

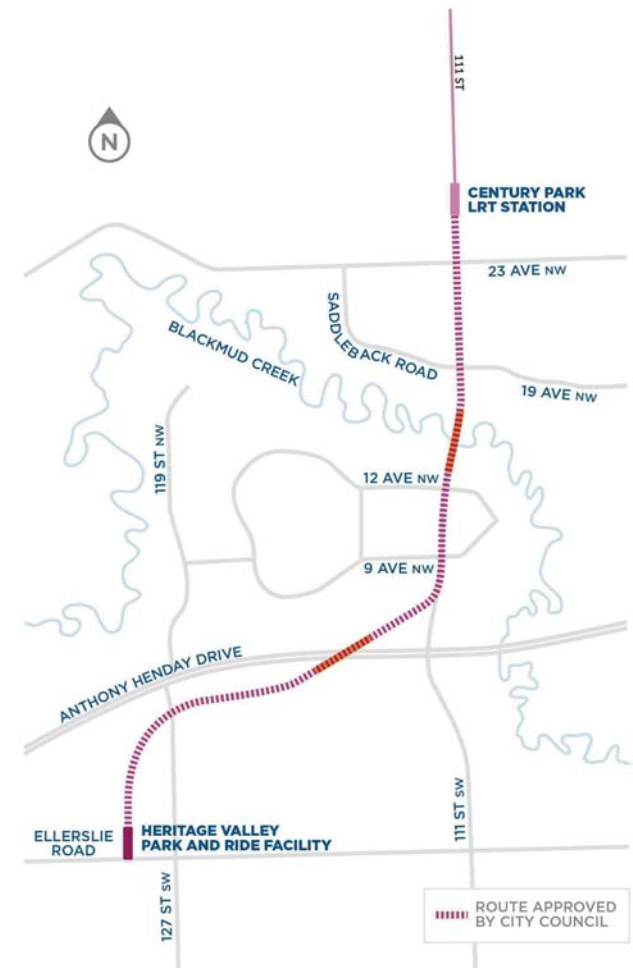
# CAPITAL LINE SOUTH LRT EXTENSION INTRODUCTION

Edmonton

**What:** The 2010 preliminary design for the Capital Line South LRT Extension will run from the Century Park Station to Ellerslie Road. It will connect to the Heritage Valley Park and Ride located at the northwest corner of Ellerslie Road between 127 Street and 135 Street.

**When:** The 2017-2018 preliminary design update will be completed by the end of 2018.

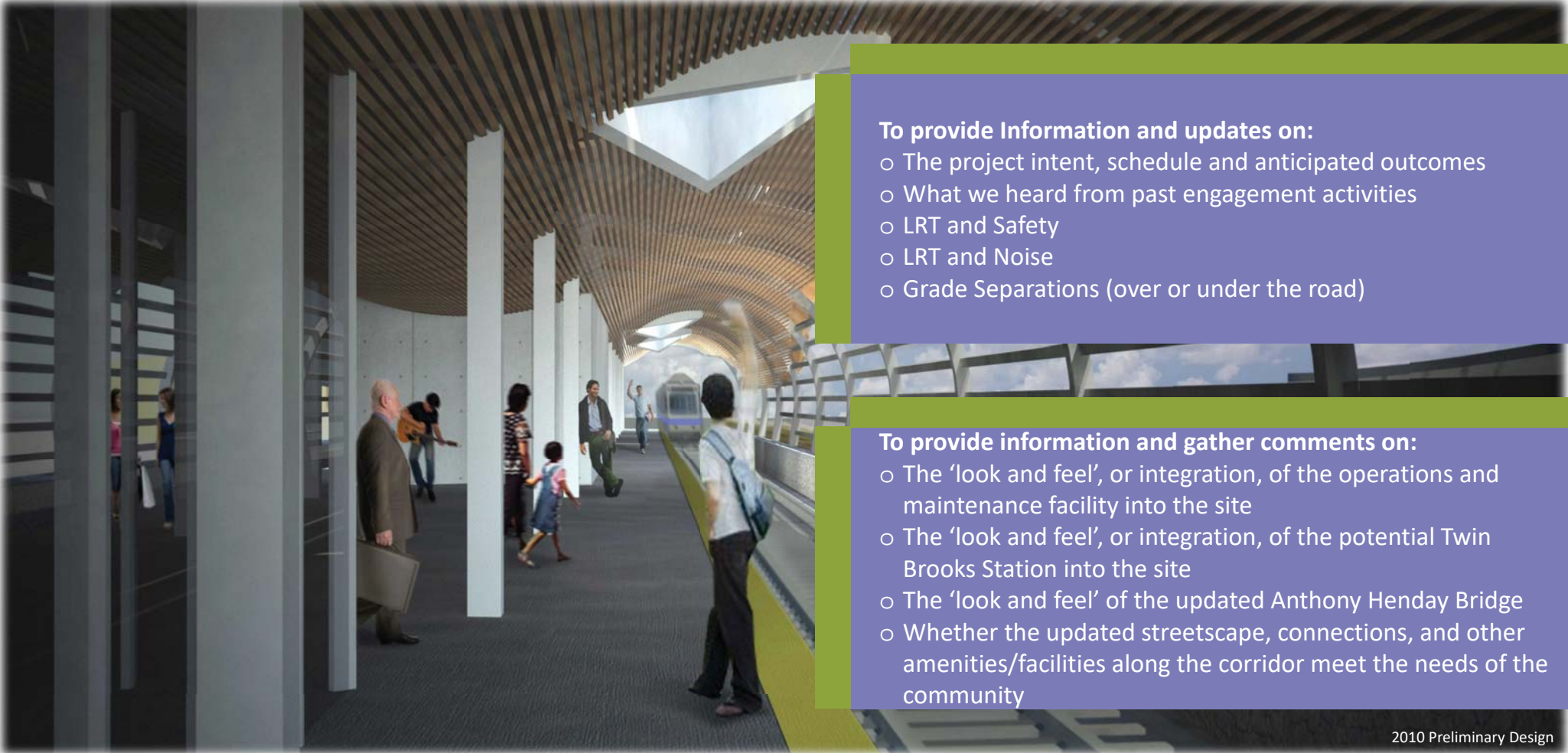
CAPITAL SOUTH LRT EXTENSION  
CENTURY PARK TO ELLERSLIE ROAD



# CAPITAL LINE SOUTH LRT EXTENSION

## MEETING PURPOSE

Edmonton



### To provide Information and updates on:

- The project intent, schedule and anticipated outcomes
- What we heard from past engagement activities
- LRT and Safety
- LRT and Noise
- Grade Separations (over or under the road)

### To provide information and gather comments on:

- The 'look and feel', or integration, of the operations and maintenance facility into the site
- The 'look and feel', or integration, of the potential Twin Brooks Station into the site
- The 'look and feel' of the updated Anthony Henday Bridge
- Whether the updated streetscape, connections, and other amenities/facilities along the corridor meet the needs of the community

