

Proposed Development Next to Freight Rail Corridors Policy Implementation Guide

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1 Introduction

The purpose of this document is to provide additional information to implement the *Development Next to Freight Rail Corridors Policy*. This document contains:

- Definitions;
- Direction on how to measure the Rail Proximity Envelope;
- Information on how to establish parcel risk profile;
- The Maximum Building Width and Maximum Use Width Table;
- Freight Rail Corridor Section Area Maps;
- Fence and barrier requirements;
- Noise Standards;
- Development Permit flow charts for General Application, Sensitive Use and Noise Susceptible Uses;
- Information on vibration studies;
- Examples of mitigation strategies related to chemical hazard release; and
- Building Design Considerations

2 Definitions

1. *Baseline Risk Assessment*

An empirical engineering study prepared in conjunction with the *Development Next to Freight Rail Corridors Policy* that determined the risk of a potential train derailment leading to a fatality for each parcel adjacent to the freight rail corridors in Calgary.

2. *Noise Study*

A report prepared by a Professional Engineer, submitted in support of a development proposal within the Envelope which must evaluate:

- The impact of noise associated with freight rail operations on adjacent development;
- Be developed in accordance with The City's Noise Study Scope; and
- Identify mitigation measures to be incorporated into the development proposal.

3. *Maximum Building Width*

The maximum width of a building allowed within the *Envelope* without requiring a Site-Specific Risk Assessment.

4. *The Maximum Use Width*

The maximum width of a Sensitive Use, either as a stand-alone building or within a building located within the *Envelope*, without requiring a Site-Specific Risk Assessment.

5. *Public Lands*

Land owned and operated by The City of Calgary including but not limited to parcels, open spaces, parks and road rights of way.

6. *Rail Proximity Envelope (Envelope)*

The three-dimensional areas on parcels adjacent to the freight rail corridor used for managing the risk of physical impact of a train derailment (Safety Envelope) and the noise impact (Noise Envelope) associated with freight rail operations. Information on how to measure both the safety and noise Envelope is contained in section 3 below.

7. *Risk Tolerance*

The identified annual probability of a potential train derailment leading to a fatality for an individual parcel.

8. *Site-Specific Risk Assessment*

A report prepared by a Professional Engineer with experience in risk management, submitted in support of development proposals within the Envelope which must:

- Contain quantitative and qualitative assessments of the mitigations required to address the risks and hazards associated with freight rail operations on an individual parcel;
- The mitigation measures must be incorporated into the development proposal;
- Not preclude The City from being able to rely on the Site-Specific Risk Assessment's conclusions in making development decisions; and
- Be developed in accordance with The City's Site-Specific Risk Assessment Scope.

9. *Train Impact Structural Review*

A report prepared by a Professional Engineer, submitted in support of development proposals within the Envelope which must evaluate:

- The effect of a direct impact from a train on the building; and
- Whether the building would experience a progressive collapse following the train impact.

3 Rail Proximity Envelope

The Rail Proximity Envelope relates to two areas: 1) Safety Envelope and 2) Noise Envelope. The depth of the Safety Envelope is measured 30.0 metres horizontally from the freight rail corridor and 7.0 metres in height from grade as shown in illustration 1 below. The depth of the Noise Envelope is measured 30.0 metres horizontally from the freight rail corridor and 64 metres in height from grade as shown in illustration 2 below. Further information on how these measurements are done is provided below.

Illustration 1: **Rail Proximity Envelope** for Safety

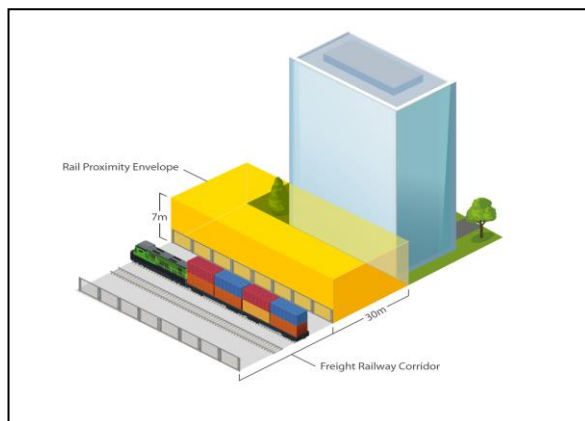
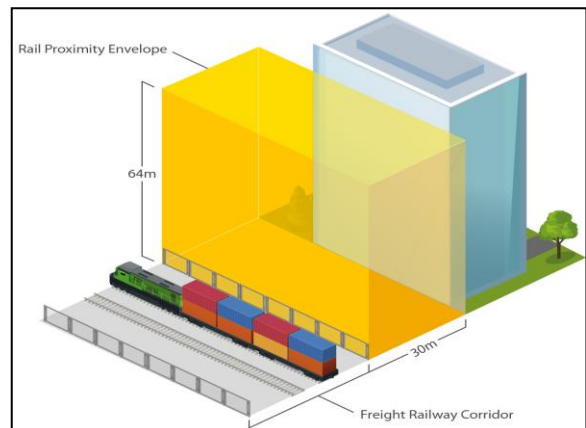


