

O-Train Proximity Study Guidelines 2024



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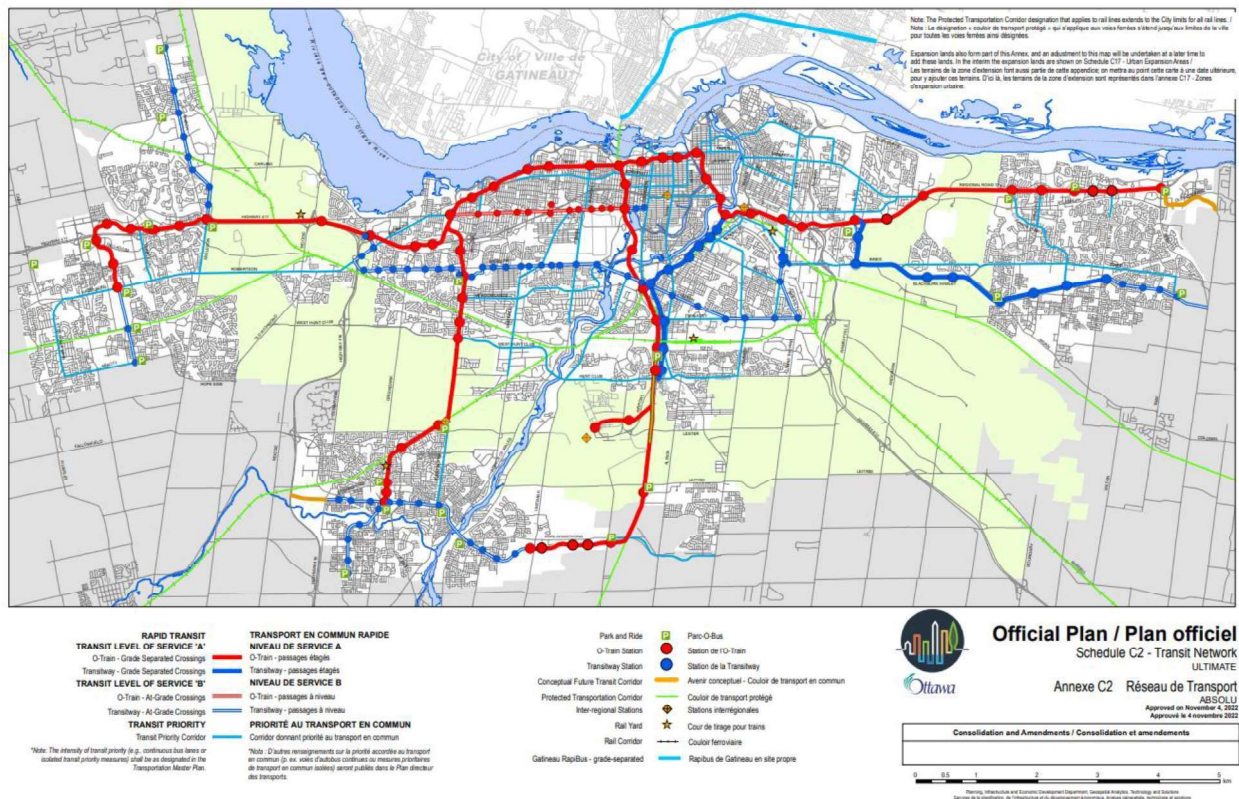
1. Introduction

The O-Train includes the Confederation Line and Trillium Line as well as a number of planned extensions as set out in the Official Plan. The Confederation Line is an electric light rail transit (LRT) facility, with an overhead catenary system. The Trillium Line is a diesel commuter rail facility which, in the future, may be converted to electric power via an overhead catenary system (or other technology). Both the Confederation Line and Trillium Line operate as grade-separated rail rapid transit lines.

When the Stage 2 Light Rail Transit expansion is complete, the Confederation Line will extend from Trim Station in the east to Moodie Station and Algonquin (Baseline) Station in the west. The Trillium Line will extend from Bayview Station in the north to Limebank Station in south, with a link from South Keys Station to the Ottawa MacDonald Cartier International Airport.

The O-Train also includes Stage 3 light rail transit extensions which are planned to extend the Confederation Line south to Barrhaven and west to Kanata and Stittsville. These projects are currently in the planning phase. Other rail transit expansion projects may also be pursued in the future, including potential introduction of grade separated and at-grade light rail transit operating within roadway corridors or Protected Future Transportation Corridors. **Figure 1** illustrates the O-Train (existing and planned) within the context of the City's planned ultimate rapid transit system.

Figure 1: City of Ottawa Ultimate Rapid Transit Network, including O-Train lines and Protected Transportation Corridors (Official Plan Schedule C2)



The City is promoting development in proximity to the O-Train to support achievement of the City's land use planning and transportation objectives (including, but not limited to, transit-focused/oriented development and 15-minute neighbourhoods). The review of a proposed development's merits in helping the City achieve these objectives is included as part of the development review process when an Applicant makes an application for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment.

At the same time, the City must ensure that development in the immediate vicinity of the O-Train occurs in a coordinated manner and does not compromise O-Train and transit infrastructure, operations and maintenance, the construction of future expansions or upgrades of the O-Train, or present risks to public health and safety. Developments should not unduly impact transit customer convenience, passenger flow, safety and security, or accessibility during construction and once operational.

The City has established a Development Zone of Influence (DZI) based on O-Train alignment and its infrastructure, facilities, geotechnical conditions and the depth and design of rail structures. The DZI is generally shown in Appendix A of these guidelines and is contained in Annex 2 of the Official Plan.

The Proximity Study Guidelines apply when an Applicant makes an application for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment with respect to lands which are wholly or partially within the DZI and lands wholly or partially within twenty (20) metres of a property line abutting a Protected Transportation Corridor. For proposed developments to which these Proximity Study Guidelines apply, the City requires all Applicants to submit Proximity Studies in support of applications for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment.

In addition, recommendations and requirements of the Proximity Studies may be included as conditions of approval of a Site Plan or Plan of Subdivision. These Proximity Study Guidelines are intended to be read in their entirety and consulted by Applicants at the very early stages of their projects.

2. Proximity Study Scope and Purpose

The purpose of a Proximity Study is to demonstrate that proposed developments wholly or partially within the Development Zone of Influence are designed and built in a manner that protects the integrity of the O-Train, during the construction of the development and throughout its lifecycle. The Proximity Study also addresses other risks to the development and its use and occupation as a result of its proximity to the O-Train including potential safety, noise and vibration risks.

