

BELTLINE MULTIPLE ACCOUNT EVALUATION SUMMARY REPORT



December 2016

Document Number		H-351173-MA-REP-N1-FP-GE0001			Rev B
Revision Record					
Rev.	Description	Originator	Checker	Approver	Date
A	Beltline MAE Summary Report	Dena Abakumov	Agnes Zukowski	Graeme Masterton	November 4, 2016
B	Beltline MAE Summary Report	Dena Abakumov	Agnes Zukowski	Graeme Masterton	November 29, 2016

Disclaimer

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

Hatch and their sub-consultant, Stantec Consulting Ltd., accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to Hatch by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from Hatch and from the party which commissioned it.

Copyright Declaration

Copyright © 2016. Hatch, Ltd. prepared for The City of Calgary. All rights reserved.

Primary Contact

Nathan Higgins, P Eng, PE, PMP, Env SP
 Program Director
 Suite 340, 840 7 Avenue S.W.
 Calgary, AB, T2P 3G2
 T 587-293-6262
 nathan.higgins@hatch.com

TABLE OF CONTENTS

1	We Are Here	4
	1.1 Milestones in 2016.....	5
2	Study Area	8
3	Beltline Options	10
	3.1 Pre – Screened Options	11
	3.1.1 10 Avenue S Elevated	12
	3.1.2 11 Avenue S Surface	12
	3.1.3 11 Avenue S Tunnel + Surface	12
	3.1.4 11 and 12 Avenue S Couplet.....	12
	3.2 Options for Evaluation	13
	3.2.1 10 Avenue S Surface	13
	3.2.2 10 Avenue S Tunnel + Surface	14
	3.2.3 12 Avenue S Surface	15
	3.2.4 12 Avenue S Tunnel + Surface	16
4	Public & Stakeholder Engagement	17
	4.1 Phase One Engagement.....	19
	4.1.1 What we did.....	19
	4.1.2 What we heard	19
	4.1.3 How the input was used	20
	4.2 Phase Two Engagement.....	20
	4.2.1 What we did.....	20

4.2.2	What we heard	21
4.2.3	How the input was used	21
4.3	Phase Three Engagement	22
4.3.1	What we did.....	22
4.3.2	Area Stakeholders.....	22
4.3.3	Next Steps.....	23
5	Evaluation Process	25
5.1	Financial Capacity	29
5.2	Community Well-Being.....	32
5.3	Transportation	36
5.4	Urban and Neighbourhood Development	41
5.5	Sustainable Environment.....	46
5.6	Feasibility and Deliverability	50
5.7	Stakeholders	55
6	Recommendation & Next Steps	57

LIST OF APPENDICES

Appendix A -	Detailed MAE Summary	61
---------------------	-----------------------------------	-----------

Executive Summary

The Green Line is Calgary's next light rail transit (LRT) line. At more than 46 kilometres in length, the Green Line will nearly double the size of the current LRT network. The Green Line is more than just a transit project; it will improve the way Calgarians live, work, play and move in the city by helping to create sustainable, liveable, and vibrant communities.

MULTIPLE ACCOUNT EVALUATION

Following City Council approval, in principle, of the underground alignment (Option D) for the Bow River crossing, an LRT tunnel will connect the Centre City from 24 Avenue N to 10 Avenue S (TT2016-0705). City council still has one section of alignment to finalize: the section in the Beltline from 2 Street SW at 10 Avenue S to the Elbow River. The Centre City and Beltline is a critical anchor to a successful LRT line and requires many factors to be considered when determining how to integrate the LRT and shape the future vision for the Beltline communities. After careful consideration, four options were selected to be evaluated: (1) a surface option on 10 Avenue S, (2) a tunnel + surface option on 10 Avenue S, (3) a surface option on 12 Avenue S and (4) a tunnel + surface option on 12 Avenue S.

The options that connect the Green Line LRT to the Beltline communities were evaluated using a set of technical, financial, economic, environmental, and community-focused criteria based on city policies. A multiple account evaluation (MAE) process was developed to understand, evaluate, and compare the relative benefits, opportunities, challenges, and trade-offs between the options. The list of accounts and criteria used in this evaluation

was reviewed and approved by Council prior to undertaking the evaluation, with all criteria weighted equally against the next.

PUBLIC ENGAGEMENT

Through 2016, the project team met with community and business leaders, property owners, developers and the public to identify the opportunities, challenges and trade-offs that needed to be considered in the evaluation of the four options. Participants had an opportunity to learn about each option and to provide input on what needed to be considered.

In November 2016, the project team reported back to stakeholders on the results of the comparative evaluation of the Beltline options and obtained additional input for further consideration and evaluation. Participants were presented with the evaluation process, with examples of the look and feel, benefits, opportunities, and challenges of each option.

Feedback from these events closely mirrored what was heard in earlier engagement, with support for the 12 avenue corridor. Participants generally agreed with the results of the option evaluation, noting that the 12 avenue corridor will better serve the larger population centers in the beltline. However, participants also wanted the project team to remember to consider the importance and value of the cycle-track, the need to minimize traffic flow issues, and concern about noise and vibration impacts on current residents. Several participants also noted potential opportunities to integrate surface or underground stations into future development in the area.

CORRIDOR RECOMMENDATION

The multiple account evaluation results found that 10 Avenue S tunnel + surface, 12 Avenue S surface, and 12 Avenue S tunnel + surface were highly ranked options. There also was a clear indication of 12 Avenue S as the preferred corridor due to several factors including:

- Better opportunities for near term redevelopment and place making largely due to more diversity in the current land use along the corridor
- Better connects the communities in the Beltline
- Established road network grid on 12 Avenue S east of Olympic Way also provides better integration and accessibility to the 4 Street SE station

There are trade-offs between the surface and tunnel + surface options on 12 Avenue S. The surface option is the lowest cost option in the Beltline but would introduce LRT and traffic delays and could require substantial changes to the road network. In turn, the tunnel + surface option is better for traffic operations, and provides LRT run times and reliability that benefits the overall Green Line. The tunnel + surface option is a higher cost option and introduces challenges to area stakeholders where the LRT surfaces from the tunnel on 12 Avenue S near 4 Street SE. A recommendation for an alignment will be based on maximizing the total return on