Illustration 2: **Rail Proximity Envelope** for Noise

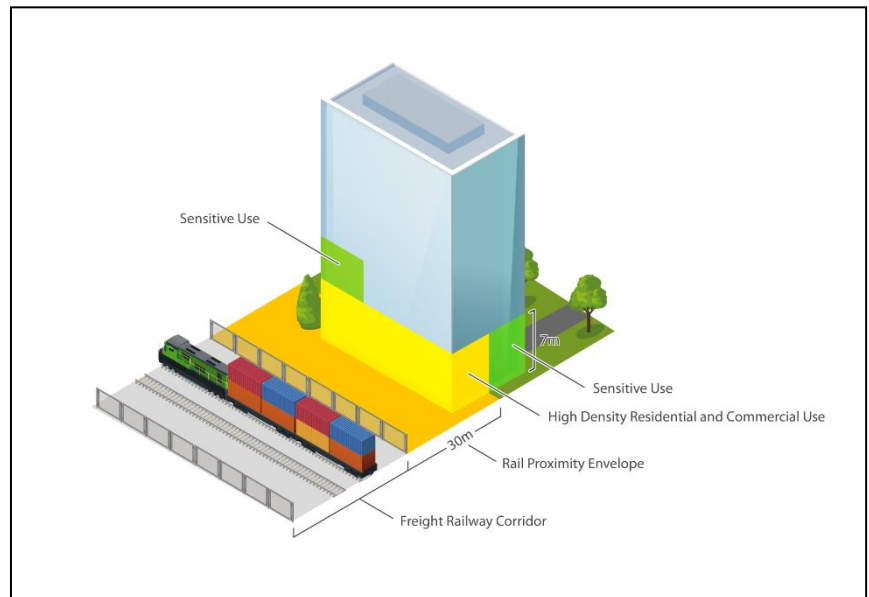


Examples of Development Proposals within the Rail Proximity Envelope

Centre City Example

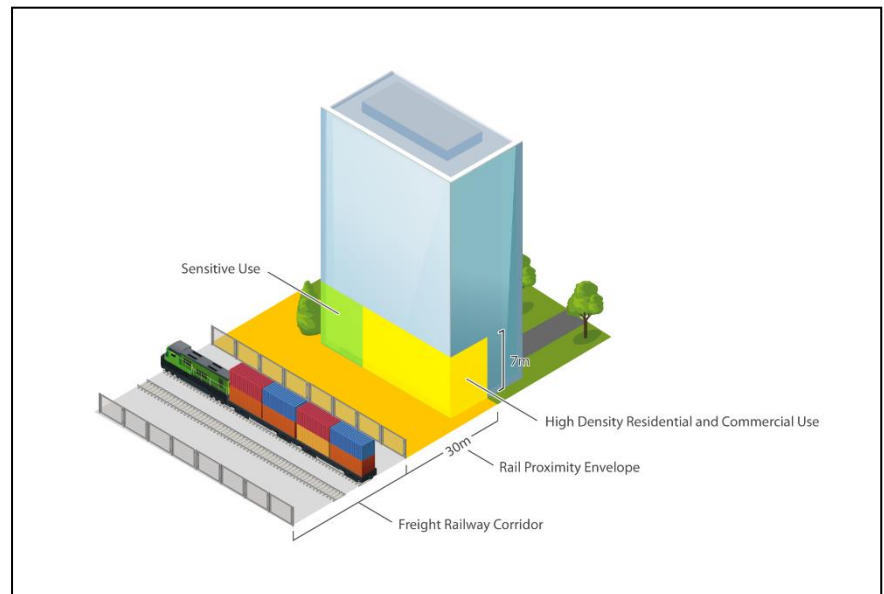
High Density Residential and Commercial Buildings that are 121m in width or less are allowed inside the Envelope without further studies. A Sensitive Use on the frontage facing the rail is not subject to the Safety Policy, but would need a Noise Study.

A Sensitive Use outside the Envelope, or not fronting onto the corridor, does not require any further information related to rail proximity.



Sensitive Use Example

Sensitive Uses are allowed within the Envelope with a Train Impact Structural Review, but do not require a Site-Specific Risk Assessment. However, if the Sensitive Use(s) exceeds the Maximum Use Width for the Sensitive Use, then a Site-Specific Risk Assessment is required.