2010 Preliminary Design

# CAPITAL LINE SOUTH LRT EXTENSION PROJECT HISTORY

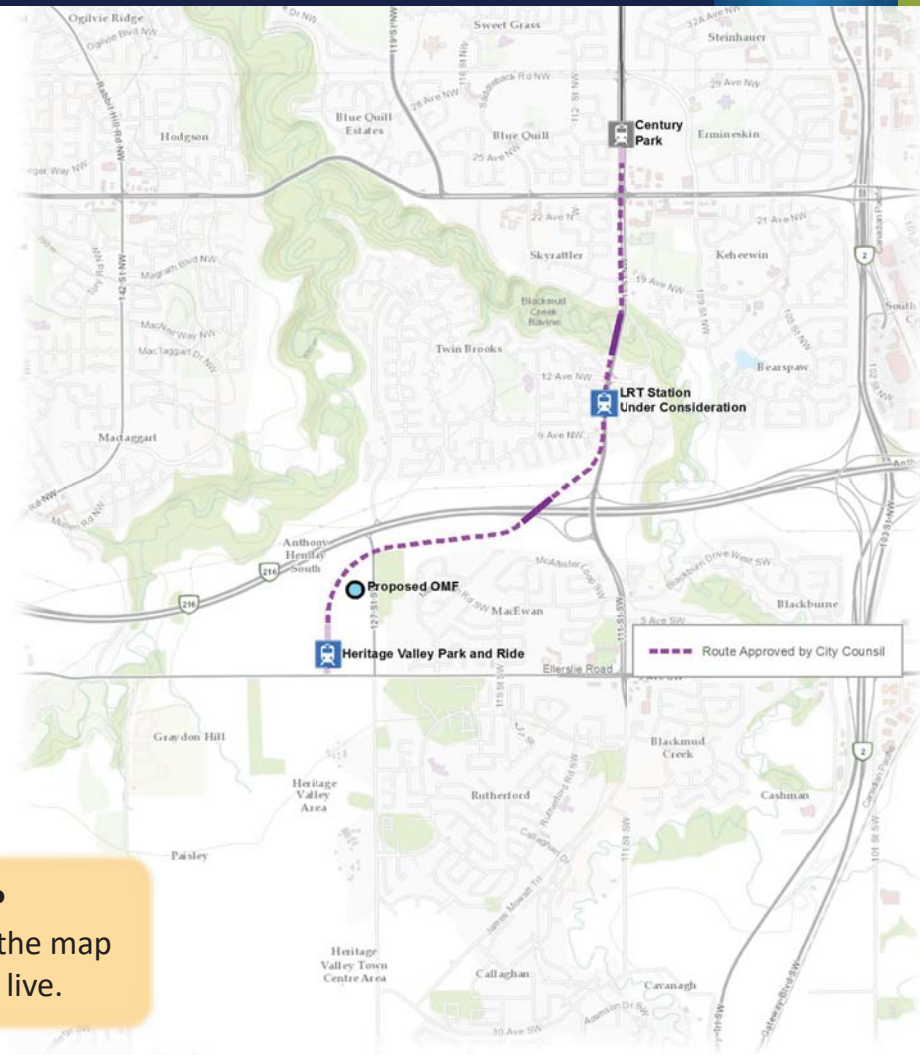
## Background

Preliminary engineering for an LRT extension of the Capital Line from Century Park to Ellerslie Road Transit Centre was completed in 2010. This high-floor LRT extension of the Capital Line is 4.5 km and includes:

- An underpass at 23 Avenue;
- Bridges crossing Blackmud Creek and Anthony Henday Drive; and
- A future operations and maintenance facility (OMF) south of Anthony Henday Drive.

At the south end of this project is a future combined LRT station, transit centre, and the Heritage Valley Park and Ride facility on the northwest corner of Ellerslie Road between 127 Street and 135 Street.

A potential station at Twin Brooks, between 9<sup>th</sup> and 12<sup>th</sup> Avenues, is also being considered.



## WHERE DO YOU LIVE?

Please place a dot on the map to show us where you live.

# CAPITAL LINE SOUTH LRT EXTENSION: WHY THE 2010 PRELIMINARY DESIGN BEING LOOKED AT NOW

Edmonton

The 2010 preliminary design is being reviewed, and updated where required, because:

- The design standards have changed
- New technology may be incorporated into the design
- Sustainable Urban Integration (SUI) guidelines for high-floor LRT are being updated. These guidelines will place a higher value on aesthetics and 'fitting' or integrating the LRT into the adjacent communities. This may require changes to the 2010 design of the landscape, trails and other elements enjoyed by people along the corridor
- The LRT Crossing Assessment Framework was developed in 2017. This is a City Council approved process that identifies the level of need for a bridge or underpass at intersections that the LRT will cross. Saddleback Road, 9<sup>th</sup> Avenue and 12 Avenues along 111 Street have been assessed using this framework. Ellerslie Road grade separation assessment has been postponed as the assessment will be completed with the Heritage Valley Neighborhood Area Structure Plan project that has recently started
- An operations and maintenance facility (OMF) in south Edmonton is needed to store and provide light maintenance for the LRT vehicles. How the identified site fits into the community is being considered
- A station at Twin Brooks and how it fits into the community is being considered
- Federal and Provincial funding became available for the project
- An updated preliminary design will help ready the City prepare for construction as funds become available

This preliminary design update will be completed at the end of 2018.

## What is a grade separation?

A grade separation is where LRT is physically separated from street-level traffic with raised, trenched, or below ground track.



Portland, USA



Pittsburg, USA



Stuttgart, Germany



Los Angeles, USA

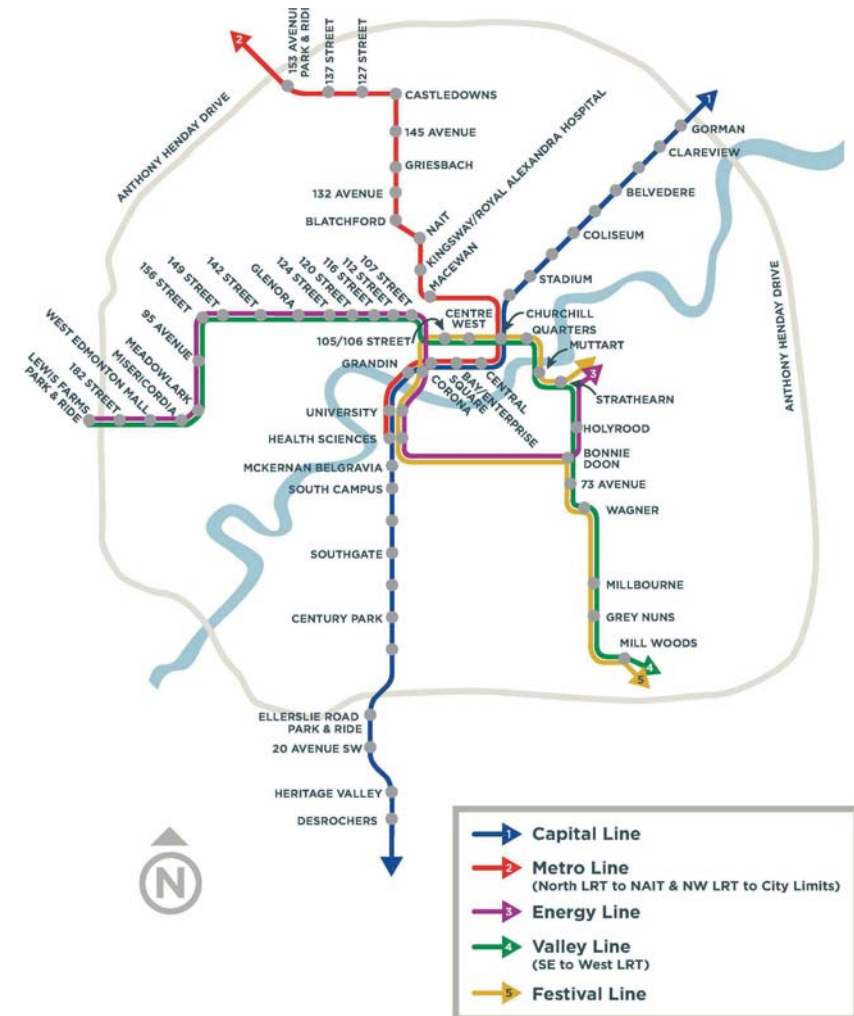
## What is a design standard?

