development is shown in **Figure 1-1**. The location of the proposed development, Clarkson TSA monitoring station, and Study Area are shown in **Figure 1-2**. The development is proposed to include four 25-storey residential buildings.

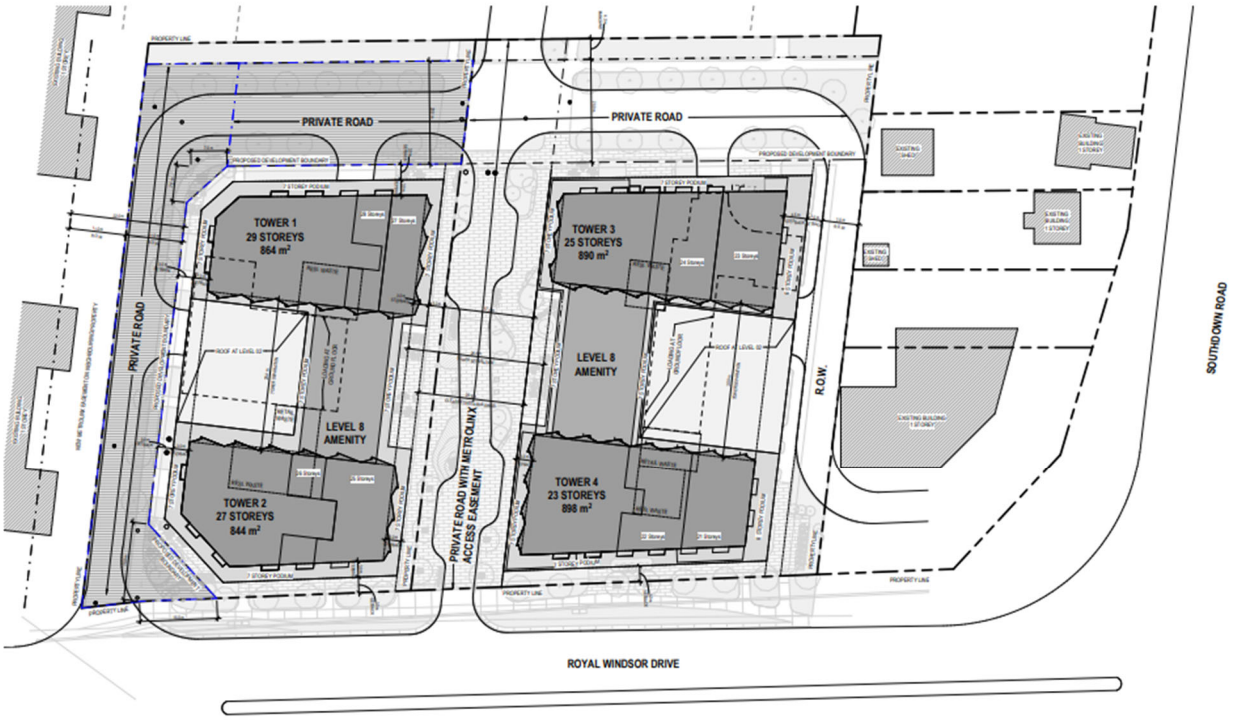


Figure 1-1 Slate Proposed Development

The location of the proposed development, Clarkson TSA monitoring station, and Study Area are shown in **Figure 1-2**.

Figure 1-2 Air Quality Assessment Study Area

1.1 COVID-19 Influences

The current COVID-19 situation has resulted in the reduction of roadway traffic and a change to train operating schedules along the GO corridor. Nearby industrial activities that may have an impact on air quality may also have altered emission rates during the COVID-19 pandemic. Vehicular emissions from the nearby parking lots and major roadways are expected to be reduced during this time period. As such, the results presented from the ambient air quality monitoring may represent atypical conditions. Monitoring data from the Clarkson Airshed Industrial Association (CASIA) was provided by the participating industries to be incorporated into the Air Quality Study for comparative purposes, where applicable. Despite the uncertainties of the effects of COVID-19 on the ambient monitoring data, WSP has confidence in the report and its finding. While there are still unknown possible effects of COVID-19 on the ambient monitoring data, several data set comparisons have been undertaken and included in this report to ensure the dependability of the information. The possible effects of COVID-19 on the ambient monitoring study are further discussed in **Section 5** of this report.

2 Monitoring Summary

2.1 Methodology

After receiving approval from the City, the ambient air quality monitoring station was installed on July 8, 2020 at the Site in order to ensure the summer months were captured in the monitoring program. The continuous analyzers were operating since the installation on July 8, 2020. The first round of discrete sampling was completed on July 14, 2020, aligning with the North American schedule. Monitoring was carried through to completion on January 10, 2021, to fulfill the requirements of the City's Terms of Reference.

Following the MECP Operations Manual for Air Quality Monitoring in Ontario (the Operations Manual) and the Terms of Reference provided by the City, the following instruments and sampling methods were used:

— Total Suspended Particulate (TSP): TSP filter media and TSP gravimetric analysis using a Tisch TE-5170 Mass Flow Controlled TSP Sampler (Hi-Vol). Sampling was conducted on a one-in-six-day schedule and ran for 24 hours (00:00 – 23:59) per sample. An exhaust hose was used to direct sampled air away from the intake.

— Particulate Matter <10 µm (PM_{10}) and <2.5 µm ($PM_{2.5}$) in diameter: PQ200 discrete samplers. Sampling was conducted on a one-in-six-day schedule and ran for 24 hours (00:00 – 23:59) per sample.

— VOCs (Benzene, dichloromethane (methylene chloride), and acrolein): US EPA Compendium Method TO-15 using vacuum canisters (concurrent sample collection). Sampling was conducted on a one-in-six-day schedule and with samples collected for 24 hours (00:00 – 23:59). A programmable timer/regulator was used on the canisters to trigger sampling. Since acrolein is highly reactive, the VOC samples were delivered to the laboratory for analysis as soon as reasonably possible.

— Sulphur dioxide (SO_2): Thermo Scientific 43i SO_2 analyzer housed in a temperature-controlled weatherproof enclosure. Sampling was continuous with a resolution of five minutes.

— Nitrogen Oxides (NO_X): Thermo Scientific 42i $NO/NO_2/NO_X$ analyzer housed in a temperature-controlled weatherproof enclosure. Sampling was continuous with a resolution of five minutes.

Sample probe siting for all sampling equipment was completed in accordance with the

Operations Manual. All monitoring equipment was distanced from walls or structures at least twice the height of the wall or structure. The SO_2 and NO_X continuous analyzers were installed to have an inlet height of at least three meters. The TSP, PM_{10}, and $PM_{2.5}$ inlets were installed to be a minimum of two meters above the ground and more than 20 m from any trees. The VOC inlet was installed to be a minimum of three meters above the ground. All other requirements of the Operations Manual related to probe siting were followed, including Table 3: Sample Probe Siting Criteria.

Monitoring results have been summarized for sampling data collected between July 8, 2020 and January 10, 2021 (the monitoring period). The location of the monitoring station is shown in **Table 2-1** and **Figure 1-1.**

Table 2-1 Monitoring Station Location

Location/Address	Zone	UTM-X Coordinates	UTM-Y Coordinates
2105 Royal Windsor Dr., Mississauga, ON	17T	610529	4818409

2.2 Equipment Calibration and Record Keeping

A site logbook was maintained and a record of each site visit including the purpose of visit, work performed on each instrument, and observations while on site were recorded. Any equipment malfunctions, repairs, and maintenance were properly logged per the Operations Manual. The logbook was kept up to date for each site visit. All site logs were reviewed monthly by the Senior Air Quality Engineer.

Calibrations of sampling equipment completed during the monitoring period were conducted in accordance with the Operations Manual, the Terms of Reference provided by the City and manufacturer recommendations. The following equipment calibrations were completed during the monitoring period:

— The Tisch TE-5170 was calibrated upon installation, and after three months of sampling;

— The PQ200 discrete samplers were calibrated bimonthly;

— VOC sampling unit leak test calibration was completed bimonthly;

— The Thermo Scientific 43i SO_2 analyzer was calibrated monthly; and

— The Thermo Scientific 42i $NO/NO_2/NO_X$ analyzer was calibrated monthly.

All equipment Calibration Certificates that were completed during the monitoring period are presented in **Appendix A**.

The SO_2 and NO_X analyzers were equipped with a data logger and remote communication to ensure data was recorded and that field staff were alerted to equipment downtime in a timely manner. The analyzers were remotely checked for normal operations a minimum of once per day.

Power to the monitoring station was hardwired (via extension cords to the adjacent building on Site) for the duration of the monitoring period to ensure consistent monitoring with no electrical background noise impacting data measurements or communication. Power draw for all sampling equipment was metered and recorded regularly in the Site's logbook during site visits.

2.3 Laboratory Analysis and Data Validation

The discrete samples that required laboratory analyses included TSP, VOCs, PM_{10}, and $PM_{2.5}$. Laboratory analysis for all discrete samples collected was completed by ALS Environmental, a laboratory whose analytical methods, as required by the monitoring program, have Canadian Association for Laboratory Accreditation (CALA) accreditation. Sample media for the discrete samplers was sampled, collected, transported and stored in accordance with the Operations Manual, Reference Methods, and laboratory requirements.

The procedure for data validation for continuous and discrete data has been completed in accordance with the Operations Manual. The discrete sampling followed a one day of every six days frequency, per the North American schedule. All laboratory analysis and continuous NO_X and SO_2 data have gone through internal review by the Senior Air Quality Engineer to ensure sampling was conducted per the Operations Manual and all data presented within this report is valid.

2.4 Uncertainties of Air Quality Monitoring

WSP followed the Operations Manual for Air Quality Monitoring in Ontario and industry best practice to ensure that uncertainties were minimized. There is some uncertainty when sampling acrolein, considering factors such as how canisters are cleaned in preparation for sample collection and the gas standards used to calibrate analytical equipment. Historically, the method typically used for sampling acrolein in ambient air was by collection on a DNPH-coated silica gel cartridge, followed by high performance liquid chromatography (HPLC) analysis, per the United States Environmental Protection Agency (USEPA) Method TO-11A. This changed in 2000 when the USEPA amended the "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air – Second Edition", which removed

acrolein due to significant data quality concerns. Air samples collected in canisters and analyzed by gas chromatography/mass spectrometry (GC/MS) per USEPA method TO-15 later became the industry standard for sampling acrolein in ambient air. As this approach was being tested, it became a concern that there may be formation of acrolein in the canisters, resulting in a reading higher than actual (i.e., high bias). In 2010, the Office of Air Quality Planning and Standards (OAQPS) conducted a study to assess how the canister cleaning process might result in increased acrolein concentration during analysis. The study showed that acrolein could be elevated even in clean canisters. The study also showed that there were variables when it came to the acrolein gas standards used to calibrate the analytical systems for different laboratories. To reduce the likelihood of uncertainties, the USEPA recommended that collection canisters be heated to a minimum of 80 °C while being cleaned. ALS Environmental follows this USEPA recommended practice of heating canisters while cleaning.

The USEPA also recommended analyzing the cleaned canisters for acrolein by GC/MS immediately after cleaning and once a week for two to three weeks to determine whether acrolein was likely to form in the canister over time. The canisters from ALS are proofed after sitting for 24 hours under pressure with humidified nitrogen. ALS also conducts method blanks to confirm the limit of reporting (LOR) is lower than 0.2 ppbv.

The calibration gas standards that laboratories use to calibrate their GC/MS analytical system can also cause variation in analysis. The 2010 study completed by OAQPS indicated that laboratories using higher concentration acrolein standards and diluting to target range provided more consistent analytical results. The gas standards that ALS Environmental uses have an analytical accuracy of ±10 %. ALS Environmental also uses a stock standard that is 1 000 ppbv and diluted to 1 ppbv. The USEPA also recommended analyzing the canister as soon as reasonably possible after collection. WSP submitted the canisters to the laboratory the following workday after each 24-hour sample.

The uncertainties for benzene and methylene chloride analysis are not as significant as acrolein. The analysis provided by ALS Environmental would be reasonably accurate based on Reference Methodology. Further, the uncertainties in particulate sampling (TSP, PM_{10}, and $PM_{2.5}$) are also minimal; however, there were some noted issues with the 47 mm PM_{10} and $PM_{2.5}$ filters at the start of the sampling program, which were later resolved by switching to more durable polytetrafluoroethylene (PTFE) filters. Uncertainties relating to NOx and SO_2 analysis are minimized as WSP maintained calibrations on the analyzers per the Operations Manual.

3 Summary of Monitoring Results

3.1 Discrete Sampling Results

Discrete sampling events were completed on a one-in-six-day schedule and ran for 24 hours (00:00 – 23:59) per sample. All discrete sampling results have been compared to the 24-hour and annual Ambient Air Quality Criteria (AAQC) guidelines for each respective sample parameter. The comparison to annual AAQC guidelines is for informational purposes only; six months of data should not be held to the annual guidelines, which account for seasonal variations. Since acrolein and PM_{10} do not have annual AAQC guidelines, only the 24-hour guidelines were used for these parameters.

$PM_{2.5}$ and PM_{10} were added to the monitoring parameters at a later date as requested by the MECP, as a result, WSP was unable to obtain the 47 mm filters in time for the July 14, 2020 sample event. At the onset of the monitoring program, there were issues with the $PM_{2.5}$ and PM_{10} sampling that occurred due to visually unobservable damage to sampling media during the sampling events. WSP was not aware of this issue until laboratory results were made available weeks after the sampling events occurred. The 47 mm filters used for $PM_{2.5}$ and PM_{10} were reported by the laboratory as showing signs of damage sustained during the sampling event. This was noted on $PM_{2.5}$ samples from July 20, August 1, August 13, and August 19, 2020. This was noted on PM_{10} samples from July 26, August 13 and August 19, 2020. Data from these sample events were not included in any average calculations as they would underestimate the levels of $PM_{2.5}$ and PM_{10} due to the damage. Despite WSP's best effort to keep the 47 mm filters intact, the issue remained. WSP investigated alternative types of 47 mm filters and decided to use the 47 mm PTFE-filters. After receiving better results on the August 25, 2020 sample event more PTFE-filters were ordered; however, they did not arrive in time for the September 6, 2020 sample event. The PTFE-filters were used for every sampling event following and did not show any signs of damage for the remainder of the ambient sampling program. All other samples were collected without any observable issues. There was an error with the flow controller on November 17, 2020 that resulted in the VOC canister's final pressure being positive. For this reason, these results were not included in the report.

A summary of the individual discrete sampling results compared to the AAQC 24-hour threshold guidelines is presented in **Table 3-1.** The Certificates of Analysis from each sampling event are located in Appendix B.

Table 3-1 Summary of 24-Hour Discrete Sampling Results

MEASURED CONTAMINANT (µg/m³)	ACROLEIN	BENZENE	METHYLENE CHLORIDE	TSP	$PM_{2.5}$	PM_{10}
24-HOUR AAQC (µg/m³)	**0.4**	**2.3**	**220**	**120**	**27**	**50**
SAMPLE DATE						
14-Jul	0.5	0.69	1.27	30.2	--	--
20-Jul	0.63	<0.32	<0.69	35.7	<0.62 [A]	<0.62
26-Jul	0.68	0.47	<0.69	51.4	1.37	<0.63 [A]
01-Aug	0.53	<0.32	<0.69	<15	<0.62 [A]	<0.63
07-Aug	0.4	0.5	0.75	45.6	2.25 [C]	0.63 [C]
13-Aug	0.63	0.45	1.22	44.9	<0.62 [A]	<0.63 [A]
19-Aug	0.45	0.69	4.42	26.1	<0.62 [A]	<0.63 [A]
25-Aug	0.53	0.49	<0.69	32.4	8.58	16.8
31-Aug	0.67	0.68	<0.69	25.3	4.7	11.1
06-Sep	0.26	<0.32	1.33	16.5	NA [B]	NA [B]
12-Sep	0.58	0.75	1.27	20.7	2.17 [C]	1 [C]
18-Sep	<0.23	<0.32	<0.69	30.1	2.5	10.1
24-Sep	0.28	0.94	1.67	96.3	22.4	58.2
30-Sep	<0.23	0.37	<0.69	27.2 [D]	10.3	22.8
06-Oct	<0.23	0.37	<0.69	89.3	4.5	37.7

MEASURED CONTAMINANT (µg/m³)	ACROLEIN	BENZENE	METHYLENE CHLORIDE	TSP	$PM_{2.5}$	PM_{10}
24-HOUR AAQC (µg/m³)	**0.4**	**2.3**	**220**	**120**	**27**	**50**
SAMPLE DATE						
12-Oct	<0.23	0.32	<0.69	14.2	2.12	3.46
18-Oct	<0.23	0.39	<0.69	25.8	5.75	14.30
24-Oct	<0.23	0.32	<0.69	14.7	0.79	4.09
30-Oct	<0.23	0.34	<0.69	19.5	4.09	10.10
05-Nov	<0.23	0.44	<0.69	10.9 [C]	7.90	47.10 [C]
11-Nov	<0.23	0.35	<0.69	34.8	6.71	14.50
17-Nov	NA	NA	NA	22.2	4.33	8.50
23-Nov	<0.23	0.49	<0.69	32.5	5.29	8.17
29-Nov	<0.23	0.48	<0.69	31.7	5.79	16.20
05-Dec	<0.23	0.34	<0.69	16.4 [C]	3.58	20.70 [C]
11-Dec	<0.23	1.79	1.91	120	28.20	84.90
17-Dec	<0.23	0.67	<0.69	94	9.37	27.20
23-Dec	<0.23	0.47	<0.69	25.3	5.75	21.50
29-Dec	<0.23	0.39	<0.69	20.9	6.66	8.75
04-Jan	<0.23	0.51	<0.69	20.2	<0.62	14.80
10-Jan	<0.23	0.58	<0.69	24.5	9.37	12.9

Note: A Filter samples in this submission show obvious signs of damage, sustained during the sampling event. Data is expected to be biased low as a result of matrix loss. Data from these samples is not included in the average calculations.

B Sample media was not available from the laboratory for Sep 6, 2020.

C Discrepancies in concentrations (TSP<PM_{10}, or PM_{10}<$PM_{2.5}$)

D Power was lost due to the extension cord being disconnected by a pedestrian, sampled October 2, 2020 instead.

'--' Requirement for PM_{10} and $PM_{2.5}$ discrete sampling was introduced after the sampling event occurred. PQ200 discrete samplers were not yet installed and ready to sample.

'<' Indicates that the sampling result was below the laboratory detection limit.

'NA' Indicates missing data.

Red text indicates measurement is above the respective 24-hour AAQC guideline.

When comparing individual sampling events to the AAQC, a total of nine acrolein samples collected during the monitoring period were elevated compared to the 24-hour AAQC guideline of 0.4 µg/m^3.

When comparing individual sampling events to the AAQC, there were no benzene, methylene chloride, or TSP samples collected during the monitoring period that were elevated compared to their respective 24-hour AAQC guidelines.

When comparing individual sampling events to the AAQC, there was one $PM_{2.5}$ measurement collected on December 11, 2020 that was elevated compared to the AAQC guideline of 27 µg/m^3. There were two PM_{10} measurements collected during the monitoring period that were elevated compared to the 24-hour AAQC guideline of 50 µg/m^3. The PM_{10} elevated levels occurred on September 24, 2020 and December 11, 2020. On December 11, 2020, PM_{10}, $PM_{2.5}$, TSP and benzene concentrations were all greater than the typical ranges seen during the monitoring period; the reason for these elevated concentrations is currently unknown. Wind direction on this day was blowing from the north northeast, so it is likely not due to the industry activities located to the south of the Site.

There were four days when discrepancies in measured TSP and PM fractions were identified where the smaller $PM_{2.5}$ size fraction was larger than the PM_{10} fraction, or TSP was less than PM_{10}. On these days no errors in sampling methodology were identified and samples were deemed valid by ALS Environmental. As a result, TSP and PM fraction results were included in the analysis.

When the benzene concentration from all sampling events is averaged over the six-month program it is elevated compared to the AAQC annual threshold limit of 0.45 µg/m^3. The average six-month concentrations for all other sample parameters with annual AAQC guidelines were below their respective AAQC guidelines. A summary of the contaminants' average concentrations compared to the AAQC annual guidelines is presented in **Table 3-2**, a reminder that this comparison is for informational purposes only and that six months of data is not a valid data set to compare to annual guidelines due to seasonal variations. The Certificates of Analysis from each sampling event can be found in **Appendix B**. The collected data represents six months of monitoring and meets the City's requirements set forth in the Project's Terms of Reference.

Table 3-2 Summary of the Discrete Monitoring Results

Contaminant	Annual AAQC Threshold ($\mu g/m^3$)[1]	Average Concentration ($\mu g/m^3$)	90th Percentile Concentrations
Acrolein	**--**	0.27	0.63
Benzene	**0.45**	0.49	0.70
Methylene Chloride	**44**	0.71	1.36
TSP	**60**	35.7	89.3
PM_{10}	**--**	18.3	42.4
$PM_{2.5}$	**8.8**	6.6	9.93

Note: Average concentrations for each contaminant were calculated by calculating the mean value across all sampling events that occurred in the monitoring period. Mean calculations presented above excluded missing or invalid sampling events.

Red text indicates a contaminant six-month average is above the Annual AAQC guideline.

Missing data or invalid data was not included in the average concentrations.

Non-detectable concentrations were assumed to be half the detection limit.

[1] Annual AAQC Threshold included for reference, average concentration from WSP sampling is not annualized, so seasonal variations have not been accounted for.

3.2 Continuous Monitoring Results

Continuous monitoring for SO_2 and NO_X was completed for the duration of the monitoring period, with a five-minute resolution in accordance with the Operations Manual. Results of continuous monitoring were compared to the corresponding AAQC guidelines. The AAQC for SO_2 was compared to the unpublished MECP changes; the old 24-hour average was removed and the new 10-minute and one-hour averages were included. As a result, SO_2 data collected was evaluated on a running average for both one-hour and 10-minute averages over the monitoring period. The one-hour and 24-hour AAQCs for NO_2 were used to compare monitoring data, per the Operations Manual. As a result, NO_2 data collected was evaluated on a running average for both one-hour and 24-hour averages over the monitoring period.

For one-hour and 10-minute running averages of SO_2 data, there were no elevated levels during the monitoring period when compared to the AAQC. For one-hour and 24-hour running averages of NO_2 data there were no elevated levels compared to the AAQC during the

monitoring period. A summary of all SO_2 and NO_X data collected over the monitoring period is presented in **Appendix C**. The maximum concentrations of NO_2 and SO_2 measured during the six-month monitoring period relative to each AAQC averaging period are presented in **Table 3-3**.

Table 3-3 Summary of the Continuous Monitoring Results – Maximum Concentrations

Contaminant	Averaging Period	Applicable AAQC Threshold (ppb)	Maximum Concentration (ppb)
Nitrogen Dioxide	1-hour	200	50
	24-hour	100	29
Sulphur Dioxide	10-minute	67	43
	1-hour	40	27
	Annual [1]	4	0.47

Note: [1] Annual AAQC Threshold included for reference, maximum concentration from WSP sampling is not annualized, so seasonal variations have not been accounted for.

4 Ambient Data Comparison

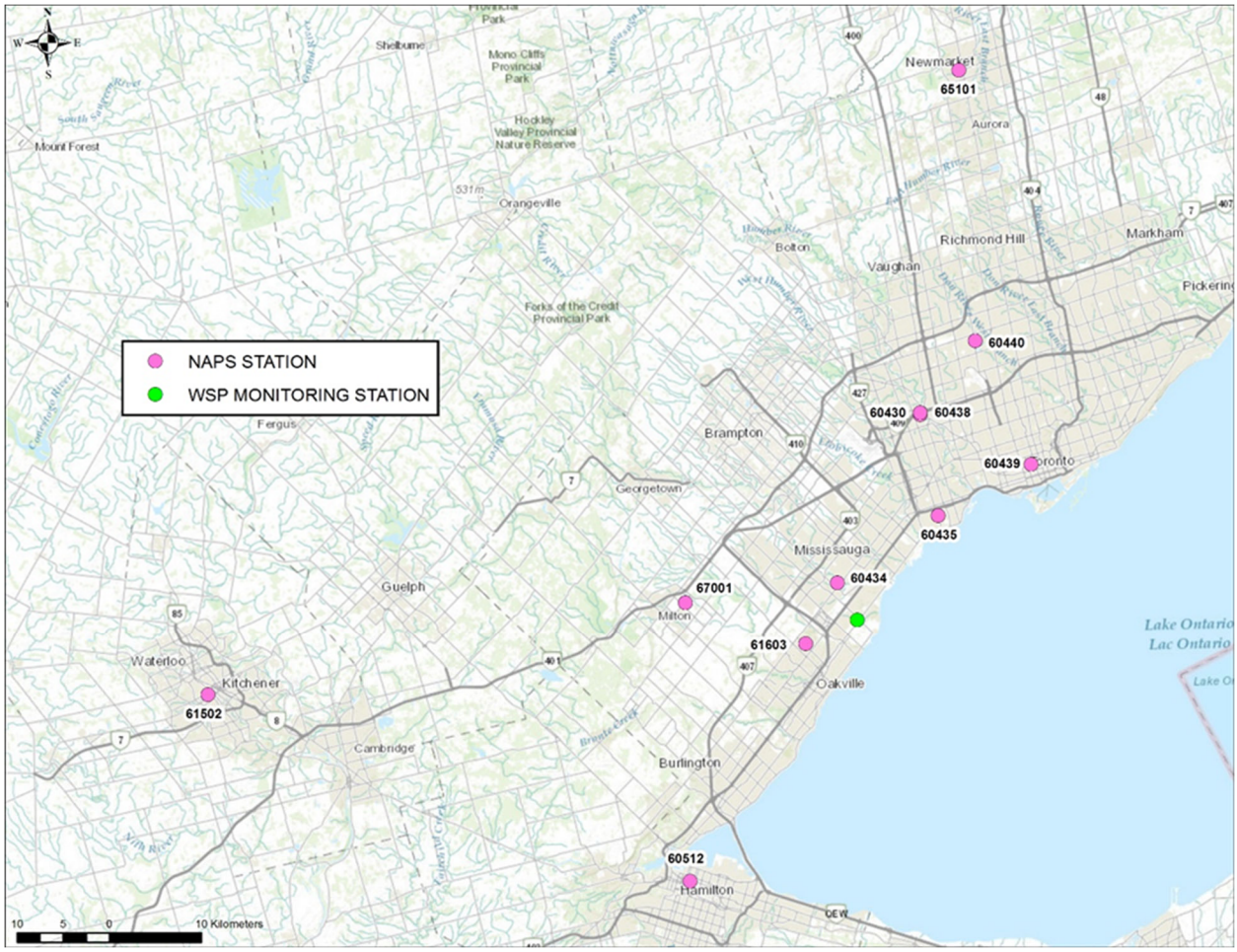


Figure 4-1 National Air Pollution Surveillance Station Location

Data comparisons were completed using the most recent validated data available from the nearest government-operated ambient air quality monitoring stations. Data from the closest National Air Pollution Surveillance (NAPS) stations were used and calculations were made based on data from July to December for each year. The location of each NAPS station used in this report can be found in **Figure 4-1**.

4.1 Discrete Monitoring

Monitoring was conducted following the North American six-day schedule to allow for comparison to local ambient air quality stations upwind and downwind of the Site. At this point

in time, current data across all sample parameters are not available from nearby MECP stations. As a result, data collected at the Site were compared to data collected from local Environment and Climate Change Canada (ECCC) monitoring stations governed by the NAPS Air Toxics Program. The NAPS stations used for data comparison had available data and were representative of the study area. Data comparisons were made with the most recent published data for the NAPS stations (past five years), which was used to compare pollutant trends to the monitoring results.

4.1.1 Acrolein Data Comparison

The ambient acrolein data was not compared to any NAPS stations due to the difference in methodology. The NAPS stations use a model 926 Two Channel Carbonyl Sampler to obtain their acrolein sample. The samples are collected on a DNPH cartridge and analyzed via high performance liquid chromatography (HPLC). The NAPS stations used 24-hour samples with a flow rate of 1 L/min resulting in a volume of approximately 1.44 m^3 over the sampling duration. The lab would need a detection limit of 0.0043 µg for acrolein per sample with a 1.44 m^3 sample to obtain the NAPS reported detection limit of 0.003 $µg/m^3$. Based on discussions with commercial laboratories the lowest detection limit for acrolein is on the order of 1 µg, over 300 times higher than what was calculated from the NAPS results. Commercial laboratories also warned of the potential risk of the high flow rate associated with the NAPS methodology and acrolein not having enough contact time with the DNPH tube to be effectively captured, resulting in the breakthrough of acrolein.

Commercial laboratories instead use evacuated canisters to get acrolein data in ambient air. This analysis is performed using procedures adapted from USEPA Method TO-15, as previously discussed in Section 2.4. Commercial laboratories do not use the ECCC high-volume DNPH methodology as it is not a published Reference Method. Due to the difference in methodology, it is not possible to compare the ambient acrolein data to the NAPS station data.

In the summer of 2007, the MECP completed an Air Quality Monitoring Program for the Clarkson and Oakville area (Report #PIBS 7074e). The monitoring program was completed to determine acrolein, acrylonitrile, and dichloromethane (methylene chloride) concentrations and the potential sources in the area. Since this data was collected from the same area using the same methodology, it was used for comparison purposes. For the MECP study, sampling was completed at three locations to attempt to triangulate a likely source. The MECP study spatially occurred within three kilometers of the WSP ambient monitoring station. MECP sampling in 2007 was completed following USEPA TO-15 methodology. MECP sampling was completed on June 14, June 26, August 28, and September 20 of 2007. Due to the variation in wind direction, the MECP could not identify a point source of elevated acrolein concentrations. The

MECP Air Quality Monitoring Report is attached in **Appendix D**. A comparison of Site data and MECP 2007 data is included in

Table 4-1.

Table 4-1 Acrolein Monitoring Results Comparison with Clarkson Airshed Study

	WSP Sample Results (2020) - µg/m³	MECP Clarkson Airshed Study (2007) - µg/m³	Percent Change
90th Percentile	0.696	2.12	-67 %

The results obtained in 2020 are lower than the baseline data collected by the MECP in 2007 as part of the Clarkson Airshed Study. The 90th percentile concentrations decreased 67 % when compared to the results collected in the 2007 Clarkson Airshed Study. It should be noted that this comparison is done with limited data and taken during different conditions (both spatially and temporally). It is also noted that 2020 data may have been reduced due to COVID-19 impacted operations or traffic. It can be assumed that the proposed development will not further degrade the air quality with respect to acrolein, as will be discussed further in the air dispersion modelling assessment.

4.1.2 Benzene Data Comparisons

Benzene data collected was compared to the closest NAPS stations with benzene data available. The following table shows the NAPS stations used and their location.

Table 4-2 NAPS Station Locations - Benzene

	NAPS Station 60435	NAPS Station 60438	NAPS Station 60440	NAPS Station 60512	NAPS Station 61502	NAPS Station 65101
Location	Etobicoke South, 461 Kipling Ave.	Etobicoke, 401W – 125 Resource Rd.	Toronto North - Downsview, 4905 Dufferin St	Hamilton, Elgin St. & Kelly St. - Beasley Park	Kitchener, West Ave. and Homewood	Newmarket, Eagle St. and McCaffrey Rd.
Distance from WSP's Station	14 km northeast	23 km northeast	33 km north east	34 km southwest	70 km west	60 km northeast

The most recent NAPS data available (2015-2019) was summarized over the same six-month sampling period (July – December) for comparison. When comparing benzene sampling

results to historical data collected at nearby NAPS stations benzene concentrations were comparable. The average benzene concentration from the monitoring program was lower than the average benzene concentrations collected at NAPS stations 60512, 60440, and 60438. The results of this comparison are shown in **Table 4-3.**

Table 4-3 Benzene Monitoring Results Comparison (July – December)

	WSP Sample Result Average	NAPS Station 60435 (2015-2016)	NAPS Station 60438 (2017-2019)	NAPS Station 60440 (2017-2019)	NAPS Station 60512 (2015-2019)	NAPS Station 61502 (2015-2019)	NAPS Station 65101 (2017-2019)	Annual AAQC[1]
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Six Month Mean	0.49	0.45	0.56	0.55	0.67	0.39	0.33	0.45
Six Month 90th Percentile	0.7	0.63	0.78	0.98	1.26	0.63	0.52	0.45

Note: [1] Annual AAQC Threshold included for reference, other concentrations from WSP and NAPS sampling are not annualized, so seasonal variations have not been accounted for.

The NAPS stations were also assessed for the number of 24-hour concentrations with elevated levels compared to the annual AAQC for benzene, the following table shows the summary.

Table 4-4 Benzene Monitoring Results Comparison – Percentage of Daily Concentrations Greater Than The Annual AAQC For Benzene (July – December)

WSP	NAPS Station 60435 (2015-2016)	NAPS Station 60438 (2017-2019)	NAPS Station 60440 (2017-2019)	NAPS Station 60512 (2015-2019)	NAPS Station 61502 (2015-2019)	NAPS Station 65101 (2017-2019)
50 %	48 %	70 %	58 %	54 %	29 %	22 %

The tables above indicate that it is already historically common for benzene to have elevated levels compared to the annual AAQC in similarly developed areas. The NAPS stations 60438 (Etobicoke 401W), 60440 (Toronto North), and 60512 (Hamilton) all have greater concentrations than WSP's monitoring station and NAPS station 60435 (Etobicoke South) had similar concentrations. NAPS station 61502 (Kitchener) and 65101 (Newmarket) have lower concentrations as expected since these areas are less developed and more rural.

The available data collected by NAPS for VOCs is limited, for this reason, the Stations in Kitchener and Newmarket were added for additional comparison, although these locations are a significant distance from the Site. It is difficult to determine the proportion of decrease related to COVID-19 restrictions on benzene concentrations; however, it can be demonstrated that the Site is within typical ranges seen historically throughout Ontario.

It can be assumed that the proposed development will not further degrade ambient air quality within the Clarkson airshed with respect to benzene, as will be discussed further in the air dispersion modelling assessment.

4.1.3 Methylene Chloride (Dichloromethane) Data Comparisons

Methylene chloride data collected was compared to the closest NAPS stations with methylene chloride data available. The following table shows the NAPS stations used and their location.

Table 4-5 NAPS Station Locations – Methylene Chloride

	NAPS Station 60435	NAPS Station 60438	NAPS Station 60440	NAPS Station 60512	NAPS Station 61502	NAPS Station 65101
Location	Etobicoke South, 461 Kipling Ave.	Etobicoke, 401W – 125 Resource Rd.	Toronto North - Downsview, 4905 Dufferin St	Hamilton, Elgin St. & Kelly St. - Beasley Park	Kitchener, West Ave. and Homewood	Newmarket, Eagle St. and McCaffrey Rd.
Distance from WSP's Station	14 km northeast	23 km northeast	33 km north east	34 km southwest	70 km west	60 km northeast

The most recent NAPS data available (2015-2019) was summarized over the same six-month sampling period for comparison (July – December).

When comparing methylene chloride sampling results to historical data collected at nearby NAPS stations methylene chloride concentrations were comparable. The average methylene chloride concentration from the monitoring program was within the typical range of concentrations collected at the NAPS stations. The results of this comparison are shown in **Table 4-6.**

Table 4-6 Methylene Chloride Monitoring Results Comparison

	WSP Sample Results	NAPS Station 60435 (2015-2016)	NAPS Station 60438 (2017-2019)	NAPS Station 60440 (2017-2019)	NAPS Station 60512 (2015-2019)	NAPS Station 61502 (2015-2019)	NAPS Station 65101 (2017-2019)	Annual AAQC[1]
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Six Month Mean	0.71	0.62	0.61	1.15	0.39	0.46	0.35	44
Six Month 90th Percentile	1.36	0.87	1.06	2.29	0.58	0.63	0.50	44

Note: [1] Annual AAQC Threshold included for reference, other concentrations from WSP and NAPS sampling are not annualized, so seasonal variations have not been accounted for.

Methylene chloride concentrations are within the typical ranges seen at the surrounding NAPS stations. Methylene chloride samples were mostly non-detectable in the laboratory reports and were below the annual AAQC of 44 µg/m³.

4.1.4 PM Data Comparison

PM_{10} and $PM_{2.5}$ data collected was compared to the closest NAPS stations with data available. The following table shows the NAPS stations used for PM_{10} and $PM_{2.5}$ data.

Table 4-7 NAPS Station Locations – PM_{10} and $PM_{2.5}$

	NAPS Station 60435	NAPS Station 60438	NAPS Station 60439	NAPS Station 60440	NAPS Station 60512
Location	Etobicoke South, 461 Kipling Ave.	Etobicoke, 401W – 125 Resource Rd.	Toronto, 200 College St.	Toronto North - Downsview, 4905 Dufferin St	Hamilton, Elgin St. & Kelly St. - Beasley Park
Distance from WSP's Station	14 km northeast	23 km northeast	25 km north east	33 km north east	34 km southwest

The most recent NAPS data available (2015-2019) was summarized over the same six-month sampling period for comparison (July – December).

Overall, PM_{10} concentrations recorded during the monitoring period were greater than the historical PM_{10} concentrations recorded at the nearby NAPS stations; however, there is no

annual AAQC guideline for PM_{10} and the six-month average concentration was below the 24-hour AAQC. The results of this comparison are shown in

Table 4-8.

Table 4-8 PM_{10} Monitoring Results Comparison

	WSP Sample Result	NAPS Station 60435 (2015)	NAPS Station 60438 (2017-2019)	NAPS Station 60439 (2015-2016)	NAPS Station 60440 (2017-2019)	NAPS Station 60512 (2015-2019)
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Six Month Average	18.3	19.3	18.2	13.5	11.8	12.4
Six Month 90th Percentile	42.4	30.9	29.2	25.0	20.3	20.6

Overall, $PM_{2.5}$ concentrations recorded during the monitoring period were generally lower than $PM_{2.5}$ historical concentrations recorded at the nearby NAPS stations. The six-month average was lower than the Annual AAQC. The results of this comparison are shown in **Table 4-9.**

Table 4-9 $PM_{2.5}$ Monitoring Results Comparison

	WSP Sample Result	NAPS Station 60435 (2015)	NAPS Station 60438 (2017-2019)	NAPS Station 60439 (2015-2016)	NAPS Station 60440 (2017-2019)	NAPS Station 60512 (2015-2019)	Annual AAQC[1]
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Six Month Average	6.6	8.9	8.6	6.9	6.5	7.5	8.8
Six Month 90th Percentile	9.9	19.0	14.5	12.6	12.0	13.1	8.8

Note: [1] Annual AAQC Threshold included for reference, other concentrations from WSP and NAPS sampling are not annualized, so seasonal variations have not been accounted for.

4.1.5 TSP Data Comparison

At this time, no representative MECP or NAPS Station data was available to compare TSP monitoring results.

4.2 Continuous Monitoring

Comparable ambient data for SO_2 and NO_X was not yet validated from nearby MECP stations; as a result, data collected at the Site were compared to data collected from local ECCC monitoring stations governed by the NAPS Air Toxics Program. NAPS stations used for data comparison were stations that had available data and were representative of the study area. The most recent NAPS data available (2015-2019) was summarized over the same six-month sampling period and compared to the WSP sampling data.

4.2.1 SO_2 Data Comparison

Continuous SO_2 data collected from the ambient program was compared to the closest NAPS stations with SO_2 data available. The following table shows the NAPS stations used and their location.

Table 4-10 Naps Station Locations - SO_2

	NAPS Station 60430	NAPS Station 60434	NAPS Station 60438	NAPS Station 60440	NAPS Station 60512	NAPS Station 67001
Location	Etobicoke, 401 W and Resources Rd.	Mississauga, 3359 Mississauga Rd. N. - UofT Campus	Etobicoke, 401W – 125 Resource Rd.	North York, 4905 Dufferin St,	Hamilton, Elgin St. & Kelly St. - Beasley Park	Milton, Main St. E. and Harris Blvd.
Distance to WSP's Station	23 km northeast	4.5 km northwest	23 km northeast	33 km north east	34 km southwest	19 km west

Continuous SO_2 data collected during the monitoring period was below the AAQC for SO_2. Overall, SO_2 concentrations recorded during the monitoring period were comparable to SO_2 concentrations recorded at the nearby NAPS stations over the past five years. It should be noted that NAPS station 60512 (Hamilton) had much higher levels of SO_2 compared to other stations as it measures the impacts of the heavily industrialized areas of Hamilton on the hospital/downtown core. The results of this comparison are shown below in **Table 4-11**.

Table 4-11 SO2 Monitoring Results Comparison – Six Month 90th Percentile

	WSP Sample Result	NAPS Station 60430 (2015-2019)	NAPS Station 60434 (2019)	NAPS Station 60438 (2017-2019)	NAPS Station 60440 (2017-2019)	NAPS Station 60512 (2015-2019)	NAPS Station 67001 (2019)
	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Six Month Mean	0.47	0.47	0.42	0.21	0.16	3.30	0.90
Six Month 90th Percentile	1.0	0.70	1.0	0.63	0.27	9.4	1.9

4.2.2 NO_X DATA Comparison

Continuous NO_X data collected as part of the ambient program was compared to the closest NAPS stations with NO_X data available. The following table shows the NAPS stations used and their location.

Table 4-12 NAPS Station Locations - NO_x

	NAPS Station 60434	NAPS Station 60435	NAPS Station 60438	NAPS Station 60512	NAPS Station 61603	NAPS Station 67001
Location	Mississauga, 3359 Mississauga Rd. N. - UofT Campus	Etobicoke, 461 Kipling Ave.	Etobicoke, 401W – 125 Resource Rd.	Hamilton, Elgin St. & Kelly St. - Beasley Park	Oakville, 8th Line & Glenashton Dr.	Milton, Main St. E. and Harris Blvd.
Distance to WSP's Station	4.5 km northwest	14 km northeast	23 km northeast	34 km southwest	6 km southwest	19 km west

Continuous NO_X data collected during the monitoring period was below the AAQC for NO_2. Overall, NO_X concentrations recorded during the monitoring period were less than NO_X concentrations recorded at the nearby NAPS stations over the past five years. The results of this comparison are shown below in **Table 4-13**.

Table 4-13 NO_x Monitoring Results Comparison

	WSP Sample Result	NAPS Station 60434 (2015 – 2019)	NAPS Station 60435 (2015 – 2019)	NAPS Station 60438 (2017-2019)	NAPS Station 60512 (2015-2019)	NAPS Station 61603 (2015 – 2019)	NAPS Station 67001 (2019)
	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Six Month Mean	10.5	10.9	21.3	39.8	15.2	9.8	12.8
Six Month 90th Percentile	23.6	23.6	44.4	86.3	31.0	21.2	28.0

5 Baseline Concentrations

Ambient air monitoring data collected as part of the Clarkson TSA ambient air quality monitoring program (Clarkson monitoring program) was used in combination with air dispersion modelling results to predict cumulative impacts of air contaminants at the Site for benzene, acrolein, $PM_{2.5}$, PM_{10}, TSP, NO_X, SO_2, and methylene chloride. In order to assess the cumulative impact on the Site, the 90th percentile of ambient concentrations of each contaminant monitored as part of the Clarkson monitoring program was calculated for 10-min, 1-hour, and 24-hour averaging periods. The 90th percentile of the available monitoring data is typically considered a conservative estimate of baseline air quality (CEA Agency and CNSC, 2009).

Ambient air monitoring data collected as part of the Clarkson Air Shed Industrial Association (CASIA) ambient air quality monitoring program (CASIA monitoring program) was used in combination with air dispersion modelling results to predict cumulative impacts of air contaminants at the Site for carbon monoxide. In order to assess the cumulative impact on the Site, the 90th percentile of ambient concentrations of carbon monoxide was calculated for 1-hour and 8-hour averaging periods. NAPS monitoring data collected in 2019 was used to supplement Clarkson monitoring data collected by WSP to allow for a full year of data to be used to calculate ambient NO_2 and $PM_{2.5}$ concentrations. There was only NO_x data available from CASIA so NAPS data with NO_2 was used instead. The $PM_{2.5}$ data from CASIA was collected continuously using a different methodology so NAPS data was used instead since the methodology was similar to WSP's ambient program.

Ambient air monitoring data collected as part of the NAPS ambient air quality monitoring program (NAPS monitoring program) and Ontario Ministry of Environment, Conservation, and Parks (MECP) ambient air quality monitoring program (MECP monitoring program) was used to obtain ambient concentrations of contaminants which are not part of the Clarkson or CASIA monitoring program. NAPS data was also used to supplement Clarkson monitoring data collected by WSP to allow for a full year of data to be used to calculate ambient contaminant concentrations. The NAPS monitoring station closest to the study area with the most recent data available was used to supplement Clarkson monitoring data. These contaminants include benzene, benzo(a)pyrene, 1,3-butadiene, formaldehyde, acetaldehyde, SO_2, NO_2, $PM_{2.5}$, xylene, and methylene chloride. In order to assess the cumulative impact on the Site, the 90th percentile of ambient concentrations of these contaminants was calculated for 10-min, ½-hour, 1-hour and 24-hour. For contaminants with annual averaging periods, the annual mean was calculated.

A summary of ambient air monitoring data and sources is shown in **Table 5-1** . Impacts from contaminants which have not been retained for the monitoring and modelling assessment will be discussed; however, these impacts will only include existing conditions.

Table 5-1 Summary of Ambient Baseline Concentrations

Contaminant	Averaging Period	Baseline Concentration (µg/m³)	Air Quality Threshold (µg/m³)	% of Threshold	Data Source
PM_{10} [A]	24 h	47	50	94%	Clarkson Air Monitoring and NAPS #60438 (Toronto)
$PM_{2.5}$ [A]	24 h	15	27	54%	Clarkson Air Monitoring and NAPS #60438 (Toronto)
	Annual	8.2	8.8	93%	
TSP [B]	24 h	89	120	74%	Clarkson Air Monitoring
	Annual	36	60	60%	
NO_x (expressed as NO_2) [A]	1 h	36	79	46%	Clarkson Air Monitoring and NAPS #60434 (Mississauga)
	24 h	30	200	15%	
	Annual	16	22.6	68%	
CO	1 h	298	36200	1%	CASIA
	8 h	279	15700	2%	
SO_2 [A]	10 min	3	175.6	2%	Clarkson Air Monitoring
	1 h	2	104.8	2%	Clarkson Air Monitoring and NAPS #60438 (Toronto)
	Annual	0.98	10.5	9%	
Acrolein [B]	1 h	1.6 [C]	4.5	36%	

Contaminant	Averaging Period	Baseline Concentration (µg/m³)	Air Quality Threshold (µg/m³)	% of Threshold	Data Source
	24 h	0.6	0.4	158%	Clarkson Air Monitoring
Benzene [A]	24 h	0.69	2.3	30%	Clarkson Air Monitoring and NAPS #60438 (Toronto)
	Annual	0.49	0.45	109%	
1,3-Butadiene	24 h	0.1	10	1%	NAPS #60435 (Etobicoke)
	Annual	0.01 [C]	2	0.5%	
Acetaldehyde	30 min	5 [C]	500	1%	NAPS #60211 (Windsor West)
	24 h	2	500	0.3%	
Formaldehyde	24 h	3	65	5%	NAPS #60211 (Windsor West)
Benzo(a)pyrene	24 h	0.0001	5.00E-05	213%	NAPS #60430 (Toronto West) NAPS # 60438 (Toronto) NAPS #60439 (Toronto Downtown)
	Annual	0.00001 [C]	1.00E-05	115%	
Methylene Chloride [A]	24 h	1.3	220	1%	Clarkson Air Monitoring and NAPS #60438 (Toronto)
	Annual	0.6	44	1.4%	
Total Reduced Sulphur (as H_2S)	10 min	1.4 [D]	13	11%	MECP #29000 (Hamilton)
	24 h	0.3	7	5%	

Contaminant	Averaging Period	Baseline Concentration (µg/m³)	Air Quality Threshold (µg/m³)	% of Threshold	Data Source
Xylenes	10 min	6.2 [D]	3000	0.2%	NAPS #60435 (Etobicoke)
	24 h	1.5	730	0.2%	

Notes:

[A] Clarkson air monitoring data supplemented with NAPS or CASIA data

[B] Ambient concentration calculated based on 6-months of Clarkson monitoring data

[C] Concentration was converted from the 24-hour concentration. Reference: Ontario Ministry of the Environment, Conservation, and Parks, 2018 (“Procedure for Preparing an Emission Summary and Dispersion Modelling Report”)

[D] The 10-minute concentration was converted from the 24-hour concentration. Reference: Ontario Ministry of the Environment, Conservation, and Parks, 2018 (“Procedure for Preparing an Emission Summary and Dispersion Modelling Report”)

As shown in **Table 5-1,** ambient concentrations of benzo(a)pyrene are greater than the 24-hour and annual air quality thresholds. Benzo(a)pyrene was not monitored by WSP, the nearest monitoring station that was used for baseline concentrations is situated next to Highway 401 as there are not many monitoring stations that monitor benzo(a)pyrene in the surrounding area. Using this location for the baseline concentration is conservative as it likely has higher concentrations of benzo(a)pyrene than at the Clarkson TSA due to the higher volume of traffic experienced on Highway 401.

Benzo(a)pyrene and other polycyclic aromatic hydrocarbons (PAHs) are widespread environmental contaminants formed during incomplete combustion or pyrolysis of organic material. These substances are found in air, water, soils and sediments, generally at trace levels except near their sources. Benzo(a)pyrene is released to the atmosphere from a wide variety of anthropogenic and natural sources including wildfires (ACGIH, 2019). Biomass burning is the most important category of PAH emissions in Canada given that wildfires and residential wood combustion are the largest reported natural and anthropogenic sources, respectively (Tevlin et al, 2020). Residential wood combustion (RWC) is also used for recreational purposes in winter (wood-burning fireplaces) and summer (fire pits, chimineas, and outdoor ovens and smokers) (Tevlin et al, 2020).

National anthropogenic PAH emissions reported through Canada's Air Pollutant Emissions Inventory have declined by a factor of three since 1990 and are now dominated by residential wood combustion (Tevlin et al, 2020). The most recent contributions from motor vehicle exhaust are comparatively small at 8 % of the anthropogenic total when accounting is conducted at the national scale. When assessed at the local scale, vehicles contribute more to PAH burdens in ambient air (Tevlin et al, 2020). Air in the Greater Toronto Area has vehicle contributions up to 50 %, and smaller municipalities that are near major highways but otherwise have few PAH sources can have vehicle contributions up to 90 % (Tevlin et al, 2020). The benzo(a)pyrene concentrations reported at the Site fall within the ranges reported in Ontario and Canada and are to be expected in urban areas.

The figure provided below illustrates ambient concentrations of benzo(a)pyrene in comparison with guidelines (Tevlin et al, 2020). Annual average ambient air guidelines from the provinces of Ontario (ON), Alberta (AB) and Quebec (QC) are depicted as horizontal blue lines.

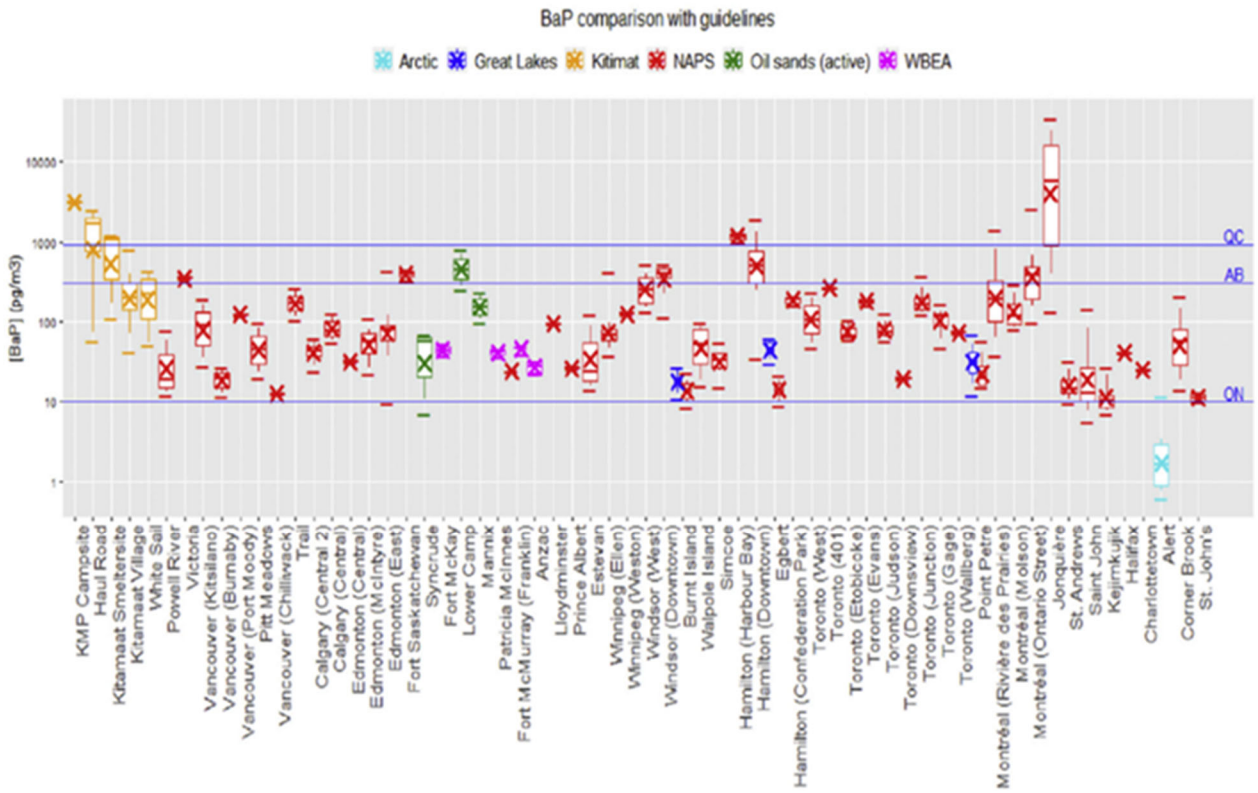


Figure 5-1 Measured Range of Annual Average Benzo(A)Pyrene Concentrations (pg/m^3)

Ambient concentrations of acrolein are also greater than the 24-hour air quality threshold. Acrolein is released to the atmosphere from a wide variety of anthropogenic and natural sources including forest, crop and grassland fires (MOE, 2009). Man-made sources of acrolein

include industrial emissions from manufacturing facilities that make or use acrolein, fossil fuel combustion, motor vehicle exhaust, tobacco smoke, burning of animal and vegetable fats, heating of lubrication oils, burning of wood and plastics and aquatic and terrestrial pesticide uses (MOE, 2009). Forest product manufacturing processes that release VOCs are also known to emit significant amounts of acrolein to the air (MOE, 2009).

From 1996 to 1998, acrolein concentrations in three urban locations in Ontario ranged from 0.14 to 0.25 µg/m^3 with a range of maximum concentrations from 0.56 to 0.71 µg/m^3 (MOE, 2009). From 1989 to 1996, the ECCC NAPS program reported acrolein levels in major urban areas across Canada ranging from 0.05 µg/m^3 to 2.47 µg/m3 with a mean of 0.18 µg/m^3. The highest level in a suburban area was 1.85 µg/m^3 and in a rural area was 0.33 µg/m^3. The acrolein concentrations reported at the Site fall within the ranges reported in Ontario and across Canada and are to be expected in urban areas.

As shown in **Table 5-1**, ambient concentrations of benzene are greater than the annual air quality threshold. Benzene was monitored by WSP for six months; therefore, WSP monitoring data was supplemented with NAPS monitoring data to provide a more representative annual baseline concentration. The nearest monitoring station that was used for baseline concentrations is situated next to Highway 401 as there are not many monitoring stations that monitor benzene in the surrounding area. Using this location for the baseline concentration is conservative as it likely has higher concentrations of benzene than at the Clarkson TSA due to the higher volume of traffic experienced on Highway 401.

All other contaminants of concern are below ambient air quality thresholds.

5.1 Impacts of COVID-19 on Ambient Air Quality

5.1.1 Metrolinx Train Data

Metrolinx has reported ridership on GO Trains being down to less than 10 % of the pre-pandemic levels from April to September 2020. Due to the decreased ridership, Metrolinx reduced the number of trains. WSP evaluated the train schedules as changes were made and determined the actual decrease in train activity for the GO Trains that stop at the Clarkson GO Station. Based on the schedule updates provided to the public by Metrolinx, the following changes were made to the Lakeshore West line since the start of the pandemic. On March 30, 2020 the express rush-hour trips were no longer running. There were further reductions on April 14, 2020 and again on April 27, 2020. On June 9 most of the trains on the Lakeshore West line were reduced from twelve to six coaches. There were still select rush hour trains which had twelve coaches. There were further reductions in the number of coaches per train that began on June 22, 2020. Sampling began on July 8, 2020, when train activity had already been reduced. On September 5, 2020, as the lockdown restrictions were being removed, the

rush hour service was resumed, providing trains every 15 to 30 minutes during rush hours and hourly or better in the midday, evenings and weekends. Most of the trains were still reduced to six cars per train. There were no further updates provided by Metrolinx until after the monitoring was completed in January 2021. Based on the available historic train schedules for the Lakeshore West line, there was a significant decrease in train activity. The following table, **Table 5-2** shows the number of train stops at the Clarkson GO Station.

Table 5-2 Number of Train Stops at Clarkson GO Station

	WEEKDAY		WEEKEND		
Schedule Date	**Eastbound**	**westbound**	**eastbound**	**westbound**	**Weekly total**
05-Jan-19	56	51	35	37	**893**
12-Apr-20	21	21	18	19	**368**
05-Sep-20	34	34	19	19	**552**
Percent Reduction in April 2020	63 %	59 %	49 %	49 %	**59 %**
Percent Reduction in September 2020	39 %	33 %	46 %	49 %	**38 %**

The total weekly stops at the Clarkson GO Station saw a percent decrease of 59 % when comparing the 2019 schedule with the April 2020 schedule. On September 5, 2020, when the schedule was increased there was still 38 % fewer train stops than during pre-COVID conditions. The reduction in train activity in the area likely contributed to reductions in nitrogen oxides, sulfur dioxide, and particulate matter that were being monitored by WSP.

5.1.2 Roadway Traffic

Official traffic data was unavailable to WSP at the time of preparing this report. There was some data available through TomTom's satellite navigation devices that show a decrease in rush hour traffic, between 33 % and 62 %, as shown in **Table 5-3**.

Table 5-3 Percent Reduction in Traffic Due to Covid-19

Month	AM Rush Hour Congestion (% Reduction)	PM Rush Hour Congestion (% Reduction)
July	62 %	43 %
August	51 %	33 %
September	59 %	37 %
October	53 %	43 %
November	61 %	46 %
December	58 %	45 %
Average	**57 %**	**41 %**

Without valid traffic data specific to the area (Royal Windsor Drive and Southdown Road), it is impossible to know the exact reduction in traffic around the Site; however, it can be assumed that it was reduced by approximately 50 %.

5.1.3 Ambient Data Comparison

In order to assess the potential impacts of the COVID-19 pandemic and associated provincial shut-downs on local air quality, the CASIA data over five years (2014 – 2018) during the same six-month period (July – December) was compared to the data collected at WSP's ambient air monitoring station for $PM_{2.5}$ and NO_X. A comparison of monitoring data is presented in **Table 5-4 and Table 5-5.**

Table 5-4 SP and Historical CASIA Data Comparison – $PM_{2.5}$

	Station ID	24-Hour 90th Percentile (µg/m³)	Six Month Mean (µg/m³)
CASIA 2014	STN46118	18.3	10.2
	STN44086	17.0	9.8
CASIA 2015	STN46118	18.5	9.5
	STN44086	19.0	9.8
CASIA 2016	STN46118	15.4	9.3
	STN44086	14.4	8.9
CASIA 2017	STN46118	15.3	10.2
	STN44086	15.4	10.3
CASIA 2018	STN46118	15.8	9.7
	STN44086	17.1	10.9
CASIA Average		16.6	9.9
WSP		15.1	6.6
Percent Change		**-9.0 %**	**-33.3 %**

Table 5-5 WSP and Historical CASIA Data Comparison – NO_X

	Station ID	24-Hr 90th Percentile (ppb)	24 Hr 98th Percentile (ppb)	1 Hr 90th Percentile (ppb)	1 Hr 98th Percentile (ppb)	Six Month Mean (ppb)
CASIA 2014	STN46118	15.3	28.9	20.7	42.0	9.4
	STN44086	20.3	34.9	24.0	52.0	11.1
CASIA 2015	STN46118	19.6	30.3	21.0	47.0	9.6
	STN44086	24.1	48.7	28.0	64.0	12.2
CASIA 2016	STN46118	20.1	38.7	23.0	48.0	10.7
	STN44086	21.4	53.9	23.0	71.0	11.4
CASIA 2017	STN46118	21.3	42.1	27.0	56.0	12.6

	Station ID	24-Hr 90th Percentile (ppb)	24 Hr 98th Percentile (ppb)	1 Hr 90th Percentile (ppb)	1 Hr 98th Percentile (ppb)	Six Month Mean (ppb)
	STN44086	23.8	46.1	28.0	65.9	12.2
CASIA 2018	STN46118	13.2	29.6	16.0	38.0	7.5
	STN44086	18.4	36.6	20.0	51.0	10.0
CASIA Average		19.7	39.0	23.1	53.5	10.7
WSP		24.7	36.1	23.6	55.4	10.5
Percent Change		**25.2 %**	**-7.4 %**	**2.1 %**	**3.5 %**	**-1.3 %**

Based on the six-month mean data comparisons presented in **Table 5-4** and **Table 5-5**, there was a 1.3 % decrease in NO_x concentrations and a 33.3 % decrease in $PM_{2.5}$ concentrations which may have been due to reduced vehicle traffic in the area, or could also be attributed to the difference in station locations or methodology. It should be noted that there is a difference in location and direct comparison between the two data sets has unknown variables. This data comparison demonstrates the reduction in $PM_{2.5}$ being 33.3 % less than the 6-month mean from the CASIA data. The 6-month mean for NOx was only reduced by 1.3 %; however, the 90th percentile increased by 25.2 %. In order to better quantify potential bias adjustment factors for COVID-related impacts on air quality recent data from MECP monitoring stations were assessed. The results are presented in the following section of the report.

Dispersion modelling was completed using supplemented data from January to July to account for the first half of the year when ambient concentrations were not monitored. The baseline concentrations for $PM_{2.5}$, NO_X, PM_{10}, SO_2, benzene and methylene chloride were supplemented with NAPS data from January - July 2019 which helps to adjust to pre-COVID-19 conditions.

5.1.4 MECP Bias Adjustment Factors

MECP air quality data was used to determine bias adjustment factors for WSP's data collected in 2020. MECP air quality data was selected for comparison and development of a bias factor over CASIA data because the MECP monitoring program uses the same sampling methodology and type of equipment. The CASIA should not be compared directly as the sampling methodology and the type of equipment which was used to conduct the sampling are not equivalent to the ones used by the MECP and WSP. MECP data for NO_2, $PM_{2.5}$, and SO_2 were analyzed to determine the percent change from 2019 to 2020. Since the majority of

WSP's sampling took place from July – December 2020, the same period was used when calculating the percent change in the MECP data.
The following table includes a list of MECP monitoring stations used to determine the bias adjustment factors.

Table 5-6 MECP Monitoring Stations Used for Bias Adjustment Factor

Station Name	Contaminants
Mississauga	NO2, PM2.5
Toronto West	NO2, PM2.5, SO2
Toronto North	NO2, PM2.5, SO2
Hamilton Downtown	SO2
Hamilton Mountain	SO2

The following tables include the percent change from 2019 (July-December) to 2020 (July-December).

Table 5-7 NO_2 Bias Adjustment Factor

	Percent Change 2019 – 2020	Average Percent Change per Year (5 Year Average)
Mississauga	-24%	3%
Toronto West	-18%	-1%
Toronto North	-24%	-6%
Average	-22%	-1%

Based on the table above it can be concluded that an approximate percent change for NO_2 concentrations from July – December (monitoring period) due to COVID-19 influences would be -21%. WSP's data set was multiplied by the bias adjustment factor of 1.266 to account for the 21% decrease from 2019. This data was then incorporated into supplementary data to obtain a baseline concentration.

Table 5-8 $PM_{2.5}$ Bias Adjustment Factor

	Percent Change 2019 – 2020	Average Percent Change (5 Year Average)
Mississauga	-2%	-4%
Toronto West	1%	-2%
Toronto North	-11%	-7%
Average	-4%	-4%

The table above demonstrates that $PM_{2.5}$ has been decreasing by approximately 4% each year since 2015. The average decrease as a result of COVID-19 lockdowns is also 4%, so it can be concluded that no bias adjustment factor is required. Further to this, $PM_{2.5}$ decreased less in 2020 when compared to the average percent change over the previous five years at the Mississauga MECP monitoring station.

Table 5-9 SO_2 Bias Adjustment Factor

	Percent Change 2019 – 2020	Percent Change 2018 - 2020	Percent Change 2018 - 2019
Toronto West	-25%	1%	34%
Toronto North	7%	-39%	-43%
Hamilton Downtown	-22%	-13%	11%
Hamilton Mountain	-6%	21%	29%
Average	-12%	-8%	8%

The data quality for SO_2 from MECP is not ideal for these purposes. The data collected from 2015 – 2018 does not include a decimal place, resulting in rounding errors when calculating the mean. There is also no station located in Mississauga that records SO_2 so two stations in

Hamilton were included. Since there does not appear to be any clear trend in the dataset, the average percent change from 2019-2020 and 2018-2020 was used. The average percent change is -10% in 2020, due to the impact of COVID-19 lockdowns. WSP's data set was multiplied by the bias adjustment factor of 1.111 to account for the 10% decrease as a result of COVID-19 lockdowns. This is a conservative approach considering that the average percent change from 2018-2019 (no COVID-19 impact) was an 8% increase, meaning the average decrease is only -2%. This data was then combined with supplementary data from NAPS to obtain a baseline concentration.

