

Terms of Reference (ToR)

Dundas Connects Land Use Compatibility

In 2018 the City of Mississauga Council endorsed the Dundas connects Master Plan (DCMP). Among the endorsed DCMP recommendations are parcels identified for potential conversion from existing employment land uses to an “Employment Mixed Use” designation. This would permit sensitive land uses such as residential, where appropriate, in proximity to established employment areas. The Terms of Reference (ToR) in this document is intended to set out a criteria for the City of Mississauga (the City) to assess land use compatibility for any land use conversions, in line with the DCMP recommendations.

Prior to the DCMP, the City introduced in 2017 an Interim Control By-Law (ICBL) 0012-2017 to temporarily restrict certain land uses within the Dixie Employment Area and parts of the Mavis-Erindale Employment Area. This was in order to carry out a review of Official Plan policies and zoning regulations for development of sensitive land uses within the Dundas-Dixie and the Mavis Erindale Employment Areas. The lands subject to the ICBL extend beyond those within the DCMP; however the ICBL provides relevant context for the development of this ToR.

This land-use compatibility ToR considers air quality (including odour), noise and vibration impacts. The scope of the ToR is limited to parcels within the DCMP that are recommended for “Employment Mixed Use” development. Those lands are shown in Figure 5-3 Land Use Concept Plan of the DCMP.

Redevelopment of the identified parcels in the DCMP, introduction new sensitive land uses in proximity to established employment areas, may result in adverse impact not only on the new sensitive land uses, but may also restrict future employment expansions and operations. As such, assessment of air quality, noise, and vibration impacts on proposed new sensitive developments is required to ensure feasibility of development through design and/or implementation of appropriate mitigative measures. It is also necessary to take into account future plans of the surrounding employment uses to avoid undue limitations on established operators.

The ToR is based on a high-level qualitative rating of existing employment uses located in the identified Employment Areas and the Western Business Park that are within and in proximity to the DCMP. The ToR is intended to assist developers in scoping and preparing appropriate and relevant studies for air quality, noise and vibration impacts for submission to the City for review and approval prior to approval of a proposed development.

This ToR is prepared by taking into consideration the Dixie and Mavis-Erindale Employment Land Use Study (Report Date: April 2018) and relevant guidelines and reference documents, including:

Policies and Guidelines

| | |
|-----------------|---|
| General | <ul style="list-style-type: none"> • Environmental Protection Act R.S.O. 1990 Chapter E19 • MECP D-Series of Guidelines for Land Use Compatibility • Mississauga Official Plan Policies related to Land Use Compatibility |
| Air Quality | <ul style="list-style-type: none"> • Ontario Regulation 419/05 (Air Pollution – Local Air Quality) • Ontario Regulation 347/12 (Registration Under Part II.2 of the Act - Automotive Refinishing) • Ontario Regulation 1/17 (Registrations under Part II.2 of the Act – Activities Requiring Assessment of Air Emissions) • Air Contaminants Benchmarks List: Standards, Guidelines and Screening Levels for Assessing Point of Impingement Concentrations of Air Contaminants • Ontario’s Ambient Air Quality Criteria - Sorted by Contaminant Name |
| Noise/Vibration | <ul style="list-style-type: none"> • NPC-300 Environmental Noise Guideline: Stationary and Transportation Sources • NPC-207 Impulse Vibration in Residential Buildings |

For the purposes of this ToR, the subject areas are divided into three Area Classes based on the potential adverse air quality, noise, and/or vibration impacts that the existing uses may impose on nearby lands. . Based on the Area Class and the potential area of influence, the developers are required to complete the appropriate studies to determine the potential adverse impacts on nearby sensitive land uses.

As per the Ministry of the Environment, Conservation and Parks (MECP)’s Land Use Compatibility Guidelines a sensitive land use is defined as a building, amenity area or outdoor space where routine or normal activities occurring at reasonably expected times would experience 1 or more adverse effect(s) from contaminant discharges generated by a nearby facility. The sensitive land use may be a part of the natural or built environment.

Please refer to **Figures 1 to 4** for an overview of the Area Classes of the existing employment uses within the defined Employment Areas in the Mississauga Official Plan (OP) located in proximity to the DCMP (Dixie and Mavis-Erindale Employment Areas, as well as the Western Business Park).

Overview of Area Classes

Class 1 Area – Low Impact

Class 1 Area is characterized by existing businesses with expected ‘low-impact’ ranking for air quality, noise, and/or vibration. These businesses mainly include general automotive repair, sign manufacturing, medical equipment manufacturing, and food production. With respect to potential adverse air quality, noise, and vibration impacts on nearby sensitive land uses, the following may apply to existing employment uses within Class 1 Areas:

- Low probability of fugitive emissions, controlled emission from sources or minor source emissions and/or emission of non-toxic air contaminants and/or low quantity of air emissions;
- Operation/activity related noise likely not audible off property;
- Infrequent movement of products and/or heavy trucks; and
- No ground-borne vibration on property with the exception of that associated with infrequent movement of heavy trucks.

The MECP's *Land Use Compatibility Guidelines*, referred to as *D-Series Guidelines* (1995), classify uses with the above mentioned characteristics as Class I Industry Facilities. Class I Industry Facilities have a potential area of influence of 70 meters and a recommended minimum separation distance of 20 m between the facility and any proposed sensitive land uses. If a proposed development is located within the potential area of influence, a development proponent is required to complete specific studies to determine the potential adverse impacts on nearby sensitive land uses with respect to air quality, noise, and vibration.

