



Community Well-being

A safe and socially inclusive service that improves access to key community destinations and provides transportation choices to Calgarians.

5.2 COMMUNITY WELL-BEING

GOAL

To provide a safe and socially inclusive service that improves access to key community destinations and provides transportation choices for Calgarians.

EVALUATION RESULTS

12 Avenue S surface ranks the highest in the Community Well-Being account. This option provides the best opportunity for a socially inclusive service that better serves the Beltline communities.



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

Community Cohesion

Considers the effect of visual intrusion and severance of neighbouring communities specifically around physical barriers.

Two metrics were used to assess options against this criterion:

- **Physical disruptions**

Retaining walls and portals (the open entry where the LRT system descends or ascends from a tunnel) introduce a high level of disruption to communities by

creating a permanent physical barrier. Options were compared by the measured area of portal structure. All four options have a portal located in the Beltline to connect to the Centre City tunnel alignment. However, 10 Avenue S surface ranked the lowest because it's portal on 10 Avenue S between 2 Street SW and 1 Street SW is the most disruptive. Requirements for traffic circulation result in minimal space for sidewalks confined between the heritage buildings and the portal wall.

- **Views and privacy**

View protection and residential and commercial privacy are determined by the length of LRT alignment that obstructs views or interferes with privacy. As all options have the LRT system on the surface for some length, are adjacent to currently vacant land, or rail corridors, all options were ranked equally.

Impact to Recreational Uses

Consideration for the ability of the LRT system to serve community events or high-profile festivals.

The Beltline community hosts several high-profile events. However, because all options are within two blocks of each other, they were ranked equally. Regardless of location, the LRT system will serve these events at major activity sites in the Beltline, including the Saddledome, the Stampede grounds, as well as the National Music Centre with proximity to options on 10 Avenue S. Impacts to vehicular access for major activity centres in the Beltline are addressed under the Transportation account.

Safety, Security, and Emergency Access

Consideration of the perceived safety and security of the LRT system, including how emergency services could access different parts of the system.

Two metrics were used to assess options against this criterion:

- **Perception of safety and security**

This metric was based on the principles of “Crime Prevention Through Environmental Design (CPTED) for Transit Users”.

Both surface options ranked higher because their stations would be on the surface, providing the most natural surveillance. However, 12 Avenue S surface option ranked the highest because 12 Avenue S has more street activity or “eyes on streets”, which contributes to a higher sense of personal security. The interaction between large crowds and the LRT operation would need to be managed for the 12 Avenue S options, this is addressed under the Transportation account.

- **Emergency access**

To evaluate the ease of emergency access, the path of travel for emergency responders to reach an emergency on the system was measured. Tunnelled options are more constrained as emergency responders have to access emergency locations through portal entrances and underground stations, while surface options would allow emergency access freely along the alignment.

12 Avenue S surface option ranked highest because it has the most surface alignment and an established grid in the road network at the 4 Street SE station. 10 Avenue S surface option ranked second highest because the road network at 4 Street SE station is not determined.

Accessibility

Consideration of a service that would be accessible to all users.

At-grade stations and underground stations provide a different ease of access for users. Options with shorter distances for users to access station platforms are considered more easily accessible and were ranked higher.

12 Avenue S surface option ranked the highest as it has two at-grade stations in addition to an established road network around 4 Street SE station. Although 10 Avenue S surface option also has two surface stations, the lack of road definition around the 4 Street SE station adjacent to CPR will introduce longer distances for users to access the station compared to 12 Avenue S.

The following chart summarizes the evaluation results for the Community Well-Being account.

Metric	10 Avenue S Surface	10 Avenue S Surface + Tunnel	12 Avenue S Surface	12 Avenue S Surface + Tunnel
+ Community Cohesion				
+ Impact to Recreational Uses				
+ Safety, Security & Emergency Access				
+ Accessibility				
Overall Score				

Highest Score
 Lowest Score
 Highest Ranked Option Overall



Transportation

A high-priority transit service that attracts transit use, walking and cycling as preferred mobility choices for Calgarians.

5.3 TRANSPORTATION

GOAL

To provide a high-priority transit service that attracts transit use, walking and cycling as preferred mobility choices for Calgarians. As well as, an integrated service that improves customer experience, meets future demand and strengthens regional and local transit networks.