5.1.5 COVID-19 Correction Recommendations

Assuming a worst-case scenario based on the MECP data comparison, where NO_2 concentrations were reduced by 22 % due to the reduction in traffic and train activity, the NO_2 concentrations may have been as high as 13.5 ppb, which is still below the 24-hour AAQC for nitrogen dioxide of 100 ppb. Based on the MECP data comparisons for 2019 and 2020 there was no significant change in $PM_{2.5}$ concentrations as a result of COVID-19. The average for the three (3) MECP monitoring stations was a 4% decrease, which is the same as the average decrease per year over the past 5 years. As an absolute worst-case scenario, $PM_{2.5}$ can be assumed to have been reduced by 4 % and the actual concentration may have been 6.9 µg/m³, which is below the annual AAQC and below the 24-hour AAQC threshold.

When assessing the reduction in nearby industrial activity, WSP has concluded that the WWTP most likely would have seen no impact, since the stay-at-home orders and business closures would not have impacted throughput. Petro Canada Lubricants confirmed verbally that their boilers did not slow down throughout 2020 when compared to 2019. Since their boilers are the primary source of the contaminants of concern evaluated in this study, it can be assumed that there were no significant changes due to the pandemic. There was likely some reduction in production at CRH; however, the data required to quantify the reduction was not available at the time this report was prepared. The emission factors used for the dispersion modelling for CRH are based on public NPRI data and working hours.

WSP determined the baseline concentrations using WSP's monitoring data from approximately July – December 2020 combined with supplementary data from the most appropriate source (CASIA, NAPS or MECP). The bias adjustment factors determined from the MECP data were applied to WSP's monitoring data (NO_2, $PM_{2.5}$ and SO_2) to account for the effects of COVID-19 lockdowns on the surrounding air quality.

At the time of this report submission, there are no full datasets for 2020 for the other contaminants monitored as part of this study (benzene, acrolein, methylene chloride, PM_{10}, TSP).

6 Ambient Air Monitoring Conclusions

Based on the ambient monitoring completed over the six-month monitoring period, the following conclusions have been made:

— Data collected since 2015 from NAPS ambient air quality monitoring stations were used to compare with monitoring results. Only data available from NAPS stations closest to the study area and generally similar in surroundings were used to allow for a representative comparison;

— Acrolein concentrations during the monitoring period were higher when compared to representative NAPS stations (2015 - 2019); however, the difference in analytical methodologies does not allow for a reasonable comparison, as such the 2007 data from the MECP Clarkson Airshed Study was used;

— Acrolein concentrations during the monitoring period were lower than the 2007 MECP air quality study. Sources of elevated acrolein concentrations could not be identified in the MECP study due to the variation in wind direction during sampling events, the same is true based on an examination of wind patterns over the six-month study just completed. No wind direction aligned with a single producer/traffic source when acrolein levels were recorded elevated compared to the AAQC;

— More than half of the acrolein samples analyzed in the six-month study were below the laboratory detection limit of 0.23 µg/m^3;

— There were no benzene samples analyzed that were greater than the 24-hour AAQC of 2.3 µg/m^3;

— $PM_{2.5}$ concentrations collected during the monitoring period were comparable or less than $PM_{2.5}$ concentrations of historic nearby NAPS stations. There was one sample that had an elevated concentration compared to the 24-hour AAQC limit for $PM_{2.5}$;

— PM_{10} concentrations collected during the monitoring period were comparable to PM_{10} concentrations of historic nearby NAPS stations. There were two sample days that had measured levels elevated compared to the 24-hour AAQC for PM_{10} of 50 µg/m^3;

— No representative TSP data was available to compare TSP sampling results; there were no 24-hour concentrations elevated compared to the 24-hour AAQC;

- Continuous SO_2 and NO_X data collected during the monitoring period were below the respective AAQC guidelines;
- The 90th percentile concentration of NO_2 was greater than the CAAQS annual concentration (2025). This standard is meant to be based on the average over a single calendar year of all 1-hour average concentrations, not 90th percentiles. The 6-month mean for NO_2 was 18.1 µg/m^3, assuming there was a 21% decrease due to COVID-19 lockdowns this becomes 22.9 µg/m^3, within the conservative 2025 CAAQS. The cumulative concentrations meet the 2020 CAAQS limits and the AAQC limits.
- Meteorological data from Petro Canada Lubricants was received and ambient data analysis for trends was completed as part of air quality dispersion modelling assessment; and
- Although monitoring data shows elevated concentrations compared to the annual AAQC for benzene, it should be noted that an AAQC guideline is a concentration of a contaminant in the air that is protective against adverse effects on health and/or the environment. Benzene exceedances are common across Ontario near sensitive receptors containing high-density residential areas; the magnitude and potential source contribution of elevated benzene will be examined as part of the air quality dispersion modelling assessment.

7 Prevailing Wind Directions

Figure 7-1 illustrates the expected prevailing wind directions at the proposed development. Wind data was obtained from the Clarkson Air Shed Monthly Columnar Data Set (Station ID# 44666) provided by Petro Canada Lubricants Inc. The data from this station was selected to best represent meteorological conditions at the proposed development due to its proximity to the proposed development, data availability over five years, and similar surrounding land uses. Data from January 1, 2016 to December 31, 2020 was used to determine prevailing winds at the Site. Based on the data, prevailing winds are expected to be blowing from the west-southwest and east-northeast. A wind rose diagram with data covering the monitoring period and each sample day can be found in **Appendix E**. When comparing the wind speed and direction for each sample date there was no clear trend indicating where sources of the sampling parameters may have been located.

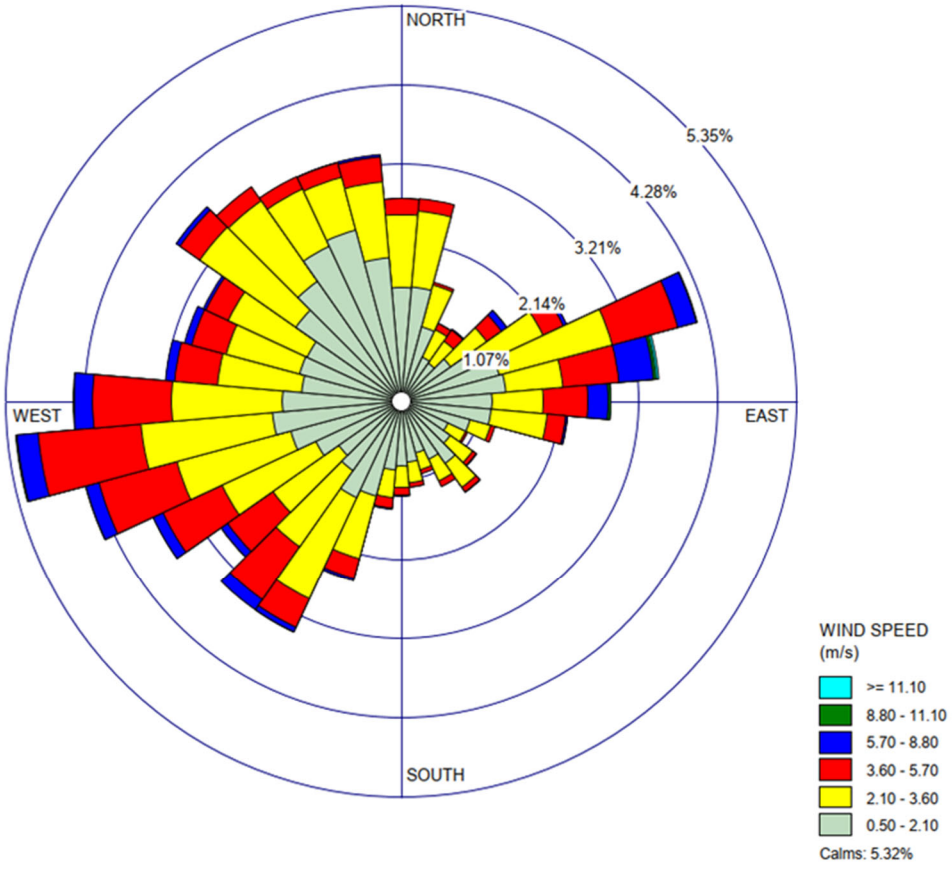


Figure 7-1 Clarkson Prevailing Wind Directions

8 Evaluation of Surrounding Land Uses

Based on the D-6 Guideline, a study area of 1 000 m around the Site was established. The D-6 Guideline outlines a recommended minimum separation distance and potential influence area between industrial facilities and sensitive land uses for three classes of industrial use. The recommended minimum separation distance is the distance (property line to property line) between the incompatible land uses, where industrial use has the potential to cause an adverse effect. The potential influence area is a greater distance in which the industrial operations may have the potential to cause an adverse effect, depending on site operations and meteorological conditions. Additionally, the facilities that are outside of their respective recommended minimum separation distance and potential influence area are expected to have no potential for creating nuisance issues that would give rise to complaints.

In this assessment, facilities of potential concern were assessed based on facility provided emission data, the National Pollutant Release Inventory (NPRI), the Environmental Activity and Sector Registry (EASR) or the Environmental Compliance Approval (ECA) data published online in the Environment Registry of Ontario, aerial photography, and other publicly available data.

8.1 D-6 Guideline

The objective of the D-6 Guideline is to prevent or minimize the encroachment of sensitive land uses upon industrial land uses and vice versa. These two land uses are normally incompatible due to possible adverse effects on sensitive land uses created by industrial operations. For the purpose of this study, a commercial or employment land use is considered an industrial operation in terms of the potential to adversely impact a sensitive land use. The D-6 Guideline categorizes industrial facilities into three classes according to their size, the volume of operations, and nature of their emissions and defines what a sensitive land use is.

The D-6 Guideline provides definitions and examples to illustrate the three industrial classes, provided in **Appendix F**. Facilities that do not meet the definition of any one of the three industrial classes have little to no potential for creating nuisance issues that would give rise to complaints. The definitions and examples in the D-6 Guideline relevant to air quality concerns were used to characterize the nearby facilities. The D-6 Guideline defines a recommended minimum separation distance and potential influence area between industrial facilities and sensitive land uses for each industrial classification, presented in **Table 8-1**.

Table 8-1 Guideline D-6 Recommended Minimum Separation Distance And Potential Influence Areas For Industrial Land Uses

Industrial Classification	Recommended Minimum Separation Distance (m)	Potential Influence Area (m)
Class I – Light Industrial	20	70
Class II – Medium Industrial	70	300
Class III – Heavy Industrial	300	1,000

8.2 Facilities Within Potential Influence Area

A total of 55 industrial facilities surrounding the proposed development were qualitatively assessed for the potential for adverse air quality impacts at the proposed development, as shown in **Table F-1** of **Appendix F**. The locations of industrial facilities identified surrounding the proposed development are shown in **Figure 8-1**. A summary of facilities located within the potential influence area or recommended minimum separation distance is shown in **Table 8-2**. There are 16 facilities located within the potential influence area and six facilities located within the recommended minimum separation as shown. The remaining facilities identified are located outside the potential influence area and are shown in **Table 8-3**.

Figure 8-1 Surrounding Industrial Facilities

Table 8-2 Summary of Industrial Facilities Within the Recommended Minimum Separation Distance or Potential Influence Area

Facility ID	Facility	Address	Industrial Classification	Approximate Distance From Site (m)	Public Reporting	Facility Within Recommended Minimum Separation Distance	Facility Within Potential Influence Area	Quantitative Air Quality Assessment Required	Comments/Rationale
A2	H.L. Blachford Limited [A]	2323 Royal Windsor Drive	III	620	Yes	No	Yes	Yes	Located within potential influence area, public air emission data available
A4	All Tank (1342131 Ontario Limited) [A]	2460 Royal Windsor Drive	III	988	Yes	No	Yes	Yes	Located within potential influence area, public air emission data available
A10	Greater Toronto Transit Authority (Clarkson Go Station) [A]	1110 Southdown Road	I	7	No	Yes	Yes	No	Located within the minimum separation distance, however, the Clarkson GO Station has an ECA for a standby diesel generator to be used during emergency situations and periodic testing. Is it expected, given its purpose, that the diesel generator will be located near a building. The nearest building to the Site is the parking garage approximately 118 m northwest of the Site. The diesel generator will be used infrequently and is expected to be located outside the recommended minimum separation distance and potential area of influence. Any additional emissions from the facility would have been captured in ambient data.
A11	ICS Universal Drum Reconditioning Limited [A]	2460 Royal Windsor Drive	III	988	Yes	No	Yes	Yes	See All Tank (Facility ID A4)
A12	IPEX Inc. [A]	2441 Royal Windsor Drive	III	882	Yes	No	Yes	Yes	Located within potential influence area, public air emission data available
A14	Petro Canada Lubricants Inc [A]	385 Southdown Road	III	887	Yes	No	Yes	Yes	Located within potential influence area, public air emission data available
A15	CRH Canada Group [A]	2391 Lakeshore Rd West	III	990	Yes	No	Yes	Yes	Located within potential influence area, public air emission data available
A16	Stackpole International Powder Metal [A]	2430 Royal Windsor Drive	III	796	Yes	No	Yes	Yes	Located within potential influence area, public air emission data available
A17	Stackpole Powertrain International [A]	2400 Royal Windsor Drive	III	884	Yes	No	Yes	Yes	Located within potential influence area, public air emission data available
A18	Trans-Northern Pipelines Inc [A]	385 Southdown Road	III	887	Yes	No	Yes	Yes	Located within potential influence area, public air emission data available
A22	Musket Transportation Ltd	2215 Royal Windsor Drive	II	223	No	No	Yes	No	Located within the potential influence area, however expected emissions associated with the facility (road dust) would be captured in ambient data

Facility ID	Facility	Address	Industrial Classification	Approximate Distance From Site (m)	Public Reporting	Facility Within Recommended Minimum Separation Distance	Facility Within Potential Influence Area	Quantitative Air Quality Assessment Required	Comments/Rationale
A27	Ritcey Custom Cabinetry	2133 Royal Windsor Drive	I	0	No	Yes	Yes	No	Located within the minimum separation distance; however, expected emissions associated with the facility (dust) would be captured in ambient data.
A29	WaySide Auto Service	2133 Royal Windsor Drive	I	0	No	Yes	Yes	No	Located within the minimum separation distance; however, expected emissions associated with the facility would be captured in ambient data.
A30	Audi Repair Mississauga - Lorne Park Car Centre	2133 Royal Windsor Drive	I	0	No	Yes	Yes	No	Located within the minimum separation distance; however, expected emissions associated with the facility would be captured in ambient data.
A48	Caruso's Service Centre Inc.	2133 Royal Windsor Drive	I	0	No	Yes	Yes	No	Located within the minimum separation distance; however, expected emissions associated with the facility would be captured in ambient data.
A55	Mississauga BMW Repair	2133 Royal Windsor Drive	I	0	No	Yes	Yes	No	Located within the minimum separation distance; however, expected emissions associated with the facility would be captured in ambient data.

Notes: [A] Facility operates under Section 9 approval (ECA/EASR).

Table 8-3 Summary of Industrial Facilities Outside the Potential Influence Area

Facility ID	Facility	Address	Industrial Classification	Approximate Distance from Site (m)	Public Reporting	Facility Within Recommended Minimum Separation Distance	Facility within Potential Influence Area	Quantitative Air Quality Assessment Required	Comments/Rationale
A1	Longlac Wood Industries Inc. [A]	2311 Royal Windsor Drive	II	420	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A3	1375 Southdown Road Ltd [A]	1375 Southdown Road	I	995	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A5	Autobody shop [A]	8-2355 Royal Windsor Drive	I	705	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A6	Bruckmann Manufacturing Inc. [A]	2265 Royal Windsor Drive	II	408	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A7	Corporation of the City of Mississauga - Fire Station #103 [A]	2035 Lushes Lane	I	140	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)

Facility ID	Facility	Address	Industrial Classification	Approximate Distance from Site (m)	Public Reporting	Facility Within Recommended Minimum Separation Distance	Facility within Potential Influence Area	Quantitative Air Quality Assessment Required	Comments/Rationale
A8	Clarkson Wastewater Treatment Plan [A]	2307 Lakeshore Road West	III	1600	Yes	No	No	Yes	Located outside potential influence area for applicable facility Class (1000 m); however, the facility has the potential for significant air emissions and public air emission data is available
A9	FMK Holdings Inc. [A]	2355 Royal Windsor Drive	II	705	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A13	The Peel District School Board [A]	1290 Kelly Drive	I	937	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A19	Trimac Transportation Services [A]	474 Southdown Road	II	1450	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A20	Wawel Villa Incorporated [A]	880 Clarkson Road South	I	690	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A21	Bernardi Building Supply	2235 Royal Windsor Drive	II	330	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A23	Car Pride Auto Spa	2380 Royal Windsor Drive	I	645	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A24	Canada Fruit	885 Avonhead Rd	II	653	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A25	Praxair Canada Inc. - CO2 Plan	566 Southdown Road	II	1300	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A26	Cleanharbors Canada [A]	551 Avonhead Road	III	1200	Yes	No	No	Yes	Located outside potential influence area (1000 m); however, the facility has the potential for significant air emissions and public air emission data is available
A28	AGT Products Inc.	2311 Royal Windsor Drive	II	420	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A31	Midas	2175 Royal Windsor Drive	I	226	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A32	City of Mississauga - Clarkson Yard	2167 Royal Windsor Drive	I	132	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A33	ShipShape Marine LTD	2265 Royal Windsor Drive	II	408	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A34	Victoria Strong	2463 Royal Windsor Drive	II	1015	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A35	Cam Tech Automotive Services	2355 Royal Windsor Drive	I	705	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A36	Nestle Purina Petcare [A]	2500 Royal Windsor Drive	III	1160	Yes	No	No	Yes	Located outside potential influence area for applicable facility Class (1000 m); however, the facility has the potential for significant air emissions and public air emission data is available

Facility ID	Facility	Address	Industrial Classification	Approximate Distance from Site (m)	Public Reporting	Facility Within Recommended Minimum Separation Distance	Facility within Potential Influence Area	Quantitative Air Quality Assessment Required	Comments/Rationale
A37	UBA Inc.	2605 Royal Windsor Drive	III	1410	Yes	No	No	Yes	Located outside potential influence area for applicable facility Class (1000 m); however, the facility has the potential for significant air emissions and public air emission data is available
A38	Total Ready Mix Limited (2159978 Ontario Limited) [A]	1040 Winston Churchill Boulevard	II	1850	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A39	Mancor Canada Inc. [A]	2481 Royal Windsor Drive	II	1860	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A40	Ashland Canada Corp. [A]	2620 Royal Windsor Drive	III	1600	No	No	No	No	Located outside potential influence area for applicable facility Class (1000 m)
A41	Nexeo Solutions [A]	2620 Royal Windsor Drive	III	1600	No	No	No	No	Located outside potential influence area for applicable facility Class (1000 m), public air emission data available however the facility operates with an environmental permit and there are no tall stacks or sources of emissions greater than 50 m in height, so it is assumed that emissions are compliant at the property boundary. Fugitive emissions would have been captured in ambient data.
A42	Tri-Phase Environmental Inc. [A]	446 Hazelhurst Rd	II	2190	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A43	The Corporation of the Regional Municipality of Peel	1201 Walden Circle	I	178	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A44	Interim Place	735 Southdown Road	I	750	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A45	ORTECH Consulting Inc.	804 Southdown Road	I	510	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A46	Bosch Service	1806 Lakeshore Rd West	I	770	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A47	Mississauga Auto Centre	1800 Lakeshore Rd West	I	770	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A49	Canadian Tire Auto Parts & Service	900 Southdown Road	I	80	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A50	Davey Tree Expert Co. of Canada, Limited	2265 Royal Windsor Drive	II	408	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)

Facility ID	Facility	Address	Industrial Classification	Approximate Distance from Site (m)	Public Reporting	Facility Within Recommended Minimum Separation Distance	Facility within Potential Influence Area	Quantitative Air Quality Assessment Required	Comments/Rationale
A51	Canadian Home Granite & Tiles	2265 Royal Windsor Drive	I	408	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A52	Tech Reset	2301 Royal Windsor Drive	I	520	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)
A53	PPG Automotive Refinish Canada Inc.	2301 Royal Windsor Drive	II	520	No	No	No	No	Located outside potential influence area for applicable facility Class (300 m)
A54	Canadian Automotive Refinish	2355 Royal Windsor Drive	I	705	No	No	No	No	Located outside potential influence area for applicable facility Class (70 m)

9 Sources and Contaminants

9.1 Stationary Sources

Industrial facilities within the Study Area were assessed per the MECP's D-Series of Guidelines, specifically the D-6 Guideline "Compatibility Between Industrial Facilities" (D-6 Guideline). A total of 9 facilities were identified as requiring further assessment based on their expected or known operations, proximity to the Site, publicly available air emission data, and ECAs. An additional four facilities were identified to require further assessment due to known operations, emissions reporting, and the presence of tall stacks greater than 50 m in height.

9.2 Facility Provided Emission Data

Facility air emission data was provided by H.L. Blachford, Stackpole International Powder Metal (Stackpole), and Clarkson Wastewater Treatment Plant (WWTP) in the form of the Emission Summary and Dispersion Modelling (ESDM) tables, which outline the facility emission rates for contaminants emitted to air from the facility as part of the ECA application process. Contaminants included in the facility ESDM reports which are also emitted by other facilities or which were included in ambient air monitoring were further assessed. A summary of shared contaminants emitted from these facilities is provided in **Table 9-1** and was quantitatively assessed for their potential to impact air quality at the proposed development. It should be noted that all contaminants included in H.L Blachford, Stackpole International Powder Metal, and Clarkson WWTP ESDM tables were below applicable air quality criteria at the facility's property boundary.

Table 9-1 Facility ESDM Contaminant Summary

Facility ID	Facility	Contaminants Reported in ESDM Report
A2	H.L. Blachford Limited	Diethanolamine, NO_X, TSP
A8	Clarkson Wastewater Treatment Plant	Ammonia, NO_X, SO_2, TRS, TSP,
A16	Stackpole International Powder Metal	Benzene, benzo(a)pyrene, cadmium, carbon monoxide, cobalt, manganese, nickel, nitrogen oxide, particulate matter, zinc

9.3 Facilities Reporting Emissions to NPRI

Facilities surrounding the Site were also qualitatively assessed for their potential to impact air quality through a review of the National Pollutant Release Inventory (NPRI) databases from 2016 to 2018 which correspond to the most recent publicly available data. A total of 13 facilities listed in **Table 8-2** and **Table 8-3** reported emissions to air in the NPRI from 2016 to 2018. A summary of NPRI reporting facilities is presented in **Table 9-2**.

Table 9-2 NPRI Reporting Facilities Within the Study Area

FACILITY ID	FACILITY	CONTAMINANTS REPORTED [A]	STACKS > 50 M
A2	H.L. Blachford Limited	Chlorinated alkanes, diethanolamine, zinc	No
A4	All Tank (1342131 Ontario Limited)	$PM_{2.5}$, PM_{10}, methyl ethyl ketone, isopropyl alcohol, toluene, xylene, hydrotreated light distillate, heptane, naphthalene, ethyl acetate, methyl isobutyl ketone, hydrochloric acid	No
A8	Clarkson Wastewater Treatment Plan	Ammonia, phenanthrene, carbon monoxide, sulphur dioxide, total particulates, hexane, toluene, NOx (as NO_2), TRS (as H_2S), hydrogen sulphide, fluorene, acenaphthylene, benzene, naphthalene, anthracene, formaldehyde, fluoranthene, benz(a)anthracene, benzo(j)fluoranthene, acenaphthene, dibenz(a,h)anthracene, 7,12-dimethylbenz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-c,d)pyrene, benzo(g,h,i)perylene, 3-methylchloranthrene, pyrene, mercury, lead, cobalt, arsenic, vanadium, manganese, copper, cadmium, chromium, selenium, nickel, zinc	No

FACILITY ID	FACILITY	CONTAMINANTS REPORTED [A]	STACKS > 50 M
A11	ICS Universal Drum Reconditioning Limited	See All Tank	No
A12	IPEX Inc. [A]	$PM_{2.5}$, PM_{10}	No
A14	Petro Canada Lubricants Inc	Pentane, butane, propane, propylene, carbon monoxide, methanol, TSP, sulphur dioxide, $PM_{2.5}$, PM_{10}, methyl ethyl ketone, hexane, isopropyl alcohol, sulphuric acid, toluene, NO_x (as NO_2), total reduced sulphur (as H_2S)	Yes
A15	CRH (CRH Canada Group)	Ammonia, phenanthrene, hexachlorobenzene, carbon monoxide, sulphur dioxide, $PM_{2.5}$, PM_{10}, total PM, methyl ethyl ketone, hexane, toluene, NO_X (as NO_2), xylene, heptane, fluorene, acenaphylene, benzene, 1,2,4-trimethylbenzene, mercury, selenium, hydrochloric acid	Yes
A16	Stackpole International Powder Metal	$PM_{2.5}$, PM_{10}, nickel	No
A17	Stackpole Powertrain International	See Stackpole International Powder Metal	No
A18	Trans-Northern Pipelines Inc (TNPI)	Naphthalene, MTBE, ethyl alcohol, benzene, cumene (isopropyl benzene), cyclohexane, ethyl benzene, hexane, toluene, xylenes [B]	No

FACILITY ID	FACILITY	CONTAMINANTS REPORTED [A]	STACKS > 50 M
A26	Cleanharbors Canada	Carbon monoxide, methanol, isopropyl alcohol, toluene, NO_X (as NO_2), xylene, methyl isobutyl ketone, dichloromethane, formaldehyde, tetrachloroethylene, ethylene glycol	No
A36	Nestle Purina Petcare	$PM_{2.5}$, PM_{10}	No
A37	UBA Inc.	Sulphuric acid, nitric acid, hydrochloric acid	No

Notes: [A] Based on National Pollutant Release Inventory data from 2016 to 2018.
[B] Emission data provided in the TNPI Facility EASR

9.4 Stationary Sources Contaminant Emission Rates

Contaminant emission rates for stationary sources were conservatively estimated using facility ESDM emission data and NPRI reported data from 2016 to 2018 when facility data was not provided. The maximum reported concentration for each contaminant was used to allow for a conservative estimate of emissions from the facility. Facility operating hours reported to NPRI were also used to determine emission rates. If a facility did not report operating hours to NPRI, it was assumed that the facility operates 5 days a week and 12 hours per day, unless otherwise communicated by the facility. Facilities which noted significant shutdown periods in the NPRI reported data were corrected to represent the total working hours of the facility per year. This includes CRH who reported shutdown periods of up to 50 days. Facility operating hours used to determine emission rates are summarized in **Table 9-3**.

Table 9-3 Facility Operating Hours

Facility	Hours Per Day	Days Per Week
H.L. Blachford Limited [B]	-	-
All Tank (1342131 Ontario Limited)	8	5
Clarkson Wastewater Treatment Plan [B]	-	-
Petro Canada Lubricants Inc	24	7

Facility	Hours Per Day	Days Per Week
CRH (CRH Canada Group)	24	6 [A]
Stackpole International Powder Metal/Powertrain [B]	-	-
Cleanharbors Canada	12	5
Nestle Purina Petcare	24	5
UBA Inc.	12	5
TransNorthern Pipeline [B]	-	-
IPEX Inc.	12	5

Notes: [A] Accounts for annual shut down periods up to 50 days
[B] Emission rates provided in ESDM table

Emissions reported to NPRI are generally in tonnes per year. Based on the facility operating hours, these rates were converted to a grams per second emission rate to be used in the air dispersion model, as shown in **Table G-1** of **Appendix G**. Contaminant emission rates for Trans-Northern Pipelines Inc. were estimated based on emission data provided in the facility's EASR. Contaminant emission rates for H.L Blachford, Stackpole, and Clarkson WWTP were estimated based on emission data provided in facility ESDM data. An example emission rate calculation is provided below.

$$\textbf{Petro Canada TSP Emission Rate } \left(\frac{\mathbf{g}}{\mathbf{s}}\right) = \left(\textbf{Maximum Reported NPRI Concentration } \left(\frac{\textbf{tonnes}}{\textbf{year}}\right) \times \mathbf{1\,000\,000} \frac{\mathbf{g}}{\textbf{tonne}}\right) \times \frac{\textbf{year}}{\textbf{364 days}} \times \frac{\textbf{day}}{\textbf{86400}} \textbf{seconds}$$

$$\textbf{Petro Canada TSP Emission Rate } \left(\frac{\mathbf{g}}{\mathbf{s}}\right) = \left(\mathbf{41.6219} \left(\frac{\textbf{tonnes}}{\textbf{year}}\right) \times \mathbf{1\,000\,000} \frac{\mathbf{g}}{\textbf{tonne}}\right) \times \frac{\textbf{year}}{\textbf{364 days}} \times \frac{\textbf{day}}{\textbf{86400}} \textbf{seconds}$$

$$\textbf{Petro Canada TSP Emission Rate } \left(\frac{\mathbf{g}}{\mathbf{s}}\right) = \mathbf{1.32}$$

9.5 Contaminant Negligibility Assessment

A contaminant negligibility assessment was completed to determine which contaminants were to be included in the air dispersion modelling assessment. The negligibility assessment was

based on the procedures outlined in the Air Dispersion Modelling Guideline for Ontario (ADMGO). The negligibility assessment was completed for each facility of concern outlined in **Table 9-4** to determine which contaminants required air dispersion modelling. All contaminants associated with each facility which have the potential to impact the proposed development were screened for negligibility, as shown in **Appendix G**. Contaminants deemed negligible were not incorporated into the modelling assessment; however, their impacts at the Site would have been captured in ambient air monitoring and baseline conditions. Dispersion factors were determined based on the distance of the facility property line to the nearest property boundary of the proposed development. If a contaminant was deemed negligible from a single facility, it was not included in the air dispersion modelling assessment. If a contaminant was deemed negligible from all facilities which emit that contaminant, the combined emissions of that contaminant was assessed for negligibility based on the emission threshold for the nearest facility. Contaminants and facilities included in the negligibility assessment are presented in **Table G-1** of **Appendix G**. Based on the negligibility assessment, a total of 13 contaminants were determined to be significant, as shown below:

— Sulphur dioxide (SO_2);

— Particulate matter less than 2.5 µm in diameter ($PM_{2.5}$);

— Particulate matter less than 10 µm in diameter (PM_{10});

— Nitrogen oxides (as NO_2);

— Sulphuric acid;

— Total reduced sulphur (as H_2S);

— Carbon monoxide (CO);

— Total suspended particulate (TSP);

— Benzene;

— Ammonia;

— Phenanthrene (as benzo(a)pyrene);

— Hydrochloric acid; and,

— Xylene.

It should be noted that phenanthrene which is emitted from the Clarkson WWTP and CRH was not deemed negligible but was not retained for the assessment as it does not have a threshold

value to use for the assessment. Benzo(a)pyrene is the polycyclic aromatic hydrocarbon (PAH) with the most stringent limit, benzo(a)pyrene was used as a surrogate for all PAHs.

9.6 Transportation Sources

Based on the "Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects" (MTO Guide), dated May 2020, and the MECP "Mitigation Strategies and Municipal Road Class Environmental Assessment Air Quality Impact Protocol", dated July 25, 2017, roadway and railway sources within 500 m of the proposed development were assessed for their potential to impact air quality at the Site. **Table 9-4** lists the road and rail sources that have been identified within 500 m of the Site which were included in the air quality assessment.

Table 9-4 Transportation Sources Identified Within the Study Area

Source	Source Type	Approximate Length of Segment Within Study Area (m)	Expected Contaminants
Clarkson GO Station Rail Corridor (travel and idling)	Rail (GO, CN, VIA)	1000	Products of diesel combustion: CO, NO_2, $PM_{2.5}$, PM_{10}, TSP, formaldehyde, benzo(a)pyrene, acetaldehyde, acrolein, benzene
Royal Windsor Drive	Road	703	Products of fuel combustion: CO, NO_2, TSP, PM_{10}, $PM_{2.5}$, and VOCs and common air toxics from mobile-sources: benzene, benzo(a)pyrene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein
Lakeshore Road West	Road	425	Products of fuel combustion: CO, NO_2, TSP, PM_{10}, $PM_{2.5}$, and VOCs and common air toxics from mobile-sources: benzene, benzo(a)pyrene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein

Source	Source Type	Approximate Length of Segment Within Study Area (m)	Expected Contaminants
Southdown Road (North of Royal Windsor/Lakeshore)	Road	588	Products of fuel combustion: CO, NO_2, TSP, PM_{10}, $PM_{2.5}$, and VOCs and common air toxics from mobile-sources: benzene, benzo(a)pyrene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein
Southdown Road (South of Royal Windsor/Lakeshore)	Road	488	Products of fuel combustion: CO, NO_2, TSP, PM_{10}, $PM_{2.5}$, and VOCs and common air toxics from mobile-sources: benzene, benzo(a)pyrene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein
Notes: Limited published information is available for 1,3-butadiene emission factors for trains, therefore emissions of 1,3-butadiene from trains were not included in the assessment.			

9.7 Transportation Contaminant Emission Rates

9.7.1 Passenger Vehicles and Trucks

Vehicle emission rates for the future conditions (2024) were estimated using the USEPA Motor Vehicle Emission Simulator (MOVES), version MOVES3, released November 10, 2020, which is the latest motor vehicle emission estimate model, and which has replaced the Canadian version of MOBILE6.2C and is approved and recommended for use by the MTO and the MECP. The MOVES model allows for coverage of multiple geographic scales and can generate emission estimates for various time periods (hour, day, month, and year). Emission rates for the assessment were estimated using Annual Average Daily Traffic (AADT) data provided by the City of Mississauga and default highway vehicle fleet (age and vehicles type distribution), emissions inspection and maintenance, and fuel properties were adjusted to reflect the geographic area of the Project (Ontario). AADT values were projected to 2024 using an annual growth rate of 1 %, as outlined in the City of Mississauga Transportation Master Plan dated May 2019. Emission rates for particulate matter included resuspension emissions. MOVES option selections are presented in **Table H-1** in **Appendix H**.

WSP did not include buses as a separate vehicle category as no traffic data was provided for buses. Traffic volume data for buses was assumed to be included in medium/heavy truck volumes. Freight emissions are included in emissions from trucks (single unit short haul and combination long haul).

9.7.2 Trains

Emission rates from trains, including GO, VIA, and CN were estimated using USEPA exhaust emission standards for Tier 2 line-haul and switch locomotives for TSP, PM_{10}, $PM_{2.5}$, NOx, and CO. Line-haul emission factors were used to estimate emission rates during travel while switch emission factors were used to estimate emission rates during idling. Emission rates for benzene, formaldehyde, acetaldehyde, acrolein, and benzo(a)pyrene were estimated using USEPA Large Uncontrolled Stationary Diesel Engines emission standards for both travel and idling. The emission rates for trains were estimated using diesel train frequency (maximum trips per day) projected to 2024 without GO electrification, average train speed, and average engine power data for the Lakeshore West rail corridor on the Port Credit to Clarkson Station segment found in the GO Rail Network Electrification TPAP Air Quality Impact Assessment Report (August 2017), as well as VIA and CN train schedules with train volumes prior to the COVID-19 pandemic. An example emission rate calculation is provided below. Emission calculation tables can be found in **Appendix I**.

$$\boldsymbol{NOx\ Emission\ Rate} = [(\boldsymbol{Travel\ Length} \div \boldsymbol{Average\ Train\ Speed}) \times \boldsymbol{Trips\ Per\ Day}] \times \boldsymbol{Average\ Engine\ Power} \times \boldsymbol{Emission\ Factor} \times \boldsymbol{Conversion}$$

$$\boldsymbol{NOx\ Emission\ Rate} = \left[\left(1\ km \div 63\frac{km}{hr}\right) \times 10\frac{Trips}{hr}\right] \times 2526\ bhp-h \times 5.5\frac{g}{bhp-hr} \times \frac{1hr}{3600s}$$

$$\boldsymbol{NOx\ Emission\ Rate} = 0.613\frac{g}{s}$$

9.8 Assessment of Contaminants

Contaminants outlined in Section 8.5 were assessed for the potential cumulative impact of air contaminants at the Site using ambient monitoring and air dispersion modelling data. Predicted cumulative concentrations of each contaminant were compared to the AAQC guideline, Canadian Ambient Air Quality Standards (CAAQS), or Ontario's Air Contaminants Benchmarks (ACB) lists for each contaminant of concern. Cumulative impacts for contaminants for which there are no existing baseline concentrations will not be presented; however, the predicted concentrations from the modelling assessment were provided. **Table 9-5** outlines the applicable air quality limit for each contaminant of concern in this assessment. The project

threshold will be selected based on the most stringent AAQC or CAAQS guideline for each contaminant. For contaminants which do not have an AAQC or CAAQS, predicted concentrations will be compared to the limit found in Ontario's ACB list.

Table 9-5 Air Quality Limits for Contaminants of Concern

Contaminant	Averaging Period	AAQC (µg/m^3)	CAAQS [A] (µg/m^3 or ppb)	Project Threshold (µg/m^3 Unless Otherwise Stated)
Benzene	Annual	0.45	-	0.45
	24-hr	2.3	-	2.3
Acrolein	1-hr	4.5	-	4.5
	24-hr	0.4	-	0.4
Particulate Matter less than 2.5 µm ($PM_{2.5}$)	24-hr	27	27 µg/m^3 [B]	27
	Annual	8.8	8.8 µg/m^3 [C]	8.8
Particulate Matter less than 10 µm (PM_{10})	24-hr	50	-	50
Total Suspended Particulates (TSP)	Annual	60	-	60
	24-hr	120	-	120
Nitrogen oxides (NO_x)	1-hr	400	2020: 60 ppb [D] 2025: 42 ppb [D] (79 µg/m^3)	79
	24-hr	200	-	200
	Annual	-	2020: 17 ppb [E] 2025: 12 ppb [E] (23 µg/m^3)	23
CO	1-hr	36200	-	36200
	8-hr	15700	-	15700
Benzo(a)pyrene	24-hr	0.00005	-	0.00005
	Annual	0.00001	-	0.00001
1,3-Butadiene	24-hr	10	-	10
	Annual	2	-	2
Formaldehyde	24-hr	65	-	65
Acetaldehyde	0.5-hr	500	-	500

Contaminant	Averaging Period	AAQC (µg/m³)	CAAQS [A] (µg/m³ or ppb)	Project Threshold (µg/m³ Unless Otherwise Stated)
	24-hr	500	-	500
Sulphur dioxide (SO_2)	10-min	178 (67 ppb)	-	178
	1-hr	106 (40 ppb)	2020: 70 ppb [F] 2025: 65 ppb [F]	106
	Annual	11 (4 ppb)	2020: 5 ppb [G] 2025: 4 ppb [G]	11
Sulphuric Acid	24-hr	5	-	5
TRS (as H_2S)	10-min	13	-	13
	24-hr	7	-	7
Ammonia	24-hr	100	-	100
Hydrochloric Acid	0.5-hr	-	-	60[H]
	24-hr	20	-	20
Xylene	10-min	3000	-	3000
	24-hr	730	-	730
Methylene chloride	Annual	44	-	44
	24-hour	220	-	220

Notes: [A] CAAQS as ppb should assume 10°C and 760 mmHg when converting to µg/m³ consistent with the approach for converting AAQCs

[B] The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations

[C] The 3-year average of the annual average concentrations

[D] The 3-year average of the annual 98th percentile daily maximum 1-hour average concentrations

[E] The average over a single calendar year of all the 1-hour average concentrations

[F] The 3-year average of the annual 99th percentile of the SO_2 daily maximum 1-hour average concentrations

[G] The average over a single calendar year of all the 1-hour average SO_2 concentrations

[H] Air Contaminants Benchmarks (ACB) List

10 Dispersion Modelling

The dispersion modelling was conducted in accordance with MECP's Guideline A11: "Air Dispersion Modelling Guideline for Ontario" (ADMGO), the Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (MTO Guide), dated May 2020, and best practices from the Air Quality Practitioners Group in Ontario, where applicable to each source.

10.1 Dispersion Modelling Input Summary

As per Section 4.5 of the ADMGO, stationary sources were characterized as point or volume sources. Volume sources were sized to cover the main emission sources at a facility and heights were estimated based on average building height. The height of the material piles at CRH was conservatively estimated at 50 m. Where stack data was available, emissions from tall stacks (> 50 m) from CRH and Petro Canada Lubricants Inc. were modelled as point sources. Stack parameters for CRH and Petro Canada Lubricants Inc. were obtained from the NPRI reported data.

Emission data for each point source was not provided within NPRI data; therefore, WSP assigned emissions to point sources based on the maximum estimated facility emission rate, the percent of stack versus fugitive emissions reported to NPRI, and the percentage of the total flow rate for each stack.

For conservatism, when publicly available data was not available to parameterize the emissions sources, WSP conducted the modelling using volume sources to provide conservative results. As a result, emissions from all other facilities were modelled as volume sources as their emissions were assumed to be fugitive in nature.

Transportation sources were characterized as line volume sources and sized to correspond to the width of the road or rail corridor and the expected average height of the vehicles that may be travelling along the roads or rail corridor. The source data required for each road source was calculated using the road type, width of the road and height of the vehicle according to the procedures provided in the ADMGO. Train idling at Clarkson GO Station was characterized as a volume source and sized to correspond to train length, height, and the approximate location at the station.

A detailed summary of dispersion modelling inputs is provided in **Appendix I**.

10.1.1 Dispersion Model Used

The AERMOD dispersion model, version 19191, predicts concentrations at points of impingement (POI) along the property line and beyond. The MECP identified AERMOD as an approved dispersion model under O. Reg. 419/05 which includes the Plume Rise Model Enhancements (PRIME) algorithms for assessing the effects of buildings on air dispersion. AERMOD is applicable for assessing dispersion accommodating rural and urban areas, flat and complex terrain, surface and elevated releases as well as multiple source types (including point, area, and volume sources). The AERMOD modelling system consists of the AERMOD dispersion model, the AERMET meteorological pre-processor and the AERMAP terrain pre-processor.

An assessment of the applicability and potential impacts of shoreline fumigation for the proposed development was also conducted. The initial assessment was completed using the SCREEN3 dispersion modelling for the point sources greater than 50 m in height with available stack information to assess the impact on the project. SCREEN3 is a highly conservative model to assess fumigation as it uses the stability class F (which is an infrequent meteorological stability class) and also a thermal inversion boundary layer factor of six (6) which is conservative. The SCREEN3 results indicate that there is potential for shoreline fumigation effects associated with the Petro Canada Lubricants Inc. sources identified as PCLI2, PCLI3, PCLI4 and the CRH Canada Group source identified as CRH5, to impact predicted concentrations at the proposed development. WSP conducted additional modelling using the Shoreline Dispersion Model (SDM) to identify the hours when fumigation could occur and to confirm whether further assessment is required for those hours. Of the 5 years of hourly meteorological data assessed for sources PCLI2, PCLI3 and CRH5, only 0.06% (approximately 26 hours) were identified where fumigation could occur; and for source PCLI4 0.11% (approximately 49 hours) were identified where fumigation could occur. The potential increase in concentration presented with fumigation would range from a factor of 1.09 to 2.84; however, the contribution to the maximum from these sources is small for all sources and contaminants except for SO_2 on an hourly basis from CRH5 (50% contribution to maximum). To estimate the potential concentration with fumigation for the worst-case hour, assuming fumigation could occur on this hour which is highly unlikely, we can apply the respective applicable factors of 1.09 to 2.84 to each of the sources (PCLI2, PCLI3, PCLI4 and CRH5). By adding this impact to the existing results we can estimate a concentration of 73 ug/m^3 for SO_2 on an hourly basis (with background) which will remain below the 106 ug/m^3 SO_2 AAQC threshold. This estimate would be highly conservative (and unrealistic) as fumigation occurs for so few hours and does not occur for all sources during the same hours, nor at the same time as maximum concentrations were predicted at the Proposed Development. Given this very

small frequency of hours when fumigation impacts could occur at the Proposed Development, and the level of conservatism already included in the assessment methodology, the emission rates, and the modelling, it was identified that no additional assessment of potential fumigation impacts was required as it would not alter the outcome of the assessment. Therefore, an assessment of predicted concentrations resulting from fumigation impacts for hours with the potential for fumigation to occur is not presented as part of this assessment.

10.1.2 Meteorological Conditions and Land Use Data

The site-specific meteorological data file was developed based on guidance in the ADMGO and USEPA AERMET User's Guide.

WSP received a five-year meteorological dataset from Petro Canada Lubricants Inc. containing data from January 2016 to December 2020. Parameters included in the dataset were wind speed, wind direction, temperature, relative humidity, solar radiation, and precipitation. Additional meteorological parameters were required to develop the meteorological dataset for AERMOD, including pressure and cloud cover. Pressure data for January 2016 to December 2020 was obtained from the Toronto City Centre station (Station ID# 48549) located at Billy Bishop Airport and operated by NAV Canada, located approximately 23 km northeast of the Site. The data from this station was selected to best represent meteorological conditions at the proposed development due to its proximity to Lake Ontario, data availability over five years, and similar surrounding land uses. Land use within three kilometres of the meteorological station was set to "Urban" and "Fresh Water" to determine albedo, Bowen ratio, and surface roughness. Cloud cover data was not available; therefore 5/10 (50 %) assumed cloud cover was used to account for the missing data as outlined in the AERMET User's Guide for AERMOD 19191. Upper air data was obtained from the Buffalo, NY upper air station located at the Greater Buffalo International Airport.

The meteorological data required to execute the MOVES emissions model consists of the temperature and pressure for the month of January and July which are considered the worst-case months. The temperature data required to run the model was obtained from Petro Canada Lubricants Inc. while pressure data were obtained from Billy Bishop Airport.

The meteorological input data was processed using AERMET to develop a site-specific data file for the Site. Only one site-specific data site was created as the project area is not large enough to warrant the development of multiple datasets.

10.1.3 Receptors and Area of Modelling Coverage

The area of modelling coverage was centered around the Site and covered a 5 km square area (25 km²). Receptors were placed along the proposed development boundary at a

minimum of 10 m intervals. Discrete receptors were placed at various heights up to 25 storeys at the property boundary to account for balconies, outdoor spaces, and operable windows. The location of discrete receptors for each model was determined based on the location of the maximum POI concentration for each contaminant. The placement of discrete receptors at various heights is considered conservative as these were placed along the property boundary and did not account for building setback distances. The modelling area and boundary receptor placement are shown in **Figure 10-1** and **Figure 10-2**, respectively.

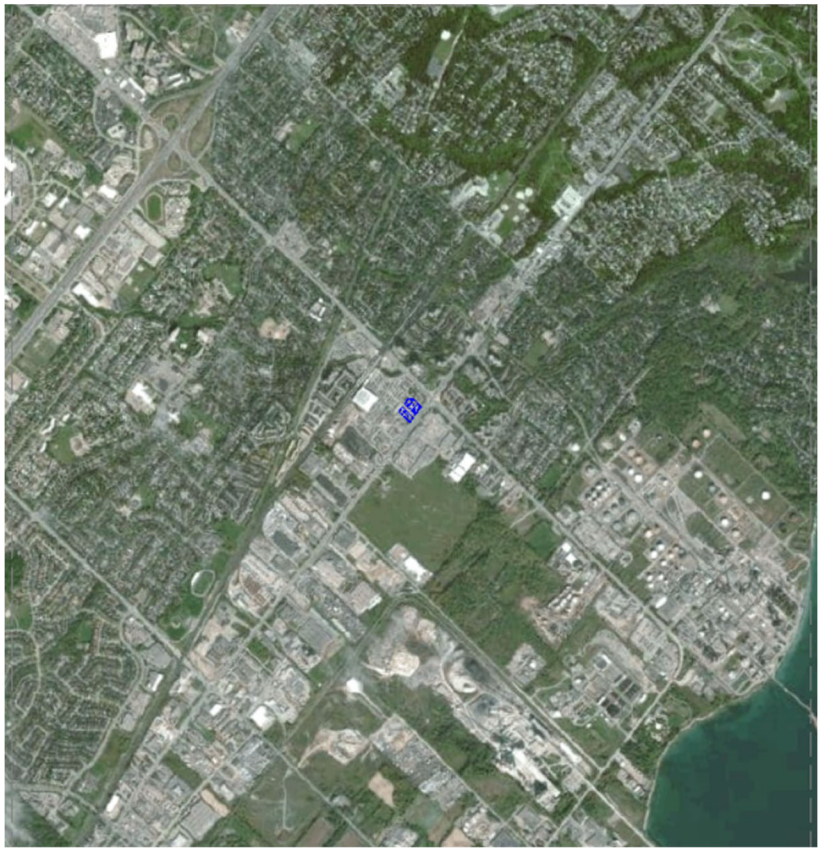


Figure 10-1 Modelling Area Receptors

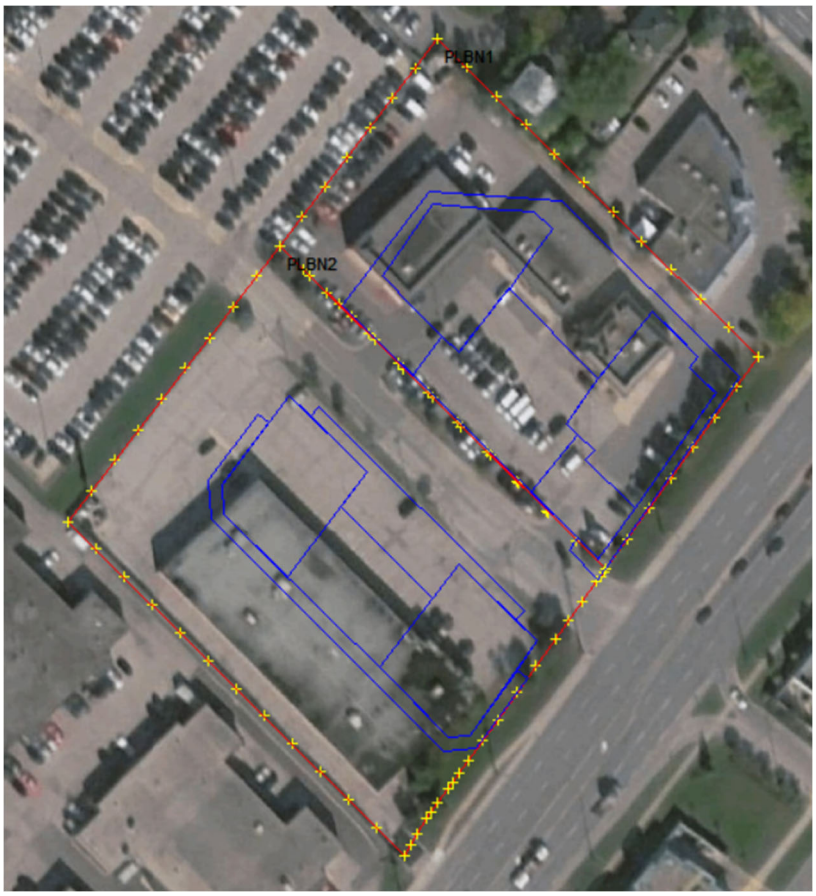


Figure 10-2 Modelling Area and Terrain

10.1.4 Building Downwash

Building wake effects are considered using the USEPA's Building Profile Input Program (BPIP-PRIME), a pre-processor to AERMOD. The inputs into this pre-processor include the coordinates and heights of the relevant buildings and stacks. The output data from BPIP-PRIME is used in the AERMOD building wake effect calculations. For the assessment, no sources of emissions were included on the proposed buildings; therefore, building downwash effects do not apply to the Proposed Development. A preliminary assessment of building downwash effects was completed for industrial sources; however, there were no building downwash effects from the industrial sources on the proposed development modelling area and therefore as a result, building downwash effects were not included in the modelling assessment.

10.1.5 Terrain Data

Terrain information for the area surrounding the Site was obtained from the MECP Ontario Digital Elevation Model data website. The terrain data is based on the North American Datum

1983 (NAD83) horizontal reference datum, cdem_dem_030M.tif, Mississauga, UTM Zone 17. This data was run through the AERMAP terrain pre-processor to estimate base elevations for the buildings, sources and receptors in order to help the model account for changes in the elevations of the surrounding terrain. The modelling area as well as terrain contours are shown in **Figure 10-3**.

Figure 10-3 Modelling Area and Terrain Contours

10.1.6 Averaging Periods Used

Many of the contaminant standards and guidelines are based on 1-hour and 24-hour averaging times, which are averaging times that are provided by AERMOD. In cases where a standard and/or guideline has an averaging period that AERMOD is not designed to predict (e.g. ½-hr or 30-day), a conversion to the appropriate averaging period was completed using the Ministry recommended conversion factors, as documented in the ADMGO and the Ministry Technical Bulletin Methodology for Modelling Assessments with 10-Minute Average Standards and Guidelines under O. Reg. 419/05, dated September 2016.

10.1.7 Dispersion Model Options

A summary of AERMOD dispersion model options is provided in **Table 10-1**.

Table 10-1 AERMOD Model Options

Model Option	Input Selected
Regulatory Options	Default
Dispersion Factor	Urban
Pollutant Models	1,3-butadiene, benzo(a)pyrene, benzene, acrolein, Base model, methylene chloride, NOx, NO_2, TSP, PM_{10}, $PM_{2.5}$, SO_2
Averaging Times	1-hour, 8-hour, 24-hour, annual
Terrain	Elevated
Emission Rate Output Units	$\mu g/m^3$
Source Operating Hours	24 hours/day and 52 weeks/year

10.1.8 Dispersion Modelling Method

Sources were modelled as point sources, volume sources, or line volume sources. All sources were set to be operating 24 hours/day, 7 days/week, 52 weeks/year in the modelling assessment.

Due to the number of sources and contaminant emissions, WSP prepared a simplified modelling approach in a “Base” model. A base emission rate of 1 g/s was entered into each AERMOD source which were then modelled as source groups. The resulting maximum POI concentration from all sources was evaluated and the contribution from each source to the maximum POI concentration was extracted to provide a dispersion factor. The dispersion factor was then used for each applicable source, and the emission rate of each contaminant was multiplied by its corresponding dispersion factor. This allows for a very conservative approach, as the maximum POI concentration from each source will not realistically occur at the same time and place along the property boundary.

Variable emissions were used for train travel and idling to account for hours which do not experience train traffic. Variable emissions were assigned based on GO, VIA and CN train schedules and data. For hours which GO, VIA, and CN are expected to operate, an emission factor of 1 was assigned.

Variable emissions were used for road sources to account for hourly traffic patterns. Midblock hourly traffic counts were provided by the City of Mississauga and used to calculate an emission factor for each hour of the day to account for peak hours.

Contaminant specific models were run for benzo(a)pyrene, benzene, acrolein, TSP, PM_{10}, $PM_{2.5}$, NO_X and NO_2, 1,3-butadiene, SO_2, and methylene chloride given that most of these contaminants are associated with road and rail sources which are expected to have the most impact at the Site. Some of these contaminants also have low air quality thresholds and the existing conditions are above the air quality threshold. This allowed for an assessment of the impact of the proposed project and cumulative impacts.

11 Modelling Results

The air dispersion modelling results for the contaminants of concern are reported in this section. The most impacted property boundary receptor for the Base model was located at the west corner of the site. Air dispersion model results for contaminants included in the modelling assessment are presented for the most impacted receptor. The cumulative impacts at the Site were calculated by aggregating the modelling results with the baseline ambient concentrations. The cumulative impacts at the most impacted receptor were compared to air quality thresholds and are presented in **Table 11-1**.

Table 11-1 Summary of Cumulative Impacts at the Site Property Boundary

Contaminant	Baseline Concentration (µg/m³)	Model Concentration (µg/m³)[1]	Cumulative Concentration (µg/m³)	Averaging Period	Air Quality Threshold (µg/m³)	Percent of Limit From Baseline (%)	Percent of Limit From Model (%)	Percent of Threshold (%)
Benzene	0.69	0.03	0.72	24-hr	2.3	30%	2%	31%
	0.49	0.009	**0.50**	Annual	0.45	**109%**	2%	**111%**
Acrolein	1.6	0.010	1.6	1-hr	4.5	36%	0.2%	36%
	0.63	0.004	**0.63**	24-hr	0.4	**158%**	1%	**158%**
$PM_{2.5}$	15	4.5	19	24-hr	27	54%	17%	71%
	8.2	1.8	**10**	Annual	8.8	93%	21%	**114%**
PM_{10}	47	6.8	**54**	24-hr	50	94%	14%	**108%**
TSP	89	15	104	24-hr	120	74%	12%	87%
	36	6	42	Annual	60	60%	10%	70%
NOx (as NO_2)	36	54	**90**	1-hr	79	46%	68%	**114%**
	30	32	62	24-hr	200	15%	16%	31%
	16	14	**30**	Annual	23	68%	63%	**131%**
CO	298	183	481	1-hr	36200	0.8%	1%	1%
	279	125	404	8-hr	15700	2%	1%	3%
Benzo(a)pyrene	**0.00011**	7.48E-07	**0.00011**	24-hr	0.00005	**213%**	1%	**215%**
	0.000012	N/A[2]	**0.000012**	Annual	0.00001	**115%**	0.0%	**115%**
1,3-Butadiene	0.06	0.001	0.06	24-hr	10	1%	0.01%	1%
	0.01	0.001	0.01	Annual	2	0.5%	0.03%	1%
Formaldehyde	3.1	0.05	3.1	24-hr	65	5%	0.08%	5%
Acetaldehyde	5.0	0.09	5.1	0.5-hr	500	1%	0.02%	1%
	1.7	0.03	1.7	24-hr	500	0.3%	0.01%	0.3%
SO_2	3	88	91	10-min	178	2%	50%	52%
	2	53	55	1-hr	106	2%	50%	52%

Contaminant	Baseline Concentration (µg/m³)	Model Concentration (µg/m³)[1]	Cumulative Concentration (µg/m³)	Averaging Period	Air Quality Threshold (µg/m³)	Percent of Limit From Baseline (%)	Percent of Limit From Model (%)	Percent of Threshold (%)
	1	1.6	2.6	Annual	11	9%	14%	23%
Sulphuric Acid	-	0.06	0.06	24-hr	5	-	1.3%	1.3%
TRS (as H_2S)	1.4	0.1	1.5	10-min	13	11%	1%	12%
	0.3	0.02	0.3	24-hr	7	5%	0.2%	5%
Ammonia	-	0.02	0.02	24-hr	100	-	0.02%	0.02%
Hydrochloric Acid	-	0.02	0.02	0.5-hr	60	-	0.03%	0.03%
	-	0.01	0.01	24-hr	20	-	0.05%	0.05%
Xylene	6	58	64	10-min	3000	0.2%	1.9%	2.1%
	1.5	11	12.5	24-hr	730	0.2%	1.5%	1.7%
Methylene Chloride	1.3	0.3	1.6	24-hr	220	0.6%	0.1%	0.7%
	0.6	0.07	0.67	Annual	44	1.4%	0.2%	1.6%

Notes: Red text indicates concentrations that are elevated compared to the air quality threshold value.

[1] Some modelling results were rounded up for ease of presentation.

[2] Not available – the concentration value is too small to be extracted from the results.

Contaminant concentrations were assessed at various heights where the most impacted property boundary receptor was located to determine where the worst-case contaminant concentrations would be expected along the expected façade of the proposed buildings. A summary of the location of maximum POI concentrations for each contaminant is presented in **Table 11-2**.

Table 11-2 Summary of Maximum POI Concentrations and Location

Contaminant	UTM-E	UTM-N	Model Conc. (µg/m³) [1]	Air Quality Threshold (µg/m³)	Avg. Period	Receptor Height (m)
Benzene	610676.36	4818432.78	0.03	2.3	24-hr	107.5
	610676.36	4818432.78	0.009	0.45	Annual	0
Acrolein	610676.36	4818432.78	0.010	4.5	1-hr	0
	610676.36	4818432.48	0.004	0.4	24-hr	0
$PM_{2.5}$	610520.39	4818401.39	4.5	27	24-hr	21.5
	610676.36	4818432.78	1.8	8.8	Annual	0
PM_{10}	610676.36	4818432.78	6.8	50	24-hr	0
TSP	610598.77	4818323.52	15	120	24-hr	21.5
	610676.36	4818432.78	6	60	Annual	0
NOx (as NO_2)	610585.53	4818486.42	54	79	1-hr	21.5
	610606.67	4818514.03	32	200	24-hr	0
	610606.67	4818514.03	14	23	Annual	0
CO [A]	610676.36	4818432.78	183	36200	1-hr	0
	610676.36	4818432.78	125	15700	8-hr	0
Benzo(a)pyrene	610596.10	4818500.22	7.48E-07	0.00005	24-hr	0
	610676.36	4818432.78	N/A[2]	0.00001	Annual	4.3
1,3-Butadiene	610676.36	4818432.78	0.001	10	24-hr	0
	610676.36	4818432.78	0.001	2	Annual	0
Formaldehyde [A]	610676.36	4818432.78	0.05	65	24-hr	0

Contaminant	UTM-E	UTM-N	Model Conc. ($\mu g/m^3$) [1]	Air Quality Threshold ($\mu g/m^3$)	Avg. Period	Receptor Height (m)
Acetaldehyde [A]	610676.36	4818432.78	0.09	500	0.5-hr	0
	610676.36	4818432.78	0.03	500	24-hr	0
SO_2	610681.47	4818439.89	88	178	10-min	60.2
	610681.47	4818439.89	53	106	1-hr	60.2
	610598.77	4818323.52	1.6	11	Annual	107.5
Sulphuric Acid [A]	610606.67	4818514.03	0.06	5	24-hr	4.3
TRS (as H_2S) [A]	610606.67	4818514.03	0.1	13	10-min	4.3
	610606.67	4818514.03	0.02	7	24-hr	4.3
Ammonia [A]	610606.67	4818514.03	0.02	100	24-hr	4.3
Hydrochloric Acid [A]	610606.67	4818514.03	0.02	60	0.5-hr	4.3
	610606.67	4818514.03	0.01	20	24-hr	4.3
Xylene [A]	610606.67	4818514.03	58	3000	10-min	4.3
	610606.67	4818514.03	11	730	24-hr	4.3
Methylene Chloride	610598.77	4818323.52	0.3	220	24-hr	25.8
	610598.77	4818323.52	0.07	44	Annual	0

Notes: [A] Maximum POI location retrieved from Base model

[1] Some modelling results were rounded up for ease of presentation.[2] N/A - Not available as the concentration is too small to be extracted from the results.

12 Dispersion Modelling Discussion

Emission rates for roadways were predicted using the USEPA's MOVES model. Emission rates for trains on the Clarkson GO rail corridor were predicted using emission standards for Tier 2 diesel locomotives and large diesel engines. Emission rates for facilities of concern were calculated using publicly available facility emission data. Cumulative concentration impacts from the baseline concentrations and the predicted modelled concentration from the stationary and transportation sources within the Clarkson study area were assessed at the Site property boundary and various heights using the AERMOD air dispersion model.

The results presented in **Table 11-1** indicate that the cumulative concentration of acrolein at the most impacted receptor is elevated compared to the 24-hour air quality threshold. It should be noted that ambient concentrations of acrolein collected during the Clarkson Air Monitoring Program are already elevated compared to the 24-hour air quality threshold. Modelled concentrations were combined with ambient data to determine the cumulative impacts; however, this approach is considered conservative as acrolein concentrations from surrounding sources would have already been captured in the Clarkson Air Monitoring Program. The predominant source of acrolein in the study area is transportation sources. As a reminder, baseline concentrations already account for some of the sources modelled for the predicted model concentration; therefore, results are conservative as they include some double counting (i.e., sources captured in the Clarkson Air Monitoring Program are then modelled and added to the results of the Clarkson Air Monitoring Program again). Acrolein has also been identified as a Transportation Related Air Pollutant (TRAP) which is generally elevated near highways and busy roads, often elevated compared to MECP guidelines. Although acrolein was shown to be elevated for the 24-hour air quality threshold in the area, emission rates for acrolein from vehicles are expected to decrease as vehicles become more efficient. To illustrate this, WSP calculated the emissions rates from MOVES for acrolein for a fleet in 2007 (MECP ambient study year) and compared the value to the 2021 and 2024 modelled emission rates. The results are presented in **Table 12-1**.

Table 12-1 Acrolein Emission Rates 2007, 2021, and 2024

Contaminant	Vehicle Type	2007 Emission Rate (g/VMT)	2021 Emission Rate (g/VMT)	2024 Emission Rate (g/VMT)	2007-2021 Change (%)	2021-2024 Change (%)
Acrolein	Passenger Car	3.77E-04	2.15E-05	1.52E-05	-94%	-29%
	Passenger Truck	4.67E-04	5.67E-05	2.95E-05	-88%	-48%

Contaminant	Vehicle Type	2007 Emission Rate (g/VMT)	2021 Emission Rate (g/VMT)	2024 Emission Rate (g/VMT)	2007-2021 Change (%)	2021-2024 Change (%)
	Medium Truck	5.79E-03	7.22E-04	3.91E-04	-88%	-46%
	Heavy Truck	4.40E-03	1.45E-03	9.97E-04	-67%	-31%

Notes: Vehicle Mile Travelled (VMT)

The results presented in **Table 11-1** indicate that cumulative concentrations of benzo(a)pyrene at the most impacted receptor are elevated compared to the 24-hour and annual air quality thresholds. It should be noted that ambient concentrations of benzo(a)pyrene collected as part of the NAPS Air Monitoring Program were already elevated compared to the 24-hour and annual air quality thresholds. Modelled concentrations were combined with ambient data to determine cumulative impacts; however, this approach is considered conservative as benzo(a)pyrene concentrations from surrounding sources would have already been captured in the ambient data, as discussed in the previous paragraph with acrolein. The predominant source of benzo(a)pyrene in the study area is transportation sources. Benzo(a)pyrene has also been identified as a TRAP which is generally elevated near highways and busy roads, often elevated compared to MECP guidelines. Emission rates of benzo(a)pyrene are expected to decrease over time as vehicles become more efficient, similar to acrolein.