Class 2 Area – Medium Impact

Class 2 Area is characterized by existing businesses with a 'medium-impact' ranking for air quality, noise, and vibration. These businesses mainly include, wood kitchen cabinet and counter top manufacturing, wood window and door manufacturing, automotive body, paint and interior repair and maintenance, wholesaler/distributors, soap and cleaning compound manufacturing, and wood container and pallet manufacturing. With respect to potential adverse air quality, noise, and/or vibration impacts on nearby sensitive land uses, the following may apply to existing employment uses within Area Class 2:

- Moderate emissions of air contaminants, emissions of air contaminants with low to moderate toxicity level, and/or medium quantity of air contaminants emitted from point or fugitive emission sources;
- Operation/activity related noise likely not audible off property on continuous basis;
- Frequent movement of products and/or heavy trucks with the majority of movements during daytime hours; and
- Existence of activities / operations that result in ground-borne vibration on property, with potential for perceivable vibration to, on occasion, extend off property.

The MECP's *D-Series Guidelines* classify uses with the above mentioned characteristics as Class II Industry Facilities. Class II Industry Facilities have a potential area of influence of 300 meters and a recommended minimum separation distance of 70 m between the facility and the proposed sensitive land use. If a proposed development is located within the potential area of influence, a developer is required to complete specific studies to determine the potential adverse impacts on nearby sensitive land uses with respect to air quality, noise, and vibration.

Class 3 Area – High Impact

Class 3 Area is characterized by existing businesses with a 'high-impact' ranking for air quality, noise, and vibration. These businesses mainly include, non-ferrous metal rolling, drawing, extruding and alloying industries, plastic manufacturers, and glass product manufacturing from purchased (i.e., recycled) glass. With respect to potential adverse air quality, noise, and vibration impacts on nearby sensitive land uses, the following may apply to existing employment uses within Area Class 3:

- High levels of air contaminant emissions in terms of quantity and emissions of air contaminants with high toxicity level;
- Operation / activity related noise likely audible off property on continuous basis;
- Continuous movement of products and employees during daytime and nighttime hours; and
- Existence of activities / operations that result in ground-borne vibration being frequently perceived off property (including impulse vibration).

The MECP's *D-Series Guidelines* classify uses with the above mentioned characteristics as Class III Industry

Facilities. Class III Industry Facilities have a potential area of influence of 1,000 meters and a recommend minimum separation distance of 300 m between the facility and the proposed sensitive land use. If a proposed development is located within the potential area of influence, a developer is required to complete specific studies to determine the potential adverse impacts on nearby sensitive land uses with respect to air quality, noise, and vibration.

Study Requirements

Based on the *D-Series Guidelines* it is the responsibility of the proponent to carry out the appropriate land use compatibility studies specific to air quality, noise and vibration. Compatibility studies are part of the development review process, and involve site-specific modelling exercises based on the ‘worst case scenario’.

The types of studies required may vary with the particular facility involved. Specific requirements are included in the various documents listed in the Procedure D-1-2, "Land Use Compatibility: Specific Applications", available online: <https://www.ontario.ca/page/d-1-2-land-use-compatibility-specific-applications>

D-Series Guidelines: The intent of the MECP’s *D-Series of Guidelines* is to minimize or prevent encroachment of incompatible land uses through the use of buffers and separation of uses. The guideline delegates responsibility to the planning authorities and requires that the guideline be followed where there is a potential encroachment of sensitive land use onto existing industrial lands and vice versa.

The Guidelines prescribe Minimum Recommended Separation Distances and Potential Areas of Influence based on three industrial classifications (i.e., Class I, Class II, and Class III). The Area of Influence represent the area between industry and sensitive receptors within which detailed technical studies should be completed to demonstrate that the uses are compatible. These studies would typically involve air dispersion modelling and / or noise propagation modelling to determine the potential impacts. Where needed, vibration assessment may also need to be undertaken to determine potential impact.

Air Quality (including Odour)

Screening Level Study: A Screening model can be used to provide a high level assessment of the worst case ground level concentration that could occur from nearby sources of air contaminant emissions. The screening should include a review of Ministry data, and an analysis of existing receptors. The screening should be completed by a qualified licensed professional. If the results of a screen-level assessment indicates exceedances, more detailed air dispersion modelling study is required.

Detailed Study – Air Dispersion Modelling: Dispersion modelling should be conducted in accordance with the MECP’s Guideline A-11: *Air Dispersion Modelling Guideline for Ontario*. The potential areas of influence for various industries within the prescribed setback distances (i.e., 70 m, 300 m and 1,000 m for Class 1, Class 2 and Class 3 areas, respectively) should be mapped out in relation to the proposed development site and assessed as per the MECP’s D-Series Guidelines. Where the proposed development is within the Potential Area of Influence of an industry, an assessment of air quality compatibility should be performed through a detailed air dispersion modelling study. If the proposed development is within the Potential Area of Influence of several industries, the cumulative impact is to be assessed.

The potential air quality impacts of major roadways and/or railways within 500 m of the proposed development should be considered for inclusion in the dispersion modelling study, as applicable.

Determination of the requirements for a dispersion modelling study for transportation-related sources (e.g., road and rail) should be determined by a licensed professional and confirmed by the City.