A design standard defines the best way to design and build a quality element. For example, LRT tracks need a specific amount of space around them for the LRV (light rail vehicle or 'car') to move on the track. Standards say what these requirements are and include such things as safety requirements, size, materials, etc.

# CAPITAL LINE SOUTH LRT EXTENSION: WHAT IS BEING CONSIDERED?

The refresh of the preliminary design has looked at many things, including:

- LRT Network Plan
- Project history/2010 preliminary design
- Environment
- Existing and future land uses
- Existing drainage patterns
- Indigenous traditional uses
- Noise and vibration
- Access to properties/neighborhoods
- Public input and community desires
  - Aesthetics (look and feel)
  - Streetscape
  - Landscape
  - Connectivity
- Blackmud Creek conditions such as: soils, slope stability, water flow, and fish and animal habitat
- Existing and future traffic requirements (including grade separations)
- Recreational activities along/crossing the LRT corridor
- Alternative types of existing and future transportation
  - Pedestrian
  - Bicycle
  - Transit
- Utilities, pipelines and other services
  - Safety
  - Cost
  - Policies
  - Technical design standards



# CAPITAL LINE SOUTH LRT EXTENSION

## WHAT WE HEARD – 2017 SUMMER SURVEY RESULTS

### Proposed Themes Along South LRT Extension



**LEGEND**

- LRT ROUTE
- LRT STATION
- PROPOSED PERMANENT PARK AND RIDE FACILITY
- BRIDGE CROSSING



**TOTAL SURVEYS COMPLETED:**  
1,687

SIP Members Preferred:  
**Nature Theme Vegetation Features:**

Along 111 Street from 9th Ave NW to Ellerslie Road



**90%**  
agreed this theme was appropriate

SIP Members Preferred:  
**Urban Transition Theme Features:**

Along 111 Street to 9th Ave NW



**90%**  
agreed this theme was appropriate

# CAPITAL LINE SOUTH LRT EXTENSION

## WHAT WE HEARD –2017 SUMMER SURVEY RESULTS

Edmonton

2010 LRT Bridge over Anthony Henday Bridge



**Nature Theme.**

**90%**

**Agreed this theme was appropriate**

2018 LRT Bridge over Anthony Henday Bridge Update



During the 2018 process, it was identified that the Anthony Henday Bridge needed to be modified to meet Alberta Transportation requirements for distance from the road to the bottom of the bridge. This resulted in a through truss bridge.

**Do you have any comments on the “look and feel” of this proposed LRT bridge over Anthony Henday Drive?**

# CAPITAL LINE SOUTH LRT EXTENSION

## WHAT WE HEARD – 2017 SUMMER SURVEY RESULTS

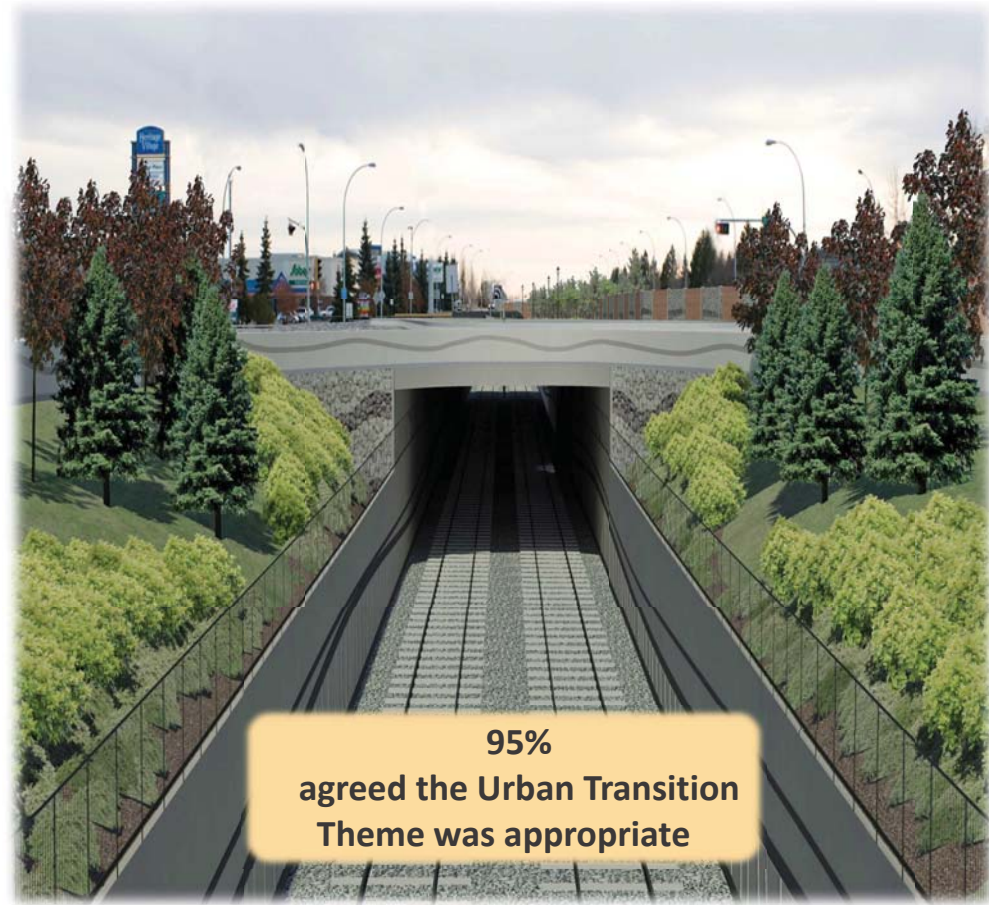
Edmonton

**Bridge over Blackmud Creek  
(2010 Preliminary Design)**



**98%**  
agreed the Urban Transition  
Theme was appropriate

**111 Street and 23 Avenue Underpass  
(2010 Preliminary Design)**



**95%**  
agreed the Urban Transition  
Theme was appropriate



# CAPITAL LINE SOUTH LRT EXTENSION

## WHAT WE HEARD – 2017 SUMMER SURVEY RESULTS

### Priority Ranking from 2010 Design

In 2010, we heard that these factors needed to be considered in the preliminary design. The 2017 survey asked which item was most important