The results presented in **Table 11-1** indicate that cumulative concentrations of NO_X at the most impacted receptor are elevated compared to the 1-hour and annual air quality thresholds. Modelled concentrations were combined with ambient data to determine cumulative impacts; however, this approach is considered conservative as NO_X concentrations from surrounding sources would have already been captured in the ambient data, as previously discussed. NOx has also been identified as a TRAP which is generally elevated near highways and busy roads, often elevated compared to MECP guidelines. The predominant source of NOx impacts at the Site is transportation sources; however, emission rates of NOx are also expected to decrease over time as vehicles become more efficient.

The results presented in **Table 11-1** indicate that cumulative concentrations of benzene at the most impacted receptor are elevated compared to the annual air quality thresholds. Modelled concentrations were combined with ambient data to determine cumulative impacts; however, this approach is considered conservative as benzene concentrations from surrounding sources would have already been captured in the ambient data, as previously discussed. Benzene has also been identified as a TRAP which is generally elevated near highways and busy roads, often elevated compared to MECP guidelines. The predominant source of benzene in the

study area is transportation sources; however, emission rates of benzene are also expected to decrease over time as vehicles become more efficient.

The results presented in **Table 11-1** indicate that cumulative concentrations of $PM_{2.5}$ and PM_{10} at the most impacted receptor are elevated compared to the annual air quality thresholds and the 24-hour air quality thresholds respectively. Modelled concentrations were combined with ambient data to determine cumulative impacts; however, this approach is considered conservative as $PM_{2.5}$ and PM_{10} concentrations from surrounding sources would have already been captured in the ambient data, as previously discussed. $PM_{2.5}$ and PM_{10} have also been identified as TRAP which are generally elevated near highways and busy roads, often elevated compared to MECP guidelines. The predominant source of $PM_{2.5}$ and PM_{10} impacts at the Site is transportation sources.

All other significant contaminants included in this assessment were predicted to be below air quality thresholds. The results presented in **Table 11-2** indicate that the maximum contaminant concentration is expected at various heights, depending on the contaminant. When assessing the maximum concentration at the Site from all sources in the Base model, the model indicated that the west corner of the property would experience the highest impact at approximately 0 m for 24-hr, 1-hr and 8-hr averaging periods. Contaminant specific models indicated that the maximum concentrations could occur at various heights depending on the location of sources. For example, the most impacted receptor for 24-hr NOx concentrations is located at the northwest property boundary at a height of approximately 0 m as a result of this location being near train and road sources. In comparison, the most impacted receptor for 1-hr SO_2 concentrations is located at the south property boundary at a height of approximately 60.2 m as a result of this location being near industrial sources of SO_2.

12.1 Nuisance Dust and Odour Impacts

The potential for nuisance dust and odour impacts on the proposed development has been assessed as part of this study. Dust was assessed as part of the dispersion modelling, where emission data was available, and ambient air monitoring. The predominant source or dust impacts on the proposed development are related to traffic and not industrial emissions. PM_{10} and TSP are expected to be below the AAQC thresholds and are not expected to be an issue with respect to nuisance impacts. Facilities within the minimum separation distance and potential influence area are not expected to produce nuisance dust that would impact the proposed development.

Odour may be present from the surrounding facilitates, including the following:

- Clarkson Wastewater Treatment Plant;
- Petro Canada Lubricants Inc; and,
- Ritcey Custom Cabinetry.

The Clarkson Wastewater Treatment Plant (CWWTP) is located approximately 1,600 m from the proposed development and emits some odorous contaminants such as TRS; however, the facility is outside the potential influence area for a Class III facility. The facility uses odour control systems to manage odour from operations to ensure that existing and future operations do not adversely impact offsite receptors. As a result, CWWTP is not expected to cause odour nuisance at the Site.

Petro Canada Lubricants Inc. emits some odorous contaminants such as TRS and is approximately 887 m from the proposed development which is within the potential influence area. The modelled concentrations of contaminants from Petro Canada Lubricants Inc. are low and do not indicate that nuisance odour would be perceivable at the proposed development.

Ritcey Custom Cabinetry is a cabinet manufacturer, the facility building is located approximately 60 m from the proposed development, within the 70 m potential area of influence, but outside the 20 m minimum separation distance for a Class I facility. This facility is small in scale and there are no visible stacks or other emission sources. All products associated with the manufacturing process are expected to be contained inside the facility with minimal potential for fugitive emissions and nuisance. There were no dust and odours were observed onsite during over thirty site visits to install and/or collect sample media. Any potential nuisance dust would have been captured by the air monitoring station on site, which was located approximately 85 m to the northeast of the facility. As a result, Ritcey Custom Cabinetry is not expected to produce any significant odours or dust that would impact the proposed development.

There are 12 auto repair shop facilities within the study area including:

- Mississauga BMW Repair
- WaySide Auto Service;
- Audi Repair Mississauga - Lorne Park Car Centre;
- Caruso's Service Centre Inc.;
- Autobody shop;
- Midas;
- Car Pride Auto Spa;
- Cam Tech Automotive Service;
- Mississauga Auto Centre;
- Canadian Tire Auto Parts & Service;
- PPG Automotive Refinish Canada Inc.; and,
- Canadian Automotive Refinish.

When the distance from the Site is adjusted to account for the distance to the facility building, most of the auto repair shops are located outside potential influence area for applicable facility Class, 70 m for Class I and 300 m for Class II. There are four automotive repair facilities on the property adjacent to the proposed development. Mississauga BMW Repair is within the 20 m

minimum separation distance. WaySide Auto Service is within the 70 m potential area of influence, but outside the 20 m minimum separation distance. Audi Repair Mississauga - Lorne Park Car Centre is within the 70 m potential area of influence but outside the 20 m minimum separation distance. Caruso's Service Centre Inc. is outside the 70 m potential area of influence. These four facilities only conduct repairs and maintenance of vehicles and there is no evidence of paint booths as no environmental permits were found. Any odour generated from operations is expected to be contained within the facility; therefore, there is little potential for nuisance odour. It should also be noted that again no dust or odours were observed in the vicinity of these facilities during over thirty site visits to install and/or collect sample media. All other automotive facilities are well outside the potential influence area and would not be expected to have any odour impacts on the proposed development.

12.2 Summary of Cumulative Human Health Assessment

The Cumulative Human Health Risk Assessment Report (HHRA) can be found in **Appendix K**. Results for each contaminant with a cumulative concentration that exceeded the AAQC and/or CAAQS were provided to the WSP human-health risk assessment team in order to determine appropriate implications and consideration of any mitigation measures for the Proposed Development. Analysis of the frequency and magnitude of exceedances was considered; however, the concentrations presented were primarily a result of existing ambient baseline concentrations due to transportation sources within the study area. As a result, a qualitative assessment of human-health risks was completed.

It was determined that the exceedances of AAQCs are related to significant contribution from ambient baseline sources, with minimal contribution from modelled concentrations. Modelled concentrations for acrolein, benzene, and benzo(a)pyrene contribute ≤2% to cumulative concentrations. The ambient background levels of acrolein, benzene and benzo(a)pyrene are comparable to reported concentrations in Ontario and Canada. Modelled concentrations for $PM_{2.5}$ and PM_{10} concentrations contribute 21% and 14%, respectively. The cumulative concentration of $PM_{2.5}$ is within the range reported in Canadian urban cities. For nitrogen oxides, modelled concentrations and baseline concentrations have similar contributions at approximately 50% to the cumulative concentrations. The NO_2 annual cumulative concentrations for the Clarkson TSA (27 µg/m3 or 15 ppb) are within the range reported in Toronto and Canadian urban areas.

A toxicological review was completed of available jurisdictional ambient air quality objectives (AAQOs) for acrolein, benzene, benzo(a)pyrene, NO_2, PM_{10} and $PM_{2.5}$. Additionally, a comprehensive review of the available short-term (acute) and long-term (chronic) numerical limits was conducted in the HHRA.

Given the ongoing sources of identified chemicals of concern from mobile vehicular and industrial sources, mitigation measures could be developed for implementation in land use planning to improve indoor air quality.

12.3 Mitigation Measures

Air quality mitigation is not required at the proposed development; however, mitigation recommendations have been included to improve indoor air quality. A memorandum with discussion of the recommended mitigation measures to improve indoor air quality can be found in Appendix L. The recommended mitigation measures were determined based on the cumulative concentrations (baseline and modelling) at various heights for each of the COCs that exceeded their respective AAQC threshold value. The cumulative impacts show that except for B(a)P and acrolein, there are no concentrations elevated compared to the AAQC at 30.1 m and above. The Mitigation Recommendations Memorandum presented that background concentrations of acrolein and B(a)P are elevated when compared to the AAQC values; however, B(a)P is elevated anywhere a development were to proceed in an urban area.

For all other COCs, excluding acrolein and B(a)P, based on the data assessed in this memo, the following recommendations are presented:

- Local Air Intakes: If air intakes are designed to be located in each suite, then for any suites below the fourth floor (12.9 m) filters to control $PM_{2.5}$ and PM_{10} impregnated with carbon to control benzene could be utilized. Percent reductions required can be calculated from Table 3. Filters require ongoing maintenance and monitoring per manufacturer specifications, which generally require replacement after a specified duration of time.
- Monitoring: Since Table 3 represents a very conservative approach then it is recommended that a method of ambient monitoring be incorporated to ensure the controls of a local air intake design are working, or even required.
- Ducted Air Intakes: An alternative to filtering local air intakes and monitoring could be to have a centralized air intake system ducted from above 43 m for any suites located below this level.
- Since NO_X is being compared to the CAAQS Annual threshold for NO_2 (12 ppb), it should be based on the same criteria which is the average over a single calendar year of all 1-hour average concentrations. The 6-month average of NO_2 measured by WSP was 6.9 ppb, when adjusted based on the bias adjustment factor (21% decrease due to COVID-19 lockdowns) it becomes 8.7 ppb. At 8.7 ppb the NO_2 concentration for the area is well within the CAAQS annual threshold. The cumulative concentrations include both measured and modelled concentrations for NO_X which is very conservative when assessing the need for mitigation.

With the recommendations presented above and detailed design of mitigation to be conducted by the proponent as part of the Design Process, WSP does not see any further requirements to fulfil a development application at this time.

13 Conclusions

Based on the air dispersion modelling assessment, the following conclusions can be made:

— Benzene, acrolein, PM_{10}, $PM_{2.5}$, NOx, and benzo(a)pyrene were predicted to be above air quality thresholds. All other significant contaminants included in this assessment were predicted to be below air quality thresholds;

— Prevailing wind direction is blowing from the west southwest and east northeast, and not from significant stationary sources of air emissions such as large facilities and tall stacks. As a result, the most significant sources of air impacts at the Site are expected to be transportation sources (road and rail);

— It should be noted that impacts from the Clarkson GO Rail Corridor are expected to decrease over time as Metrolinx electrifies their transportation network, though not included in this assessment as diesel GO trains would continue to operate and pass by until the entirety of the corridor was electrified;

— Modelled maximum air quality impacts were predicted at the most impacted receptor (property boundary or flagpole receptor);

— Concentrations of acrolein at the Site were reported as elevated compared to the 24-hour air quality threshold; however, the proposed development and the cumulative concentration from the nearby sources will not contribute to increasing the existing concentration (i.e., the development is not a source of acrolein);

— Concentrations of benzo(a)pyrene at the Site property boundary were reported as elevated compared to the 24-hour and annual air quality thresholds; however, reported concentrations have been conservatively combined with ambient air monitoring data which would have already captured benzo(a)pyrene concentrations in ambient air and the resulting cumulative concentration was not altered - the cumulative impacts at the proposed development remain unchanged from existing conditions;

— Concentrations of $PM_{2.5}$ and PM_{10} at the Site property boundary were reported as elevated compared to the annual air quality threshold; however, reported concentrations have been conservatively combined with ambient air monitoring data which would have already captured $PM_{2.5}$ concentrations in ambient air and the resulting cumulative concentration was not significantly altered. The cumulative impacts at the proposed development showed a minor increase from existing conditions likely as a result of expected traffic growth in the study area;

- Concentrations of PM_{10} at the Site property boundary were reported as elevated compared to the 24-hour air quality threshold; however, reported concentrations have been conservatively combined with ambient air monitoring data which would have already captured PM_{10} concentrations in ambient air and the resulting cumulative concentration was not significantly altered. The cumulative impacts at the proposed development showed a minor increase from existing conditions likely as a result of expected traffic growth in the study area;
- Concentrations of NOx at the Site property boundary were reported as elevated compared to the 1-hour and annual air quality thresholds; however, reported concentrations have been conservatively combined with ambient air monitoring data which would have already captured NOx concentrations in ambient air. The cumulative impacts at the proposed development showed an increase from existing conditions likely as a result of expected traffic growth in the study area;
- The 90th percentile 24-hour concentration of NO_2 recorded at the monitoring station was below the AAQC threshold. The cumulative concentration calculated from the dispersion modelling was above the annual Canadian Ambient Air Quality Standard (CAAQS) of 12 ppb which may be attributable to the addition of sources to the baseline ambient data which already includes the nearby sources. It should also be noted that the CAAQS is based on the average over a single calendar year of all 1-hour average concentrations, not 90th percentiles. The average of all 1-hour NO_2 concentration collected at the monitoring station was 6.9 ppb.
- Acrolein, PM_{10}, $PM_{2.5}$, benzene, NOx, and benzo(a)pyrene have been identified as Traffic Related Air Pollutants and are identified as often elevated compared to the air quality thresholds in urban areas and near highways and roadways. Elevated concentrations of these contaminants are not unique to the Clarkson TSA and are expected throughout urban areas in Ontario (i.e., Greater Toronto Area and Hamilton) and Canada;
- Based on publicly available data, acrolein and benzo(a)pyrene are not emitted by surrounding industrial facilities in significant amounts; therefore, it is expected that air quality impacts from these contaminants at the proposed development are predominantly associated with transportation emissions;
- Ambient concentrations of acrolein, benzene, NOx, and benzo(a)pyrene are expected to decrease as older vehicles are removed from service and vehicle emission controls become more efficient;

- The proposed development is expected to introduce stationary sources of air emissions associated with comfort heating equipment. These sources would emit contaminants from the stationary combustion and would not alter the results presented as these sources will be very small compared to the transportation emissions. It is unlikely that the introduction of the stationary sources would alter the outcome of the assessment which is dominated by transportation emissions and is conservative;
- Based on the air dispersion assessment, the potential for nuisance odour impacts at the proposed development is not expected based on modelled and cumulative ammonia and TRS concentrations. Ammonia concentrations are well below the 24-hour air quality threshold. Cumulative TRS concentrations are below the 10-minute and 24-hour air quality thresholds, and the majority of TRS concentrations are attributable to baseline conditions which were obtained from Hamilton, Ontario. Based on the model concentrations, there are no significant impacts from surrounding facilities to the proposed development;
- Based on the air dispersion assessment, the potential for nuisance dust impacts at the proposed development is not expected based on cumulative PM_{10} and TSP concentrations. The concentration of TSP is below the air quality threshold. The maximum 24-hour PM_{10} concentration is elevated compared to the air quality threshold; however, reported concentrations have been conservatively combined with ambient air monitoring data which would have already captured PM_{10} and TSP concentrations in ambient air. $PM_{2.5}$ concentrations were elevated compared to the annual air quality threshold; however, $PM_{2.5}$ impacts are predominately from transportation sources that would not give rise to nuisance complaints;
- The Health Assessment, located in Appendix K, determined that the exceedances of AAQCs are related to a significant contribution from ambient baseline sources, with minimal contribution from modelled concentrations. Modelled concentrations for acrolein, benzene and benzo(a)pyrene contribute ≤2% to cumulative concentrations. The ambient background levels of acrolein, benzene and benzo(a)pyrene are comparable to reported concentrations in Ontario and Canada. Modelled concentrations for $PM_{2.5}$ and PM_{10} concentrations contribute 21% and 14%, respectively. The cumulative concentration of $PM_{2.5}$ is within the range reported in Canadian urban cities. For nitrogen oxides, modelled concentrations and baseline concentrations have similar contribution at approximately 50% to the cumulative concentrations. The NO_2 annual cumulative concentrations for the Clarkson TSA (29 $\mu g/m^3$) are within the range reported in Toronto and in Canadian urban areas.
- Air quality mitigation is not required at the proposed development; however, mitigation recommendations have been included to improve indoor air quality.

- The Mitigation Recommendations Memorandum, located in Appendix L, determined that background concentrations of acrolein and B(a)P are elevated when compared to the AAQC values; however, B(a)P is elevated anywhere a development were to proceed in an urban area.

- If air intakes are designed to in each suite, then for any suites below the fourth floor (12.9 m) filters to control PM_{10} and $PM_{2.5}$ impregnated with carbon to control benzene could be utilized to improve indoor air quality. It is recommended that a method of ambient monitoring be incorporated to ensure the controls of a local air intake design are working, or even required. An alternative to filtering local air intakes and monitoring could be to have a centralized air intake system ducted from above 12.9 m for any suites located below this level. A detailed design of mitigation will be conducted by the proponent as part of the Design Process;

- Based on the air quality study, air quality in the study area is not expected to adversely impact high density residential development nor the existing local industrial sites level of compliance to existing standards. Elevated concentrations of contaminants reported (i.e., above health-based thresholds) which could lead to health risks are not unique to the Clarkson TSA and are expected throughout urban areas in Ontario (i.e., Greater Toronto Area and Hamilton) and Canada. Transit-oriented development within the Clarkson TSA is expected to reduce reliance on passenger vehicle trips as the community shifts to alternative modes of transportation such as public transit and active transportation. This transition is expected to reduce emissions of TRAP contaminants within the Clarkson TSA and likely will result in improved air quality in the community.

14 References

ENVIRONMENT AND CLIMATE CHANGE CANADA (ECCC). 2020. National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada. Catalogue #: En81-4E-PDF.

ONTARIO MINISTRY OF THE ENVIRONMENT (MOE). 2012. Ontario's Ambient Air Quality Criteria. 15 pages.

ONTARIO MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP). 2018. Preserving and Protecting our Environment for Future Generations: A Made-in-Ontario Environment Plan.

ONTARIO MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP). 2018. Ontario's Ambient Air Quality Criteria. PIBs #6570e01.

ONTARIO MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE. 2017. Air dispersion modelling guideline for Ontario [Guideline A-11] Version 3.0. PIBs #5165e03. 159 pages.

ONTARIO MINISTRY OF TRANSPORTATION (MTO). 2019. Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects. 75 pages.

STATISTICS CANADA. 2010. Canadian Vehicle Survey: Annual 2009. Catalogue #: 53-223-X. 43 pages.

U.S. ENVIRONMENTAL PROTECTION AGENCY (US-EPA). 2014. User Guide for MOVES 2014. EPA-420-B-14-055. Office of Transportation and Air Quality, Research Triangle Park, NC.

U.S. ENVIRONMENTAL PROTECTION AGENCY (US-EPA). 2011. Compilation of Air Pollutant Emission Factors: AP 42, Fifth Edition, Volume I: Miscellaneous Sources, Section 13.2.1 Paved Roads.

U.S. ENVIRONMENTAL PROTECTION AGENCY (US-EPA). 2016. User's Guide for the AERMOD Meteorological Preprocessor (AERMET). EPA-454/B-16-010. Office of Air Quality Planning and Standards, Research Triangle Park, NC.

U.S. ENVIRONMENTAL PROTECTION AGENCY (US-EPA). 2018. AERMOD Implementation Guide. Office of Air Quality Planning and Standards, Research Triangle Park, NC.

U.S. ENVIRONMENTAL PROTECTION AGENCY (US-EPA). 2015. 11th Modeling Conference, Updates to EPA's AERMOD Modeling System. http://www3.epa.gov/ttn/scram/11thmodconf.htm.

U.S. ENVIRONMENTAL PROTECTION AGENCY (US-EPA). 2005. Guideline on Air Quality Models, 40 CFR Part 51, Appendix W.

ACGIH, 2019. American Conference of Governmental Industrial Hygienists. Chemical Profile for Benzo(a)Pyrene.

IARC, 2010. IARC Some non-heterocyclic polycyclic aromatic hydrocarbons and some related exposures. IARC Monogr Eval Carcinog Risks Hum, 92: 1–853. PMID:21141735 PMID:18756632

MOE, 2009. Ontario Air Standards for Acrolein, Standards Development Branch, Ontario Ministry of the Environment, dated December 2009.

Tevlin et al, 2020. Tevlin, A., Galarneau, E., Zhang, T. and Hung H. Polycyclic aromatic compounds (PACs) in the Canadian environment: Ambient air and deposition. Journal of Environmental Pollution 271: 116232 (2021).

National Pollutant Release Inventory: https://pollution-waste.canada.ca/national-release-inventory/archives/index.cfm?lang=En

Access Environment: https://www.accessenvironment.ene.gov.on.ca/AEWeb/ae/GoSearch.action?search=basic&lang=en

GHD. 2020. Emission Summary and Dispersion Modelling Report Stackpole International – Powder Metal.

AECOM. 2010. Regional Municipality of Peel – Clarkson Water Pollution Control Plant Application for an Amendment to a Site-Wide Certificate of Approval (Air).

H.L. Blachford. Table 4: Emission Summary Table

APPENDIX

D MECP CLARKSON AIRSHED STUDY

Clarkson

Airshed Study

A Scientific Approach to Improving Air Quality

Addendum to Part II – The Ambient Air Monitoring Program: South Mississauga (Clarkson) and Oakville Sampling Results for Acrolein, Acrylonitrile and Dichloromethane in Ambient Air, Summer 2007

April 2009

PIBS 7074e

Protecting our environment. Ontario

Ministry of the Environment

Central Region
Technical Support Section

5775 Yonge Street, 8th Floor
North York, Ontario M2M 4J1
Tel.: (416) 326-6700
Fax: (416) 325-6345

Ministère de l'Environnement

Région du Centre
Section d'appui technique

5775, rue Yonge, 8ième étage
North York, Ontario M2M 4J1
Tél. : (416) 326-6700
Téléc. : (416) 325-6347

April 1, 2009

MEMORANDUM

TO: Dan Orr
Technical Support Manager (A)
Central Region

FROM: Susanne Edwards
Air Quality Analyst
Technical Support Section, Central Region

RE: South Mississauga (Clarkson) and Oakville Sampling Results for Acrolein, Acrylonitrile and Dichloromethane in Ambient Air, Summer 2007

During the implementation of the Clarkson Airshed Part II - Ambient Air Monitoring Program, detectable concentrations of acrolein in ambient air were occasionally measured at three monitoring stations in south Mississauga. Two of these stations (Site No. 44075 and 44080, also called Station QEW West and Station QEW East) were sited west and east, respectively, on the verge of the Queen Elizabeth Way and Highway 403 interchange. The third station (Site No. 46128, also called Station Industrial Centre) was located east of Winston Churchill Boulevard off of Royal Windsor Drive in Mississauga.

Similarly, detectable concentrations of acrylonitrile in ambient air were occasionally measured at five monitoring stations in south Mississauga and Oakville, with elevated concentrations observed at 2 of these monitoring stations. The five monitoring stations were Site No. 44075, 44080, 46117 (also called Station Industrial East), 44083 (also called Station Ford Drive, Oakville), and 44086 (also called Station Residential, Oakville). Elevated acrylonitrile in ambient air was observed at both Oakville locations, namely stations 44083 and 44086.

One June 2004 sample result for dichloromethane, an industrial solvent and paint thinner, exceeded the Ministry 24-hour Ambient Air Quality Criteria (AAQC) and the Ontario Regulation 419/05 Schedule 3 Standard, scheduled to take effect in 2010.

Acrolein is typically emitted into the atmosphere from the combustion and breakdown of petroleum products. For the acrolein results observed in the Clarkson Airshed Part II - Ambient Air Monitoring

Program, this attribution would be consistent with contributions primarily from vehicle emissions, with secondary contributions from the Clarkson industrial complex. Acrylonitrile is used in the manufacture of synthetic polymers or materials. For the acrylonitrile results observed in the Clarkson Airshed Part II - Ambient Air Monitoring Program, this attribution would be consistent with contributions primarily from the Clarkson industrial complex and the vehicle manufacturing facility in Oakville.

Based upon the preliminary results observed, surmising the source contribution areas, and knowing that both compounds are linked to known or suspected health effects, the Halton-Peel District Office requested that further ambient air monitoring for volatile organic compounds (VOC), particularly for acrolein, acrylonitrile and dichloromethane, be undertaken in the summer of 2007 to expand the VOC database for the south Mississauga-Oakville area.

This report focuses on the results for acrolein, acrylonitrile and dichloromethane sampling in ambient air the vicinity of industrial sources near Winston Churchill Boulevard on Royal Windsor Drive only. Detailed information of these sampling conditions are presented in Appendix 1. Competing monitoring priorities limited the number and duration of VOC sampling during 2007.

A total of three monitoring sites were installed, as shown in Figure 1, at the following locations:

1. 2255 Royal Windsor Drive (in the proximity of Station No. 46128),
2. 2509 Royal Windsor Drive (close to Universal Drum), and
3. 2645 Royal Windsor Drive (Electrovaya Inc.).

Figure 1: VOCs in Ambient Air Sampling Locations – Clarkson, Summer 2007

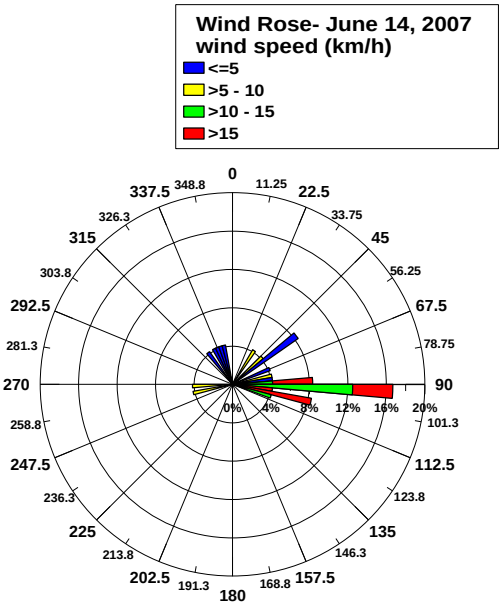
Air sampling for VOC determination was conducted using evacuated stainless steel 2-litre canisters with 24-hour calibrated orifices. Four samples were collected at each of the sampling locations, resulting in twelve samples in total. The samples were collected and submitted to Environment Canada for analysis according to the US EPA TO-14A/TO-15 methodologies.

The four daily (24 h) sampling events were collected on June 14-15, June 26-27, August 28-29, and September 20-21, 2007. Three of the four sampling events were conducted during smog advisories called for the Greater Toronto Area (GTA); June 14-15th, June 26th, and August 29.

Meteorological data from the closest AQI station in Oakville (Station 44017) was used to determine wind speed and direction during the sampling periods.

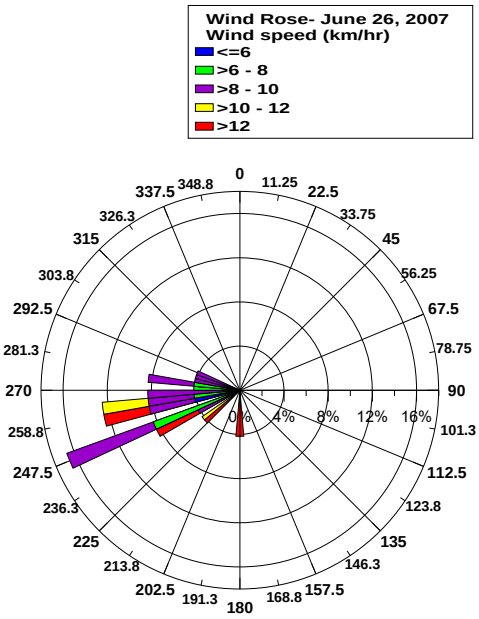
On June 14-15, 2007 the predominant winds were from the East quadrant where 62.5% of the time the wind direction was from 50 degrees to 110 degrees. The wind speeds ranged from 10 to 15 km per hour as illustrated in Figure 2.

Figure 2: Windrose plot for Station 44017 on June 14-15 Sampling Event



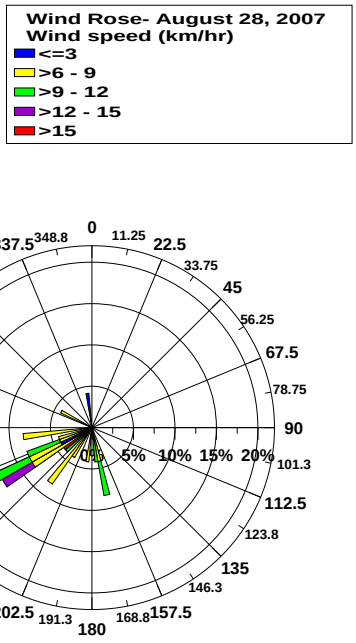
During the June 26-27, 2007 sampling event, the predominant winds were from the South West quadrant where 67% of the time the winds were blowing from 225 to 270 degrees. The wind speeds ranged from 6 to 12 km per hour as illustrated in Figure 3.

Figure 3 Windrose Plot for Station 44017 on June 26-27 Sampling Event



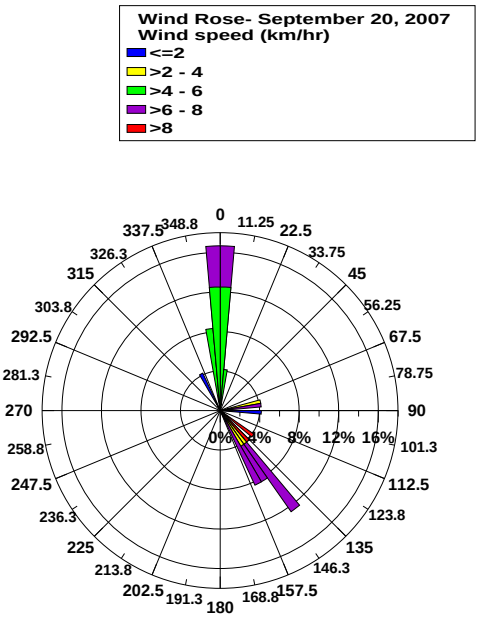
On August 28-29, 2007 the predominant winds were also from South-West quadrant where 58% of the time the winds were from 230 to 270 degrees. The wind speeds ranged from 3 to 15 km per hour as illustrated in Figure 4.

Figure 4 Windrose Plot for Station 44017 on August 28-29 Sampling Event



The fourth sampling event was conducted on September 20-21, 2007. On this day, the predominant winds were blowing from the North 49% of the time (330 degrees to 10 degrees) and later in the day (37.5% of the time) the winds changed to the South-East (125 – 155 degrees). The wind speeds ranged from 2 to 8 km per hour as illustrated in Figure 5.

Figure 5 Windrose Plot for Station 44017 on September 20-21 Sampling Event



The industries situated along Royal Windsor Drive between Winston Churchill and Southdown that potentially contribute to the Volatile Organic Compounds (VOCs) are:

1. UBA Chemicals (2605 Royal Windsor Drive),
2. Ashland Chemicals (2620 Royal Windsor Drive),
3. Universal Drums (2460 Royal Windsor Drive),
4. Stackpole (2400 Royal Windsor Drive),
5. PPG Canada Inc. (2301 Royal Windsor Drive),and
6. Blachford Ltd. (2323 Royal Windsor Drive).

The above industries are mainly involved in the manufacture of chemicals such as adhesives, lubricants, and synthetic polymers, or use a wide range of solvents in their process.

Other potential sources of VOCs, particularly acrolein emissions, are from vehicular traffic and other industries situated west of Winston Churchill, such as Ford Canada, and east of Southdown Road, such as Petro Canada Lubricants.

The sampling results for acrolein, acrylonitrile and dichloromethane are summarized in Table 1.

The daily (24h) concentrations for acrolein were all greater than the Reg 419/05 Schedule 3 standard of 0.08 µg/m^3, The maximum 24-hour average concentration obtained was 3.94 µg/m^3 during the August 28-29 sampling event at the 2645 Royal Windsor Drive station.

During Phase II of the Clarkson Airshed Study, the maximum 24-hour average result obtained was 0.51 µg/m^3 at the Industrial Centre station. In addition, the acrolein levels

Table 1 Daily (24 h) Acrolein, Acrylonitrile and Dichloromethane Concentrations (ug/m^3) in Ambient Air in the vicinity of Royal Windsor Drive, south Mississauga, Summer 2007.

Sampling Dates	Acrolein [1]	Acrylonitrile [2]	Dichloromethane [3]	Location	Station ID. 44017 WD (deg)	Station ID 44017 WS(km/h)
June 14-15, 2007	0.58	<MDL	1.07	2255Royal Windsor	51	4
	1.37	<MDL	8.59	2509Royal Windsor		
	1.70	<MDL	40.5	2645Royal Windsor		
June 26-27, 2007	1.78	<MDL	1.40	2255 Royal Windsor	246	7
	1.69	<MDL	0.75	2509 Royal Windsor		
	1.21	<MDL	0.71	2645 Royal Windsor		
August 28-29, 2007	1.85	<MDL	16.3	2255 Royal Windsor	237	7
	2.14	<MDL	1.81	2509 Royal Windsor		
	3.94	<MDL	2.25	2645 Royal Windsor		
September 20-21, 2007	1.51	<MDL	1.55	2255 Royal Windsor	7	5
	1.93	<MDL	126	2509 Royal Windsor		
	1.08	<MDL	9.57	2645 Royal Windsor		

Notes: The MDL (method detection limit) for acrylonitrile and acrolein is 0.031 ug/m^3 and 0.027 ug/m^3, respectively.

1. O. Reg 419/05 Schedule 3 24-hour standard is 0.08 ug/m^3
2. O. Reg 419/05 Schedule 3 24-hour standard is 0.6 ug/m^3
3. O. Reg 419/05 Schedule 3 24-hour standard is 220 ug/m^3

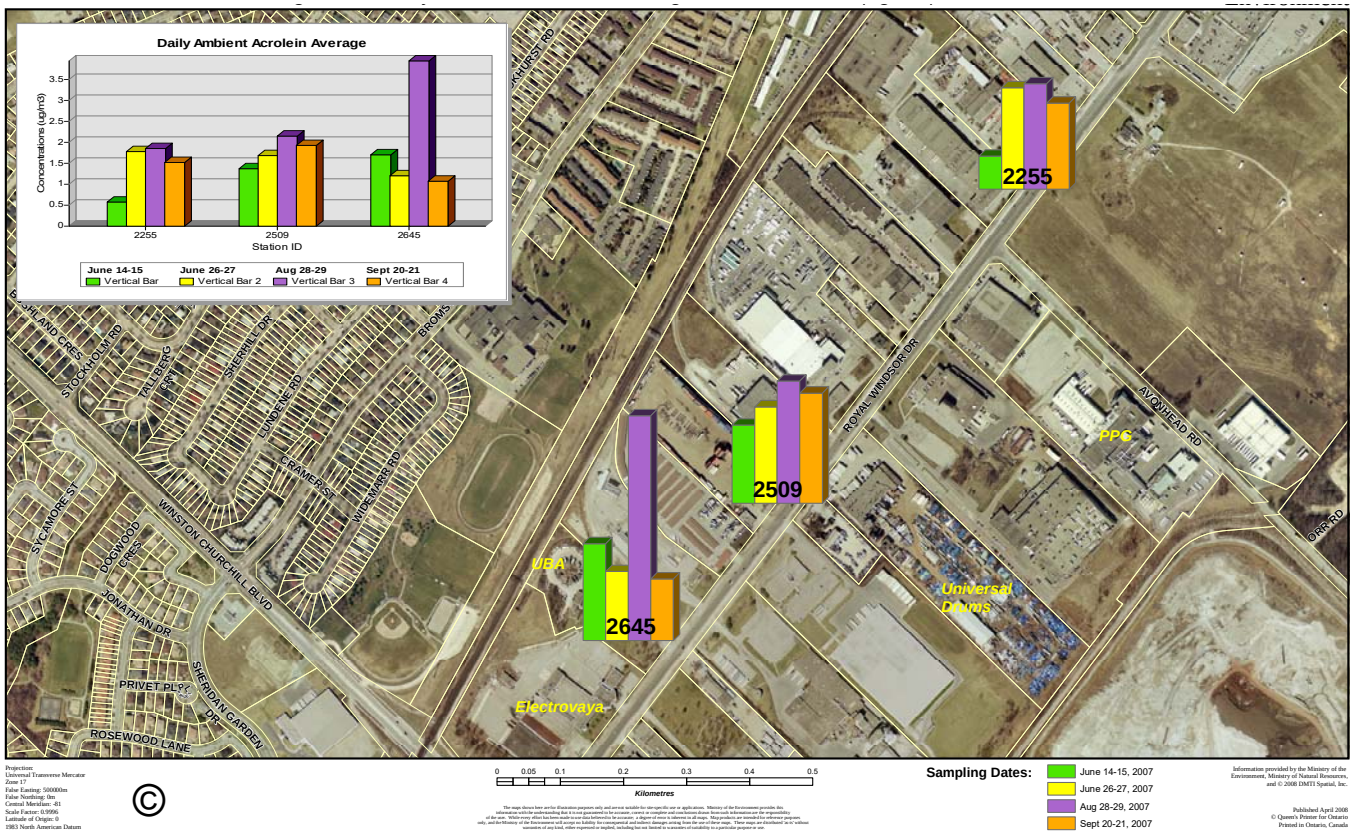
also exceed the O. Reg. 419/05 Upper Risk Threshold (Schedule 6) of 0.8 µg/m^3. However, it is important to note that these standards are based on point of impingement (POI), single source releases, and not the cumulative impacts from all the industries and other potential sources in the area.

Figure 6 shows the spatial variation between the three monitoring stations. Referring to the windrose patterns associated with the sampling events, it is not possible to infer any consistent correlation between wind direction and acrolein concentrations measured. Individual point sources may contribute significantly to maximum 24-hour acrolein concentrations measured, but it is more likely that all industrial point sources and area sources (vehicle emissions) cumulatively contribute to these maximum values.

As shown in Table 1, acrylonitrile levels at all stations were recorded below the detection limit and did not exceed the O. Reg. 419/05 Schedule 3 24-hour standard of 0.6 µg/m^3. During Phase II of the Clarkson Airshed study, the maximum 24-hour acrylonitrile average result obtained was 18.31 µg/m^3 at the Ford Drive station.

Dichloromethane levels are also presented in Table 1. This compound exceeded the AAQC 24-hour standard of 220 µg/m^3 during the Phase II of the Clarkson Airshed Study by 12%. Based on the four sampling events, all the daily dichloromethane levels were below the O. Reg. 419/05 24-hour Schedule 3 standard of 220 µg/m^3. The maximum 24-hour average concentration of 126 µg/m^3 was obtained on September 20-21, 2007 at the 2509 Royal Windsor Drive station.

Figure 6 Daily (24 h) Average Ambient Acrolein Concentrations (µg/m^3) in south Mississauga, Summer 2007



Conclusions

Based on 2007 measurements, and its potential to exceed O. Reg. 419/05 Schedule 3 air standards, which come into effect in 2010, acrolein remains an air quality parameter of concern in the south Mississauga area. Acrylonitrile and dichloromethane concentrations appear to be reduced from Phase II levels

The results from the three sampling locations and the twelve samples, coupled with Phase II results, are statistically insufficient to determine the source(s) contributing to the acrolein exceedances. Based upon poor correlation with wind direction, no one particular point source can be attributed to exclusively contributing to the elevated acrolein concentrations measured. Rather, all industrial point sources and vehicle emissions in the area emitting acrolein likely contribute to the levels measured.

Accordingly, the Ministry of the Environment has decided to undertake additional measurements in the same vicinity of sampling undertaken in 2007 to better characterize VOC concentrations and to identify likely sources. To isolate individual sources of the VOCs of concern, particularly acrolein sources, it will be necessary for future monitoring to undertake short-term sampling (½ hour) at the point of impingement under conditions when wind speed and direction remain relatively constant. Although 2007 levels of

acrylonitrile and dichloromethane appear to be reduced from 2004 levels, these compounds should continue to be monitored to discount the possibility of missing possible higher concentrations by random sampling or being an artifact of the sampling locations chosen.

The results of this study have been shared with the Region of Halton and Region of Peel Public Health Units for their information.

Appendix 1: Summary of sampling conditions for Acrolein, Acrylonitrile and Dichloromethane in Ambient Air – south Mississauga, Summer 2007.

June 14 2007 - Acrolein/Acrylonitrile

					GPS Locations		Electrovaya Meteorological			Sampling Time			
Sample #	**Sample Location**	**Canister ID**	**Initial Vacuum (inch Hg)**	**Final Vacuum (inch Hg)**	**X**	**Y**	**MET (WS) m/s**	**MET (WD) deg**	**Ambient Temp.**	**Started (EST)**	**Finished (EST)**	**Elapsed Time (h:min)**	**NOTES**
1	2255 Royal Windsor	EPS 216	-30	-4.5	610288	4817896	2.1	256.5	24.1	14/06/2007 10:15	15/06/2007 10:15	24.00	
2	2509 Royal Windsor	MOE 024	-29	-5.5	609897	4817397	2.1	256.5	24.1	14/06/2007 10:20	15/06/2007 10:20	24.00	
3	2645 Royal Windsor	MOE 009	-28.5	-4	609661	4817076	2.1	256.5	24.1	14/06/2007 10:24	15/06/2007 10:25	24.01	

Notes: No Met Data, only 2 hours during the 24-hour period is available (met data listed above is from 9:00 am)

June 26-27 2007 - Acrolein/Acrylonitrile

					GPS Locations		Wind Parameter			Sampling Time			
Sample #	**Sample Location**	**Canister ID**	**Initial Vacuum (inch Hg)**	**Final Vacuum (inch Hg)**	**X**	**Y**	**MET (WS) Km/h**	**MET (WD) deg**	**Field Notes**	**Started (EST)**	**Finished (EST)**	**Elapsed Time (h:min)**	**NOTES**
1	2255 Royal Windsor	MOE 022	-28	-5.5	610288	4817896	None	None	None	2007/06/26 10.35	27/06/2007 10:35	24.00	
2	2509 Royal Windsor	MOE 001	-30	-7.2	609897	4817397	None	None	None	2007/06/26 10.40	27/06/2007 10:40	24.00	
3	2645 Royal Windsor	MOE 019	-30	-5.5	609661	4817076	None	None	None	2007/06/26 10.45	27/06/2007 10:45	24.00	

Notes: No Met Data

August 28-29 /2007 -
Acrolein/Acrylonitrile

					GPS Locations		Wind Parameter			Sampling Time			
Sample #	Sample Location	Canister ID	Initial Vacuum (inch Hg)	Final Vacuum (inch Hg)	X	Y	MET (WS) Km/h	MET (WD) deg	Field Notes	Started (EST)	Finished (EST)	Elapsed Time (h:min)	NOTES
1	2255 Royal Windsor	MOE009	-29	-5	610288	4817896				28/08/2007 16:27	29/08/2007 16:04	23.37	
2	2509 Royal Windsor	MOE016	-29	-7	609897	4817397				28/08/2007 16:44	29/08/2007 16:16	23.32	
3	2645 Royal Windsor	MOE006	-30	-5	609661	4817076				28/08/2007 16:50	29/08/2007 16:25	23.35	
	Notes	No Met Data											

September 20-21/20074-
Acrolein/Acrylonitrile

					GPS Locations		Wind Parameter			Sampling Time			
Sample #	Sample Location	Canister ID	Initial Vacuum (inch Hg)	Final Vacuum (inch Hg)	X	Y	MET (WS) Km/h	MET (WD) deg	Field Notes	Started (EST)	Finished (EST)	Elapsed Time (h:min)	NOTES
1	2255 Royal Windsor	MOE013	-29	-3	610288	4817896				20/09/2007 11:16	21/09/2007 11:06	23.50	
2	2509 Royal Windsor	MOE001	-29	-6	609897	4817397				20/09/2007 10:52	21/09/2007 10:45	23.53	
3	2645 Royal Windsor	MOE015	-30	-4	609661	4817076				20/09/2007 11:04	21/09/2007 10:55	23.51	
	Notes	No Met Data											

APPENDIX

K CUMULATIVE HUMAN HEALTH ASSESSMENT

SLATE ASSET MANAGEMENT L.P.

HUMAN HEALTH ASSESSMENT

CLARKSON TRANSIT STATION AREA AIR QUALITY STUDY

DECEMBER 09, 2022

HUMAN HEALTH ASSESSMENT

CLARKSON TRANSIT STATION AREA

SLATE ASSET MANAGEMENT L.P.

PROJECT NO.: 201-06851-00
DATE: DECEMBER 09, 2022

WSP
100 COMMERCE VALLEY DRIVE WEST
THORNHILL, ON, CANADA L3T 0A1

WSP.COM

SIGNATURES

PREPARED BY

Ahmed Negm, M.Env.Sc
Risk Assessor

March 14, 2022 (Original Assessment)
Date

Yangfan Chen, M.Sc., E.I.T
Risk Assessor

March 14, 2022 (Original Assessment)
Date

APPROVED[1] BY

Theresa Repaso-Subang, DABT, ERT, QP_{RA}
Senior Technical Lead,
Toxicology & Risk Assessment

March 14, 2022 (Original Assessment)
Date

REVISIONS REVIEWED AND APPROVED[2] BY

Camille Taylor
Project Manager
Air, Noise, Vibration and Climate

WSP Canada Inc. prepared this report solely for the use of the intended recipient, SLATE ASSET MANAGEMENT L.P., in accordance with the professional services agreement. The intended recipient is solely responsible for the disclosure of any information contained in this report. The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report. This limitations statement is considered an integral part of this report.

The original of this digital file will be conserved by WSP for a period of not less than 10 years. As the digital file transmitted to the intended recipient is no longer under the control of WSP, its integrity cannot be assured. As such, WSP does not guarantee any modifications made to this digital file subsequent to its transmission to the intended recipient.

TABLE OF CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 BACKGROUND

The City of Mississauga (the "City") is developing land use policies for the Clarkson Transit Station Area (TSA) to support intensification of the area. It is recognized that with possible redevelopment of this area and introduction of new sensitive land uses, there would be a need to assess air quality impacts on proposed new sensitive developments, especially given the historical state of air quality in the area.

WSP Canada Inc. (WSP) has been retained by Slate Asset Management (Slate) to complete the TSA Air Quality Study (AQS) based on Terms of Reference provided by the City of Mississauga, intended to be used to assess the compatibility of proposed development blocks within the TSA. In support of the Clarkson TSA AQS, a human health assessment (HHA) was completed to assess any acute and chronic risks associated with the cumulative concentrations of chemicals predicted to be above Ambient Air Quality Criteria (AAQC) or federal standards, established by Ontario Ministry of Environment, Conservation and Parks (MECP), and determine appropriate implications and consideration of any mitigation measures for the proposed development/intensification.

The HHA relies on six months of ambient on-site air monitoring data and an air dispersion modelling assessment of identified contaminants of potential concern (COPCs) from the recently completed Clarkson TSA AQS (WSP, 2021). The model results represent the air quality impacts on the proposed development from surrounding land uses, including industrial operations and transportation sources in the Clarkson TSA. Based on the results of the ambient air monitoring and air dispersion modelling, the HHA evaluates the potential health effects from the predicted cumulative impacts from nearby activities on the proposed development.

This HHA predicts the potential health impacts of the proposed development within the Clarkson TSA that will consist of four 25-storey residential buildings.

1.2 OBJECTIVES OF THE HHA

The purpose of the HHA is to assess potential human health risks, if any, associated with predicted cumulative concentrations of identified COPCs from nearby activities on the proposed development.

To achieve this objective, WSP evaluated the source-pathway-receptor linkage based on possible interactions with human receptors within the proposed development. The HHA applied risk assessment approaches and methodology that are endorsed by federal and provincial regulatory agencies including Health Canada, MECP, and other relevant regulatory agencies.

The objectives of the HHA included the following:

- To assess whether the predicted cumulative concentrations of COPCs in ambient air influenced by nearby activities pose a health concern for identified human receptors in the proposed development; and,
- Based on the findings of the HHA, identify controls, mitigation measures, or monitoring programs that could be implemented to prevent or address the potential for health effects.

2 PROBLEM FORMULATION

The problem formulation section of the HHA is the first step in the assessment that lays out the source-pathway-receptor linkage based on possible interactions with human receptors at the proposed development to assess how the predicted cumulative concentrations from nearby sources may affect health. This step identifies the chemical of concern, receptors of concern, and exposure pathways to be evaluated in the assessment.

2.1 CHEMICALS OF POTENTIAL CONCERN

Available air quality data collected during the AQS (WSP, 2021) was used to determine COPCs.

The six months of ambient air monitoring data (Clarkson monitoring program) and dispersion modelling assessment were completed in accordance with the terms of reference (TOR) provided by the City and completed in accordance with the MECP operations manual for air quality monitoring in Ontario. The parameters outlined in the City TOR for monitoring were:

- Total suspended particulate matter (TSP);
- Volatile organic compounds (VOCs) (benzene, dichloromethane, and acrolein);
- Nitrogen oxides (NO_x); and,
- Sulphur dioxide (SO_2).

Particulate matter with aerodynamic diameter of 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$) were later added to the list of monitored parameters at the request of the MECP. The monitoring took place from July 8, 2020, to January 10, 2021.

The Clarkson monitoring program was used in combination with air dispersion modelling results to predict cumulative impacts at the Site for benzene, acrolein, PM_{10}, $PM_{2.5}$, TSP, NO_x, SO_2, and dichloromethane.

Several contaminants were not monitored as part of the Clarkson monitoring program, in which case ambient air monitoring concentrations were obtained from the Clarkson Air Shed Industrial Association (CASIA) monitoring program, the National Air Pollution Surveillance (NAPS), and the MECP ambient air quality monitoring program. These contaminants include carbon monoxide (CO), benzene, benzo(a)pyrene, 1,3-butadiene, formaldehyde, acetaldehyde, SO_2, total reduced sulphur [TRS (as H_2S)], xylene, and dichloromethane.

In order to assess the cumulative impacts on the Site, the 90th percentile of ambient air concentrations of each contaminant was calculated for 10-min, 1-hour, and 24-hour averaging periods. For contaminants with annual averaging periods, the annual mean was calculated.

The complete list of contaminants for which monitoring data was collected (as described above) includes: PM_{10}, $PM_{2.5}$, TSP, NO_x (expressed as NO_2), CO, SO_2, acrolein, benzene, 1,3-butadiene, acetaldehyde, formaldehyde, benzo(a)pyrene, methylene chloride, TRS (as H_2S), and xylenes.

Predicted modelled concentrations from stationery and transportation sources within the Clarkson study area (i.e., 1000 m area around the proposed development) were assessed at various heights using the AERMOD air dispersion model. Air dispersion modelling included predicted emission rates from roadways, trains on the Clarkson GO rail corridor, and facilities of concern within the study area. Cumulative concentration impacts from ambient background concentrations and predicted modelled concentrations were then compared to air quality project thresholds [i.e., either the AAQC or Canadian Ambient Air Quality Standards (CAAQS), whichever is more stringent].

For each contaminant with a cumulative concentration that exceeded its air quality project threshold, it was identified as a COPC and assessed for potential human health risks as part of the HHA. These contaminants include **acrolein**, **benzene**, **benzo(a)pyrene**, **NO_2**, and **$PM_{2.5}$**. Although PM_{10} and TSP reported cumulative concentrations that were greater than 80% of their respective air quality project thresholds, they were not considered as part of the assessment as they have no available health-based benchmarks for evaluation. Moreover, given their large particulate size, they are usually trapped in the upper respiratory airways and thus, are not a considered predominant

health concern relative to finer ($PM_{2.5}$) particulate matter. All other contaminants identified in the AQS were below their air quality project thresholds, and thus, were not carried forward as part of this assessment.

Table 3-2 in Section 3 presents the complete list of COPCs, their cumulative concentrations, and their respective air quality project thresholds.

It is important to note that the COVID-19 pandemic resulted in a reduction of traffic in the area, and a reduced train frequency along the Lakeshore West corridor during the monitoring period; therefore, this report assumes that vehicular emissions from nearby parking lots and major roadways were reduced. The ambient air quality monitoring results are used in conjunction with dispersion modelling to conservatively assess the air quality impacts on the proposed development. Dispersion modelling was completed using data from prior to the COVID-19 pandemic. Historical data, including monitoring data from the Clarkson Airshed Industrial Association (CASIA) from 2012 to 2018 was also incorporated into this study for comparative purposes, where applicable. Despite the uncertainties of the effects of COVID-19 on the ambient monitoring data, WSP has confidence in the report and its findings. Further details are found in the AQS (WSP, 2021).

2.2 RECEPTORS OF POTENTIAL CONCERN

The human receptors evaluated in the HHA were identified based on the proposed development within the Clarkson TSA (i.e., four 25-storey residential buildings). The human receptors associated with this identified land use are intended to be inclusive of human populations including sensitive subpopulations such as asthmatics, children, pregnant females, and the elderly. The following two (2) human receptors were considered:

1. Toddler residents who live in the buildings within the proposed development; and
2. Adult residents who live in the buildings within the proposed development.

The exposure modelling, described below in Section 3.0, considered that all of these human receptors may be exposed to maximum impacts associated with cumulative concentrations of COPCs that may be influenced by neighbouring sources. This approach provides maximum flexibility in the interpretation of results but may be overly conservative if the likelihood of human presence is not accounted for in the risk characterization.

2.3 EXPOSURE PATHWAYS OF CONCERN

A complete exposure pathway requires the following four elements:

- The presence of a chemical substance;
- A migration pathway (environmental transport);
- An exposure point for contact (e.g., air); and,
- An exposure route (e.g., inhalation).

An exposure pathway is not complete unless all four elements are present. If a pathway is incomplete, no significant exposure is anticipated to occur.

The HHA quantitatively evaluated the following exposure pathways based on the identified human receptors, COPCs [i.e., acrolein, benzene, benzo(a)pyrene, NO_2, and $PM_{2.5}$], and relevant environmental media (i.e., ambient air).

Toddler Residents:

– Exposure to concentrations of COPCs via direct inhalation of ambient air emissions.

Adult Residents:

– Exposure to concentrations of COPCs via direct inhalation of ambient air emissions.

For the purposes of exposure modelling, it was assumed that the predicted cumulative concentrations of COPCs in outdoor air are equal to that in indoor air (i.e., established equilibrium).

It should be noted that maximum COPC concentrations are expected at various heights and locations across the proposed development, depending on the contaminant. More importantly, several studies that investigate vertical difference of chemical concentrations confirm findings from atmospheric measurements and modeling that show concentrations tend to decrease with building height (Stephens *et al*, 2019). Table 2-1 (below) provide adjusted ambient concentrations with increasing building heights. A 10% reduction in chemical concentration with building height is observed at approximately 25 m. As a conservative measure, the worst-case COPC concentrations were used for assessment of all receptor groups.

A more detailed discussion on the exposure pathways for the above-noted receptors is provided in Section 3.0.

Table 2-1 Maximum Model Ambient Air Concentrations for Identified COPCs Adjusted with Increasing Building Height

RECEPTOR HEIGHT (M)	CONTAMINANT (µG/M³)						
	PM2.5	NOX		ACROLEIN	BENZENE	B(A)P	
	ANNUAL	1 HR	ANNUAL	24 HR	ANNUAL	24 HR	ANNUAL
0	8.20	36.0	16.0	0.63	0.49	5.00E-05	1.00E-05
4.3	8.20	36.0	16.0	0.63	0.49	1.10E-04	1.00E-05
8.6	7.67	35.3	15.5	0.56	0.44	1.10E-04	1.00E-05
12.9	7.04	33.6	15.4	0.45	0.38	1.08E-04	9.81E-06
17.2	6.35	39.0	14.8	0.35	0.33	1.04E-04	9.49E-06
21.5	5.71	41.7	13.4	0.28	0.28	1.15E-04	1.05E-05
25.8	5.15	38.5	11.3	0.20	0.25	1.22E-04	1.11E-05
30.1	4.63	32.7	8.9	0.14	0.22	1.23E-04	1.12E-05
34.4	4.16	26.1	6.6	0.11	0.20	1.11E-04	1.01E-05
38.7	3.71	20.7	4.8	0.08	0.18	9.40E-05	8.54E-06
43	3.29	16.7	3.5	0.07	0.17	7.42E-05	6.74E-06
47.3	2.90	15.8	2.6	0.06	0.16	5.70E-05	5.18E-06
51.6	2.53	15.7	2.1	0.06	0.15	4.65E-05	4.22E-06
55.9	2.19	15.5	1.8	0.05	0.15	3.90E-05	3.55E-06
60.2	1.89	15.5	1.6	0.05	0.14	3.29E-05	2.99E-06
64.5	1.62	15.6	1.5	0.05	0.14	2.81E-05	2.55E-06
68.8	1.38	15.7	1.4	0.05	0.14	2.41E-05	2.19E-06
73.1	1.17	15.8	1.4	0.04	0.14	2.03E-05	1.84E-06
77.4	0.99	16.0	1.4	0.04	0.14	1.75E-05	1.59E-06
81.7	0.84	16.3	1.4	0.04	0.14	1.51E-05	1.38E-06
86	0.71	16.5	1.4	0.04	0.14	1.37E-05	1.25E-06
90.3	0.61	16.7	1.4	0.04	0.14	1.24E-05	1.13E-06
94.6	0.52	17.0	1.4	0.04	0.14	1.14E-05	1.04E-06
98.9	0.45	17.3	1.4	0.04	0.14	1.07E-05	9.70E-07
103.2	0.40	17.5	1.4	0.03	0.14	1.01E-05	1.00E-05
107.5	0.35	18.0	1.5	0.03	0.14	9.41E-06	1.00E-05

Assumes ambient concentrations are collected at a minimum of 2m in height

Estimated ambient concentrations at heights based on % change from ground level

2.4 UNCERTAINTY ANALYSIS

The major sources of uncertainty associated with the problem formulation of the HHA are briefly described below:

- For the purpose of exposure modelling, it has been assumed that the predicted concentrations of COPCs in outdoor air are equal to that in indoor air. Ambient indoor air concentrations are dependant on a multitude of variables including infiltration rates, indoor decay rates, ventilation system set-ups, and other factors. To maintain a conservative approach, the assumption that equilibrium is established between outdoor and indoor ambient air was applied for this assessment.
- It is possible that other human receptors may be present at the proposed development for a period of time (e.g., site visitor or indoor worker); however, a resident is assumed to be the most sensitive human receptor to occupy the proposed development. Therefore, assessment of residents is protective of all other human receptors that may occupy the proposed development.

3 EXPOSURE ASSESSMENT

The receptor-specific exposure parameters for toddler residents, and adult residents are summarized in **Table 3-1** and **Table 3-2.**

3.1 EXPOSURE PARAMETERS FOR TODDLER RESIDENTS

It is assumed that toddlers from the ages of 7 months to 4 years old would reside in one of the buildings at the proposed development. The toddler is assumed to spend 24 hours/day, 7 days/week, for 50 weeks/year within their residential unit. It is also assumed that this receptor (whether in an indoor or outdoor environment, or both) will be continuously exposed to COPC concentrations in ambient air throughout the duration of their residence.

3.2 EXPOSURE PARAMETERS FOR ADULT RESIDENTS

It is assumed that an adult (i.e., > 20 years) would reside in one of the buildings at the proposed development. The adult is assumed to spend 24 hours/day, 7 days/week, for 50 weeks/year (assuming a two-week vacation) within their residential unit. It is also assumed that this receptor (whether in an indoor or outdoor environment, or both) will be continuously exposed to COPC concentrations in ambient air throughout the duration of their residence. A pregnant female resident was also evaluated to assess potential exposure to developmental COPCs (i.e., benzo(a)pyrene). A key difference in the evaluation of developmental toxicants is the absence of dose averaging. As such, exposure is assumed to occur for 24 hours/day, 7 days/week, for 52 weeks/year.

The exposure duration assumptions applied were considered reasonable and appropriate given the proposed development and anticipated receptors.

Table 3-1 Exposure Factors for Toddler, Adult, and Pregnant Female Residents

EXPOSURE FACTOR	UNITS	TODDLER (RESIDENT)	ADULT (RESIDENT)	PREGNANT FEMALE (RESIDENT)	REFERENCE
EF (exposure frequency for inhalation) = EFa x EFb x EFc	hrs/yr	8400	8400	8760	MECP, 2011
EFa (daily exposure frequency)	d/wk	7	7	7	MECP, 2011
EFb (weekly exposure frequency)	wk/yr	50	50	52	MECP, 2011
EFc (hourly exposure frequency)	hr/d	24	24	24	MECP, 2011
ED (exposure duration)	yr	4.5	56	56	MECP, 2011
AP (averaging period): non-cancer	yr	4.5	56	56	MECP, 2011
AP (averaging period): cancer	yr	76	76	76	MECP, 2011

3.3 CUMULATIVE EXPOSURES

The AQS (WSP, 2021) determined background ambient COPC concentrations to complete the air dispersion modelling and assess the predicted cumulative impacts from nearby activities on the proposed development.

Selected background ambient concentrations are added to modelled predictions to determine the cumulative impact to air quality. In this context, “background ambient” is defined as concentrations collected as part of the Clarkson monitoring program or the NAPS monitoring program and which represent background air quality.

For this assessment, the 90th percentile of ambient background concentrations of each COPC monitored was calculated for 10-min, 1-hour, and 24-hour averaging periods. For COPCs with annal averaging periods, the annual mean was calculated. Further details on the complete air dispersion modelling methodology applied as part of this assessment can be found in the AQS (WSP, 2021). A discussion on the conservatism applied to generate the cumulative concentrations are provided in Section 3.4.

Predicted modelled concentrations were collected from stationary and transportation sources within the study area. All sources were conservatively assumed to be operating 24 hours/day, 7 days/week, 52 weeks/year in the modelling assessment.

Subsequently, the cumulative impacts at the proposed development are calculated by aggregating the background ambient concentrations with the predicted modelling results (i.e., background ambient + predicted modelled = cumulative).

Table 3-2 below summarizes the COPC cumulative concentrations (including background ambient and predicted modelled concentrations) compared to their respective air quality project thresholds.

Although the AQS modelled concentrations from a total of 18 contaminants (as listed in section 2.1), only those contaminants that exceeded their applicable AAQC were listed in the table below and carried forward as part of the assessment

Table 3-2 Summary of Modelled Concentrations, Ambient Background Concentrations, and Cumulative Concentrations for COPCs against their Air Quality Project Thresholds

COPC	CAS Number	Total Emission Rate (g/s)	Air Dispersion Model Used[1]	Concentration (µg/m³)			Averaging Period	Air Quality Project Threshold (µg/m³)	Threshold Source	Percent of Limit from Background (%)	Percent of Limit from Modelled Conc. (%)	Percent of Limit (%)
				Modelled[2]	Background	Cumulative						
Acrolein	107-02-8	7.26E-06	AERMOD v.19191	0.010	1.6	1.6	1-hr	4.5	AAQC	36%	0. 2%	36%
				0.004	0.63	0.63	24-hr	0.4	AAQC	**158%**	1%	**158%**
Benzene	71-43-2	1.87E-01	AERMOD v.19191	0.03	0.69	0.72	24-hr	2.3	AAQC	30%	2%	31%
				0.009	0.49	0.50	Annual	0.45	AAQC	**109%**	2%	**111%**
Benzo(a)pyrene	50-32-8	6.49E-08	AERMOD v.19191	7.48E-07	0.00011	0.00011	24-hr	0.00005	AAQC	**213%**	1%	**215%**
				0.00E+00	0.000012	0.000012	Annual	0.00001	AAQC	**115%**	0%	**115%**
NO_x (as NO_2)	10102-44-0	1.13E+02	AERMOD v.19191	54	36	90	1-hr	79	CAAQS	46%	68%	**114%**
				32	30	62	24-hr	200	AAQC	15%	16%	31%
				14	16	30	Annual	23	CAAQS	68%	63%	**131%**
$PM_{2.5}$	N/A[1]	2.14E+00	AERMOD v.19191	4.5	15	19	24-hr	27	AAQC	54%	17%	71%
				1.8	8.2	10	Annual	8.8	AAQC	93%	21%	**114%**

Notes:

[1] Predicted modelled concentrations were derived using the MECP identified AERMOD dispersion model, version 19191.

[2] Maximum point of impingement (POI) concentrations are based on AERMOD dispersion modelling results.

Due to rounding, some cumulative values may not correspond with the sum of the background and modelled values

AAQC = Ambient Air Quality Criteria

CAAQC = Canadian Ambient Air Quality Standard

Bolded = concentrations exceed the air quality project threshold

3.4 UNCERTAINTY ANALYSIS

The major sources of uncertainty associated with the exposure assessment of the HHA are briefly described below:

- Worst-case exposure scenarios were evaluated for all human receptors considered. For example, it has been assumed that the predicted concentrations of COPCs in outdoor air are equal to that in indoor air. Ambient indoor air concentrations are dependant on a multitude of variables including infiltration rates, indoor decay rates, ventilation system set-ups, and other factors. To maintain a conservative approach, the assumption that equilibrium is established between outdoor and indoor ambient air was applied for this assessment.
- The HHA also assume that predicted concentrations of COPCs are constant with building height. However, several studies that investigate vertical difference of concentrations confirm findings from atmospheric measurements and modeling that PM concentrations tend to decrease with building height, meaning that high-rise housing could experience improved air quality relative to low-rise housing (Stephens *et al*, 2019).
- The maximum point of impingement (MPOI) concentration for each COPC was selected as the predicted modelled concentration to be used for assessment. The MPOI is specific to a certain height and location along the façade of the proposed buildings. For example, the most impacted receptor for 24-hr NO_2 concentrations is located at the northwest property boundary at a height of approximately 21.5 m as a result of this location being near train and road sources. However, all identified human receptors were assumed to be exposed to the COPC-specific MPOI concentrations at all times regardless of their spatial location within the proposed development. This is considered a conservative method of characterization and may overestimate risks.
- For those COPCs which were not part of the Clarkson monitoring program, there is an added level of uncertainty given that ambient background concentrations were collected from monitoring stations outside of the Clarkson TSA; and thus, the data becomes less representative of actual site conditions. For example, ambient background concentrations for benzo(a)pyrene were based on a NAPS station located near Highway 401. As such, higher concentrations were recorded given the close proximity to high volumes of vehicular traffic than in the vicinity of the Clarkson TSA. In this case, this is considered a conservative approach, and may overestimate risks.
- In many cases the ambient background concentrations collected already accounted for some of the sources modelled for the predicted modelled concentrations. In other words, sources captured in the Clarkson monitoring program are then modelled and added again to the results of the background ambient concentrations collected from the monitoring program to calculate the cumulative concentrations; in essence, leading to double counting. This is considered a conservative approach and may overestimate risks.