Rail Proximity Envelope Measurement

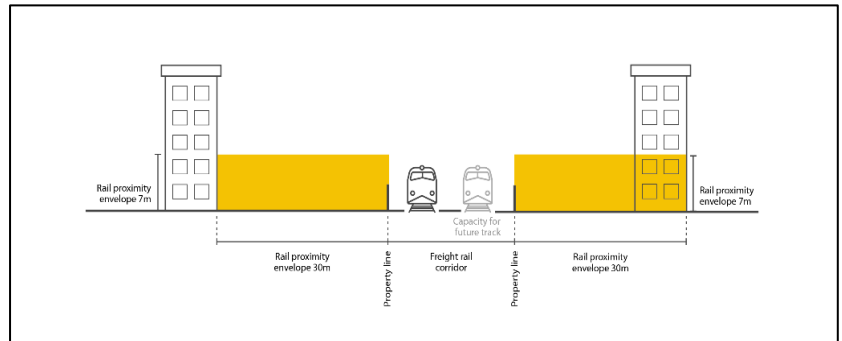
The depth of the Safety Envelope and Noise Envelope is typically measured from the property line of the freight rail corridor but could be adjusted based on surrounding contexts. Proper measurement of the Safety Envelope and Noise Envelope is based on four factors:

1. the capacity for additional freight tracks within the freight rail corridor;
2. existing buildings;
3. the presence of existing or proposed Light Rail Transit (LRT) within the freight rail corridor; and
4. the elevation difference between the freight rail corridor and adjacent parcels.

The following scenarios can be used to measure the Envelope:

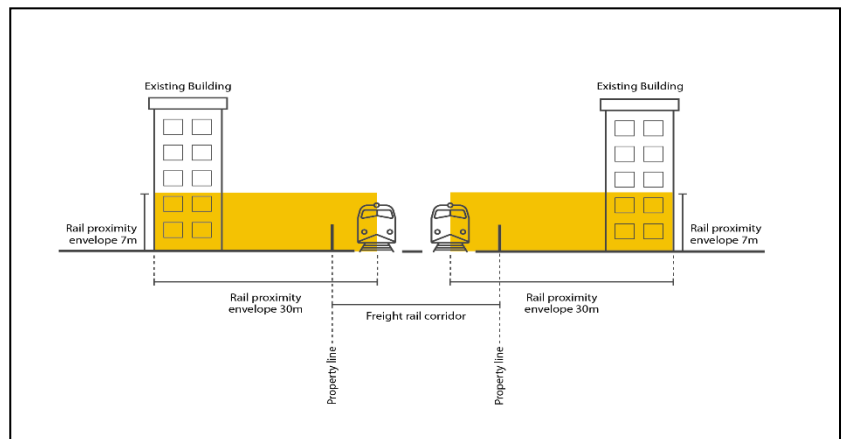
a. Standard Envelope

Because a rail company can add additional track within the corridor, the Envelope is usually measured from the freight rail corridor property line. However, there are four exceptions to this rule.



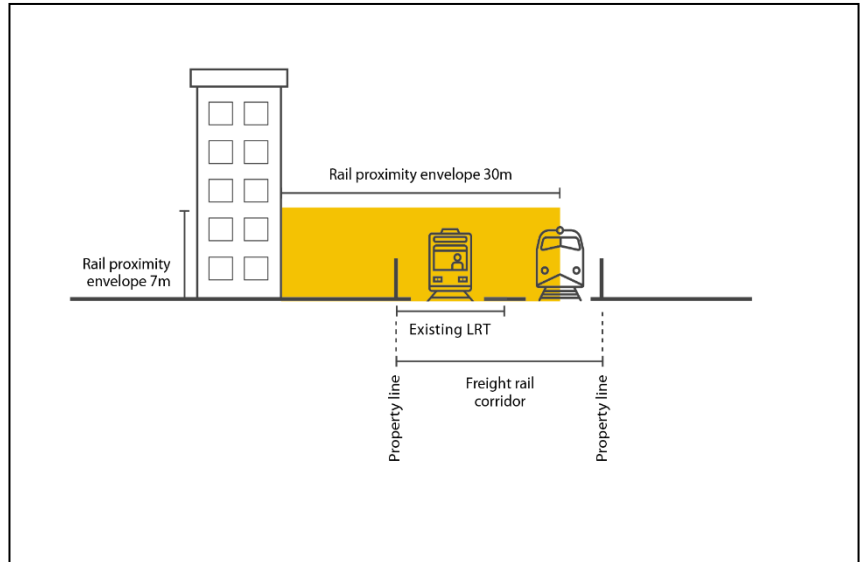
b. Four Exception Envelopes i. Existing buildings

For existing buildings in which a change of use to a Sensitive Use or dwelling unit is proposed, the level of exposure is based on the existing freight tracks within the freight rail corridor; therefore, the Envelope is measured from the centerline of the nearest freight track to the portion of the building applying for the change of use.