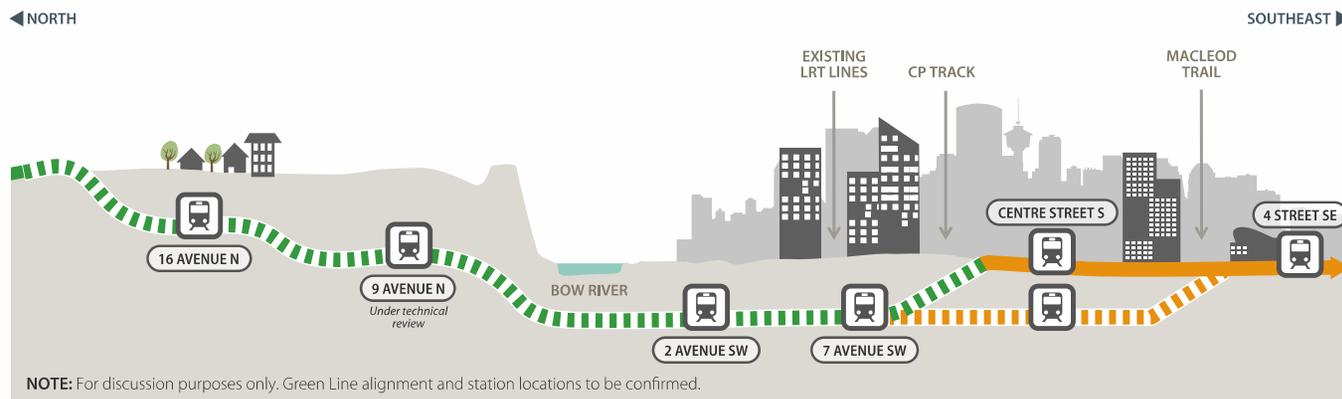
investment for Calgarians.

12 Avenue S Surface Option:

After leaving the downtown tunnel heading south, the LRT surfaces along 2 Street SW between 10 Avenue S and 11 Avenue S. It then turns east onto 12 Avenue S to proceed along the surface to Centre Street Station. Continuing east, it then proceeds to the 4 Street SE station, prior to turning north along side of the Victoria Park Transit Facility and connecting to the approved Green Line Southeast LRT alignment at the Elbow River.

12 Avenue S Tunnel + Surface Option:

After leaving the downtown tunnel heading south, the LRT continues in a tunnel under 2 Street SW, turning east under 12 Avenue S to an underground station at Centre Street. The LRT surfaces east of Macleod Trail, proceeding further east to a surface 4 Street SE station. The LRT continues on the surface, turning north alongside the Calgary Transit Victoria Park Transit Facility, and connecting to the approved Green Line Southeast LRT alignment at the Elbow River.



Evaluation Criteria	10 Avenue Surface	10 Avenue Surface + Tunnel	12 Avenue Surface	12 Avenue Surface + Tunnel
 Financial Capacity An affordable and cost effective service. Costs are achievable, sustainable in the long term and provide good value for money.			✓	
 Community Well-being A safe and socially inclusive service that improves access to key community destinations and provides transportation choices for Calgarians.			✓	
 Transportation A high priority transit service that attracts transit use, walking & cycling as preferred mobility choices for Calgarians. An integrated service that improves customer experience, meets future demand and strengthens the regional & local transit networks.				✓
 Urban + Neighbourhood Development A service that supports current and future land use, development along the corridor, and integrates with neighbouring communities.				✓
 Sustainable Development A service that reduces greenhouse gases and minimizes impact to the existing natural environment.	✓	✓	✓	
 Feasibility + Deliverability A service that can be constructed and operated without significant technical issues or constraints.		✓		
 Stakeholders A service that reflects the values and priorities of communities.				✓
 OVERALL All Criteria	✓	✓ ✓	✓ ✓ ✓	✓ ✓ ✓

✓ Highest Ranked Option

1 WE ARE HERE

The Green Line is Calgary’s next light rail transit (LRT) line. At more than 46 kilometres in length, the Green Line will nearly double the size of our current LRT network. This investment is more than just a transit project; it will improve the way we live, work, play and move in the city by helping to create sustainable, liveable, and vibrant communities.

End-to-end, the Green Line will connect Keystone in the north and Seton in the southeast to the Centre City and serve an estimated 90,000 to 140,000 passengers per weekday. The north leg of the Green Line will be 18 kilometres long running from 160 Avenue N to 4 Street SE through the Beltline, while the south leg will be 28 kilometres running from the Beltline to Seton. Overall the Green Line may have up to 30 stations (not including the Calgary International Airport) that will let Calgarians live, work, play and move in the city.

The Centre City will serve as the connection between the north and southeast communities along the Green Line. Integration of the Green Line in the Centre City will provide a new north-south LRT route along 2 Street SW in the Downtown Core, with a connection to the existing Red and Blue Lines at 7 Avenue S.

CENTRE CITY MULTIPLE ACCOUNT EVALUATION

City Council has approved, in principle, the underground alignment (Option D) for the Bow River crossing connecting downtown from 24 Avenue N to 10 Avenue S (TT2016-0705). This approval dictates the possible options for the Beltline.