A series of conservative assumptions and characterization methods (as described above) were applied when obtaining ambient background concentrations and predicted modelled concentrations for COPCs. These assumptions, when used in aggregate, may result in conservative overestimates. Further details about the assumptions, methods, and uncertainties used to predict cumulative COPC concentrations can be found in the AQS (WSP, 2021).

4 HAZARD ASSESSMENT

The hazard assessment step provides the basis for evaluating what is an acceptable exposure and what level of exposure may be harmful to human health. This step involves identification of potentially harmful effects associated with each COPC and determines the dose that a receptor can be exposed to without experiencing unacceptable health effects. This value is called the toxicity reference value (TRV).

4.1 REVIEW OF TOXICOLOGICAL BASIS OF JURISDICTIONAL AMBIENT AIR QUALITY OBJECTIVES OF COPCS

Exposure limits are derived based on the duration of exposure. For this HHA, exposure limits selected to evaluate short-term (acute) and long-term (chronic) exposures were based on the following definitions:

- **Acute** – single or intermittent exposures lasting up to 24-hours; and,
- **Chronic** – repeated exposures over longer term periods that are conservatively assumed to take place over a lifetime.

A toxicological review was completed of available jurisdictional ambient air quality objectives (AAQOs) for acrolein, benzene, benzo(a)pyrene, NO_2, and $PM_{2.5.}$ Additionally, a comprehensive review of the available short-term (acute) and long-term (chronic) numerical limits was conducted. This review considered the following:

- For the available acute and chronic AAQOs, the technical (toxicological) basis of the numerical limits was assessed;
- The health endpoints of these limits were identified and the toxicological studies (human or animal data) upon which the numerical limits are based on were identified. Uncertainties inherent in the studies were also described;
- The scientific rigour in the derivation of the numerical limits was assessed;
- Key regulatory considerations in the standard deviation process were described; and,
- Of the jurisdictional limits available for acute and chronic exposure durations, for each COPC, the jurisdictional AAQO that is health-protective was identified and applied as the TRV in the HHA.

Exposure limits used in the HHA were obtained from reputable regulatory agencies that regularly review and update the science supporting the exposure limits, provide supporting documentation, and/or engage a peer-review process in their standards development process. For the purposes of this HHA, these sources included: Federal agencies (e.g., Health Canada, Canadian Council of Ministers of the Environment [CCME], United States Environmental Protection Agency [US EPA]), provincial or state agencies (e.g., British Columbia Ministry of Environment and Climate Change Strategy [BC MoECCS], Alberta Environment [AENV], MECP, California Office of Environmental Health Hazard Assessment [Cal OEHHA]), and international organizations (e.g., World Health Organization [WHO]). Human health-based screening criteria from Ontario, Health Canada, and CCME were prioritized.

Scientifically defensible exposure limits applied in the HHA for each COPC and for each duration (acute vs chronic) were selected based on the following considerations:

- Established or derived by reputable and credible regulatory agencies;
- Protective of public health based on the current scientific understanding of the health effects known and/or suspected to be associated with exposures to the COPC;
- Protective of sensitive individuals through the use of appropriate uncertainty factors (UFs); and,

- Supported by adequate documentation.

In the case that the above criteria were supported by more than one standard, guideline or objective, the most scientifically defensible limit was selected and the rationale for the decision is provided in the toxicity profile (Section 4.2). The findings of the jurisdictional review of available AAQOs for acute and chronic exposure and their toxicological basis are described in the sections below for each COPC.

4.1.1 ACROLEIN

Jurisdictional acute (or short-term, expressed as 1-hr and/or 8-hr) and chronic (or long-term, expressed as annual) exposure limits for acrolein are provided in **Table 4-1** and **Table 4-2**, respectively. The studies supporting the available exposure limits are described in detail below.

Table 4-1 Acute Inhalation Exposure Limits for Acrolein

REGULATORY AGENCY	TYPE	VALUE (ppb)	VALUE (µg/m³)	REFERENCE
BC ENV	1-hour AAQO	-	-	BC ENV, 2020
	8-hour AAQO	-	-	
AENV	1-hour AAQO	1.9	4.5	AENV, 2019
	24-hour AAQO	0.17	0.40	
ATSDR	Acute (1 to 14 days)	3	6.9	ATSDR, 2007
CCME	1-hour CAAQS	-	-	CCME, 2017
ON MECP	1-hour AAQC	-	4.5	Ontario MECP, 2022
US EPA	10 mins to 8 h	-	70	US EPA, 2010
	-	-	7	US EPA, 2008
Cal OEHHA	Acute 1-hour	1.1	2.5	Cal OEHHA, 2014
	8 hour	0.30	0.70	
WHO	1-hour AQG	-	-	WHO, 2000
	8-hour AQG	-	-	
Health Canada Environmental Canada	STEL (1h) REL	17	38	HC and EC, 2000
	LTEL (24h)	0.19	0.44	
Cal EPA	Acute (1h)	1.1	2.5	Cal OEHHA, 2008
ANSES	Acute (1h)	3	6.9	ANSES, 2013
TCEQ	Acute Reference Value (1h)	4.8	11	TCEQ, 2015
	Acute ESL (1h)	1.4	3.2	

AAQO - Ambient Air Quality Objective; AAQC – Ambient Air Quality Criteria; AQG - Air Quality Guideline; CAAQS – Canadian Ambient Air Quality Standard; REL – Reference Exposure Limit, STEL-Short Term Exposure Levels, TLV-Threshold Limit Value, TWA – Total Weighted Average; STEL Short Term Exposure Limit; LTEL – Long term Exposure Limit; AAQG-Ambient Air Quality Guideline

AENV – Alberta Environment, BC ENV – British Columbia Ministry of Environment and Climate Change Strategy; ATSDR-Agency for Toxic Substances and Disease Registry; ANSES - Agence Nationale de Sécurité Sanitaire de L'alimentation ; Cal OEHHA - California Office of Environmental Health Hazard Assessment; CCME – Canadian Council of Ministers of Environment; ON MECP – Ontario Ministry of

Environment, Conservation and Parks; US EPA – United States Environmental Protection Agency; WHO – World Health Organization. TCQE - Texas Commission on Environmental Quality.

There are no available acute (short-term) jurisdictional limits from BC MoECCS, CCME or WHO.

Table 4-2 Chronic Inhalation Exposure Limits for Acrolein

REGULATORY AGENCY	TYPE	VALUE (ppb)	VALUE (µg/m^3)	REFERENCE
ATSDR	Chronic MRL	-		ATSDR, 2007
AENV	Annual AAQO	-	-	AENV, 2019
BC ENV	Annual AAQO	-	-	BC ENV, 2020
CCME CAAQS	Annual CAAQS	-	-	CCME 2017
Health Canada Environment Canada	Chronic		0.4	HC and EC, 2000
ON MECP	Annual AAQC	-	-	Ontario MECP 2022
	Chronic (24 h)	0.17	0.4	OMoE, 2009
Cal OEHHA	Chronic	0.15	0.35	Cal OEHHA, 2008
Arizona Department of Health Services		-	-	AESRD, 2013
US EPA	Chronic		0.02 (RfC for Nasal Lesions)	US EPA, 2003
ANSES	Chronic		0.8	ANSES, 2013
WHO (unit risk)		-	-	WHO 2017
TCEQ	Air monitoring comparison Value (Annual)	0.1	0.2	TCEQ, 2015

AAQO - Ambient Air Quality Objective; AAQC – Ambient Air Quality Criteria; AQG - Air Quality Guideline; CAAQS – Canadian Ambient Air Quality Standard; REL – Reference Exposure Level, STEL-Short Term Exposure Levels, TLV-Threshold Limit Value, TWA – Total Weighted Average; STEL Short Term Exposure Limit,

AENV – Alberta Environment, BC ENV – British Columbia Ministry of Environment and Climate Change Strategy; ATSDR-Agency for Toxic Substances and Disease Registry, AESRD - Alberta Environment and Sustainable Resource Development; ANSES - Agence Nationale de Sécurité Sanitaire de L'alimentation Cal OEHHA - California Office of Environmental Health Hazard Assessment; CCME – Canadian Council of Ministers of Environment; ON MECP – Ontario Ministry of Environment, Conservation and Parks;OMoE – Ontario Ministry of Environment; US EPA – United States Environmental Protection Agency; WHO – World Health Organization; TCEQ - Texas Commission on Environmental Quality

ATSDR, BC ENV, AENV, CCME, ON MECP, Arizona Department of Health Services, and WHO have not established annual Ambient Air Quality Standards, objectives, criteria, or exposure limits for acrolein.

Environment Canada and Health Canada

In 2000, Environment Canada and Health Canada completed an assessment report for acrolein. The report concluded that acrolein is considered to be "toxic" as defined in Section 64 of the Canadian Environmental Protection Act, 1999. Within the report, Environment Canada and Health Canada developed an inhalation Tolerable Concentration (TC) of 0.4 µg/m^3(Microgram per cubic meter) for acrolein based on a chronic (3-day) exposure study investigating non-neoplastic lesions in the nasal and respiratory epithelium in rats.

Agency for Toxic Substances and Disease Registry

ATSDR (2007) derived an acute (1 to 14 day) minimal risk level of 3 part per billion (ppb) (6.9 µg/m^3), based on a lowest-observed-adverse-effect Level (LOAEL) of 0.3 part per million(ppm) (0.7 mg/m^3) for an increase in eye, nose, and throat irritation, and a decrease in respiration rate in a study of 46 volunteers exposed to acrolein for 60 minutes (Weber-Tschopp *et al.*, 1977). UFs of 10 for the use of a LOAEL and 10 for intraspecies variation were applied, giving a total UF of 100.

California Environmental Protection Agency

For acute exposures, the California Environmental Protection Agency (Cal EPA) (Cal OEHHA) (2008) derived an acute (1 hour) reference exposure level of 2.5 µg/m^3. This reference level is based on the geometric mean of effect levels for eye irritation in humans from the following two studies: a LOAEL of 138 µg/m^3 in a study of 36 volunteers exposed (eye only) to acrolein for 5 minutes, and a LOAEL of 210 µg/m^3 in a study of 53 volunteers exposed to increasing acrolein concentrations for 40 minutes. UFs of 6 for the use of LOAELs and 10 for intraspecies variation were applied, giving a total UF of 60. The revised value is set to protect against nasal lesions however it incorporates new scientific information pertaining to observed histological changes in the upper airways which are relevant to setting an air quality standard.

United States Environmental Protection Agency

The US EPA (2010) derived an acute exposure guideline limit (AEGL-1) of 70 µg/m^3 for non-disabling effects for timeframes of 10 minutes to 8 hours, based on eye irritation at 210 µg/m^3 in humans exposed to increasing acrolein concentrations for 40 minutes. An UF of 3 was applied to account for intraspecies variability.

In their pesticide evaluations, the US EPA (2008) and Health Canada's Pest Management Regulatory Agency (2016) derived a concentration of concern for short-term exposure of 7 µg/m^3, using a LOAEL of 210 µg/m^3 for eye irritation with UFs of 10 for intraspecies sensitivity and 3 or lack of no-observed-adverse-effect level (NOAEL), and a LOAEL of 700 µg/m^3 for nasal and throat irritation with UFs of 10 for intraspecies sensitivity and 10 for lack of NOAEL.

The US EPA (2003b) derived an inhalation reference concentration (RfC) of 0.2 µg/m^3, based on a LOAEL of 0.9 mg/m^3 from a 13-week rat study in 1978. The LOAEL was adjusted for continuous exposure (6 hours/14 hours and 5 days/7 days), and a human equivalent concentration (HEC) was calculated using a regional gas dose ratio (RGDR) conversion factor of 0.13 (HEC = 0.02 mg/m^3). This ratio accounts for pharmacokinetic but not pharmacodynamic differences between animals and humans; an UF of 3 was also applied for pharmacokinetic differences between species. UFs of 10 for sensitive human populations, 10 to account for the use of a subchronic study, and 3 for the use of a LOAEL were also applied, giving a total UF of 1000.

Health Canada and Environment Canada

The Government of Canada (Environment Canada and Health Canada, 2000) derived a tolerable concentration of 0.4 µg/m^3, based on a benchmark concentration producing a 5% response rate (BMC05) of 0.14 mg/m^3 from a 3-day study, which was adjusted for continuous exposure (6 hours/24 hours). UFs of 10 for interspecies extrapolation and 10 for sensitive human populations were applied, giving a total UF of 100.

Ontario Ministry of Environment, Conservation and Parks

Based on an evaluation of the scientific rationale of air guidelines from leading agencies, the following AAQCs are set for acrolein: A one-hour average AAQC of 4.5 µg/m^3, based on the development of irritation following acute exposure to acrolein; a 24-hour average AAQC of 0.4 µg/m^3, based on the development of lesions in the upper airways following chronic exposure to acrolein.

Alberta Environment

Alberta Environment (AENV, 2019) reports a 1-hour AAQO for Acrolein of 4.5 µg/m^3 (1.9 ppb) based on the development of irritation and 24-hour AAQO for 0.40 µg/m^3 (0.17 ppb) based on the development of lesions in upper airways. These values were both adopted from OMoE. According to OMoE, these levels are to protect against or prevent the development of nasal lesions following chronic exposure to acrolein.

California Office of Environmental Health Hazard Assessment

The California Office of Environmental Health Hazard Assessment (Cal OEHHA) is required to develop guidelines for conducting health risk assessments under the Air Toxics Hot Spots Program. Cal OEHHA, 2014 derived an acute Reference exposure level (REL) of 2.5 µg/m^3 (1.1ppb) based on the critical effects of subjective ocular irritation of eyes. The 8-hour REL and chronic REL are 0.70 µg/m^3 (0.30 ppb) and 0.35 ug/m^3 (0.15 ppb), respectively. Both of the above values are based on the critical effects of lesions in respiratory epithelium affecting the respiratory system.

Texas Commission on Environmental Quality

According to TCEQ (2015), a literature review was conducted for acrolein. The Weber-Tschopp et al. (1977) 1-hr study with a LOAEL of 0.3 ppm is selected as the key study because the exposure duration of 60 min corresponds to that desired for derivation of an acute Reference Value (ReV)/ Effects Screening Level (ESL). The experimental procedures and study discussion were more robust than those of the 1960 study and resulted in a LOAEL similar to that from the 40-minute Weber-Tschopp et al. (1970) study; and 1960 study only evaluated eye irritation for a 5-min exposure whereas the Weber-Tschopp study evaluated eye irritation (sensory effects) and effects on the respiratory tract using both qualitative and quantitative measures. The following UFs were applied to the point of departure adjusted for human equivalent concentration (POD_{HEC}) of 0.3 ppm: 10 for intra-human variability (UF_H), 6.3 for extrapolation from a LOAEL to a NOAEL (UF_L), and 1 for database uncertainty (UF_D) for a total UF = 63. Based on the above information, TCEQ derived the acute ReV (1 h) of 4.8 ppb. The acute ReV was multiplied by 0.3 to calculate the acute ESL. Thus, at the target hazard quotient of 0.3, the acute ESL is 1.4 ppb (3.2 µg/m^3).

Agence Nationale de Sécurité Sanitaire de L'alimentation

ANSES (2013) derived a short-term exposure guideline of 6.9 µg/m^3 for a 1-hour time frame, based on a LOAEL of 0.7 mg/m^3 for eye, nose, and throat irritation in volunteers exposed to acrolein for 60 minutes (Weber-Tschopp et al. 1977). UFs of 10 for the use of a LOAEL and 10 for intraspecies variability were applied, giving a total UF of 100.

ANSES (2013) also used the NOAEL of 0.46 mg/m^3 from a 2008 study to derive a long-term exposure guideline of 0.8 µg/m^3. No duration adjustment was made, and a HEC was calculated using an RGDR conversion factor of 0.13 (HEC = 60 µg/m^3). This ratio accounts for pharmacokinetic but not pharmacodynamic differences between animals and humans; an UF of 2.5 was also applied for pharmacokinetics. UFs of 10 for sensitive human populations and 3 to account for the use of a subchronic study were also applied, giving a total UF of 75.

4.1.2 BENZENE

Jurisdictional acute (or short-term, expressed as 1-hr and/or 8-hr) and chronic (or long-term, expressed as annual) exposure limits for benzene are provided in **Table 4-3** and Table 4-4, respectively. The studies supporting the available exposure limits are described in detail below.

Table 4-3 Acute Inhalation Exposure Limits for Benzene

Regulatory Agency	Type	Value (ppb)	Value (µg/m^3)	Reference
BC MoECCS	1-hr AAQO	-	-	BC MoECCS 2020

Regulatory Agency	Type	Value (ppb)	Value (µg/m^3)	Reference
	8-hr AAQO	-	-	
AENV	1-hr AAQO	9.0	30	AENV 2019
	8-hr AAQO	-	-	
ATSDR	Acute MRL	9	30	ATSDR 2007
	Intermediate MRL	6	19.44	
CCME	1-hr CAAQS	-	-	CCME 2017
Health Canada	REL	-	-	Health Canada 2021
	Inhalation Tolerable Concentration	-	-	
ON MECP	1-hr AAQC	-	-	Ontario MECP 2020
	8-hr AAQC	-	-	
US EPA	1-hr Standard	-	-	US EPA NAAQS Table 2021
	8-hr Standard	-	-	
Cal OEHHA	8-hr REL	0.1	3	California OEHHA 2014
	1-hr REL	8	26	
WHO	1-hr AQG	-	-	WHO 2000
	8-hr AQG	-	-	

AAQO - Ambient Air Quality Objective; AAQC – Ambient Air Quality Criteria; AQG - Air Quality Guideline; CAAQS – Canadian Ambient Air Quality Standard; MRL – Minimum Risk Level; NAAQS – National Ambient Air Quality Standard; REL – Reference Exposure Level

AENV – Alberta Environment, BC MoECCS – British Columbia Ministry of Environment and Climate Change Strategy; ATSDR-Agency for Toxic Substances and Disease Registry, Cal OEHHA - California Office of Environmental Health Hazard Assessment; CCME – Canadian Council of Ministers of Environment; ON MECP – Ontario Ministry of Environment, Conservation and Parks; US EPA – United States Environmental Protection Agency; WHO – World Health Organization

Table 4-4 Chronic Inhalation Exposure Limits for Benzene

Regulatory Agency	Type	Value (ppb)	Value (µg/m^3)	Reference
BC MoECCS	Annual AAQO	-	-	BC MoECCS 2020
AENV	Annual AAQO	0.9	3	AENV AAQO 2019
CCME	Annual CAAQS	-	-	CCME 2017
Health Canada	Risk-Specific Concentration	0.19 to 1.4	0.6 to 4.5	Health Canada 2021; Risk-Specific Concentration that corresponds with derived Inhalation Unit Risks (IURs) of 1.6 x 10^{-2} $(mg/m^3)^{-1}$
ON MECP	Annual AAQC	0.14	0.45	MECP 2020
	24-hour AAQC	0.72	2.3	
Cal OEHHA	Chronic	1	3	OEHHA 2014; based on health effects to hematologic system, nervous system, and development effects.
ATSDR	Chronic MRL	3	9	ATSDR 2007
TCEQ	Annual Average	1.4	4.5	TCEQ 2015; based on long-term effect screening level used for permitting and an incremental lifetime cancer risk of 1 in 100,000 of developing leukemia
US EPA	Reference Concentration	9	30	US EPA 2003 based on decreased lymphocyte count based on human occupational

				inhalation study (Rothman *et al* 1996)
	Risk-Specific Concentrations	0.4 to 1.4	1.3 to 4.5	US EPA 2003 ; Risk-Specific Concentrations that correspond with derived IURs that range from 2.2 x 10^{-6} $(\mu g/m^3)^{-1}$ to 7.8 x 10^{-6} $(\mu g/m^3)^{-1}$
WHO	Risk-Specific Concentrations	0.53	1.7	WHO 2017; based on protection of leukaemia effects and an incremental lifetime cancer risk of 1-in-100,000.

AAQO - Ambient Air Quality Objective; AAQC – Ambient Air Quality Criteria; AQG - Air Quality Guideline; CAAQS – Canadian Ambient Air Quality Standard; MRL – Minimum Risk Level, REL – Reference Exposure Level

AENV – Alberta Environment, BC MoECCS – British Columbia Ministry of Environment and Climate Change Strategy; ATSDR-Agency for Toxic Substances and Disease Registry, Cal OEHHA - California Office of Environmental Health Hazard Assessment; CCME – Canadian Council of Ministers of Environment; ON MECP – Ontario Ministry of Environment, Conservation and Parks; US EPA – United States Environmental Protection Agency; WHO – World Health Organization

Alberta Environment

Alberta Environment (AENV, 2019) reports a 1-hour AAQO for benzene of 30 µg/m^3 (9 ppb) based on haematological effects. This value was adopted from Texas and the guideline was developed in 1999. According to the TCEQ, the basis for the development of short-term and long-term ESLs are unknown; however, these levels are based on data concerning health effects, odour nuisance potential, effects with respect to vegetation and corrosion effects and are not ambient air standards. If predicted or measured airborne levels of a chemical do not exceed the screening level, adverse health or welfare effects would not be expected to result. If ambient levels of constituents in the air exceed the screening levels, it does not necessarily indicate a problem, rather, triggers a more in-depth review.

The annual average AAQO for benzene is 3 µg/m^3 (0.9 ppb) based on carcinogenic effects.

United States Environmental Protection Agency

The US EPA (2002) derived a RfC for benzene of 30 µg/m^3, which represents a daily inhalation exposure of the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious haematological (blood) effects during a lifetime of exposure. The RfC was derived based on benchmark dose (BMD) modeling of the absolute lymphocyte count data from the occupational epidemiologic study of Rothman *et al.* (1996), in which workers were exposed to benzene by inhalation. A comparison analysis based on BMD modeling of haematological data from the Ward *et al*. (1985) subchronic experimental animal inhalation study was also conducted. In addition, comparison analyses using the LOAELfrom the Rothman *et al.* (1996) study and the NOAEL from the Ward *et al.* (1985) study were performed.

The RfC was derived by dividing the adjusted benchmark concentration level of 8.2 mg/m^3 by the overall UF of 300 (i.e., RfC = $BMCL_{ADJ/UF}$ = 8.2 mg/m^3 ÷ 300 = 0.03 mg/m^3). The overall UF of 300 comprises a UF of 3 for effect-level extrapolation, 10 for intraspecies differences (human variability), 3 for subchronic-to-chronic extrapolation, and 3 for database deficiencies.

US EPA (2003) derived Inhalation Unit Risks (IURs) of 2.2 x10^{-6} $(\mu g/m^3)^{-1}$ to 7.8 x 10^{-6} $(\mu g/m^3)^{-1}$ based on leukemia effects, mainly acute myelogenous leukemia, by extrapolation of low dose linearity utilizing maximum likelihood estimates. The corresponding Risk-Specific Concentrations from these IURs are 1.3 to 4.5 µg/m^3. For this HHA, the risk-specific concentration of 4.5 µg/m^3 was applied based on Health Canada (2021), TCEQ (2015), and US EPA (2003).

Agency for Toxic and Disease Registry

ATSDR has derived an acute-duration inhalation minimum risk level (MRL) of 0.009 ppm (9 ppb) for benzene based on a LOAEL of 10.2 ppm for immunological effects in mice exposed for 6 hours/day for 6 consecutive days).

The LOAEL of 10.2 ppm was adjusted from intermittent to continuous exposure ($LOAEL_{ADJ}$= 2.55 ppm) and converted to a human equivalent concentration ($LOAEL_{HEC}$= 2.55 ppm); an UF of 300 (10 for use of a LOAEL, 3 for extrapolation from animals to humans using dosimetric conversion, and 10 to protect sensitive individuals) was applied.

ATSDR has derived an intermediate-duration inhalation MRL of 0.006 ppm (6 ppb) for benzene based on a LOAEL of 10 ppm for significantly delayed splenic lymphocyte reaction to foreign antigens evaluated in in vitro mixed lymphocyte reaction following the exposure of male C57Bl/6 mice to benzene vapors for 6 hours/day, 5 days/week for 20 exposure days. The concentration was adjusted from intermittent to continuous exposure ($LOAEL_{ADJ}$= 1.8 ppm) and converted to a human equivalent concentration ($LOAEL_{HEC}$= 1.8 ppm); an UF of 300 (10 for the use of LOAEL, 3 for extrapolation from animals to humans using dosimetric conversion, and 10 for human variability) was applied.

ATSDR has derived a chronic-duration inhalation MRL of 0.003 ppm (3 ppb) for benzene based on the results of BMD modeling of B cell counts in workers of shoe manufacturing industries in Tianjin, China. The resulting value was adjusted from intermittent to continuous exposure by applying an UF of 10 (to protect sensitive individuals).

California Office of Environmental Health Hazard Assessment

The Cal OEHHA is required to develop guidelines for conducting health risk assessments under the Air Toxics Hot Spots Program. In 2014, Cal OEHHA derived a 1-hour inhalation REL) of 27 µg/m^3 based on effects to the reproductive/development system and aplastic anemia and acute myelogenous leukemia. The critical effects were developmental hematotoxicity in fetal and neonatal mice.

The chronic REL is 3 µg/m^3 based on the critical effects of decreased peripheral blood cells in Chinese workers affecting hematologic system. The target endpoint following chronic benzene exposure is the hematopoietic (blood) system. Neurological effects are also of concern at slightly higher concentrations. Impairment of immune function and/or various types of anemia may result from the hematotoxicity. Repeated benzene exposures can also lead to life-threatening aplastic anemia. These lesions may lead to the development of leukemia years later, after apparent recovery from the hematologic damage.

Health Canada

Health Canada has not established an inhalation RfC; however, they provide an IUR of 1.6E-02 $(mg/m^3)^{-1}$ which corresponds to an excess lifetime risk of 1-in-100,000 and 0.6 µg/m^3 concentration in air. The IUR to protect the general population against leukemia was derived based on chronic inhalation occupational exposures from two studies: Ohio Pliofilm Cohort $(0.044\ (ppm)^{-1}$ or $0.014\ (mg/m^3)^{-1})$ and Chinese Cohorts $(0.056\ (ppm)^{-1}$ or $0.018\ (mg/m^3)^{-1})$.

For the recommended IUR, Health Canada cites two references: Guidance for Benzene in Residential Indoor Air (Health Canada, 2013) and Public Health Goal for Benzene in Drinking Water (OEHHA, 2001). Based on these documents, the risk-specific concentrations associated with a 1 x 10^{-6} (or one-in-one million) risk of leukemia range from 0.06 µg/m^3 (OEHHA 2001) to 0.45 µg/m^3. For 1 in 100,000 risk, the risk-specific concentrations range from 0.6 µg/m^3 to 4.5 µg/m^3.

Texas Commission on Environmental Quality

Epidemiological studies following short-term (i.e., acute, subacute) inhalation exposures to benzene demonstrated limited hematologic effects as per review conducted by TCEQ. The Midzenski *et al.* (1992) study cited in the TCEQ benzene profile reported leukopenia, anemia, thrombocytopenia, and increased mean corpuscular volume in 15 male workers following subacute occupational exposure (mean of 5 days) at a LOAEL of 60 ppm. Dizziness and nausea were also reported in workers with more than 2 days of exposure. However, review of the study indicates that the reported sampling results (after exposure had ended) were “greater than 60 ppm” to 653 ppm (and could have been even higher due to sampling breakthrough), which does not allow for identification of a reliable LOAEL.

Additionally, the study did not identify a NOAEL. The inability to identify a reliable LOAEL (or NOAEL) from the Midzenski *et al.* study (1992) precludes its use in the calculation of an acute ReV and acute acute ESL.

The chronic REL of 4.5 µg/m^3 (1.4 ppb) is based on a cancer endpoint of acute myelogenous and acute monocytic leukemia in occupationally exposed workers. Epidemiologic and case studies provide clear and consistent evidence of a causal association between benzene exposure and acute myelogenous (nonlymphocytic) leukemia, the dominant leukemia type observed among benzene-exposed workers in the studies reviewed. To a lesser extent, benzene exposure may be associated with chronic myelogenous (nonlymphocytic) leukemia and chronic lymphocytic leukemia, but studies have not yielded consistent results.

World Health Organization

World Health Organization (WHO) decided to rely on the 1994 risk calculations rather than derive new estimates. The geometric mean of the range of estimates of the excess lifetime risk of leukaemia at an air concentration of 1 µg/m^3 is 6 x 10^{-6}. The concentrations of airborne benzene associated with an excess lifetime risk of 1-in-10 000, 1-in-100 000 and 1-in-1 000 000 are 17, 1.7 and 0.17 µg/m^3, respectively.

4.1.3 BENZO(A)PYRENE

Jurisdictional acute (or short-term, expressed as 1-hr and/or 8-hr) and chronic (or long-term, expressed as annual) exposure limits for benzo(a)pyrene are provided in **Table 4-5** and **Table 4-7,** respectively. The studies supporting the available exposure limits are described in detail below.

Table 4-5 Acute Inhalation Exposure Limits for Benzo(a)pyrene

Regulatory Agency	Type	Value (ppb)	Value (µg/m^3)	Reference
AENV	1-hour AAQO	-	-	AENV AAQO 2019
	8-hour AAQO	-	-	
ATSDR	Acute MRL	-		ATSDR, 1995
	Intermediate MRL	-		
Arizona Department of Health Services	24-hour	-	0.18	Arizona DHS, 1999
	1-hour	-	0.67	
BC ENV	1-hour AAQO	-	-	BC ENV 2020
	8-hour AAQO	-	-	
Cal EPA	AAQS	-	-	California EPA, 1999
TCEQ	1-hour average ESL		0.03	TNRCC, 2004
MOE	24-hours AAQC		0.00005	MOE 2020
US EPA	Reference Concentration (Developmental Toxicity)	-	0.002	US EPA, 2017
WHO	1-hour AQG	-	-	WHO 2000
	8-hour AQG	-	-	

AAQO - Ambient Air Quality Objective; AQG - Air Quality Guideline; REL – Reference Exposure Level; ESL – Effects Screening Levels; MRL – Minimal Risk Level; TLV-Threshold Limit Value; AAQS – Ambient Air Quality Standard; AAQC – Ambient Air Quality Criteria.

AENV – Alberta Environment; ATSDR-Agency for Toxic Substances and Disease Registry; Arizona DHS – Department of Health Services; BC ENV – British Columbia Ministry of Environment and Climate Change Strategy; Cal EPA – California Environmental Agency; TCEQ – Texas Commission on Environmental Quality; MOE – Ontario Ministry of Environment; US EPA – United States Environmental Protection Agency; WHO – World Health Organization.

AENV, ATSDR, BC ENV, Cal EPA and WHO have not established acute Ambient Air Quality Standards, objectives, criteria or exposure limits for benzo[a]pyrene.

Table 4-6 Chronic Inhalation Exposure Limits for Benzo(a)pyrene

Regulatory Agency	Type	Value (ppb)	Value (µg/m^3)	Reference
ATSDR	Chronic MRL	-		ATSDR 2007
BC ENV	Annual AAQO	-	-	BC ENV2020
AENV	Annual AAQO	2.9*10^{-5}	0.30 ng/m^3	AENV, 2019
MOE	Annual AAQC	-	0.00001	MECP 2020
TCEQ	Annual averaging time	-	0.003	TNRCC, 2004
Arizona DHS	Annual AAQG	-	0.00048	Arizona DHS, 1999
US EPA (unit risk)	Risk-Specific Concentration	-	0.002	US EPA, 2017; Risk-Specific Concentration that corresponds with an IUR of 6 x 10^{-4} (µg/m^3)$^{-1}$ and an excess lifetime risk level of I in 1,000,000.
Cal EPA (unit risk)	Risk-Specific Concentration		0.009	Cal EPA, 1999; Risk-Specific Concentration that corresponds with an IUR of 1 x 10^{-3} (µg/m^3)$^{-1}$ and an excess lifetime risk level of I in 100,000.
WHO (unit risk)	Ambient air guidance value (protection for general population using an IUR of 8.7(10^{-5}) per ng/m3 and corresponding to an excess lifetime risk level pf I in 100,000.	-	0.0012	WHO 2000

AAQO - Ambient Air Quality Objective; AAQC – Ambient Air Quality Criteria; AAQG – Ambient Air Quality Guideline; CAAQS – Canadian Ambient Air Quality Standard; MRL – Minimal Risk Level; IUR – Inhalation Unit Risk.

ATSDR-Agency for Toxic Substances and Disease Registry; BC ENV – British Columbia Ministry of Environment and Climate Change Strategy; AENV – Alberta Environment; MOE-Ontario Ministry of Environment; TCEQ – Texas Commission on Environmental Quality; Arizona DHS - Arizona Department of Health Services; US EPA – United States Environmental Protection Agency; Cal EPA – California Environmental Protection Agency; WHO – World Health Organization.

ATSDR, BC ENV, CCME, and MOE have not established annual Ambient Air Quality Standards, objectives, criteria or exposure limits for Benzo[a]pyrene.

Alberta Environment

Alberta Environment (AENV, 2019) reports an annual AAQO for B[a]P of 0.30 ng/m^3 based on chronic and carcinogenic human health effects. However, the basis for the selection of these thresholds was not specified in this document.

United States Environmental Protection Agency

Developmental toxicity, represented by decreased embryo/fetal survival, was chosen as the basis for the proposed inhalation RfC as the available data indicates that developmental effects represent a sensitive hazard of benzo[a]pyrene exposure. A 2002 developmental inhalation study in rats and the observed decreased embryo/fetal

survival (i.e., increased resorptions) following exposure to benzo[a]pyrene on gestation days 11−20 were used to derive the overall RfC. The LOAEL of 25 µg/m^3 based on decreased embryo/fetal survival was selected as the points of departure (POD). The LOAEL was adjusted to account for the discontinuous daily exposure to derive the POD_{ADJ} and the HEC was calculated from the POD_{ADJ} by multiplying by the regional deposited dose ratio for extra-respiratory (i.e., systemic) effects. These adjustments resulted in a POD_{HEC} of 4.6 µg/m^3, which was used as the POD for RfC derivation

The RfC was calculated by dividing the POD by a composite UF of 3,000 to account for toxicodynamic differences between animals and humans (3), interindividual differences in human susceptibility (10), LOAEL-to- NOAEL extrapolation (10), and deficiencies in the toxicity database (10).

Based on a study in 1981, the inhalation unit risk of 6×10^{-4} per µg/m^3 was calculated by linear extrapolation (slope factor = 0.1/benchmark concentration lower confidence limit ($BMCL_{10}$)) from a $BMCL_{10}$ of 0.16 mg/m^3 for the occurrence of upper respiratory and upper digestive tract tumors in male hamsters chronically exposed by inhalation to benzo[a]pyrene (US EPA, 2017). The corresponding risk-specific concentration from this IUR is 0.002 µg/m^3 based on an excess lifetime cancer risk level of 1 in 1,000,000.

Ontario Ministry of the Environment

The OMoE adopted an AAQC of 0.00005 µg/m^3 and 0.00001 µg/m^3 as a 24-hour and annual guideline, respectively. Note that the 24-hour AAQC is a converted value from the annual AAQC which is based on carcinogenic effects (MECP, 2020).

California Environmental Protection Agency

A risk specific concentration (RsC) of 0.009 µg/m^3 corresponding to 1 in 100,000 risk was used to illustrate a benzo[a]pyrene guideline for the Cal EPA (1999). The RsC corresponding to 1 in 100,000 risk (risk criteria used in Alberta) was derived using respiratory tract tumor data from male hamsters, in which an IUR of 1.1E-03 per (µg/m^3) was calculated using a linearized multistage procedure. It was based on the assumptions of additivity of individual risks posed by other selected PAHs with four or more rings classified as carcinogens.

Arizona Department of Health Services

The annual AAAQG is derived by taking the US EPA oral cancer slope factor of 7.3 [mg/kg/day]$^{-1}$ and an acceptable cancer risk of 1 in 1,000,000 (10^{-6}). The 24-hour AAAQG is derived by multiplying the annual AAAQG by 365. The one-hour AAAQG is derived by multiplying the 24-hour AAAQG by 3.8. The multiplier of 3.8 represents the proportional difference in the LOAEL for 24-hour and 1-hour exposure to a common irritant (SO_2) in human subjects (Arizona DHS, 1999). AAAQGs are not intended to be used as standards. Rather, they are intended to provide health-based guidelines that may be useful in making environmental risk management decisions. AAAQGs consider human health risk from inhalation of contaminants in ambient air. They do not take into account odor thresholds or threats to wildlife (Arizona DHS, 1999).

AAAQGs are residential screening values that are protective of human health, including children. Chemical concentrations in air that exceed AAAQGs may not necessarily represent a health risk. Rather, when contaminant concentrations exceed these guidelines, further evaluation may be necessary to determine whether there is a true threat to human health. Arizona DHS has individual guidelines for other selected PAHs with four or more rings that are classified as carcinogens (commonly present as mixtures of PAHs in the atmosphere with benzo[a]pyrene) (Arizona DHS, 1999).

Texas Commission on Environmental Quality

ESLs are used to evaluate the potential for effects to occur as a result of exposure to concentrations of constituents in air. ESLs are based on data concerning health effects, odor nuisance potential, effects with respect to vegetation, and corrosion effects. They are not ambient air standards. If predicted or measured airborne levels of a chemical do not exceed the screening level, adverse health or welfare effects would not be expected to result. If ambient levels of

constituents in air exceed the screening levels, it does not necessarily indicate a problem, but rather, triggers a more in-depth review (TNRCC, 2004).

World Health Organization

The WHO (2000) recommended an ambient air guidance value of 0.0012 µg/m^3 for the general population using an inhalation unit risk factor of 8.7x 10^{-5} per mg/m^3 and corresponding to an excess lifetime cancer risk level of 1 in 100,000. The guideline is intended to provide background information and guidance to governments in making risk management decisions, particularly in setting standards. It is not stated how other selected PAHs with four or more rings classified as carcinogens are treated by the WHO.

4.1.4 NITROGEN DIOXIDE

Jurisdictional acute (or short-term expressed as 1-hr and/or 8-hr) and chronic (or long-term expressed as annual) exposure limits for NO_2 are provided in Table 4-7 and Table 4-8. Jurisdictions with established values are reviewed and studies supporting these exposure limits are described in detail below.

Table 4-7 Acute Inhalation Exposure Limits for NO2

Regulatory Agency	Type	Value (ppb)	Value (µg/m^3)	Reference
Metro Vancouver	1-hour AAQO	60	113	Metro Vancouver 2020
BC MoECCS	1-hour AAQO	60	113	BC MoECCS 2020
CCME 2020 CAAQS (2025 CAAQS)	1-hour CAAQS	60 (42)	-	CCME 2017
AENV	1-hour AAQO	159	300	AENV 2011
ON MECP	1-hour AAQC	200	400	MECP 2020
	24-hour AAQC	100	200	
US EPA	1-hour Standard	100	-	US EPA 2018
Cal OEHHA	1-hour REL	-	470	California OEHHA 2008
WHO	1-hour AQG		200	WHO 2005

AAQO - Ambient Air Quality Objective; AAQC – Ambient Air Quality Criteria; AQG - Air Quality Guideline; CAAQS – Canadian Ambient Air Quality Standard; REL – Reference Exposure Level.

BC MoECCS – British Columbia Ministry of Environment and Climate Change Strategy; AENV – Alberta Environment; CCME – Canadian Council of Ministers of Environment; ON MECP – Ontario Ministry of Environment, Conservation and Parks; US EPA – United States Environmental Protection Agency; Cal OEHHA - California Office of Environmental Health Hazard Assessment; WHO – World Health Organization

Metro Vancouver and British Columbia Ministry of Environment and Climate Change Strategy

The British Columbia Ministry of Environment and Climate Change Strategy (BC MoECCS 2020) and Metro Vancouver (2020) revised their acute 1-hour AAQOs for NO_2 to further reduce NO_2 emissions and minimize impacts to public health resulting from increasing population density. Both BC MoECCS and Metro Vancouver adopted the 2020 CAAQS for NO_2 endorsed by the CCME in 2017. The Provincial Framework (2021) lays out an approach for setting AAQO relative to the CAAQS. Whenever CAAQS are available, CAAQS and their supporting science assessments form the basis from which the provincial AAQO are developed. The process of adopting AAQO involves consideration of B.C.-specific factors that include vulnerable populations and other sensitive receptors, achievability, and clarifications of how AAQO will be implemented.

The proposed change in the CAAQS by the CCME is based on strong correlation between increasing NO_2 ambient air levels and respiratory effects, and contribution to early mortality at ambient concentrations commonly found in Canada, particularly for sensitive individuals including the young, elderly and those with pre-existing respiratory conditions (Metro Vancouver 2020).

Canadian Council of Ministers of the Environment

CCME was consulted to obtain detailed rationale for the derivation of the CAAQS for NO_2; however, there was no technical documentation available. WSP contacted Ms. Megan Krohn, Program Coordinator at CCME, to request technical scientific documentation that supports the CAAQS for NO_2. Ms. Krohn confirmed that the information is not currently available from the CCME website and provided to WSP a report entitled: "Guidance Document on Achievement Determination for Canadian Ambient Air Quality Standards for Nitrogen Dioxide" (CCME, 2020). This CCME (2020) document provides guidance on methodologies for determining whether the CAAQS for NO_2 are achieved or exceeded; however, it does not provide epidemiological studies that support either the 2020 or 2025 CAAQS for NO_2.

Health Canada (2016) completed a comprehensive review of relevant health- and exposure-related data during the conduct of a "Human Health Assessment for Ambient Nitrogen Dioxide" to support the development of the CAAQS for NO_2 to replace the previous National Ambient Air Quality Objectives (NAAQOs). Health Canada (2016) concluded the following:

- there is strong evidence that ambient NO_2 causes both short-term and long-term respiratory effects, and short-term mortality, as well as suggestive evidence linking it to a wide range of other adverse health outcomes;
- these effects have been observed in epidemiological studies at NO_2 concentrations that commonly occur in Canada, well below the levels of the NAAQOs and other ambient standards, such as provincial/territorial guidelines and the US National Ambient Air Quality Standards;
- in studies examining the shape of the concentration-response curve, there is an approximately linear relationship between ambient NO_2 concentrations and health effects, with no clear evidence of a threshold; hence, based on the balance of the evidence it should be assumed that any increment in levels of ambient NO_2 presents an increased risk for health effects, up to and including mortality; and
- the health evidence supports the establishment of both short-term and long-term standards to protect against the full suite of health effects associated with ambient NO_2.

Alberta Environment

Alberta Environment (AENV 2011) issued a 1-hour AAQO for NO_2 of 159 parts per billion (ppb; 300 $\mu g/m^3$) based on respiratory effects. The previous 24-hour AAQO of 200 $\mu g/m^3$ has been withdrawn by AENV. However, limited information is provided regarding the rationale for the derivation of 300 $\mu g/m^3$ as the 1-hour objective. The report titled: "*Assessment Report on Nitrogen Dioxide for Developing Ambient Air Quality Objectives"* (AENV 2007) provides a general overview of the potential health effects associated with NO_2; however, it did not detail the derivation of the 1-hour value. The report noted that healthy individuals may experience airway inflammation following acute exposures to NO_2 concentrations of 2000 ppb or lower. Individuals with pre-existing respiratory conditions including those with asthma, Chronic Obstructive Pulmonary Disease (COPD) or chronic bronchitis will experience greater sensitivity to acute NO_2 exposures compared to healthy individuals. Pre-exposure to NO_2 can also increase responsiveness to allergens by asthmatic individuals. It is unclear what effect thresholds or UFs were selected by AENV in the derivation of the 1-hour AAQO of 300 $\mu g/m^3$.

Ontario Ministry of Environment, Conservation and Parks

The Ontario MECP provides a 1-hour AAQC of 200 ppb (400 $\mu g/m^3$) and a 24-hour AAQC of 100 ppb (200 $\mu g/m^3$). While the MECP identifies that these numerical values are based on health, there was no technical supporting document that provides detailed rationale supporting the derivation of these AAQCs.

United States Environmental Protection Agency

Although no inhalation RfC was available from US EPA (2012), a 1-hour NAAQS has been derived by the US EPA (2010). This value is based on a 3-year average 98th percentile of the annual distribution of daily maximum 1-hour concentrations. Although it is derived from NO_2 exposure data, it is intended to apply to all NO_x compounds. Experimental evidence from human and animal studies indicates that respiratory effects attributable to NO_2 can occur after brief exposures (e.g., less than 1 hour up to 3 hours). The US EPA's 2008 Integrated Science Assessments concluded that 1-hour exposures of 100 ppb may result in small, significant increases in airway responsiveness. This is based in part on the observations from human clinical studies where airway inflammation

and increased airway responsiveness were observed in asthmatics at concentrations less than 2 ppm. In contrast, airway inflammation has been observed at much higher concentrations (100 to 200 ppm/minute or 1 ppm for 2 to 3 hours) in healthy individuals. The 1-hour standard of 100 ppb (188 µg/m^3) is intended to be protective of sensitive individuals in the population, including asthmatics and individuals with pre-existing respiratory conditions. On April 6, 2018 based on a review of the full body of scientific evidence, US EPA issued a decision to retain the current NAAQS for oxides of nitrogen. US EPA concluded that the current NAAQS provide adequate protection of public health, including at-risk populations of older adults, children, and people with asthma, with an adequate margin of safety.

California Office of Environmental Health Hazard Assessment

The Cal OEHHA (2008) derived a 1-hour REL of 470 µg/m^3 based upon respiratory effects. While OEHHA (2008) identified that the REL is based on a NOAEL of 250 ppb (470 µg/m^3) in sensitive asthmatics exposed for 1 hour with an increase in airway reactivity as the critical effect, the key study upon which this is based is not well described. Also, the supporting document cited (CARB, 1992) is not readily available.

World Health Organization

The World Health Organization (WHO, 2005) derived a 1-hour guideline of 200 µg/m^3 for NO_2. This value is based on short-term animal and human experimental toxicology studies which associate significant health effects (including adverse respiratory effects) with exposure to NO_2 levels exceeding 200 µg/m^3. In a 1992 meta-analysis of 20 broncho-constrictor studies of asthmatics and 5 studies of normal subjects, researchers identified a statistically significant increase in airways responsiveness to a range of constrictor stimuli when asthmatic subjects were exposed to levels of NO_2 > 200 µg/m^3. WHO has specified that as this short-term guideline of 200 µg/m^3 has yet to be challenged by more recent studies (at the time of writing), the guideline should therefore remain. WHO has not updated its guideline for NO_2 since 2005.

Table 4-8 Chronic Inhalation Exposure Limits for NO_2

Regulatory Agency	Type	Value (ppb)	Value (µg/m^3)	Reference
Metro Vancouver	Annual AAQO	17	32	Metro Vancouver 2020
BC MoECCS	Annual AAQO	17	32	BC MoECCS 2020
CCME 2020 CAAQS (2025 CAAQS)	Annual CAAQS	17 (12)	-	CCME 2017
AENV	Annual AAQO	24	45	AENV AAQO 2019
ON MECP	24-hour AAQC	-	-	Ontario MECP 2020
US EPA	Annual Standard	53	100	US EPA 2018
WHO	Annual AQG	-	40	WHO 2005

AAQO - Ambient Air Quality Objective; AAQC – Ambient Air Quality Criteria; AQG - Air Quality Guideline; CAAQS – Canadian Ambient Air Quality Standard; REL – Reference Exposure Level

BC MoECCS – British Columbia Ministry of Environment and Climate Change Strategy; AENV – Alberta Environment; CCME – Canadian Council of Ministers of Environment; ON MECP – Ontario Ministry of Environment, Conservation and Parks; US EPA – United States Environmental Protection Agency; Cal OEHHA - California Office of Environmental Health Hazard Assessment; WHO – World Health Organization

Metro Vancouver and British Columbia Ministry of Environment and Climate Change Strategy

Similar to the 1-hour AAQOs, the BC MoECCS (2020) and MV (2020) revised their annual AAQOs for NO_2 by adopting the 2020 annual CAAQS for NO_2 endorsed by CCME in 2017. The Provincial Framework (2021) lays out an approach for setting AAQO relative to the CAAQS. Whenever CAAQS are available, CAAQS and their supporting science assessments form the basis from which the provincial AAQOs are developed. The process of adopting AAQO involves consideration of B.C.-specific factors that include vulnerable populations and other sensitive receptors, achievability, and clarifications of how AAQO will be implemented.

This proposed change is based on the strong correlation between increasing NO_2 ambient air levels and respiratory effects, and contribution to early mortality at ambient concentrations commonly found in Canada particularly for sensitive individuals including the young, elderly and those with pre-existing respiratory conditions (MV2019).

Canadian Council of Ministers of Environment

Technical supporting documents were not available to determine the basis for the annual CAAQS for NO_2.

Alberta Environment

Alberta Environment (2011) derived an annual AAQO of 24 ppb (45 µg/m^3) based on its effects to vegetation. The report titled: "Assessment Report on Nitrogen Dioxide for Developing Ambient Air Quality Objectives" (AENV 2007) provides a general overview of the potential chronic human health and plant health effects but does not provide detailed information regarding exposure concentrations above which adverse effects would be anticipated in humans.

Ontario Ministry of Environment, Conservation and Parks

The Ontario MECP has not determined an annual AAQC for NO_2.

United States Environmental Protection Agency

The US EPA (2012) has not derived an inhalation RfC for NO_2. In 1971, US EPA derived a NAAQS of 53 ppb (100 µg/m^3) which remains current to date based on a scientific and regulatory review that was completed (US EPA, 2010). Although the 1971 document is not readily available, the scientific reviews conducted in 1993 and 2010 by US EPA suggested that the annual standard is associated with the potential for human health effects. A scientific review of the annual air standard conducted in 1993 suggested that the standard of 53 ppb (100 µg/m^3) was upheld, based upon the results of a meta-analysis of epidemiological studies conducted in children ages 5 to 12. Within this review, an increase of 0.015 ppm or 28 µg/m^3 of NO_2 over an averaging period of 2 weeks was associated with a 20% increase in respiratory symptoms. The NO_2 sources included both indoor and outdoor sources, and average concentrations in the studies were noted to range from 0.008 to 0.065 ppm (US EPA 1993). In 1996, the annual standard was maintained by the US EPA on the basis that, in combination with the short-term standard, the annual standard was protective of both the potential short-term and long-term human health effects of NO_2 exposure (US EPA 1996). The most recent edition of the Final Rule (US EPA 2018) indicates that the annual standard of 53 ppb (100 µg/m^3) was retained due to the uncertainty associated with the potential long-term effects of NO_2.

World Health Organization

The WHO (2005) guideline value of 23 ppb (40 µg/m^3) represents an annual value recommended by the WHO International Program on Chemical Safety (IPCS). WHO IPCS (1997) indicates that 23 ppb (40 µg/m^3) is based on consideration of background concentrations and the observation that harmful health effects occur with an additional level of 15 ppb (or 28.2 µg/m^3) or more. It should be noted that some population studies have identified an association between adverse health effects and exposure to NO_2 levels below 40 µg/m^3. While the results of these studies may warrant a lowering of the guideline, it is also important to consider that adverse effects may be a consequence of co-exposure since NO_2 is an important constituent of combustion generated air pollution and is highly correlated with other primary and secondary combustion products. As such, WHO has determined that it is unclear to what extent the health effects observed are attributable to NO_2 itself, therefore, the guideline value of 40 µg/m^3 has been retained until challenged by sufficient evidence.

4.1.5 FINE PARTICULATE MATTER (<2.5 µm)

Jurisdictional acute (or short-term, expressed as 1-hr and/or 24-hr) and chronic (or long-term, expressed as annual) exposure limits for $PM_{2.5}$ are provided in **Table 4-10** to **Table 4-11**. The studies supporting the available exposure limits are described in detail below.

Table 4-9 Acute Inhalation Exposure Limits for $PM_{2.5}$

REGULATORY AGENCY	TYPE	VALUE (ppb)	VALUE ($\mu g/m^3$)	SOURCE
BC MoECCS	24-hour	-	25	BC MoECCS 2020
AENV	1-hour	-	80	AENV AAQO 2018
	24-hour	-	29	
CCME 2020 (2025)	24-hour	-	27	CCME 2019
ON MECP	24-hour	-	27	Ontario MECP 2020
US EPA	24-hour	-	35	US EPA 2021
Cal OEHHA	-	-	-	Cal OEHHA 2016
WHO	24-hour	-	25	WHO 2005

Notes:
BC MoECCS – British Columbia Ministry of Environment and Climate Change Strategy; AENV – Alberta Environment; CCME – Canadian Council of Ministers of Environment; ON MECP – Ontario Ministry of Environment, Conservation and Parks; US EPA – United States Environmental Protection Agency; Cal OEHHA - California Office of Environmental Health Hazard Assessment; WHO – World Health Organization

British Columbia Ministry of Environment and Climate Change Strategy

The new AAQC for $PM_{2.5}$ were adopted by the BC MoECCS (2020) on April 9, 2009 and remains as the current provincial standard. The 24-hour AQO was set to 25 $\mu g/m^3$ and is based on the annual 98th percentile of daily average, over one year. No technical supporting documents detailing the derivation of the AQO were made available.

Alberta Environment

Alberta Environment (AENV, 2019) issued a 1-hour and 24-hour AAQO of 80 $\mu g/m^3$ and 29 $\mu g/m^3$, respectively. The 1-hour value is intended for use in monitoring and reporting of the Ambient Air Quality Index. AENV (2018) outlines that exposure to fine PM may be associated with respiratory health effects including: reduced lung function, asthma, emphysema and bronchitis, or cardiovascular effects such as: angina, heart attacks and hypertension. Fine PM has also been linked with increased emergency room visits (ERVs) and hospitalizations. AENV (2018) also referenced a 2011 Health Canada report which identified a linear relationship between the concentration of $PM_{2.5}$ and the health response, with no clear evidence of a threshold for effects. Beyond this information, it is unclear how AENV came to derive the 1-hour and 24-hour AAQOs.

Ontario Ministry of the Environment, Conservation and Parks

The Ontario MECP (2020) provides a 24-hour AAQC for $PM_{2.5}$ of 27 $\mu g/m^3$. This value reflects the 3-year average of the annual 98th percentile of the daily 24-hr average concentrations and is based on the 2020 CAAQS value. While the MECP (2020) identifies that this numerical value is based on health endpoints, there were no technical supporting documents that provide rationale supporting the derivation of this AAQC. For more details, the MECP references a 2012 CCME document entitled “Guidance Document on Achievement Determination Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone”. However, the document only focuses on methodologies, criteria, and procedures for reporting on achievement of the CAAQS and makes no mention of how the CAAQS value was derived.

United States Environmental Protection Agency

In 2006, the 24-hour NAAQS) for $PM_{2.5}$ was revised from 65 to 35 µg/m^3. This value is identified as a 98th percentile, averaged over 3 years. US EPA (2006) concluded that a 24-hour standard of 35 µg/m^3 would protect public health with an adequate margin of safety from serious health effects including premature mortality and hospital admissions for cardiorespiratory causes that are likely associated with short-term exposure to fine PM. In 2012, US EPA re-evaluated the 24-hour value of 35 µg/m^3 for fine PM and retained it as the current standard.

CCME

The CCME provides a 24-hour 2020 CAAQS for $PM_{2.5}$ (27 µg/m^3); however, unlike other pollutants such as SO_2 and NO_2, a 2025 CAAQS is not provided for fine PM. CCME was consulted to obtain detailed rationale for the derivation of the CAAQS for fine PM; however, there was no technical documentation available.

World Health Organization

The World Health Organization (WHO, 2005) provided a 24-hour guideline for $PM_{2.5}$ of 25 µg/m^3. This value represents a 99th percentile of the distribution of daily values and are intended to protect against peaks of pollution that would lead to substantial excess morbidity or mortality. The value is largely based on published risk coefficients from multicentre studies and meta-analyses, which reported an average short-term mortality effect for PM_{10} of approximately 0.5% per 10 µg/m^3. This value is considered to provide significant reductions in risks from acute exposure health effects such as short-term mortality.

Table 4-10 Chronic Inhalation Exposure Limits for $PM_{2.5}$

REGULATORY AGENCY	TYPE	VALUE (ppb)	VALUE (µg/m^3)	SOURCE
BC MoECCS	Annual	-	8	BC MoECCS 2020
AENV	-	-	-	AENV AAQO 2019
CCME 2020 (2025)	Annual	-	8.8	CCME 2021
ON MECP	Annual	-	8.8	Ontario MECP 2020
US EPA	Annual	-	12	US EPA 2021
Cal OEHHA	Annual	-	12	Cal OEHHA 2016
WHO	Annual	-	10	WHO 2005

Notes:
BC MoECCS – British Columbia Ministry of Environment and Climate Change Strategy; AENV – Alberta Environment; CCME – Canadian Council of Ministers of Environment; ON MECP – Ontario Ministry of Environment, Conservation and Parks; US EPA – United States Environmental Protection Agency; Cal OEHHA - California Office of Environmental Health Hazard Assessment; WHO – World Health Organization

British Columbia Ministry of Environment and Climate Change Strategy

In 2009, BC MoECCS (2020) provided an annual AQO of 8 µg/m^3 for $PM_{2.5}$. No technical supporting documents detailing the derivation of the AQO were made available.

Ontario Ministry of the Environment, Conservation and Parks

The MECP (2020) provides an annual AAQC of 8.8 µg/m^3 for $PM_{2.5}$. The value reflects a 3-year average of the annual average concentrations. While the MECP identifies that this numerical value is based on health endpoints, there were no technical supporting documents that provide rationale supporting the derivation of this AAQC. For more details, the MECP references a 2012 CCME document entitled “Guidance Document on Achievement Determination Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone”. However, the document only focuses on methodologies, criteria, and procedures for reporting on achievement of the CAAQS and makes no mention of how the CAAQS value was derived.

United States Environmental Protection Agency

In 2013, US EPA revised the annual NAAQS for $PM_{2.5}$ from 15 to 12 µg/m^3, a value identified as an annual arithmetic mean, averaged over 3 years. Growing evidence since the last review showed that a lowering of the 15 µg/m^3 standard (originally set in 1997) was warranted given the multiple, multi-city studies over long periods of time demonstrating clear evidence of premature death, cardiovascular and respiratory harm as well as reproductive and developmental harm at concentrations below 15 µg/m^3. US EPA (2013) determined that an annual standard of 12 µg/m^3 is below the long-term mean $PM_{2.5}$ concentrations reported in each of the key multi-city, long- and short-term exposure studies that identified numerous serious health effects such as premature mortality and increased hospitalization for cardiovascular and respiratory effects. Additionally, a standard of 12 µg/m^3 takes into account the evidence of reproductive and developmental effects such as infant mortality and low birth weight which were identified in studies that provided evidence suggestive of a causal relationship with long-term $PM_{2.5}$ concentrations. A level of 12 µg/m^3 is approximately the same level as the lowest long-term mean concentration reported in these studies. US EPA (2013) concluded that an annual standard of 12 µg/m^3 provides the requisite degree of public health protection including the health of sensitive populations, with an adequate margin of safety.

California Office of Environmental Health Hazard Assessment

Cal OEHHA recommended an annual CAAQS of 12 µg/m^3 for $PM_{2.5}$, which places significant weight on the long-term exposure studies using the American Cancer Society (ACS) and Harvard Six-Cities data. In both studies, robust associations were identified between long-term exposure to $PM_{2.5}$ and mortality; the mean $PM_{2.5}$ concentrations were 18 and 18.2 µg/m^3 in the Harvard and ACS studies, respectively. In addition, the annual CAAQS placed weight on the results of multiple studies investigating the relationship between $PM_{2.5}$ and adverse health outcomes. These studies had long-term (three- to four-year) means in the range of 13 to 18 µg/m^3. It was concluded by Cal OEHHA (2001) that an annual $PM_{2.5}$ standard of 12 µg/m^3 would provide adequate public health protection, including that of infants and children, against adverse effects of long-term exposure.

World Health Organization

An annual average guideline value of 10 µg/m^3 for $PM_{2.5}$ was set by WHO (2005) to represent the lower end of the range over which significant effects on survival have been observed in the ACS study. This value also places significant weight on the long-term exposure studies using the ACS and Harvard Six Cities data which demonstrated a robust association between long-term exposure to $PM_{2.5}$ and mortality (also discussed above). This annual standard is believed to be both achievable in large urban settings and is expected to effectively reduce health risks.

4.2 TOXICOLOGICAL REVIEW OF COPCS

A complete toxicology review of associated health effects following inhalation exposures to the COPCs was also performed. The health outcomes related to inhalation exposures to COPCs following short- and long-term exposures and the available human (or epidemiological) toxicological data was summarized in the sections below.

4.2.1 ACROLEIN

Acrolein is a colourless or yellowish liquid at 1013 hPa and 20 °C. Acrolein is miscible with lower alcohols, ketones, benzene, diethyl ether, and other common organic solvents (ECHA, 2022). It is a very reactive and volatile α,β-unsaturated aldehyde, which is found in both indoor and outdoor air (HC, 2021) .

Acrolein is ubiquitous throughout the ambient environment. The primary natural source of acrolein is incomplete combustion of organic matter during forest fires. The principal anthropogenic source of atmospheric acrolein is the combustion of organic matter and fuels, with motor vehicles (including aircrafts) generating most of the acrolein

emissions. Industrial processes such as incineration, pulp and paper and oriented-strand board production, and coal electricity generation also contribute to acrolein emissions, though much less than mobile sources.

Acrolein levels in residential indoor air are generally greater than outdoor levels. Some of the sources of acrolein in indoor air are smoking, using gas stoves, wood-burning fireplaces, burning incense, cooking with oils, and secondary formation by oxidation of other VOCs from products and building materials. However, no information is available on the relative contributions of these various sources to the total indoor air concentration of acrolein. (HC, 2021).

4.2.1.1 *SHORT-TERM HEALTH EFFECTS*

Among all acrolein studies, eye irritation was the most sensitive endpoint, occurring at concentrations of 0.14 to 0.23 mg/m^3 for exposure durations as short as 5 minutes (HC, 2021).

Weber-Tschopp *et al.* (1997) conducted three studies. In the first study, 53 volunteers were exposed to continuously increasing acrolein concentrations (up to 1.4 mg/m^3) for 40 minutes; significantly higher incidence of eye irritation was first observed at 0.210 mg/m^3. Reports of nasal irritation was noted starting at 0.35 mg/m^3, throat irritation starting at 1.0 mg/m^3 and respiratory irritation (measured by decreased respiration rate) starting at 0.69 mg/m^3. In the second study, 42 subjects were exposed to acrolein for 1.5 minutes at concentrations of 0.35 to 1.4 mg/m^3. Finally, 46 volunteers were exposed to acrolein for 60 minutes at 0.69 mg/m^3. Eye, nose, and throat irritation increased during the first 10 to 20 minutes, and there was a significant decrease in respiration rate.

Similar effects were observed from other studies. In a 1957 study that observed that exposures of 1.84 mg/m^3 for 10 minutes, or 2.76 mg/m^3 for 5 minutes were “extremely irritating” and caused lacrimation (US EPA, 2003a). Another study in 2016 found that volunteers reported eye irritation starting about 7 minutes into a 15-minute eye-only exposure to 0.36 mg/m^3 acrolein. Irritation continued for 10 minutes after cessation of exposure. No difference in eye irritation was found between control exposures and a 45-minute exposure to 0.16 mg/m^3 or a 60-minute exposure to 0.07 mg/m3. A study in 2015 exposed 18 subjects to 0.12 or 0.23 mg/m^3 acrolein for 2 hours. Subjective eye irritation and blink frequency were slightly increased at 0.23 mg/m^3 but not 0.12 mg/m^3 acrolein. There was no difference between control and exposed subjects in terms of breathing frequency, pulmonary function, or inflammatory markers in blood or sputum.

Several case studies describe the effects of acute exposure to acrolein; however, exposures are often to multiple substances, and acrolein concentrations are generally unknown. A two-year-old boy was hospitalized for acute respiratory failure following exposure for about an hour to acrid smoke from vegetable oil burning. Lung effects were still visible eighteen months following exposure (Cal OEHHA, 2008). A chemical worker was exposed to a sudden release of acrolein in the workplace, causing chemical pneumonia and eye irritation, both of which were resolved with treatment (US EPA 2003a). The Centers for Disease Control and Prevention (CDC) (2013) conducted a review of acute poisonings to acrolein from occupational use of pesticides and identified eight cases in the United States between 1993 and 2009. Symptoms observed included respiratory distress, eye irritation, headache, dyspnea, and skin irritation/burns.

Therefore, eye irritation is the most sensitive endpoint, and the t LOAELs identified for this endpoint were 0.21 mg/m^3 from a study in 1977 and 0.23 mg/m^3 from another study in 2015. As the 1977 study did not identify a NOAEL, the NOAEL of 0.12 mg/m^3 (115 µg/m^3) for eye irritation from the 2015 study was selected as the POD for the acute RfC. This POD is also below the LOAEL and NOAEL for respiratory effects observed by 1997 study and 2015 study, respectively. An UF of 3 was applied to account for sensitive individuals and is considered sufficient as eye irritation due to contact is not expected to vary greatly across the population (NRC 2001; US EPA 2008). No UF for database deficiencies was applied as the critical study and the database for acute toxicity were adequate. Thus, the acute RfC is 38 µg/m^3 (HC, 2021).

Adverse health effects reported in well conducted human studies following the acute inhalation of acrolein and the air concentration at which they are predicted to occur are summarized in **Table 4-12** below.