Dispersion modelling should be conducted in accordance with the MECP's Guideline and incorporate the following project-specific considerations:

- Consideration should be given to large sources in proximity to Lake Ontario. Any active source exceeding 50 m in height within 1 kilometre of the lake should be assessed with an appropriate shoreline fumigation model. Examples of shoreline fumigation models include, SCREEN3, CALPUFF, and Shoreline Dispersion Model (SDM).
- The dispersion modelling study should consider the built forms of each development in the final build-out of the area when determining the impact of building effects. Where no built form has been established, consideration should be given to general building massing when performing the modelling and maximum building heights as per the preferred concept plan.
- All elevated points of reception (e.g., balconies, windows, air handling units) should be included as discrete receptor points within the dispersion modelling.

The results and analysis of the air quality studies are to be peer reviewed by a licensed professional representing the City of Mississauga and review comments / deficiencies are to be addressed prior to issuance of the studies for City's decision making and approval process.

Noise

Screening Level Study:

The MECP has developed industry / equipment specific noise screening tools that can be used to determine the need for a detailed study. The noise screening process (Primary and Secondary Screenings) is applicable for certain industries and only a prescribed list of equipment / processes. If the noise screening study indicates that a proposed sensitive land-use development falls within the minimum setback distance to an industry then a detailed study including noise propagation modelling is to be undertaken. The study is to demonstrate compliance with the applicable noise criteria at the proposed development (cumulative impact).

More information about noise screening is available online: <https://www.ontario.ca/page/primary-noise-screening-method-guide>

Detailed Study – Noise Propagation Modelling

The 2013 Environmental Noise Guideline: Stationary and Transportation Sources (NPC 300 Guideline) is the primary guideline used in Ontario to assess and control noise emissions.

NPC-300 provides sound level limits for stationary sources, such as industries and businesses, affecting receptors in noise sensitive land uses. These limits apply to existing, future, and/or modified stationary sources and are required to be met for the issuance of E.C.A.s under Part II.1 of the E.P.A. The noise limits specific to a stationary source are defined using area classifications (not to be confused with the D-6 industrial classifications), which are based on the nearby receptor's existing acoustical environment. NPC-300 area classifications are as follows:

- Class 1 – An area with an acoustical environment typical of a major population centre, where background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum"
- Class 2 – An area with an acoustical environment that has qualities representative of a Class 1 area

- during daytime hours, and representative of a Class 3 area during evening and night-time hours.
- Class 3 – A rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic.
 - Class 4 – An area or specific site that would otherwise be defined as Class 1 or Class 2 and which:
 - is an area intended for development with new noise sensitive land use(s) that are not yet built;
 - is in proximity to existing, lawfully established stationary source(s); and has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process.

[Note: The above area classifications are directly extracted from MECP's NPC-300 and not all area classes may apply to the subject study areas].

NPC-300 also outlines how to properly assess stationary and transportation noise impacts on proposed noise sensitive developments. Part C of the guideline is intended to provide a common framework for the land use planning authorities, developers, and consultants to address noise impacts on proposed noise sensitive land uses. The objectives of Part C of NPC-300 (which also adheres to the D-Series Guidelines) are to:

1. create a suitable acoustical environment for the protection of users/occupants/residents of the proposed noise sensitive land uses;
2. to protect the lawful operations of any stationary source(s) located close to a proposed noise sensitive land use (stationary sources need to be able to maintain compliance with the legal requirements of their Ministry approval, when the development of new noise sensitive land uses are introduced in their proximity);
3. to protect existing and/or formally approved transportation corridors and transportation sources of noise when the development of new noise sensitive land uses are introduced in their proximity; and,
4. to create compatible land uses and avoid potential adverse effects due to noise.

Preparation of a detailed noise impact study that includes noise propagation modelling and cumulative noise assessment (i.e., includes impact from all industries that fall within the prescribed Area of Influence) is to demonstrate compliance at all proposed receptors. The methodology for noise assessment is to be based on ISO 9613 (Parts I and II) and as per NPC-300.

Vibration

The MECP publication NPC-207 is titled: Impulse Vibration in Residential Buildings (November, 1983) and it is intended to provide an assessment method for determining vibration levels inside occupied residential building that are caused by operation of stationary sources of vibration at industrial facilities (e.g., stamping presses, forging hammers). The publication also provides vibration limits for frequent and infrequent impulses of vibration. The vibration limits are expressed in terms of peak vibration velocity in mm/s and duration of impulses.

Table 1 – Area Classifications and Technical Studies Summary Table

| Area Classes | Description | Area of Influence (m) | Recommended Minimum Separation Distance (m) | Examples of Industries | Technical Studies |
|--|---|-----------------------|---|---|---|
| <i>Class 1 Area – Low Impact</i> | Class 1 Area is characterized by existing businesses with expected ‘low-impact’ ranking for air quality, noise, and/or vibration. | 70 | 20 | General automotive repair, sign manufacturing, medical equipment manufacturing, and food production. | Land use compatibility studies and mitigation measures Air Quality and Odour Screening Level Study Air Dispersion Modelling (if required) Noise Screening Level Study Noise Propagation Modelling (if required) Industrial Vibration Study (if required) |
| <i>Class 2 Area – Medium Impact</i> | Class 2 Area is characterized by existing businesses with a ‘medium-impact’ ranking for air quality, noise, and vibration. | 300 | 70 | Wood kitchen cabinet and counter top manufacturing, wood window and door manufacturing, automotive body, paint and interior repair and maintenance, wholesaler/distributors, soap and cleaning compound manufacturing, and wood container and pallet manufacturing. | Land use compatibility studies and mitigation measures Air Quality and Odour Screening Level Study Air Dispersion Modelling (if required) Noise Screening Level Study Noise Propagation Modelling (if required) Industrial Vibration Study (if required) |

