

LRT Crossing Assessment Framework

INTRODUCTION

As a result of traffic-related concerns, Council has asked City staff to examine the possibility of raising or lowering several arterial road and LRT crossings above or below grade level. This is called “grade separation” and occurs where the LRT line is physically separated from street-level traffic. Grade separation can offer reduced traffic congestion and shorter travel times in the short term, but must be balanced with the long-term implications on the broader transportation network and other Council-approved plans related to land use and compact urban form.

In June 2017, Council approved a framework to evaluate intersections and determine if they required further analysis related to potential grade separation. The Crossing Assessment Framework provides a consistent and objective process for determining the optimal configuration for LRT crossings and any adjacent LRT stations or stops. The framework includes initial screening, development of crossing options, and a comparative analysis of the options with weighted criteria. New potential LRT route corridors will be evaluated using this framework to ensure the preferred corridor reflects the City’s Transportation Master Plan, The Way We Move, and the LRT Network Plan approved by Council in 2009. The framework is not a formula, but rather a starting point to assess options for specific crossing locations.

PHASE ONE: INITIAL SCREENING

The Institute of Transportation Engineers has developed a methodology and graph to assess when LRT crossings should remain at-grade, should be grade separated or require additional analysis. They suggest that a comparison of LRT crossing frequency to the worst case per-lane traffic volumes be used as a starting point. The City has overlaid the Institute of Transportation Engineers’ grade separation graph with the City’s existing and planned LRT crossings. This tool will be used as an initial screening for future LRT crossing assessments.

PHASE TWO: CROSSING OPTION DEVELOPMENT

Once a specific location is identified for assessment through the screening phase, LRT crossing option development should explore the following options, if not more:

- At-grade crossing with maximized roadway/intersection capacity
- Grade separation of LRT for both over and under scenarios
- Off-corridor improvements that may mitigate traffic delays at the crossing in question

Option development would also include assessment of impacts on any adjacent LRT stops/stations (i.e. does the option create the need to elevate, bury or relocate the station). Once all options are developed, a comparative analysis of the options is completed using weighted criteria.

Public Engagement

Stakeholder engagement will be required for all crossing locations when they are identified for assessment. This engagement will help identify challenges, opportunities and concerns specific to the surrounding community. Public and stakeholder feedback will be included with location-specific recommendation reports brought to Council for approval.

PHASE THREE: COMPARATIVE ANALYSIS

The City considers several factors when the assessment framework indicates further analysis of a crossing is

needed. The framework considers four categories of weighted criteria to explore the value of grade separation at key intersections in current and future LRT projects. Once the weighted scores are applied, a preferred option is considered by Council and Administration for the concept and design phases of the project. The design is then refined through planning and engineering analysis.

LRT Crossing Assessment Framework- Criteria & Weighting

Criteria Category	Category Weighting	Sub-Criteria
Accessibility <i>How the various transportation modes link between one another and with adjacent developments.</i>	4	<ul style="list-style-type: none"> • Promotes pedestrian connectivity through safe and efficient transfers and connections between various transportation modes • Ease of LRT station/stop accessibility based on pedestrian connectivity • Connectivity between LRT stations/stops and transit centres • Ease of vehicular access (delivery, service and emergency) to adjacent businesses, communities, and future developments
Network Operations <i>How the surrounding and broader transportation network is impacted.</i>	4	<ul style="list-style-type: none"> • Provides safe interactions between the various transportation modes • Improves network efficiency through minimization of travel delays for active modes (pedestrian, bike, etc), transit, emergency vehicles and goods movement in both opening day and long term time horizons • Provides the optimal LRV reliability / minimizes potential of delay to LRT operations and as a result minimizes LRV fleet requirements • Transportation network resiliency
Urban Design & Social Environment <i>How the surrounding communities and stakeholders are impacted.</i>	4	<ul style="list-style-type: none"> • Promotes City vision of integrating land use and transportation development through Urban LRT • Promotes increase in adjacent property values • Minimizes negative impacts to connectivity between adjacent communities • Privacy and visual impacts • Promotes public safety • Creates placemaking opportunities • Appropriate fit with adjacent land uses and proposed TOD planning. • Minimizes impacts to parkland and open spaces • Reduces potential noise/vibration impacts
Feasibility & Construction <i>Feasibility, cost and risk assessments.</i>	2	<ul style="list-style-type: none"> • Reduces life cycle costs - capital, operating, maintenance and renewal • Reduces need for private property acquisition • Constructability