For developments to which these Guidelines apply, Proximity Studies must also demonstrate that developments are designed and built in a manner that allows the City to cost-effectively expand the O-Train and build future rail transit in Protected Transportation Corridors, in

addition to operating and maintaining it once it is built. Timing of proposed developments will also be reviewed to ensure potential conflicts between proposed development and light rail transit construction activities (including the need for transit detours) can be managed effectively.

The aspects of the O-Train that may require consideration in a Proximity Study include the following structures and infrastructure:

- Below grade and elevated running structures (e.g. tunnels, box structures and bridges);
- Track and Guideway, including below grade, at-grade and elevated segments;
- O-Train stations (multimodal) including platforms, concourses, entrances, public access and egress, emergency access and egress, vertical circulation, mechanical/electrical, service rooms, fare control and fare paid zones, amenities, public art installations, signage, wayfinding (e.g., Algonquin Wayfinding Wheel), lighting, landscaping, retail spaces, sidewalks, and adjoining walking and cycling facilities;
- Provision of utilities, services and associated infrastructure to the Guideway and O-Train stations;
- Transit plazas, bike storage and parking;
- Access, egress, parking and turning circles for maintenance and operations of the O-Train;
- Construction laydown areas and construction working zones;
- Bus terminals (bus loops, bus stops, operator/supervisor buildings and lay-up areas), passenger pick-up and drop-off areas and Park and Ride lots associated with an O-Train station;
- Pedestrian and cycling facilities, infrastructure and connectivity;
- Traction power substations and overhead catenary system;
- Rail systems including signaling and train control and communication systems;
- Fire/life safety and emergency response features;
- Station and tunnel ventilation shafts and access shafts and associated infrastructure; and,
- Maintenance facilities and other ancillary facilities.

The Proximity Study will be required to examine and assess the following:

- The risk of structural settlement and/or damage to the O-Train;
- The risk of liability/litigation from damage to the O-Train;
- The potential impact on access and egress to O-Train for use, operation, maintenance, repair and replacement of O-Train infrastructure and assets;
- The risk of operational impacts resulting from construction of the development;

- Protection of current and future O-Train needs, including (without limitation): fire ventilation, station ventilation, additional exits, accessibility for persons with disabilities, and other operational requirements;
- The risk of encroaching on a location required for future O-Train works or operational requirements; and,
- The potential for increased risks, difficulty or cost of constructing the O-Train or expanding rail transit in Protected Transportation Corridors.

As noted in the Introduction to these Guidelines, an assessment of the manner in which development has been designed to support transit infrastructure and to support the realization of transit-focused/oriented development will be undertaken as part of the development review process. The purpose of the Proximity Study is to demonstrate that the proposed development will be undertaken in such a way as to provide protection to the O-Train, including with respect to its alignment, its assets, infrastructure and any existing or future operational requirements related to OC Transpo or the O-Train, which includes OC Transpo's current and future bus system where it connects to the O-Train at light rail stations.

Applicants should relate the contents of the Proximity Study to the O-Train system's components and risk factors, as articulated above. The City's review of the Proximity Study will focus on planning considerations as well as technical considerations such as construction methodology, O-Train infrastructure and possible coordination of the project with future transit plans. Details of any mitigation required to address possible impacts during and after construction must be identified.

The requirements of the Proximity Study will vary depending on the nature of the development proposal and the proximity to key features of the O-Train.

Development in proximity to Rail Corridors where there are active rail operations currently being undertaken by other railways and/or railway operators, including operators providing passenger and freight rail services, or where there is a regulatory requirement to accommodate rail freight or a reasonable prospect of rail freight operations resuming, will also be required to demonstrate alignment with the Federation of Canadian Municipalities-Railway Association of Canada Guidelines for New Development in Proximity to Railway Operations (the "FCM-RAC Guidelines") and may require additional analysis or studies, in addition to the Proximity Study requirements described in this document. Railway operators include CN, CPR, VIA Rail Canada, and other short line railways that operate within the City limits. Development in proximity to Rail Corridors owned by the City and retained by Capital Railway may also be required to demonstrate alignment with the FCM-RAC Guidelines.

2.1 TRILLIUM LINE SPECIFIC REQUIREMENTS

The Trillium Line, which is situated primarily within an existing railway corridor purchased from a predecessor railway company, operates as a federally regulated railway in accordance with a Certificate of Fitness issued by the Canadian Transportation Agency. The City of Ottawa's regulatory obligations with respect to the Trillium Line may, from time to time, produce requirements over and above those described in these Proximity Study Guidelines.

As an example, a segment of the Trillium Line Guideway between Walkley Diamond (north of Greenboro Station) and a point just south of Lester Road supports freight rail movements to and from the National Research Council of Canada (NRC) Automotive and Surface Transportation Research Centre. As such, this segment of the Trillium Line Guideway is identified in the City's Official Plan as having additional safety requirements for any proposed development adjacent to this segment of the Guideway based on the principles of the FCM-RAC Guidelines.

The Trillium Line is primarily a single-track railway and is currently operated by trains using diesel technology. Developments proposed within the DZI must be reviewed to ensure that sufficient horizontal and vertical clearances are maintained to protect for future double-tracking and electrification of the Trillium Line.

2.2 CONFEDERATION LINE SPECIFIC REQUIREMENTS

The Confederation Line, which is situated within a railway corridor assembled by the City of Ottawa, operates in accordance with an agreement concluded between the City of Ottawa and the federal Minister of Transportation which authorizes the City of Ottawa to regulate certain matters covered by the *Canada Transportation Act* and the *Railway Safety Act*. The City of Ottawa's regulatory obligations with respect to the O-Train may, from time to time, produce requirements over and above those described in these Guidelines.

3. Levels of Review

The City has established three (3) levels of Proximity Study technical requirements based primarily on the proximity of the proposed development to the O-Train or a Protected Transportation Corridor and anticipated impacts, with Level 1 being the lowest risk of potential impacts on the O-Train or Protected Transportation Corridor, Level 2 indicating higher risk for potential impacts to the O-Train and Level 3 indicating the highest risk of potential impacts to the O-Train, including where integration with the O-Train or crossings of the Guideway are proposed or required.