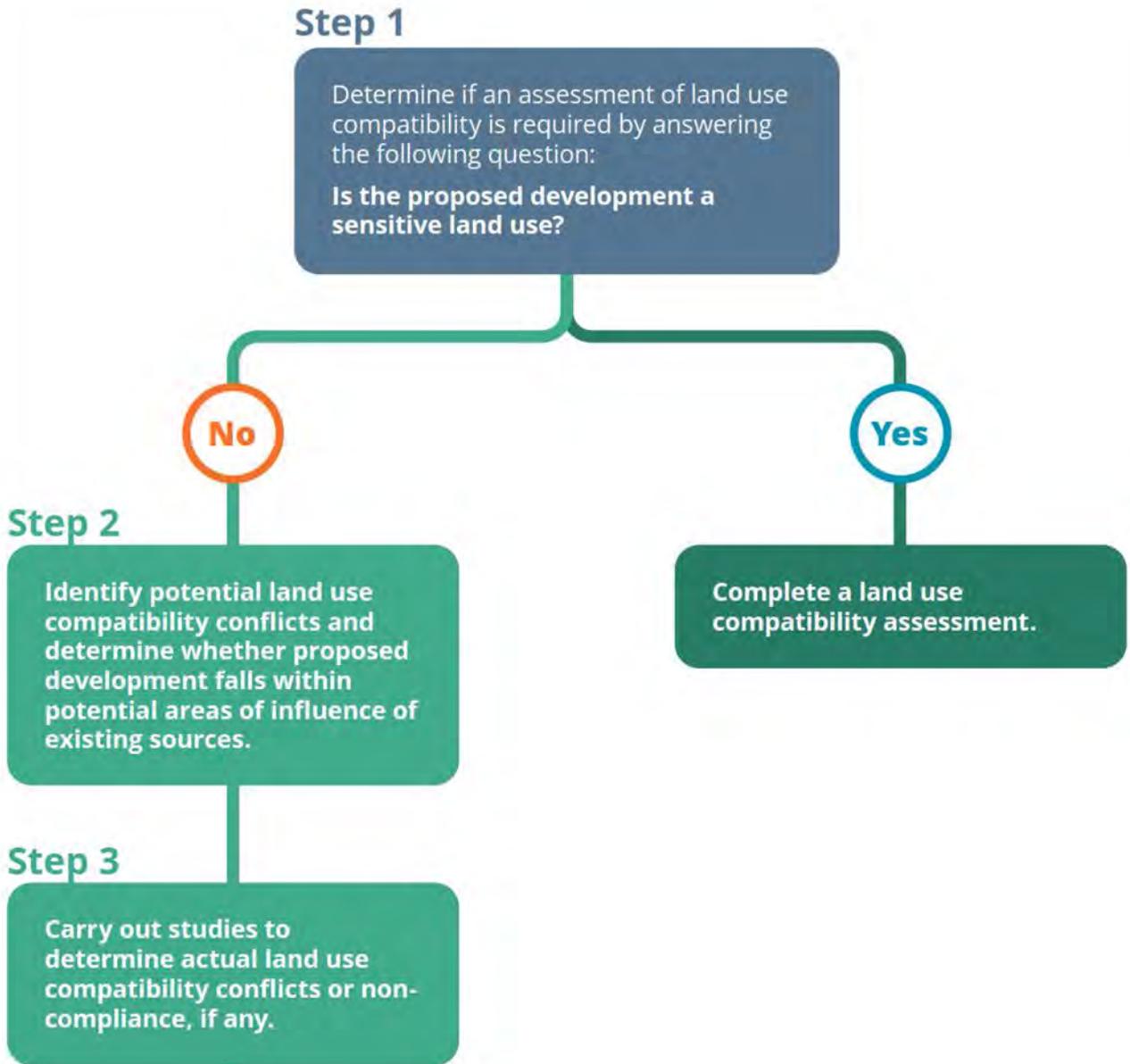
| Area Classes | Description | Area of Influence (m) | Recommended Minimum Separation Distance (m) | Examples of Industries | Technical Studies |
|--|--|-----------------------|---|--|--|
| <i>Class 3 Area – High Impact</i> | Class 3 Area is characterized by existing businesses with a 'high-impact' ranking for air quality, noise, and vibration. | 1,000 | 300 | Non-ferrous metal rolling, drawing, extruding and alloying industries, plastic manufacturers, and glass product manufacturing from purchased (i.e., recycled) glass. | <p>Land use compatibility studies and mitigation measures</p> <p>Air Quality and Odour Screening Level Study</p> <p>Air Dispersion Modelling (if required)</p> <p>Industrial Vibration Study (if required)</p> <p>Noise Screening Level Study</p> <p>Noise Propagation Modelling (if required)</p> |

Development Approval Process

As per the MECP's *D-1-1 Land Use Compatibility: Procedure for Implementation Guideline* City staff may request a third party to carry out specific studies as part of a proposed development when the feasibility to meet Ministry objectives is in question. In addition to meeting Ministry objectives, the City may require the implementation of any necessary mitigation measures as a condition of draft approval. Staff must be satisfied that conditions are met before recommending final approval.