EVALUATION RESULTS

Both the tunnel + surface options on 10 Avenue S and 12 Avenue S ranked the highest in the Transportation account. Due to the grade separation west of Macleod Trail, both options allow mobility patterns to be maintained for pedestrians, automobiles and cyclists in the Beltline.



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

Ride Time for LRT

Consideration for the travel time for each option.

Maintaining run times through the Beltline is important for the operation of the overall Green Line LRT system. The 10 Avenue S tunnel + surface option ranked the highest because it has the shortest ride time from 7 Avenue SW station to the Inglewood/Ramsay station. This short run time is the result of having the shortest and most direct route through the Beltline and avoiding tight track geometry that could slow down the train.

Transportation Network Reliability

Consideration of impacts to traffic, and demand on the overall transportation network.

Two metrics were used to assess options against this criterion:

- **Downtown network impacts**

This metric assesses the effects on traffic throughout the downtown network. 10 Avenue S tunnel + surface option ranked the highest because it has the least effect on the overall downtown network.

- **Traffic impact on special events**

This metric assesses the effect on traffic during special events in the Beltline. Both options on 10 Avenue S ranked the highest because the LRT on 10 Avenue S has the least effect on traffic in the Beltline, resulting in existing traffic patterns being mostly maintained for special events access. Although the 12 Avenue S tunnel +

surface option is grade separated at Macleod Trail, the placement of the portal between 4 Street and 5 Street may introduce localized access constraints for special events.

Integration with Existing and Future Transit Service

Considers opportunities to strengthen regional and local transit networks by providing convenient connections to existing and future rapid transit routes.

Options were assessed by their ability to provide a direct connection to the Red Line at Victoria Park Station or to the future high speed rail (HSR) station at Rail town on 10 Avenue S. With access to the two connections equally weighted, all options ranked equally as options on 10 Avenue S are closer to the future HSR, while options on 12 Avenue S are closer to the Red Line.

LRT Service Reliability

Consideration of factors that could influence the reliability of the LRT service, such as the interaction of light-rail vehicles (LRVs) and pedestrians, cyclists or vehicles that may disrupt transit service.

The option with the fewest conflict points between LRVs and pedestrians, cyclists and vehicles at crossings and intersections will rank highest against this criterion.

Two metrics were used to assess options against this criterion:

- **Number of Conflict Points**

For each option, the number of conflict points between a LRV and pedestrians, cyclists or vehicles at surface

crossings were counted. Tunnelled options ranked the highest as they minimize the number of conflict points with the LRV.

- **Provision for special trackwork**

Options that can easily accommodate special trackwork, including crossovers and setoff tracks, are able to preserve operational flexibility for the LRT system in the Beltline.

All options were tied as they have the potential to accommodate special trackwork. However, the location of the portal in the 12 Avenue S tunnel + surface option may constrain the location of special trackwork.

Catchment Area

Consideration for the catchment area predicted for each option.

The integration of the LRT system into the Beltline has the potential to extend the catchment area further south into the Beltline, providing new transit service to this community. Both options on 12 Avenue S would be able to increase the catchment area with the LRT alignment and, as a result, rank highest.

Complete Streets: Multi-modes, Connectivity and Accessibility

Consideration of the addition of new cyclist or pedestrian facilities along the corridor to support active transportation.

Two metrics were used to assess options against this criterion:

- **Preservation of cycling network**

Preserving the pilot cycle track network in the Beltline is important for making sure that transportation mode choices exist in the Beltline. Both options on 10 Avenue S and the 12 Avenue S tunnel + surface option rank highest as the LRT on 10 Avenue S would minimally disrupt the pilot cycle track and preserves the cycling network. Should the pilot be made permanent, we would accommodate a facility in all green line designs.

- **Space for public realm**

Space available for public realm for each option was considered to be the area from the back of the proposed curb to the property line. Options with the largest public realm are considered to have the most potential for enhancements to public realm. 12 Avenue S tunnel + surface option ranked the highest because it provides the most public realm space with the LRT underground on 12 Avenue S.

The following chart summarizes the evaluation results for the Transportation account.