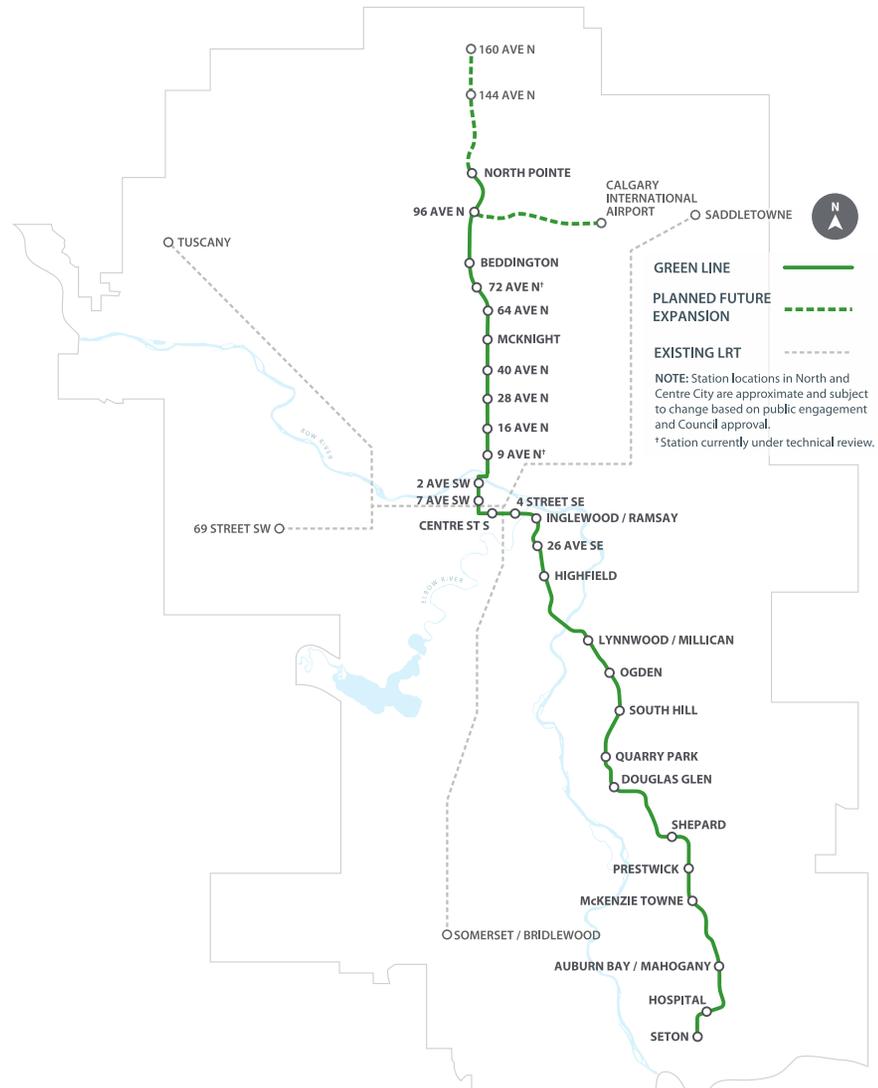


FIGURE 1 GREEN LINE LRT ALIGNMENT

OUR CHALLENGE

Our challenge is to find the best way to integrate the Green Line into the Beltline communities and future development in the area establishing the long term vision.

The Green Line will provide a new east–west LRT route on the eastern side of the Beltline communities connecting over the Elbow River to Inglewood and Ramsay. Assessing how to best integrate the LRT into the Beltline is critical in developing a vision for the future.

Options for the Green Line in the Beltline are complex and numerous. A multiple account evaluation (MAE) process, similar to the process developed for the Centre City options, was developed to understand, evaluate, and compare the relative benefits, opportunities, challenges, and trade-offs between the options. The list of accounts and criteria used in the evaluation was reviewed and approved by council prior to undertaking the evaluation, with each criterion weighted equally against the next. Due to the number of design variants, a pre-screening process that included the following factors was used to narrow the options:



The options that passed the pre-screening process were then put through the detailed MAE using a set of technical, financial, economic, and community-focused criteria.

The evaluation of the Beltline options is just one part of a larger evaluation process. Key factors that will support a final recommendation include:

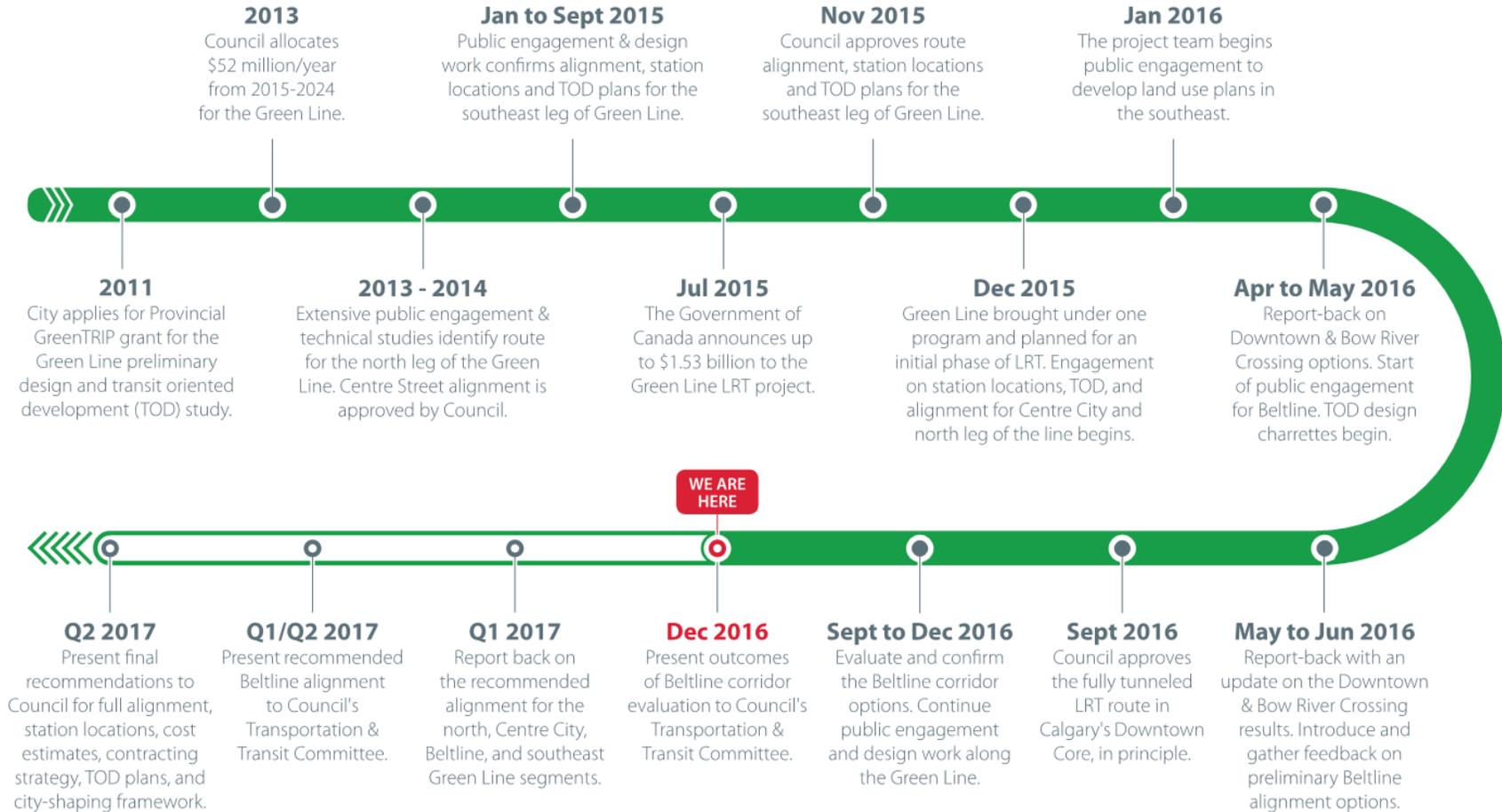
- Feedback from the public, downtown stakeholders and surrounding communities
- Assessment of economic impacts and opportunities
- Assessment of qualitative and quantitative risks
- Capital cost estimates

1.1 MILESTONES IN 2016

Presented on the following page is a summary of the timeline and milestones for the Green Line program. Listed below are some of the important milestones that the project team will have met by the end of 2016:

- Public engagement through a series of open houses and online engagement
- Developer working group with key land owners in the Beltline
- Recommendation for the underground option in the Centre City
- Ongoing geotechnical investigations through the Centre City and Beltline

Green Line LRT: Project Timeline





Pedestrian's view from a station on 10 Avenue S at Centre Street

2 STUDY AREA

The study area for the Beltline evaluation extends from the CPR tracks at 2 Street SW to the Elbow River as shown in figure 2. All options in the Beltline will connect to the tunnel, approved in principle by Council. The option selected in the Beltline will affect the depth of the tunnel on 2 Street SW. Similarly, all options will connect to the approved southeast alignment at the proposed Elbow River LRT bridge.