Important Preliminary Design Considerations from 2010	Percent of Responses
Provide adequate room and all-weather protection at stations	24%
Provide noise attenuation where possible	18%
Improve connectivity into the communities with multi-use trails	18%
Minimize impacts on the environment	15%
If trees need to be removed, relocate them in the neighborhood and replace lost trees	4%
Use easy to maintain materials and features	4%
Build less expensive bridges and spend money on landscaping and aesthetics along the LRT	3%
Use natural themed landscape and/or screening to shield views of the LRT, station, transit centre and Park and Ride	3%
Use energy-efficient lighting and features	3%
Use a natural suburban theme with lots of trees in transition area	1%
None of these	7%

For more details from this survey go to: [www.edmonton.ca/capitalsw](http://www.edmonton.ca/capitalsw)

### Twin Brooks Station

2017 survey results indicated that 60% of the respondents thought that LRT users would benefit from a station at Twin Brooks.

2017 survey results for Twin Brooks residents only, indicated that 58% of Twin Brooks residents who responded thought that LRT users would benefit from a station at Twin Brooks.

# CAPITAL LINE SOUTH LRT EXTENSION

## WHAT WE HEARD - 2018 SUMMER SURVEY RESULTS

An online survey was conducted from August 6, 2018 to September 5, 2018 on the potential Twin Brooks station and grade separations for three intersections along 111 Street at Saddleback Road, 9<sup>th</sup> Avenue and 12<sup>th</sup> Avenue. Pop-ups at various locations were also held to conduct the survey.

### Which grade crossing do you prefer?

	Saddleback Road and 111 Street NW (1108 Responses)	12 <sup>th</sup> Avenue/111 Street NW (1075 Responses)
At-Grade	29%	32%
Elevated Crossing	29%	23%
Urban LRT Underpass (Trenched) Crossing	17%	18%
Tunnel Crossing	23%	24%
No Preference	2%	3%

**9 Avenue/ 111 Street NW** is one of two intersections that provide access into the adjacent neighbourhood of Twin Brooks along 111 Street. An elevated crossing at this location is not possible due to the distance required between the AltaLink overhead high voltage power lines and the LRT. A tunnel or Urban LRT Underpass is not possible due to distances required from underground pipelines and utilities, and from the potential Twin Brooks Station. An at-grade crossing is being recommended as no other option is possible at this location.

**TOTAL SURVEYS COMPLETED:**  
1,696

### Do you support the addition of a station at Twin Brooks, between 9 and 12 Avenues along 111 Street NW?

YES	66%
NO	25%
NO PREFERENCE	8%

We received 4735 comments and are currently analyzing the data. A summary of the survey results will be posted on the webpage by the end of November.

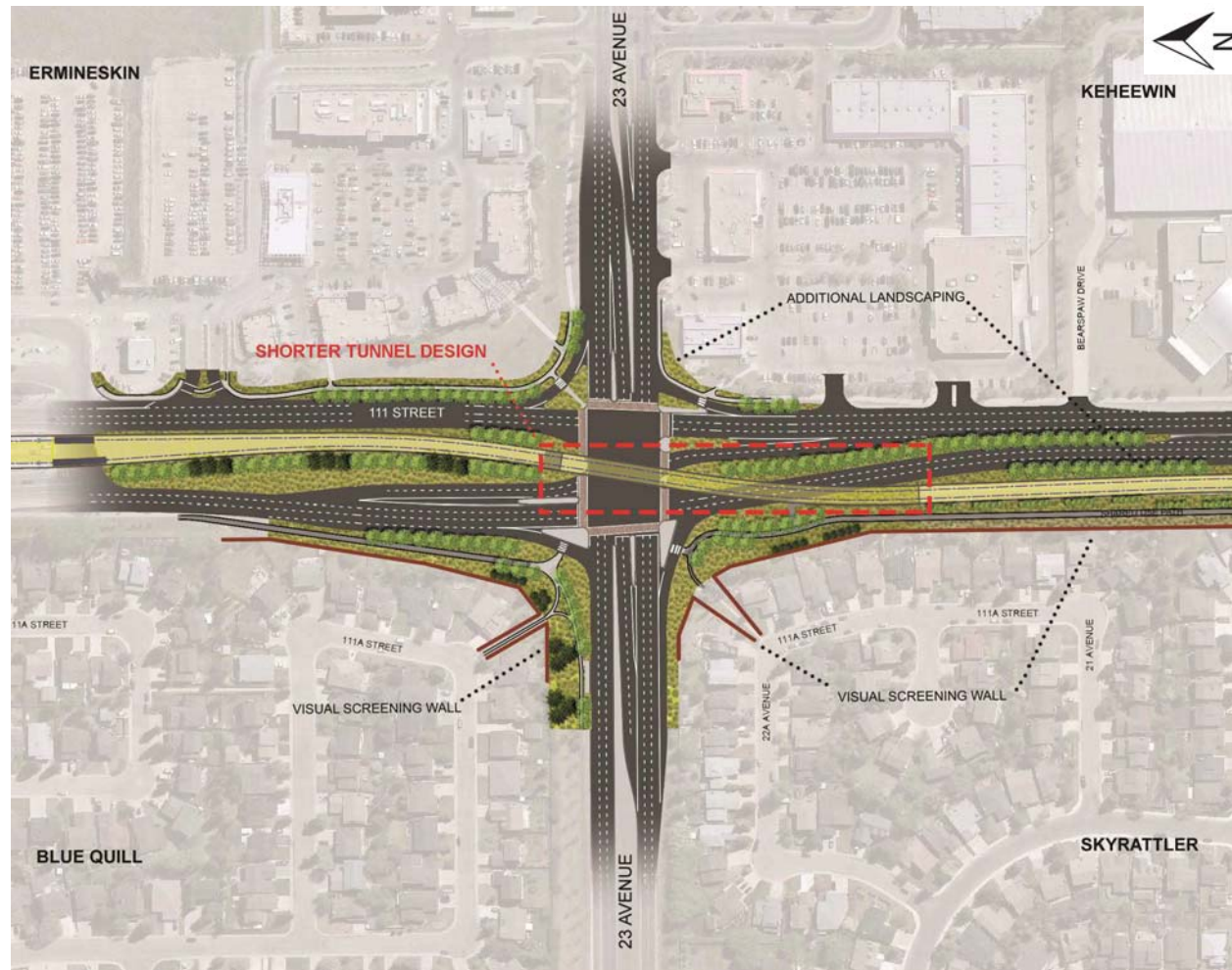
# CAPITAL LINE SOUTH LRT EXTENSION THE UPDATED PRELIMINARY DESIGN

## Streetscape and Landscape

The streetscape, including the landscape, shared-use path, pedestrian crossings, noise walls, lighting and site furniture were first designed in 2010. Updates have occurred in various areas and have been identified on the roll plans with a red box around areas with significant changes.

Note: The landscape along the corridor has been updated throughout.