Level 1 includes 1A and 1B. Level 1A captures developments on lands wholly or partially within the DZI where minimal impact on O-Train system is anticipated and includes (but is not limited to) lands wholly or partially within the DZI in proximity of those portions of the O-Train which are not currently in operation, under construction, or part of any project currently underway in the City of Ottawa at the time the relevant application for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment is made. Level 1B captures development on lands wholly or partially within twenty (20) metres of a property line adjacent to a Protected Transportation Corridor. Levels 2 and 3 refer to developments wholly or partially within the DZI in proximity to the O-Train where sufficient design detail for the O-Train is known and can be used to assess the potential impacts of the proposed development on the O-Train.

Table 1 identifies the levels of review. The subsequent sections of the Guidelines identify the technical requirements for each type of Proximity Study.

Table 1: Levels of Review

Level of Review	Proximity and Expected Impact
1	<ul style="list-style-type: none"> • Level 1A: Development wholly or partially within Development Zone of Influence, minimal impact on O-Train system anticipated including (but not limited to) development in proximity to those portions of the O-Train which are not currently in operation, under construction, or part of any project currently underway in the City of Ottawa at the time the relevant application for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment is made. • Level 1B: Development wholly or partially within twenty (20) metres of a property line adjacent to a Protected Transportation Corridor.
2	<p>Development wholly or partially within Development Zone of Influence, substantial impact on O-Train system anticipated, for example developments that have the potential to:</p> <ul style="list-style-type: none"> • change the loading conditions on an O-Train system element; • create unbalanced lateral earth pressure on an O-Train element; or • impact construction, transit operations (including, without limitation, bus operations within O-Train station areas), maintenance, repair or replacement.
3	<p>Development on, over, under the Guideway or an O-Train station or within approximately 1 metre of the Guideway or an O-Train station, and/or which requires approval of the City and legal agreements such as entrance connection agreements, crossing agreements, cost sharing agreements or other legal arrangements on lands which the City has an interest.</p>

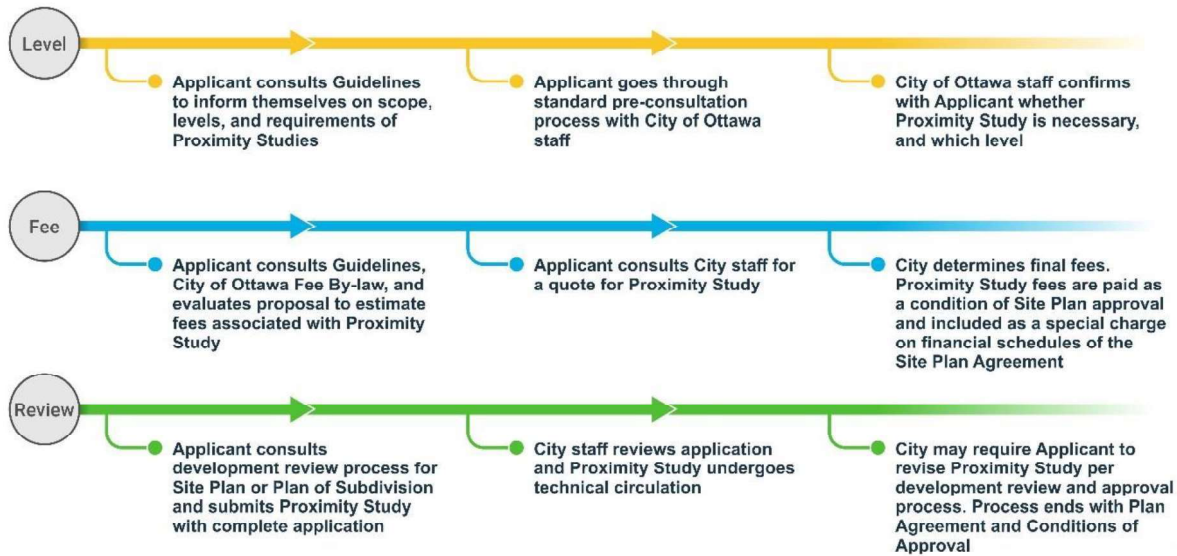
4. Process

A Proximity Study is to be undertaken by an applicant submitting an application for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment within the Development Zone

of Influence, or wholly or partially within twenty (20) metres of a property line abutting a Protected Transportation Corridor.

The DZI area varies depending on the O-Train system footprint and anticipated future O-Train requirements. The Proximity Study identifies the key feature of the development, impacts and risks as it relates to the O-Train’s assets, infrastructure, utilities, construction, maintenance, repair, replacement and operations or as it relates to Protected Transportation Corridors.

Figure 2: Proximity Study – General Process



At the pre-application consultation stage of the application for an approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment, the City will categorize the level of review based on the available information about the proposed development and conceptual drawings provided by the Applicant. The City will also identify the specific technical requirements for the Proximity Study, based on section 5 and 6 of these Guidelines.

Applicants will submit the Proximity Study as part of an application for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment. The review of a Proximity Study will be undertaken as a technical circulation within the City as part of the development review process and will include all relevant City departments and relevant third parties such as light rail contractors, maintainers or operators. Additional information on the proposed development may be requested during the review process, based on the Proximity Study submitted. In the event that new or additional information becomes available, the City may require the Applicant to provide a higher level of Proximity Study for review.

The information provided in the Proximity Study may result in the inclusion of conditions of approval of a Site Plan or a Plan of Subdivision to protect the O-Train or Protected Transportation Corridor and/or to ensure that the development is constructed in such a way as to mitigate any impacts of the development on the O-Train or Protected Transportation Corridor. In addition to any conditions arising from the City’s review of a Proximity Study, the City’s conditions of approval for developments wholly or partially within the DZI may also include requirements to coordinate construction activities with O-Train construction. Section 5

of the Guidelines identifies a non exhaustive list of common potential conditions of approval of a Site Plan or Plan of Subdivision related to matters identified as a result of a Proximity Study.

Prior to the City releasing technical information, including plans or drawings, with respect to the O-Train, the City may require that the Applicant, its advisors, lenders and any consultants preparing the Proximity Study or who will have access to the information to execute a Non-Disclosure Agreement.

5. Proximity Study Submission Requirements

This section identifies the technical requirements for each level of Proximity Study. Some of the technical requirements of Proximity Studies are not new documents or studies, rather, they may involve the submission of additional transit-specific information within documents or studies that are already required for applications for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment. The Guidelines include transit-specific requirements for the submission requirements of each level.