Since guidelines and protocols may change from time to time, it is recommended for developers and their consultants to review relevant provincial guidelines and reference documents with respect to air quality, noise, and vibration, as well as policies related to land use compatibility within the Mississauga Official Plan to ensure that any submitted documents address the applicable requirements. As part of the development application process, a third party should consider the potential adverse impacts of existing uses on nearby sensitive land uses by following the steps outlined in the flow chart presented in **Figure 5**. Any required analysis must also take into consideration potential future expansions of existing employment uses in their studies, when assessing air quality, noise and vibration impacts. This will require discussions initiated by the consultant with the nearby / impacting industries / commercial establishment.

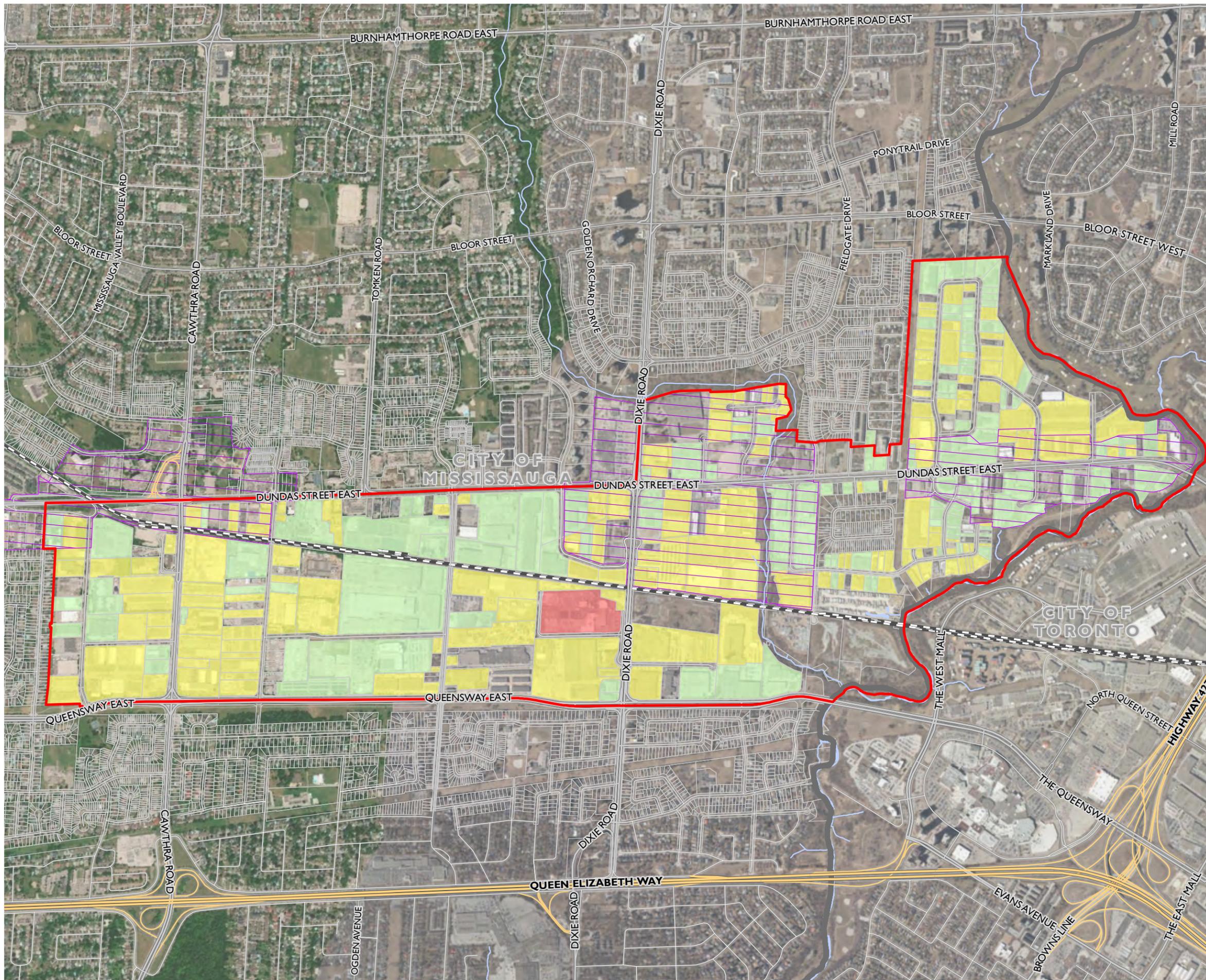
Figure 5 – Development Approval Flow Chart



Examples of commonly applied mitigation / control measures are provided in **Table 2**. The control measures are typically applied to sources of emission; however, there are noise and vibration mitigation measures that can be implemented at receptors, such as, noise barrier wall / berm and building isolations.