FIGURE 2 STUDY AREA FOR THE BELTLINE EVALUATION

Figure 3 shows the communities that are included within the Centre City boundary. The Green Line will connect the Beltline communities of Victoria Crossing Centre, East Victoria Crossing, and Stampede Park which are all located within the Victoria Park Area.



FIGURE 3 CENTRE CITY COMMUNITIES



Pedestrian's view from a station on 12 Avenue S at Centre Street

3 BELTLINE OPTIONS

Integrating the Green Line into the Beltline has the potential to shape the vision for these communities in the future. With ten million square feet of redevelopment anticipated for East Victoria Park, the urban fabric is evolving.

To extend LRT service into the heart of the Beltline, three corridor options were originally explored with a combination of surface, elevated, and underground options. The corridors that were assessed included 10, 11 and 12 Avenues S.

In all, eight corridor options, illustrated on the following page, were developed for the Beltline:

- 10 Avenue S surface
- 10 Avenue S tunnel + surface
- 10 Avenue S elevated
- 11 Avenue S surface
- 11 Avenue S tunnel + surface
- 12 Avenue S surface
- 12 Avenue S tunnel + surface
- 11 & 12 Avenues S surface couplet

These options were pre-screened based on several factors including

- Technical feasibility due to constrained LRT geometry
- Capital cost estimates
- Community and property impacts particularly impacts to heritage / historic buildings in the community
- Efficiency of operations for the LRT with slow turns results in longer ride times through the Beltline
- Public and stakeholder input gathered on the various options

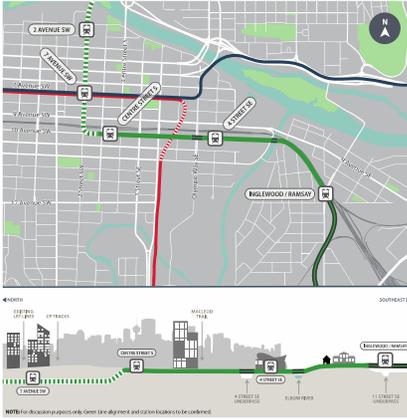


Four options were dropped from consideration, as illustrated on the following page. The following four options were carried forward into the detailed MAE:

- 10 Avenue S surface
- 10 Avenue S tunnel + surface
- 12 Avenue S surface
- 12 Avenue S tunnel + surface

3.1 PRE - SCREENED OPTIONS

10 Avenue S Surface



10 Avenue S Tunnel

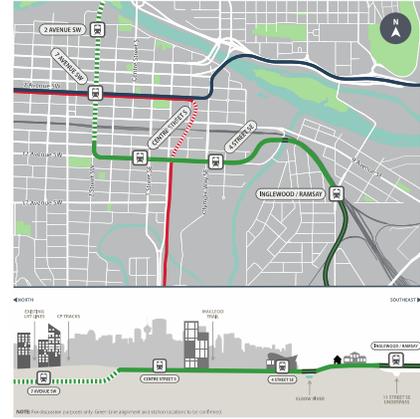


11 Avenue S Tunnel

Eliminated due to:

- Loss of heritage building
- Portal placement may restrict development east of 4 Street SE

12 Avenue S Surface



10 Avenue S Elevated

Eliminated due to:

- Elevated guideway did not fit into urban context
- Numerous grade changes

11 Avenue S Surface

Eliminated due to:

- Loss of heritage building
- Constructability issues with portal on 2 Street SW

11 and 12 Avenue S Surface Couplet

Eliminated due to:

- Loss of heritage building
- Traffic circulation most restricted due to turn restrictions

12 Avenue S Tunnel



3.1.1 10 Avenue S Elevated

On 10 Avenue S the elevated option was not carried forward for further consideration. When the elevated guideway was assessed as part of the Centre City MAE, it received poor feedback from the public and key stakeholders. The elevated guideway would introduce concrete piers in the middle of the road that would make it more challenging to create a positive public realm.

In addition to public realm challenges, this option would result in the loss of Centre Street Station. To tie to the Centre City tunnelled alignment the LRT would need to surface on 10 Avenue S between 2 Street SW and 1 Street SW and then quickly begin to transition to an elevated guideway before 1 Street SE. The short distance for a transition would not provide sufficient space for a station at Centre Street.

3.1.2 11 Avenue S Surface

The 11 Avenue S surface option was not carried forward for further consideration. For this option to function, it was assumed that traffic would be transferred to 10 Avenue S which would require four lanes of traffic on 10 Avenue S. However, the placement of the portal on 2 Street SW may encroach onto 10 Avenue S not allowing for 10 Avenue S to function for through traffic.

Additionally, the turn for the LRT from 2 Street SW onto 11 Avenue S would require a tight radius that would conflict with the heritage building on the northeast corner of the intersection. This building conflict was considered high risk as it may require

this heritage building to be relocated and would impact several owners in the building.

3.1.3 11 Avenue S Tunnel + Surface

Similar to the surface option on 11 Avenue S, this option was also not carried forward for further consideration due to the tight turn from 2 Street SW onto 11 Avenue S. Although in a tunnel, it is anticipated that there could be high risk to the heritage building.

Additionally, this tunnel option would surface on 11 Avenue S east of 4 Street SE. The placement of this portal may be seen as restricting development as main access at 5 Street would be constrained.

3.1.4 11 and 12 Avenue S Couplet

This option was not carried forward for further evaluation for similar reasons as the 11 Avenue S surface option. For this option the portal would be in the same location and would impact traffic operations on 10 Avenue S. It would also impact the heritage building on the northeast corner of 2 Street SW and 11 Avenue S.

This option would also introduce the most constraints on traffic circulation. With one set of LRT tracks on each of 11 Avenue S and 12 Avenue S it would result in both avenues being reduced to two traffic lanes due to the placement of the LRT tracks and the stations.