Table 4-11 Acute Effects Following Human Exposure to Acrolein

Acute Effects Following Human Exposure to Acrolein Effect	Exposure Period	Air Concentration ppm (mg/m^3)	Reference
Eye irritation	5 minutes	0.06 (0.14)	HC, 2021
Eye irritation	40 minutes	0.09 (0.21)	Weber-Tschopp *et al*. 1977
Nasal irritation	40 minutes	0.15 (0.35)	Weber-Tschopp *et al*. 1977
Throat irritation	40 minutes	0.43 (1)	Weber-Tschopp *et al*. 1977
A decrease in respiration rate	40 minutes	0.6 (1.4)	Weber-Tschopp *et al*. 1977
Eye irritation	1.5 minutes with recovery period between exposures	0.3 (0.69)	Weber-Tschopp *et al*. 1977
Nasal Irritation	1.5 minutes with recovery period between exposures	0.6 (1.4)	Weber-Tschopp *et al*. 1977
Eye, nose, throat irritation, and decrease in reparation rate	60 minutes	0.3 (0.69)	Weber-Tschopp *et al*. 1977
lacrimation	10 minutes	0.8(1.84)	HC, 2021
lacrimation	5 minutes	1.2 (2.76)	HC, 2021
Eye irritation	7 minutes	(0.36)	HC, 2021
Eye irritation	2 hours	0.1(0.23)	HC, 2021

4.2.1.2 *LONG-TERM HEALTH EFFECTS*

Epidemiological data on the long-term effects in humans are limited to two studies in France. One study showed a positive association between acrolein levels in schools and allergic asthma in the previous year, and between acrolein levels and exercise-induced asthma, but a negative association between acrolein levels and non-allergic asthma. In the other study, no significant relationship was identified between acrolein levels measured in homes and asthma in the previous year. Neither study showed a relationship between acrolein levels and rhinitis (HC, 2021).

A study in 2008 identified a NOAEL of 0.46 mg/m^3 and LOAEL of 1.38 mg/m^3 for degenerative lesions in the respiratory epithelium of the rat nasal cavity. The NOAEL of 0.46 mg/m^3 was selected as the POD because it was the lowest exposure concentration associated with an adverse effect. Toxicokinetic differences between rats and humans were accounted for by applying a regional gas dose ratio of 0.13 for a category 1 gas with extra-thoracic respiratory effects, giving a human equivalent NOAEL of 11 $\mu g/m^3$. UFs of 2.5 for toxicodynamic differences between rats and humans, and 10 for sensitivity in the human population were also applied. Thus, the long-term RfC is 0.44 $\mu g/m^3$.

Regarding acrolein developmental and reproductive toxicity, the existing data do not suggest that inhalation of an extremely reactive and irritating aldehyde like acrolein would present a significant teratogenic or reproductive risk. While the delivered dose of acrolein to the embryo as a consequence of cyclophosphamide or other anticancer drug metabolism can be sufficient to induce developmental toxicity, the absorbed dose of acrolein after inhalation of the compound would be insufficient to produce an increase in acrolein concentrations in tissues distant from initial contact (ACGIH, 2001).

4.2.1.3 CARCINOGENIC EFFECTS

With respect to carcinogenicity, the International Agency for Research on Cancer (IARC) considers acrolein "not classifiable as to its carcinogenicity to humans" (Group 3; IARC 1995) due to inadequate evidence in both humans and experimental animals. The US EPA also considers the acrolein database inadequate for the assessment of its carcinogenicity potential (US EPA, 2003). Conclusions regarding its carcinogenicity potential cannot be drawn from the limited studies available (HC, 2021).

One occupational case-control study in 1989 identified workers exposure to multiple chemicals. Exposure to acrolein was reported for two men who had died with non-Hodgkin's lymphoma, one with multiple myeloma, and three with nonlymphocytic leukaemia. There was no statistically significant increase in cancer cases for workers exposed to acrolein, therefore, the results of this study are insufficient to conclude on the carcinogenic potential of acrolein.

No additional studies on the carcinogenic potential of inhaled acrolein were identified in the literature (HC, 2021).

4.2.2 BENZENE

Benzene is a clear, colourless, volatile, highly flammable liquid with a characteristic sweet aromatic odour. It is formed from both natural processes and human activities. Natural sources include emissions from volcanoes and forest fires. Industrial processes are the main source of benzene in the environment. Benzene is found in crude oil and is also formed in oil refineries and other petrochemical operations for use in the manufacturing of other chemical products. It is a component of gasoline (regulated in Canada to below 1% by volume on an annual basis, with an absolute ceiling of 1.5%). Small amounts of benzene are created whenever an organic (i.e. carbon-based) material is burned, e.g. gasoline or cigarettes, or during a forest fire.

Benzene is degraded rapidly in the upper atmosphere. Because of its solubility in water, a minor amount may be removed by rain to contaminate surface waters and soil. However, it is not persistent in surface water or soil, either volatilizing back to air or being degraded by bacteria. Airborne benzene exists almost exclusively in the vapour phase and is transformed primarily by reaction with hydroxyl radicals, resulting in a residence time ranging from 2 hours (at higher hydroxyl radical concentrations) to 8 days (at lower hydroxyl radical concentrations). The most significant route of exposure to human is through inhalation.

4.2.2.1 SHORT-TERM HEALTH EFFECTS

Brief exposure (5–10 minutes) to very high levels of benzene in air (10,000–20,000 ppm) can result in death. Lower levels (700–3,000 ppm) can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. In most cases, people will stop feeling these effects when they are no longer exposed and begin to breathe fresh air.

The cause of death from acute overexposure to benzene has been reported to result from asphyxiation, respiratory arrest, Central Nervous System depression or cardiac collapse (ATSDR). Brief exposure (30 minutes) to 300 ppm (978 mg m-3) benzene produced drowsiness, dizziness and headaches in exposed workers (ATSDR).

Occupational exposure of males to benzene air concentrations >60 ppm (196 mg m-3) for up to 3 weeks (2.5 to 8 hours/day) during the removal of residual fuel from shipyard tanks produced respiratory effects (mucus membrane irritation and dyspnea), reduced blood cell counts (leukocytes, erythrocytes, and thrombocytes), and neurological effects (dizziness, nausea, headache, fatigue) (ATSDR).

Uncertainty in exposure levels and duration, the potential for confounding exposures to other chemicals, and lack of corresponding control groups, limit the use of data collected from an occupational setting; however, the ATSDR has identified well conducted occupational studies with effects linked to specific benzene exposure concentrations. Adverse health effects reported in well conducted human studies following the acute inhalation of benzene and the air concentration at which they are predicted to occur are summarized in the table below.

Table 4-12 Acute Effects Following Human Exposure to Benzene

Acute Effects	Exposure Period	Air Concentration ppm (mg m^{-3})	Reference
Death	5 to 10 minutes	20,000 (65,200)	Flury *et al*. 1928

Acute Effects	Exposure Period	Air Concentration ppm (mg m^{-3})	Reference
Neurological: drowsiness, dizziness, headaches	30 min	300 (978)	Flury *et al*. 1928
Neurological: dizziness, headaches, nausea, fatigue (males)	1-21 d, 2.5-8 hr/d	60 (196)	Midzenski *et al*. 1992
Respiratory: mucus membrane irritation and dyspnea (males). Hematological: leucopenia, anemia, and thrombocytopenia (males).	1-21 d, 2.5-8 hr/d	60 (196)	Midzenski *et al*. 1992

4.2.2.2 LONG-TERM HEALTH EFFECTS

The major effect of benzene from long-term exposure is on the blood. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection. Reduction in other components in the blood can cause excessive bleeding. Blood production may return to normal after exposure to benzene stops. Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries, but it is not known for certain that benzene caused the effects. It is not known whether benzene will affect fertility in men.

Long-term exposure to benzene can cause cancer of the blood-forming organs. This condition is called leukemia. Exposure to benzene has been associated with development of a particular type of leukemia called acute myeloid leukemia. Most information on effects of long-term exposure to benzene are from studies of workers employed in industries that make or use benzene. These workers were exposed to levels of benzene in air far greater than the levels normally encountered by the general population. Current levels of benzene in workplace air are much lower than in the past. Because of this reduction and the availability of protective equipment such as respirators, fewer workers have symptoms of benzene poisoning.

Similar to the effects reported following acute exposures, subchronic and chronic exposure to relatively low levels of benzene produced measurable depression of one or more circulating blood cells, resulting in haematotoxic and immunotoxic effects. Subchronic and chronic studies in humans and animals have reported pancytopenia or the reduction in number of all major blood cells, including leukocytes (white blood cells), erythrocytes (red blood cells), and thrombocytes (platelets). Blood cells are produced by the bone marrow and therefore pancytopenia is a condition that results from the inability of the bone marrow to adequately produce mature blood cells. A more severe effect of benzene exposure is aplastic anaemia in which the bone marrow is unable to function and stem cells do not mature. The progression of aplastic anaemia can result in acute myelogenous leukemia, or cancer of the myeloid line of white blood cells (ATSDR).

Pancytopenia was reported in workers occupationally exposed to benzene concentrations ranging from 3 to 210 ppm (10 to 685 mg m-3) over periods of 4 months to 3 years (ATSDR). Decreased production of white blood cells (leucocytes and lymphocytes) occurred in workers occupationally exposed for 1 to 21 years to benzene concentrations ranging from 0.57 to 75 ppm (1.86 to 245 mg m-3) (ATSDR). Decreased red blood cell counts and anaemia were reported following subchronic and chronic occupational exposure to benzene concentrations ranging from 2.26 to 29 ppm (7.37 to 95 mg m-3) (ATSDR).

There was a lack of observed adverse effects on blood cells in male refinery workers exposed to 0.53 ppm (1.73 mg m-3) benzene for 1-21 years (ATSDR). This exposure level was selected by the California Office of Environmental Health Hazard Assessment and adjusted for continuous exposure and variation in human sensitivity to develop a chronic REL of 0.02 ppm or 60 µgm-3 (OEHHA).

The study reporting the lowest air concentration at which white blood cell (lymphocyte) levels were reduced was selected by the ATSDR for the development of the MRL for chronic inhalation exposure (>365 days) to benzene. Significant decreases in B-lymphocyte counts were reported for male shoe manufacturing workers in Tianjin, exposed to 0.57 ppm (1.86 mg m-3) benzene for an average of 6.1 years (ATSDR). A chronic MRL of 0.003 ppm

(0.01 mg m-3) was determined using BMD modeling and adjusting from occupational to continuous exposure. A 10-fold UF was also applied to account for variations in human sensitivity (ATSDR).

The US EPA developed a RfC also based on a study reporting decreased lymphocyte counts following occupational exposure to 7.6 ppm (24 mg m-3) benzene (US EPA, 2002). The US EPA used benchmark dose modeling and adjusted for human variability, subchronic-to-chronic exposures, and database deficiencies to arrive at an RfC of 30 µg m-3 for lifetime chronic human exposure to benzene (US EPA, 2002).

The California OEHHA, the ATSDR, and the US EPA have all developed chronic exposure guidelines for benzene based on effects (or lack thereof) on blood cell counts following occupational exposures.

Exposure to benzene may be harmful to the reproductive organs. Some women workers who breathed high levels of benzene for many months had irregular menstrual periods. When examined, these women showed a decrease in the size of their ovaries. However, exact exposure levels were unknown, and the studies of these women did not prove that benzene caused these effects. It is not known what effects exposure to benzene might have on the developing fetus in pregnant women or on fertility in men. Studies with pregnant animals show that breathing benzene has harmful effects on the developing fetus. These effects include low birth weight, delayed bone formation, and bone marrow damage.

Several studies linked the occupational exposure of women to benzene with reproductive effects, including menstrual disorders, reduced fertility, and increased frequency of spontaneous abortions (ATSDR). One case study reported severe pancytopenia and increased chromosomal aberrations in a woman exposed to benzene throughout her pregnancy but not in her child (ATSDR). In contrast, another study reported chromosomal effects in the lymphocytes of children born of women exposed to benzene (and other solvents) during pregnancy (ATSDR).

Several case-control studies reported significant associations between childhood leukemia and parental exposure to benzene (US EPA, 2002). Maternal exposure to benzene during pregnancy was associated with acute nonlymphocytic leukemia (ANL) in second or later-born (versus firstborn) children (US EPA, 2002). Maternal exposure to pesticides, petroleum products, and solvents (including benzene) during pregnancy was associated with an increased occurrence of ANL in offspring (ATSDR). Paternal exposure to benzene prior to conception was also associated with childhood leukemia (US EPA, 1998).

4.2.2.3 *CARCINOGENIC EFFECTS*

Both the IARC and the EPA have determined that benzene is carcinogenic to humans. The IARC has classified benzene as a Group I human carcinogen. Based on "several studies of increased incidence of nonlymphocytic leukemia from occupational exposure, increased incidence of neoplasia in rats and mice exposed by inhalation and gavage, and some supporting data", benzene has been placed in the EPA weight-of-evidence classification A, human carcinogen (US EPA).

Long-term exposure to high levels of benzene in the air can cause leukemia, particularly acute myelogenous leukemia, often referred to as AML. This is a cancer of the bloodforming organs. Studies of controlled animal exposure to benzene have also reported leukemia as well as non-Hodgkin's lymphoma, and tumours in the lung, liver, mammary gland, and Zymbal gland (US EPA 2002).

Occupational exposure to benzene and solvents containing benzene has been associated ANL as well as non-Hodgkin's lymphoma and multiple myeloma (ATSDR). Although limited by confounding exposures to other chemicals and lack of precise exposure monitoring, the available occupational studies demonstrate a consistent increase in the risk of leukemia with exposure to benzene (ATSDR).

A cohort of rubber hydrochloride manufacturing workers at three facilities in Ohio (Pliofilm workers cohort) is considered to be the most thoroughly studied occupational group with respect to the risk of developing leukemia following exposure to benzene (ATSDR). Data from this cohort has been used for the development of ambient air quality guidelines for benzene by Health Canada, the US EPA, as well as the WHO, European Union, and Health Council of the Netherlands.

An IUR of 2.2 x 10-6 per µg/m^3 has been derived by US EPA based on hematologic effects of leukemia.

4.2.3 BENZO(A)PYRENE

Benzo[a]pyrene is a five-ring polycyclic aromatic hydrocarbon (PAH) (US EPA, 2017). It exists in various crystalline forms when pure, usually as yellowish plates or needles. It is insoluble in water, but very soluble in chloroform and it is also soluble in benzene, toluene, and xylene. In nature, Benzo[a]pyrene is considered an environmental pollutant, usually bound to small particulate matter present in smoke from forest fires, industrial processes, vehicle exhaust, cigarettes, and through the burning of fuel (such as wood, coal, and petroleum products). Benzo[a]pyrene levels are often used as a rough index of air pollution and of total PAHs (ACGIH, 2001).

Although epidemiological and toxicological studies have confirmed that benzo[a]pyrene is a potent carcinogen, benzo[a]pyrene emissions are not controlled in the United States (ACGIH, 2001). The magnitude of human exposure to benzo[a]pyrene depends on factors such as lifestyle (e.g., diet, tobacco smoking), occupation, and living conditions (e.g., urban versus rural setting, domestic heating, and cooking methods) (US EPA, 2017).

Inhalation exposure to single PAH compounds, for example benzo[a]pyrene alone, does not occur without other PAHs being present. Several PAHs with four of more rings are treated as having the potential to cause cancer in addition to benzo[a]pyrene. As a result, benzo[a]pyrene is proposed as an indicator for the carcinogenic fraction of these PAHs which are all present as mixtures in ambient air. Further, a method using factors of 10 to represent the potency of individual PAHs relative to benzo[a]pyrene is recommended to address mixtures of PAHs in ambient air (AENV, 2004).

4.2.3.1 SHORT-TERM HEALTH EFFECTS

There is limited information on non-carcinogenic acute toxicity in humans and animals, and any acute human studies looking at non-carcinogenic effects focus on developmental endpoints, which are discussed below (US EPA, 2017; ATSDR, 1995; WHO, 2000).

4.2.3.2 LONG-TERM HEALTH EFFECTS

The primary route of benzo[a]pyrene exposure is via inhalation, and the majority of epidemiologic studies to date have studied the correlation between mortality from lung cancer and benzo[a]pyrene exposure. Although cigarette smoking, air pollution, and occupational exposure are all significant means of inhalation exposure, it is generally agreed that cigarette smoking is the overwhelming factor in the causation of lung cancer (ACGIH, 2001).

Table 4-13 Chronic Effects Following Human Exposure to Benzo(a)Pyrene

Chronic Effects Following Human Exposure to Benzo[a]pyrene	Exposure Period	Air Concentration ppm (mg/m^3)	Reference[1]
Respiratory: bloody vomit, breathing problems, chest pains, chest irritation, throat irritation and cough (Serious LOAEL)	6 months to <6 years (Occupational study)	9.69×10^{-6} (0.0001)	ATSDR, 1995
Increased rate of mutations in peripheral lymphocytes (LOAEL)	2 to 46 years (Occupational study)	8.7×10^{-5} (0.0005)	ARSDR, 1995
Reduced serum immunoglobins	Average 15 years	$1.9\text{x}10^{-5}$ – 0.048 (0.0002 - 0.50) Szczeklik *et al.*, cited in	ATSDR, 1995

The available human PAH mixtures studies report developmental and reproductive effects that are generally analogous to those observed in animals, and provide qualitative, supportive evidence for the hazards associated with benzo[a]pyrene exposure (US EPA, 2017).

Human and animal studies provide evidence for benzo[a]pyrene-induced male and female reproductive toxicity. Effects on sperm quality and male fertility have been demonstrated in human populations highly exposed to PAH mixtures. The use of internal biomarkers of exposure in humans (e.g., BPDE-DNA adducts) supports associations

between benzo[a]pyrene exposure and these effects. In females, numerous epidemiological studies indicate that cigarette smoking reduces fertility; however, few studies have specifically examined levels of benzo[a]pyrene exposure and female reproductive outcomes. Animal studies demonstrate decrements in sperm quality, changes in testicular histology, and hormone alterations following benzo[a]pyrene exposure in adult male animals, and decreased fertility and ovo-toxic effects in adult females following exposure to benzo[a]pyrene. (US EPA, 2017)

Animal studies demonstrate that exposure to benzo[a]pyrene is associated with developmental (including developmental neurotoxicity), reproductive, and immunological effects. In addition, epidemiology studies involving exposure to PAH mixtures have reported associations between internal biomarkers of exposure to benzo[a]pyrene (benzo[a]pyrene diol epoxide-DNA adducts) and adverse birth outcomes (including reduced birth weight, postnatal body weight, and head circumference), neurobehavioral effects, and decreased fertility (US EPA, 2017).

4.2.3.3 CARCINOGENIC EFFECTS

The strong and extensive experimental evidence for the carcinogenicity of benzo[a] pyrene in many animal species, supported by the consistent and coherent mechanistic evidence from experimental and human studies provide biological plausibility to support the overall classification of benzo[a]pyrene as a human carcinogen (Group 1). (IARC, 2010)

According to US EPA, benzo[a]pyrene is “carcinogenic to humans” based on strong and consistent evidence in animals and humans. The evidence includes an extensive number of studies demonstrating carcinogenicity in multiple animal species exposed via all routes of administration and increased cancer risks, particularly in the lung and skin, in humans exposed to different PAH mixtures containing benzo[a]pyrene. Mechanistic studies provide strong supporting evidence that links the metabolism of benzo[a]pyrene to DNA-reactive agents with key mutational events in genes that can lead to tumor development. These events include formation of specific DNA adducts and characteristic mutations in oncogenes and tumor suppressor genes that have been observed in humans exposed to PAH mixtures. This combination of human, animal, and mechanistic evidence provides the basis for characterizing benzo[a]pyrene as “carcinogenic to humans.” (US EPA, 2017)

4.2.4 NITROGEN DIOXIDE

NO_2 is the main pollutant within a group known as NO_x. NO_2 is produced from nitrogen and oxygen during fuel combustion; as such, ambient NO_2 comes from burning of coal, fuel, oil, diesel, and gasoline. Exposure to NO_2 can cause pulmonary irritation and contributes to respiratory health effects. Vulnerable individuals with heightened sensitivity to NO_2 include children, older adults, people with asthma and COPD, and those engaged in vigorous physical activity or who spend substantial amounts of time near major roadways (BC MoECCS 2021).

NO_2 in ambient air is chemically reactive and can combine with water vapour to form nitric acid (HNO_3), that can subsequently react with ammonia and other organic chemicals to produce secondary particles such as ammonium nitrate. Ammonium nitrate can contribute to the harmful effects of particulate pollution and reduce visibility. NO_2 can also react with hydrocarbons in the atmosphere to produce ozone and other photochemical by-products.

4.2.4.1 SHORT-TERM HEALTH EFFECTS

In support of CAAQS development, Health Canada conducted a comprehensive HHA based on most recent and relevant health studies to investigate the impacts of ambient NO_2 on the vulnerable population. Health Canada (2016) reviewed epidemiological studies of health effects associated with short-term exposure to ambient NO_2 with a focus on relevant studies from Canada and United States. Health Canada (2016) uses the 2008 US EPA Integrated Science Assessment of Oxides of Nitrogen – Health Criteria (US EPA ISA, 2008) as a starting point for summarizing previous epidemiological data.

Health Canada (2016) reports the effect of estimates for health outcomes as a percentage change in the outcome relative to a baseline mortality or morbidity rate, based on an incremental change in exposure. To enhance comparability of the risk estimates between studies, these relative risks need to be presented by a uniform increment of exposure. Health Canada (2016) compared risks associated with short-term indices from many studies using a standard exposure increment of 30 parts per billion (ppb) for 1-hour maximum NO_2 and 20 ppb for 24-hour average NO_2. However, different NO_2 exposure indices with different averaging times have been used in the existing epidemiological literature. Since concentrations are lower and less variable for longer averaging times, risks of

health outcomes for a given concentration range are not directly comparable across exposure metrics, which complicates the determination of a standard increment.

In short-term epidemiological studies of asthmatics (including controlled, single-city and multi-city exposure studies), exposure to near-ambient levels of NO_2 elicited a range of adverse respiratory effects, including decreased lung function, increased airway hyperresponsiveness , and airway inflammation. Respiratory endpoints typically include asthma, bronchitis and emphysema (collectively referred to as COPD), upper and lower respiratory infections and other minor categories. Consistent associations were observed for children and older adults ≥65 years of age, with an interquartile range of 1 to 13% risk per 20 ppb increment in 24-hour average NO_2 or 30 ppb increase in 1-hour max NO_2. Risk estimates were often greater for those studies that considered combined exposures over several days, though the magnitude was also quite variable between studies.

Health Canada (2016) reported positive associations between ambient NO_2 and hospital admissions and ERVs for above mentioned respiratory endpoints combined, for participants of all ages based on US EPA ISA (2008). Findings were generally very similar in studies of different designs, including time-series, case crossover, and multi-city studies. In two-pollutant models, the associations of HAs/ERVs with NO_2 were generally not very sensitive to adjustment for PM or other gaseous pollutants. With respect to HAs and ERVs, the 2008 US EPA ISA considered that there was suggestive evidence of an association between these outcomes and ambient NO_2 levels. Risk estimates were most often positive, and they were generally greater for children than for adults and older adults (≥65 years of age), with an IQR of 1–25% excess risk estimated per 20 ppb 24-hour average NO_2 or 30 ppb 1-hour max NO_2. Those for adults as a whole and for older adults (aged ≥65) were generally positive, but few were statistically significant. In analyses for subjects of all ages combined, associations were overwhelmingly positive, especially in relation to daily NO_2. The risk estimates with NO_2 were generally robust to adjustment for other gaseous and particulate pollutants in co-pollutant models.

As for the possible role of ambient NO_2 in HAs or ERVs for other respiratory outcomes, the 2008 US EPA ISA reported that a limited number of studies had investigated COPD, and still fewer had examined upper respiratory tract infections (URTIs), pneumonia, bronchitis, allergic rhinitis, and lower respiratory disease. While some of these studies reported positive and statistically significant associations, others reported null or negative associations, and based on the limited available data the US EPA concluded that it was difficult to draw conclusions with respect to the effects of NO_2 on these other respiratory conditions.

In more recent population-based studies, there continues to be evidence that ambient NO_2 is associated with increases in HAs for respiratory endpoints, primarily asthma hospitalizations and asthma ERV. A large Canadian time-series study in 10 Canadian cities between 1993 and 2000 (Cakmak et al (2006) as cited in Health Canada, 2016) observed that all-age admissions were significantly related to ambient NO_2. The relationship between ambient NO_2 and ERVs for asthma was investigated in many studies, and findings indicated positive and significant associations were consistently observed for children's asthma ERVs and restricted to the warm season.

4.2.4.2 *LONG-TERM HEALTH EFFECTS*

While studies of the health effects of long-term exposure to air pollution are generally more complex to conduct than studies on daily variations in air pollutants, there is an increasing database that examines the consequences of long-term exposure to NO_2 and other air pollutants. Several authors used NO_2, NO_X and/or NO as markers of the traffic air pollution mixture, not specifically attributing the effects observed to NO_2 per se. The independent relation of NO_2 to mortality has not been widely characterized in these epidemiological studies, given the high collinearity among the various air pollutants, and uncertainty remains with respect to possible confounding by co-pollutants. Most studies utilized single-pollutant models. In studies that included co-pollutant analyses (with traffic indicators, PM indices) the results were somewhat inconsistent, though the effects of NO_2, which were mostly attenuated, often remained significant or at least presented some evidence of association with adverse outcomes.

The effects of long-term exposure to ambient NO_2 have been mostly examined with prospective cohort studies. There have been relatively few studies that examined the health effects of longer-term exposure to air pollutants. Health Canada (2016) focused on studies that are particularly relevant to the risks associated with exposure to ambient NO_2 in Canada. Based on the quartiles of exposure, the effects appeared to increase at daily NO_2 levels above 21 ppb in the youngest men (aged 51–70); a linear dose–response relationship was observed for the oldest men (aged 71–90) for NO_2 daily levels between 10.6 and 32 ppb. The high correlation between NO_2 and the PM indices made the interpretation of the independent contribution of NO_2 difficult to determine. The US EPA

concluded at that time that the health database was inadequate to infer the presence or absence of a causal relationship between total mortality and long-term exposure to NO_2.

Annual ambient concentrations of NO_2 (8.99–24.15 ppb) observed in the European studies reporting significant associations were relevant to those in Canada. Several cohort studies conducted in North America and in Europe showed positive associations between long-term NO_2 exposure and increased mortality due to cancer, but most of these associations were not significant. Deficits in lung function growth have been associated with long-term exposures to NO_2 in many epidemiologic studies 2008 US EPA ISA (US EPA, 2008). Overall, previous epidemiological studies indicated positive associations between long-term exposure to low NO_2 levels and both decrements in lung function measurements and partially irreversible deficits in lung function growth. It should, however, be noted that it has been difficult to distinguish the independent effects of NO_2, due to the high correlations with the other air pollutants for which similar risk estimates have been found.

Significant associations were observed between NO_2 exposure and decrements in markers at 33.9 ppb NO_2, in 48% of children. Among children with high parental stress, decrements in markers were measured at 21.8 ppb increase in residential and school NO_x, NO and NO_2. No significant associations were measured in low-stress households.

In Stockholm, Sweden, lifetime residential, day care, and school addresses were geocoded, and time-weighted average outdoor levels were calculated using emission inventories and air /m^3 dispersion models. A significant association between exposure to NO_x levels during the first year of life (23.40 ppb) and persistent wheeze was found using a small sub-cohort of the BAMSE cohort study, which mainly focused on the genetic interactions between exposure to traffic-related air pollution for development of childhood allergic diseases.

Fewer studies have investigated the relationship between long-term exposure to air pollutants and asthma in adults. No significant cross-sectional associations were observed between hay fever and modelled NO_2 levels based on the highest (19.57 ppb) versus lowest quintile (<18.04 ppb) in adults aged 18–70 in the population-based study conducted in Nottingham, England. This study also found no evidence to suggest that living near traffic is a major determinant of allergic diseases in adults. No cross-sectional associations were found in adults aged 18–70 in a population-based study conducted in Nottingham between long-term exposure to NO_2 and total IgE, based on the highest (>19.57 ppb) versus lowest quintile (<18.04 ppb).

NO_2 was the principal focus of a study involving 2,360 patients from a respiratory disease clinic in Toronto, Ontario. Non-significant associations were observed between long-term exposures to NO_2 and respiratory mortality, while results for lung cancer were inconclusive. Some positive associations were also reported with all cardiovascular mortality based on NO_x increases at 49.31ppb.

A small number of studies, including a few conducted in Canada, investigated the relationship between long-term exposure to ambient NO_2 and a variety of cardiovascular outcomes. Most of these new publications studied the impact of traffic air pollutants on stroke incidence or hospitalization due to stroke. Studies in Canada, the US and Europe find positive associations of stroke with NO_2/NO_x, though these results are generally not statistically significant. Overall, the database is currently limited and provides inconsistent results on the relationship between long-term exposure to ambient NO_2 and cardiovascular morbidity. Moreover, most of these studies only reported single-pollutant models and is several of these associations were more strongly related to particulate matter air pollution.

In epidemiological studies, long-term exposure to ambient NO_2 was associated with adverse respiratory effects, especially in children, including reduced measures of lung function and reduced lung function growth. In children, several cohort studies also showed relationships between long-term exposure to NO_2 and the development of asthma and/or allergic responses. Long-term exposure to NO_2 levels appears to increase the incidence of asthma in adults as well. However, some uncertainty remains about the possible role of other co-occurring pollutants in the NO_2-related respiratory effects.

The epidemiological associations with respiratory health endpoints exhibit consistency, strength of association, and coherence across disciplines, as well as some indication of robustness and biological plausibility. However, considering the questions surrounding the possible role of co-pollutants, the overall evidence indicates that there is likely a causal relationship between long-term exposures to current levels of ambient NO_2/NO_x and respiratory effects related to the development of asthma or allergic-related disease.

4.2.4.3 CARCINOGENIC EFFECTS

The relationship between long-term exposures to NO_x/NO_2 and lung cancer has been assessed in Europe using data from major cohorts. In the Dutch cohort, in which 2,183 lung cancer cases were identified among participants, no evidence of an association was found between NO_2 and lung cancer incidence at 15.96 ppb in NO_2 concentration. Positive but non-significant associations were also observed for several other types, including buccal cavity and pharynx, oesophagus, liver, uterus, kidney, bladder, and breast cancer and non-Hodgkin's lymphoma.

A Canadian study suggested a possible association between long-term exposure to NO_2 levels and post-menopausal breast cancer incidence, while in France acute leukemia was found to be associated with traffic-NO_2 levels and other indicators of traffic. Additional studies are required, however, to confirm these observations on cancer incidence given the difficulty in disentangling any effect associated with NO_2 from those of other co-occurring pollutants.

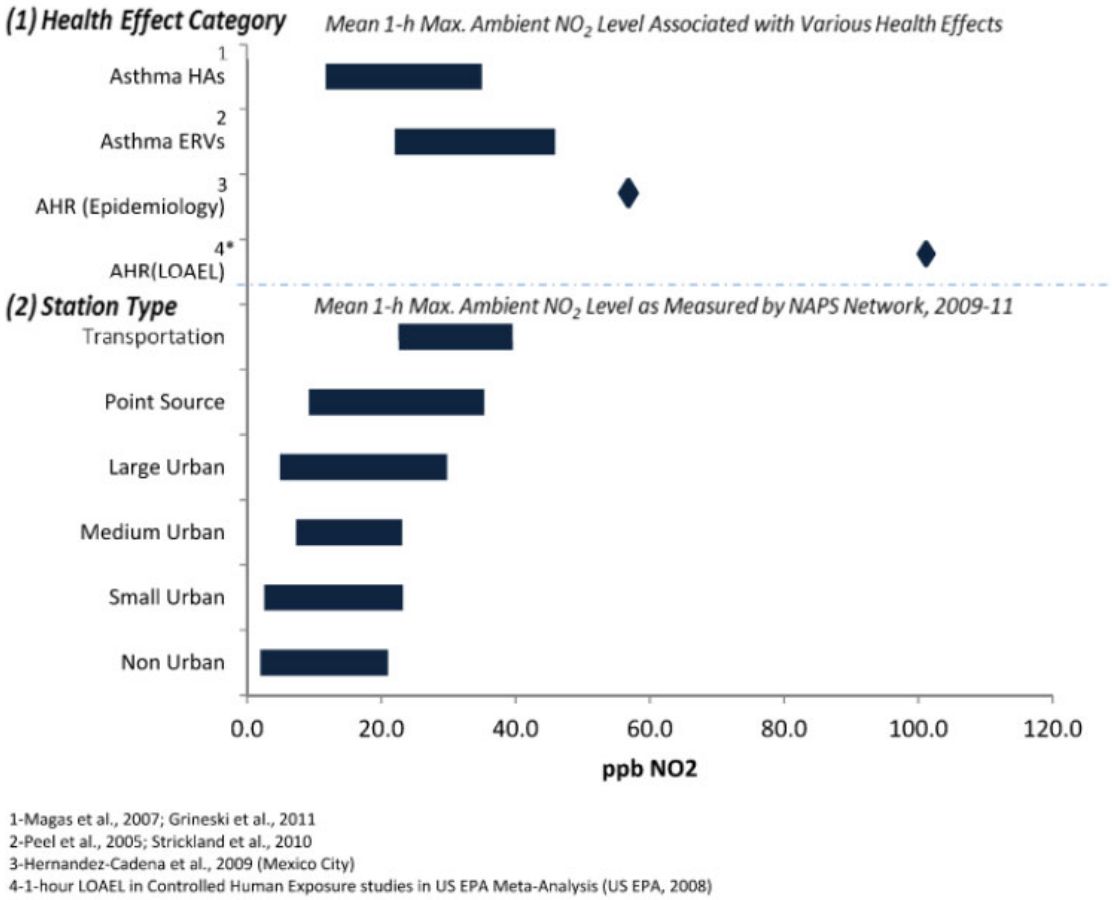
Effects of NO_2 on reproduction in humans are not known. IARC and US EPA have not classified nitrogen oxides for potential carcinogenicity. Nitrogen oxides have caused changes in the genetic material of animal cells, but it is not known if these can cause developmental effects in humans.

4.2.4.4 COMPARISON OF AMBIENT CONCENTRATIONS IN CANADA AND KEY EPIDEMIOLOGICAL STUDIES

Health Canada (2016) characterized health risks associated with exposure to ambient NO_2 in Canada by comparing the concentrations at which health effects are observed in key epidemiological studies with the levels measured at monitoring stations in the NAPS network across Canada. Health Canada (2016) carried out the comparison as follows:

- focused on health endpoints for which the weight of evidence concluded "causal" or "likely to be causal" including mortality associated with short-term exposure to ambient NO_2 and respiratory disease associated with each of short-term and long-term exposure;
- reviewed key health effect studies conducted in Canada and United States that involved primarily human epidemiological studies of ambient NO_2-related effects;
- studies were further limited to those that reported significant association between ambient NO_2 and key health endpoint categories which provided effect estimates for NO_2 for the same metrics as are commonly used for ambient standards; that is, daily 1-hour max, 24-hour average and long-term average; and
- for those studies that reported associations for short-term exposures, studies were only included if the findings for NO_2 were robust to adjustment for other pollutants, or if exclusively single-pollutant models were run and health outcomes were significantly related to NO_2 and not to other pollutants. These latter criteria were not applied in selecting long-term studies because almost none of the long-term exposure studies adjusted for co-pollutants, given the high collinearity among the various air pollutants.

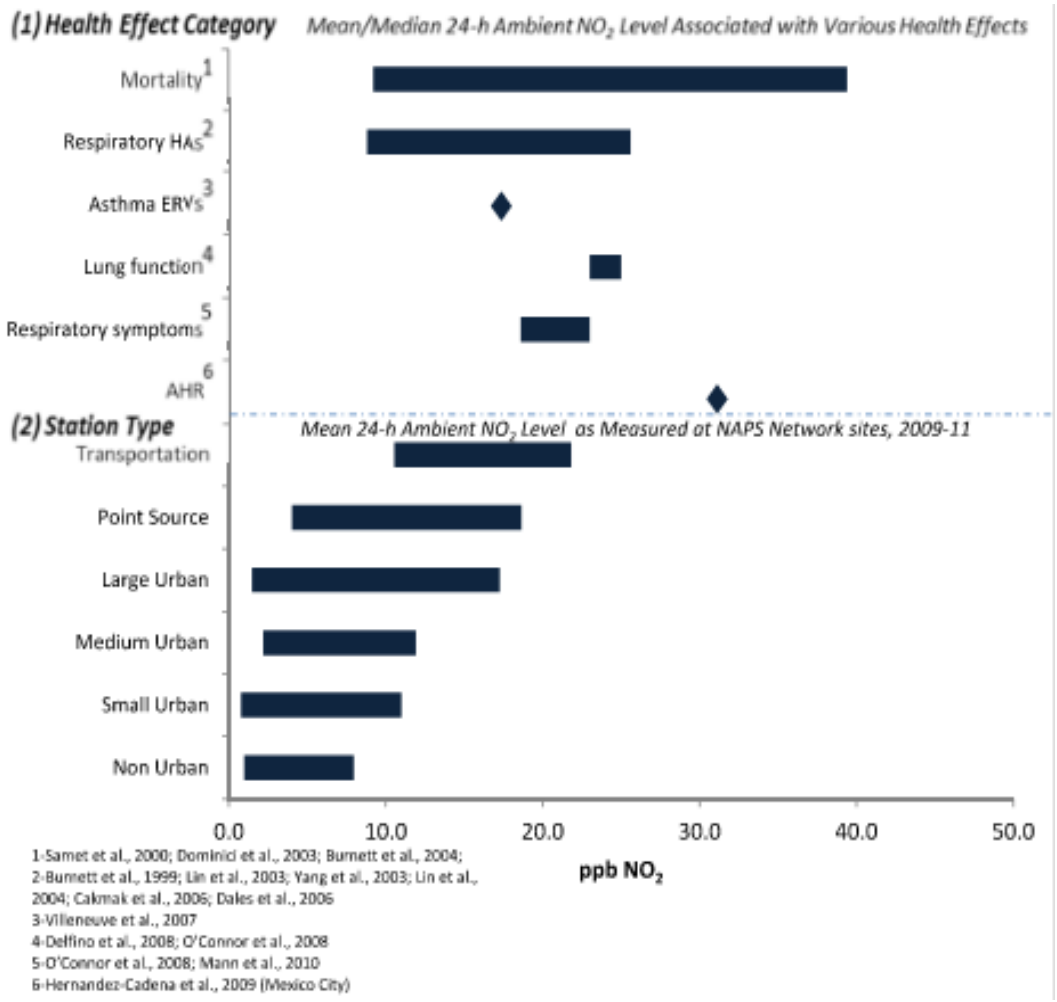
Health Canada (2016) presented the analyses in **Figure 4-1** for the daily 1-hour max NO_2, in **Figure 4-2** for the 24-hour average NO_2, and in **Figure 4-3** for NO_2 as the long-term (annual/multi-year) average. For each figure, the top panel presents the mean or median NO_2 levels associated with various categories of health effects; while the lower panel presents the mean concentrations of NO_2 measured at the NAPS stations, grouped by station type. In cases where there is more than one data point, they are presented as a bar that represents the range of mean/median concentrations, whereas if there is only a single data point, it is presented as a diamond.



1-Magas et al., 2007; Grineski et al., 2011
2-Peel et al., 2005; Strickland et al., 2010
3-Hernandez-Cadena et al., 2009 (Mexico City)
4-1-hour LOAEL in Controlled Human Exposure studies in US EPA Meta-Analysis (US EPA, 2008)

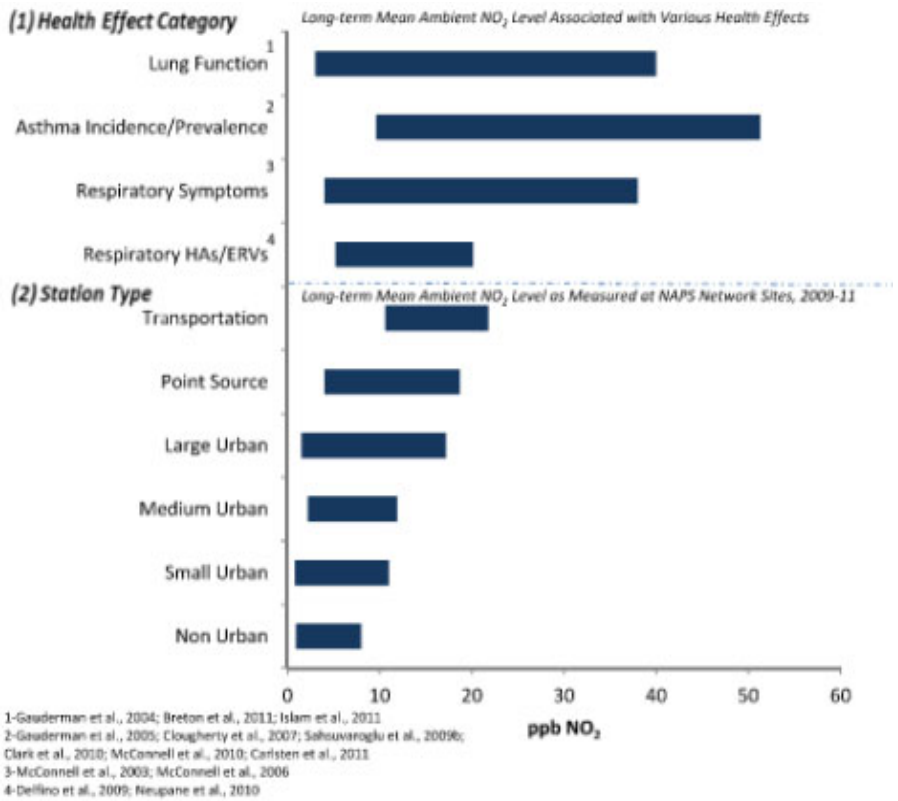
Notes:
HA – hospital admissions
ERV – emergency room visits
AHR – airway hyper-responsiveness

Figure 4-1 **Comparison between daily 1-h max ambient NO_2 levels (1) associated with various health effects in the selected Canadian/US epidemiology studies and (2) measured at Canadian NAPS monitoring stations (Figure 12.1 from Health Canada (2016))**



Notes:
HA – hospital admissions
ERV – emergency room visits
AHR – airway hyper-responsiveness

Figure 4-2 **Comparison between mean 24-h avg ambient NO2 levels (1) associated with various health effects in the selected Canadian/US epidemiology studies and (2) measured at Canadian NAPS monitoring stations (Figure 12.2 from Health Canada (2016))**



Notes:
HA – hospital admissions
ERV – emergency room visits
AHR – airway hyper-responsiveness

Figure 4-3 Comparison between mean long term ambient NO_2 levels (1) associated with various health effects in the selected Canadian/US epidemiology studies and (2) measured at Canadian NAPS monitoring stations (Figure 12.3 from Health Canada (2016))

4.2.1 FINE PARTICULATE MATTER (<2.5 µm)

Particulate matter is identified as all solid and liquid airborne particles (except water) that are microscopic in size. $PM_{2.5}$, also known as fine PM, is identified as those particles that are 2.5 µm or less in aerodynamic diameter. Sources of $PM_{2.5}$ primarily include fossil fuel combustion processes, industrial processes, and biomass burning. In general, exposure to $PM_{2.5}$ can lead to adverse health effects to the heart and lungs and may also lead to other health issues including asthma attacks, chronic bronchitis, and heart attacks (CCME 2021). In addition, exposure to $PM_{2.5}$ has been linked to increased ERVs and hospitalization due to respiratory and cardiovascular problems, as well as increased risk of premature mortality (CCME 2021).

Unlike SO_2 and NO_2, Health Canada has not prepared a comprehensive risk assessment report for $PM_{2.5}$. The most comprehensive assessment for $PM_{2.5}$ health science currently available is the US EPA Integrated Science Assessment (ISA) for PM (US EPA, 2019), which builds upon a previous ISA for PM published in 2009 (US EPA, 2009). The US EPA (2019) reviewed hundreds of studies investigating a wide of potential health effects and, as shown in Table 4-14 below, determined that the weight of scientific evidence supported causal links between $PM_{2.5}$ exposure and cardiovascular effects, as well as total mortality. Links between $PM_{2.5}$ exposure and respiratory effects, nervous system effects and cancer were determined “likely to be causal”.

Table 4-14 Summary of US EPA Integrated Science Assessment for Particulate Matter Causality Determinations

	Short-Term Exposure	Long-Term Exposure
Respiratory Effects	Likely to be causal	Likely to be causal
Cardiovascular Effects	Causal	Causal
Metabolic Effects	Suggestive of, but not sufficient to infer	Suggestive of, but not sufficient to infer
Nervous System Effects	Suggestive of, but not sufficient to infer	Likely to be causal
Reproductive and Developmental Effects	N/A	Suggestive of, but not sufficient to infer
Cancer	N/A	Likely to be causal
Mortality	Causal	Causal

The following sections provide further detailed discussion for each of the health effects identified in Table 4-14.

4.2.1.1 *SHORT-TERM HEALTH EFFECTS*

RESPIRATORY EFFECTS

US EPA (2019) examined possible short-term respiratory effects of $PM_{2.5}$ including exacerbation of asthma and allergy symptoms, development of COPD, and increasing incidences of respiratory-related HA and ERV visits, respiratory infection, respiratory health effects in healthy populations, respiratory effects in population with cardiovascular disease and respiratory mortality. The US EPA ISA (2019) concluded that there was a "likely to be causal relationship" between short-term $PM_{2.5}$ exposure and respiratory effects.

The collective data of animal and epidemiologic studies were evaluated for strength of causality. Overall evidence links COPD HA and ERV visits to short-term $PM_{2.5}$ exposures; however, uncertainty exists related to lack of assessment of co-pollutants and potential for confounding and comparison to previous findings showing attenuation of the $PM_{2.5}$ associations with adjustment for NO_2 (US EPA, 2019). The causal link between COPD HA and ERV visits to short-term $PM_{2.5}$ exposures is further supported by the findings of controlled human exposure and animal toxicologic studies that demonstrate increases in COPD symptoms, medication use, pulmonary inflammation, lung injury and decreases in lung function following short-term exposures to $PM_{2.5}$ (US EPA, 2019).

Regarding HA and ERV for combined respiratory-related diseases and infections, associations are seen in children, people of all ages, and older adults from single-city studies and in people of all ages in multicity studies (US EPA, 2019). Studies of respiratory mortality also report associations in single-and multicity studies, although confidence intervals are sometimes wide.

Regarding respiratory infections and short-term $PM_{2.5}$ exposures, the previous 2009 ISA reported consistent findings between $PM_{2.5}$ concentrations and HA or ERV visits for respiratory infections; however, recent studies are not consistent with the results of older studies because the respiratory infection-related outcomes examined were heterogeneous (US EPA, 2019). Many studies of respiratory infection did not examine any co-pollutants, making it unclear whether $PM_{2.5}$ associations are independent of co-pollutants (USEP 2019). Animal data demonstrate biological plausibility based on altered host defense and greater susceptibility to bacterial infection as a result of short-term $PM_{2.5}$ exposure (US EPA, 2019).

Regarding respiratory effects in healthy populations and short-term $PM_{2.5}$ exposures, epidemiologic studies reported changes in lung function and pulmonary inflammation. However, changes tend to be transient and co-pollutant confounding is inadequately examined (US EPA, 2019). Controlled human exposure and animal toxicologic studies provide evidence for lung function decrements and pulmonary effects including inflammation, injury, oxidative stress, morphologic changes, and allergic sensitization; but these effects were not observed in every study (US EPA, 2019).

CARDIOVASCULAR EFFECTS

US EPA (2019) examined possible short-term cardiovascular effects of $PM_{2.5}$ including ischemic heart disease and myocardial infarction, heart failure and impaired heart function, ventricular depolarization, repolarization and arrhythmia, cerebrovascular disease and stroke, blood pressure and hypertension, venous thromboembolism disease and pulmonary embolism, HA and ERV, cardiovascular mortality, heart rate and heart rate variability, systemic inflammation, oxidative stress, coagulation, endothelial dysfunction and arterial stiffness. The US EPA ISA (2019) concluded that there was a "causal relationship" between short-term $PM_{2.5}$ exposure and cardiovascular effects.

The collective data of animal controlled human exposure and epidemiologic panel studies were evaluated for strength of causality. Overall evidence links HA and ERV for cardiovascular-related effects, particularly, for ischemic heard disease and heart failure. These results are supported by experimental evidence from animal studies and controlled human exposure of endothelial dysfunction, impaired cardiac function, increased risk of arrhythmia, changes in heart rate variability, increases in blood pressure, systemic inflammation, oxidative stress, and coagulation (US EPA, 2019).

Evidence demonstrates a continuum of cardiovascular-related health effects following short-term exposure to $PM_{2.5}$ (US EPA, 2019). These cardiovascular-related health effects range from relatively modest increases in biomarkers related to inflammation and coagulation, to subclinical cardiovascular endpoints such as endothelial dysfunction, to HAs and ERVs for outcomes such as ischemic heart disease and heart failure (US EPA, 2019). In coherence with this continuum of effects is a body of epidemiologic studies reporting a relatively consistent relationship between short-term $PM_{2.5}$ exposure and cardiovascular-related mortality (US EPA, 2019). The current body of evidence also reduces uncertainties from the previous review related to potential co-pollutant confounding and limited biological plausibility for cardiovascular effects following short-term $PM_{2.5}$ exposure (US EPA, 2019).

METABOLIC EFFECTS

US EPA (2019) examined possible short-term metabolic effects of $PM_{2.5}$ including glucose and insulin homeostasis, inflammation, and liver function. The collective data of animal and epidemiologic studies were evaluated for strength of causality. Overall, the collective evidence is "suggestive of, but not sufficient to infer, a causal relationship between short-term $PM_{2.5}$ exposure and metabolic effects" (US EPA, 2019).

Recent studies provide some evidence supporting the effects of exposure on glucose and insulin homeostasis and other indicators of metabolic function. However, causal evidence is based on a small number of epidemiologic and toxicologic studies reporting effects on glucose and insulin homeostasis and other indicators of metabolic function such as inflammation in the visceral adipose tissue and liver (US EPA, 2019).

NERVOUS SYSTEM EFFECTS

US EPA (2019) examined possible short-term nervous system effects of $PM_{2.5}$ including effects on the autonomic nervous system, and changes in hypothalamic neurotransmitters. The collective data of animal and epidemiologic studies were evaluated for strength of causality. Overall, the collective evidence is "suggestive of, but not sufficient to infer, a causal relationship between short-term exposure to $PM_{2.5}$ and nervous system effects" (US EPA, 2019).

Animal data provides the strongest evidence that indicate an effect of short-term $PM_{2.5}$ exposure on the autonomic nervous system and changes in hypothalamic neurotransmitters. US EPA (2019) states that these studies provide evidence that $PM_{2.5}$ exposure leads to changes in norepinephrine which in turn, indicates that the hypothalamus plays an important role in mediating effects. However, human studies related to short-term $PM_{2.5}$ exposures and diseases of the nervous system remain limited (US EPA, 2019).

Regarding short-term exposure to $PM_{2.5}$ and diseases of the nervous system or depression, evidence is limited to a small number of analyses. Positive associations were not observed in studies of HAs for depression, dementia, or Alzheimer's disease (US EPA, 2019). A small increase in HAs for Parkinson's disease was reported in a large US study of Medicare recipients (age 65+) indicating that short-term exposure to $PM_{2.5}$ may exacerbate a range of symptoms experienced by Parkinson's disease patients (US EPA, 2019). A study of school children reported associations of $PM_{2.5}$ with some tests of neuropsychological function (US EPA, 2019). None of the epidemiologic studies considered confounding by co-pollutant exposures (US EPA, 2019).

MORTALITY

US EPA (2019) concluded that there was a "causal relationship" between short-term $PM_{2.5}$ exposure and non-accidental total mortality. This conclusion was supported by a large number of single and multi-city times series studies that indicate a consistent association between short term $PM_{2.5}$ exposures and total mortality. The strongest evidence is based primarily from the assessment of $PM_{2.5}$-related cardiovascular morbidity, with more limited evidence from respiratory morbidity, which collectively provides biological plausibility for mortality from short-term $PM_{2.5}$ exposures. This association has been shown to hold for a range of exposure assessment approaches, as well across both rural and urban study locations. Studies assessing the impacts of co-pollutant confounding and other sources of confounding (i.e. weather) generally indicated that association between short-term $PM_{2.5}$ exposure and short term mortality are robust and independent of confounding effects.

4.2.1.2 *LONG-TERM HEALTH EFFECTS*

RESPIRATORY EFFECTS

US EPA (2019) examined possible long-term respiratory effects of $PM_{2.5}$ including lung function and development; development of asthma, allergy, COPD and respiratory infection; severity of respiratory disease; subclinical respiratory effects in healthy population; subclinical effects in populations with cardiovascular disease; and respiratory mortality. The collective data of animal and epidemiologic studies were evaluated for strength of causality. The US EPA ISA (2019) concluded that sufficient evidence supports a "likely to be causal relationship" between long-term $PM_{2.5}$ exposure and respiratory effects.

This conclusion was based mainly on epidemiologic evidence demonstrating associations between long-term $PM_{2.5}$ exposure and changes in lung function or lung function growth rate in children with more limited evidence for asthma development and prevalence in children, childhood wheeze, and pulmonary inflammation. These associations were observed across numerous cohort studies that differed in location, exposure assessment methodology and study period. Recent studies of long term $PM_{2.5}$ exposure show pulmonary oxidative stress, inflammation, and morphologic changes in the upper (nasal) and lower airways. Other results show changes consistent with the development of allergy and asthma and impaired lung development. Biological plausibility for these observed effects was provided by long-term toxicologic studies that demonstrated impaired lung development and increased airway responsiveness in animal models. Epidemiologic studies indicated that long-term $PM_{2.5}$ exposure accelerated lung function decline, but also indicated that declining $PM_{2.5}$ concentrations over time have resulted in measurable improvements in pulmonary function growth and bronchitic symptoms in children and improvements in lung function in adults.

As with short-term respiratory effects, there was the potential for a confounding impact of co-pollutant exposure, but the US EPA ISA (2019) concluded that there was likely sufficient toxicologic evidence of $PM_{2.5}$-induced effects to support the independent effect of $PM_{2.5}$ exposure on long-term respiratory health outcomes.

CARDIOVASCULAR EFFECTS

US EPA (2019) examined possible long-term cardiovascular effects of $PM_{2.5}$ including ischemic heart disease and myocardial infarction, cerebrovascular disease and stroke, atherosclerosis, heart failure and impaired heart function, ventricular depolarization, repolarization and arrhythmia, blood pressure and hypertension, venous thromboembolism disease and pulmonary embolism, cardiovascular mortality, heart rate and heart rate variability, systemic inflammation, oxidative stress and blood lipids, coagulation, impaired vascular function and arterial stiffness.

The collective data of animal and epidemiologic studies were evaluated for strength of causality. The US EPA ISA (2019) concluded that there was a "causal relationship" between long-term $PM_{2.5}$ exposure and cardiovascular effects. This conclusion was based primarily on numerous mortality studies of U.S. and Canadian cohorts that have shown consistent strong associations between long-term $PM_{2.5}$ exposure and cardiovascular mortality, even in areas with relatively low annual mean $PM_{2.5}$ levels (4.08−17.9µg/m^3). The causal link between cardiovascular mortality and long-term $PM_{2.5}$ exposures were consistently reported in studies that differed in location, exposure assessment and statistical methodology and study period. The study findings remained relatively unchanged or increased in co-pollutant models adjusted for ozone, NO_2, $PM_{10–2.5}$, or SO_2 (US EPA, 2019). Analyses of the concentration response function relating cardiovascular mortality to long-term $PM_{2.5}$ exposure generally supported a linear, no-threshold relationship, particularly at low $PM_{2.5}$ concentrations,

Associations with coronary heart disease, stroke, and atherosclerosis progression were also observed in several additional epidemiologic studies, providing coherence with the mortality findings. Recent studies have also shown associations between long-term $PM_{2.5}$ exposure and cardiovascular morbidity, including heart failure, high blood pressure and hypertension. Biological plausibility for these observed effects was provided by long-term animal toxicologic studies that demonstrated increased atherosclerosis and coronary artery wall thickness, decreased cardiac contractility and output, and changes in blood pressure in response to long term $PM_{2.5}$ exposure (US EPA, 2019).

METABOLIC EFFECTS

US EPA (2019) examined possible long-term metabolic effects of $PM_{2.5}$ including metabolic syndrome, glucose and insulin homeostasis, Type 2 diabetes mellitus, inflammation, liver function, endocrine hormones, adiposity and weight gain, and gestational diabetes. The collective data of animal and epidemiologic studies were evaluated for

strength of causality. The US EPA ISA (2019) concluded that the collective evidence is "suggestive of, but not sufficient to infer, a causal relationship between long-term $PM_{2.5}$ exposure and metabolic effects" (US EPA, 2019).

This conclusion is based on epidemiologic studies that report positive associations between long-term $PM_{2.5}$ exposure and diabetes-related mortality in well-established cohorts in the U.S. and Canada. Although results were not consistent across cohorts, some epidemiologic studies report positive associations with incident diabetes, metabolic syndrome, and glucose and insulin homeostasis. Consideration of co-pollutant confounding was limited. Some support was provided by experimental studies demonstrating increased blood glucose, insulin resistance, and inflammation and visceral adiposity but the experimental evidence was not entirely consistent.

NERVOUS SYSTEM EFFECTS

US EPA ISA (2019) concluded that there was a "likely to be causal relationship" between long-term $PM_{2.5}$ exposure and nervous system effects. This conclusion is primarily based on toxicologic studies from multiple research groups that show inflammation, oxidative stress, morphologic changes, and neurodegeneration in multiple brain regions following long-term exposure of adult animals to $PM_{2.5}$ concentrated ambient particles (US EPA, 2019). Both experimental and epidemiologic evidence are well substantiated and coherent, supporting a pathway involving neuroinflammation in specific regions of the brain (i.e., the hippocampus, cerebral cortex and hypothalamus) and morphologic changes in the brain indicative of neurodegeneration (US EPA, 2019). In addition to the nervous system effects primarily observed in adults, there is preliminary but limited epidemiologic evidence of neurodevelopmental effects, specifically autism spectrum disorder. Evidence for this outcome is supported by an animal toxicologic study demonstrating $PM_{2.5}$-induced inflammatory and morphologic changes in regions of the brain consistent with autism spectrum disorder (US EPA, 2019). Evidence for a relationship between long-term $PM_{2.5}$ exposure and Alzheimer's disease and dementia is provided by both animal toxicologic and epidemiologic studies (US EPA, 2019). There has been limited assessment of the impact of co-pollutant exposure, but the above-noted toxicologic studies provided evidence of an independent effect of long term $PM_{2.5}$ exposure on nervous system effects (US EPA, 2019).

REPRODUCTIVE AND DEVELOPMENTAL EFFECTS

US EPA (2019) examined possible long-term reproductive and developmental effects of $PM_{2.5}$ including male and female fertility and reproduction, pregnancy and birth outcomes and developmental outcomes. The body of animal and epidemiologic studies were evaluated for strength of causality. Overall, the collective evidence is "suggestive of, but not sufficient to infer, a causal relationship between long-term $PM_{2.5}$ exposure and reproductive and developmental effects" (US EPA, 2019).

Regarding male fertility and reproduction, strongest evidence with $PM_{2.5}$ exposure come from studies on sperm motility (from human data) and spermiation (from animal data) (US EPA, 2019). However, uncertainties exist from lack of evaluation of co-pollutant confounding or multiple potential sensitive windows of exposure. Other studies on sperm including the epidemiologic literature on sperm morphology have inconsistent results. Studies of female reproduction in association with $PM_{2.5}$ exposure also have mixed results (US EPA, 2019). In rodents, ovulation and estrus are affected by $PM_{2.5}$ exposure. In the epidemiologic literature, results on human fertility and fecundity in association with $PM_{2.5}$ exposure is limited, with evidence from *in vitro* fertilization showing a modest association of $PM_{2.5}$ concentrations with decreased odds of becoming pregnant. Animal toxicologic studies show inconsistent results from $PM_{2.5}$ exposure and its effects on reproduction. Biological plausibility for outcomes on male and female fertility and reproduction come from laboratory animal studies that show genetic and epigenetic changes to germ cells with $PM_{2.5}$ exposure (US EPA, 2019)."

Regarding pregnancy and birth outcomes, several studies indicated an association between $PM_{2.5}$ and low birth weight and preterm birth in animal studies. The epidemiologic and toxicologic literature generally show positive associations of $PM_{2.5}$ exposure with reduced fetal growth and reduced birth weight. Most of the epidemiologic studies do not control for co-pollutant confounding and do not have a specific sensitive window of exposure, but there is biological plausibility from the animal toxicologic literature in support of these outcomes as well as support for multiple sensitive windows for $PM_{2.5}$ exposure associated outcomes. Various pregnancy-related pathologies, including gestational hypertension, pre-eclampsia, and gestational diabetes, show inconsistent results in association with $PM_{2.5}$ exposure (US EPA, 2019).

MORTALITY

US EPA (2019) examined possible long-term effects of $PM_{2.5}$ and total mortality. Available epidemiologic studies were evaluated for strength of causality. The US EPA ISA (2019) concluded that there was a "causal relationship"

between long-term $PM_{2.5}$ exposure and non-accidental total mortality. This conclusion was supported by numerous epidemiologic studies mainly in North America and Europe that show association between long-term $PM_{2.5}$ exposures and total mortality, even in study areas with relatively low $PM_{2.5}$ levels (≤12 µg/m^3) (US EPA, 2019). The strongest evidence is based on the Harvard Six Cities Study and the American Cancer Study, adding mortality data due to cardiovascular disease (including ischemic heart disease) and respiratory disease (including COPD), and extending the follow-up period of the American Cancer Study to 22 years (1982−2004). U.S. and Canadian cohort studies demonstrate consistent, positive associations between long-term $PM_{2.5}$ exposure and mortality across various locations, exposure assessment and statistical methods, where mean annual average concentrations are ≤12 µg/m^3.

The association for total mortality was also supported by the associations for cause-specific mortality (i.e., cardiovascular mortality) reported above. In same way that early cohort studies indicated that increased levels of long-term $PM_{2.5}$ exposure decreased life expectancy, more recent studies have indicated the converse: over time, decreasing $PM_{2.5}$ exposure levels led to increases in life expectancy. As with short-term exposures, the association between long-term $PM_{2.5}$ exposure and mortality was robust across different exposure assessment approaches, co-pollutant models, and other confounders such as smoking and socioeconomic status, indicating an independent effect of long term $PM_{2.5}$ exposure on total mortality.

4.2.1.3 *CARCINOGENIC EFFECTS*

US EPA, 2019 concluded that there was a "likely to be causal relationship" between long-term $PM_{2.5}$ exposure and cancer. A number of epidemiologic studies indicated associations between long-term $PM_{2.5}$ exposure and lung cancer. However, studies of cancer development have often focused on exposure to whole particulate matter, rather than the $PM_{2.5}$ size fraction, or exposure to individual components of particulate such as metals. Despite this, biological plausibility for an association between long-term $PM_{2.5}$ exposure and cancer was provided by a wide range of toxicologic studies that indicated that components of $PM_{2.5}$ are mutagenic, cytogenic and can cause DNA damage and differential expression of genes potentially relevant to genotoxicity, as well as exhibiting carcinogenic potential. Assessment of pollutant confounding was limited but did indicate that multipollutant models including ozone did not change the association between long-term $PM_{2.5}$ exposure and lung cancer incidence.

Notwithstanding the conclusions of the US EPA, 2019, it is important to note that IARC have not classified the carcinogenicity of $PM_{2.5}$. The IARC determination of carcinogenicity for "outdoor air pollution" (IARC 2013) considers a range of individual gaseous and particulate pollutants including $PM_{2.5}$ but stops short of assigning carcinogenicity to individual components of the "outdoor air pollution" mixture.

4.3 SELECTED TOXICOLOGICAL REFERENCE VALUES FOR APPLICATION IN THE HHA

Based on review of available jurisdictional health-based standards for selected COPCs, as well as review of health and exposure related data reviewed and discussed in the toxicological summary write-up, this HHA adopted the health-based TRVs shown in **Table 4-15**, below.

Table 4-15 Selected TRVs for the HHA

COPC	Type	TRV	Source	Basis
Acute Exposure Duration				
Benzene	24-hr	30 µg/m^3	US EPA (2003)	**Protection against hematopoietic effects.** This TRV (30 µg/m^3) is based on benchmark dose modelling of the absolute lymphocyte count data from the occupational epidemiologic study of Rothman et al. (1996) cited in US EPA (2003), in which workers were exposed to benzene by inhalation.

COPC	Type	TRV	Source	Basis
Acrolein	1-hr	2.5 µg/m^3	Cal OEHHA (2014)	**Protection against eye irritation** This 1-hr TRV is based on the geometric mean of effect levels for eye irritation in humans from two studies: a LOAEL of 138 µg/m^3 in a study of 36 volunteers exposed (eye only) to acrolein for 5 minutes, and a LOAEL of 210 µg/m^3 in a study of 53 volunteers exposed to increasing acrolein concentrations for 40 minutes. A total UF of 60 was applied.
Benzo(a)pyrene	24-hr	0.002 µg/m^3	US EPA (2017)	**Protection against decreased embryo/fetal survival** This TRV was chosen given that developmental effects represent a sensitive hazard of benzo(a)pyrene exposure. The TRV is based on a LOAEL of 25 µg/m^3 from a developmental inhalation study in rats which observed decreased embryo/fetal survival. Several adjustments including use of an UF of 3000 were then applied to derive the TRV.
NO_2	1-hr	113 µg/m^3	Health Canada (2016)	**For protection of airway hyper-responsiveness (AHR)** The 1-hour TRV (113 µg/m^3) is primarily based on an exposure study involving 85 asthmatic children (aged 7-12) from Mexico City (Hernandez-Cadena et al, 2009 cited in Health Canada, 2016). In this study, exposure to ambient NO_2 was associated with reduced broncho-dilating response to inhaled corticosteroids in asthmatic children, indicating increased AHR. The study findings indicated elevated NO_2 levels were associated with a 15% decrease in lung function response to inhaled corticosteroids (as indicated by FEV_1 or forced expiratory volume in 1 second response to short-acting β agonists) per 10 ppb daily 1-hour max NO_2, with similar decreases in response 0 to 3 days following exposure inhaled corticosteroids.
	1-hr	79 µg/m^3	Health Canada (2016)	**To reduce frequency of asthma ERVs** Asthma ERV is also considered as a health endpoint in this HHA as ERVs associated with increased incidences of asthma in children or adults have been consistently associated with short-term ambient NO_2 in the studies reviewed by Health Canada (2016). However, ERVs were also related to exposures to other pollutants as few co-pollutant analyses were conducted (Health Canada, 2016).
$PM_{2.5}$	24-hr	25 µg/m^3	WHO (2005)	**For protection against excess morbidity or mortality** This 24-hour TRV (25 µg/m^3) represents a 99th percentile of the distribution of daily values and is intended to protect against peaks of pollution that would lead to substantial excess morbidity or mortality. This value is largely based on published risk coefficients from multicentre studies and meta-analyses, which reported an average short-term mortality effect for PM_{10} of approximately 0.5% per 10 µg/m^3. This value is considered to provide a significant reduction in risks from acute exposure health effects such as short-term mortality.