Table 2 – Commonly applied control / mitigation technologies

| Impact Type | Impact Specifications | Common Control Measures |
|---|-----------------------------------|--|
| Air Quality | Particulate Matter | Dust collectors / baghouses |
| | | Cyclones |
| | | Electrostatic precipitators |
| | | High temperature ceramic particulate filters |
| | Nitrogen oxides (NOX) | Selective Catalytic Reduction (SCR) |
| | Volatile Organic Compounds (VOCs) | Thermal oxidizers (incinerator) |
| | | Adsorptive technology |
| | Unburned Hydrocarbons | Catalytic converters |
| Carbon monoxide | Catalytic converters | |
| Polycyclic Aromatic Hydrocarbons (PAHs) | Catalytic converters | |
| Noise | Stationary noise sources | Silencers |
| | | Acoustic Louvers |
| | | Acoustic enclosures |
| | | Noise barrier wall |
| | | Noise berm |
| Vibration | Stationary vibration sources | Isolation pads / adsorptive pads |
| | | Foundation isolation |
| Odour | Stationary odour sources | Bio filters |
| | | Odour neutralizing compounds |



**DUNDAS STREET CORRIDOR
MISSISSAUGA ONTARIO**

**FIGURE I
AIR, NOISE VIBRATION EMISSIONS
DIXIE EMPLOYMENT AREA**

- Study Area
 - Railway
 - Municipal Boundary
 - Dundas Connect Focus Area
 - Parcel Boundary
- Qualitative Impact Level**
- Area Class 3
 - Area Class 2
 - Area Class 1

Ranking based on noise, vibration and air quality (including odour).

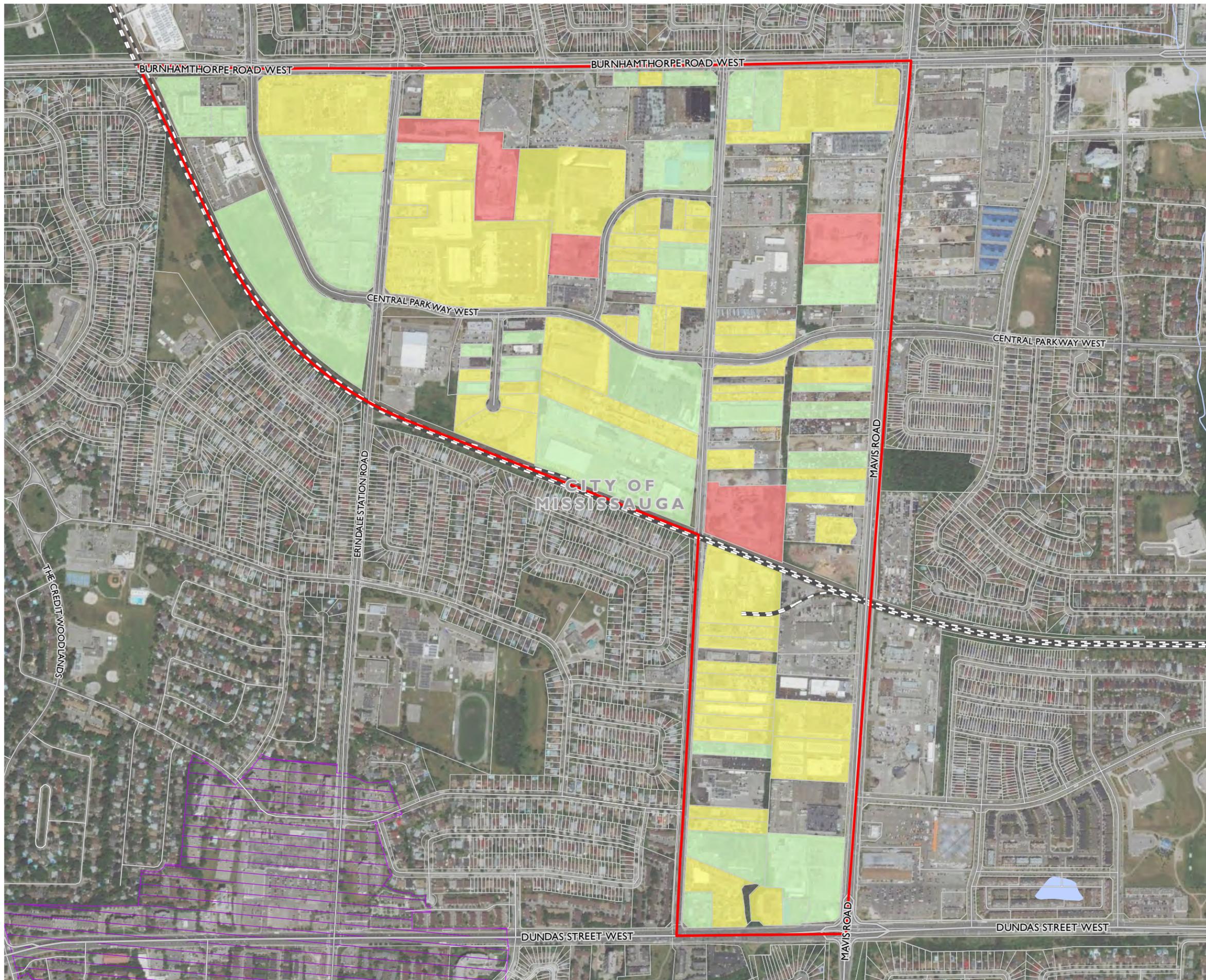


MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: AI
MAP PROJECTION: NAD 1983 UTM Zone 17N



PROJECT: 202856
STATUS: DRAFT
DATE: 2020-10-01



**DUNDAS STREET CORRIDOR
MISSISSAUGA ONTARIO**

**FIGURE 2
AIR, NOISE VIBRATION EMISSIONS
MAVIS ERINDALE EMPLOYMENT AREA**

- Study Area
 - Railway
 - Municipal Boundary
 - Dundas Connect Focus Area
 - Parcel Boundary
- Qualitative Impact Level**
- Area Class 3
 - Area Class 2
 - Area Class 1

Ranking based on noise, vibration and air quality (including odour).