3.2 OPTIONS FOR EVALUATION

3.2.1 10 Avenue S Surface

This option begins at the Inglewood/Ramsay station and continues on the surface to a new Elbow River LRT bridge. From the bridge, the alignment continues west on the surface, paralleling the existing CP tracks to the surface 4 Street SE station. West of this station, the alignment crosses Olympic Way on a new LRT bridge and ties back to 10 Avenue SE on the surface to the Centre Street S station. West of this station, the alignment descends into a tunnel with a portal located between 2 Street SW and 1 Street SW. In the tunnel, the alignment turns north under the CPR tracks to connect to the Centre City tunnel alignment.

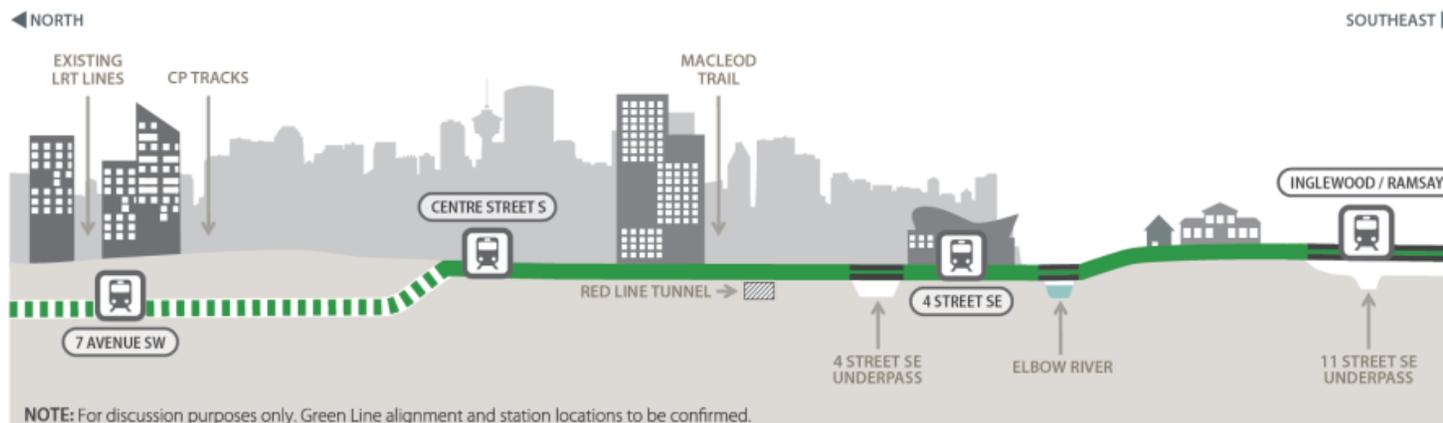


Challenges

- Higher risk due to a high number of utility conflicts along 10 Avenue S
- Challenging integration of LRT into existing public realm
- Traffic and parking disruption
- No direct connection to Beltline communities
- Portal location near historical buildings

Opportunities

- Lower relative cost
- Long-term redevelopment potential



3.2.2 10 Avenue S Tunnel + Surface

This option begins at the Inglewood/Ramsay station and continues on the surface to a new Elbow River LRT bridge. From the bridge, the alignment continues west on the surface, paralleling the existing CP tracks. The LRT then descends into a tunnel with a portal on 10 Avenue S between 3 Street SE and Macleod Trail, above the existing Red Line tunnel. The alignment continues in the tunnel to an underground station at Centre Street S. From the station, the alignment continues west, underground to the CPR tracks and then turns north to connect to the Centre City tunnel alignment.

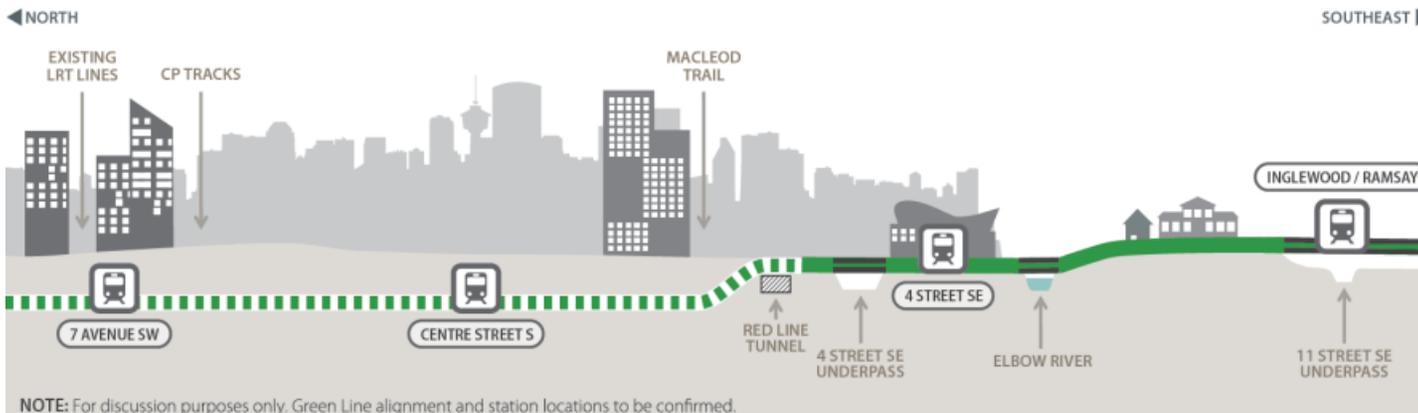
Challenges

- Higher risk due to a high number of utility conflicts along 10 Avenue S
- Challenging integration of LRT into existing public realm
- No direct connection to Beltline communities
- Higher relative cost



Opportunities

- Preserves current transportation network in Beltline for all modes
- Long term redevelopment potential



3.2.3 12 Avenue S Surface

In this option the alignment begins at the Inglewood/Ramsay station and continues on the surface to a new Elbow River LRT bridge. Immediately after the bridge, the alignment continues on the surface around the northwest side of the Victoria Park Transit Facility and on to 12 Avenue at 6 Street SE. The alignment continues west along 12 Avenue with surface stations at 4 Street SE Station and Centre Street S. The alignment continues west along 12 Avenue, turning north onto 2 Street SW. The alignment descends into a portal on 2 Street SW between 11 Avenue S and 10 Avenue S and continues under the CPR tracks to connect to the Centre City tunnel alignment.