Metric	10 Avenue S Surface	10 Avenue S Surface + Tunnel	12 Avenue S Surface	12 Avenue S Surface + Tunnel
+ Ride Time for LRT				
+ Transportation Network Reliability				
+ Integration of Existing & Future Transit Service and Customers				
+ LRT Service Reliability				
+ Ridership				
+ Complete Streets: Multi-modes, Connectivity & Accessibility				
Overall Score				

Highest Score
 Lowest Score
 Highest Ranked Option Overall



Urban + Neighbourhood Development

A service that supports current and future land use and development along the corridor and integrates with neighbouring communities.

5.4 URBAN AND NEIGHBOURHOOD DEVELOPMENT

GOAL

To provide a service that supports current and future land use and development along the corridor and integrates with neighbouring communities.

EVALUATION RESULTS

12 Avenue S tunnel + surface option ranks the highest because it has the highest near-term development potential, has more opportunities to integrate stations within the existing urban realm, preserves on-street capacity and parking, and has the potential to provide for near-term place making. This option provides the best opportunity to support redevelopment along the corridor because the alignment is underground in the Beltline, with minimal disruptions on the surface. 10 Avenue S as a corridor also has long-term redevelopment potential, however, existing land uses along the avenue may pose short-term redevelopment challenges as well as limitations with the existing railway setback on the north side.



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

Transit Oriented Development (TOD) Potential

Consideration of how well station locations and the alignment integrate into existing land uses and provide opportunities for future development.

The measure of success of an LRT system is how well it is able to shape a city and provide for future development along its corridor and is measured by the alignments ability to spur development.

Two metrics were used to assess options against this criterion:

- **TOD integration potential**

Options were ranked based on their ability to spur redevelopment in the direct area of the station. Options on 12 Avenue S ranked highest because the existing adjacent land uses near stations on 12 Avenue S are more conducive to redevelopment compared to on 10 Avenue S.

- **Near-term redevelopment potential**

Options were ranked based on their near-term redevelopment potential along the corridor. Due to the high amount of redevelopment that is already in the planning stages for the Victoria Park area there is redevelopment potential on both corridors. However, options on 12 Avenue S ranked slightly higher because the existing urban fabric along 12 Avenue S is more established. 12 Avenue S has a many development permits in the works, construction of new buildings already underway, as well as underutilized lands prime

for redevelopment. In comparison, 10 Avenue S has far fewer active development permits or planned redevelopments, as has more established building stock, such as large parkades along the corridor which will remain in place in the near term.

- **Number of access agreements**

Although access agreements may be required to tie stations into developments, particularly for underground stations, all options have been planned to assume that primary access can be provided through the public right-of-way (ROW). Thus, all options were ranked the same relative to each other.

Streetscape and Public Realm

Evaluation of potential ways to improve the street environment and create high-quality public spaces.

The potential for improvements to the streetscape and public realm at the station locations was considered because the stations have the highest amount of activity that can contribute to improved streetscape and public realm.

Two metrics were used to assess options against this criterion:

- **Legibility of stations**

Locating stations so that they are easily legible to the public is an important part of improving the public realm. 12 Avenue S surface option ranked highest because it has two at-grade stations, which are noticeably more legible and easy to decipher in comparison to underground stations which are only noticeable at the

station entrances. The 4 Street SE station would also be more legible in the existing urban realm on 12 Avenue S in comparison to 10 Avenue S due to limited street network and pedestrian access at that location.

- **Integration of stations**

This metric is used to assess if stations can be integrated seamlessly into existing and future public realm with present and future streetscape and public realm improvements. Due to the well-established existing urban fabric on 12 Avenue S, those options ranked the highest.

Impact on Parking

Consideration of public and private parking availability and access.

Within the Beltline parking is a major consideration. This criterion relates to the affect the option will have on existing parking.

Two metrics were used to assess options against this criterion:

- **Number of on-street parking stalls removed**

The ability to preserve on-street parking in the Beltline is an asset to any option because on-street parking encourages redevelopment. Both tunneled options preserve the most on-street parking because they reduce disruptions to the street for more than half of the alignment.

- **Number of private parking access restrictions**

Running the LRT system through the Beltline will restrict access to various private parking lots. Such restrictions may result in traffic problems that may inhibit redevelopment in the area. Both tunnel + surface options rank the highest because they each include a tunnel for more than half the alignment.