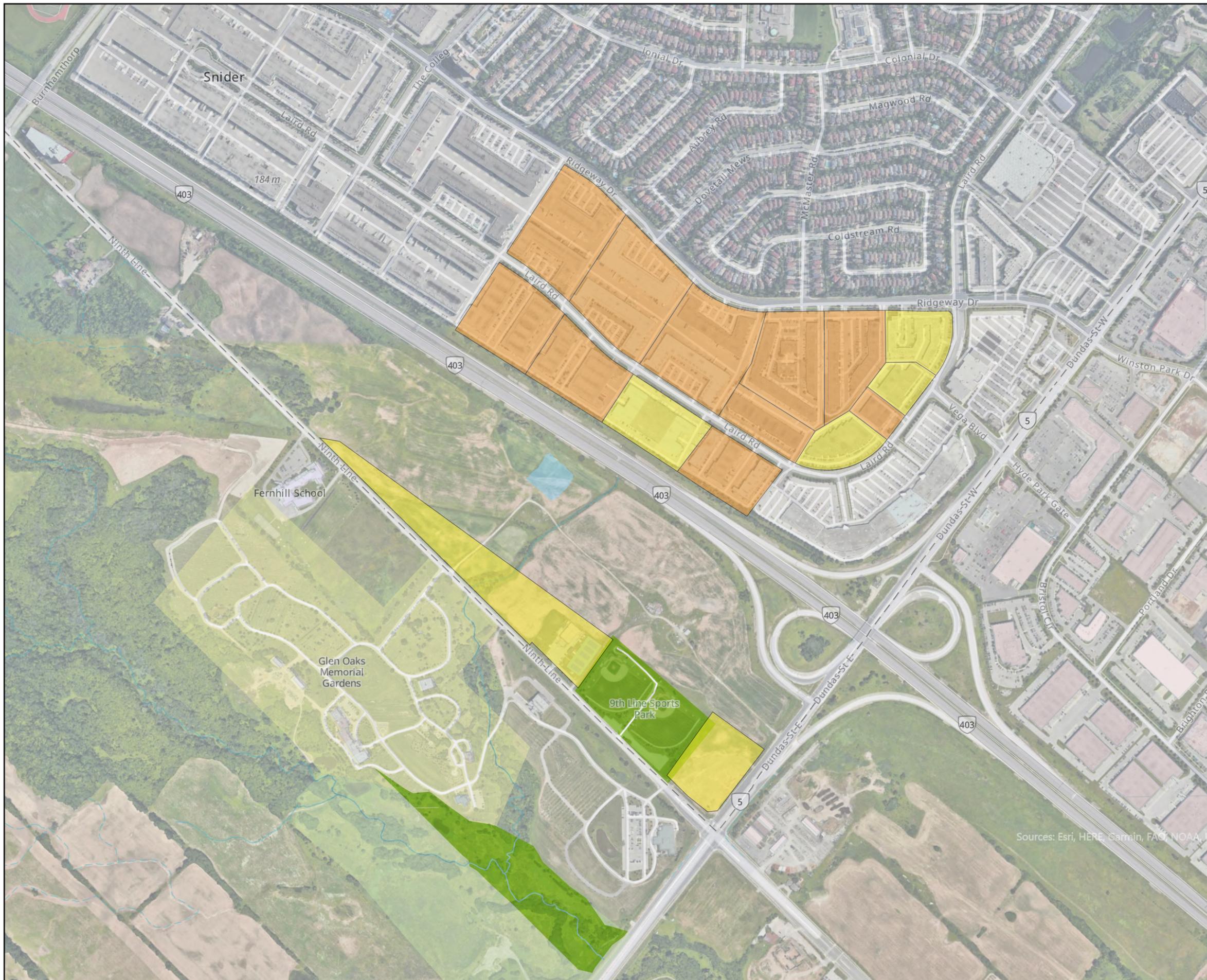


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DATE: 2020-10-01



**DUNDAS STREET CORRIDOR
MISSISSAUGA ONTARIO**

**Figure 3
West of Mavis (Part I)
Mississauga Ontario**

-  Study Area
 -  Railway
 -  Municipal Boundary
 -  Dundas Connect Focus Area
 -  Parcel Boundary
- Qualitative Impact Level**
-  Area Class 3
 -  Area Class 2
 -  Area Class 1