For all levels of review, the City reserves the right to ask for additional information, beyond what is identified in this section, based on the specifics of the application for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment. Additionally, depending on the project complexity, site, and timelines, the City may permit some Proximity Study requirements to be deferred to a future stage of the development approvals process or to be addressed through the review process and/or included as conditions of approval of the Site Plan or Plan of Subdivision. These requirements would be identified during the pre-consultation phase and/or development review process.

5.1 LEVEL 1 REQUIREMENTS

Table 2 identifies the technical requirements for Level 1 Proximity Studies. Level 1 Studies consider developments which, for Level 1A are located wholly or partially within the DZI but are anticipated to have low potential for impacts to the O-Train (examples of which can include minor site alterations, low-rise development with no deep foundations), or for Level 1B are located wholly or partially within twenty (20) metres of a property line abutting a Protected Transportation Corridor. As illustrated in **Table 2**, there are often no new documents or reports required for Level 1 Proximity Studies. Transit-specific information (listed in the second column of the table) can be included within the general documentation that the City requires for an application for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment (left column of the table).

Table 2: Level 1 Proximity Study Requirements

General Submission Requirements	Transit-Specific Requirements	1A (O-Train)	1B (Protected Transportation Corridors)
<p>Site Plan (or Plan of Subdivision) of the development</p> <p>A sketch may be required in connection with a Zoning By-law Amendment Application.</p>	<ul style="list-style-type: none"> • Illustrate clearances from the O-Train or Protected Transportation Corridor 	Required	Required
<p>Floor Plans for the development (Site Plan Application only)</p>	<ul style="list-style-type: none"> • Provide Floor Plans for ground level and any underground levels, and illustrate clearances from the O-Train or Rail Corridor • Provide Floor Plans for levels above ground where the O-Train is or will be above ground (e.g. elevated Guideway, overhead pedestrian crossing, etc.) 	Required	Not Required

General Submission Requirements	Transit-Specific Requirements	1A (O-Train)	1B (Protected Transportation Corridors)
Development cross-section (Site Plan Application only)	<ul style="list-style-type: none"> Locate the O-Train or Protected Transportation Corridor relative to the development, including underground storage tanks, services, structures, etc. 	Required	Required
Geotechnical Report prepared in accordance with the City's Geotechnical Investigation and Reporting Guidelines for Development Applications	<ul style="list-style-type: none"> Provide high-level description of foundation design and construction methods 	Required adjacent segments of the O-Train currently in operation, under construction, or part of any project currently underway in the City of Ottawa	Not required

General Submission Requirements	Transit-Specific Requirements	1A (O-Train)	1B (Protected Transportation Corridors)
Up-to-date property survey of existing and proposed property lines prepared to Strata Reference Plan Standards, signed and sealed by an Ontario Land Surveyor	<ul style="list-style-type: none"> Illustrate the O-Train and its proximity to the subject development lands 	<p>Required adjacent segments of the O-Train currently in operation, under construction, or part of any project currently underway in the City of Ottawa</p> <p>May be required where future O-Train requirements have been defined or identified (e.g. Environmental Assessment study)</p>	Not required
Utility Servicing Plan	<ul style="list-style-type: none"> Identify any utility relocations and installations proposed adjacent to the O-Train or Protected Transportation Corridor. 	Required	Required

General Submission Requirements	Transit-Specific Requirements	1A (O-Train)	1B (Protected Transportation Corridors)
Stormwater Management Plan and Grading Plan	<ul style="list-style-type: none"> • Demonstrate that stormwater from the development will not affect the O-Train or the Protected Transportation Corridor • Demonstrate that proposed grades and retaining structures will not affect the O-Train or the Protected Transportation Corridor. 	Required	Required
Architectural drawings and Landscape Plans	<ul style="list-style-type: none"> • Illustrate onsite walking and/or cycling routes leading towards nearest O-Train station and/or transit plaza • Elevations showing proposed cladding materials, windows and balconies on walls facing or adjacent to the O-Train to identify any potential lighting/glare or balcony impacts 	<p>Required adjacent segments of the O-Train currently in operation, under construction, or part of any project currently underway in the City of Ottawa.</p> <p>May be required where future O-Train has been defined or identified (e.g. Environmental Assessment study)</p>	Not Required

General Submission Requirements	Transit-Specific Requirements	1A (O-Train)	1B (Protected Transportation Corridors)
Noise and Vibration Study prepared in accordance with the City's Environmental Noise Control Guidelines	<ul style="list-style-type: none"> Assess noise and vibration from the O-Train (including bus loops which can operate up to 24 hours a day); confirm that they have been considered in design with mitigation measures applied as appropriate Acknowledge the potential for stray current and electromagnetic interference (EMI) from the O-Train 	<p>Required adjacent segments of the O-Train currently in operation, under construction, or part of any project currently underway in the City of Ottawa.</p> <p>Required where future O-Train has been defined or identified (e.g. Environmental Assessment study)</p>	Not required.

5.2 LEVEL 2 REQUIREMENTS

Table 3 identifies the technical requirements for a Level 2 Proximity Study. Level 2 Proximity Studies consider developments on lands wholly or partially within the DZI that include (but are not limited to) elements such as deep foundations, tower cranes or construction activities which are close or abut the O-Train, but which do not directly connect into a station or cross the Guideway. Many of the requirements are the same as for a Level 1 Proximity Study and can be fulfilled as part of the general documentation required for an application for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment. Additional information on foundation design and loading is required in the Geotechnical Report.

For Level 2 Proximity Studies, additional documents will also likely be required to address specific issues including, as applicable:

- a fire/life safety and HVAC Report;
- an Excavation Plan; and

- a high-level Construction Plan.

Table 3: Level 2 Proximity Study Requirements

General Submission Requirements	Transit-Specific Requirements
<p>Site Plan (or Plan of Subdivision) of the development</p> <p>A sketch may be required in connection with a Zoning By-law Amendment Application.</p>	<ul style="list-style-type: none"> • Illustrate clearances from the O-Train • Proposed vehicular and service access to the O-Train
<p>Floor Plans for the development (Site Plan approval application only)</p>	<ul style="list-style-type: none"> • Provide Floor Plans for ground level and any underground levels, and illustrate clearances from the O-Train • Provide Floor Plans for levels above ground where the O-Train is or will be above ground (e.g. elevated Guideway, overhead pedestrian crossing, etc.)
<p>Development cross-section (Site Plan approval application only)</p>	<ul style="list-style-type: none"> • Locate the O-Train or Protected Transportation Corridor relative to the development, including underground storage tanks, services, structures, etc.
<p>Geotechnical Report prepared in accordance with the City’s Geotechnical Investigation and Reporting Guidelines for Development Applications</p>	<ul style="list-style-type: none"> • Provide foundation design including waterproofing system (30% design) – final design to be provided prior to building permit application • Conduct a structural loading analysis for the foundation and provide modeling parameters, including seismic design parameters • Identify foundation loads on the soil, and demonstrate that this loading will not adversely impact the O-Train • Submit an engineering report on loading analysis and seismic design demonstrating that it meets regulatory requirements including Building Code