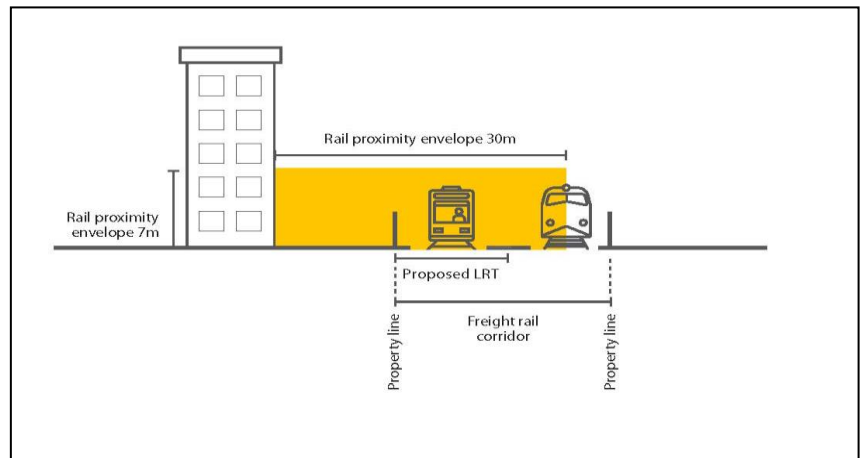
ii. Existing Light Rail Transit

The presence of Light Rail Transit limits the rail company's ability to add additional freight tracks. For areas between 42 Avenue SE and Spruce Meadows Trail SE west of the freight rail corridor, the Envelope is measured from the centerline of the nearest freight track to the proposed development.



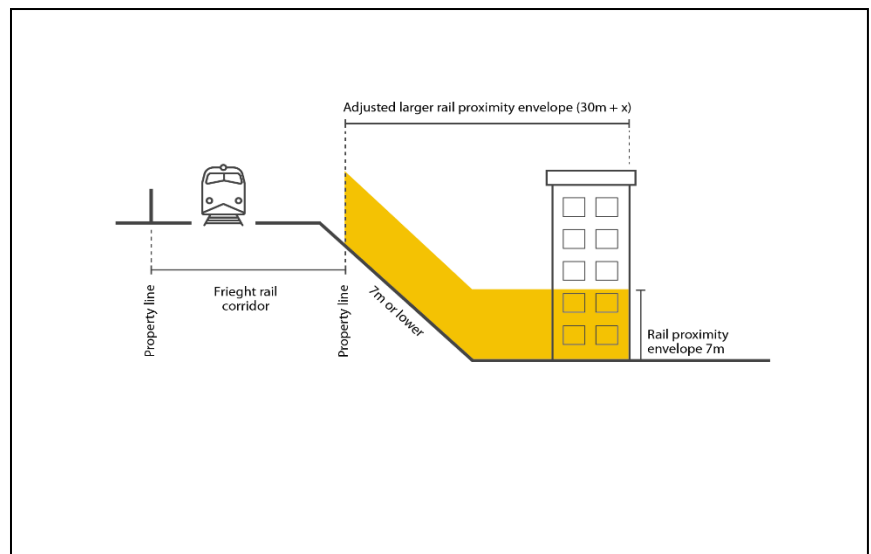
iii. Future Light Rail Transit

For areas between 4 St SE and 26 Ave SE, and between 69 St SE and Glenmore Trail, where portions of the approved Green Line Light Rail Transit will share the corridor with the freight rail, the Envelope is measured from the centerline of the nearest freight track to the proposed development.



iv. Elevation changes – parcels lower than the adjacent tracks

For parcels that are 7.0 metres or lower than the grade of the corridor's property line, the Envelope extends beyond 30 metres. The adjusted Envelope has been determined on an individual site-by-site basis and is available on the web-based interactive rail proximity maps on Calgary.ca.












4 Risk Tolerance for a parcel

The interactive web-based map available on Calgary.ca provides the Risk Tolerance for every parcel along the six corridors.

5 Maximum Building Width and Maximum Use Width Table

Table 1 below provides the Maximum Building Width and Maximum Use Width information and is to be used in conjunction with Map 1. Maximum Building Width means the maximum width of a building allowed within the *Envelope* without requiring a Site-Specific Risk Assessment. The Maximum Use Width means the maximum width of a Sensitive Use, either as a stand-alone building or within a building located within the *Envelope*, without requiring a Site-Specific Risk Assessment.