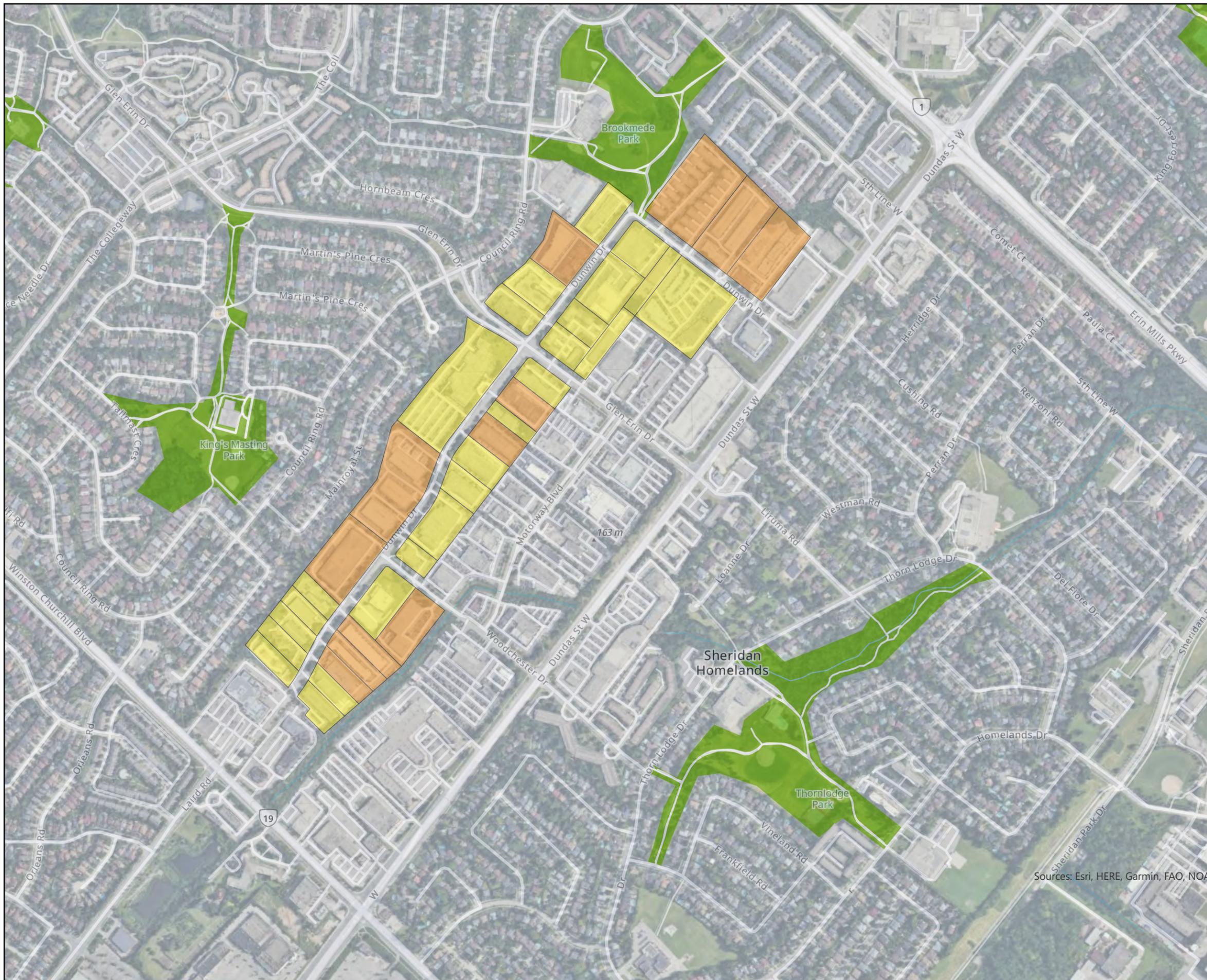
MAP DRAWING INFORMATION:
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MAP CREATED BY: AB
MAP CHECKED BY: AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS



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**DUNDAS STREET CORRIDOR
MISSISSAUGA ONTARIO**

**Figure 4
West of Mavis (Part 2)
Mississauga Ontario**

- Study Area
 - Railway
 - Municipal Boundary
 - Dundas Connect Focus Area
 - Parcel Boundary
- Qualitative Impact Level**
- Area Class 3
 - Area Class 2
 - Area Class 1



MAP DRAWING INFORMATION:
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MAP CREATED BY: AB
MAP CHECKED BY: AB
MAP PROJECTION: NAD 1983 UTM Zone 17N

Sources: Esri, HERE, Garmin, FAO, NOAA



PROJECT: 20-2856
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The definition of sensitive land use as per the MECP is as follows (also available online at: <https://www.ontario.ca/page/d-1-3-land-use-compatibility-definitions>):

Sensitive Land Use

A building, 'amenity area' or outdoor space where routine or normal activities occurring at reasonably expected times would experience 1 or more 'adverse effect(s)' from contaminant discharges generated by a nearby 'facility'. The 'sensitive land use' may be a part of the natural or built environment. Depending upon the particular 'facility' involved, a sensitive land use and associated activities may include one or a combination of:

- i. residences or facilities where people sleep (e.g. single and multi-unit dwellings, nursing homes, hospitals, trailer parks, camping grounds, etc.). These uses are considered to be sensitive 24 hours/day.
- ii. a permanent structure for non-facility related use, particularly of an institutional nature (e.g. schools, churches, community centres, day care centres).
- iii. certain outdoor recreational uses deemed by a municipality or other level of government to be sensitive (e.g. trailer park, picnic area, etc.).
- iv. certain agricultural operations (e.g. cattle raising, mink farming, cash crops and orchards).
- v. bird/wildlife habitats or sanctuaries.