COPC	Type	TRV	Source	Basis
Chronic Exposure Duration				
Benzene	Annual (carcinogenic); 24-hr (non-carcinogenic)	0.45 µg/m³ (1) (carcinogenic); 30 µg/m³ (non-carcinogenic)	Health Canada (2021), TCEQ (2015) and US EPA (2003)	**Carcinogenic** **Protection against leukemia, mainly acute myelogenous leukemia** This TRV (4.5 µg/m³) was derived based on a risk specific concentration relating to a 1 in 100,000 risk of developing leukemia observed in workers exposed via inhalation. **Non-Carcinogenic** **Protection against hematopoietic effects.** A TRV of 30 µg/m³ was also used for chronic non-carcinogenic exposures given the 24-hr averaging period. The basis of this value is outlined (above) under the acute exposure duration heading of this table.
Acrolein	Chronic (24-hr)	0.4 µg/m³	HC and EC (2000); MECP (2009)	**Protection against development of lesions in upper airways** This TRV is derived from a BMC05 of 0.14 mg/m³ from a 3-day study. Adjustments for continuous exposure and a total UF of 100 was applied derive the TRV.
Benzo(a)pyrene	Annual (carcinogenic);	0.002 µg/m³(2) (carcinogenic);	US EPA (2017)	**Protection against upper respiratory and digestive tract tumors** This TRV is based on a study in 1981 which calculated an IUR of 6.0E-04 per µg/m³ by linear extrapolation from a $BMCL_{10}$ of 0.16 mg/m³ for the occurrence of upper respiratory and upper digestive tract tumors in male hamsters chronically exposed by inhalation.
NO_2	Annual	23 µg/m³	Health Canada (2016)	**Protection of respiratory morbidity** This TRV (23 µg/m³) is based on long-term exposure to ambient NO_2 and respiratory morbidity. Uncertainty remains with respect to possible confounding effects by co-pollutants.
$PM_{2.5}$	Annual	10 µg/m³	WHO (2005)	**Protection against excess mortality** This TRV (10 µg/m³) represents the lower end of the range over which significant effects on survival have been observed in the ACS study.

Notes:

[1] Value reported in Health Canada is 4.5 µg/m³ (based on an incremental lifetime cancer risk of 1-in-100,000). This value was converted to 0.45 µg/m³ to reflect an incremental lifetime cancer risk of 1-in-1,000,000, which was applied as part of this assessment.

[2] IUR was converted to a risk-specific concentration of 0.002 µg/m³ to reflect an incremental lifetime cancer risk of 1-in-1,000,000, which was applied as part of this assessment.

All chronic TRVs evaluated for benzo(a)pyrene as part of this assessment were based on carcinogenic human health effects; as such, benzo(a)pyrene was assessed as a carcinogen only for chronic exposure.

4.4 UNCERTAINTY ANALYSIS

The major sources of uncertainty associated with the hazard assessment of the HHA are briefly described below

NO_2:

— While Health Canada (2016) details the health- and exposure-studies supporting the CCME 2020 and 2025 CAAQS, CCME does not provide any documentation that describes how the proposed numerical values for 2020 or 2025 CAAQS for NO_2 were derived.

- Exposure to co-pollutants in ambient air and potential confounding health effects: Exposure to co-pollutants remains the major uncertainty in the overall health database for air pollutants including NO_2.
- Adjustments through statistical control can be completed to control for potential co-pollutant confounding in air pollution health effects studies. Co-pollutant regression models are the most widely used technique whereby, the NO_2 effect estimate represents the risk associated with NO_2 while keeping the level of the other co-pollutant(s) or other covariate(s) constant. There are limitations to multivariable models; in particular, high correlations between NO_2 levels and potential confounders can affect the magnitude or precision of the effect estimate for NO_2 or the covariate and are a concern for models that include a traffic-related co-pollutant or that include three or more pollutants in the same model.
- With respect to asthma and respiratory incidence in children, Health Canada (2016) states that overall findings were generally not highly sensitive to study design, but uncertainty remains about whether the effects related to NO_2 are independent of other pollutants. In a limited number of studies examining effects of NO_2 in co-pollutant models, robust associations were generally observed following adjustment for various air pollutants including particulate matter and/or ozone or sulphur dioxide. Results from these studies are coherent with associations found in children for asthma incidence and respiratory symptoms.
- Human epidemiology studies are observational rather than experimental, and hence there can be uncertainty as to whether the effects reported in the epidemiology studies are in fact due to ambient NO_2 alone. The NO_2 may be a marker (in whole or in part) for other air pollutants, or the observed association may even be the result of some other factor (Health Canada, 2016).
- Uncertainty associated with exposure to co-pollutants applies to HAs and ERVs as a health endpoint because it is challenging to separate the effect of each air pollutant.
- This same uncertainty also applies to long-term exposure to NO_2 levels from traffic-related exposures as co-pollutant models adjusting for other key traffic-related air pollutants such as carbon monoxide or ultrafine particulates have not been performed.
- Health-based 1-hour and annual AAQOs are available from other jurisdictions that are higher than values adopted by Metro Vancouver, BC MoECCS and CCME; however, these exposure limits are either dated and/or documentation describing the technical basis of or derivation of the standards are lacking. As such, it is not possible to confirm whether exposure limits from other jurisdictions are adequately protective of human health.

Fine Particulate Matter (<2.5 µm):

- Considerable uncertainty remains as to which of the PM fractions (coarse or fine) are responsible for eliciting certain health effects. For instance, the extent to which fine PM may also contribute to the health effects observed as a result of exposure to coarse PM is an important source of uncertainty affecting the HHA.
- Some acute- and chronic- health based standards from other jurisdictions are higher than the values adopted as part of this assessment; however, these exposure limits are either dated and/or documentation describing the technical basis or derivation of the standards are lacking. As such, it is not possible to confirm whether exposure limits from other jurisdictions are adequately protective of human health.

Acrolein:

- As only limited data were available on repeated inhalation exposure to acrolein in humans, animal data were used as a POD when deriving the RfC. Although the nature of effects (irritation) is likely to be the same across species, quantitative differences in sensitivity were accounted for using default values for the toxicodynamic UF (rats to humans) and an intraspecies UFs (for sensitive individuals). No studies could be found on the effects of acrolein in sensitive individuals such as asthmatics which would reduce the uncertainty in the RfC.
- Studies on the effects of long-term inhalation exposure to acrolein are limited. There were also significant limitations, as described in section 4 to the few epidemiological studies examining associations between acrolein exposure and asthma or rhinitis. Similarly, most studies in experimental animals did not go beyond a subchronic duration, and those few chronic studies available were inadequate to draw conclusions about the carcinogenicity of acrolein.
- Existing exposure studies have evaluated 24-hour sampling times to give an average daily exposure. Exposures to peak concentrations over shorter durations have not been evaluated. As described in section 3, acrolein is difficult to quantify accurately, and current methods have limitations.

- Exposure to co-pollutants in ambient air and potential confounding health effects: Exposure to co-pollutants remains the major uncertainty in the overall health database for air pollutants including acrolein.

Benzene:

- It is noted that no jurisdictional limits were identified from Ontario MECP or CCME for benzene.
- Uncertainty in exposure levels and duration, as well as potential for confounding exposures to other chemicals, presents some uncertainty in the interpretation of health effects from occupational studies with benzene.

Benzo(a)pyrene:

- It is noted that no jurisdictional limits were identified from Ontario MECP or CCME for benzo(a)pyrene.
- Uncertainty in exposure levels and duration, as well as the potential for confounding exposures to other chemicals, presents some uncertainty in the interpretation of health effects from occupational studies with benzo(a)pyrene.

5 RISK CHARACTERIZATION

Risk characterization is the final step in the HHA process, during which the exposure and hazard (toxicity) assessments are integrated. The process of risk characterization conducted in this HHA reflects the conservative approach used to generate risk estimates. The process and interpretation of these steps are discussed in the following sections. Key uncertainties that influence results, including data gaps, are also described.

5.1 QUANTIFYING HAZARDS FOR NON-CARCINOGENIC CHEMICALS

Most chemicals are reported to have associated health endpoints (other than cancer) and as such, these substances are often referred to as non-carcinogens. Regulatory agencies assume that for non-carcinogens, there is a dose level below which no harmful health effects will occur. As such for non-carcinogens, the potential for exposures to result in harmful human health effects is based on the ratio between the estimated exposure and health-based TRV. This ratio is called the Hazard Quotient (HQ) and is calculated as shown below:

$$HQ = \frac{EE}{TRV}$$

Where:

HQ = Hazard Quotient (unitless)

EE = Exposure Estimate (µg/m^3)

TRV = Chemical-Specific Toxicological Reference Value (µg/m^3)

The HQ provides an indication of whether estimated exposures are large enough to be of concern for human health. Typically, a HQ of less than 1 indicates that exposures would not be expected to result in adverse human health effects. Given that conservative assumptions are used by regulatory agencies in the development of toxicity values, HQ values greater than 1.0 do not mean that adverse human health effects will occur, but the likelihood that an adverse effect will occur increases as the HQ value rises above 1.0.

It should be noted that EE is derived differently for acute (1-hour) versus chronic (annual) exposures.

For acute exposures, the daily maximum concentration (1-hour or 8-hour) is compared directly to the acute TRV to calculate a HQ.

For chronic exposures, EE is defined as the 24-hour or annual mean air concentration (with adjustment for hours of exposure and averaging time for each receptor group, “Adj EE”) because the timeframe of interest is related to longer term annual exposures. The adjusted concentration is then compared to the chronic TRV to calculate a HQ.

The equation used to derive the adjusted chronic (annual) EE is presented below:

$$AdjEE = C_{air} \times ET \times EF \times ED/AT$$

Where:

C_{air} = Measured or modelled concentration of contaminant in air (µg/m^3);

ET = Exposure time (hours/day);

EF = Exposure frequency (days/year);

ED = Exposure duration (years); and,

AT = Averaging time (days)

A HQ benchmark (or “Target HQ”) of 1.0 was applied to acute and chronic exposures for all COPCs and for all human receptors. In the case where contaminant exposure from all potential sources, including ambient exposures

are considered, a HQ benchmark of 1.0 is considered acceptable. This assumption is considered to be met for all identified human receptors (i.e., toddler and adult residents).

5.2 QUANTIFYING HAZARDS FOR CARCINOGENIC CHEMICALS

Some chemicals are reported to have cancer-causing health effects and generally, these substances (also known as carcinogens) behave based on a non-threshold mechanism. To maintain a health-protective approach, regulatory agencies typically assume that there is no dose below which a harmful health effect will not occur and any exposure to a carcinogen is associated with some level of risk. For carcinogenic chemicals, the potential for exposures to result in harmful effects is based on the Incremental Lifetime Cancer Risk (ILCR). The ILCR is calculated as the product of estimated exposure and IUR.

$$ILCR = \text{Adj}EE \times IUR$$

Where:

ILCR = Incremental Lifetime Cancer Risk (Unitless)
Adj EE = Adjusted Exposure Estimate (µg/m^3)
IUR = Inhalation Unit Risk (µg/m^3)$^{-1}$

As described in Section 4, benzene and benzo(a)pyrene are classified as being carcinogenic to humans because there is sufficient animal and/or human evidence that demonstrates cancer causing activity.

Predicted cancer risks are based on the lifetime probability of developing cancer as a result of environmental exposure to a carcinogenic substance. An ILCR represents the increased probability of an individual developing cancer over a 76-year lifespan as a result of exposure to a carcinogenic COPC associated with the proposed development (i.e., incremental risk above the typical background risk that exists). The MECP considers that acceptable ILCR to be one-in-one million (1 x 10^{-6}). An ILCR greater than 1 x 10^{-6} is indicative of a potential health concern that should be more closely examined. An ILCR of less than 1 x 10^{-6} is considered essentially negligible.

5.3 RESULTS OF THE QUANTITATIVE ASSESSMENT

In this section, the contribution of overall risk from each source-receptor pathway is discussed. The predicted exposure estimates, ILCRs, and HQs for acute and chronic exposures for each of the identified receptors and COPCs are provided in **Table 5-1** to **Table 5-12**.

5.3.1 ACROLEIN

Table 5-1 Predicted Non-Carcinogenic Health Risks Associated with Acute Exposure to Acrolein for Toddler and Adult Residents

1-Hr Acute TRV (µg/m^3)	Background Conc. (µg/m^3)	HQ (Background)	Modelled Conc. (µg/m^3)	HQ (Modelled -Only)	Cumulative Conc. (µg/m^3)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
2.5	1.6	6.4E-01	0.01	4.0E-03	1.6	6.4E-01	99%
Adult Resident							
2.5	1.6	6.4E-01	0.01	4.0E-03	1.6	6.4E-01	99%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration

Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

Table 5-2 Predicted Non-Carcinogenic Health Risks Associated with Chronic Exposure to Acrolein for Toddler and Adult Residents

24-hr Chronic TRV (µg/m³)	Background Conc. (µg/m³)	HQ (Background)	Modelled Conc. (µg/m³)	HQ (Modelled -Only)	Cumulative Conc. (µg/m³)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
0.4	0.63	**1.5E+00**	4.0E-03	9.59E-03	0.63	**1.5E+00**	99%
Adult Resident							
0.4	0.63	**1.5E+00**	4.0E-03	9.59E-03	0.63	**1.5E+00**	99%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

The results presented above in **Table 5-1** and **Table 5-2** indicate the following:

- A predicted cumulative 24-hr acrolein concentration of 0.63 µg/m³ results in HQs that are greater than 1.0, and thus may result in the potential for increased development of lesions in upper airways for toddler and adult residents.

It should be noted that predicted health risks are associated almost entirely with background acrolein concentrations, which represent approximately 99% of cumulative concentrations, and thus, are a significant driver of predicted health risks. For acrolein, the results of this HHA are consistent with the results derived by the City of Toronto and Toronto Public Health wherein a comparable HQ of 1.6 was presented in a report entitled: "Traffic-Related Air Pollution (TRAP) in Toronto and Options for Reducing Exposure" (City of Toronto and Toronto Public Health, 2017).

A major reason for the elevated HQ reported in this HHA as well as in the city-wide study is the adoption of an updated, more stringent threshold for health effects based on information from MECP. That is, while the concentrations of acrolein across the greater Toronto area are not much different from what was modelled in previous studies, our understanding of the risk associated with acrolein has changed.

While the HQs for acrolein appear to be elevated, monitoring data suggests that the levels predicted by the modelling are not unusual. Data collected by Canada's NAPS network between 2009 and 2013 suggests that acrolein concentrations are routinely above guideline levels at sites across Canada, and indicated concentrations could commonly be in the range of 0.1 to 1 µg/m³ or greater (Galarneau *et al.,* 2016). For comparison, the modelling for the City of Toronto predicted concentrations ranging from 0.02 µg/m³ – 0.05 µg/m³. Acrolein is primarily emitted by transportation sources, and the highest risks are predicted to be along the busy highways and congested areas of greater Toronto area. However, given that acrolein is transportation-related and given previous studies, there is evidence to suggest that these concentrations could also diminish as you move above ground level.

5.3.2 BENZENE

Table 5-3 Predicted Non-Carcinogenic Health Risks Associated with Acute Exposure to Benzene for Toddler and Adult Residents

24-Hr Acute TRV (µg/m³)	Background Conc. (µg/m³)	HQ (Background)	Modelled Conc. (µg/m³)	HQ (Modelled -Only)	Cumulative Conc. (µg/m³)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
30	0.69	2.3E-02	0.03	1.0E-03	0.72	2.4E-02	96%
Adult Resident							
30	0.69	2.3E-02	0.03	1.0E-03	0.72	2.4E-02	96%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

Table 5-4 Predicted Non-Carcinogenic Health Risks Associated with Chronic Exposure to Benzene for Toddler and Adult Residents

Annual Chronic TRV (µg/m³)	Background Conc. (µg/m³)	HQ (Background)	Modelled Conc. (µg/m³)	HQ (Modelled -Only)	Cumulative Conc. (µg/m³)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
30	0.49	1.6E-02	0.009	2.9E-04	0.50	1.6E-02	98%
Adult Resident							
30	0.49	1.6E-02	0.009	2.9E-04	0.50	1.6E-02	98%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

Table 5-5 Predicted Carcinogenic Health Risks Associated with Chronic Exposure to Benzene for Adult Residents

Annual Chronic TRV (µg/m³)	Background Conc. (µg/m³)	ILCR (Background)	Modelled Conc. (µg/m³)	ILCR (Modelled -Only)	Cumulative Conc. (µg/m³)	ILCR (Cumulative)	% Background ILCR Attributable to Cumulative
Adult Resident							
0.45	0.49	7.7E-01	0.009	1.4E-02	0.50	7.9E-01	97%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
ILCRs per 1-in-1,000,000 presented in **bold** if > 1

The findings of the HHA indicated that background concentrations of benzene account for 96-98% of the cumulative concentrations, HQ, and ILCR, which suggests that background concentrations are a significant driver of the cumulative concentrations and predicted health risks.

Air quality studies in the City of Toronto have identified benzene as an important vehicle emission exceeding the annual average and 24-hr average health benchmarks (City of Toronto, 2017). **Figure 5-1** below, obtained from the report entitled: "Avoiding the TRAP: Traffic-Related Air Pollution in Toronto and Options for Reducing Exposure" shows modelled annual average concentrations of benzene based on 2012 collected data.

The influence of transportation emissions is clear along Highway 401 in **Figure 5-1** as well as along other major highways, including the additional traffic on ramps and at highway crossings and interchanges. Benzene levels are also elevated in the congested downtown area. While the provincial annual AAQC for benzene is 0.45 µg/m^3 (0.14 ppb), the modelled concentration is predicted at 0.004 µg/m^3. Depending on the exact location within Toronto; the City does not achieve the annual AAQC guideline, with most areas exceeding the AAQC.

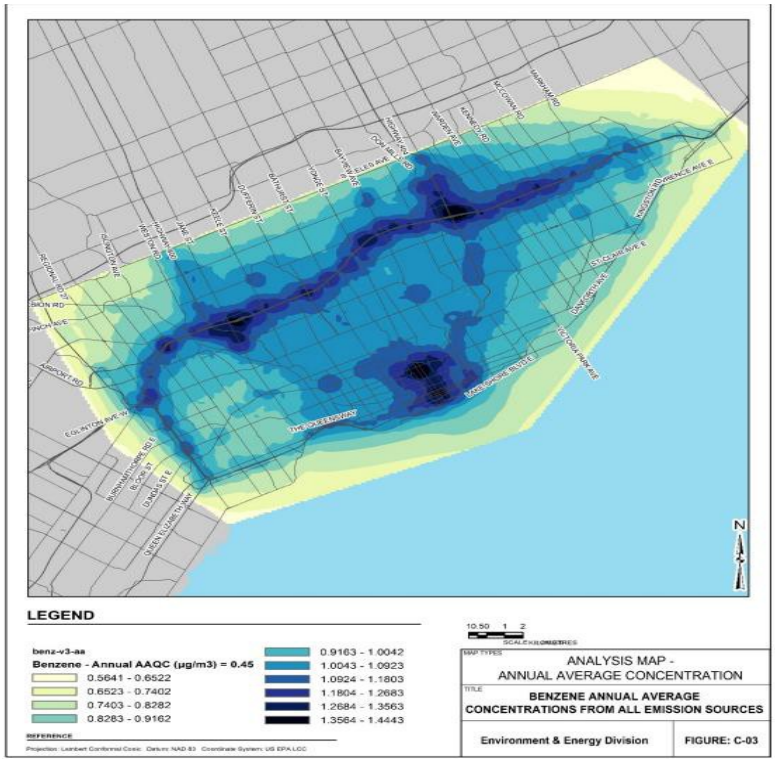


Figure 5-1 **Toronto Modelled Annual Benzene Concentrations (2012), from City of Toronto, 2017**

5.3.3 BENZO(A)PYRENE

Table 5-6 **Predicted Non-Carcinogenic Health Risks Associated with Acute Exposure to Benzo(a)pyrene for Toddler and Adult Residents**

24-Hr Acute TRV (µg/m^3)	Background Conc. (µg/m^3)	HQ (Background)	Modelled Conc. (µg/m^3)	HQ (Modelled -Only)	Cumulative Conc. (µg/m^3)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
0.002	1.1E-04	5.5E-02	7.48E-07	1.5E-02	1.1E-04	5.5E-02	100%
Adult Resident							

24-Hr Acute TRV (µg/m³)	Background Conc. (µg/m³)	HQ (Background)	Modelled Conc. (µg/m³)	HQ (Modelled -Only)	Cumulative Conc. (µg/m³)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
0.002	1.1E-04	5.5E-02	7.48E-07	1.5E-02	1.1E-04	5.5E-02	100%
Pregnant Resident							
0.002	1.1E-04	5.5E-02	7.48E-07	1.5E-02	1.1E-04	5.5E-02	100%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

Table 5-7 Predicted Carcinogenic Health Risks Associated with Chronic Exposure to Benzo(a)pyrene for Adult Residents

Annual Chronic TRV (µg/m³)	Background Conc. (µg/m³)	ILCR (Background)	Modelled Conc. (µg/m³)	ILCR (Modelled -Only)	Cumulative Conc. (µg/m³)	ILCR (Cumulative)	% Background ILCR Attributable to Cumulative
Adult Resident							
0.002	1.2E-05	0.006	0	0	1.2E-05	0.006	100%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
ILCRs per 1-in-1,000,000 presented in **bold** if > 1

The results presented above in **Table 5-5** to **Figure 5-6** Average PM2.5 concentrations in selected Canadian urban areas (From Environment Canada and Climate Change (ECCC), Air quality - Canada.ca) indicate that no unacceptable health risks from acute or chronic exposure to benzo(a)pyrene were predicted for any of the identified human receptors, given that cumulative concentrations did not exceed a target HQ of 1 or an ILCR of 1 x 10^{-6}.

It should be noted that background concentrations of benzo(a)pyrene account for approximately 100% of the cumulative concentrations, HQ, and ILCR, which suggests that background concentrations are a significant driver of the cumulative concentrations.

Additionally, benzo(a)pyrene present in the atmosphere is primarily bound to particulate matter and as such, is already accounted for in the $PM_{2.5}$ assessment shown in section 5.3.4

National anthropogenic PAH emissions reported through Canada's Air Pollutant Emissions Inventory have declined by a factor of three since 1990, and are now dominated by residential wood combustion (RWC) (Tevlin et al, 2020). The most recent contributions from motor vehicle exhaust are comparatively small at 8% of the anthropogenic total when accounting is conducted at the national scale. When assessed at the local scale, vehicles contribute more to PAH burdens in ambient air (Tevlin et al, 2020). Air in the Greater Toronto Area has vehicle contributions up to 50%, and smaller municipalities that are near major highways but otherwise have few PAH sources can have vehicle contributions up to 90% (Tevlin et al, 2020).

Figure 5-2 provided below illustrates ambient concentrations of benzo(a)pyrene in comparison with guidelines (Tevlin et al, 2020). The benzo(a)pyrene concentrations reported at the Clarkson Study Area are within the range reported in Ontario and in Canada.

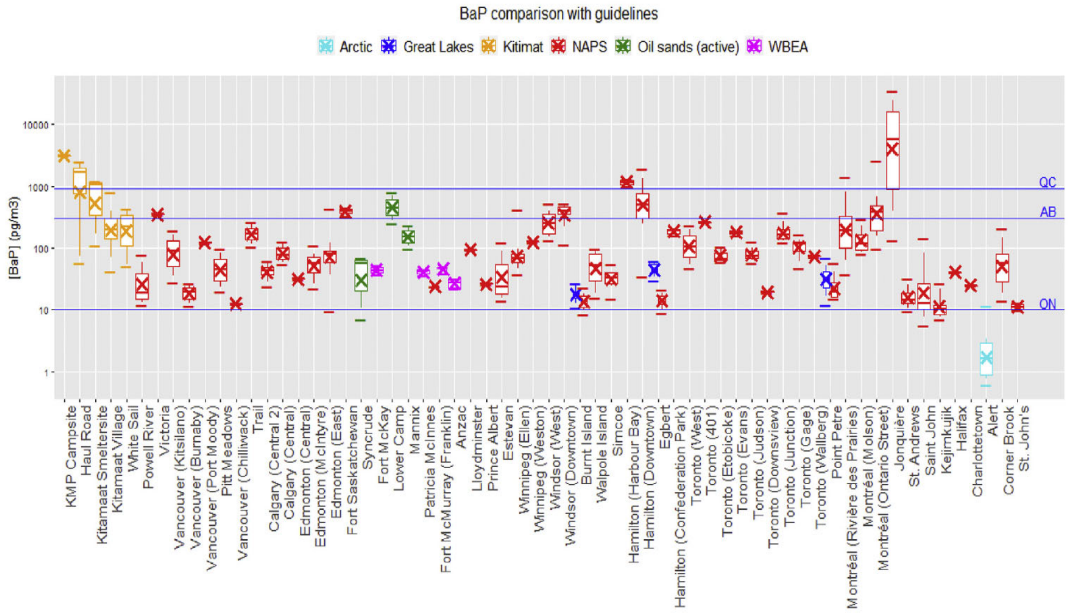


Figure 5-2 **Measured range of annual average benzo(a)pyrene concentrations (pg m^{-3}). Annual average ambient air guidelines from the provinces of Ontario, Alberta, and Quebec are depicted as horizontal blue lines.**

5.3.4 NITROGEN DIOXIDE

Table 5-8 **Predicted Health Risks Associated with Acute Exposure (Airway Hyper-Responsiveness) to Nitrogen Dioxide for Toddler and Adult Residents**

1-Hr Acute TRV (µg/m³)	Background Conc. (µg/m³)	HQ (Background)	Modelled Conc. (µg/m³)	HQ (Modelled -Only)	Cumulative Conc. (µg/m³)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
113	36	3.2E-01	54	4.8E-01	90	8.0E-01	40%
Adult Resident							
113	36	3.2E-01	54	4.8E-01	90	8.0E-01	40%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

Table 5-9 Predicted Health Risks Associated with Acute Exposure (Asthma Emergency Room Visits) to Nitrogen Dioxide for Toddler and Adult Residents

1-Hr Acute TRV (µg/m³)	Background Conc. (µg/m³)	HQ (Background)	Modelled Conc. (µg/m³)	HQ (Modelled -Only)	Cumulative Conc. (µg/m³)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
79	36	4.6E-01	54	6.8E-01	90	**1.1E+00**	42%
Adult Resident							
79	36	4.6E-01	54	6.8E-01	90	**1.1E+00**	42%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

Table 5-10 Predicted Health Risks Associated with Chronic Exposure to Nitrogen Dioxide for Toddler and Adult Residents

Annual Chronic TRV (µg/m³)	Background Conc. (µg/m³)	HQ (Background)	Modelled Conc. (µg/m³)	HQ (Modelled -Only)	Cumulative Conc. (µg/m³)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
23	16	6.7E-01	14	5.8E-01	30	**1.3E+00**	54%
Adult Resident							
23	16	6.7E-01	14	5.8E-01	30	**1.3E+00**	54%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

The results presented above in **Table 5-8** to **Table 5-10** indicate the following:

- A predicted cumulative 1-hr NO_2 concentration of 90 µg/m³ is greater than the TRV of 79 µg/m³ and results in HQs that are marginally greater than 1.0, and thus may result in the potential for increased asthma ERVs for toddler and adult residents; and,
- A predicted cumulative annual NO_2 concentration of 30 µg/m³ results in HQs that are greater than 1.0, and thus may result in the potential for increased respiratory morbidity for toddler and adult residents.

However, it should be noted that a significant portion of the predicted health risks are associated with background NO_2 concentrations, which represent between 42-54% of cumulative concentrations, and thus, are a significant driver of predicted health risks.

Canadian emission estimates for numerous pollutants including NO_x/NO_2 are compiled in the National Pollutant Release Inventory (NPRI). It comprises facility-reported data collected under the authority of CEPA 1999. The NPRI also presents emission summaries and trends for key air pollutants, including NO_x/NO_2, based upon facility-reported data and emission estimates for such other sources as motor vehicles, residential heating, forest fires and agriculture.

Figure 5-3 below, provides a breakdown of the 2011 Canadian NO_x emissions by the broadest NPRI categories. At a national level mobile sources (transportation) are the dominant NO_x source, at 50% of the total, with industrial sources contributing a further 30%. Non-industrial (e.g. electrical power generation, commercial fuel combustion) and natural sources combined contributed slightly less than 20% of 2011 NO_x emissions, with incineration, miscellaneous and open sources together contributing the remaining 1%. Mobile sources are even more important from at human health perspective than this breakdown would suggest, considering that most of the Canadian population lives in urban areas where the bulk of NO_x emissions are from transportation and to a lesser extent consumer/residential sources (e.g. residential fuel combustion, residential wood combustion); such areas tend to be removed from natural and industrial sources.

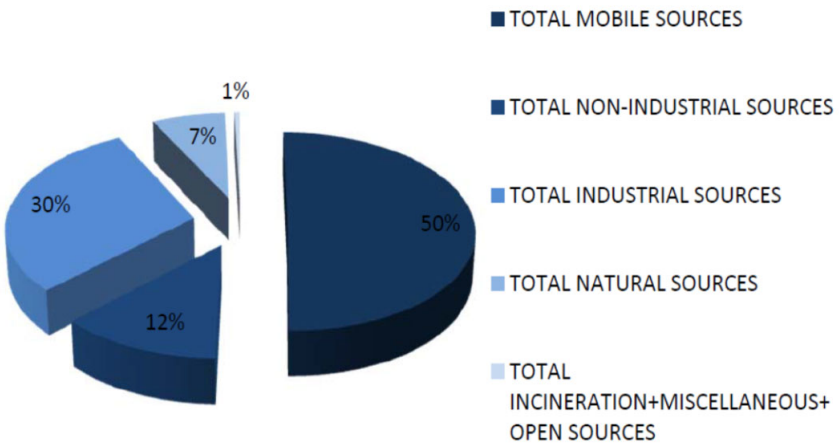


Figure 5-3 2011 NPRI NO_x emissions by broad source category (From NPRI, https://www.ec.gc.ca/inrp-npri/)

NPRI reports generally decreasing trends from 1985 to 2011, particularly from three of the dominant sources including mobile sources, natural sources and non-industrial sources. Industrial NO_x emissions have increased over the same time period by approximately 13%, largely because of increased emissions from the upstream petroleum sector. Due to the importance of the mobile sources for NO_x emissions, there has been an overall decrease in emissions nationally, though this is not true in all regions as a result of the differing importance of various sectors.

In 2016 among the selected urban areas, concentrations of NO_2 were the highest in Calgary, Toronto, Windsor, Vancouver and Hamilton, while Charlottetown, Yellowknife and Fredericton had the lowest concentrations. **Figure 5-4** presents the average annual ambient concentration (in ppb) and **Figure 5-5** presents the peak annual ambient concentrations (in ppb) for NO_2 in selected Canadian urban areas.

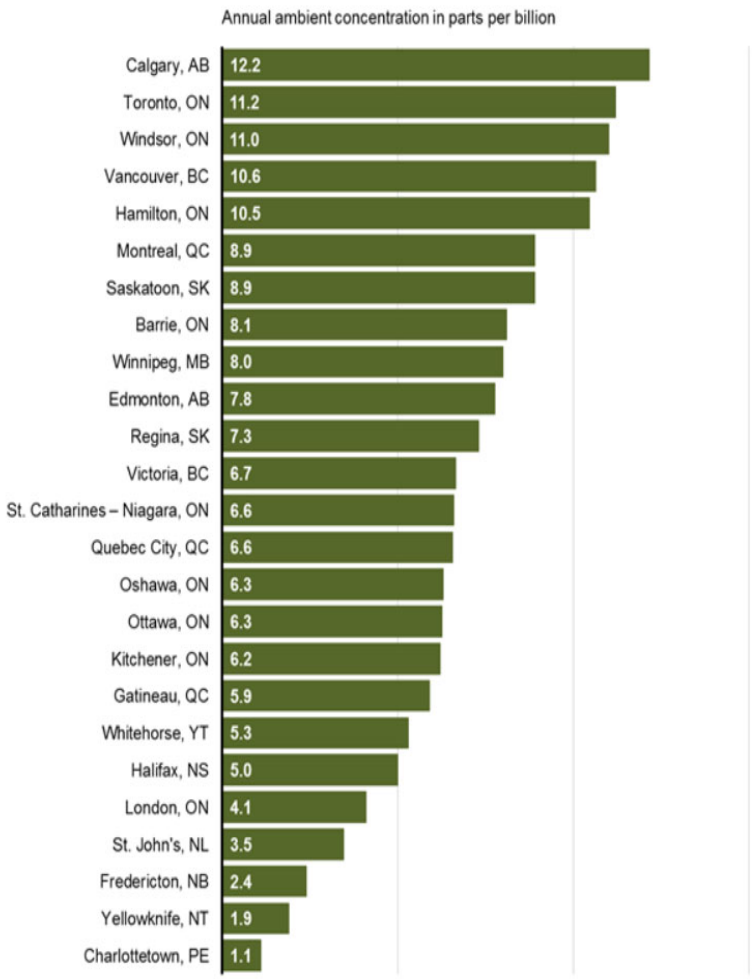


Figure 5-4 **Average NO_2 concentrations in selected Canadian urban areas (2016) (From Environment Canada and Climate Change (ECCC), https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/air-quality.html#NO2-average)**

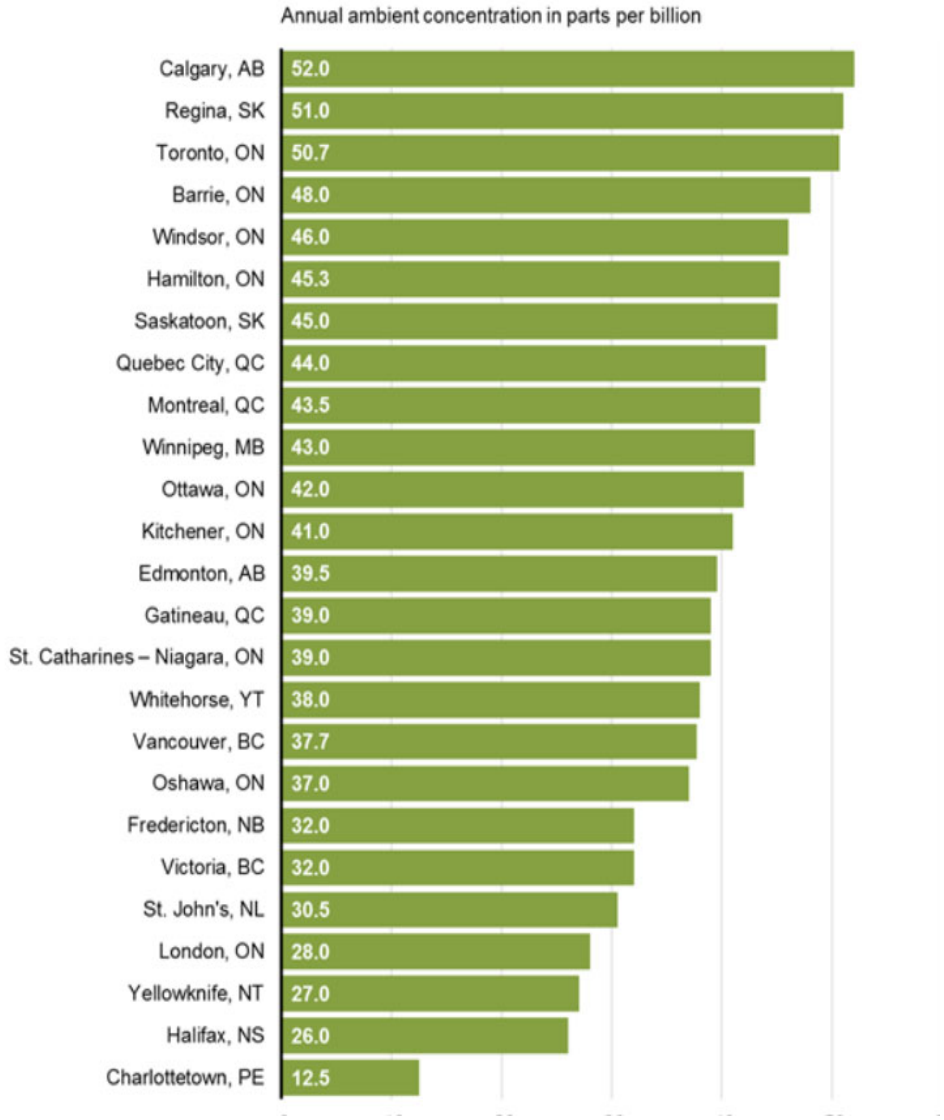


Figure 5-5 **Peak NO_2 concentrations in selected Canadian urban areas (From Environment Canada and Climate Change (ECCC), https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/air-quality.html#NO2-average)**

The influence of transportation emissions for NO_2 is significant. The NO_2 annual cumulative concentrations for the proposed development within Clarkson TSA (30 µg/m^3 or 16 ppb) are within the ranges reported in Toronto and in Canadian urban areas (as shown in **Figure 5-4** and **Figure 5-5**, above).

5.3.5 PARTICULATE MATTER (2.5 µm)

Table 5-11 Predicted Non-Carcinogenic Health Risks Associated with Acute Exposure to PM2.5 for Toddler and Adult Residents

24-Hr Acute TRV (µg/m³)	Background Conc. (µg/m³)	HQ (Background)	Modelled Conc. (µg/m³)	HQ (Modelled -Only)	Cumulative Conc. (µg/m³)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
25	15	6.0E-01	4.5	1.8E-01	19	7.6E-01	79%
Adult Resident							
25	15	6.0E-01	4.5	1.8E-01	19	7.6E-01	79%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

Table 5-12 Predicted Non-Carcinogenic Health Risks Associated with Chronic Exposure to PM2.5 for Toddler and Adult Residents

Annual Chronic TRV (µg/m³)	Background Conc. (µg/m³)	HQ (Background)	Modelled Conc. (µg/m³)	HQ (Modelled -Only)	Cumulative Conc. (µg/m³)	HQ (Cumulative)	% Background HQ Attributable to Cumulative
Toddler Resident							
10	8.2	7.9E-01	1.8	1.7E-01	10	9.6E-01	82%
Adult Resident							
10	8.2	7.9E-01	1.8	1.7E-01	10	9.6E-01	82%

Notes:
Cumulative Concentration = Background concentration + Modelled concentration
Target HQ = 1
HQs presented in **bold** if exceeding Target HQ

The results of the HHA indicated that background concentration accounts for a significant portion of the predicted health risk given that background concentrations account for approximately 80% of cumulative concentrations for toddler and adult residents.

In 2016, among the selected urban areas, concentrations of $PM_{2.5}$ were the highest in Windsor, Quebec City, and Regina. Whitehorse, Charlottetown and Victoria had the lowest concentrations. **Figure 5-6** presents the average annual ambient concentration (in µg/m³) and **Figure 5-7** presents the peak annual ambient concentrations (in µg/m³) for $PM_{2.5}$ in selected Canadian urban areas.

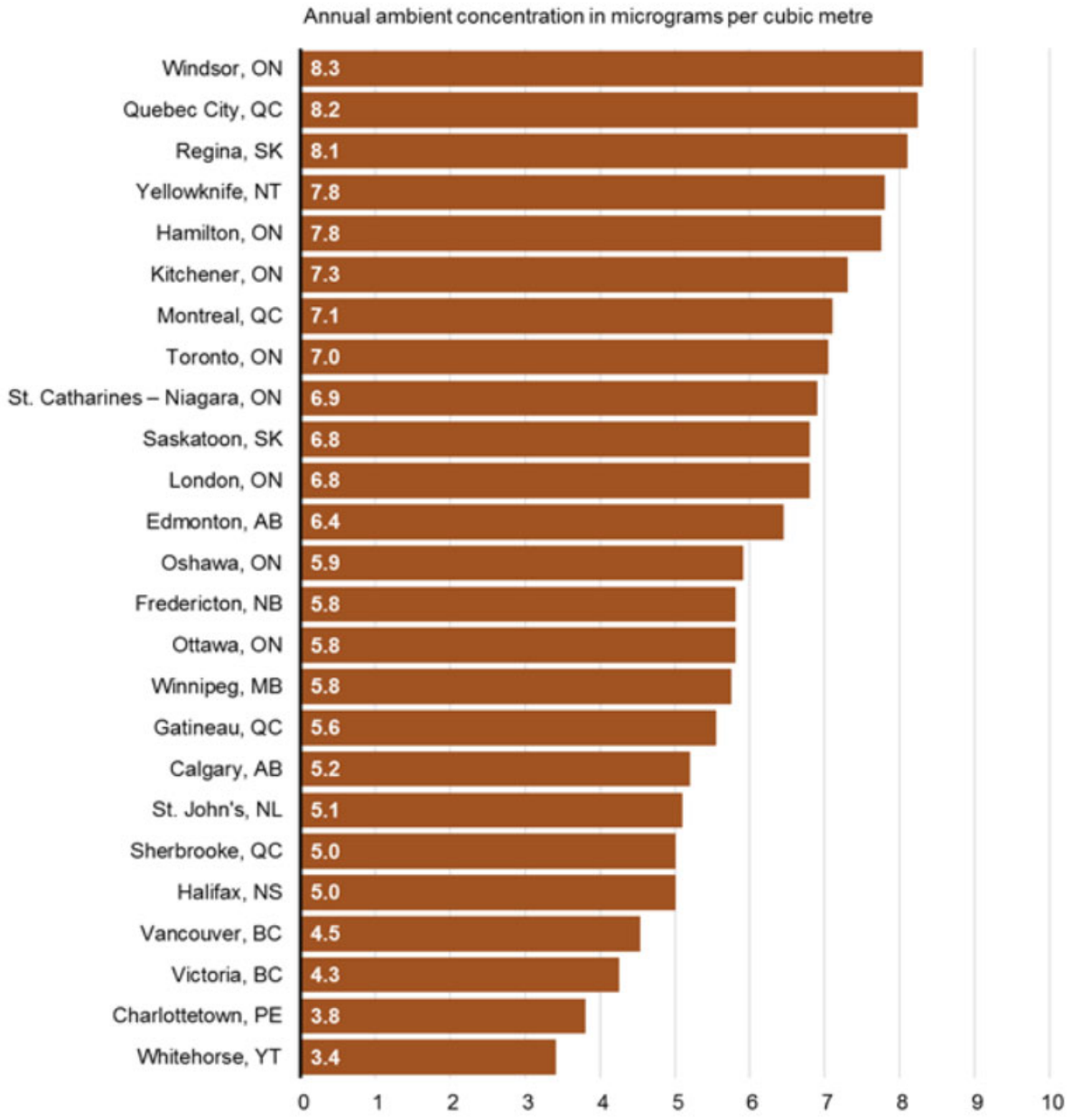


Figure 5-6 **Average $PM_{2.5}$ concentrations in selected Canadian urban areas (From Environment Canada and Climate Change (ECCC), Air quality - Canada.ca)**

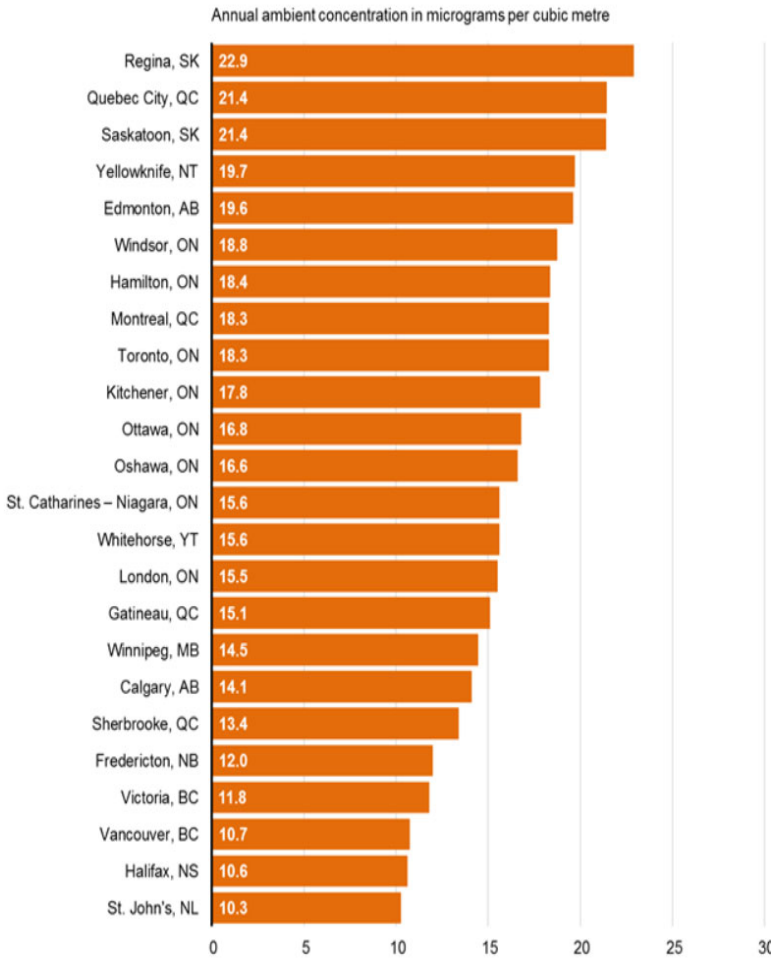


Figure 5-7 **Peak $PM_{2.5}$ concentrations in selected Canadian urban areas (From Environment Canada and Climate Change (ECCC), Air quality - Canada.ca)**

The influence of transportation emissions for $PM_{2.5}$ is significant. The $PM_{2.5}$ annual cumulative concentration for the proposed development at Clarkson TSA (9.5 µg/m^3) is within the ranges reported in Canadian urban cities (as shown in **Figure 5-6** and **Figure 5-7**).

5.4 UNCERTAINTY ANALYSIS

Conducting a risk assessment involves many steps within the process and assumptions are made at each stage to account for the lack of scientific data pertaining to the given project. Due to the application of these assumptions, uncertainty is inherently involved in the process. However, these assumptions are considered to be conservative and result in an overestimation of the true risk. A summary of the major assumptions made in the HHA and resulting uncertainties are provided below:

- Exposure Point Concentrations: The HHA relies largely on output from predictive air dispersion modelling rather than measured values. A detailed discussion of the assumptions and uncertainties related to the air quality modelling is provided in the AQS (WSP, 2021) and include:
    - The air dispersion modelling exercise assumed that all sources would emit continuously (i.e., 24 hrs/day, 7 days/week, 52 weeks/year) and simultaneously. In reality, this scenario is not likely to occur as it is not representative of a typical real-world scenario and only acts as a highly conservative upper bounding case.

- Background ambient concentrations collected from surrounding monitoring stations (such as those captured in the Clarkson monitoring program) in many cases already account for some of the sources modelled for predicted modelled concentrations. Given that modelled concentrations are being added to background concentrations, this double count in concentrations results in a conservative assessment.

- Confounding exposures by co-pollutants and synergistic effects:
  - As discussed in Section 4, human epidemiology studies are observational rather than experimental and hence there can be uncertainty as to whether the effects reported in the epidemiology studies are in fact solely due to a specific contaminant of interest as it is challenging to separate the effect of each air pollutant.
  - Environmental air pollutants are typically inhaled as complex mixtures; despite this, it is difficult to quantify or evaluate potential synergistic effects between individual contaminants. Although some scientific literatures (largely laboratory experiments) have demonstrated synergism among certain co-pollutants, our understanding on a public health scale remains uncertain given the limited ability to address this issue in epidemiological studies. This is largely because it is difficult to investigate synergism outside of a laboratory environment as there is no control over spatial-temporal variations, exposure concentrations, and population size, among other variables. Thus, it is difficult to characterize the true synergistic effects of co-pollutants in the environment. It is important to note that although synergistic effects of co-pollutants cannot be characterized, all the COPCs identified in the HHA act via different modes of action and elicit different toxicological effects (see Table 4-15); as such, additive effects of co-pollutants are not expected.

- TRVs: The TRVs used in this HHA (and in general) are typically based on the most sensitive endpoints, with the application of safety factors to protect sensitive subpopulations. The uncertainty associated with TRVs is highly dependent on the number of studies available, and whether the key study was based on humans (higher certainty) or animals (lower certainty). When few studies are available, and the studies available are conducted using animals as test organisms under laboratory-testing conditions, several types of safety factors must be applied to account for this uncertainty (e.g., factors for inter- and intraspecies sensitivity).

Significance of background ambient concentrations:

- Background ambient concentrations contribute a significant portion of the cumulative (short-term and long-term) concentrations for all COPCs. For instance, the cumulative concentration (24-hr) for acrolein is 0.63 $\mu g/m^3$ which results in a HQ of 1.5 for toddler and adult residents. However, background ambient concentrations also recorded a concentration of approximately 0.63 $\mu g/m^3$ whereas the predicted modelled concentration is only 4×10^{-3} $\mu g/m^3$. This results in the background ambient concentration comprising of approximately 99% of the cumulative concentration and HQ, which highlights the significance of background ambient concentrations in contributing to the overall cumulative acrolein concentrations and predicted health effects. The significance of ambient background concentrations is further demonstrated for all other COPCs, with the contribution of background concentrations to cumulative concentrations and predicted health risks ranging from 40% to 100%.

The risks identified in Section 5.3, are therefore, considered theoretical (i.e., there is the potential for risk, but there is some uncertainty as to whether adverse effects would be evident in the human receptors when exposed to the predicted concentrations).

6 SUMMARY AND CONCLUSIONS

The City of Mississauga is developing land use policies for the Clarkson TSA to support intensification of the area. It is recognized that with the possible redevelopment of this area and introduction of new sensitive land uses, there would be a need to assess air quality impacts on proposed new sensitive developments, especially given the historical state of air quality in the area.

The HHA relies on six months of ambient air monitoring data and an air dispersion modelling assessment of identified COPCs from the recently completed Clarkson TSA AQS (WSP, 2021). The model results represent the air quality impacts on the proposed development from surrounding land uses, including industrial operations and transportation sources in the Clarkson TSA. Based on the results of the ambient air monitoring and air dispersion modelling, the HHA evaluates the potential health effects from the predicted cumulative impacts from nearby activities on the proposed development.

The human receptors evaluated in the HHA were identified based on the proposed development within the Clarkson TSA (i.e., four 25-storey residential buildings). The human receptors associated with this identified land use are intended to be inclusive of human populations including sensitive subpopulations such as asthmatics, children, pregnant females, and the elderly. The following two (2) human receptors were considered:

1. Toddler residents who live in the buildings within the proposed development; and
2. Adult residents who live in the buildings within the proposed development.

A review of health outcomes related to COPC exposures following short- and long-term exposures were completed as well as a jurisdictional review of available ambient air exposure limits. Based on review of available jurisdictional health-based standards for COPCs, as well as toxicological review of health and exposure-related data, this HHA evaluated whether the predicted cumulative concentrations of COPCs in ambient air influenced by nearby activities pose a public health concern in the proposed development for identified human receptors.

A list of the final TRVs used for the assessment can be found in **Section 4.3** (**Table 4-15**).

The findings of the HHA for identified short-term and long-term health endpoints are summarized below.

<u>Acrolein:</u>

- A predicted cumulative 24-hr acrolein concentration of 0.63 µg/m^3 results in HQs that are greater than 1.0, and thus may result in the potential for increased development of lesions in upper airways for toddler, and adult residents.
- It should be noted that predicted health risks are associated almost entirely with background acrolein concentrations, which represent approximately 99% of cumulative concentrations, and thus, are a significant driver of predicted health risks.
- The results of this HHA are consistent with the results derived by the City of Toronto and Toronto Public Health wherein a comparable HQ of 1.6 was presented in a report entitled: “Traffic-Related Air Pollution (TRAP) in Toronto and Options for Reducing Exposure” (the City of Toronto and Toronto Public Health, 2017).
- Monitoring data suggests that the levels predicted by the modelling are not unusual. Data collected by Canada’s NAPS network between 2009 and 2013 suggest that acrolein concentrations are routinely above guideline levels at sites across Canada and indicated concentrations could commonly be in the range of 0.1 to 1 µg/m^3 or greater (Galarneau *et al.,* 2016).

<u>Benzene:</u>

- No unacceptable health risks following acute or chronic exposure to benzene were predicted for any of the identified human receptors, given that cumulative concentrations did not exceed a target HQ of 1 or an ILCR of 1 x 10-6.

- It should be noted that background concentrations of benzene account for 96-98% of the cumulative concentrations, HQ, and ILCR, which suggests that background concentrations are a significant driver of the cumulative concentrations and predicted health risks.

Benzo(a)pyrene:

- No unacceptable health risks from acute or chronic exposure to benzo(a)pyrene were predicted for any of the identified human receptors, given that cumulative concentrations did not exceed a target HQ of 1 or an ILCR of 1 x 10^{-6}.
- It should be noted that background concentrations of benzo(a)pyrene account for approximately 100% of the cumulative concentrations, HQ, and ILCR, which suggests that background concentrations are a significant driver of the cumulative concentrations.

Nitrogen Dioxide:

- A predicted cumulative 1-hr NO_2 concentration of 90 µg/m^3 is greater than the TRV of 79 µg/m^3 and results in HQs that are marginally greater than 1.0, and thus may result in the potential for increased asthma ERVs for toddler and adult residents.
- A predicted cumulative annual NO_2 concentration of 30 µg/m^3 results in HQs that are greater than 1.0, and thus may result in the potential for increased respiratory morbidity for toddler and adult residents.
- It should be noted that a significant portion of the predicted health risks are associated with background NO_2 concentrations, which represent between 42-54% of cumulative concentrations, and thus, are a significant driver of predicted health risks.

Fine Particulate Matter ($PM_{2.5}$):

- No unacceptable health risks from acute or chronic exposure to $PM_{2.5}$ were predicted for any of the identified human receptors, given that cumulative concentrations did not exceed a target HQ of 1.
- It should be noted that background concentrations of $PM_{2.5}$ account for approximately 80% of cumulative concentrations and HQs for toddler and adult residents and therefore comprise a significant portion of the predicted health risks.

It is emphasized that while the HHA identifies exceedances of the TRVs for certain COPCs and exposure durations, there are uncertainties associated with these predicted health outcomes. The major points of uncertainty include:

- The HHA relied on stringent predicted air dispersion modelling which applies highly conservative scenarios to generate predicted modelled values (e.g., assuming all sources are continuously emitting at 24 hrs/day, 5 days/week, 52 weeks/year);
- Double counting of predicted modelled concentrations as in many cases the modelled sources are already accounted for in the background ambient concentration measurements;
- Worst-case exposure scenarios were evaluated for all human receptors considered. For example, it has been assumed that the predicted concentrations of COPCs in outdoor air are equal to that in indoor air. Ambient indoor air concentrations are dependant on a multitude of variables including infiltration rates, indoor decay rates, ventilation system set-ups, and other factors. To maintain a conservative approach, the assumption that equilibrium is established between outdoor and indoor ambient air was applied for this assessment.
- The HHA also assume that predicted concentrations of COPCs are constant with building height. However, several studies that investigate vertical difference of concentrations confirm findings from atmospheric measurements and modeling that PM concentrations tend to decrease with building height (Stephens *et al*, 2019).
- Background ambient concentrations make up a significant portion of the cumulative concentrations for all COPCs, ranging from 40% to 100% of cumulative concentrations. This indicates that generally, background concentrations, relative to modelled concentrations, are the drivers and major contributors to predicted health risks.

Further discussion on the uncertainties applied in this HHA including the conservatism inherent in developing TRVs can be found in Sections 2.4, 4.4, and 5.4.

Based on the findings of the AQS and the HHA, WSP is of the opinion that air quality in the study area is not expected to adversely impact high density residential development. Elevated concentrations of contaminants reported (i.e., above health-based thresholds) which could lead to potential health risks (see Section 5.3), are not unique to the Clarkson TSA and are expected throughout urban areas in Ontario (i.e., the Greater Toronto Area) and Canada. Transit-oriented development within the Clarkson TSA is expected to reduce reliance on passenger vehicle trips as the community shifts to alternative modes of transportation such as public transit and active transportation. This transition is expected to reduce emissions of TRAP contaminants within the Clarkson TSA and likely will result in improved air quality in the community. Full details regarding the mitigation recommendations as well as potential air quality improvements at Clarkson TSA are included in the Mitigations Recommendations Memo provided as Appendix L of the AQS (WSP, 2022).

REFERENCES

City of Toronto. 2017. Avoiding the TRAP: Traffic-Related Air Pollution in Toronto and Options for Reducing Exposure, dated October 2017.

Environment Canada and Climate Change (ECCC). 2018. Canadian Environmental Sustainability Indicators: Air Quality. https://www.canada.ca/content/dam/eccc/documents/pdf/cesindicators/air-quality/air-quality-en.pdf.

Galarneau, E., Wang, D., Zlotorzynska-Dabek, E., Siu, M., Celo, V., Tardif, M., Harnish, D. and Jian, Y. 2016. Air toxics in Canada measured by the National Air Pollution Surveillance (NAPS) program and their relation to ambient air quality guidelines, Journal of the Air & Waste Management Association, 66:2, 184-200, DOI: 10.1080/10962247.2015.1096863

Ontario Ministry of the Environment (MOE). 2009. Ontario Air Standards for Acrolein, Standards Development Branch, Ontario Ministry of the Environment, dated December 2009.

Ontario Ministry of the Environment, Conservation and Parks (MECP). 2011. Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario. Standards Development Branch.

Stephens, B., Azimi, P. and Leung, L. 2019. How do Outdoor Pollutant Concentrations Vary Along the Height of a Tall Building? CTBUH Journal, Issue 1, p26-32.

Tevlin, A., Galarneau, E., Zhang, T. and Hung H. 2020. Polycyclic aromatic compounds (PACs) in the Canadian environment: Ambient air and deposition. Journal of Environmental Pollution 271: 116232 (2021).

WSP Canada Inc. (WSP). 2021. Clarkson Transit Station Area Air Quality Study: Monitoring and Dispersion Modelling Report.

Acrolein:

American Conference of Governmental Industrial Hygienists (ACGIH). 2001. Acrolein.

Agence Nationale de Sécurité Sanitaire de L'alimentation (ANSES). 2013. Proposition de valeurs guides de qualité d'air intérieur. L'acroléine. Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail, www.anses.fr/en/documents/AIR2011sa0354Ra.pdf.

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Acrolein. Agency for Toxic Substances and Disease Registry, Public Health Service, US Department of Health and Human Services, Atlanta, GA.

Alberta Environment (AENV). 2019. Alberta Ambient Air Quality Objectives and Guidelines Summary. AEP, Air Policy, 2016, No. 2. January 2019. https://open.alberta.ca/publications/9781460134856

Alberta Environment and Sustainable Resource Development (AESRD). 2013. Alberta Ambient Air Quality Objectives : Acrolein. https://open.alberta.ca/dataset/408d107b-72a8-423d-9a46-e56f6735a867/resource/b77246d2-5fc2-4050-b7d4-8756d6413d5d/download/2013-aaqo-acrolein-oct2013.pdf.

B.C. Ministry of Environment and Climate Change Strategy (BC ENV). 2020. B.C. Ambient Air Quality Objectives. February 28, 2020. BC ENV 2020 https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_fact_sheet.pdf

California Office of Environmental Health Hazard Assessment (Cal OEHHA). 2014. Appendix D.2 Acute, 8-Hour and Chronic REL Summaries. https://oehha.ca.gov/media/downloads/crnr/appendixd1final.pdf

Cal OEHHA. 2008. TSD [Technical Support Document] for Noncancer RELs: Appendix D. Individual Acute, 8-Hour and Chronic Reference Exposure Level Summaries. D.1 Summaries using this version of the Hot Spots Risk Assessment Guidelines. California Environmental Protection Agency. www.oehha.ca.gov/air/hot_spots/2008/AppendixD1_final.pdf#page=42.

Canadian Council of Ministers of the Environment (CCME). 2022. Resource for Air Quality. https://ccme.ca/en/resources#.

Centers for Disease Control and Prevention (CDC). 2013. Acute pesticide-related illness resulting from occupational exposure to acrolein—Washington and California, 1993–2009. Centers for Disease Control and Prevention—Morbidity and Mortality weekly report, 26(16).

European Chemical Agency (ECHA). 2022. Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) for Acrolein. Assessed online at: https://echa.europa.eu/fi/registration-dossier/-/registered-dossier/13444.

Environment Canada and Health Canada. 2000. Priority Substances List Assessment Report: Acrolein. Government of Canada, Ottawa, ON, Canada.

Health Canada. 2016. Proposed Re-evaluation Decision: Acrolein. PRVD2016-16. Health Canada, Pest Management Regulatory Agency. Ottawa, Ontario.

Health Canada. 2021. Residential Indoor Air Quality Guidelines: Acrolein.

International Agency for Research on Cancer (IARC). 1995. Dry Cleaning, Some Chlorinated Solvents and Other Industrial Chemicals. IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, 63: 75.

MECP. 2022. Ambient Air Quality Criteria. Human Toxicology and Air Standards Section. Technical Assessment and Standards Development Branch. https://www.ontario.ca/page/ontarios-ambient-air-quality-criteria#section-4

MoE. 2009. Standards Development Branch. Ontario Air Standards for Acrolein.

National Research Council (NRC). 2001. Standing Operating Procedures for Developing Acute Exposure Guideline Levels for Hazardous Chemicals. Washington, DC: National Academy Press.

Texas Commission on Environmental Quality (TCEQ). 2015. Development Support Document: Acrolein. https://www.tceq.texas.gov/assets/public/implementation/tox/dsd/final/acrolein.pdf.

United States Environmental Protection Act (US EPA). 2003a. Toxicological Review of Acrolein (107-02-8). In Support of Summary Information on the Integrated Risk Information System (IRIS). EPA/635/R-03/003, United States Environmental Protection Agency, Washington, D.C. http://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/0364tr.pdf.

US EPA. 2003b. IRIS Chemical Assessment Summary of Acrolein. https://iris.epa.gov/static/pdfs/0364_summary.pdf

US EPA. 2008. Reregistration Eligibility Decision: Acrolein. https://archive.epa.gov/pesticides/reregistration/web/pdf/acrolein_red.pdf.

US EPA. 2010. Data Quality Evaluation Guidelines for Ambient Air Acrolein Measurements. https://www3.epa.gov/ttnamti1/files/ambient/airtox/20101217acroleindataqualityeval.pdf.

Weber-Tschopp, A., Fischer, T., Gierer, R. and Grandjean, E. 1977. Experimentally induced irritating effects of acrolein on men (author's transl). International Archives of Occupational and Environmental Health, 40(2): 117–130.

WorkSafeBC. 2021. Guidelines for the Workers Compensation Act, Part 5: Chemical and Biological Agents https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-05#SectionNumber:G5.48-1 and https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-05#ExposureLimits

World Health Organization (WHO). 2000. Air Quality Guidelines https://www.who.int/ipcs/features/benzene.pdf

WHO. 2017. Evolution of WHO air quality guidelines https://www.euro.who.int/__data/assets/pdf_file/0019/331660/Evolution-air-quality.pdf

Benzene:

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Benzene. https://www.atsdr.cdc.gov/toxprofiles/tp3.pdf

Alberta Environment (AENV). 2019. Alberta Ambient Air Quality Objectives and Guidelines Summary. AEP, Air Policy, 2016, No. 2. January 2019. https://open.alberta.ca/publications/9781460134856

B.C. Ministry of Environment and Climate Change Strategy (BC MoECCS). 2020. B.C. Ambient Air Quality Objectives. February 28, 2020. https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_fact_sheet.pdf

Cal OEHHA. 2014. Appendix D.1 Summaries using this version of the Hot Spots Risk Assessment guidelines. Appendix D. Individual Acute, 8-Hour, and Chronic Reference Exposure Level Summaries (ca.gov)

CCME. 2017. Canada's Air. https://ccme.ca/en/air-quality-report#slide-1

Environment Canada/Health Canada. 2021. Residential Indoor Air Quality Guidelines. https://www.canada.ca/en/health-canada/services/air-quality/residential-indoor-air-quality-guidelines.html

Flury, F. 1928. [II. Toxicities in modern industry. IIa. Pharmacological-toxicological aspects of intoxicants in modern industry.] Arch Exp Pathol Pharmakol 138:65-82. (German)

Health Canada. 2021. Federal Contaminated Site Risk Assessment in Canada, Toxicological Reference Values (TRVs), Version 3.0. Ottawa, ON.

MECP. 2020. Ambient Air Quality Criteria. Human Toxicology and Air Standards Section. Technical Assessment and Standards Development Branch. https://www.ontario.ca/page/ontarios-ambient-air-quality-criteria#section-4

Metro Vancouver Ambient Air Quality Objectives, updated January 2020. http://www.metrovancouver.org/services/airquality/AirQualityPublications/CurrentAmbientAirQualityObjectives.pdf

Midzenski MA, McDiarmid MA, Rothman N, et al. 1992. Acute high dose exposure to benzene in shipyard workers. Am J Ind Med 22:553-565.

Rothman N, Li Gl, Dosemeci M, et al. 1996. Hematotoxicity among Chinese workers heavily exposed to benzene. Am J Med 29(3):236-246.