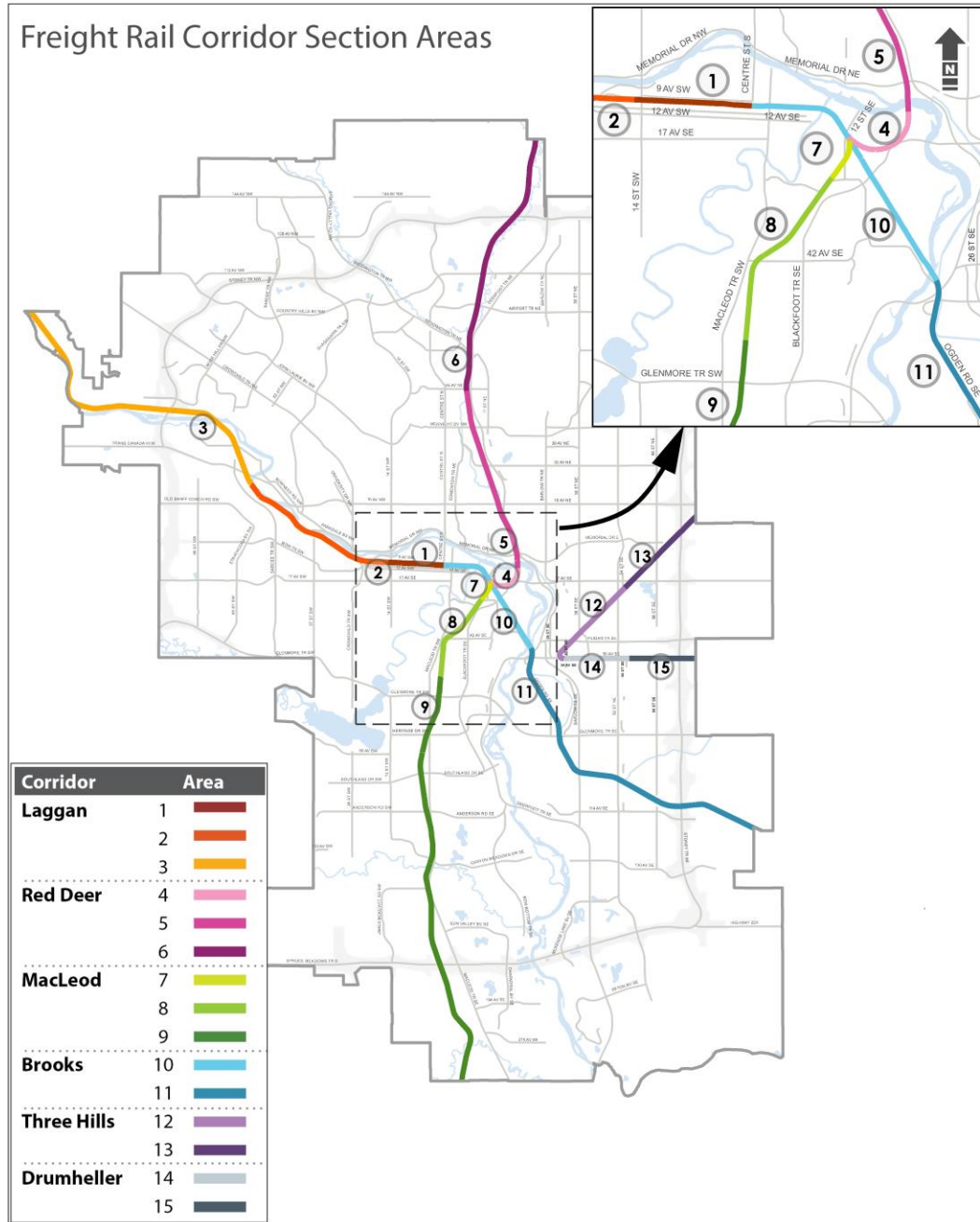
Table 1: Maximum Building Width and Maximum Use Width¹

Freight Rail Corridor	Area	Maximum Building Width (Metres) High Density Uses	Maximum Use Width (Metres) Sensitive Uses	Description
Laggan	1	121	35	Between Centre St S and 15 St SW as shown in  on map 2.
	2	97	29	Between 15 St SW and south of 16 Ave NW as shown in  on map 2.
	3	72	21	Between south of 16 Ave NW and City limits as shown in  on map 2.
Red Deer	4	274	82	Between east of 12 St SE and south of Bow River as show in  on map 2.
	5	161	48	Between south of Bow River and 64 Ave NE as shown in  on map 2.
	6	113	35	Between 64 Ave NE and City limit as shown in  on map 2.
MacLeod	7	1,931	595	Between 12 St SE underpass and 26 Ave SE as shown in  on map 2.
	8	950	274	Between 26 Ave SE and 58 Ave SE as shown in  on map2.
	9	274	80	Between 58 Ave SE and City limit as shown in  on map2.
Brooks	10	129	39	Between Centre St S and Deerfoot Trail as shown in  on map 2.
	11	79	23	Between Deerfoot Trail and City limits as shown in  on map 2.
Three Hill	12	1,336	402	Between 50 Ave SE and east of 54 St SE as shown in  on map 2.
	13	644	193	Between east of 54 St SE and City limits as shown in  on map 2.
Drumheller	14	769	230	Between at-grade crossing on 50 Ave SE and east of 52 St SE as shown in  on map 2.
	15	224	66	Between east of 50 Ave SE and City limits as shown in  on map 2.