Please provide any comments you may have about the updated areas on sticky notes and place them on the maps.



# CAPITAL LINE SOUTH LRT EXTENSION FUTURE OPERATIONS & MAINTENANCE FACILITY (OMF)

Edmonton

## What is an OMF?

This OMF is a site that contains a building for LRV (light rail vehicles or LRT 'cars') storage and light maintenance (car wash, painting, etc). It will also have tracks to move LRVs around the site and provide storage when they are not in use. Offices and parking for staff will be provided.

## When will it be built?

This OMF may be constructed as a separate project. The timing for construction has not been decided. City Administration will recommend to City Council that the OMF be constructed at this site. Council will make a decision in November 2018.

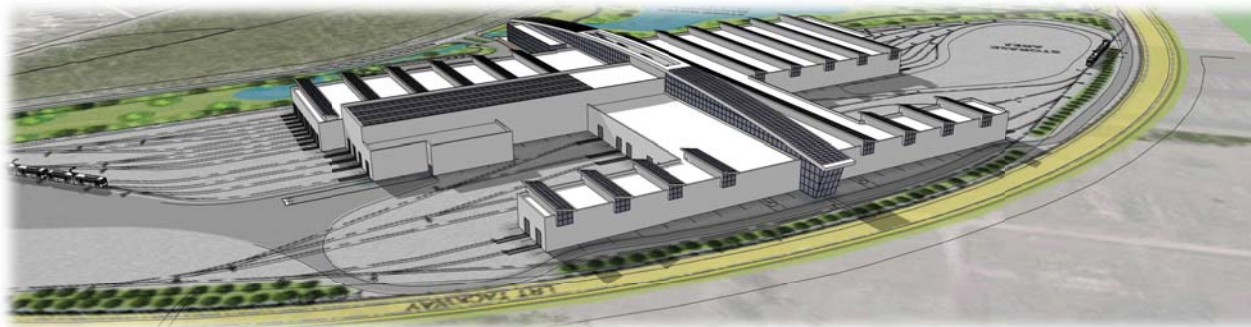


# CAPITAL LINE SOUTH LRT EXTENSION FUTURE OPERATIONS & MAINTENANCE FACILITY (OMF)

Edmonton

## Why at this site?

As the LRT Network expands, more storage and maintenance facilities are required. An OMF Strategy has been developed by the City. It describes the maintenance and storage capacity requirements, functional requirements, and expansion priorities for the high floor LRT network. This site was identified in the OMF Strategy and is now being considered for future use.



Have we 'fit' or integrated the OMF into the site with regards to the look and feel? For example: Do the screening, landscape and other elements meet the needs of the community?



# CAPITAL LINE SOUTH LRT EXTENSION POTENTIAL TWIN BROOKS STATION

Edmonton

## Background

The Twin Brooks Station is included in the LRT Network Plan, approved by City Council in 2009. It was not included in the 2010 preliminary designs for the Capital Line South LRT Extension but is being now being considered to meet LRT urban principles, including shorter distances between stations.

## The Station Design

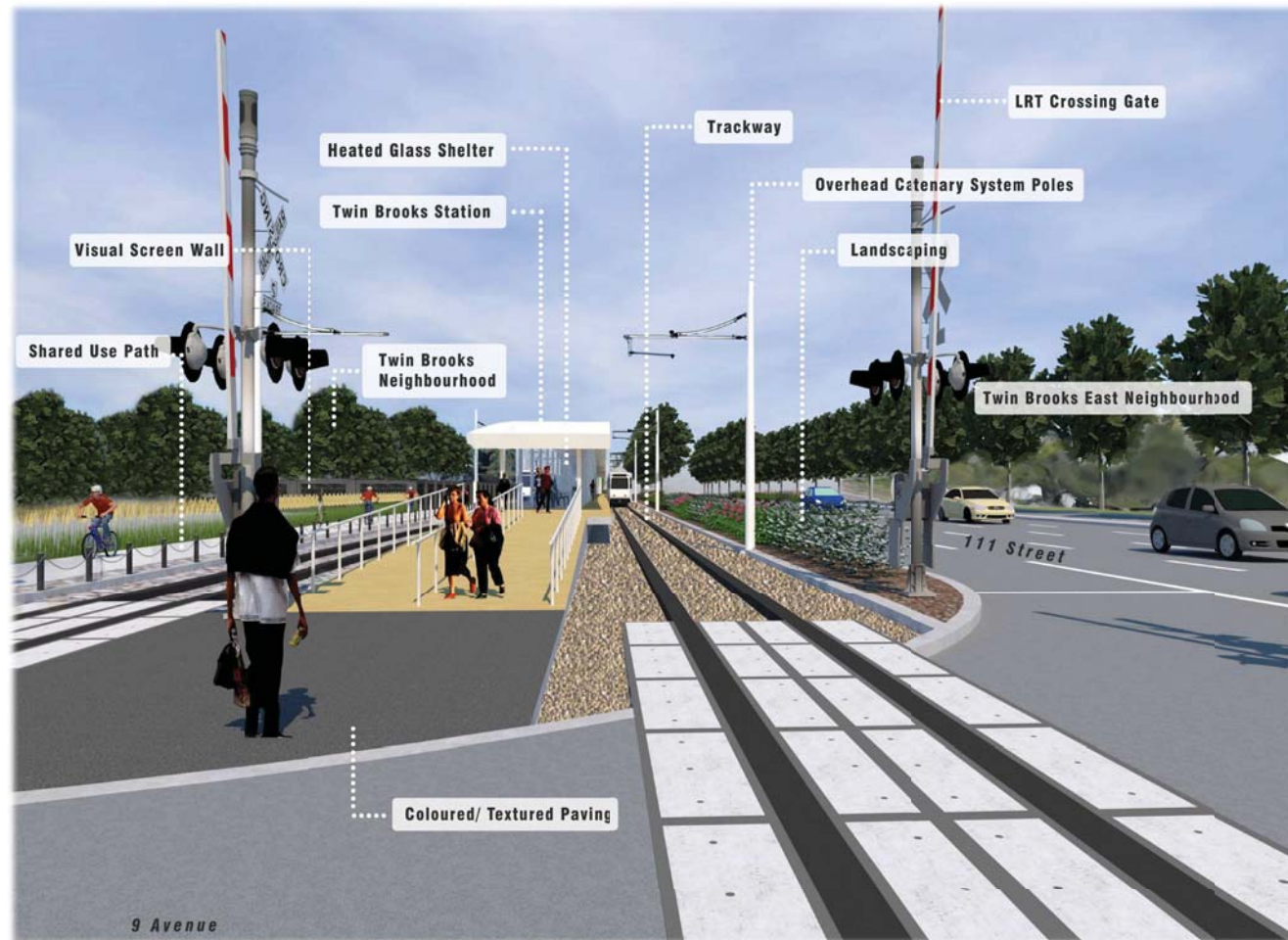
The design encourages passengers to access this station by “walking-on” from the adjacent community with ramps at both the north and south side of the platform. These ramps connect to existing sidewalks and/or the Shared Use Path. Bus stops are close by.