TCEQ. 2015. Benzene, Development Support Document. Revised September 2015. https://www.tceq.texas.gov/assets/public/implementation/tox/dsd/final/benzene.pdf

US EPA. 1998. Carcinogenic effects of benzene: An update. Washington, DC: U.S. Environmental Protection Agency. EPA600P97001F. PB99101420.
US EPA. 2002 Toxicological Review of Benzene (Non-Cancer Effects) CAS No. 71-43-1 In Support of Summary Information on the Integrated Risk Information System.
https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/0276tr.pdf

US EPA. 2003. Integrated Risk Information System (IRIS) Chemical Assessment Summary of Benzene.
https://iris.epa.gov/ChemicalLanding/&substance_nmbr=276

US EPA. 2021. National Ambient Air Quality Standards, NAAQS Table. https://www.epa.gov/criteria-air-pollutants/naaqs-table

Ward CO, Kuna RA, Snyder NK, et al. 1985. Subchronic inhalation toxicity of benzene in rats and mice. Am J Ind Med 7:457-473

WHO. 2000. Air Quality Guidelines – Chapter 5.2, Benzene.
https://www.euro.who.int/__data/assets/pdf_file/0017/123056/AQG2ndEd_5_2benzene.pdf

WHO. 2017. Evolution of WHO air quality guidelines.
https://www.euro.who.int/__data/assets/pdf_file/0019/331660/Evolution-air-quality.pdf

Benzo(a)pyrene:

ACGIH. 2001. Benzo[a]pyrene.

AENV. 2004: Review of Approaches for Setting an Objective for Mixtures in Ambient Air Using Polycyclic Aromatic Hydrocarbons (PAHs), As an Example: Benzo(a)Pyrene.

AENV. 2019. Alberta Ambient Air Quality Objectives and Guidelines Summary. AEP, Air Policy, 2016, No. 2. January 2019. https://open.alberta.ca/publications/9781460134856.

Arizona Department of Health Services (DHS). 1999. 1999 Update – Arizona Ambient Air Quality Guidelines (AAAQGs). Report prepared for Arizona Department of Environmental Quality, Air Programs Division. Arizona DHS, Office of Environmental Health, Phoenix, AZ. 11 May 1999. 20 pp.

ATSDR. 1995. Toxicological profile for Polycyclic Aromatic Hydrocarbons. U.S Department of Health and Human Services, Public Health Service. https://www.atsdr.cdc.gov/toxprofiles/tp69.pdf.

B.C. Ministry of Environment and Climate Change Strategy (BCENV). 2020. B.C. Ambient Air Quality Objectives. February 28, 2020. BC ENV 2020
https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_fact_sheet.pdf

California Environmental Protection Agency (Cal EPA). 1999. Determination of Acute Reference Exposure Levels for Airborne Toxicants. Office of Environmental Health Hazard Assessment, Air Toxicology and Epidemiology Section, Cal EPA. Oakland, CA. March 1999.

IARC. 2010. Monographs for Benzo[a]pyrene.

National Institute for Occupational Safety and Health (NIOSH). 2002. Benzo[a]Pyrene. The Registry of Toxic Effects of Chemical Substances (RTECS). http://www.cdc.gov/niosh/rtecs/dj381378.html

MECP. 2020. Ambient Air Quality Criteria. Human Toxicology and Air Standards Section. Technical Assessment and Standards Development Branch. https://www.ontario.ca/page/ontarios-ambient-air-quality-criteria#section-4

Texas Natural Resource Conservation Commission (TNRCC). 2004. Toxicology & Risk Assessment (TARA) Section Effects Screening Levels. Available at: http://www.tnrcc.state.tx.us/permitting/tox/index.html (accessed 17 February 2004).

US EPA. 2002. Integrated Risk Information System. Toxicological Review of Benzo[a]pyrene [CASRN 50-32-8]. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/0136tr.pdf.

US EPA. 2017. Integrated Risk Information System, National Center for Environmental Assessment : Toxicological Review of Benzo[a]pyrene.

WHO. 2000. Air Quality Guidelines for Europe, 2nd Edition. WHO Regional Publications, European Series, No. 91. WHO Regional Office for Europe, Copenhagen. 273 pp.

Nitrogen Dioxide:

AENV. 2007. Assessment Report on Nitrogen Dioxide for Developing Ambient Air Quality Objectives. https://open.alberta.ca/dataset/c1d93f22-b949-4b7e-9504-d6f87dc7b891/resource/862c1d97-38bd-4c27-a5e2-d003f7a6b4f8/download/2007-assessmentreport-nitrogendioxide-oct2007.pdf.

AENV. 2011. Alberta Ambient Air Quality Objectives. https://open.alberta.ca/dataset/836cdc25-935a-426b-8f95-d89506679ff1/resource/c6c530d5-c03a-4d8d-932f-b3198eaaff48/download/2011-AAQO-NitrogenDioxide-Jun2011.pdf

AENV. 2019. Alberta Ambient Air Quality Objectives and Guidelines Summary. AEP, Air Policy, 2016, No. 2. January 2019. https://open.alberta.ca/publications/9781460134856

BC MoECCS. 2020. Provincial Framework for Developing Provincial Air Quality Objectives. https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/provincial_framework_for_developing_provincial_air_quality_objectives_-_info_sheet.pdf.

BC MoECCS. 2021. Provincial Air Quality Objectives for Nitrogen Dioxide. Policy Intentions Paper 2021. https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/env_no2_intentionpaper.pdf

California Air Resources Board (CARB). 1992. Review of the one-hour ambient air quality standard for nitrogen dioxide technical support document. Sacramento: State of California Air Resources Board Technical Support Division; December 1992.

Cal OEHHA. 2008. Appendix D.2 Acute RELs and toxicity summaries using the previous version of the Hot Spots Risk Assessment guidelines.

CCME. 2017. Canada's Air. https://ccme.ca/en/air-quality-report#slide-1

Health Canada. 2016. Human Health Risk Assessment for Ambient Nitrogen Dioxide, Water and Air Quality Bureau, Safe Environments Directorate, Healthy Environments and Consumer Safety Branch, Health Canada Available at: https://www.canada.ca/en/health-canada/services/publications/healthy-living/human-health-risk-assessment-ambient-nitrogen-dioxide.html

Fine Particulate Matter ($PM_{<2.5}$):

AENV. 2018. Alberta Ambient Air Quality Objectives and Guidelines – Fine Particulate Matter (PM2.5). AEP, Air Policy, 2018, No. 1.

AENV. 2019. Alberta Ambient Air Quality Objectives and Guidelines Summary. AEP, Air Policy, 2016, No. 2.

BC MoECCS. 2020. Provincial Air Quality Objective. Information Sheet.

Cal OEHHA. 2001. Health Effects of Particulate Matter. Public Review Draft.

Cal OEHHA. 2016. Ambient Air Quality Standards. https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards

CCME. 2012. Guidance Document on Achievement Determination Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone.

CCME. 2017. Canada's Air. https://ccme.ca/en/air-quality-report#slide-1

CCME. 2020. Guidance Document on Achievement Determination Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone.

CCME. 2021. Air Quality Report. https://www.ccme.ca/en/air-quality-report

Health Canada. 2016. Human Health Risk Assessment for Coarse Particulate Matter.

IARC. 2013. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 109: Outdoor Air Pollution.

MECP. 2020. Ambient Air Quality Criteria. Human Toxicology and Air Standards Section. Technical Assessment and Standards Development Branch.

Metro Vancouver. 2020. Ambient Air Quality http://www.metrovancouver.org/services/airquality/AirQualityPublications/CurrentAmbientAirQualityObjectives.pdf

US EPA. 1997. National Ambient Air Quality Standards for Particulate Matter. Federal Agency / Vol. 62, No. 138.

US EPA. 2006. National Ambient Air Quality Standards for Particulate Matter; Final Rule. Federal Register / Vol. 71, No. 200.

US EPA. 2009. U.S. EPA. Integrated Science Assessment (ISA) for Particulate Matter (Final Report, Dec 2009). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-08/139F.

US EPA. 2013. National Ambient Air Quality Standards for Particulate Matter; Final Rule. Federal Register / Vol. 78, No. 10.

US EPA. 2019. Integrated Science Assessment (ISA) for Particulate Matter (Final Report, Dec 2019). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-19/188.

US EPA. 2021. Timeline of Particulate Matter (PM) National Ambient Air Quality Standards. https://www.epa.gov/pm-pollution/timeline-particulate-matter-pm-national-ambient-air-quality-standards-naaqs

WHO. 2005. Air Quality Guidelines. Global Update.

APPENDIX

L MITIGATION OPTIONS

MEMO

TO: Slate Asset Management L.P.

FROM: WSP Canada Inc.

SUBJECT: **Mitigation Recommendations, Clarkson Transit Station Area**

DATE: **August 26, 2022, revised February 15, 2023**

Based on the WSP Air Study, mitigation is not required at the proposed development; however, mitigation recommendations have been included to improve indoor air quality. This memorandum outlines mitigation recommendations to improve indoor air quality based on the results of two WSP Canada Inc. (WSP) reports:

- Clarkson Transit Station Area Air Quality Study, Monitoring and Dispersion Modelling Report, January 23, 2023 (WSP Air Study); and,

- Human Health Assessment, Clarkson Transit Station Area (TSA) Study, December 9, 2022 (WSP Health Assessment)

The focus of this mitigation memo is to examine the potential for future building construction with appropriate HVAC and air filtration systems to reduce ingress of chemicals of concern into indoor air. Mitigation could be accomplished by adjusting where intake air is drawn into the suites. The modelling completed as part of the WSP Air Quality Study examined concentrations at receptors at various heights at the property boundary. Predicting the concentrations at receptors at the property line at various heights is conservative since the contaminants of concern (COCs) are traffic-related air pollution (TRAP):

- Particulate matter less than 10 µm (PM_{10});
- Particulate matter less than 2.5 µm ($PM_{2.5}$);
- Oxides of Nitrogen (NO_X);
- Acrolein;
- Benzene; and,
- Benzo(a)pyrene [B(a)P].

Table 1 attached displays the model results for the primary contaminants of concern (COCs) listed above and the equivalent time-weighted average Ambient Air Quality Criteria (AAQC). None of the predicted model concentrations result in a value that is elevated compared to the respective AAQC.

Table 2 uses the percentage change of the modelled concentrations in **Table 1** with height and modifies the baseline ambient monitoring concentrations to show their equivalent change with height. This was performed as a direct percentage change since the ambient conditions would change in a similar proportion to the modelled fractions. Correcting the ambient concentrations for

82 Lancaster Street West
Kitchener, ON
Canada N2K 1M3

F: +1 519 743-8778
wsp.com

height was performed assuming that ambient data is collected from an equivalent height as the modelled 4.3 m receptor height, following best practices. **Table 2** demonstrates the background ambient concentration variability with height, and that for all COCs except B(a)P, impacts are not elevated compared to the AAQC at 17.2 m and above.
Table 3 conservatively adds together values from **Table 1** (modelled concentration) and **Table 2** (ambient concentrations). Adding together the modelled results and ambient results is extremely conservative and usually only conducted for Environmental Assessments (EAs) and Transit Project Assessment Process (TPAP) work. In EAs and TPAPs, a future scenario is often examined to show the project; such as highway expansion or rail improvements, has a net positive impact compared to alternatives. By examining cumulative impacts, **Table 3** effectively takes the known sources modelled (**Table 1**) and adds them to all known and unknown sources (**Table 2**). In this case the cumulative impacts show that except for acrolein and B(a)P, there are no concentrations elevated compared to the AAQC at 30.1 m and above. Background concentrations of acrolein and benzo(a)pyrene are elevated compared to the AAQC values; however, B(a)P is elevated anywhere a development were to proceed in an urban area.

Based on the data assessed in this memo, the following recommendations are presented:

- **Local Air Intakes**: If air intakes are designed to be located in each suite, then for any suites below the fourth floor (12.9 m) filters to control particulates ($PM_{2.5}$ and PM_{10}) impregnated with carbon to control benzene could be utilized to improve indoor air quality. Percent reductions required can be calculated from **Table 3**. Filters require ongoing maintenance and monitoring per manufacturer specifications, which generally require replacement after a specified duration of time. It should be noted that mitigation for particulate will also incidentally reduce the concentration of B(a)P since B(a)P binds to particulate and may be partially mitigated through filtration.

- **Monitoring**: Since **Table 3** represents a very conservative approach then it is recommended that a method of ambient monitoring be incorporated to ensure the controls of a local air intake design are working, or even required.

Ducted Air Intakes: An alternative to filtering local air intakes and monitoring could be to have a centralized air intake system ducted from above 30.1 m for any suites located below this level.

- **NO_x**: No additional controls are recommended for NOx given the level of conservatism in the Air Quality Study and as the measured values (baseline) are well below for ambient air quality criteria for NOx as NO_2. The baseline already includes both industry, rail, and roadways emissions. Railway emissions dominated the predicted modelling concentration and are conservative as no reductions have been included for the electrification of the GO Stations. Therefore, baseline combined with modelling is an overpredicting of the concentrations at the Proposed Development and the potential need for mitigation.

- It is recommended that the proponent conduct a detailed design of mitigation as part of the Design Process.

In addition to the recommendations, WSP identifies the following improvements noted for the Clarkson airshed:

- Ongoing MECP compliance for Industry; and,

- Metrolinx Regional Express Rail Lakeshore West line is expected to be electrified in the coming years (some trains will remain diesel, but the majority will be electrified).

Further improvements of air quality are expected based on the City of Mississauga's local initiatives that are ongoing to improve air quality and reduce greenhouse gases.

Memo

To: Romas Juknevicius (City of Mississauga)
Wai Ying DiGiorgio (The Planning Partnership)

From: Hamish Corbett-Hains, M.A.Sc., P.Eng.
Rob Willis, B.Sc., MES, EP, QP_{RA}, QP_{CA}
Amir A. Iravani, Ph.D., P.Eng.

cc: Taral Shukla (City of Mississauga)
Luisa Galli (City of Mississauga)

Date: March 7, 2023

Subject: ***Executive Summary – Clarkson Residential Development Air Quality and Human Health Assessment Studies***

Our File: 19-1221

Introduction

Dillon Consulting Limited (Dillon) was retained by the City of Mississauga (the City) through The Planning Partnership (TPP) to undertake a technical review of the air quality and human health risk assessment studies that were completed for a proposed development within the City's Clarkson GO Major Transit Station Area (MTSA). The Proposed Development consists of 4 residential towers to be located at 2077, 2087, 2097 and 2105 Royal Windsor Drive in Mississauga, Ontario. The developer is Slate Asset Management L.P. (Slate) and the consultant that completed the air quality assessment (both ambient monitoring and dispersion modelling) and human health assessment is WSP Canada Inc. (WSP). We have completed a review of the submitted material and are satisfied with the assessment methodology and the findings of the study.

This executive summary provides a high-level overview of the findings of the studies that were completed by WSP Canada Inc.

Key Highlights

- Air quality in the Clarkson MTSA has historically been impacted by a combination of vehicle exhaust, industrial emissions, and long-range transport of air contaminants from outside the airshed.
- Slate is proposing the introduction of four residential towers within the Clarkson MTSA. Slate's consultant, WSP, performed an analysis to support the development, including ambient air monitoring, air dispersion modelling, and a human health assessment.

- The City convened an expert Review Committee to review each submission from Slate and WSP prior to acceptance by the City.
- WSP's ambient air quality and dispersion modelling studies identified air contaminants which were predicted to be elevated with respect to the relevant air quality thresholds (criteria). As such, WSP performed a human health assessment to assess the potential risk to human health resulting from these elevated concentrations.
- The human health assessment found that air quality in the Clarkson MTSA is expected to pose a similar level of predicted human health risk as that of other urban centers in the Greater Toronto Area, and that the level of potential human health risk in the MTSA (due to the predicted concentrations of contaminants in ambient air) does not reach a threshold where residential development should be prohibited.

Background

Historically, air quality in the Clarkson MTSA has been compromised, as documented in the Ministry of the Environment, Conservation and Parks (MECP) *Clarkson Airshed Study* (beginning in 2003), as well as through ambient monitoring completed by the Clarkson Airshed Industrial Association (CASIA) beginning in 2012. As per the MECP's reporting, the suspected causes of compromised air quality are a combination of vehicle emissions, industrial emissions, and long-range transport of contaminants from outside of the Clarkson airshed.

Dillon's involvement in this project began in 2018 through the development of the *Clarkson Air Quality, Noise & Vibration and Radiofrequency Compatibility Overview Study*, which included a high-level assessment of the suitability of the MTSA for increased sensitive uses. This study was informed by the previous air quality work by MECP and CASIA, and re-affirmed that air quality within the MTSA was a potential concern limiting future residential development in the area.

Subsequent to Dillon's study, the City introduced an Official Plan Amendment (Amendment No. 117, December 9th, 2020) which added a policy requiring "*… a satisfactory air quality study before sensitive land uses can be considered on the lands located within the Southdown Employment Area Character Area and the Clarkson GO Major Transit Station Area (MTSA) boundary, once delineated.*" Dillon prepared a Terms of Reference (ToR) outlining the requirements of the Clarkson MTSA Air Quality Study which would meet the requirements of the Official Plan Amendment, and included specific provisions requiring an ambient air quality monitoring study, a compatibility assessment, an air dispersion modelling study, and if needed a human health risk assessment. The ToR identified the general methodologies to be used in performing the required studies and highlighted key considerations such as the inclusion of industrial, roadway, and railway emissions within the studies.

In 2020, Slate Asset Management and their consultant, WSP, submitted scopes of work to the City detailing an ambient air quality monitoring study and a dispersion modelling study intended to satisfy the ToR for a proposed development on Slate's lands located at 2077, 2087, 2097, and 2105 Royal Windsor Drive in Mississauga, Ontario (the Site). Slate's plans include the

introduction of four residential buildings on the Site, including a 23-, 25-, 27-, and 29-storey building (the Proposed Development).

The City convened a Review Committee to review and provide feedback on each submission made to the City throughout the Project. The Review Committee members included: City of Mississauga, Peel Public Health, the MECP, Dillon, and local industries (i.e., Petro-Can Lubricant Plant, CRH Canada Group Inc., and CertainTeed Canada Inc.). For each of the scopes of work, and the studies described below, each Review Committee member was provided the opportunity to review and provide feedback prior to the City's acceptance of the studies. As such, multiple rounds of feedback were considered and incorporated in preparing the final deliverables (i.e., plans and studies). The summaries below are based on the final studies and consider all Review Committee members' feedback.

Land-Use Compatibility Study

Land use compatibility studies are performed to evaluate the likelihood of nuisance impacts between industrial and sensitive uses. Within the Clarkson MTSA, the intention of a compatibility study is to maintain the viability of existing commercial and industrial land uses in the context of the introduction of new sensitive land uses to the area. WSP performed a compatibility assessment following the methods outlined in the MECP's D-6 Guideline *Compatibility between Industrial Facilities* which is the applicable guideline in Ontario. In accordance with the Guideline, WSP classified each existing industrial facility and, based on distance to the proposed sensitive use, assessed the potential for compatibility concerns. The study found that nuisance issues resulting from incompatible uses are unlikely with respect to the Proposed Development. As compatibility is based on nuisance complaints which are a matter of individual perception (i.e., each person can tolerate different levels of noise or odour for example). As such, a compatibility study cannot guarantee an absence of complaints. Dillon is satisfied that the study which was performed is in-line with industry standard practices and provides a reasonable level of assurance that compatibility issues are unlikely.

Air Quality Assessment

Ambient Air Monitoring

Ambient air quality typically refers to the concentrations of specific contaminants that may be present in the local outdoor air within an area. Ambient air quality varies widely with geography, terrain, traffic volume, presence/absence of industrial activity, wind speed and direction, temperature, the presence or absence of buildings, and numerous other factors.

Ambient air monitoring involves deploying monitoring equipment within a study area to quantify (measure) and understand the levels of contaminants in outdoor ambient air, and how these levels vary over time. Outdoor ambient air measurements represent the levels of contaminants in air that a person may be exposed to (via breathing) while present in the area.

WSP performed an ambient air monitoring study at the Site from July 8, 2020 until January 10, 2021. During this time, selected indicator compounds were monitored following MECP-approved methodologies. The indicator compounds selected were based on common air contaminants for a typical urban setting as well as those which have historically been elevated in the Clarkson Airshed. The ambient air monitoring study occurred during the COVID pandemic where many typical sources of air pollutants were operating at a reduced capacity or were shut-down altogether. For example, there was a decrease in rail activity on the nearby GO line, and roadway traffic was estimated to have been reduced by 33% to 62% in comparison to pre-pandemic levels. WSP performed an evaluation of the potential impact on the monitored values through analysis of historical data at MECP and CASIA monitoring stations. Data corrections were made to select contaminants to account for potential reductions from baseline during COVID. For some traffic-related contaminants (e.g., benzene) no correction was applied. It was WSP's opinion that including roadway and railway emissions in the air dispersion modelling assessment was sufficient to account for any variations in the baseline concentrations as the roadway model would account for peak traffic volumes in addition to background concentrations. It should be noted that reductions across multiple activity types as a result of the COVID pandemic have introduced uncertainty in the measured ambient concentrations of air contaminants (i.e., air monitoring results), however, Dillon is satisfied that a sufficient level of conservatism has been retained in the characterization of ambient concentrations through dispersion modelling assessment.

The ambient air quality study describes an airshed that is fairly typical for an industrialized urban center in Southwestern Ontario. Of the contaminants assessed, five (i.e., suspended particulate matter ($PM_{2.5}$ and PM_{10}), NO_x, acrolein, benzene, and benzo(a)pyrene) exceeded the relevant air quality thresholds. The ambient concentrations of the exceeding air contaminants are primarily related to transportation, and similar exceedances of the relevant air quality thresholds have been recorded in other urban jurisdictions of comparable size and characteristics. The Human Health Risk Assessment discussed later in this summary, evaluated the potential health implications of these exceedances.

Air Dispersion Modelling

Air dispersion modelling is a computational method of predicting how contaminant emissions from sources of emissions disperse and impact specific receptor locations based on local meteorology, topography, and nearby buildings. Air dispersion modelling estimates ambient outdoor air contaminant concentrations at key identified locations (i.e., receptors) within a given area.

WSP performed an air dispersion modelling assessment to predict the concentration of selected air contaminants at the Proposed Development. The dispersion modelling assessment considered the major industrial sources in the area, as well as those identified through the D-6 screening study, roadway emissions resulting from vehicle traffic, and railway emissions. Results of the dispersion modelling were combined with the ambient concentrations established in the ambient air monitoring study to evaluate the cumulative concentrations

which would be expected at the Development. The air dispersion modelling study was performed in accordance with the relevant MECP guidelines which represent standard industry practice in Ontario. The United States Environmental Protection Agency's (US EPA) AERMOD dispersion model was used to predict concentrations from the significant industrial facilities at all relevant points of reception on the Proposed Development. Dillon's review of the dispersion modelling files confirmed that appropriate modelling inputs were selected.

The MECP's Guideline A-11 *Air Dispersion Modelling Guideline for Ontario* provides a description of the approved methodologies for incorporating an effect known as shoreline fumigation into air dispersion modelling studies. Shoreline fumigation is a phenomenon which occurs when tall stacks are located close to a large body of water. Temperature differentials between air masses over land and over water can generate convective air currents which can result in contaminant plumes from tall stacks being brought down to ground-level rapidly. The AERMOD dispersion model cannot account for shoreline fumigation. Guideline A-11 details acceptable methodologies to be used for assessment of shoreline fumigation. WSP used the SCREEN3 model to evaluate the potential for shoreline fumigation from some of the large industrial stacks along Lake Ontario to the south of the Proposed Development. This screening-level model showed that shoreline fumigation could occur and that further detailed modelling was justified. WSP performed additional modelling using the Shoreline Dispersion Model (SDM) to assess the predicted impacts during fumigation events, which showed that fumigation was not expected to result in increased impacts from the industrial facilities. This approach to modelling is aligned with MECP requirements as stated in Guideline A-11. During stakeholder review, nearby industries raised concerns with this approach, stating that they are using the more advanced CALPUFF dispersion model to estimate concentrations during normal operations and under shoreline fumigation conditions. CALPUFF is considered a more accurate model in many situations and may be better suited to predicting impacts from the existing industry at the Proposed Development, however, as previously stated, the approach used by WSP follows guidance from the MECP. Dillon contacted the MECP to discuss the modelling approach selected by WSP, and it was confirmed that the use of SCREEN3, SDM, and AERMOD is in line with MECP requirements. While Dillon acknowledges industries' ongoing concerns, Dillon is satisfied that the dispersion modelling was conducted in alignment with the current acceptable standard industry practice in Ontario.

WSP combined the results of the dispersion modelling study with the ambient air quality concentrations to represent cumulative concentrations at the Proposed Development. This is considered to be a conservative approach. Of the 18 air contaminants of concern that WSP modelled, 12 were below the applicable air quality threshold at all times. Of the contaminants which were predicted to exceed the applicable air quality threshold (benzene, acrolein, $PM_{2.5}$, PM_{10}, NO_x, and benzo(a)pyrene), three were predicted to exceed based solely on ambient background (baseline) conditions (benzene, acrolein, and benzo(a)pyrene). In other words, ambient concentrations of these air contaminants within the MTSA exceeded their respective air quality thresholds independent of the Proposed Development, and entirely due to existing urban air pollution sources within the MTSA. $PM_{2.5}$, PM_{10}, and NO_x were predicted to exceed

when the modelled industrial and transportation sources were added on. This finding indicates that air quality in the area *may* be impacted (on the basis of measured and predicted air concentrations being compared against stringent and protective air quality thresholds (criteria)) Whenever air quality is predicted to be impacted due to exceedance of ambient air concentrations over applicable air quality criteria, the appropriate next step is to perform a Human Health Assessment to quantify the expected degree of risk (if any) to human health.

Human Health Assessment

A Human Health Risk Assessment (also called a Human Health Assessment) is typically required for any contaminants for which the cumulative air concentrations were predicted to exceed the relevant air quality thresholds. Dillon's review of the Human Health Assessment (HHA) found that the overall methodology (including the approach to estimating cumulative air concentrations of the air contaminants of concern) that was used is appropriate and standard for an air quality-based HHA. The air quality thresholds applied by WSP (e.g., inhalation toxicity reference values, ambient air quality criteria) were appropriate and adequately protective of human health. The HHA was also a conservative (protective) assessment in which the approaches and assumptions that were applied tend to overestimate the potential for human exposure to air contaminants.

The HHA provided important context on relative source contributions of the air contaminants of interest. The cumulative air concentration exceedances over applicable air quality thresholds were generally due to elevated urban background (or baseline) concentrations of air contaminants. The HHA also found that cumulative air concentrations for the modelled air contaminants were typical of urban areas of similar size and characteristics (i.e., in proximity of industries and major arterial roads). All of the assessed air contaminants are known to be associated with different types of effects in exposed people and are unlikely to interact with each other in a manner that would increase or otherwise exacerbate potential health effects of the air contaminants.

The overall conclusion of the HHA, and Dillon's review of the HHA, was that air quality in the area is expected to pose a similar level of predicted human health risk as that of other urban centers within the Greater Toronto Area (GTA), that are also influenced by industrial air emissions, traffic air emissions and other common sources of urban air pollutants. While there is a quantifiable increase in predicted potential risk as a result of elevated concentrations of certain air contaminants at the Proposed Development, the level of potential risk is not significantly different than what would be predicted at other comparable urban areas within the GTA. Dillon agrees with WSPs conclusion that the level of potential human health risk related to air quality at the Proposed Development does not reach a threshold where residential development should be prohibited.

WSP discussed mitigation measures for the Proposed Development. It is noted that the proposed mitigation measures are intended to *improve* indoor air quality for the residences of

the Proposed Development and as such are not considered to be a necessary requirement for the Development to proceed. It is also noted that the identified mitigation measures do not mitigate exposure to air contaminants if windows are opened, or when in the outdoor areas such as balconies, terraces or other outdoor amenities.

Hamish Corbett-Hains, M.A.Sc., P.Eng.

Rob Willis, B.Sc., MES, EP, QP_{RA}, QP_{CA}

Amir A. Iravani, Ph.D., P.Eng.

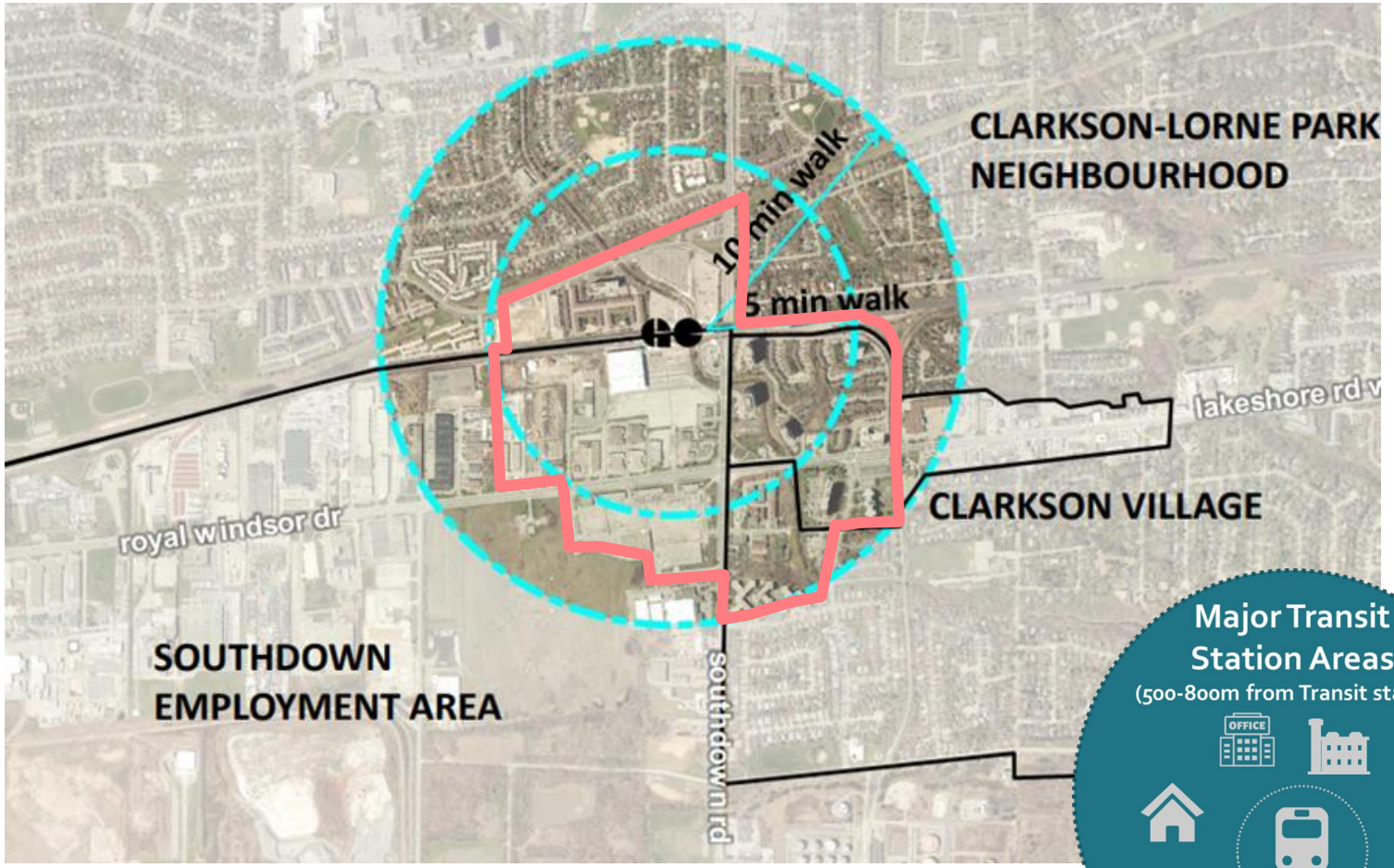
Clarkson Transit Station Area Study

Air Quality Study Findings, Community Feedback, and Next Steps

Planning & Development Committee, May 29, 2023

Romas Juknevicius, Project Lead, City Planning Strategies

In 2018, the City started the Clarkson Transit Station Area Study



Area surrounding 500-800m of the Clarkson GO Station

Requirement of an updated Air Quality Study before planning for new residential growth in the Southdown Employment Area

Technical studies + Community Feedback =

Air Quality MOPA 117, 2020

Clarkson Transit Station Area Boundary

Southdown Employment Area

A team of experts was set up by the City

The City of Mississauga
City Planning Strategies, Planning & Building Dept.

Peer Reviewer

Environmental Expert: Dillon Consulting

+

Expert Review Committee

- Ministry of Environment, Conservation and Parks
- Region of Peel Public Health
- City of Mississauga, Environment Division
- Major Industries : CRH Cement Inc, PetroCanada and CertainTeed

The City identified the requirements for an Air Quality Study to be completed

Terms of Reference

Land Use Compatibility

Determine if additional residential uses are compatible with existing industries

+

Air Quality Monitoring

Monitor air pollutants on-site for at least 6 months

+

Air Dispersion Modelling

Analyze combined impact of all pollution sources

+

Human Health Assessment

Evaluate impacts and risk of increased pollution levels on human health

Air Quality Study 2020-2023

A landowner completed an Air Quality Study as per the City's Terms of Reference

Clarkson Transit Station Area Boundary

Landowner (2077, 2087, 2097 and 2105 Royal Windsor Drive)

Air Quality Monitoring

Monitor air pollutants on-site for at least 6 months

6

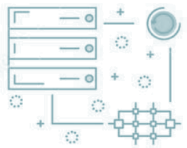
months of Air Quality monitoring (July 2020 to January 2021)

Covid shutdown resulted in reduced pollution levels

Data adjustments were made to select pollutants to account for Covid

Air Dispersion Modelling

Analyze combined impacts of all pollution sources



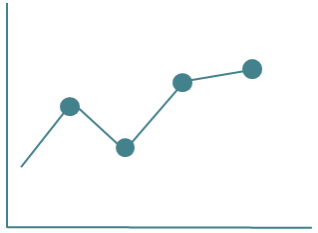
Air monitoring data combined with permitted industrial emissions and traffic data

Account for local weather and wind factors

MECP approved models

- ☑ AERMOD + Shoreline fumigation + Screen 3
- ❑ CALPUFF

Key findings of Air Quality Monitoring and Dispersion Modelling



Pollutants found above acceptable levels

(NOx, PM 2.5, PM 10, Acrolein, Benzene and Benzo(a)pyrene)

Transportation is primary source of elevated pollution levels

Similar levels of air quality have been noted across GTA

Human Health Assessment

Evaluate impacts and risk of increased pollution levels on human health

Air quality levels represent typical urban environment

Elevated pollutant levels typically found in urban areas across GTA

Frequency & source of elevated pollution levels do not prohibit residential development

Community Meeting March 22, 2023

Air Quality Study Findings

+

Direction to complete Master Plan

+

Next Steps

Are we heading in the right direction?

Residential and mix of uses near Clarkson GO

Well-connected public spaces

Protect and enhance natural features and parks

Vibrant, animated streets

Safe, reliable walking and cycling connections

High quality, Green buildings

Community Meeting # 3

March 22, 2023

What we Heard!

Safe walking and cycling access to Clarkson GO

Green spaces

COVID Adjustments? What are acceptable pollution limits?

Poll: Majority Support for Guiding Principles

Residential & Industrial Compatibility

PDC to Endorse :
Next Steps on Clarkson Transit Station Area Study

Summer 2023

Draft Master Plan & Implementation Policies

- land uses, built form, parks, roads, transportation analysis, stakeholder consultation

Review of Development Application

2077, 2087, 2097 and 2105 Royal Windsor Drive

Fall 2023 (targeted)

Community Meeting # 4

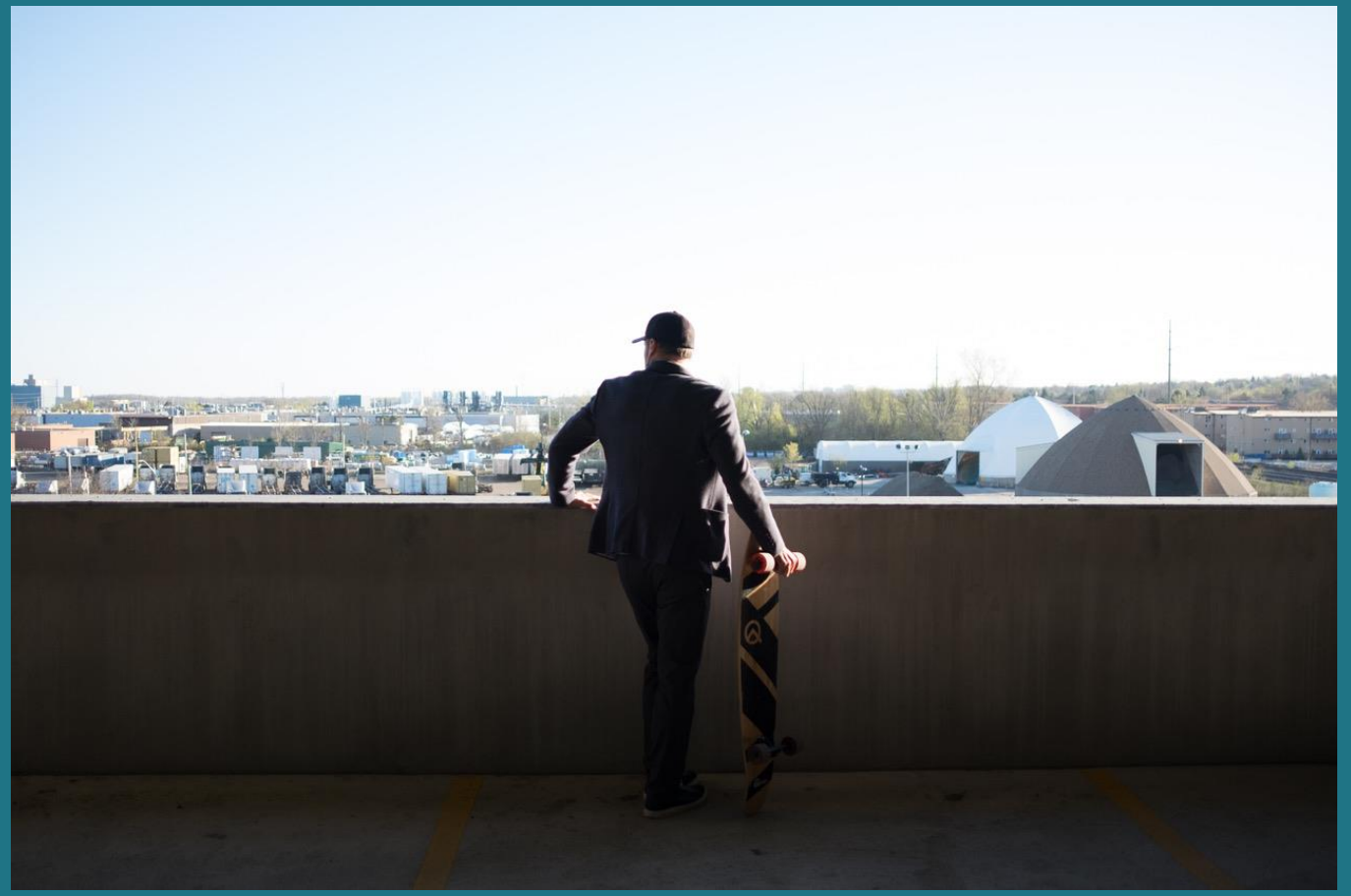
Draft Master Plan & Implementation Policies

Early 2024 (targeted)

Implementation

Official Plan Policies & Zoning as Necessary

Questions?



Southdown Industrial Landowner Group – Clarkson MTSA

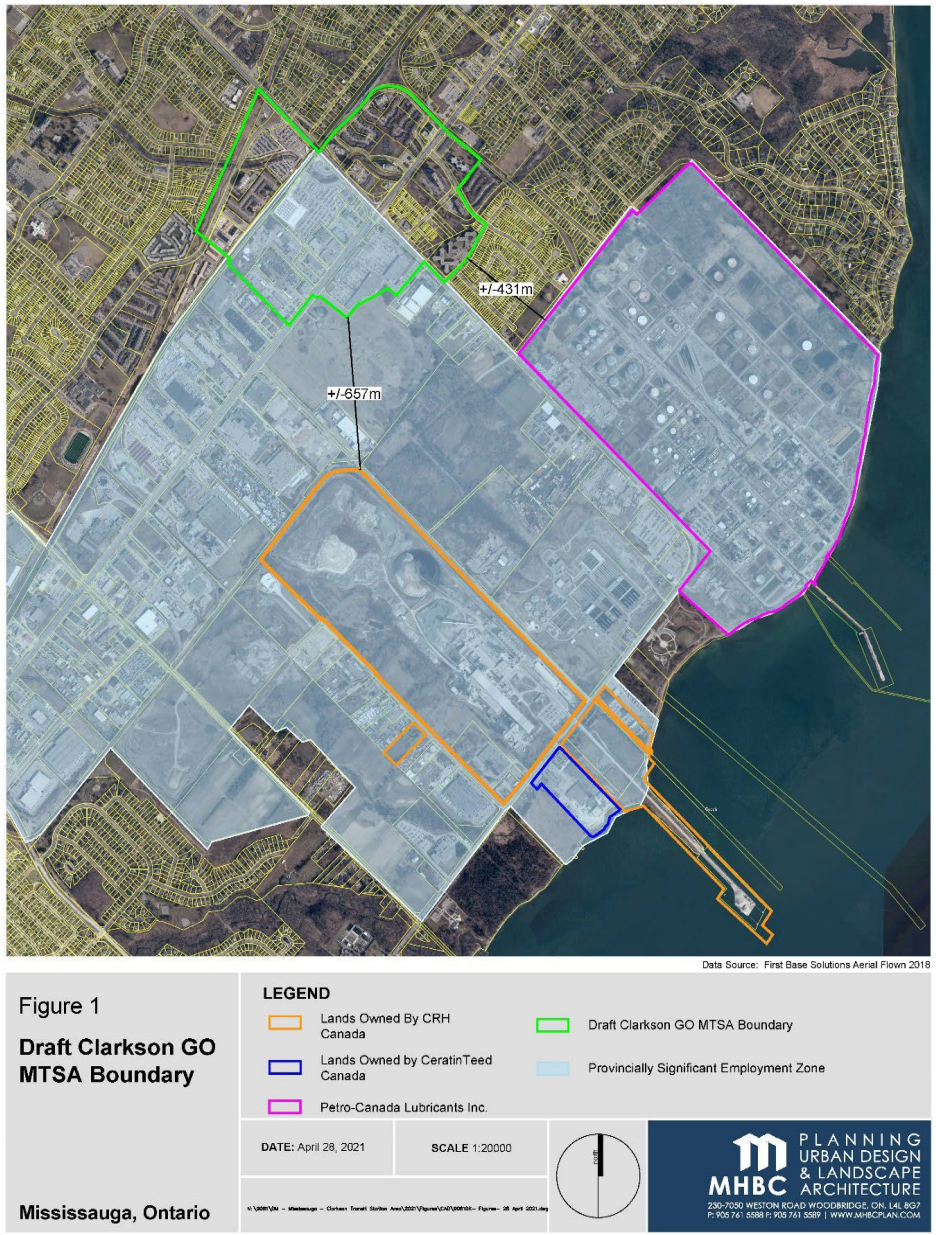
(Ashgrove, a division of CRH Canada Group + Petro-Canada Lubricants Inc. + CertainTeed Canada Inc.

MHBC
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

May 2023

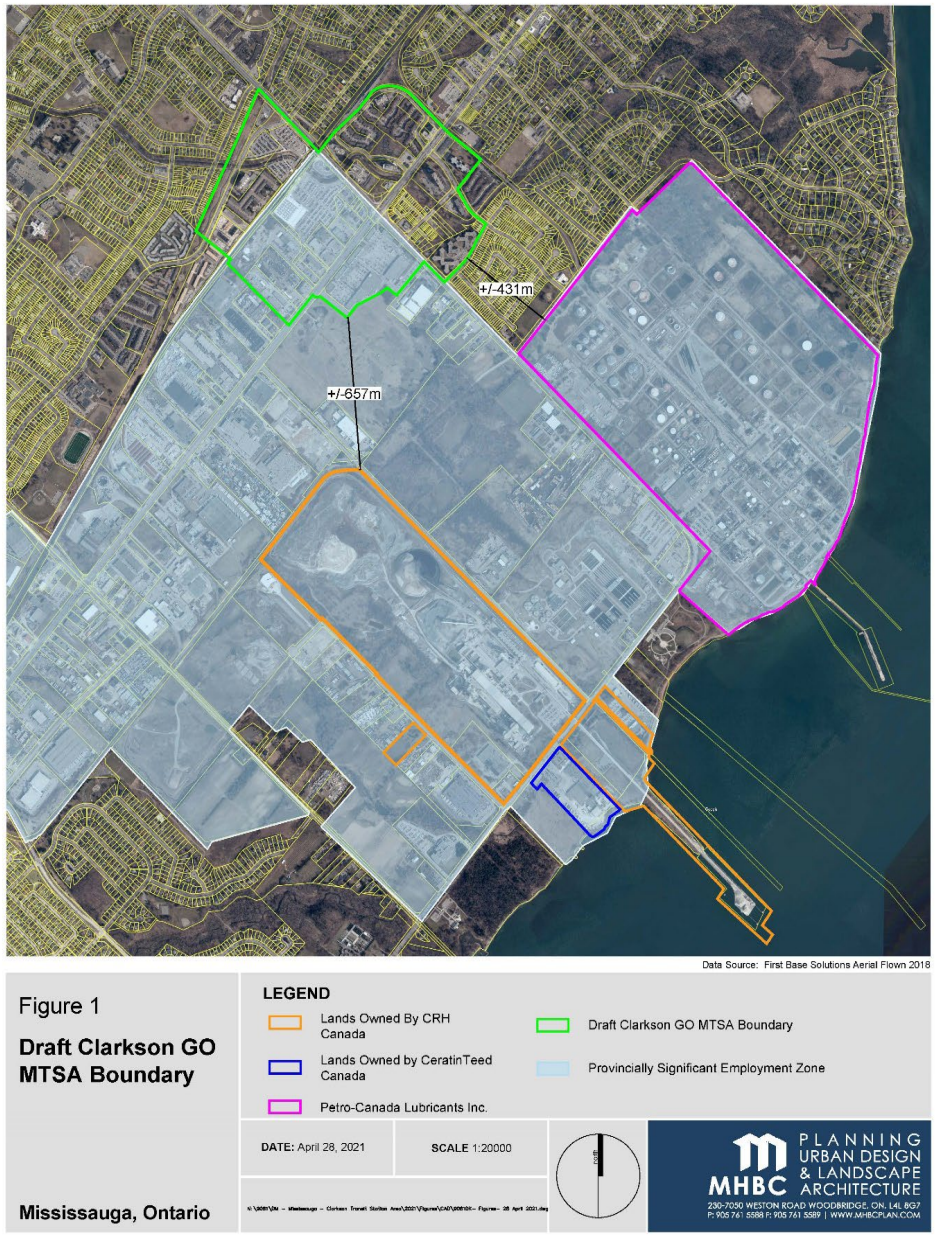
CONTEXT

1. Southdown Industrial Landowner Group: 3 prominent industrial landowners - ±175 ha (430 acres):
    1. Ashgrove (CRH) – cement plant
    2. Petro-Canada Lubricants Inc.
    3. CertainTeed Canada Inc.



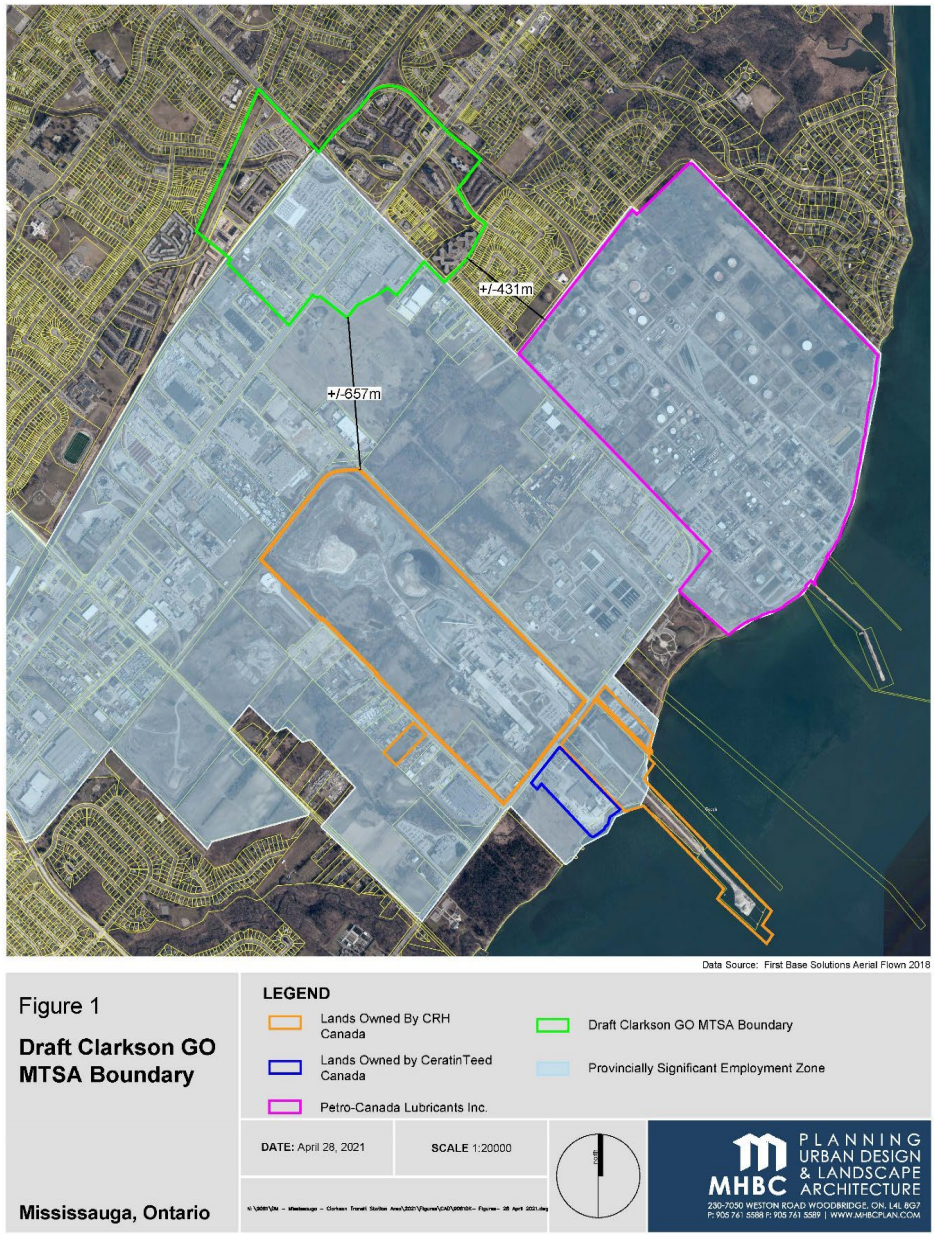
Provincial Objectives

1. Thank you to Staff
2. Balance of Provincial Objectives:
    1. Protecting provincially-significant employment areas
    2. Accommodating intensification in MTSA
    3. Land use compatibility



PROTECTING CRITICAL INDUSTRY

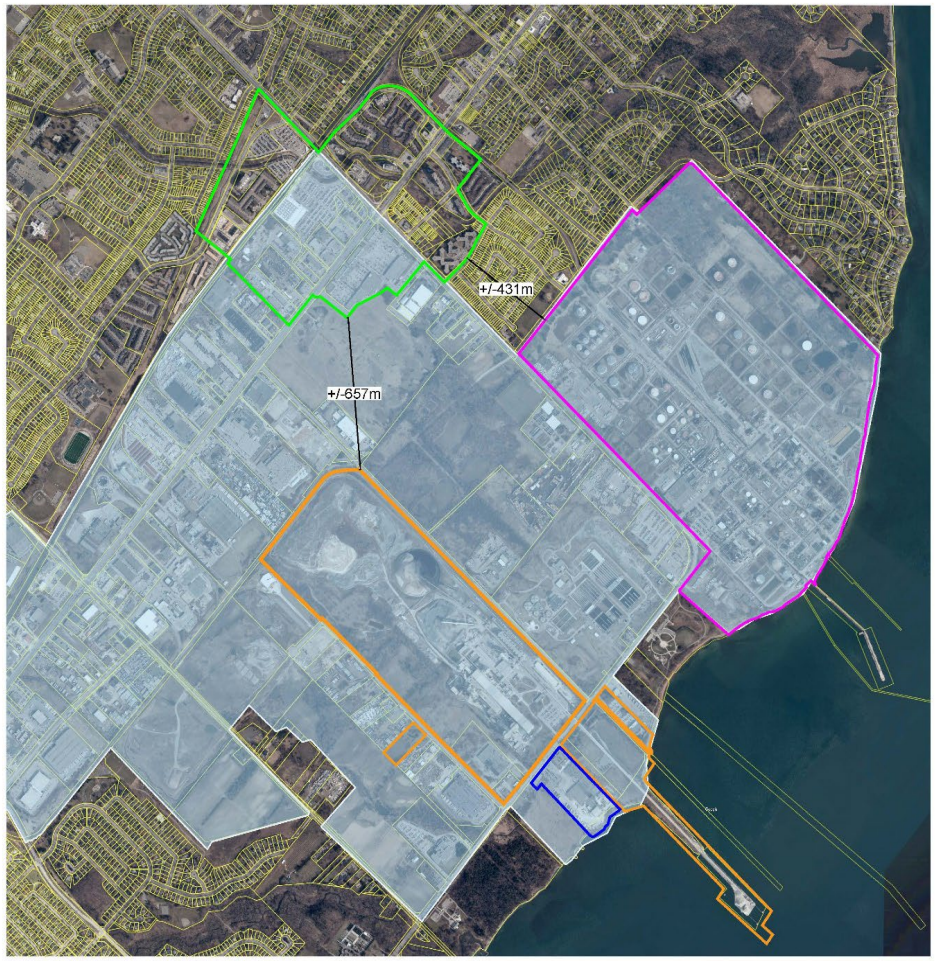
1. A Provincially Significant Employment Zone
2. Provincial guidelines, requires a minimum 300 m separation distance and a 1,000 m area of influence – cement plant



CONCERNS

1.Land Use Compatibility

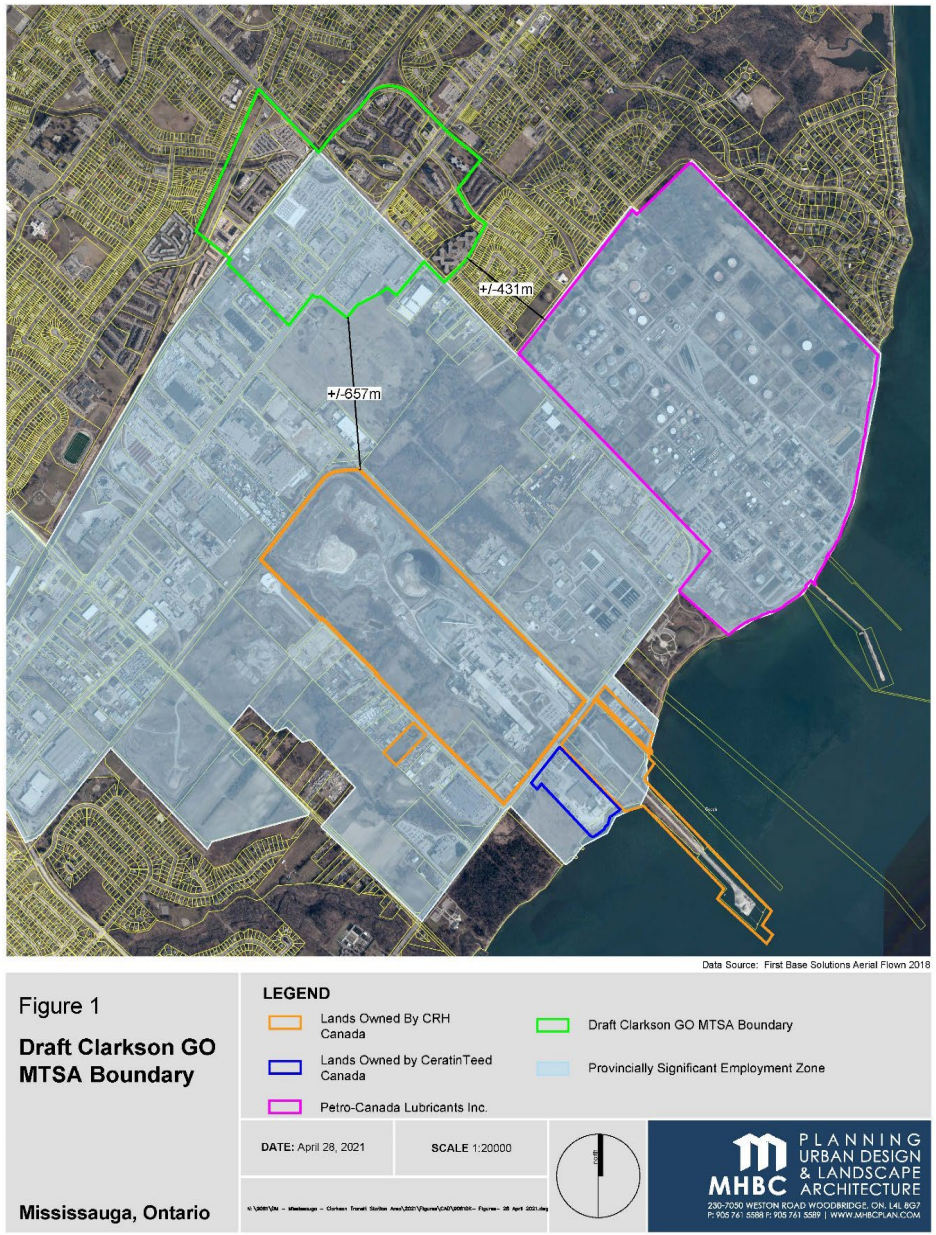
- Demonstrate no adverse affect on viability of this employment area
- Avoidance as a first principle
- Onus of mitigation on residential developer proposing to encroach into area of influence



CONCERNS

2. Industry being held to a 'higher modelling standard' for AQ

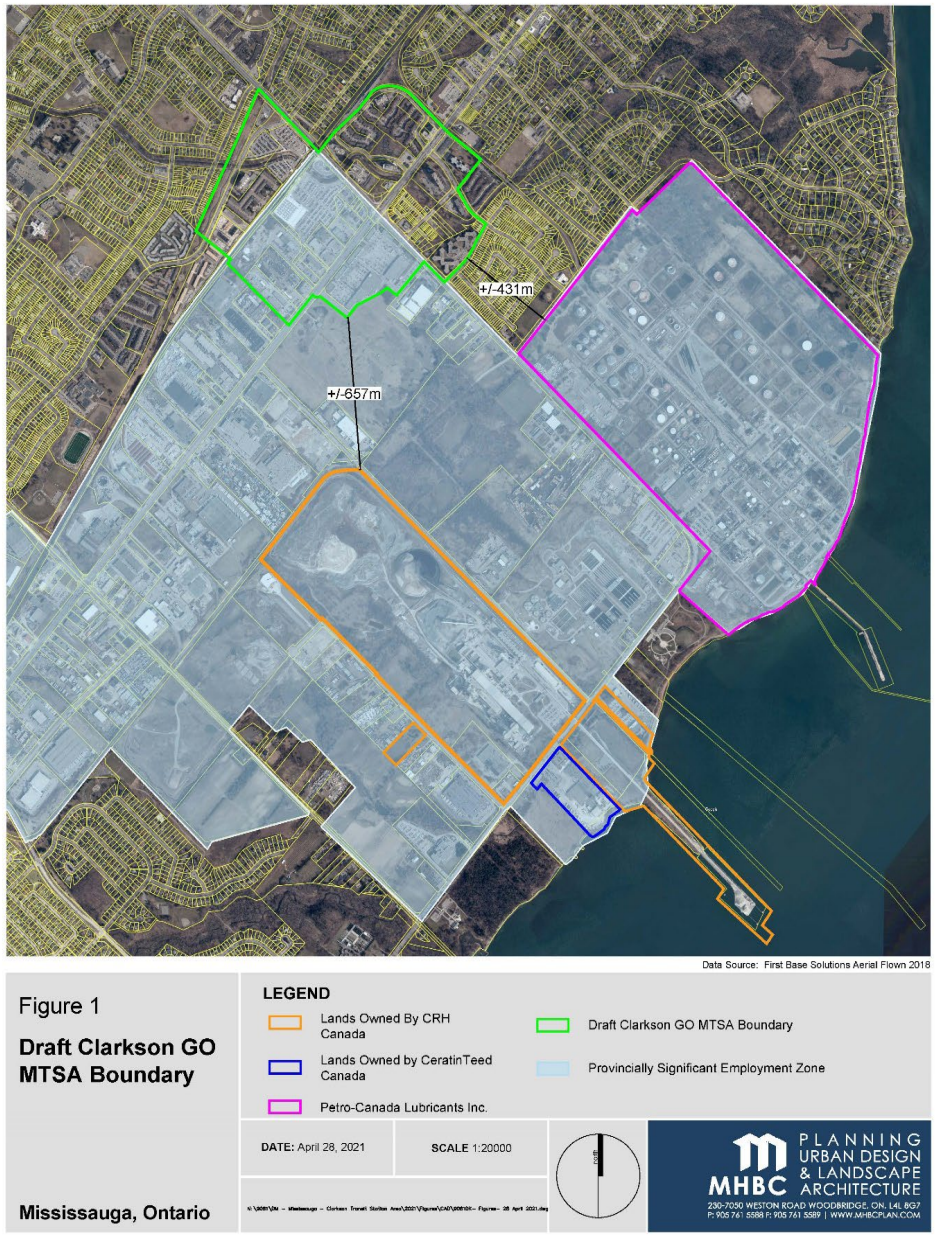
- Significant discrepancy in AQ modelling - current standard being replaced with a more accurate model (shoreline fumigation)
- Province not currently requiring City and/or developers to use the more accurate model
- At same time, Province requiring industries through their ECAs to use it
- Planning decisions should be based on same model as industry to minimize potential for unacceptable land use conflict in the future



Next Steps

1. Incorporate strong Land Use Compatibility policies
   - Avoidance – not all areas in MTSA may allow sensitive land uses
   - Set out which areas may warrant further Assessment (prior to rezoning):
     - Establish Terms of Reference Upfront
     - Nuisance Impact Studies
     - Air Quality Assessments
     - Noise Impact Assessments
   - Designate certain areas as Class 4 (MECP)
   - Onus of mitigation on developer encroaching

2. Require that any site specific applications (employment conversions in PSEZ) be deferred until Comprehensive Review and Policy in place for overall MTSA



City of Mississauga
Corporate Report

MISSISSAUGA

Date: May 5, 2023

To: Chair and Members of Planning and Development Committee

From: Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Originator's files: CD.22-LAK

Meeting date: May 29, 2023

Subject

PUBLIC MEETING RECOMMENDATION REPORT (WARD 1)

Lakeview Innovation District Community Improvement Plan

Recommendation

1. That the proposed Lakeview Innovation District Community Improvement Plan contained in Appendix 1 of the report titled, "Lakeview Innovation District Community Improvement Plan" dated May 5, 2023 from the Commissioner of Planning and Building be adopted.
2. That an implementing by-law to adopt the Lakeview Innovation District Community Improvement Plan be brought to a future City Council meeting and that the City Solicitor be authorized to make any non-substantive stylistic and technical changes to the Community Improvement Plan, as may be required, prior to Council adoption.

Executive Summary

- In the Innovation District, desired uses are unlikely to occur without incentives.
- The Community Improvement Plan (CIP) is an enabling document, permitting the City to incentivize private corporations. However, Council is under no obligation to approve individual applications for incentives.
- In order to address the range of goals identified for the CIP, incentives are proposed for two categories: Economic Development Key Sectors (Key Sectors) and Low-Carbon Technologies and Energy Systems (Low-Carbon).
- Proposed incentives for both categories include Tax Increment Equivalent Grants (TIEG), Development Charge (DC) Deferrals, and Municipal Property Acquisition and Disposal. Municipally Funded Parking is also proposed for the Key Sectors and Capital Loans are proposed for Low-Carbon.

- CIP applications will be received for seven years. The issuance of any incentives is subject to eligibility criteria and an executed Financial Incentives Agreement, subject to Council approval.

Background

The Inspiration Lakeview Master Plan, received by City of Mississauga (City) Council in 2014, envisions a world class, destination urban waterfront community. The Inspiration Lakeview Innovation Corridor (Innovation District) will be the economic driver for the new community delivering an environment where people can research and develop innovative solutions that help to educate and drive behavioural change, and, help to generate prosperity.

Three Key Sectors are targeted for the Innovation District: Life Sciences, Clean Technology (including low-carbon technology like district energy), and Information and Communications Technology, but a significant gap between development costs and achievable revenues (rents) currently exists. City intervention is required if these uses are to be realised.

A Community Improvement Plan (CIP) is a tool under Section 28 of the *Planning Act* that enables the City to provide incentives without contravening the *Municipal Act*'s bonusing rules. Prior to enacting a CIP, a Community Improvement Project Area (CIPA) must be designated by Council.

At the February 13, 2023 Planning and Development Committee meeting, staff proposed that the Lakeview Innovation District be designated a CIPA[1], resulting in Council adopted Recommendation PDC-001-2023 (March 1, 2023):

1. That a by-law be enacted to designate the Innovation District […] as a Community Improvement Project Area […].
2. That a future public meeting be held to consider the Community Improvement Plan for the Innovation District within the Lakeview Waterfront Major Node.

As a result, by-law 0052-2023 was enacted on March 22, 2023 enabling staff to prepare a CIP for the Innovation District.