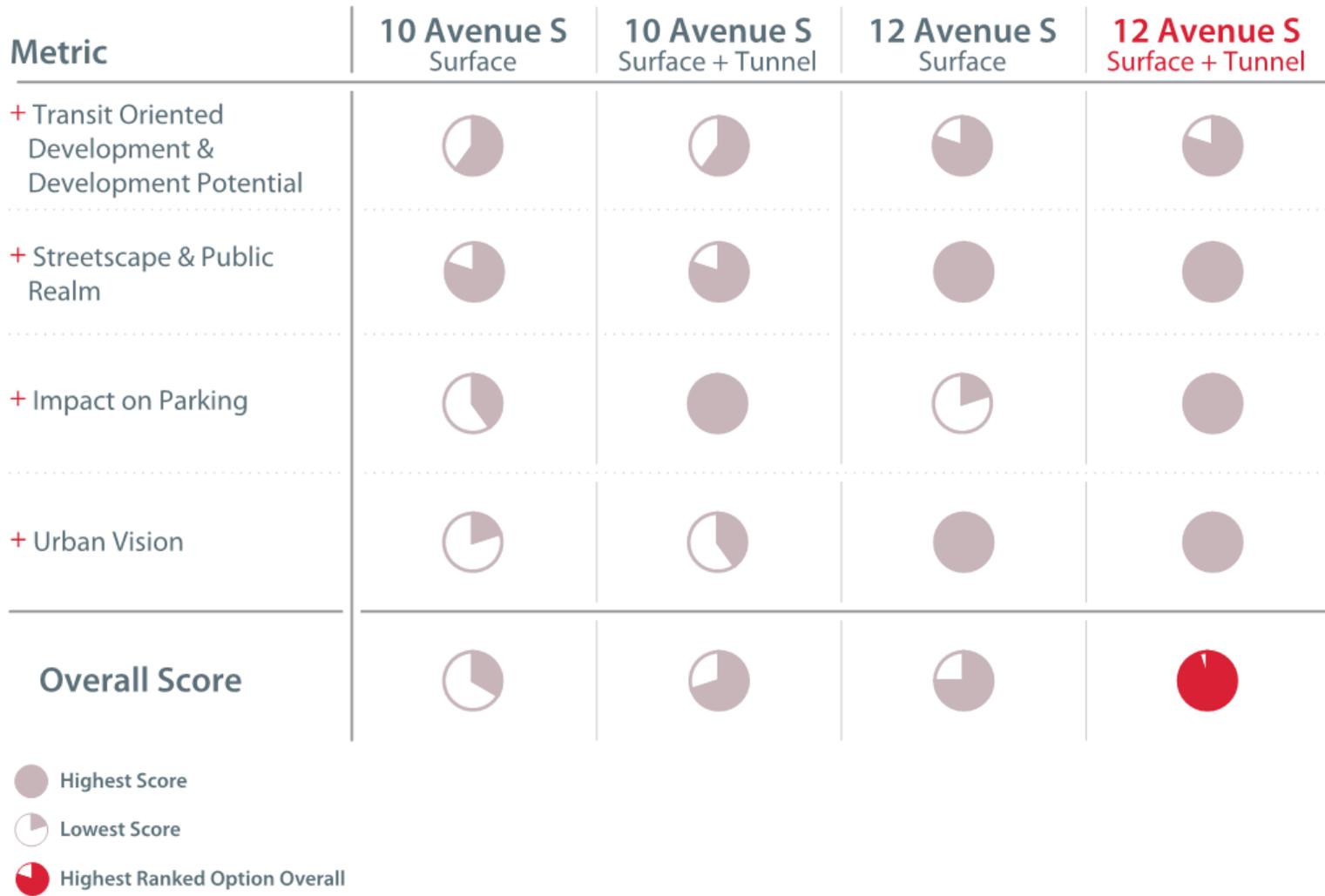
Urban Vision

Consideration for the near-term ability of the option to capitalize on the local community's assets and potential to create an urban realm that promotes community well-being.

This criterion focuses on the ability to provide for place making opportunities in the Beltline.

Both options on 12 Avenue S rank the highest because 12 Avenue S provides more such areas for place making opportunities due to the existing urban fabric of the corridor.

The following chart summarizes the evaluation results for the Urban and Neighbourhood Development account.





Sustainable Environment

A service that promotes sustainable development by reducing greenhouse gases and minimizes the effect on the existing natural environment.