The platform will be open and will have passenger amenities such as benches, lean rails, enclosed shelters, ticketing machines, digital schedules, ski racks, and advertising.

## Who Makes the Decision?

City Administration’s recommendation to City Council is that this station be included as part of the Capital Line South LRT Extension. City Council will make their decision on the Twin Brooks Station in November 2018.

The 2017 and 2018 survey results, which support this recommendation will be provided as background information to City Council.



# CAPITAL LINE SOUTH LRT EXTENSION POTENTIAL TWIN BROOKS STATION

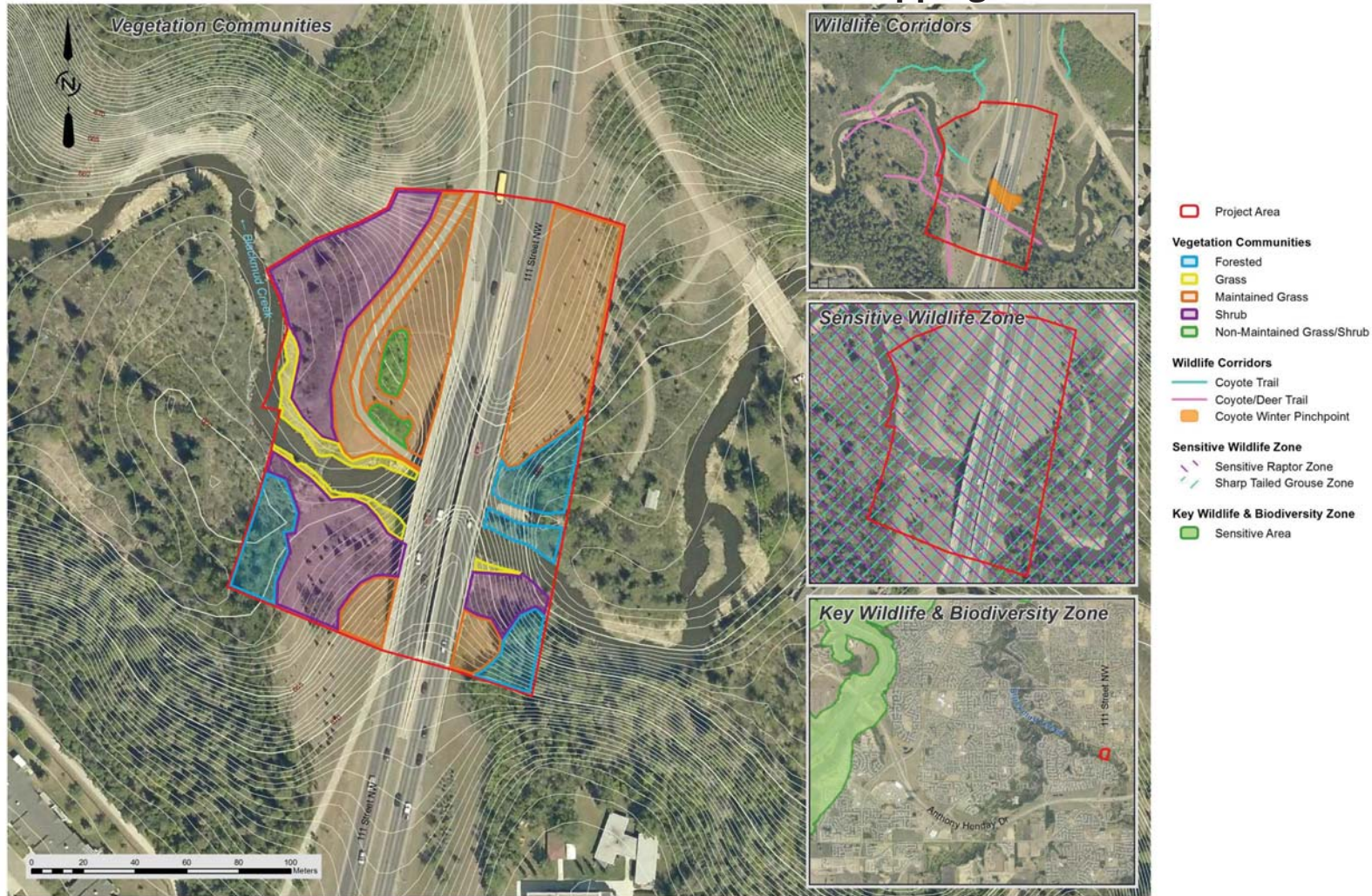


Have we 'fit' or integrated the Twin Brooks Station into the site with regards to the look and feel of the site? For example: Do the screening, landscape and other elements meet the needs of the community?



# CAPITAL LINE LRT: BLACKMUD CREEK CROSSING ENVIRONMENTAL IMPACT ASSESSMENT

## Environmental Sensitivities Mapping





# CAPITAL LINE LRT: BLACKMUD CREEK CROSSING

## ENVIRONMENTAL IMPACT ASSESSMENT

### Overview:

- The City of Edmonton is planning to extend the existing light rail transit (LRT) system south from Century Park to Ellerslie Road. The City has proposed development of a clear-span LRT bridge and shared use path (SUP) where the bridge crosses Blackmud Creek
- Blackmud Creek is part of the North Saskatchewan River Valley and any new construction work in the River Valley is protected under the North Saskatchewan River Area Redevelopment Plan, Bylaw No. 7188
- As per Bylaw 7188, the City's Parks and Biodiversity office determined that an Environmental Impact Assessment (EIA) is to be completed for the project. Please provide any information that you wish to the project team regarding the environment at the project location. This information will be considered when completing the EIA

### What is the Purpose?

- The objective of this EIA is to assess the potential environmental impacts of the bridge construction and develop strategies to avoid or minimize impacts. This assessment:
  - Described the proposed project;
  - Identified and described the existing environment;
  - Identified the potential environmental impacts of the construction, operation, and maintenance of the bridge;
  - Described the strategies and procedures required to avoid or reduce environmental impacts;
  - Identified any remaining environmental impacts that cannot be reasonably minimized.



### Results

The review of existing information, the proposed preliminary design, and field assessments have led to identification of Valued Ecosystems Components (VEC) for the project area. A VEC is an element of the environment that has scientific, economic, social or cultural significance. The following are the VEC's in the Project Area:

1. Blackmud Creek floodplain and how the water flows in the creek channel;
2. Blackmud Creek and vegetation along the creek;
3. Natural vegetation (forested areas);
4. Rare plant species.
5. Wildlife and movement corridors; and
6. Historical resources, such as archaeological (human artifacts and remains) or paleontological (fossil) sites.

# CAPITAL LINE: LRT BLACKMUD CREEK CROSSING ENVIRONMENTAL IMPACT ASSESSMENT

The proposed location of the clear-span LRT bridge and shared use path will use previously disturbed areas, reducing the impacts to the surrounding natural environment and no work will take place within the creek. The proposed development will have short-term minor / low environmental impacts to the identified VECs. *Concerns will be managed by following mitigation measures and best management practices during all phases of the project (Planning and Design, Construction, and Operation).*



## General Mitigation Recommendations

These recommendations will be reviewed by City of Edmonton and the accepted recommendations will be implemented.