Comments

Central to the rationale for establishing a CIP is the "but for" test, which establishes the need for incentives and asks: but for the existence of X, would Y have occurred? In the Innovation District, but for the existence of incentives, development of the desired uses are unlikely to occur. Therefore, it is unlikely that the Innovation District vision can be achieved in the absence

[1] https://pub-mississauga.escribemeetings.com/Meeting.aspx?Id=2d7c92bb-e364-4623-8a58-7809f229dba8&Agenda=PostAgenda&lang=English&Item=10&Tab=attachments

of City incentives. The CIP is an enabling document. Council is not obligated to approve the individual applications for incentives.

GOALS

The CIP was prepared to achieve the following goals:

1. Create a complete community with a balance between employment and population.
2. Expand the City's entrepreneurship and innovation ecosystem.
3. Achieve the Innovation District guiding principles of: Environmental Sustainability; Entrepreneurship and Innovation; and Equitable and Inclusive Growth.
4. Support the achievement of the City's Climate Change Action Plan goals and actions.

Given the range of goals, the CIP was developed on the basis of two application categories: Economic Development Key Sectors (Key Sectors) and Low-Carbon Technologies and Energy Systems (Low-Carbon). The Key Sectors support CIP goals one through three, while Low-Carbon supports goals three and four.

KEY SECTORS

The CIP proposes to incentivize Key Sectors employment uses that create high quality, knowledge-intensive jobs and advance the City's innovation ecosystem. Incentives for Key Sectors are more structured so that they can be marketed to prospective businesses. It is anticipated that most applicants will apply under this category.

The Key Sectors identified for the Innovation District are:

- **Clean Technology** – any process, product or service that reduces environmental impacts through environmental protection activities and resource management activities that result in a more efficient use of natural resources.
- **Life Sciences** – the study of all living organisms and the use of technology to deliver commercially-viable products and services and those that directly support these activities along the entire commercial value chain.
- **Information and Communications Technology** – computing, broadcasting activities, telecommunications, and related professional and support services.

The following four (4) incentive programs are proposed for the Key Sectors:

Incentive	Description	Details
1. Tax Increment Equivalent Grant (TIEG)	Provides assistance in the form of annual grants to offset the change in property taxes related to reassessment resulting from the completion of development.	10 years of grants starting at 100% of the tax increment and declining by 7% annually (matches Council approved TIEG for Oxford under the Downtown Office CIP).
2. Development Charge (DC) Deferrals	Provides assistance in the form of deferring the payment of DCs to a future date.	5 year deferral that may be extended once for a total maximum deferral of 10 years.

Incentive	Description	Details
3. Municipally Funded Parking	Provides parking at reduced cost.	Dependent on capital funding and market interest.
4. Municipal Property Acquisition and Disposal	Makes City lands available at below fair market rates.	Dependent on capital funding and market interest.

The Region currently has a complementary Major Office Incentives (MOI) program, which matches City TIEGs for eligible major office developments. While this program is currently paused due to legislative changes, City staff continue to encourage the Region to offer incentives for office and other key uses.

LOW CARBON

Incentives are proposed for businesses that develop and/or implement technologies or energy systems that decrease greenhouse gas (GHG) emissions compared to business as usual. Low-Carbon uses will support the sustainability goals of the Innovation District and advance the City's GHG reduction goals while attracting Key Sectors uses. These incentives are more flexible as each applicant is anticipated to have unique requirements and benefits.

The following four (4) incentive programs are proposed for Low-Carbon uses:

Incentive	Description	Details
1. Tax Increment Equivalent Grant (TIEG)	Provides assistance in the form of annual grants to offset the change in property taxes related to reassessment resulting from the completion of development.	TIEG structure and value to be evaluated on a case by case basis by staff and approved by Council.
2. Development Charge (DC) Deferrals	Provides assistance in the form of deferring the payment of DCs to a future date.	Maximum deferral period and any extensions to be approved by Council. Option for Council to forgive a portion of the DC, subject to conditions.
3. Municipal Property Acquisition and Disposal	Makes City lands available at below fair market rates.	Dependent on capital funding and market interest.
4. Capital Loan	Provision of a low or no interest loan to support Low-Carbon uses start up costs.	Dependent on capital funding and market interest. Option for Council to forgive a portion of the loan, subject to conditions.

IMPLEMENTATION

The CIP is proposed to be in effect for an initial term of seven (7) years, during which applications may be received. Individual incentives may extend beyond this term. The term of the CIP may be extended through a CIP amendment and/or repealed at time by Council.

All CIP applications will be subject to eligibility criteria to ensure that the issuance of incentives supports the achievement of the CIP's goals. Incentives will only be issued once they have been secured through an executed Financial Incentives Agreement, which will outline the terms and conditions of any incentives, and is subject to Council approval.

Monitoring of the CIP will be conducted to provide the basis for decisions regarding program design and funding. Reports will be presented to Council on a biannual basis, at a minimum.

Strategic Plan

The Lakeview Innovation District provides a unique opportunity to advance the Prosper visionary action: We will create a model sustainable community on the waterfront.

Engagement and Consultation

In the winter and spring of 2023, staff engaged stakeholders through stakeholder meetings, an engagement website where questions could be asked, ideas could be shared, and surveys could be completed. The engagement revealed that there was general support for the proposed incentives and targeted uses.

Financial Impact

A CIP is intended to stimulate desired development that will not occur "but for" the provision of incentives. The overall extent of the financial impact will be determined by the financial tools utilized and participation in the CIP by the private sector.

Contributing to TIEGs result in a deferral of increased property taxes for the property owner on development that might not otherwise occur. A TIEG provides a grant for the differences between the pre-development taxes and the post-development taxes for a property for a given amount of years. The City would benefit from the development through economic benefits created by the development.

The change in assessment value will generate supplementary tax revenue in the year that the new development is assessed by the Municipal Property Assessment Corporation (MPAC). Once the post-development assessment change is incorporated into the City's assessment base, the property will incur a larger distribution of the City's total tax levy. In the year that the revised assessment value is added to the City's assessment base it will generate growth for the tax levy.

The value of the TIEG over the ten years will be lost revenue for the City and create a budget pressure relative to the increased need for services for the new development. The 10-year TIEG would provide 100% of the incremental increase in taxes in the first year and decline to 37% in the 10th year. The cost of the grant is estimated at the time of application based on an estimated post-development assessment value, the actual grant would be based on the actual assessment change as determined by MPAC.

The annual tax levy is collected from the City's assessment base, if the grant is funded through the operating budget this cost will be collected as part of the annual tax levy. There is a moderate risk that the cost of the grant could be significantly higher than estimated depending on the final post development assessment value as determined by MPAC. There is also a minor risk that the uptake in the program could be greater than anticipated leading to a greater budget pressure. These risks can be mitigated by establishing a cap for the maximum grant available.

Conclusion

A CIP would allow the City to grant incentives to identified sectors locating within the CIPA. A CIP would help advance the vision for the Innovation District and achieve the objectives of balancing growth, creating a complete community, and supporting infrastructure investments. Proposals received under the program must meet the established criteria and align with the strategic objectives and priorities of the City.

Attachments

Appendix 1: Lakeview Innovation District Community Improvement Plan

A Whittemore

Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building

Prepared by: Melissa Slupik, Planner

Lakeview Innovation District Community Improvement Plan

Table of Contents

1. Introduction

1.1. What is a Community Improvement Plan?

A Community Improvement Plan ("CIP") is a tool that allows a municipality to direct funds and implement policy initiatives toward a specifically defined area of need, known as a Community Improvement Project Area ("CIPA"). CIPs are intended to encourage rehabilitation initiatives and/or stimulate development through incentives such as tax assistance, grants, or loans under Section 28 of the *Planning Act*. The objective is to realise environmental, social, cultural and economic benefits through more sustainable growth management and development practices.

CIP programs can span a wide spectrum of municipal objectives where, in the medium- and long-term, public benefits are achieved resulting in more socially cohesive, environmentally friendly and economically sound communities. The concept is that the municipal assistance offered through a CIP helps achieve the stated goal(s) that otherwise would not be realized in the absence of the intervention.

1.2. Purpose of this Community Improvement Plan

The Lakeview Innovation District ("Innovation District") is part of the 71.63 hectare Lakeview Village, an ambitious historic reimagining of the former coal-burning Lakeview Generating Station in Mississauga. The Innovation District CIP is intended to stimulate the development of employment uses in the identified economic development key sectors ("Key Sectors") and/or the development of low-carbon technologies and energy systems ("Low-Carbon") on these designated employment lands.

The Innovation District is envisioned to result in a development opportunity of employment space comprising primarily office, flex-office, and lab uses. The Innovation District has the potential to accommodate up to 140,000 m^2 of employment space and 9,000 jobs. Activating the entire Innovation District is anticipated to take several years with market dependencies playing a significant factor in the attraction of businesses and tenants.

Under current conditions, there is a significant development gap in the Lakeview market for the envisioned uses. Left to market forces alone, the Innovation District would likely develop as low-rise industrial, however the current zoning requires a minimum of three storeys on most of the lands. The development gap requires stewardship from the City of Mississauga ("City") to create a conducive market – absent incentives, the Innovation District is unlikely to develop.

2. Vision & Goals

2.1. Vision

The Innovation District will be the economic driver for the new community, delivering an environment where people can research and develop innovative solutions that help to educate and drive behavioural change, and commercialize innovation solutions.

2.2. Goals

The primary goals of this CIP are to:

- Create a complete community with a balance between employment and population.
- Expand the City's entrepreneurship and innovation ecosystem within its innovation identity (IDEA Mississauga).
- Achieve the Innovation District guiding principles of:

  - Environmental Sustainability;
  - Entrepreneurship and Innovation; and
  - Equitable and Inclusive Growth.
- Support the achievement of the City's Climate Change Action Plan ("CCAP") goals and actions.

2.3. Objectives

The CIP is intended to achieve the following objectives:

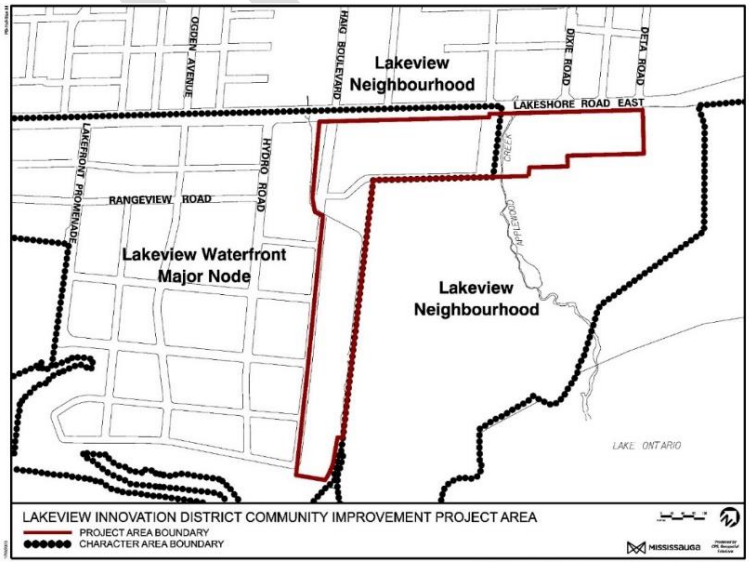
- Create up to 9,000 high quality, knowledge-intensive jobs and 140,000 m^2 of employment space in 12 to 14 buildings comprising primarily office, flex-office, and lab uses.
- Leverage the Innovation District to help position Mississauga as a global leader in scaling and commercialization, and to become a centre of excellence for entrepreneurship and innovation within the region.
- Attract employers in the Clean Technology ("Cleantech"), Life Sciences, and Information and Communications Technology ("ICT") sectors.
- Attract Low-Carbon uses.
- Attract high-growth and scaling firms which have surpassed preliminary product/service validation and sales that are interested in scaling and commercializing an innovative business solution through dynamic growth.
- Support the CCAP goals to decrease greenhouse gas (GHG) emissions and increase resilience.
- Address CCAP Action 1 to support and encourage developer-led efforts to include low-carbon energy systems in new development.

3. Community Improvement Project Area

3.1. The Community Improvement Project Area

For the purposes of this CIP, all community improvement activities, including financial incentive programs, will only be undertaken within the Innovation District CIPA, identified in Figure 1, which was designated by City Council through By-law 0052-2023 on March 22, 2023.

Figure 1: Lakeview Innovation District Community Improvement Project Area



3.2. Site Context

Lakeview is located in southeast Mississauga at the border of the City of Toronto and along the shore of Lake Ontario. The area is split between the Lakeview Waterfront Major Node ("Major Node") and the Lakeview Neighbourhood Character Areas. Within the Major Node is Lakeview Village, a future residential development, Rangeview Estates, an existing employment area and future residential community, and the Innovation District.

Lakeview is an important part of the city's history commencing with serving as home to Indigenous Peoples for thousands of years prior to nineteenth century settlement by Europeans. The last Indigenous Peoples to occupy and live off the lands were the Mississaugas of the Credit First Nation.

Over the past 200 years, the site has transformed from rural pastoral lands to an aerodrome, rifle range, wartime barracks, small arms manufacturing, and postwar temporary housing. Most recently, the lands were the site of the Lakeview Generating Station and light industrial uses. Since the closure of the generating station, the lands have been predominantly vacant, except for some remaining light industrial uses.

The Innovation District is over 5.9 hectares, of which 2.5 hectares will be transferred to the City. The remainder of the Innovation District is owned by the development consortium known as Lakeview Community Partners Limited ("LCPL") and individual property owners along Lakeshore Road East.

The lands around the Innovation District include:

- The G.E. Booth Water Resource Recovery Facility ("G.E. Booth Facility") to the east.
- The Rangeview Estates employment area, consisting primarily of older one-storey industrial buildings constructed in the 1960s, to the northwest.
- The future Lakeview Village development to the west.

Currently, the Innovation District lands are designated Business Employment which permits various industrial, technology and office uses. Generally, the lands within the Innovation District are zoned Employment in Nodes (E1) exception and Employment (E2) exception, where:

- The LCPL lands are zoned H-E1-29, which permits Office, Science and Technology, University/College, commercial school, manufacturing, broadcasting, communication facility, and other complementary uses, subject to removing the holding provision.
- The City lands are zoned H-E1-30, which permits the same uses as the LCPL lands in addition to district energy generation and distribution centre, and vacuum waste collection centre, subject to removing the holding provision.
- The remaining privately owned lands are zoned E2-21, which permits many of the same uses as the LCPL lands as well as wholesaling facility, self storage facility, and additional commercial and hospitality uses.

3.2.1. Inspiration Lakeview

The 2017 Inspiration Lakeview Master Plan ("Master Plan") was inspired by a citizen driven project known as the "Lakeview Legacy". Creating the Master Plan was a collaborative process with community and stakeholder input resulting in a community vision and Master Plan that visualizes the transformation of the Lakeview Waterfront from an industrial area to a new mixed use waterfront community.

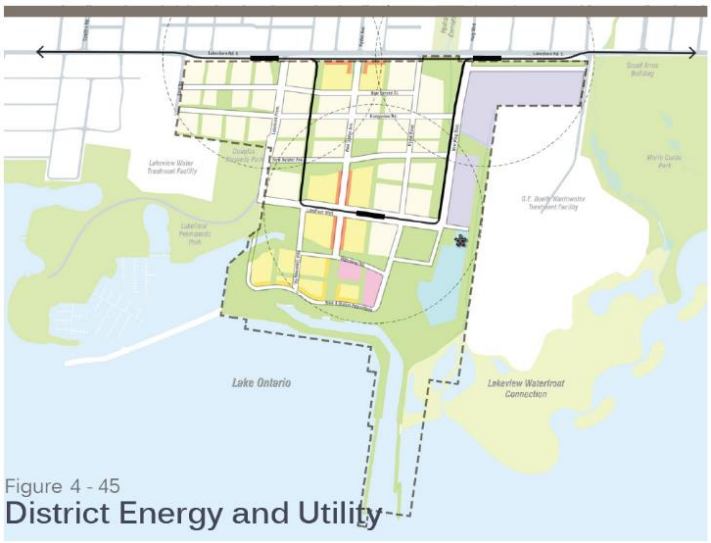
The Master Plan identifies an Employment and Innovation Corridor (now known as the Innovation District) that is rooted in the area's industrial history, current stable job base, and good planning principles. On-site

employment supports the realisation of a genuine complete community with a balance between population and high quality, knowledge-intensive jobs.

The Innovation District is a transitional use between the G.E. Booth Facility and the future Lakeview Village community. As a green technology district, it is intended to attract research and development-type jobs and create affinities with the planned institutional uses. It provides significant space for green technology – including low carbon energy, sustainable and innovative design, and green building.

Lakeview is an ideal location to deliver low-carbon energy through a DE system. A parcel of land identified for District Energy ("DE") is centrally located in the Innovation District, shown by the asterisk in Figure 2 below.

Figure 2: Area Dedicated to District Energy (Source: Inspiration Lakeview Master Plan)



Due to the scale and complexity of the Master Plan, phasing is required. The Innovation District will be primarily driven by the market with City investment related to strategic economic development and policy initiatives.

3.2.2. Lakeview Waterfront Major Node Character Area Policies

The Master Plan was translated into policy through Mississauga Official Plan Amendment 89 ("MOPA 89"), which was approved by Council on July 4, 2018. MOPA 89 establishes the Major Node and related policies in the Mississauga Official Plan ("Official Plan").

MOPA 89 envisions the Major Node as a model green, sustainable and creative community on the waterfront. It will be mixed use with a vibrant public and private realm including generous open spaces, cultural and recreational amenities, and employment opportunities.

The Major Node, among other things, is intended to:

- Be an area of intensification including a mix of uses.
- Provide uses such as cultural spaces, innovative employment and institutional uses, and waterfront activities.
- Achieve a targeted gross density between 200 and 300 residents plus jobs per hectare and a population to employment ratio of 2:1.
- Be a sustainable community and incorporate green development standards.

3.2.3. Lakeview Innovation District Activation Project

The Lakeview Innovation District Activation Project was undertaken by the City's Economic Development Office in 2021 to provide a better understanding of the existing market conditions and advance the City's strategic priorities in the context of the market conditions. It included a Land Development Plan that assessed the existing market conditions to identify the most appropriate approach to position the City's portion of the Innovation District, and an Operational Plan that identified recommendations to transform the Innovation District into a cohesive and fully operational site.

The Innovation District vision leverages the site's rich historic legacy, local industry strengths and key emerging opportunities to establish a clear market identifier differentiating the site from the broader Toronto-Waterloo Innovation Corridor and global innovation ecosystem. Key components of the Innovation District's value proposition include:

- Guiding Principles
    - Environmental Sustainability;
    - Entrepreneurship and Innovation; and
    - Equitable and Inclusive Growth.
- Sector Focus
    - Cleantech;
    - Life Sciences; and
    - ICT.
- High-Growth and Scaling Entrepreneurship & Innovation Focus.

The Innovation District is envisioned to result in primarily office, flex-office, and lab uses. These uses currently face a development gap and the market is unlikely to deliver the Lakeview vision. In the short- and long-term, the highest and best uses are low-rise industrial and low-rise flex industrial spaces respectively.

Given the development gap, City stewardship is required create the market for the envisioned uses. A CIP, in addition to other City initiatives, is a key priority to get the site market ready.

3.2.4. Low-Carbon Energy

The CCAP is built around the central vision that Mississauga will be a low-carbon and resilient community.

Cities are major contributors to GHG emissions. In Mississauga, roughly 50% of GHG emissions come from buildings – primarily from the burning of natural gas to heat indoor spaces and water. Sustainable building design and the use of clean energy are key factors in minimizing GHG emissions.

In order to reach its GHG emission reduction targets, emissions from the building sector, specifically reduced use of natural gas, is required. DE provides this opportunity as it "is one of the least-cost and most-efficient solutions for reducing GHG emissions and primary energy demand."[1]

DE systems provide numerous benefits including more efficient heating and cooling production, fuel source flexibility, and the ability to use local energy and fuel sources. For building owners, DE saves on upfront capital costs and makes buildings easier to operate and manage in the future. A key challenge of DE is the high upfront costs to build the system, including constructing the energy centre and installing distribution pipes.

[1] UNEP, District Energy in Cities: Unlocking the Potential of Energy Efficiency and Renewable Energy (2015).

The City is working with stakeholders including DE providers, land owners, and other public authorities to establish a DE system in the Innovation District to primarily serve Lakeview Village where 8,050 residential units in addition to mixed-use employment and retail commercial spaces are currently approved. If implemented, DE would significantly reduce CO_2 emissions compared to business as usual by utilizing waste heat from the adjacent G.E. Booth Facility as its main fuel source.

4. Public Benefit Rationale

Central to the rationale of a CIP is the "but for" test, which establishes the need for the incentives by asking: but for the existence of X, would Y have occurred? In the Innovation District, but for incentives, development of Key Sectors and Low-Carbon uses are unlikely to occur.

The development of the Innovation District is central to achieving the Master Plan vision, but the market currently does not support the desired uses, therefore intervention is required.

As outlined above, the Master Plan was developed with a sustainability lens and identified the Innovation District as a green technology district that would attract research and development jobs as well as contain innovative and technologically advanced design solutions. At full build out, the Major Node is targeted to contain 15,000 to 22,000 residents and 7,000 to 9,000 jobs, achieving a 2:1 population to employment ratio. The Innovation District is essential to reaching this balanced ratio and creating a complete community. Further, the incorporation of Low-Carbon uses will help the City achieve its CCAP mitigation and resilience goals.

This CIP seeks to partially offset the significant development gap exists between the Key Sectors and potential revenue streams. Additionally, Low-Carbon developments typically require significant upfront capital costs before any revenue can be generated.

This CIP intends to provide incentives in order to achieve the Innovation District vision, so that the greater public and community benefits of a complete community, high quality employment, and GHG reductions can be realised.

5. Legislative and Policy Framework

5.1. Authority for CIP and Grants

Section 106 of the *Municipal Act* prohibits municipalities from assisting, either directly or indirectly, any manufacturing business or other industrial or commercial enterprise through the granting of bonuses or assistance except where municipalities exercise powers under Section 28(6), (7), or (7.2) of the *Planning Act*.

Section 28 of the *Planning Act* authorizes municipalities to designate a CIPA where there is an official plan in effect that contains provisions relating to community improvement in the municipality. The *Planning Act* further authorizes Council to prepare a plan suitable for adoption as a CIP for the CIPA.

The Official Plan contains appropriate provisions (19.22.2) related to community improvement as required in order to designate and prepare plans for CIPAs as envisioned in Section 28 of the *Planning Act*.

CIPA means "a municipality or an area within a municipality, the community improvement of which in the opinion of the council is desirable because of age, dilapidation, overcrowding, faulty arrangement, unsuitability of buildings or for any other environmental, social or community economic development reason".

The *Planning Act* authorizes municipalities to use a CIP to "make grants or loans, in conformity with the community improvement plan, to registered owners, assessed owners, and tenants of lands and buildings within the community improvement project area, and to any person to whom such an owner or tenant has assigned the right to receive a grant or loan, to pay for the whole or any part of the eligible costs of the community improvement plan" (Section 28(7)).

The Official Plan (19.22.6) provides that CIPs may be considered for the following, among other matters:

- Opportunities for infilling and development of underutilized sites;
- Identification of the need to encourage office and other employment opportunities;
- Identification of the need to encourage energy improvements; and
- Opportunities to support the growth management objectives of this Plan and encourage transit supportive communities.

According to the Official Plan, CIPs may be implemented through:

- The acquisition and assembly of lands for public facilities and infrastructure, and possible development (19.22.7 e); and
- Allocation of public funds, in the form of grants, loans or other financial instruments for the physical rehabilitation or improvement of land and/or buildings including the remediation of contaminated properties (19.22.7 h).

The Official Plan also identified that "the Region of Peel may be a planning and/or financial partner in a Community Improvement Plan for matters within its jurisdiction" (19.22.5).

5.2. How this Plan was Prepared

The Master Plan laid the groundwork for this CIP. To gain an understanding of the key issues and gaps that the CIP should address, CIPA community improvement needs have been determined through:

- Research and analysis of legislation, policies, regulations and other applicable sources.
- Staff input from various City service areas including:
    - Economic Development;
    - Environment;
    - Finance;
    - Planning and Building; and
    - Strategic Communications and Initiatives.
- Council input.
- Stakeholder input and public consultation (described below in 5.2.1.).
- Review of municipal best practices.

At the February 13, 2023 Planning and Development Committee meeting, staff recommended that a By-law be brought to Council to designate the Innovation District as a CIPA. On March 22, 2023, Council designated the CIPA (Figure 1) through By-law 0052-2023.

5.2.1. Consultation

In the winter and spring of 2023, staff engaged stakeholders, specifically the merit of modest incentives given the current development gap faced by desired uses. Engagement consisted of stakeholder meetings, an engagement website where questions could be asked, ideas could be shared, and surveys (for the public and

industry) could be completed. The engagement revealed that there was general support for the proposed incentives and targeted uses.

A public meeting was held on May 29, 2023 to provide members of the community and interested stakeholders an opportunity to comment on the draft CIP. [**NTD::** details to be added post-meeting]

6. The CIP Program

6.1. 'Toolbox' Approach

The Innovation District CIP incentive programs represent a 'toolbox' of programs designed to help address the development gap and achieve the goals and objectives of this CIP. The programs are designed to encourage private sector investment within the CIPA.

The programs are referred to as a 'toolbox' because once the CIP is adopted and approved, Council is able to fund, activate, and implement the incentive programs individually or in combination. All programs are subject to the availability of funding, and Council may choose to implement, suspend, or discontinue one or more program(s) at any time. This CIP is an enabling document and Council is not obligated to activate and implement any incentive programs or approve individual CIP applications.

The programs are also referred to as a 'toolbox' because once activated, they can be used individually or in combination by an Applicant. The CIP contains two separate application categories:

- Key Sectors for projects resulting in the creation of high quality, knowledge-intensive jobs that advance the City's innovation ecosystem.
- Low-Carbon for projects achieving environmental benefits.

Applicants may choose to apply for any combination of programs under either Key Sectors or Low-Carbon, but may only apply under one category per project.

CIP applications are subject to a case-by-case evaluation, financial assessment, and City staff review, with Council acting as the approval body for all CIP applications.

If Council approves an application, incentives are only secured after the execution of a formal and legally binding Financial Incentives Agreement ("Agreement") between the Applicant and the City that meets all CIP program requirements and conditions, to the satisfaction of Council.

6.2. Economic Development Key Sectors Incentive Programs

The Key Sectors programs provide incentives for the following employment sectors:

- **Cleantech** – any process, product or service that reduces environmental impacts through environmental protection activities and resource management activities that result in a more efficient use of natural resources.
- **Life Sciences** – the study of all living organisms and use of technology to deliver commercially-viable products and services and those that directly support these activities along the entire commercial value chain.
- **ICT** – computing, broadcasting activities, telecommunications, and related professional and support services.

The development of Key Sectors will ensure that the Major Node contains a balance of employment and population through the creation of high quality, knowledge-intensive jobs. The creation of local jobs supports the local economy, enhances community wellbeing, and promotes balanced growth.

There are four (4) Key Sectors incentive programs available:

- Tax Increment Equivalent Grants ("TIEG");
- Development Charge ("DC") Deferrals;
- Municipally Funded Parking; and
- Municipal Property Acquisition and Disposal.

Applicants may apply to any combination of the above incentive programs.

All projects seeking Key Sectors incentives, must meet the following program requirements and general eligibility criteria:

- The project must be located on a property within the CIPA.
- The Applicant must be the owner of the subject property or have the owner's written authorization to apply for the program(s).
- The project must create, at a minimum, 2,000 m^2 of gross floor area ("GFA") dedicated to one or more of the Key Sectors. In multi-tenant buildings, incentives will be pro-rated to the portion of the project dedicated to Key Sectors.
- The project must result in the creation of a minimum of 100 jobs in one or more of the Key Sectors.
- The project must result in building(s) that are a minimum of 3 storeys.
- The project must utilise low-carbon energy sources, where available.
- The project must result in an increase in assessment value as determined by the Municipal Property Assessment Corporation ("MPAC").
- The subject property must not be in a position of tax arrears.
- The project must conform to all municipal by-laws, policies, procedures, standards, and guidelines.
- The project must meet all mandatory policies of the Green Development Standards and should meet the voluntary policies.
- Condominium tenure projects are not eligible for incentives. Individual condominium unit owners may apply for incentives if they can independently fulfill all of the program requirements and conditions.
- Council adoption of this CIP must predate the issuance of any building permit(s) for the project.

An executed Agreement will be required prior to the issuance of any incentives.

Projects that qualify under both Key Sectors and Low-Carbon may only apply under one category of the CIP. Applicants are advised to apply under the category that best aligns with the goals and outcomes of their project.

6.2.1. Tax Increment Equivalent Grant

The TIEG program provides assistance in the form of a series of annual grants to eligible owners or tenants. The grant partially offsets the change in property taxes related to reassessment resulting from the completion of new Key Sectors project(s). TIEGs are intended to stimulate new development by removing the financial disincentive associated with increased property taxes post-development.

TIEG Calculation

The value of the TIEG will be equivalent to 100% of the **City Tax Increment** in **Year 1** and decline by 7% annually for a maximum of ten (10) years as outlined below in Table 1, where:

- **Year 1** means the first full taxation year following both the completion of the project and the reassessment of the subject property by MPAC.
- **City Tax Increment** means the difference between the **Post-development Property Tax** and **Pre-development Property Tax** for the subject property, or portion thereof. The **City Tax Increment** includes:
    - The City portion of property taxes (Regional and education portions of property taxes are excluded);
    - The portion of the subject property that was improved by the eligible development – excludes and increases or decreases in taxes arising from a change in assessed value associated with any other portion of the subject property; and
    - Increases in taxes resulting from valuation changes from MPAC reassessments are excluded.
- **Pre-development Property Tax** means the City portion of property taxes as per the assessment roll in the taxation year preceding MPAC's post-development reassessment of the subject property. This value is fixed for the duration of the TIEG for the purposes of determining the **City Tax Increment**, subject to any adjustments arising from assessment appeals or changes made by MPAC through requests for reconsideration, equity changes or gross error.
- **Post-development Property Tax** means the City portion of property taxes as per the assessment roll applicable to the first full taxation year following both the completion of the project and MPAC's reassessment of the subject property. This value is fixed for the duration of the TIEG for the purposes of determining the **City Tax Increment**, subject to any adjustments to taxes arising from assessment appeals or changes made by MPAC through requests for reconsideration, equity changes or gross error.

Table 1: Key Sectors Tax Increment Equivalent Grant Calculation

Year	Grant (as % of City Tax Increment)
1	100%
2	93%
3	86%
4	79%
5	72%
6	65%
7	58%
8	51%
9	44%
10	37%
11+	0%

At the time of execution, the Agreement will identify the grant schedule by percent of **City Tax Increment** to be granted, as outlined above in Table 1. Once MPAC has reassessed the subject property post-development, the grant schedule will be amended to include the exact dollar value of each annual grant as calculated based on the

City Tax Increment. Subsequent regularly scheduled MPAC assessments will not be considered for the purpose of calculating the TIEG.

Maximum TIEG Amount

The total TIEG amount may not exceed the lesser of:

- 70% of the **City Tax Increment** over the 10-year maximum duration of the TIEG; or
- The total cost of the project, minus all other City incentives and any matching grants or other CIP incentives from the Region, where the total cost of the project includes:
    - Construction costs as shown by the main building permit associated with the project; and
    - The costs of associated studies and surveys, development of plans and specifications, implementation, and administration of the project including staff and professional service costs for architectural, engineering, legal, financial, and planning services.

If the post-development MPAC assessment exceeds the estimated assessment value provided by the Applicant at the time of Council approval, the TIEG will be capped at 10% above the estimated values.

TIEGs are limited to City property taxes and pro-rated to apply to the portion of a project dedicated to Key Sectors.

Funding & Adjustments

For greater clarity, property owners or tenants are required to pay all property taxes owed in full annually, after which the City will issue a grant for a portion of the **City Tax Increment**, as outlined in the executed Agreement. No portion of the **Pre-development Property Tax** is eligible.

Only the **City Tax Increment**, which excludes the Regional and education portions of property tax, is included in this program. In order to qualify for a TIEG, Applicants must enter into and fulfill the terms and conditions of an executed Agreement with the City.

If during the course of the project, the scope of the project changes along with associated costs, the City reserves the right to increase, decrease, or cancel the total amount of the TIEG. The annual grant will be based on the grant schedule contained in the executed Agreement, unless adjusted in accordance with the Agreement.

TIEG amounts will be adjusted to reflect:

- Reductions in GFA occupied by Key Sectors for the year in which the grant is calculated; and
- Subsequent changes to the City taxes payable in any year due to reductions resulting from assessment appeals and/or tax adjustment applications. Where such tax changes occur after grants have been issued, future year grant entitlements will be reduced accordingly. Any overpayment of grants arising from subsequent reassessment or tax reductions will be deemed a debt owning to the City.

Duration

TIEGs are limited to a maximum duration of 10 years.

TIEGs will cease if the project is converted to an ineligible use or if the building is demolished except to expand an eligible use. Grants that would have been payable in the year in which the demolition occurs, or the ineligible use commences, will not be issued.

Staged Development

In the case of a staged development, the TIEG will be applicable in accordance with the building permit completion and reassessment of the subject property. The TIEG will be based on the **City Tax Increment** arising from the completion and post-development assessed value as provided by MPAC. If further building permits are required for the subject property after reassessment, a new application may be submitted, subject to the continued availability of the incentive program, and requirements in place at the time.

Timing

Once the CIP is in full force and effect, applications may be submitted for seven (7) years from the date of Council approval of the CIP Implementing By-law. Agreements that extend beyond the application period will remain active and valid, but TIEGs shall not be issued beyond a total of ten (10) years.

Other Conditions

An independent tax study, by a qualified consultant, providing an estimate of the subject property assessment increment anticipated upon project completion may be required as part of an application, at the sole cost of the Applicant. For the purposes of the tax study, a consultant will be considered to be qualified if they have one of the following designations:

- AACI (Accredited Appraiser Canadian Institute) designation;
- AIMA (Associate) designation from the Institute of Municipal Assessors; or
- MIMA (Accredited) designation from the Institute of Municipal Assessors.

The need for this study and terms of reference, if applicable, will be determined through preliminary application meetings with City staff.

Grant Payment

Grants will be paid once per annum as set out in the Agreement provided that the Applicant is in compliance with the executed Agreement.

Grants will not be applied as tax credits against property tax accounts. Annual property taxes must be paid in full prior to the issuance of any grants for the applicable year.

In the case of an assessment appeal, the City reserves the right to withhold any forthcoming grants pending final disposition of the appeal.

6.2.2. Development Charge Deferrals

DCs are fees collected from development at the time of building permit issuance, to help offset the cost of growth-related infrastructure.

The DC deferral program intends to better align the payment of DCs with the Applicant's operations and revenue stream recognizing that revenue may not be realised until after the project is complete and the Applicant has established operations.

Maximum Deferral Period

DCs may be deferred for a period of five (5) years, renewable a maximum of once, for a total maximum deferral period of ten (10) years. Renewal is subject to the continued availability of the incentive program and the program requirements and conditions in place at that time.

All deferrals will cease if the building is converted to an ineligible use or demolished except to expand an eligible use. The DC deferral will be terminated and payment will be due in full in addition to any interest or other fees, payable in accordance with the Agreement.

Adjustments

If during the course of the work, the scope of work changes along with associated costs, the City reserves the right to amend or cancel the terms of the deferral to reflect any changes in GFA occupied by Key Sectors for the years to which the deferral applies.

If an Applicant receiving a CIP incentive ceases doing business at the subject location, the DC deferral will be terminated and payment will be due in full in addition to any interest or other fees, payable in accordance with the Agreement.

Staged Development

In the case of a staged development, the DC deferral will be applicable in accordance with the date of building permit issuance. If further building permits are required for the subject property, and are eligible for a DC deferral, an application may be submitted, subject to the continued availability of the incentive program, and the program requirements and conditions in place at that time.

Timing

Once the CIP is in full force and effect, applications may be submitted for seven (7) years from the date of Council approval of the CIP Implementing By-law. Agreements that extend beyond the application period will remain active and valid, but shall not defer DC payments beyond a duration of five (5) years, or ten (10) years if renewed.

Other Conditions

Detailed implementation including, but not limited to, incentive limitations, funding and posting of financial securities, and other conditions will be determined through an Agreement, subject to Council approval.

DC Payment

At the end of the deferral period, the deferred DC payment will be due in full in addition to any interest or other fees, payable in accordance with the Agreement.

6.2.3. Municipally Funded Parking

The Municipally Funded Parking program intends to provide parking at reduced costs to the developer in order to stimulate the creation of new GFA for Key Sectors.

The City may build and own a stand-alone municipal parking facility and provide below fair market rent or lease rates for the parking. Alternatively, the City may co-locate a portion of municipally owned parking within a private development, while retaining ownership of the parking for the long-term.

Funding

The funding for this program is limited to capital budget approval by Council.

Timing

Once the CIP is in full force and effect, applications may be submitted for seven (7) years from the date of Council approval of the CIP Implementing By-law. Agreements that extend beyond the application period will remain active and valid.

Other Conditions

Detailed implementation including, but not limited to, leasing rate, incentive limitations, duration, funding and posting of financial securities, and other conditions will be determined through an Agreement, subject to Council approval.

6.2.4. Municipal Property Acquisition and Disposal

The Municipal Property Acquisition and Disposal program is intended to make lands available in order to stimulate the creation of new GFA for Key Sectors employment uses. For example:

- Property acquisition by the City;
- City issuance of Request for Proposals for the development of municipal property by or in partnership with a private entity to achieve the goals and objectives of this CIP; or
- The sale or lease City-owned property at below fair market rates.

Funding

The funding for this program is limited to capital budget approval by Council.

Timing

Once the CIP is in full force and effect, applications may be submitted for seven (7) years from the date of Council approval of the CIP Implementing By-law. Agreements that extend beyond the application period will remain active and valid.

Other Conditions

Detailed implementation, including but not limited to, leasing rate, sale price, duration, funding and posting of financial securities, and other conditions will be determined through an Agreement, subject to Council approval, or at the time of land acquisition or disposal.

6.3. Low-Carbon Technologies and Energy Systems Incentive Programs

The Low-Carbon programs provide incentives for businesses that develop and/or implement technologies or energy systems that decrease GHG emissions compared to business as usual.

Low-Carbon uses support the sustainability goals of the Innovation District and advance the City's GHG reduction goals. These uses may also serve to enhance the value proposition of the Innovation District by attracting employment in the Key Sectors.

There are four (4) Low-Carbon incentive programs available:

- TIEGs;
- DC Deferrals;
- Municipal Property Access, Acquisition and Disposal; and
- Capital Loans.

Applicants may apply to any combination of the above programs.

All projects seeking Low-Carbon incentives must meet the following program requirements and general eligibility criteria:

- The project must be located on a property within the CIPA.

- The Applicant must be the owner of the subject property or have the owner's written authorization to apply for the program(s).
- The project must support the CCAP goal of reducing GHG emissions through a decrease of at least 50% compared to business as usual.
- The project must supply or utilise low-carbon energy sources.
- The project must result in an increase in assessment value as determined by MPAC.
- The subject property must not be in a position of tax arrears.
- The project must conform to all municipal by-laws, policies, procedures, standards, and guidelines.
- The project must meet all mandatory policies of the Green Development Standards and should meet the voluntary policies.
- Condominium tenure projects are not eligible for incentives. Individual condominium unit owners may apply for incentives if they can independently fulfill all of the program requirements and conditions.
- Council adoption of this CIP must predate the issuance of any building permit(s) for the project.

An executed Agreement will be required prior to the issuance of any incentives.

Projects that qualify under both Key Sectors and Low-Carbon may only apply under one category of the CIP. Applicants are advised to apply under the category that best aligns with the goals and outcomes of their project.

6.3.1. Tax Increment Equivalent Grant

The TIEG program provides assistance in the form of a series of annual grants to eligible owners or tenants. The grant partially offsets the change in property taxes related to reassessment resulting from the completion of new Low-Carbon project(s). TIEGs are intended to stimulate new development by removing the financial disincentive associated with increased property taxes post-development.

TIEG Calculation

The value of the TIEG and its calculation will be determined by Council based on recommendations from City staff and information provided by the Applicant.

At the time of execution, the Agreement will identify the grant schedule by percent of **City Tax Increment** to be granted. Once MPAC has reassessed the subject property post-development, the grant schedule will be amended to include the exact dollar value of each annual grant as calculated based on the **City Tax Increment**. Subsequent regularly scheduled MPAC reassessments will not be considered for the purposes of calculating the TIEG.

Maximum TIEG Amount

The total TIEG amount may not exceed the lesser of:

- 100% of the **City Tax Increment** over the duration of the TIEG; or
- The total cost of the project, minus all other City incentives and any matching grants or other CIP incentives from the Region, where the total cost of the project includes:
    - Construction costs as shown by the main building permit associated with the project; and
    - The costs of associated studies and surveys, development of plans and specifications, implementation, and administration of the project including staff and professional service costs for architectural, engineering, legal, financial, and planning services.

If the post-development MPAC assessment exceeds the estimated assessment value provided by the Applicant at the time of Council approval, the TIEG will be capped at 10% above the estimated values.

TIEGs are limited to City property taxes and pro-rated to apply to the portion of a project dedicated to Low-Carbon uses.

Funding & Adjustments

For greater clarity, property owners or tenants are required to pay all property taxes owed in full annually, after which the City will issue a grant for a portion of the **City Tax Increment**, as outlined in the executed Agreement. No portion of the **Pre-development Property Tax** is eligible.

Only the **City Tax Increment**, which excludes the Regional and education portions of property tax, is included in this program. In order to qualify for a TIEG, Applicants must enter into and fulfill the terms and conditions of an executed Agreement with the City.

If during the course of the project, the scope of the project changes along with associated costs, the City reserves the right to increase, decrease, or cancel the total amount of the TIEG. The annual grant will be based on the grant schedule contained in the executed Agreement, unless adjusted in accordance with the Agreement.

TIEG amounts will be adjusted to reflect:

- Reductions in GFA occupied by Low-Carbon uses for the year in which the grant is calculated; and
- Subsequent changes to the City taxes payable in any year due to reductions resulting from assessment appeals and/or tax adjustment applications. Where such tax changes occur after grant amounts have been issued, future year grant entitlements will be reduced accordingly. Any overpayment of grants arising from subsequent reassessment or tax reductions will be deemed a debt owing to the City.

Duration

The duration of the TIEG will be determined by Council based on recommendations from City staff and information provided by the Applicant.

TIEGs will cease if the project is converted to an ineligible use or if the building is demolished except to expand an eligible use. Grants that would have been payable in the year in which the demolition occurs, or the ineligible use commences, will not be issued.

Staged Development

In the case of a staged development, the TIEG will be applicable in accordance with the building permit completion and reassessment of the subject property. The TIEG will be based on the **City Tax Increment** arising from the completion and post-development assessed value as provided by MPAC. If further building permits are required for the subject property after reassessment, a new application may be submitted, subject to the continued availability of the incentive program, and requirements that are in place at the time, unless TIEGs for future stages are otherwise approved by Council and addressed in an executed Agreement.

Timing

Once the CIP is in full force and effect, applications may be submitted for seven (7) years from the date of Council approval of the CIP Implementing By-law. Agreements that extend beyond the application period will remain active and valid.

Other Conditions

An independent tax study, by a qualified consultant, providing an estimate of the subject property assessment increment anticipated upon project completion will be required as part of an application, at the sole cost of the Applicant. For the purposes of the tax study, a consultant will be considered to be qualified if they have one of the following designations:

- AACI (Accredited Appraiser Canadian Institute) designation;
- AIMA (Associate) designation from the Institute of Municipal Assessors; or
- MIMA (Accredited) designation from the Institute of Municipal Assessors.

Grant Payment

Grants will be issued once per annum as set out in the Agreement provided that the Applicant is in compliance with the executed Agreement.

Grants will not be applied as tax credits against property tax accounts. Annual property taxes must be paid in full prior to the issuance of any grants for the applicable year.

In the case of an assessment appeal, the City reserves the right to withhold any forthcoming grants pending final disposition of the appeal.

6.3.2. Development Charge Deferrals

DCs are fees collected from development at the time of building permit issuance, to help offset the cost of growth-related infrastructure.

The DC deferral program intends to better align the payment of DCs with the Applicant's operations and revenue stream recognizing that revenue may not be realised until after the project is complete and the Applicant has established operations.

At the sole discretion of Council, based on the recommendation of staff, a portion of the deferred DC payment may be forgiven at the end of the deferral period in the form of a grant, subject to conditions outlined in the Agreement. In order to be considered for forgiveness, the project must result in a minimum 60% reduction of GHGs compared to business as usual.

Maximum Deferral Period

The maximum initial deferral period as well as any options and conditions for renewal will be determined by Council based on recommendations from City staff and information provided by the Applicant.

All deferrals will cease if the building is converted to an ineligible use or demolished except to expand an eligible use. The DC deferral will be terminated and payment will be due in full in addition to any interest or other fees, payable in accordance with the Agreement.

Adjustments

If during the course of the project, the scope of work changes along with associated costs, the City reserves the right to amend or cancel the terms of the deferral to reflect any change in GFA occupied by Low-Carbon uses for the years to which the deferral applies.

If an Applicant receiving a CIP incentive ceases doing business at the subject location, the DC deferral will be terminated and payment will be due in full in addition to any interest or other fees, payable in accordance with the Agreement.

Staged Development

In the case of a staged development, the DC deferral will be applicable in accordance with the date of building permit issuance. If further building permits are required for the subject property, a new application may be submitted, subject to the continued availability of the incentive program, and the program requirements and conditions in place at that time, unless DC deferrals for future stages are otherwise approved by Council and addressed in an executed Agreement.

Timing

Once the CIP is in full force and effect, applications may be submitted for seven (7) years from the date of Council approval of the CIP Implementing By-law. Agreements that extend beyond the application period will remain active and valid.

Other Conditions

Detailed implementation, including but not limited to, incentive limitations, maximum value, interest, duration, deferral payments, forgiveness (where applicable), funding and posting of financial securities, and other conditions will be determined through an Agreement, subject to Council approval.

If approved by Council, the forgivable portion of a DC payment will be provided on the same terms and conditions as the deferral except for the following:

- If the Applicant is not otherwise in default of the Agreement, DC forgiveness will occur at the end of the deferral period in the form of a grant.
- Forgiveness shall not be pro-rated if the Applicant vacates the space prior to the end of the deferral period.
- In order to earn the forgiveness, the Applicant shall:
    - Occupy the development subject to the deferral for the entire deferral period; and
    - Realize all GHG reductions, as outlined in the Agreement.

DC Payment

At the end of the deferral period, the deferred DC payment will be due in full in addition to any interest or other fees, payable in accordance with the Agreement.

6.3.3. Municipal Property Access, Acquisition and Disposal

The Municipal Property Access, Acquisition and Disposal program is intended to make lands available in order to stimulate Low-Carbon uses. Incentives under this program, may include, but are not limited to:

- Property acquisition by the City;
- City issuance of Request for Proposals for the development of municipal property by or in partnership with a private entity that achieves the goals and objectives of this CIP; or
- The sale, lease, or access of City-owned lands at below fair market rates.

Funding

The funding for this program is limited to capital budget approval by Council.

Timing

Once the CIP is in full force and effect, applications may be submitted for seven (7) years from the date of Council approval of the CIP Implementing By-law. Agreements that extend beyond the application period will remain active and valid.

Other Conditions

Detailed implementation, including but not limited to, leasing rate, sale price, duration, funding and posting of financial securities, and other conditions will be determined through an Agreement, subject to Council approval, or at the time of land acquisition or disposal.

6.3.4. Capital Loan

The Capital Loan program is designed to support the start up costs of Low-Carbon uses through the provision of a low or no interest loan.

At the sole discretion of Council, based on the recommendation of staff, a portion of the total loan commitment, approved and utilized by the Applicant, may be forgiven in the form of a grant, at the end of the loan term, subject to conditions outlined in the Agreement. In order to be considered for forgiveness for any portion of the Capital Loan, the project must result in a minimum 60% reduction of GHGs compared to business as usual.

Funding

The funding for this program is limited to capital budget approval by Council.

Timing

Once the CIP is in full force and effect, applications may be submitted for seven (7) years from the date of Council approval of the CIP Implementing By-law. Agreements that extend beyond the application period will remain active and valid.

Other Conditions

Detailed implementation, including but not limited to, maximum loan value, interest, duration, advance payments, loan payments, forgiveness (where applicable), funding and posting of financial securities, and other conditions will be determined through an Agreement, subject to Council approval.

If approved by Council, the forgivable portion of a loan will be provided on the same terms and conditions as the loan except for the following:

- If the Applicant is not otherwise in default of the Agreement, loan forgiveness will occur at the end of the loan term in the form of a grant.
- Forgiveness shall not be pro-rated if the Applicant vacates the space prior to the end of the loan term.
- In order to earn the forgiveness, the Applicant shall:
    - Occupy the development to which the loan applies for the entire loan term; and
    - Realise GHG reductions, as outlined in the Agreement.

Loan Payment

Loan repayment, in addition to any interest or other fees, is payable in accordance with the Agreement.

6.4. Application and Review Process

This CIP will be administered by the City's Planning and Building Department. There is no application fee for any of the incentive programs.

The Planner will be the initial point of contact for Applicants interested in seeking incentives under this CIP. The Planner will coordinate the review of the application within the City, which may include:

- City staff from City Planning Strategies, Development and Design, Economic Development, Environment, Finance, Revenue, Legal, and other service areas as appropriate.

- Members of the City's Leadership Team: City Manager/Chief Administrative Officer and the Commissioners of Community Services, Corporate Services, Planning and Building, and Transportation and Works.
- City Council and Committees of Council, as applicable.

The application and review process comprises the following key steps:

- **CIP Pre-application Form** – Applicant provides the City with information about the proposed project.
- **Pre-application Meeting** – Applicant and City staff meet to review preliminary concepts and project eligibility.
- **Eligibility** – City staff determine project eligibility based on information provided by the Applicant.
- **CIP Application** – if the project is eligible and the Applicant proceeds to apply, a detailed application form is submitted. The application is circulated to relevant staff for review and comment. If staff confirm that it satisfies the intent of the CIP and merits incentive(s), Finance staff will undertake a financial analysis of the requested incentive(s) to determine the impact to the City Budget.
- **Recommendation Report** – once staff have completed their review, a Recommendation Report will be brought to the Planning and Development Committee for discussion.
- **Council Decision** – if the application is recommended for approval by the Planning and Development Committee, it will advance to Council. Upon Council approval, an Agreement will be prepared by the City's Legal staff and be entered into by the City and the Applicant.
- **Development Approval Process** – the project will follow the standard development approval process.
- **Reimbursement** (if applicable) – grants issued in accordance with the enacted Agreement.

The details and structure of individual incentives will be determined on a case-by-case basis, subject to Council approval. The level of incentives available to successful Applicants may be based on the following factors, among others: location within the CIPA, type of development, quality of the proposal, public benefit, and alignment with the strategic priorities of the City. If Council approves any incentives for a project, they must be secured through a legally binding Agreement.

There is no seed funding allocated to this CIP. Incentives that require funding, capital or other, require Council approval informed by a comprehensive financial review. Financial reviews should be timed to occur as part of the City's standard budget process, however since the CIP is application driven, this may not always be possible.

Once a CIP application is approved and an Agreement is executed between the City and the Applicant, the City is obligated to continue any payments as set out in the Agreement provided that the Applicant is in compliance with the Agreement.

6.5. Financial Incentives Agreement

Applicants will be required to enter into a legally binding Agreement with the City, registered on title, in order to secure any approved incentives. The Agreement will set out the terms and conditions of the incentive(s), as applicable.

The terms and conditions identified below are for information purposes only. Individual legal agreements will likely be subject to provisions beyond those listed.

- The City reserves the right to require the submission of any additional documentation or enter into any additional agreements as deemed necessary by the City to ensure the goals and purpose of this CIP are met.
- The City is not responsible for any costs incurred by an Applicant in relation to the program, including, without limitation, costs incurred to apply for the CIP or in anticipation of receiving an incentive.
- The combined total of all City incentives approved for any one project through this CIP or any other City program, in conjunction with any matching grants or other CIP incentives from the Region may not exceed the total cost of the project, where the total cost of the project includes:
    - Construction costs as shown by the main building permit associated with the project; and
    - The costs of associated studies and surveys, development of plans and specifications, implementation and administration of the project including staff and professional service costs for architectural, engineering, legal, financial, and planning services.
- The subject property must not be in a position of tax arrears at any point in time commencing with the time of CIP application and throughout the duration of an executed Agreement. The subject property, and any other property(ies) owned by the Applicant within the city, must be in good standing with respect to all municipal taxes, fees, and charges.
- The Applicant may not be in litigation with the City.
- Incentives cannot be applied retroactively. Applicants are encouraged to apply as early as possible. Costs, fees, and charges incurred prior to CIP application submission are not eligible for CIP assistance.
- The project shall be in conformity with Mississauga Official Plan, the Zoning By-law, and other planning requirements and approvals at both the local and regional levels.
- The subject property must not be subject to any outstanding work orders and/or orders or requests to comply from any municipal or provincial entity.
- All improvements made to buildings and/or land shall be made pursuant to a Building Permit and/or other required permits, and constructed in accordance with the Ontario Building Code and all applicable zoning requirements and planning approvals.
- Municipal inspection requirements to ensure activities subject to the incentives conform with municipal approvals and the Agreement.
- Works, actual or estimated costs, and any associated supporting documentation/studies may be subject to audit or independent review by a third party qualified consultant, at the sole cost of the Applicant, to determine eligibility in accordance with this CIP, to the satisfaction of the City.
- Protocol governing communications between the owner/Applicant and the City, including notification procedures where there is a change in ownership of the subject property.
- Municipal recourse should the project be converted to an ineligible use or demolished, except to expand an eligible use.
- Municipal recourse should the Applicant cease doing business at the subject property.
- Any applicable interest or other fees and charges on loans and/or deferred payments under any of the CIP incentive programs.
- If during the course of the project, the scope of work changes along with associated costs, the City reserves the right to amend or cancel the terms of the incentive to reflect any changes in GFA occupied by eligible use(s) or user(s).
- Once a CIP application is approved and an Agreement is executed between the City and the Applicant, the City is obligated to continue any payments as set out in the Agreement provided that the Applicant is in compliance with the Agreement.

- It is the sole responsibility of the Applicant to satisfy the City that they are in compliance with the Agreement. Failure to do so will result in recourse and/or conditions.
- Incentives are not transferable and are only available to the Applicant that signed the original application and executed Agreement, unless authorized by the City in accordance with the terms of the Agreement.

7. Implementation

7.1. Activation

This CIP shall come into effect upon the expiry of the appeal period following Council's approval of the CIP Implementing By-law. Applications for the CIP incentive program(s) may only be submitted once the CIP is in full force and effect.

7.2. Marketing

Marketing of the CIP may occur through a number of means, including but not limited to:

- Website content on one or more City webpages.
- Print media including newspaper advertisement, program notice distribution to eligible properties, brochures, and/or press releases.
- A targeted social media campaign (e.g. Twitter, LinkedIn) and email communications to key stakeholders.
- Coordination with the Economic Development Office's marketing strategies, including:
    - Potential alignment with IDEA Mississauga – Mississauga's entrepreneurship and innovation market identifier and community;
    - Development and launch of a Lakeview marketing campaign including event(s) centered around increasing the awareness and potential of the Innovation District;
    - Pursuit of key strategic partnership development opportunities and investment preparation activities to prime the site for investment attraction; and
    - Issuance of Request for Expression of Interest to the market.
- Meetings with key stakeholders including property owners, industry representatives, and other interest groups.

7.3. Monitoring

Monitoring of the CIP, program participation, and performance will be conducted by the Planning and Building Department to provide the basis for recommendations regarding program design and funding. Reports will be presented to Council biannually, at a minimum.

The monitoring program is proposed to include the following items:

- **Inquiries:** number and type received.
- **Applications:** number and type received, completion of projects.
- **Assessment:** increases in assessment values, the City's total tax base, and property tax revenue.
- **Building permits:** number and value of permits issued.
- **Job creation:** increases in full-time and part-time employment.
- **Environment:** GHG reductions.

- **Development:** hectares of land redeveloped, GFA constructed, value of private sector investment leveraged.
- **Incentives:** value of approved incentives, duration of approved incentives.

Monitoring results will be used to improve the CIP by recommending adjustments to eligibility requirements and the administration process. The City may periodically review and adjust the terms and requirements of the incentive programs, or discontinue incentive programs as outlined in the following section.

7.4. CIP Review and Amendments

The CIP will be reviewed prior to the expiry of the Implementing By-law for this CIP to determine whether it should be extended, with or without amendment, or expire.

In the event that this CIP, or any portion thereof, is repealed or expires, the terms and conditions of any executed Agreement(s) will remain active and valid.

Minor and technical amendments (e.g. correcting typographical errors) may be made without Council approval. Major and substantive amendments (e.g. CIPA boundaries, new incentive programs, eligibility criteria) may be made by amendment, subject to the statutory process under the *Planning Act*. Notwithstanding, the City may discontinue any of the programs contained in this CIP without formal amendment.

Planning and Development Committee

ITEM 6.7

Lakeview Innovation District Community Improvement Plan (CIP)

May 29, 2023

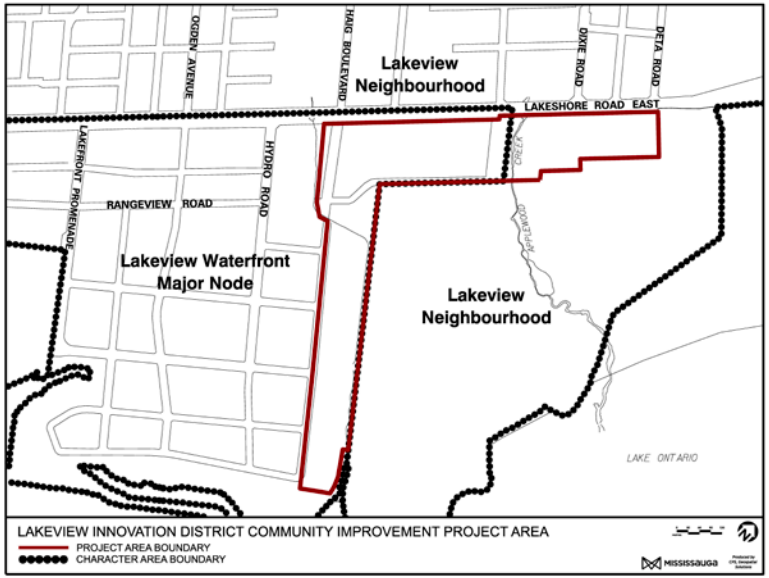
MISSISSAUGA

Outline

1. Overview
2. Targeted Uses
3. Incentive Programs
4. Eligibility Criteria
5. Application Process
6. Next Steps

Overview

- Community Improvement Project Area currently in effect
- “But for” provision of incentives, targeted uses will not locate here
- Proposing initial term of 7 years
- Applications, including associated funding, require Council approval



Targeted Uses

- Economic Development **Key Sectors**
  - Clean Technology
  - Information & Communications Technology
  - Life Sciences
- **Low-Carbon** Technologies & Energy Systems
  - Develop and/or implement technologies or energy systems that decrease GHG emissions

Incentive Program	Key Sectors	Low-Carbon
Tax Increment Equivalent Grant (TIEG)	☑	✓
Development Charge (DC) Deferral	☑	✓
Municipally Funded Parking	✓	☒
Municipal Property Acquisition & Disposal	✓	✓
Capital Loan	☒	✓

☑ - structured program ✓ - flexible program ☒ - not applicable

Eligibility Criteria

- Located in Innovation District
- Increased assessment value
- Not in a position of tax arrears
- Conforms to all municipal by-laws, policies, procedures, standards, and guidelines

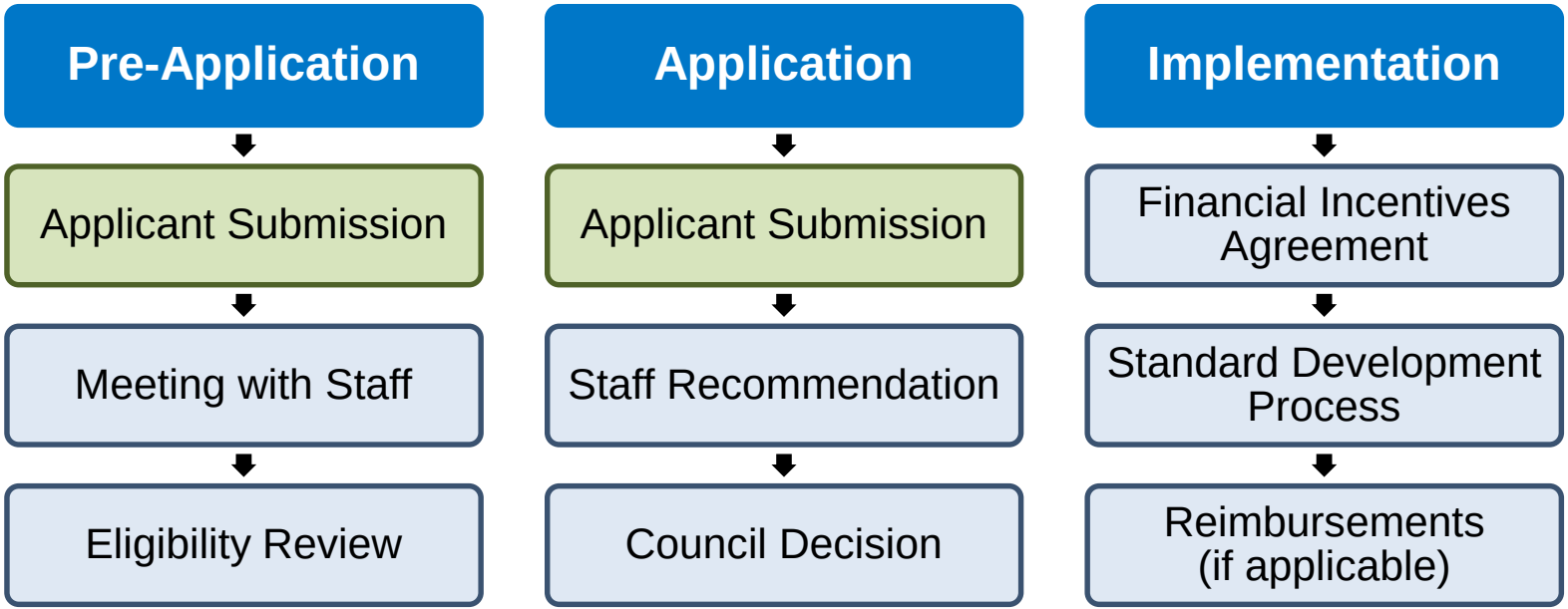
Key Sectors

- Minimum 2,000 m^2 Key Sector GFA
- Minimum 100 Key Sector jobs
- Minimum 3 storeys

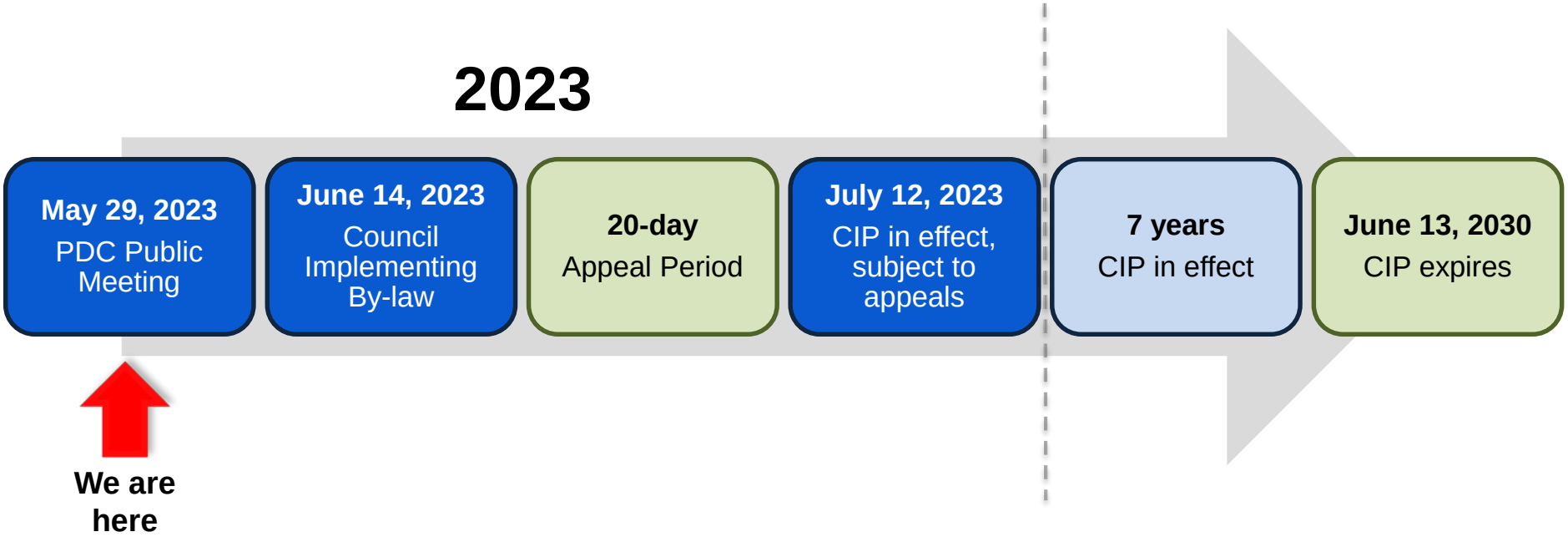
Low-Carbon

- Support City's GHG reduction goal
- Supply or utilize low-carbon energy sources

Application Process



Next Steps


2023
May 29, 2023
PDC Public Meeting
June 14, 2023
Council Implementing By-law
20-day
Appeal Period
July 12, 2023
CIP in effect, subject to appeals
7 years
CIP in effect
June 13, 2030
CIP expires
We are here

Planning and Development Committee

ITEM 6.7

Lakeview Innovation District Community Improvement Plan (CIP)

May 29, 2023

MISSISSAUGA