

## Valley Line West LRT Crossing Assessment Summary of Results - Stony Plain Road and 149 Street

### **Stony Plain Road and 149 Street Intersection**

The intersection of Stony Plain Road and 149 Street is located at the intersection of the Canora, Grovenor, Crestwood and West Jasper Place communities. This intersection is also located adjacent to the MacKinnon Ravine Park which consists of a trail network that connects to the North Saskatchewan River Valley. With the introduction of LRT on Stony Plain Road, the roadway configuration will be reduced to 1 lane in each direction. The currently planned Valley Line West LRT alignment travels down the center of Stony Plain Road, crossing 149 Street at-grade, with the nearest at-grade LRT Stop located between 150 and 151 Street.

Different design options were considered. The three options that performed the best against assessment criteria are: 1) at-grade LRT along center alignment of Stony Plain Road; 2) underground LRT, and 3) at-grade LRT along center alignment with 149 Street grade separated passing underneath Stony Plain Road.

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

The at-grade centre running LRT alignment with an at-grade LRT Stop scored high in the accessibility, urban design/social environment and feasibility/constructability categories. The 149 Street Underpass option ranked 2nd overall; it scored high in the network operation category as a result of enhanced capacity for the high volume north-south traffic but scored poorly under the urban design/social environment and the feasibility/constructability categories.

In reviewing the overall transportation network, the LRT on Stony Plain Road crosses three north-south arterial roadways within 1.6 kilometre. The proposed LRT 90 degree turn at Stony Plain Road and 156 Street will further reduce roadway capacity. In order to mitigate the direct operational impact to vehicles, additional roadway capacity in the adjacent corridors would be required. The 149 Street underpass option would increase roadway capacity to accommodate overall traffic growth within the City by offering an enhanced capacity connection to east-west corridors north of Stony Plain Road (107 Avenue, 111 Avenue, 118 Avenue and Yellowhead Trail) . The 149 Street underpass is the design recommendation at this location.



At-Grade LRT, Center Alignment



Underground LRT, Center Alignment



149 Street Underpass; LRT At-Grade, Center Alignment

	At-Grade LRT, Center Alignment	Underground LRT, Center Alignment	149 Street Underpass; LRT At-Grade Center Alignment																																																																	
Accessibility	✓✓✓	✓	✓✓																																																																	
Considerations	<ul style="list-style-type: none"> <li>• The underground LRT option would result in an underground LRT Station.</li> <li>• In the underground LRT option, the tunnel ramps and portals would impede north/south pedestrian movements across Stony Plain Road and pose access restrictions to adjacent properties.</li> <li>• In the 149 Street underpass option, the interchange ramps would pose access restrictions to adjacent properties and may create a perceived barrier to the ravine system.</li> </ul>																																																																			
Network Operations	✓	✓✓✓	✓✓✓																																																																	
Considerations	<ul style="list-style-type: none"> <li>• On average, the travel time savings for vehicles through the introduction of an underground LRT crossing at 149 Street intersection would be minimal. Due to reduced roadway capacity along Stony Plain Road, traffic signal green time allocation would favor east-west vehicle movements over 149 Street even with LRT underground.</li> <li>• The underground option eliminates the conflict points between the LRT and other modes.</li> <li>• The 149 Street underpass option provides enhanced capacity for north-south vehicular through movements. It is anticipated that the introduction of an underpass will: significantly reduce northbound and southbound queues and attract additional traffic in the range of 1000 vehicles per hour for the peak direction to 149 Street from adjacent roadways.</li> </ul> <p>Afternoon Peak Model Average Delay (seconds/vehicle)</p> <table border="1"> <thead> <tr> <th></th> <th>EBL</th> <th>EBT</th> <th>EBR</th> <th>WBL</th> <th>WBT</th> <th>WBR</th> <th>NBL</th> <th>NBT</th> <th>NBR</th> <th>SBL</th> <th>SBT</th> <th>SBR</th> </tr> </thead> <tbody> <tr> <td>Opening Day, No LRT</td> <td>32</td> <td>53</td> <td></td> <td>16</td> <td>26</td> <td></td> <td>56</td> <td>28</td> <td></td> <td>38</td> <td>36</td> <td>6</td> </tr> <tr> <td>30 year, At-Grade</td> <td>165</td> <td>16</td> <td></td> <td>99</td> <td>34</td> <td></td> <td>63</td> <td>45</td> <td></td> <td>83</td> <td>64</td> <td>0</td> </tr> <tr> <td>30 year, LRT Grade Separated</td> <td>30</td> <td>39</td> <td></td> <td>22</td> <td>42</td> <td></td> <td>69</td> <td>30</td> <td></td> <td>49</td> <td>34</td> <td>0</td> </tr> <tr> <td>30 year, Road</td> <td></td> <td>14</td> <td></td> <td>46</td> <td>19</td> <td></td> <td>71</td> <td>0</td> <td></td> <td></td> <td>0</td> <td></td> </tr> </tbody> </table>				EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Opening Day, No LRT	32	53		16	26		56	28		38	36	6	30 year, At-Grade	165	16		99	34		63	45		83	64	0	30 year, LRT Grade Separated	30	39		22	42		69	30		49	34	0	30 year, Road		14		46	19		71	0			0	
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	Under-pass											
Urban Design and Social Environment	✓✓✓	✓✓	✓									
Considerations	<ul style="list-style-type: none"> <li>The at-grade LRT option performed best in terms of urban design considerations such as pedestrian experience, minimizing infrastructure footprint and the overall fit of LRT into the community and surrounding land use.</li> <li>The 149 Street underpass option impacts a number of existing businesses on the west side of 149 Street. The underpass may create a perceived barrier to the ravine system. It is inconsistent with the principles to promote a walkable and urban area in the Jasper Place ARP.</li> </ul>											
Feasibility and Construction	✓✓✓	✓	✓									
Considerations	<ul style="list-style-type: none"> <li>The tunnel and underground station increase the cost of the underground LRT option compared to the at-grade LRT option.</li> <li>The 149 Street underpass option has a higher cost for additional property requirements, stormwater storage facilities, and significant retaining walls compared to the at-grade LRT option. It also has a greater potential to impact the adjacent MacKinnon Ravine due to construction activity.</li> </ul>											
Relative Ranking	1	3	2									
Order of Magnitude Cost Estimate (+/- 30%)	-	An additional \$260 million	An additional \$160 million									