Phase of Project	Mitigation Measure
Planning and Design	<ul style="list-style-type: none"> <li>• Follow the preliminary design standard for a clear-span bridge, with no in stream work requirement.</li> <li>• Locate laydown areas for construction equipment in previously disturbed areas where possible.</li> <li>• Conduct early and late season rare plant survey prior to vegetation clearing.</li> <li>• Plan vegetation clearing activities outside the breeding and nesting period (March 1 to August 15) for owls, birds of prey, and migratory birds.</li> <li>• Ensure final design allows for appropriate spacing and openness to maintain wildlife corridors.</li> </ul>
Construction	<ul style="list-style-type: none"> <li>• Implement temporary Erosion and Sediment Control (ESC) measures around the construction area to prevent storm water from carrying soils from the site to the creek</li> <li>• Ensure construction personnel stay on existing road and trails to prevent unnecessary damage to surrounding vegetation</li> <li>• If rare plants are found they should be reported immediately to the City and an environmental professional should be consulted to advise on the proper mitigation measures</li> <li>• Consult with Alberta Environment and Parks prior to construction activities if work is planned during the breeding and nesting period</li> <li>• Educate all workers regarding the potential for human/wildlife encounters and proper procedures</li> <li>• Report any historical resource finds to Alverta Culture and Tourism</li> </ul>
Operation	<ul style="list-style-type: none"> <li>• Inspect and maintain any wildlife exclusion fencing. Repair fencing and restore vegetation where required</li> <li>• Avoid disturbing nesting birds during bridge maintenance. Time maintenance to occur outside of the breeding and nesting period.</li> <li>• Monitor wildlife movement following construction to verify corridor use has not been altered</li> </ul>

# CAPITAL LINE SOUTH LRT EXTENSION NOISE & VIBRATION

## What is considered in a noise study?

The City of Edmonton Urban Traffic Noise Policy C506A (2013) provides direction for maximum noise levels [65 decibels (dBA)] and mitigation. Noise studies consider the following to determine the future noise levels and the required mitigation:

- Traffic (vehicles per hour, % of heavy trucks, speed limits)
- LRT (number of trains per hour, train speed, bells/ gates)
- Topography (contours)
- Vegetation

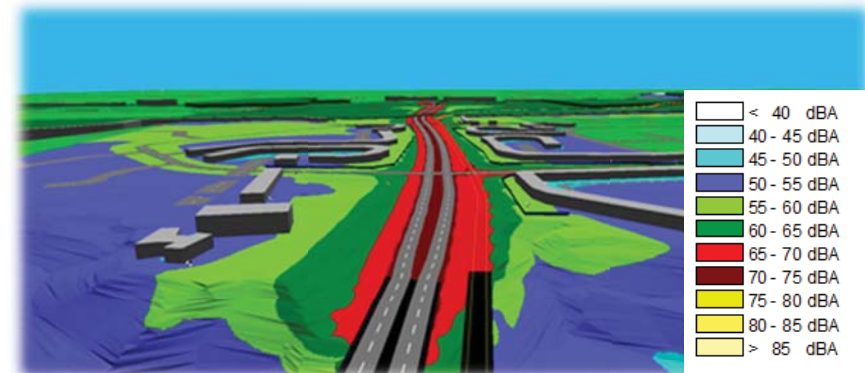
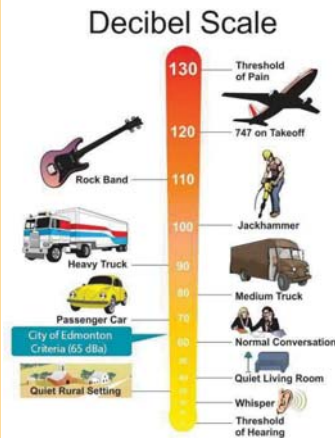
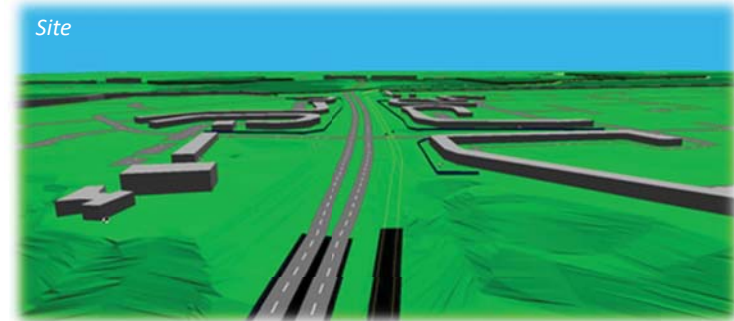
Noise modelling considers all these parameters under future conditions and provides conservative estimates.

The noise levels are then modelled and mapping is developed to show noise levels.

Any residential properties adjacent to the LRT corridor that meet or exceed noise levels of 65 decibels (dBA) are considered for noise mitigation (walls, berms or a combination of both).

The analysis of the modeling is currently being completed for the Capital Line South LRT Extension. The results will be reviewed again during detailed design.

Vibration calculations have indicated that all traffic and LRT (combined) vibration contributions will be under the current required criteria.



# CAPITAL LINE SOUTH LRT EXTENSION INDIGENOUS ENGAGEMENT

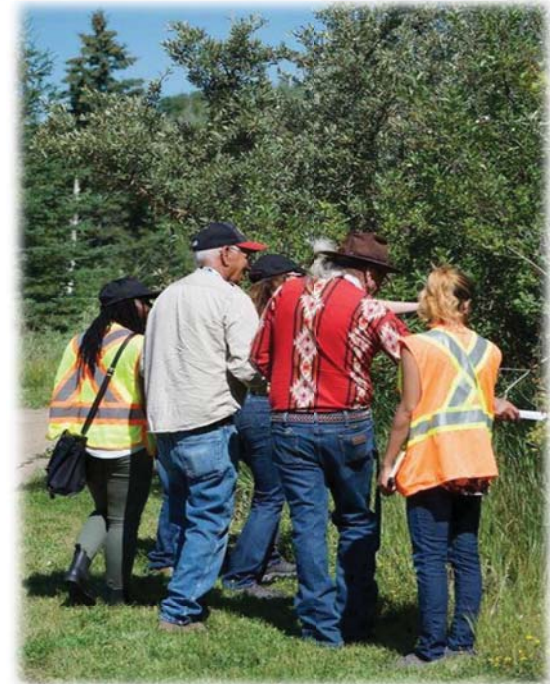
Edmonton



In 2017, the City reached out to Indigenous communities to jointly develop plans for engagement and to begin establishing an engagement charter. The City was seeking input from Indigenous communities on the City's LRT infrastructure projects. Throughout 2017 and 2018, engagement with Indigenous communities continued and the following activities took place:

- Site visits with Elders, knowledge holders and technicians
- Meetings with Elders and knowledge holders
- Ceremony prior to construction activities (for Heritage Valley Park and Ride)
- Construction/excavation monitoring (for Valley Line Southeast LRT)

In the summer of 2018, the Capital Line South LRT Extension project completed four site visits with 21 Indigenous communities. During the site visits, the City made a commitment to continue building relationships with Indigenous communities and to keep them informed of project updates. In fall 2018, the engagement process that occurred, the feedback received, and the next steps will be summarized in a report which will be distributed to the Indigenous communities for validation. The feedback received throughout all activities will be considered by the project team as the project moves forward.

