

LRT Crossing Assessment—87 Avenue / 178 Street

INTRODUCTION

The Valley Line is a top infrastructure priority, and is a key to achieving the City's vision for sustainable transportation that will help connect Edmonton's communities. It is a new urban-style LRT line that is very different from the existing Capital Line and the Metro Line in several important respects:

- It uses low-floor cars that can be boarded from platforms that are just slightly higher than a regular sidewalk...like a bus stop.
- Though it has its dedicated right-of-way, it runs alongside the traffic and is controlled by regular traffic signals, like the cars on the road. In other words, it goes on green and stops on red. No crossing arms, no flashing railway lights and no clanging bells at typical intersections, and virtually no additional interference with cross-traffic.
- It is more compact, and running at slower speeds, is able to accommodate more frequent stops. This puts LRT access within walking distance for thousands more people.
- It is designed to blend in better with the surrounding community.



The Concept Plan for the entire Valley Line from Mill Woods to Lewis Farms was approved by City Council on February 15, 2012. The Concept Plan defined:

- where LRT tracks will be located along the route.
- where the LRT stops and stations will be located.

Preliminary design was completed in 2013, and included public consultation and engineering regarding:

- Visually integrating the system into the existing landscape and communities.
- LRT stop/station aesthetics.
- Landscape architecture aesthetics.
- Public art opportunities (to be managed by the Edmonton Arts Council).
- Connectivity to existing transportation forms, such as walking and cycling, as well as park and ride.
- Understanding impacts with stakeholders and working with stakeholders to lessen those impacts where possible.

Construction of Valley Line Southeast (between Mill Woods and Downtown) began in 2016. The City is now taking steps to have Valley Line West ready for construction as soon as additional funding becomes available. To prepare the project for implementation, the preliminary design is being reviewed and refined where necessary to recognize changes that have occurred since it was prepared in 2013. This review includes the assessment, at City Council's request, of two high-volume intersections (Stony Plain Road / 149 Street and 87 Avenue / 178 Street) to ensure planned crossing arrangements are still appropriate.

178 STREET CROSSING ASSESSMENT—WHAT’S INVOLVED

The assessment considers whether the LRT crossing at 178 Street should proceed at street level as planned, or be grade-separated by elevating it or putting it underground. There are many factors that will need to be considered, including impacts on nearby homes and businesses, road users, transit users, cyclists and pedestrians. Cost and constructability are also evaluated.



Stakeholder and public input is important: we want to hear about issues, opportunities or considerations we need to take into account in the crossing assessment.

OPTIONS & THEIR CHARACTERISTICS

	At-grade (current design)	Elevated	Underground
Appearance	 <p>Portland OR</p>	 <p>Richmond BC</p>	 <p>Edmonton AB</p>
Travel time (cars)	In the future, as the City grows and develops, with or without LRT, this corridor will experience increased traffic congestion. Traffic will also fluctuate through the year also causing congestion independent of the LRT. The LRT will affect the signal timing of the intersection, benefiting those movements running with the LRT and impacting those that will cross the LRT. In general, an at-grade crossing will add an average of approximately 14 seconds of delay for cross-traffic at the intersection.	Grade separation would enable traffic signal green times to be redistributed to potentially reduce the level of traffic congestion, compared to the at-grade arrangement. Turning movements could benefit the most. On average, the travel time savings for cross-traffic through the intersection would be approximately 14 seconds compared to the at-grade arrangement.	
Travel time (LRT riders)	N/A	The grade separation option would provide an average LRT travel time savings of approximately 25 seconds through the intersection.	
Additional cost	N/A	An elevated section would add approximately \$50 - \$75 million to the cost.	Because of the elevated track and station is so nearby at West Edmonton Mall, an underground arrangement is not feasible at 178 Street and thus has already been screened out.

FACTORS TO CONSIDER

The City considers several factors when assessing LRT crossing locations for possible special treatment.