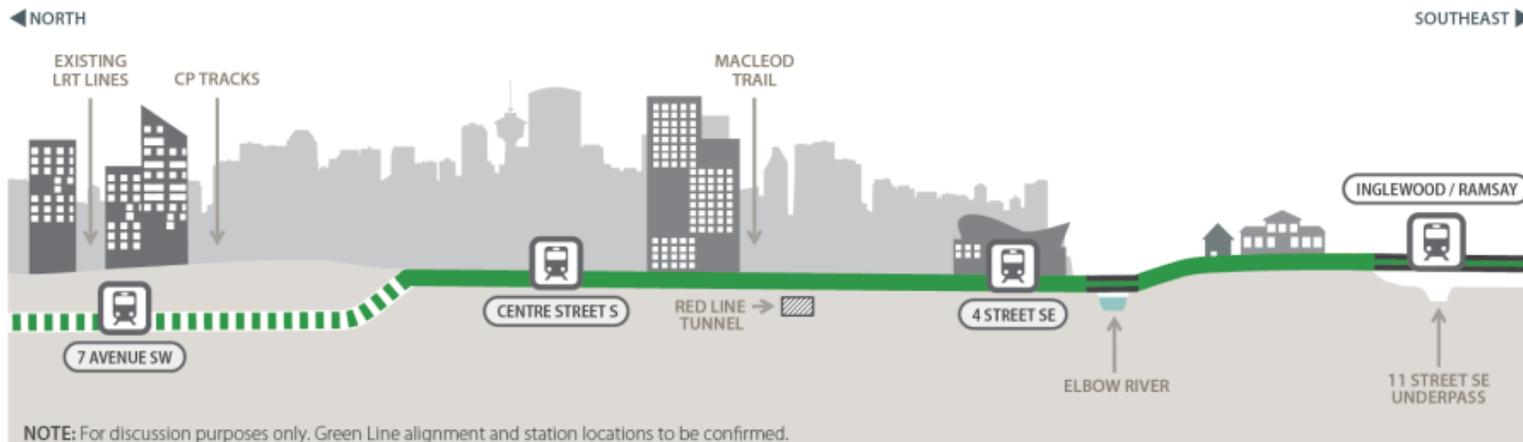


Opportunities

- High potential for integration into existing public realm
- High potential for long-term redevelopment
- Better connects the Beltline communities
- Lowest relative cost

Challenges

- Traffic, cycling and parking disruptions
- Winding track geometry east of 6 Street SE



NOTE: For discussion purposes only. Green Line alignment and station locations to be confirmed.

3.2.4 12 Avenue S Tunnel + Surface

This option begins at the Inglewood/Ramsay station and continues at-grade to a new Elbow River LRT bridge. Immediately after the bridge, the alignment continues at-grade around the northwest side of the Victoria Park Transit Facility and onto 12 Avenue S at 6 Street SE. The alignment continues west to a surface station at 4 Street SE. Immediately west of the station, the alignment descends into a tunnel with a portal on 12 Avenue S between 4 Street SE and 5 Street SE. The alignment continues underground, below the Red Line tunnel, to an underground station at Centre Street S. West of the Centre Street S station, the alignment turns north under 2 Street SW and continues underground under the CPR tracks and connects to the Centre City tunnel alignment.

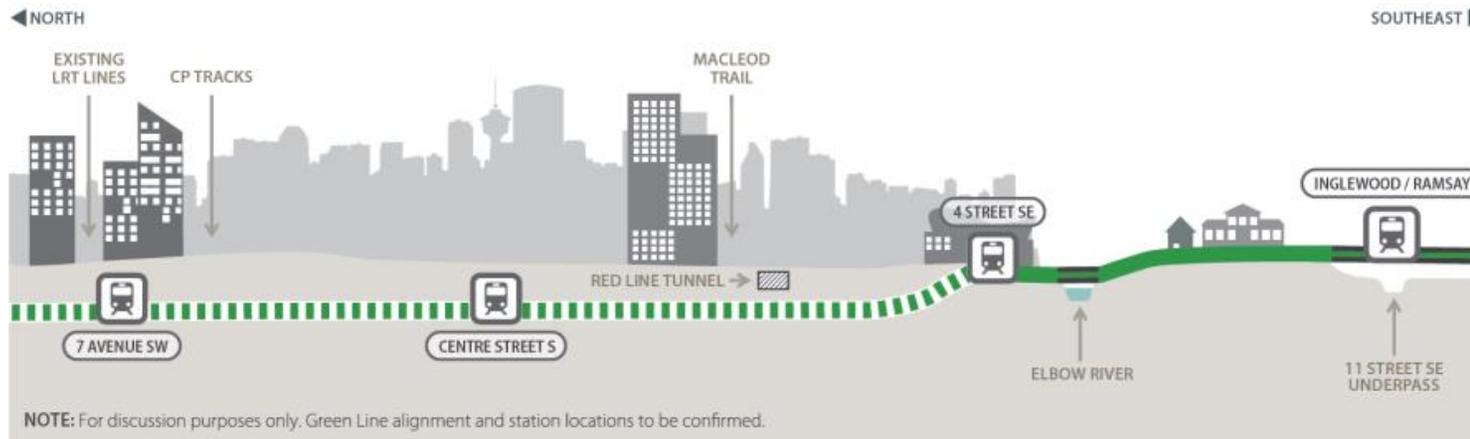
Challenges

- Higher relative cost
- Winding track geometry east of 6 Street SE
- Portal located next to future development in East Victoria Park



Opportunities

- High potential for long-term redevelopment of the corridor
- Better connects the Beltline communities
- Preserves transportation network in the Beltline west of 4 Street SE



4 PUBLIC & STAKEHOLDER ENGAGEMENT

The engagement strategy for the Beltline alignment focused on exploring the opportunities and challenges presented by different alignment options through the Beltline community, connecting over the Elbow River to the Inglewood/Ramsay station.

Stakeholders included local residents, community associations, business owners and business groups, development industry partners, sports organizations, business improvement areas, major landholders in the area and interested members of the public throughout the city.

Building on the approach used to determine the Centre City alignment, stakeholder engagement was conducted in tandem with the technical, financial, economic, environmental, and community-focused study required for the detailed options evaluation. Engagement was conducted over three phases, with the project team narrowing the number of potential options at each phase based on a combination of stakeholder input and information gleaned from the broader options evaluation process.