¹ For details on how the Maximum Building Width and Maximum Use Width were determined please refer to "City of Calgary Rail Baseline Risk Assessments Methodology and Results, dated March 16, 2018".

Map 1: Freight Rail Corridor Section Area

Based on the risk profiles established in the Baseline Risk Assessment, there are 17 distinct freight rail corridor section areas as shown on Map 1.



6 Sensitive Use Locations

Sensitive Uses may be located within the Envelope. However, the applicant or building owner should consider locating Sensitive Uses either outside of the Envelope or in portions of a building that are not facing the freight rail corridor when inside the Envelope.

7 Fences

A fence or similar barrier must have a minimum height of 1.83 metres along the property line of the development parallel to the freight rail corridor.

8 Noise

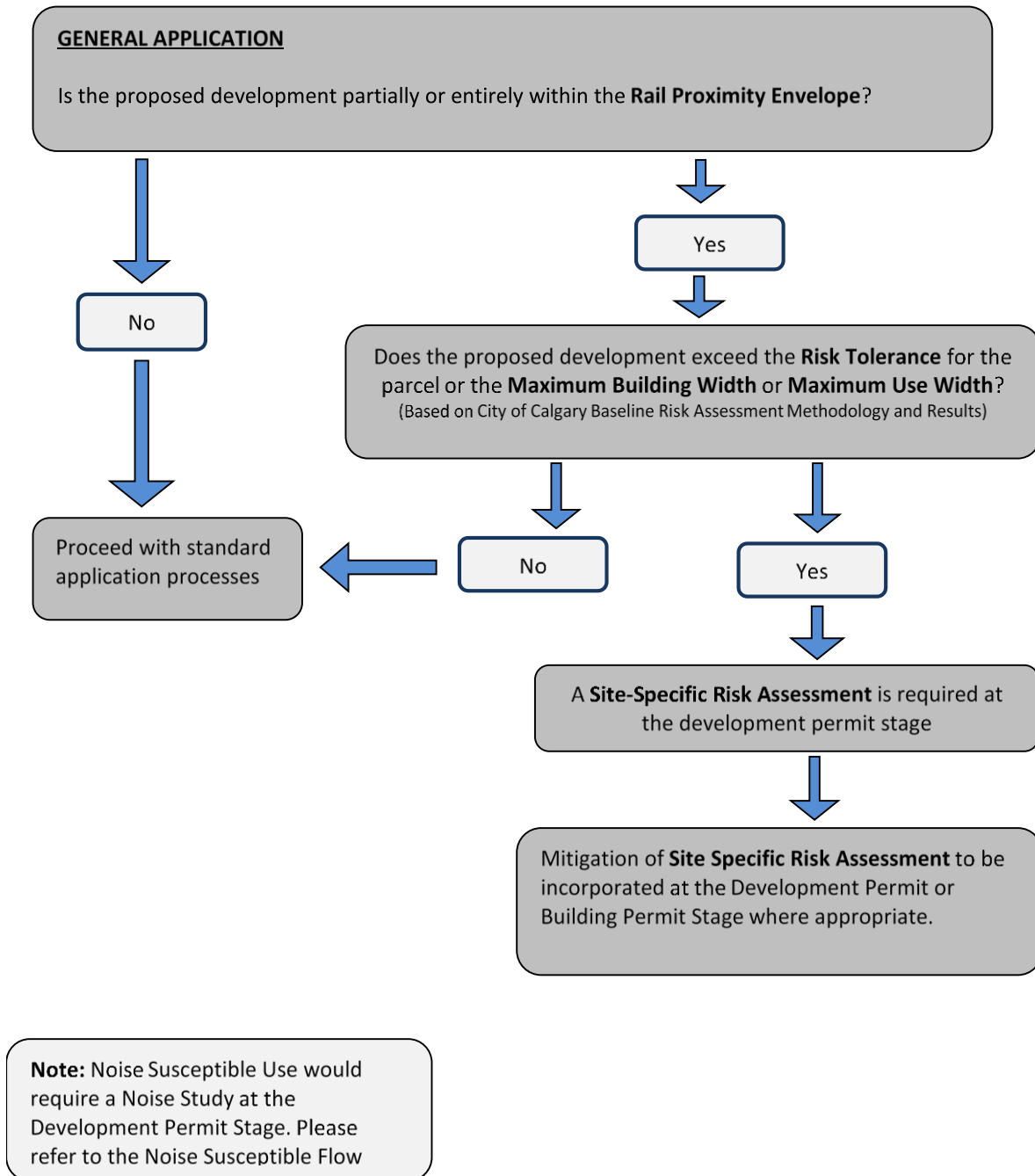
The noise policy applies to the units in a building that directly faces the freight rail corridor. The noise study must only address the noise associated with freight rail operations.