LRT CROSSING ASSESSMENT FRAMEWORK*	
Category	Key Factors
Accessibility: <i>How the various transportation modes link between one another and with adjacent developments</i>	<ul style="list-style-type: none"> • Promotes pedestrian connectivity through safe and efficient transfers and connections between various transportation modes (includes pedestrian connectivity) • 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>	<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 (Light Rail Vehicle) reliability / minimizes potential of delay to LRT operations and, as a result, minimizes LRV fleet requirements • Transportation network resiliency (surrounding network capacity)
Urban Design & Social Environment: <i>How the surrounding communities and stakeholders are impacted</i>	<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” (positive public spaces) opportunities • Appropriate fit with adjacent land uses (planned or existing) and proposed Transit Oriented Development (TOD) planning • Minimizes impacts to parkland and open spaces • Reduces potential noise/vibration impacts
Feasibility & Construction: <i>Feasibility, cost and risk assessments</i>	<ul style="list-style-type: none"> • Reduces life-cycle costs—capital, operating, maintenance and renewal • Reduces need for private property acquisition • Constructability
*Approved by City Council June 2017	

FAQ

Why is the LRT designed to run primarily at-grade, and how is it made compatible with car traffic?

The Valley Line LRT is designed to meet the overall goals of LRT expansion while fully integrating with the communities it serves. The low-floor, urban-style LRT allows stops to be small...basically a raised curb and sidewalk with a shelter. Stops can be spaced closer together, making LRT accessible to more people. It costs less than elevated or subway systems.

The Valley Line LRT will run alongside traffic in designated lanes and follow the posted speed limits. The LRT will cross through an intersection during a green light and stop at a red light, just like the other vehicles on the road. The LRT may get green light priority at some intersections (i.e. the green may be extended until the LRT passes through), but because no crossing arms will be lowered, cross-traffic won't have to wait additional time before and after the LRT passes. As a result, increases in wait times are usually insignificant.

Another benefit of keeping the LRT at grade is that no overhead structures or tunnels are required. Grade separations create visual and physical barriers in the community that reduce comfort and accessibility for pedestrians and cyclists moving through or within the area.

When are grade separations considered?

There are some locations where grade separations are required. For instance, on Valley Line Southeast, the LRT crosses CP and CN train tracks. Due to rail safety requirements and technical difficulties with having LRT tracks and train tracks intersect, the LRT was grade separated for these crossings. At other locations, at-grade crossings are incompatible with the style of road. For example, grade separations are required when an LRT crosses over Anthony Henday Drive or any of the streets in Edmonton's "inner ring road" (Whitemud Drive, 75 Street, Yellowhead Trail, 170 St).

Grade separations are also considered where traffic volume is already causing intersection gridlock and there is no other way to provide relief.

Why not elevate or tunnel the entire LRT?

A fully-elevated or underground LRT would be inconsistent with the City's vision, and it would be very costly. This higher cost would result in a much longer time to expand the system and realize the benefits.

What would a grade separation involve?

An above-grade crossing would require a bridge over the intersection for the LRT vehicles to travel on. The bridge is called an elevated guideway, and consists of a single deep beam that supports the weight of the bridge, LRT vehicles, snow, rain, wind, etc. The elevated guideway ramps up/down for about two blocks on each side of the intersection to get to its required height. It is typically supported on large concrete piers

centered below the beam, but sometimes may need to be supported on a second layer of deep beams that span across the road onto concrete columns.

Due to the close proximity of the elevated station at West Edmonton Mall, a below-grade, or underground, arrangement is not considered feasible at 178 Street.

Because an LRT stop can't be placed on a slope, a grade separation would usually mean that LRT stops intended to be placed near the intersection would need to be either shifted further from the intersection or built above grade as well.

Grade separations would be a departure from the City's vision for a sustainable, urban, integrated, low-floor LRT system designed to blend into surrounding mature communities. An elevated crossing would be more of a visual and potentially physical barrier. A grade separation would involve extending the tracks above ground from the elevated West Edmonton Mall station westward to cross over 178 Street and ramp down to ground level east of 182 Street. The 182 Street LRT stop is far enough away from 178 Street that it would probably be unaffected.

How are travel time savings calculated?

Travel times are calculated using transportation modelling software to measure travel times for vehicle, LRT and traffic congestion.

Do the plans for the Valley Line involve LRT priority? Is removing LRT priority a viable alternative to grade separation?

Plans call for partial priority for the LRT at some major intersections where the green signal can be extended slightly to allow the LRT can pass before it turns red. However, the LRT may still get a red signal that will require it to stop. The assessment includes determining if a reasonable balance of intersection movements can be achieved.

FIND OUT MORE ABOUT THE VALLEY LINE WEST PROJECT

- Visit www.edmonton.ca/valleylinewest
- Call the LRT Projects Information Centre at 780.496.4874 or email lrtprojects@edmonton.ca