Phase One

- April - June 2016
- Eight Beltline Options

Phase Two

- September - October 2016
- Four Beltline Options

Phase Three

- November 2016
- Detailed Option Evaluation Results

Phase Four

- Q1 / Q2 2017 Alignment Recommendation

TABLE 1 SUMMARY OF TOTAL PARTICIPANTS REACHED

	Date	Event	Participants
Phase One	April 18 – May 11	Beltline and Centre City alignment pop-up events	1189
	April 18 – May 11	Beltline Options online engagement on engage.calgary.ca	819
	April - May	Beltline alignment brochures distributed by Calgary Transit	*9200
	May 26	Beltline Developers Lunch Workshop	6
	June 1	Beltline Options Open House	101
Phase Two	September 14	Beltline Options Open House (Ramsay)	103
	September 15	Beltline Options Open House (Beltline)	46
	September 14 – October 18	Beltline Options online engagement on engage.calgary.ca	498
	October 13	Beltline Stakeholders Workshop	16
Phase Three	November 2	Beltline Detailed Option Evaluation Results Open House	59
Total Participants (*not including brochures)			2,837

4.1 PHASE ONE ENGAGEMENT

4.1.1 What we did

Phase One of the engagement program began in April 2016, with combined Beltline and Centre City alignment pop-up events, online engagement at www.engage.calgary.ca, and a public open-house on June 1. Stakeholders were presented with eight Beltline alignment options and were asked to comment on the opportunities and challenges for each option:

- 10 Avenue S Tunnel + Surface
- 10 Avenue S Surface
- 10 Avenue S Elevated
- 11 Avenue S Tunnel + Surface
- 11 Avenue S Surface
- 11 & 12 Avenue S Couplet
- 12 Avenue S Tunnel + Surface
- 12 Avenue SW Surface

4.1.2 What we heard

All of the options generated conversations about potential opportunities and challenges. Major and recurring themes from this input included:

- **Traffic flow is a priority**
Every option generated significant conversation about the opportunities and challenges as they relate to traffic flow, as well as pedestrian and bicycle movement. In particular, concerns were expressed about interruptions to traffic flow east-west along 11 Avenue S and 12

Avenue S, as well as north-south traffic flow along Macleod Trail and 1 Street SE, and the impact to the cycle track along 12 Avenue S.

- **More opportunities are perceived with tunnel options**
More support was expressed for the tunnel options compared to surface or elevated options. The most common reasons for the tunnel preference were to minimize impact on traffic flow and avoiding splitting neighborhoods and walking routes. The challenges associated with the tunnel options focused on user safety, cost, and lost opportunity for street-level revitalization.
- **More perceived challenges for surface options**
More challenges than opportunities were identified for surface level options. The most common concerns were about traffic disruptions. Preferences for surface options included the comparative low cost and the potential for business revitalization along the corridors.
- **Street-level revitalization is important**
Participants shared different perspectives as to whether surface options would provide the opportunity to revitalize streetscapes and adjacent businesses or would pose a challenge in the form of limited access, parking, or negative streetscape impacts.
- **Little interest in elevated option or couplet**
Both options generated the least amount of conversation. Concerns about the elevated configuration focused on the potential community impacts and lack of

accessibility. The main opportunities with the elevated configuration were the unimpeded movement of the LRT through the Beltline, and the minimal impact on traffic flow. The couplet also received minimal support and comment. Participants identified that, while it offered some traffic flow and bike lane opportunities, there were more challenges with traffic crossings and two impacted streetscapes.

4.1.3 How the input was used

Public feedback on the options presented in Phase One was used to help inform the evaluation process, as well as gauging the overall public acceptability of each of the options. Determining the level of public acceptability was based on the number of positive opportunities and negative challenges identified by participants.

Stakeholder feedback was one of the inputs considered by the project team – along with the technical, financial, economic, environmental, and community-focused criteria – in conducting the evaluation and narrowing the potential alignment options from eight to three:

- 10 Avenue S Tunnel + Surface
- 10 Avenue S Surface
- 12 Avenue S Surface

4.2 PHASE TWO ENGAGEMENT

4.2.1 What we did

Phase Two engagement included two public open houses in September in the Beltline and Ramsay neighbourhoods, as well as online engagement at www.engage.calgary.ca.

On October 4, 2016, Calgary City Council voted to continue to explore the 12 Avenue S tunnel option that had been dropped from consideration after the Phase One engagement and evaluation, for affordability and other considerations. This resulted in four options being presented to the public for feedback and discussion:

- 10 Avenue S Surface
- 10 Avenue S Tunnel + Surface
- 12 Avenue S Surface
- 12 Avenue S Tunnel + Surface

A workshop with local developers, business representatives, the Beltline Neighbourhoods Association, the Victoria Park Business Improvement Area (BIA) and major area stakeholders (Calgary Municipal Land Corporation, Calgary Sports and Entertainment, Remington and the Calgary Stampede) was also held in early October 2016. Stakeholders were presented with the four short-listed Beltline alignment options and asked to share what they felt were the opportunities and challenges for each.

4.2.2 What we heard

All the options generated conversations around potential opportunities and challenges. Major and recurring themes from this input included:

- **Traffic flow and congestion**
The most common response in all categories was traffic flow and congestion; this was identified as a challenge for both surface options, and as a positive opportunity for the tunnel options. The 12 Avenue S surface option received equal concern from participants about traffic flow on Macleod Trail crossing the alignment, as well as along 12 Avenue S. Concerns about traffic flow along 10 Avenue S were less common.
- **Service to Beltline population**
After traffic flow, the next most common theme was the strong desire for increased access and integration into the Beltline community and to a lesser extent, access to transit service to and from the East Village.
- **Impact to cycle-track pilot**
Several participants expressed concern that surface LRT along 12 Avenue S would negatively impact the cycle-track pilot. Participants stated that the cycle track is well-used and it was a hard-fought process to get it built. It was suggested that surface LRT on 12 Avenue S could result in a loss of a community amenity in order to meet commuter needs.

- Participant feedback was once again split on whether surface running options would afford opportunities or challenges for increased local development and public realm improvements.
- Conversations about cost were also divided. The sentiment that the benefits of tunnelling outweighed the added cost compared to surface options.

4.2.3 How the input was used

Feedback collected during Phase Two of the engagement was reviewed and major themes about opportunities and challenges identified for each option. The results were used to inform the evaluation of the options. As well, overall public acceptability of each of the options was gauged based on the number of opportunity or challenge comments that were received, and the potential scope of the positive opportunity or negative challenge that these themes represented. Input received through the engagement program has been incorporated into the scores presented in this document under the Stakeholders account.

4.3 PHASE THREE ENGAGEMENT

4.3.1 What we did

Phase three engagement includes a presentation of the results of the detailed options evaluation to the public at an open-house in the Beltline Community, as well as online at www.engage.calgary.ca. Stakeholders were asked to provide feedback on the results and whether there is anything else that should be considered when choosing a preferred alignment for the Beltline.