9 Decision Tree Flow Chart

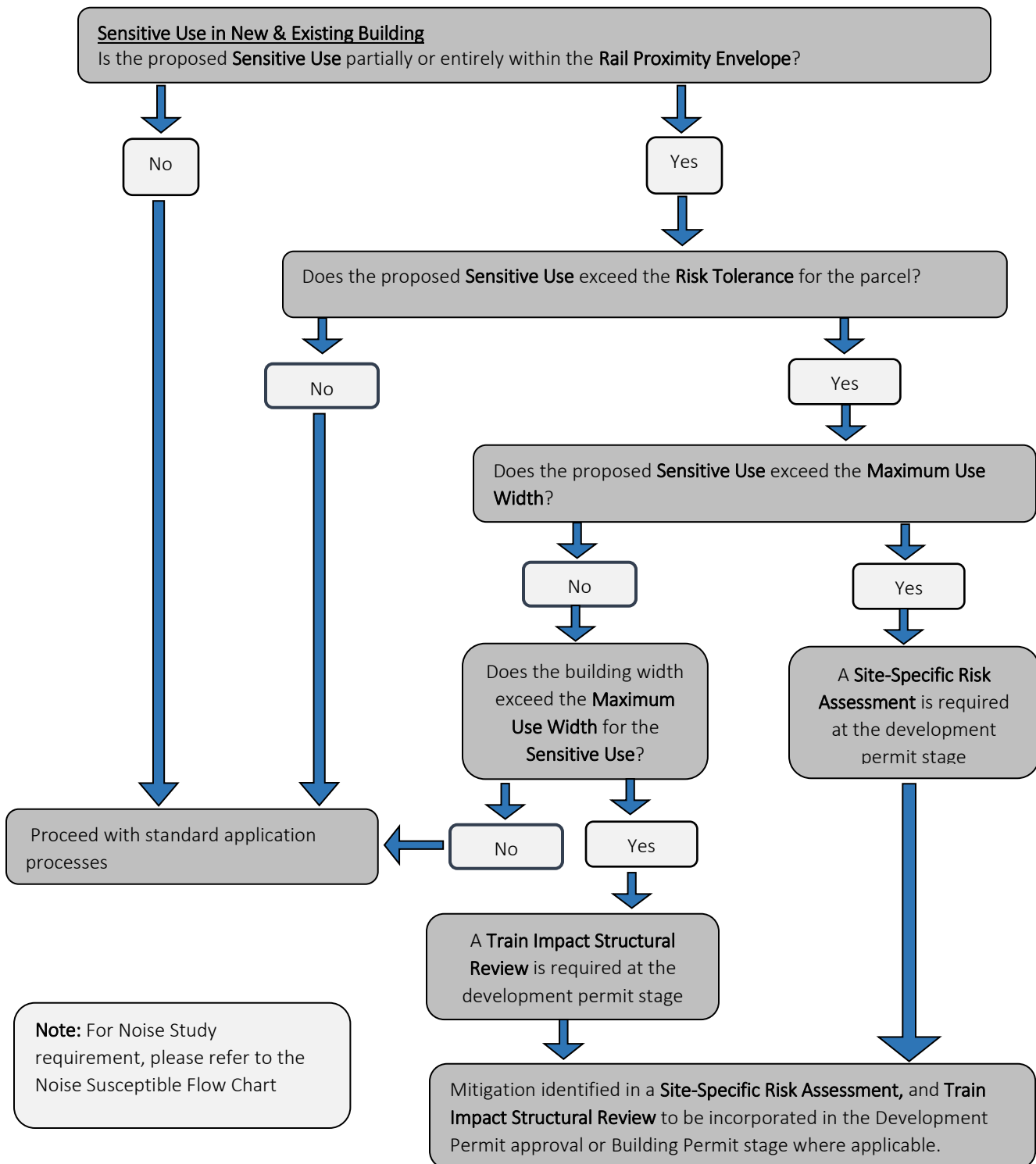
Based on the Baseline Risk Assessment, the following three flow charts are intended to guide applicants and the Development Authority as to when a Site-Specific Risk Assessment, Train Impact Structural Review and a Noise Study is required during the Development Permit review process. This is only for development that are proposed within the Envelope:

1. Flow Chart for General Application within the Rail Proximity Envelope;
2. Flow Chart for a Sensitive Use within the Rail Proximity Envelope; and
3. Flow Chart for a Noise Susceptible Use within the Rail Proximity Envelope.

