

## Metro Line LRT and 111 Avenue - Crossing Assessment Summary

### **Metro Line LRT and 111 Avenue Crossing**

The intersection of 111 Avenue and 106 Street is located near several major destination points in north Edmonton. Kingsway Mall and the Royal Alexandra Hospital anchor the northwest and southeast corners of this intersection, while 106 Street provides access to the NAIT campus. In addition, it is located in close proximity to the arterial intersection of 111 Avenue and Kingsway. It is a busy intersection along the Metro Line LRT alignment, with traffic congestion issues identified by Council and the public.

The existing Metro Line LRT travels at-grade through the east leg of the intersection of 111 Avenue and 106 Street between the Kingsway/Royal Alex LRT Station and the temporary NAIT LRT station. Several traffic movements are prohibited at this intersection, including the northbound left and right turns, southbound through movement, eastbound right turn, and westbound left turn.

When applying Phase 1 of the LRT Crossing Assessment Framework, the traffic volume impact scored moderately low on the graph shown in Attachment 1, but was over the line to pass into Phase 2 screening.

Different design options were considered to improve the existing conditions at the intersection. Three types of improvements were assessed:

- A) grade separations (over and under for both the LRT and 111 Avenue),
- B) modifications to 106 Street, and
- C) operational refinements to the existing configuration.

OPTION A.1 – Grade Separation (showing 111 Avenue Over with LRT At-Grade)



OPTION A.2 – Grade Separation (showing 111 Avenue At-Grade with LRT Elevated)



This set of options involve elevating or trenching 111 Avenue over/under the LRT right of way, as well as 106 Street and Kingsway, or conversely, elevating or trenching the LRT over/under 111 Avenue, as well as Kingsway (which would also require a new elevated or trenched LRT station). It would result in additional restrictions of many left and right turning movements to accommodate the grade separation ramps.



OPTION B.1 – Modifications to 106 Street

Option B.1 contemplates a new public road through the Kingsway Mall site at the south end of the building, connecting 106 Street to Kingsway, and removing the section of 106 Street from 111 Avenue to that new roadway. This would eliminate many of the traffic movements immediately adjacent to the Metro Line crossing at 111 Avenue, simplifying traffic operations. However this scenario would displace the traffic congestion to the intersection of the new road and Kingsway, and likely have an adverse impact on the intersection of Princess Elizabeth Avenue and 106 Street.

Privately owned land would need to be acquired for this option, and to date that landowner has not been engaged on this option.

OPTION B.2 – Modifications to 106 Street

Option B.2 contemplates eliminating the two left turning movements at the intersection of 106 Street and 111 Avenue (eastbound to northbound, and southbound to eastbound), leaving only the intersection's through movements and the right turning movements to and from 106 Street to the north. While restricting turning movements at the intersection would improve east-west traffic, it would displace traffic currently making those movements to other portions of the road network. It may also have an adverse impact on bus accessibility to the transit centre.

### OPTION C – Operational Refinements

Several different operational modification options were considered to improve the operations at the existing 111 Avenue LRT crossing, including: traffic system optimization, signaling system optimization, and modifications to LRT operations.

### Options Assessment

The below table summarizes performance of the three options in response to each of the assessment criteria.

The grade separation options scored high in the Network Operations category and low in all other categories. The 106 Street Modifications options scored high in the Urban Design category and moderately in all other categories. The operational refinements options scored high in the Urban Design and Feasibility and Construction categories and moderately in the other categories. Overall, operational refinements are the highest performing option.

	OPTION A - Grade Separation	OPTION B – Modifications to 106 Street	OPTION C – Operational Refinements
Accessibility	✓	✓✓	✓✓
	<ul style="list-style-type: none"> <li>The grade separation options introduce pedestrian barriers near ramps/portals and may require an elevated/trenched LRT station.</li> </ul>		
Network Operations	✓✓✓	✓✓	✓✓
	<ul style="list-style-type: none"> <li>Option A (grade separation) scored highest in these criteria as they are expected to improve intersection operations. However grade separation of the roadway would limit vehicular access to adjacent properties.</li> <li>Options B and C score moderately as they are also expected to improve traffic operations, however to a lesser extent.</li> <li>Restricting 106 Street to right-in / right-out only at 111 Avenue would compromise ability for buses to access the transit centre</li> </ul>		

Urban Design and Social Environment	✓	✓✓✓	✓✓✓
	<ul style="list-style-type: none"> <li>Grade separated options are visually and physically more intrusive compared to an at-grade LRT crossing. The at-grade options scored highest for this category due to the fit with adjacent land uses, reduced barriers between communities, and public safety factors.</li> </ul>		
Feasibility and Construction	✓	✓✓	✓✓✓✓
	<ul style="list-style-type: none"> <li>Grade separated options are higher cost compared to the at-grade options and will require significant time and service interruptions to construct.</li> <li>Operational refinements are the lowest cost options and can be implemented relatively quickly and without significant service interruptions.</li> </ul>		
Order of Magnitude Cost Estimate (+/-50%)	An additional \$75-\$250 million (conceptual level estimate; <b><i>dependent on grade separation option chosen</i></b> )	An additional \$5-\$20 million (conceptual level estimate; <b><i>land acquisition required</i></b> )	An additional \$0.5-\$2.0 million (conceptual level estimate)
Overall Performance	✓	✓✓	✓✓✓

**Next Steps:**

Administration continues to both work with the Metro Line signalling contractor, and to develop other mitigation strategies to optimize the traffic-to-LRT interface at this location.