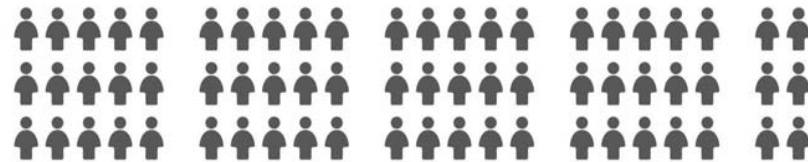


# CAPITAL LINE SOUTH LRT EXTENSION TRAFFIC MODELLING

## Maximizing Efficiency

The redistribution of commuters and road network use is part of what the City wants- to maximize the efficiency of the transportation network. If many of the City's main intersections are already at capacity, and Edmonton continues to grow, choices become limited: build more roads or make better use of the current system. While in some places, like along 75<sup>th</sup> Street between Whitemud and Wagner Road, the City is increasing road capacity to support multiple objectives (like goods movement) – in most parts of the city that just isn't realistic. LRT, in contrast, offers the ability to fit the capacity of around 600 private vehicles, or 600-700 people, on a single train. Increasing LRT isn't about making a choice between private vehicles or public transit – it's about offering options that allow everyone to make the best use of Edmonton's transportation network.

## TRANSPORTATION: FROM ROADS TO RAILS



**660 people**  
(based on existing LRT system design guidelines)

= 10 people



**600 cars**  
(based on 1.1 person per vehicle occupancy during peak periods)

= 10 cars



**One  
4-car train**

# CAPITAL LINE SOUTH LRT EXTENSION TRAFFIC MODELLING

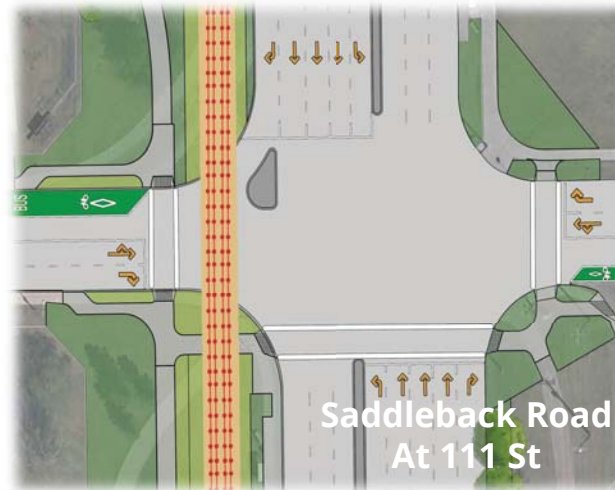
## Modelling Using Levels of Service and Turn Movement Counts:

The City of Edmonton models the impact of LRT on traffic by using a set of software programs. Traffic, train, and pedestrian movements are considered for opening day as well as long-term.

The programs used include:

- A program that predicts traffic volumes across all of Metro Edmonton based on land use, population, employment, infrastructure, and other factors.
- A program that analyzes intersection capacity, based on the intersection's shape, current and future traffic volumes, and traffic signal timing.
- A program that models the LRT's movement through the system, including train travel time and frequency.
- A program that models the flow of the LRT and traffic through the entire network.

It's important to understand that there is no 'magic bullet' solution that can do all of this at the same time – results from one program are used as inputs for the next, which are fed into the next, and so on in a cycle. This is because any change the City makes to the transportation network, such as introducing LRT or changing traffic light timing, affects all other parts of the transportation network as drivers change their routes and habits. It might help to think of this as trying to solve a giant jigsaw puzzle... except every time a piece is fit together with another, the pieces all change slightly and the picture on the box changes as well. Nothing is static.



## What is Level of Service (LOS)?

LOS is used to analyze roadways and intersections by categorizing traffic flows and assigning quality levels of traffic based on performance measures like vehicle speed, density, congestion, etc. The City of Edmonton determines the level of service of each road and works to keep or improve that LOS with changes to signals, turning lanes, etc.

# CAPITAL LINE SOUTH LRT EXTENSION GRADE SEPARATION

## Grade Separation

A grade separation is where LRT is separated from traffic with a bridge or underpass.

LRT crossing assessments, along with traffic modelling and network analysis up to 2050, have been undertaken to determine potential grade separations for the following intersections along 111 Street:

- 9<sup>th</sup> Avenue
- 12 Avenue
- Saddleback Road (19 Avenue)

The LRT Crossing Assessment Framework was approved by City Council in June 2017. It was not used to determine crossings on the current Capital and Metro LRT lines.

## The Results

- The crossing at 9 Avenue must be at grade. An elevated crossing is not possible due to the distance required between the AltaLink overhead high voltage power lines and the LRT. A tunnel or Urban LRT underpass is not possible due to distances required from underground pipelines and utilities, and from the potential Twin Brooks Station.
- At-grade crossings for 12 Avenue and Saddleback Road (19 Avenue) along 111 Street have been assessed as being suitable and will be recommended by City Administration in their November 6, 2018 report to City Council. Criteria scoring will be included in this report and were not ready for the public meetings.
- City Council will make a decision based on the recommendations. The 2018 survey results will be provided to Council as background information.

The Ellerslie Road crossing assessment will be completed with the development of the Heritage Valley Neighbourhood Area Structure Plan.

Urban LRT Underpass (Trench)



Ottawa Trench Example



Tunnel



At Grade LRT



Elevated LRT



# CAPITAL LINE SOUTH LRT EXTENSION

## NEXT STEPS

2010 Preliminary Design

Thanks for participating!  
Your comments matter

### Next steps:

- Complete an online or hardcopy comment form by October 5, 2018
- Go to the website ([edmonton.ca/capitalsw](http://edmonton.ca/capitalsw)) for 'What We Heard' summary at the end of November 2018
- Look for the final plans on the project webpage in late December 2018

### Next steps for the project team:

- The project team will present the updates/changes from the 2010 plan at a City Public Hearing on November 6, 2018
- A summary of the online survey and comments received from meeting will be posted to the project webpage in late November 2018
- The comments received will be considered in finalizing the preliminary design

### Public Engagement Timeline

We Are Here

June 2017

Sept 2017

Jan 2018

May 2018

Sept 2018

Dec 2018

#### Introduce & Identify

- Introduce the project
- Validate the 2010 preliminary design
- Identify changes to 2010 preliminary design

#### Refine & Test

- Update 2010 preliminary design from "What We Heard"

#### Take to Public

- Finalize preliminary design update

#### Project Completion





**CAPITAL LINE  
SOUTH LRT  
EXTENSION  
PROJECT**

**Increased  
urban mobility  
options,  
greener cities**

**\$15.0 M**

Spring 2017 - Winter 2019

**PROJET  
D'EXTENSION  
DE LA LIGNE DE  
CAPITAL SUD DU TLR**

**Options de  
mobilité urbaine  
accrues, villes  
plus vertes**

**\$15.0 M**

Printemps 2017 – Hiver 2019