4.3.2 Area Stakeholders

The evaluation of the Beltline options is one part of a larger evaluation process and it was through stakeholder engagement that it was understood that the alignment options must closely reflect the ongoing plans for redevelopment in Victoria Park. As a result, the team will continue to develop and evaluate 12 Avenue S alignment options determining how to best connect to the Council approved southeast alignment and based on a set of principles that have been established with the key stakeholders in Victoria Park.

The Green Line LRT Beltline alignment options are to be based on the following principles as agreed to with the Victoria Park stakeholders:

- Establish a common vision and masterplan for the area
 - Our team will work with the community and key stakeholders to develop the best plan for Green Line in the Beltline.

- Green Line LRT is important to meet the City's rapid transit and transportation needs.
- Urban realm (creating a street vibe) contiguous to the alignment through the Beltline will be addressed in the detailed design, once the alignment has been confirmed
- Support development in the area
 - LRT alignment (portal and stations) will be integrated with future development planned for the area east of Macleod Trail Southeast. This includes consideration of:
 - Land use and development in Victoria Park
 - Future plans for the Stampede grounds and the Saddledome.
 - Future plans for the Calgary Transit bus facility to best integrate with future development and for operational efficiency
 - Flexibility
 - Local access and circulation will continue to be accommodated through traffic analysis and suggestions to optimize traffic movement, with emphasis on the area east of Macleod Trail Southeast and access/egress to Stampede grounds.
 - Cycling access in the Beltline, currently a pilot project cycle track on 12 Avenue South and 5 Street Southwest, may be reconfigured with construction/implementation of Green Line.

4.3.3 Next Steps

Engagement with the public as well as area stakeholders will continue in early 2017 as options on 12 Avenue S are further defined. Based on the principles outlined above, additional engagement will continue to inform how to best integrate the LRT into the area to address station placement and portal configuration. Further evaluation may result in a different configuration for the LRT on the east end of Victoria Park.

In the spring/summer of 2017, City administration will present the recommended Beltline alignment to city council. This recommendation as well as the results of all public and stakeholder engagement will be presented to Calgary City Council in June of 2017 for decision.





View of a portal on 10 Avenue S east of Macleod Trail

5 EVALUATION PROCESS

The Beltline options were evaluated using the same set of technical, financial, city shaping and community-focused accounts that were developed and used during the Centre City MAE. These accounts, which align with the overall objectives of the program and long term vision for the Green Line, were based on the City’s targets outlined in the 2020 Sustainability Direction plan and reflect the project’s vision of taking advantage of city-shaping opportunities and public input. This section summarizes the Beltline MAE results. Appendix A contains a detailed scoring table. Figure 4 illustrates the accounts and project objectives.

Within each account, the criteria and metrics were defined to help determine which option best meets the program objectives and best aligns with the City’s sustainability direction and long-term priorities. To differentiate between the two potential corridors in the Beltline, metrics were adjusted to help highlight corridor differences. All the criteria used in the evaluation have equal weight in the evaluation to minimize subjective value judgment in the evaluation process. For example, cost is equal in weight to community impacts.

The accounts were reviewed and approved by Council in December 2015. Additional details on the criterion included within each account are shown on the following page.



FIGURE 4 ACCOUNTS & PROJECT OBJECTIVES



Financial Capacity

- + Capital Cost
- + Land Impact
- + Operating & Maintenance Cost



Urban & Neighbourhood Development

- + Transit Oriented Development Potential
- + Streetscape & Public Realm
- + Impact on Parking
- + Urban Vision



Stakeholders

- + Public Acceptability
- + Alignment with City of Calgary Plans & Policies



Community Well-being

- + Community Cohesion
- + Impact to Recreational Uses
- + Safety, Security & Emergency Access
- + Accessibility



Sustainable Environment

- + Impact on Existing Natural Environment
- + Environmental Soil Conditions & Contamination
- + Adaptability to Extreme Climate Conditions
- + Noise & Vibration Impacts



Transportation

- + Ride Time for LRT
- + Transportation Network Reliability
- + Integration of Existing & Future Transit Service and Customers
- + LRT Service Reliability
- + Catchment Area
- + Complete Streets: Multi-modes, Connectivity & Accessibility



Feasibility & Deliverability

- + Constructability
- + Construction Impacts
- + Impacts to Residences & Businesses
- + Archaeological & Heritage Impacts



View of an underground station.



Financial Capacity

An affordable and cost-effective service. Costs are achievable, sustainable in the long term and provide good value for money.

5.1 FINANCIAL CAPACITY

GOAL

To deliver an LRT system that is affordable and provides cost-effective service. Costs are achievable, sustainable in the long term and provide good value for money.

EVALUATION RESULTS

Overall, 12 Avenue S surface ranks the highest in the Financial Capacity account as it has the lowest estimated capital cost, lower land-acquisition costs, and lower maintenance costs for stations. It provides the best opportunity to deliver an LRT system that is affordable.



Presented below is a summary of the criteria included in this account.

Capital Cost

Considers the full costs to construct the LRT system based on the capital cost estimates.

Capital cost estimates were developed based on unit quantities derived from functional design alignment plans and profiles. The unit price for these quantities were derived from a cost database developed from similar transit projects throughout North America.

12 Avenue S surface option ranked the highest overall as it is the lowest capital cost option because it involves fewer utility relocations compared to 10 Avenue S, the option with the next-lowest capital cost.

Land Cost

Considers the cost of land to be purchased to accommodate the LRT system and other required infrastructure.

Land cost is based on the amount of land anticipated to be required for the LRT track and stations on a parcel-by-parcel basis measured from the property line. In general, if access to a property was irreparably affected, it was assumed as a full land acquisition.

12 Avenue S tunnel + surface option had the lowest anticipated land acquisition costs and, therefore, ranked the highest based on this criterion. Although this option does result in some property takes due to impacted accesses at the surface station platforms, the cost of the parcels required are lower than those for the 10 Avenue S options.

Operating and Maintenance Cost

Considers the overall life-cycle costs to operate and maintain the LRT system.

Each option was ranked based on the costs associated with operating and maintaining the alignment. Overall surface and underground systems are anticipated to have similar operations and maintenance costs over a thirty year lifecycle. However, based on further analysis done on operations and maintenance

costs, it was determined that tunnels and underground stations have higher maintenance costs than surface stations with the addition of escalators, elevators, and heating and ventilation requirements. Surface options ranked the highest as they include surface stations, which have lower maintenance costs.

The following chart summarizes the evaluation results for Financial Capacity account.