General Submission Requirements	Transit-Specific Requirements
Up-to-date property survey of existing and proposed property lines prepared to Strata Reference Plan Standards, signed and sealed by an Ontario Land Surveyor	<ul style="list-style-type: none"> • Illustrate the O-Train and its proximity to the subject development lands
Utility Servicing Plan	<ul style="list-style-type: none"> • Identify any utility relocations and installations proposed adjacent to the O-Train
Stormwater Management Plan and grading plan	<ul style="list-style-type: none"> • Demonstrate that stormwater from the development will not affect the O-Train • Demonstrate that proposed grades and retaining structures will not affect the O-Train
Architectural drawings and Landscape Plans (Site Plan only)	<ul style="list-style-type: none"> • Illustrate onsite walking and/or cycling routes leading towards nearest O-Train station and/or transit plaza • Elevations showing proposed cladding materials, windows and balconies on walls facing or adjacent to the O-Train to identify any potential lighting/glare or balcony impacts
Noise and Vibration Study prepared in accordance with the City's Environmental Noise Control Guidelines	<ul style="list-style-type: none"> • Assess noise and vibration from the O-Train (including bus loops which can operate up to 24 hours a day); confirm that they have been considered in design with mitigation measures applied as appropriate • Acknowledge the potential for stray current and electromagnetic interference (EMI)

Additional Proximity Study Requirements

Description of Requirements (Transit-Specific)

Fire/life safety and HVAC Report (as applicable)	<ul style="list-style-type: none">• Demonstrate that HVAC and fire/life safety design requirements of Ontario Building Code and NFPA 130 are met, as applicable• If close to limiting distances, provide mechanical drawings and conduct a fire/smoke dispersion analysis
Excavation Plan (as applicable)	<ul style="list-style-type: none">• Identify excavation methods and support systems, including shoring design• Identify whether any blasting, pile driving, or dynamic compaction will be conducted• Provide a dewatering and groundwater control plan
Construction Plan (as applicable)	<ul style="list-style-type: none">• Provide a high-level construction schedule and construction Staging Plan• Identify site access provisions and any lane closures during construction including any temporary impacts to transit operations, pedestrian and cycling access to the O-Train and/or access for O-Train construction or maintenance• Location of any construction cranes and area of swing

Additional submissions may be required in specific instances where potential issues need to be addressed:

- Air quality analysis if development is in proximity to vent shaft or station entrances;
- Smoke dispersal analysis if the development is in proximity to vent shaft to demonstrate concentration of smoke discharged from vent shaft and drawn into building will be acceptable and smoke management system/emergency response plan is feasible;
- Engineering statement regarding impacts of proposed development;
- Shoring Plans;

- Structural analysis showing effects of loadings on the O-Train;
- Monitoring Plan for movement of shoring;
- Pre-construction and post-construction condition surveys (where proposed development has potential for significant impact to the O-Train);
- Demolition Plan where activities will be immediately adjacent to the O-Train;
- Plans showing hoarding and stockpiling of materials; and
- Other plans/documents such as ESA (Environmental Site Assessment), record of site condition, risk assessments, Transportation Impact Study, etc.

5.3 LEVEL 3 REQUIREMENTS

Level 3 Proximity Studies are required for developments within the DZI immediately abutting the O-Train and in all instances where the Applicant proposes or the City requires that there be direct interaction between the proposed development and O-Train (e.g. direct station connection, building above or under the Guideway). There may be additional circumstances where the City requires a Level 3 Proximity Study. It should be noted that any proposed connection to the O-Train or development that requires construction on, under or over the O-Train will require additional approvals from the City, which may be withheld.

For development applications that require Level 3 review, Proximity Studies will be required to include all technical information listed for Level 2 Proximity Studies.

In addition, the City will request more detailed information on design and construction plans related to matters such as structural design, foundation design, mechanical and electrical design; accessibility, interconnection of fire alarms, security systems and other integrated systems, construction methods and scheduling, stairs/elevators, shared walls, and architecture and design details. For proposed construction on, over or under the O-Train, the City may require the Applicant to provide information necessary to satisfy all of its regulatory requirements.

The specific technical requirements and submission formats for Level 3 Proximity Studies will be determined at the pre-application consultation stage, or once sufficient information is provided by the Applicant.

Note that for applications that require Level 3 Proximity Study and review, the City may also require the applicant to enter into Entrance Connection Agreements, Crossing Agreements tie back agreements, or other legal agreements. The provisions of such agreements may address or supersede Proximity Study technical requirements. Level 3 Proximity Studies may also be required to include, in specific instances where potential issues need to be addressed:

- Building Code Compliance Report;
- Materials specific to situations where development is proposed or approved to be integrated with an existing/planned station and modifications are proposed to any part of the O-Train;
- Temporary conditions during construction; and

- Separate requirements and information relating to construction agreements, crossing agreements, cost sharing agreements, etc., which are not part of the Proximity Study but which will need to be considered and implemented as part of the conditions of approval of a Site Plan or Plan of Subdivision or otherwise.

5.4 PROXIMITY STUDY FORMAT

The City is flexible on the format of the Proximity Study. In relation to Level 1 Proximity Studies, Applicants may choose to submit an overview report with a table that summarizes how each requirement is fulfilled and references the supporting documentation within the general application package. Alternatively, Applicants may choose to re-package the supporting application documentation to create a consolidated Proximity Study that fulfills all requirements as a stand-alone document. Application documents, including Proximity Study documents, must be signed and/or sealed by an appropriately qualified professional.

6. Further Guidance on Technical Requirements

This section provides guidance on expectations for Proximity Studies related to the following technical requirements identified in section 5:

- Geotechnical Reports and foundation designs;
- Excavation Plans;
- Clearances from light rail infrastructure;
- Fire/Life Safety and HVAC Reports; and
- Construction Management Plans.

The purpose of the information in this section is to help Applicants prepare the technical documentation required pursuant to section 5. The City reserves the right to provide revised guidance or additional guidance on technical inputs, constraints and expectations to supersede the information provided in this document, based on the specifics of the development application.