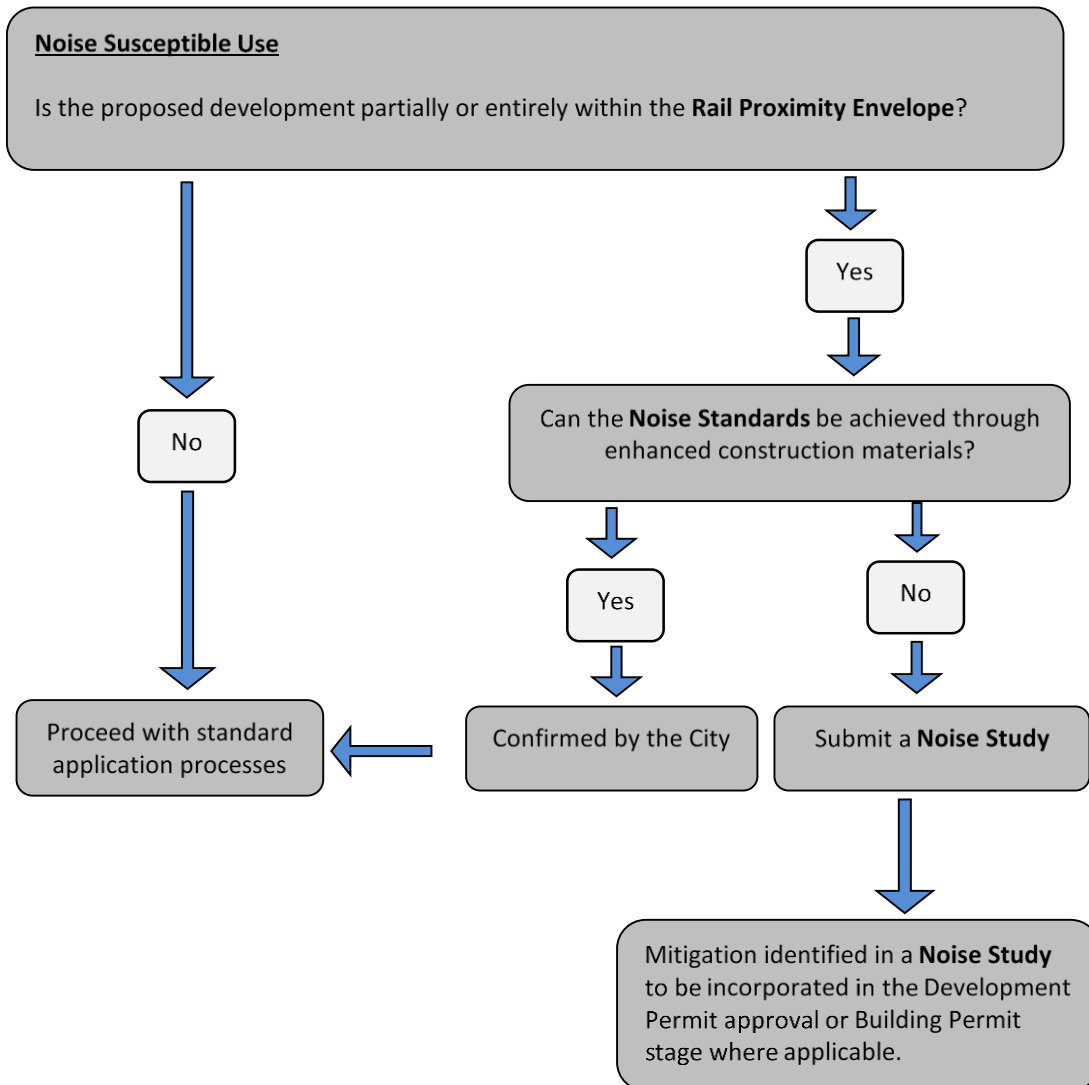
Flow Chart 1: General Application within the Rail Proximity Envelope



Flow Chart 2: Sensitive Use within the Rail Proximity Envelope



Flow Chart 3: Noise Susceptible Uses within the Rail Proximity Envelope



10 Vibration Information

If an applicant chooses to mitigate the impact of vibration, the Vibration Assessment Scope will be provided by the City to the applicant upon request.

11 Chemical Hazard Release

Applicants are encouraged to consider incorporating the following mitigation strategies into new building designs and into retrofit projects for existing buildings along the freight rail corridors:

1. Heating, ventilation, and air conditioning (HVAC) modifications to provide opportunities for shelter-in-place in the event of a chemical release due to a rail incident such as:
 - a. Installing chemical gas sensors linked to building automation systems to improve response time during an emergency;
 - b. Elevated locations of air intakes; and
 - c. The ability to completely shut down the building air intake.
2. Install cameras on building façades facing the freight rail corridor to improve response time during an emergency; and
3. Regular review and update of emergency response plans for the buildings.

12 Building Design Considerations

Wherever possible, new building design should consider providing access to water, such as dry standpipe for firefighting purposes on the rail side of the building.