6.1 GEOTECHNICAL REPORTS AND FOUNDATION DESIGN

Applicants must avoid placement of any adjacent structure, facility, equipment or material that causes additional stress, reduces the safety of or decreases the durability of the O-Train. Developments are therefore not permitted to structurally bear on or place unbalanced loads on the O-Train for any purpose at any time.

All foundations for future developments must be designed and built such that loads applied by the development foundations do not increase lateral loads on the O-Train greater than that applied by the in-situ soil for foundations. Unless otherwise proven through mutually accepted

geotechnical analysis, at-rest pressures shall be determined using a pressure coefficient of 0.5 ($K_0 = 0.5$). This may require that adjacent structures be founded on footings or pile groupings that are at or below the same elevation as those for the O-Train.

6.2 EXCAVATION PLAN

Any excavations planned near the O-Train will require technical analysis and design by a qualified geotechnical engineer, and the appropriate certifications and documentation provided for review and acceptance by the City.

Ground improvements (such as stone columns, dynamic compaction, blasting or piledriving) must be monitored and such work must commence starting at the farthest distance from the O-Train and working toward the O-Train. Piles installed in connection with developments wholly or partially within the DZI must be predrilled and completed without pile driving. Where this is demonstrated to not be practical, alternate piling options should be assessed, such as bored cast-in-place piles or use of vibratory piling techniques in lieu of conventional hammer-driving.

Shored excavations adjacent to the O-Train must be instrumented and monitored to ensure that lateral deflections and any potential movement of the excavation shoring does not adversely affect the adjacent to the O-Train. During excavation on the adjacent property, temporary shoring anchors from construction of the O-Train may be encountered and must be cut-off at the excavation face. At no time should such anchors be forcibly pulled from the excavation. Any tiebacks or similar support of excavation systems utilized for shoring and excavation on an adjacent property may not extend onto any existing or future Guideway or other component of the O-Train, Railway Corridor or Protected Future Transportation Corridor except in accordance with a legal tie back and encroachment agreement.

As a condition of entering into any legal tie back or encroachment agreement permitting the temporary use of any part of the O-Train, Railway Corridor or Protected Future Transportation Corridor, the City will require tiebacks or similar support of excavation systems utilized for shoring and excavation to be temporary, to be de-tensioned following construction, and to pose no risk to any existing, planned or future structure, excavation, construction or building within the O-Train, Railway Corridor or Protected Future Transportation Corridor.

6.3 CLEARANCES FOR SITE PLANS, FLOOR PLANS AND CROSS-SECTIONS

Developments located on lands wholly or partially within the DZI must avoid any alterations or compromise to the design and performance of any part of the O-Train. For station structures, particular attention is required to passenger entry/exit flow capacity.

Developments must respect minimum clearances from the O-Train for construction, operations, maintenance, repair and replacement.

Minimum clearances to allow for operations and maintenance will vary based on the specific location and will be confirmed by the City. General guidelines are as follows:

- 3 m horizontal clearance is required from the outermost edge of the O-Train to allow for maintenance; this includes stations, maintenance facilities, and elevated

- structures. Additional horizontal clearance is required from station entrances/exits to allow for passenger flow.
- 3 m vertical clearance is required above the roof of a station or structure to allow for maintenance.
 - 1.6 m vertical clearance is required above an existing overhead catenary system for maintenance. For the O-Train Trillium Line, 4.5 m vertical clearance is required to protect for a future overhead catenary system, with an additional 1.6 m vertical clearance space for maintenance.
 - Developments must also abide by the Transport Canada Standard Respecting Railway Clearance (TC E-05) for structures over or beside a railway track.

In addition to these minimum clearances, additional clearances to allow for construction of O-Train or other rail transit infrastructure are as follows:

- 10 m horizontal clearance on all sides of the O-Train, or Protected Transportation Corridor, to allow for construction access and equipment clearance. (Note: This requirement may vary where FCM-RAC Guidelines apply).

Clearances will require further discussion and input from the Rail Construction Office, OC Transpo and other relevant City departments. In general, at the Environmental Assessment stage, a 20 m clearance zone (30 m through station areas) is protected to allow some flexibility as part of project implementation. The 10 m construction clearance noted above should be considered in addition to this envelope; however, it will be largely dependent on the nature of the O Train alignment or Railway Corridor and the availability of other lands (e.g. public road rights-of-way) for construction access. Prior to an Environmental Assessment being undertaken (which would identify construction access requirements), the City will require 10 m clearance zones on all sides of the O-Train and Protected Transportation Corridors. It should be noted that the 10 m clearance zone does not prevent an Applicant from using the space for elements such as driveways, parking, landscaping or temporary structures. The intent of the clearance zones is to ensure that sufficient space exists along the O-Train alignment and Protected Transportation Corridors to provide for a future temporary construction easement, which would be secured at time of project implementation, once design requirements have been finalized. In the vicinity of stations or major structures (e.g. tunnels, bridges) additional space may be required for construction staging purposes. Additional space may also be required for servicing and utility requirements.

The City will provide as-designed or as-built horizontal and vertical alignment data for the O-Train to the applicant, to the extent available and at the cost of the Applicant. It is the Applicant's obligation to superimpose the O-Train's alignment on the Applicant's structural drawings and to tie in the two structures together from a reference survey perspective to demonstrate that O-Train setback requirements and property boundaries have been respected. It is the applicant's responsibility to confirm, by survey if necessary, the actual as-built location of all relevant O-Train facilities.

Where possible, developments immediately adjacent to the O-Train should be designed in a manner that prevents objects/projectiles thrown from windows or balconies from reaching the guideway (e.g., no balconies facing the guideway, windows or screens that don't open or

other suitable safety measures). Future developments in proximity to the O-Train may also need to consider snow impacts (e.g., snow from adjacent development cannot fall onto tracks, cannot increase fare gate precipitation exposure) including ensuring that storage and removal of snow occurs entirely on private property.

The applicability of these Proximity Study Guidelines can be discussed with Applicants on a case-by-case basis.

6.4 FIRE/LIFE SAFETY AND HVAC REPORT

Developments must avoid interference with or compromising of HVAC air-flow or fire and life safety elements of the O-Train design. Where relevant, applicants will be required to conduct NFPA 130 standard review and Ontario Building Code Review to ensure fire and life safety design requirements in relation to rail infrastructure are met, including:

- Adequate separation is required between air intakes, exhausts and entrances of the development and rail tunnels/stations.
- All HVAC air-flow capacities of stations and tunnel portals must be preserved.
- No interference with or compromising of fire and life safety elements of design within the O-Train will be allowed, including for emergency egresses and ventilation structures. In particular, the limiting distance as defined in the Ontario Building Code must be respected.
- Where developments are close to the limiting distances, fire/smoke dispersion analysis may be required to demonstrate that cross contamination of smoke/particulate matter generated by emergency O-Train events does not affect adjacent developments and vice versa.
 - For example, development entrances and air intakes must be located a minimum of 12 metres from O-Train ventilation structures to allow emergency ventilation in-take or exhaust for high temperature smoke in the event of a fire.
- No construction, penetration or alterations will be allowed within any electrical or mechanical ancillary rooms in stations.
- For entrance connections approved by the City, Applicants will be required to enter into an Entrance Connection Agreement that addresses design details and fire/life safety features (e.g. interconnection of fire alarm systems) as a condition of approval.

6.5 CONSTRUCTION MANAGEMENT PLAN

Construction Management Plans should include:

- Site access provisions addressing lane closures during construction and any temporary impacts to transit operations, pedestrian and cycling access to the O-Train and/or access for O-Train construction or maintenance.

- Ingress and egress from station entrances and emergency accesses, to ensure accessibility is maintained and that opportunities for unauthorized access to the O-Train are eliminated (e.g. scaffolding placement).
- Traffic Management Plans, Staging Plans, etc.
- Crane tower location, configuration and proposed swing radius.

7. Conditions of Approval

Following the delivery of a Proximity Study, provisions may be included as conditions of approval of a Site Plan or Plan of Subdivision including to ensure that development on lands wholly or partially within the DZI or within twenty (20) metres of a Protected Transportation Corridor is carried out such that there are no temporary or permanent adverse effects placed on any part of the O-Train or Protected Transportation Corridors, and that temporary adverse effects are paired with suitable mitigation strategies.

The City may add conditions to an approval of a Site Plan or Plan of Subdivision that protect the O-Train against the potential impacts of the construction and/or operation of developments. For example, the City may impose restrictions on:

- Hours of construction;
- Methods of construction; or
- Sequence of construction.

The above is to avoid direct or indirect impacts of any kind on present, planned and/or future construction, operations or maintenance of the O-Train, including (without limitation) bus operations and customer access at stations. The conditions of approval may also reflect the conclusions and recommendations of the Proximity Study or arising as a result of the City's review of the Proximity Study.

Conditions of approval may also relate to protective measures, with respect to both the O-Train and Protected Transportation Corridors, including but not limited to the following:

- Submission of final foundation design with structural loading analysis confirming that the building's footing and foundation walls will not adversely impact the O-Train. A signed report from a suitably qualified engineer related to structural loads, tie-backs, anchors etc., may also be required.
- Completion of pre-construction and post-construction surveys of the O-Train.
- Submission of construction protocols and monitoring plans for City approval such as:
 - Blasting Plan;
 - Vibration and Movement Monitoring Plan;
 - Dust Control and Monitoring Plan;
 - Groundwater Control and Monitoring Plan; and

- Safety protection measures (e.g. hoarding, overhead protection, flagging, signage, dust-barriers, etc.).
- Submission of construction schedules, Staging Plans and construction coordination protocols for City approval.
- Submission of Traffic Management Plans for City approval including site access provisions during construction, lane closures, haul routes and staging.
- Requirements related to noise and vibration, stray current and EMI (electromagnetic interference) including:
 - Covenants and environmental impact warning clauses incorporated in all transfers/deeds and leases;
 - Implementation of noise control attenuation measures; and
 - Restrictions on generating stray current, EMI, or vibration.
 (*Note: the above will be required for all developments wholly or partially within the DZI or wholly or partially within (20) metres of a Protected Transportation Corridor.)
- Completion of legal agreements such as Crane Swing Agreements.
- Submission of as-built drawings.
- Fulfilment of Insurance Requirements.
- Completion of City safety training or orientation for work in proximity to the O-Train.
- Temporary and permanent easements (Applicants are required to grant temporary and permanent easements for the benefit of lands on which the O-Train is constructed, including but not limited to for maintenance or pedestrian access).
- Crossing agreements (if a crossing over or under the Guideway is approved by the City).
- Licensed Use of Air Rights (if air rights are approved by the City).
- Post development condition survey.

Conditions of approval may be required to be fulfilled prior to the registration of a Plan of Subdivision or a Site Plan Agreement, before building permit application, before start of construction, or on other timelines as specified by the City.

8. Timelines, Fees and Cost Recovery

The City will charge the applicant a technical review fee to cover the City's review costs for the Proximity Study in accordance with the City's Planning Fees Bylaw. The fees charged are intended only to cover the City's cost to review each Proximity Study (including use of third-party reviewers for specialized analyses) and will vary depending on the complexity of the development and the number and type of technical plans, reports and studies required.

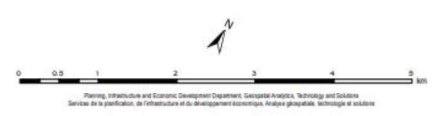
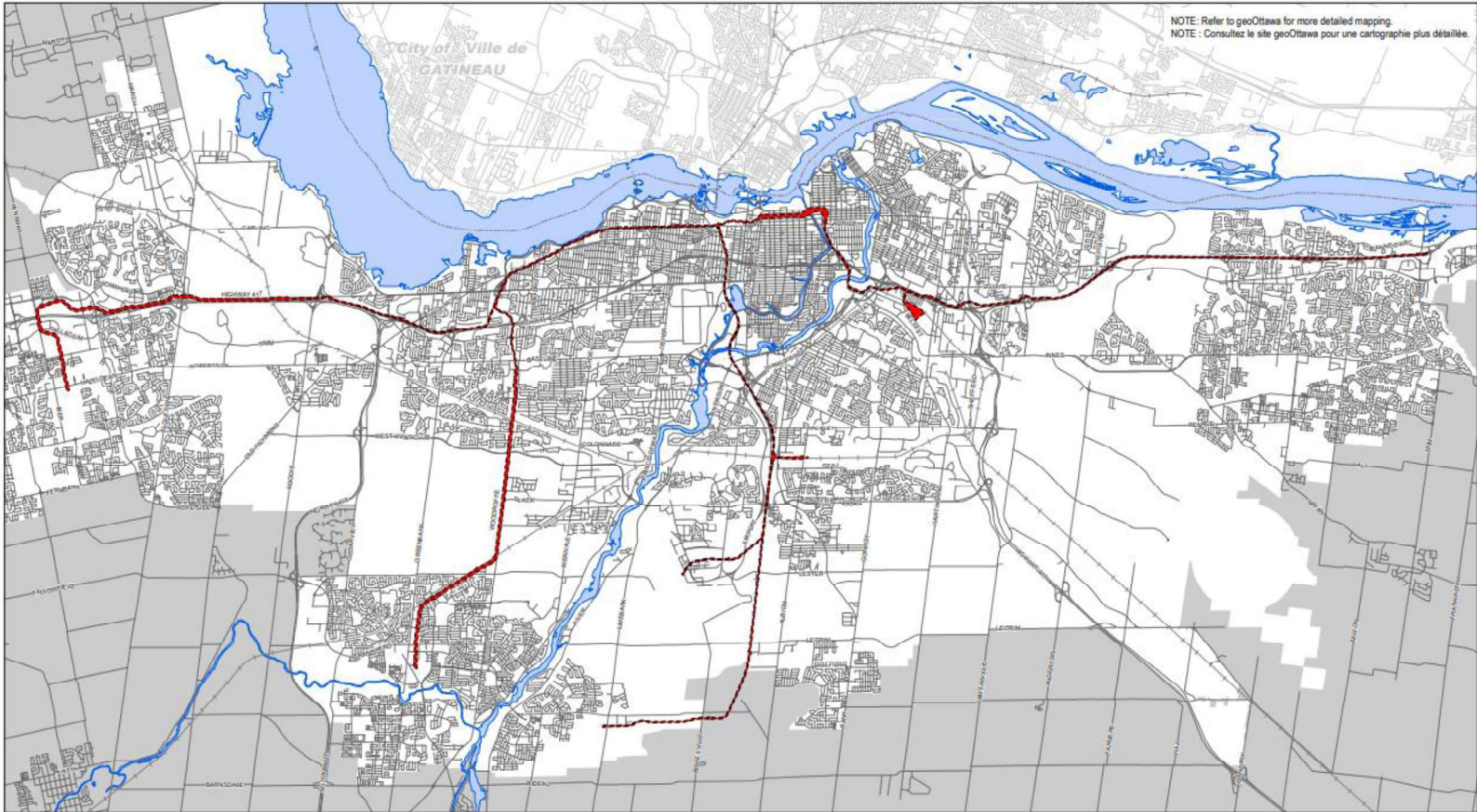
The costs of implementing recommendations of the Proximity Study and any Conditions of Approval are the responsibility of the Applicant.

In addition to the fees for City review of Proximity Studies contained in the Planning Fee By-law, as part of the approval or construction of new development, the Applicant will be required to reimburse the City for costs incurred by the City in connection with matters including but not limited to the following:

- Cost of traction power isolation (e.g. de-energizing OCS for construction activities);
- Cost of system testing (e.g., electrical or fire system load tests);
- Flag person duties for OC Transpo bus operations;
- Rules qualified escort for the Confederation Line (Line 1 and 3) or a Canadian Rail Operating Rules qualified flag person for the Trillium Line (Line 2 and 4).
- OC Transpo safety/training requirements;
- Direct labour and/or supervisory staff costs for construction management/operations management;
- Cost of operation diversions or other impacts on OC Transpo operating costs;
- Equipment costs;
- Other City incremental costs related to construction or operation of the development (e.g., more frequent cleaning of Stations and facilities);
- Amounts charged to the City by third parties with whom the City has contractual commitments, including without limitation constructors and/or maintainers;
- Crossing Agreement fees; and
- Costs and expenses related to the preparation and execution of all legal agreements.

The full extent of the costs associated with the above matters may not be known at the outset, may change as the relevant development application and related plans and drawings progress and may be payable at various stages of the development review process and/or during the construction of the development. OC Transpo may be able to provide estimates of the above referenced costs for recovery by the City from time to time during the review of the development application or following registration of the Site Plan Agreement or Plan of Subdivision if applicable.

Appendix A Development Zone of Influence



■ Development Zone of Influence / la Zone d'influence de l'aménagement



Official Plan / Plan officiel

Annex 2 - Development Zone of Influence
Appendice 2 - Zone d'influence de l'aménagement

November 4, 2022 / 4 novembre 2022

Appendix B Definitions

Term	Definition
Confederation Line	Lines 1 and 3 of the O-Train.
Applicant	An owner of lands, or the proponent of the development of lands who applied for approval of a Site Plan, Plan of Subdivision or Zoning By-law Amendment with respect to lands wholly or partially within the Development Zone of Influence or wholly or partially within twenty (20) metres of a Protected Transportation Corridor.
Development Zone of Influence or DZI	Means the area identified as the Development Zone of Influence in Annex 2 of the Official Plan and in Appendix A of these Proximity Study Guidelines which has been developed based on O-Train alignment and its infrastructure, facilities, geotechnical conditions and the depth and design of rail structures.
Guideway	A channel, track, or structure along which a rail transit vehicle moves.
O-Train	Means the existing and planned O-train rail transit system identified in Schedule C2- Transit Network (Ultimate) of the Official Plan and includes all rights-of-way, corridors, structures, infrastructure, facilities and improvements associated with existing and planned O-train rail transit system and including without limitation Guideways, stations, station entrances, station access and egress, bus loops, bus stops, operator and supervisor buildings, bridges and grade separations, tunnels, drainage and stormwater management systems and infrastructure, fencing, wayfinding, transit plazas, maintenance facilities, parking, utilities and related infrastructure including all installations, poles, conduits, pipes, transformers, manholes and catch basins;
Plan of Subdivision	For the purposes of these Proximity Study Guidelines, includes both plans of subdivision for which approval is sought under section 51 of the <i>Planning Act</i> and the plans, documents filed in connection with an application for approval of a condominium description under Section 9 of the <i>Condominium Act</i> .
Protected Transportation Corridors	Means the existing corridors generally identified in Appendix C to these Proximity Study Guidelines.
Proximity Study	Means a written report prepared by suitably qualified experts on behalf of an Applicant in accordance with these Proximity Study Guidelines.
Proximity Study Guidelines	Means the O-Train System Proximity Study Guidelines dated [2024]

Rail Corridor Lands which accommodate or may in future accommodate any rail related infrastructure.

Trillium Line Lines 2 and 4 of the O-Train.

Appendix C Protected Transportation Corridors