5.5 SUSTAINABLE ENVIRONMENT

GOAL

To provide a service that promotes development by reducing greenhouse gases and minimizing effects on the existing natural environment.

EVALUATION RESULTS

All four options have the same river crossing and are close to the CPR tracks and the Victoria Park Transit Centre. However, the 12 Avenue S tunnel + surface option is ranked slightly lower because of the location of the tunnel portal is close to the Elbow River and has potential higher exposure to flooding.

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

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

Impact on the Existing Natural Environment

Consideration of the impact on biodiversity and natural environment, both during and after construction.

Using the same standardized method for phase one biophysical impact assessments, the following three metrics were used to assess options against this criterion:

- **Permanent effect on the environment**
- **Effects of construction on the environment**

- **Effects on wildlife**

In the Beltline, the only natural area that the options cross is the Elbow River valley area. All four options cross the Elbow River with a bridge in the same location; therefore, all four options were ranked the same for this criterion.

Environmental Soil Conditions and Contamination

Consideration of the number of contaminated sites that may be disturbed during construction.

A high-level modified phase 1 environment site assessment (ESA) was done for the Beltline study area from the CPR tracks to 13 Avenue S.

Two options were used to assess options against this criterion:

- **Number of contaminated sites**

This metric used the results of the modified phase 1 ESA, which identified sites within 25 metres of the alignment with a moderate or high risk of contaminated soil. Because the options are within two blocks of each other, they each contained almost the same number of sites. However, options on 12 Avenue S ranked slightly higher because they had fewer sites.

- **Level of remediation**

The level of remediation required for the sites identified in the modified phase 1 ESA is based on professional judgement and a literature review of historical data for the sites. In general, surface options ranked highest

because surface construction displaces less soil than tunnel construction.

Adaptability to Extreme Climate Conditions

Consideration of the impact of extreme weather conditions and climate change on the LRT infrastructure.

The alignments of all the Beltline options will be exposed to the risk of flooding effects because portions of each alignment option are located within the flood inundation zone for the 1:100-year design flood event. However, having a tunnel portal located outside the 1:100-year flood event area would greatly reduce the risk associated with an option.

10 Avenue S tunnel + surface option ranked the highest because it's portal is placed outside the floodplain. Although the underground Centre Street station is in the floodplain area, design mitigations such as raising the elevation of the station entrance can be used to reduce the risk of flooding at the station.

Noise and Vibration Impacts

Consideration of the effects of noise and vibration on residents and businesses in the area during LRT operations.

Options were assessed based on the effects of noise and vibration on residents and businesses within the area during operation of the LRT system.

The following two metrics were included in the metrics used to assess options against this criterion:

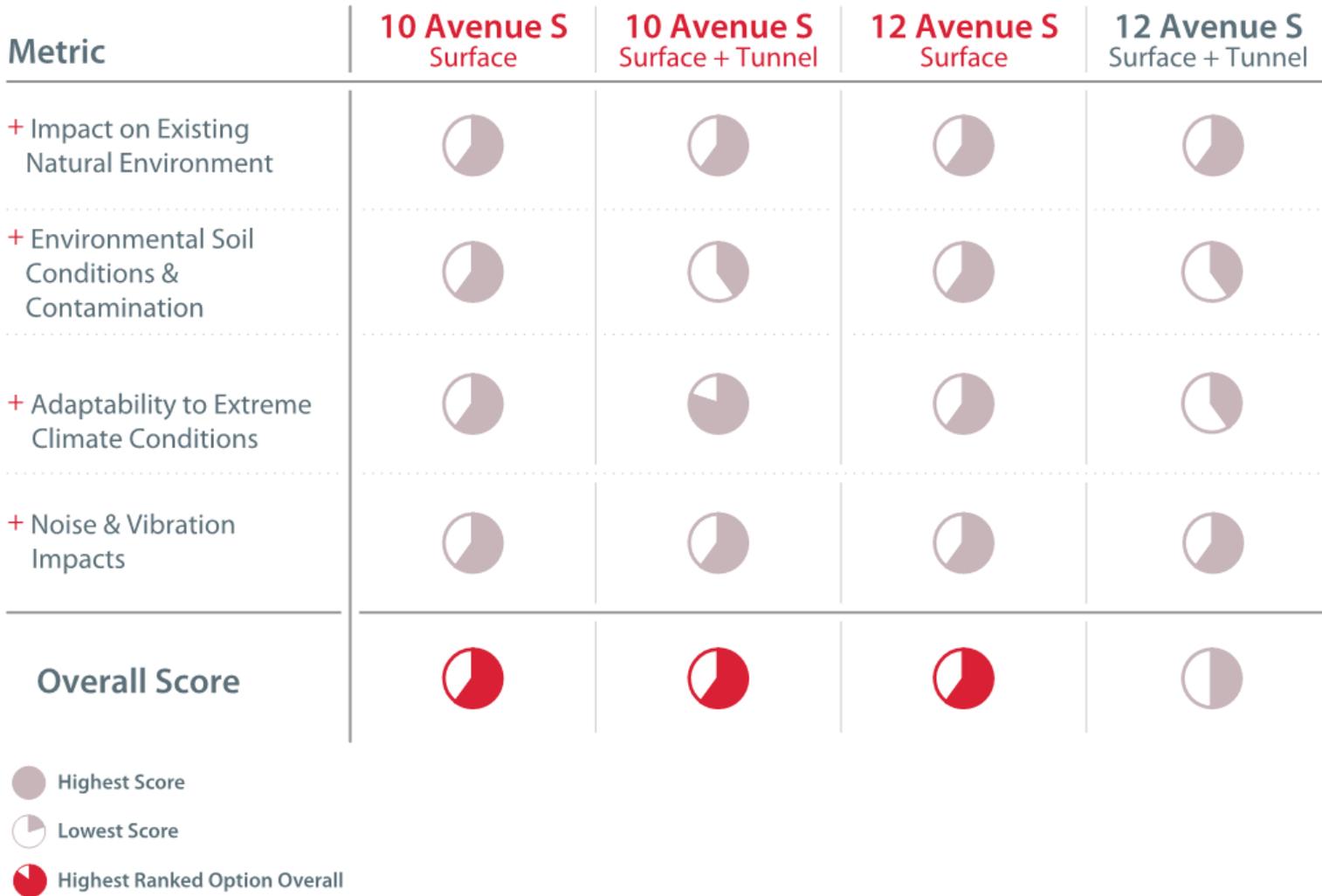
- **Level of noise pollution during operation**

Based on the relatively high ambient noise level in the Beltline area, the effect of the LRT system on noise levels would not be discernible for underground or at-grade options. Noise levels for the at-grade LRT would be expected to be within urban noise levels based on City bylaws. As a result, all options were ranked the same relative to each other.

- **Number of high-sensitivity vibration receptors**

The number of potential sensitive vibration receptors along each corridor was counted. These receptors included locations with vibration sensitive equipment at dentist's and doctor's offices and veterinary clinics. Because the options are located within two blocks of each other, all options were ranked the same.

The following chart summarizes the evaluation results for the Sustainable Environment account.





Feasibility + Deliverability

A service that can be constructed and operated without significant technical issues or constraints.

5.6 FEASIBILITY AND DELIVERABILITY

GOAL

To provide an LRT system that can be constructed and operated without significant technical issues or constraints.

EVALUATION RESULTS

10 Avenue S tunnel + surface option ranked the highest because it has the smallest surface component, minimizing the potential to affect surrounding residences and businesses, and minimizing any potential risk to existing heritage sites in the area. However, there are risks related to technical constraints at the portal and to the large number of utility relocations required along the corridor.



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

Constructability

Consideration of technical constraints such as existing utilities, ground conditions and system-wide challenges, and construction risk related to each option.

The risk associated with constructing a tunnelled LRT segment is assumed to be higher than risk associated with constructing a

surface LRT segment. The risk of a schedule delay is also included in this criterion.

12 Avenue S surface option ranked the highest as it has the LRT on surface, which minimizes the potential for construction risks and avoids 10 Avenue S which has a high concentration of utilities within its right of way. Also, it avoids disputed lands in the Beltline area which reduces potential schedule risks.

Construction Impacts

Consideration of traffic impacts and disruptions to the surrounding community during construction activities.

Preliminary assessment of staging and laydown area requirements for each option was assessed based on the amount of anticipated surface disruption. The option with the lowest staging/laydown area requirements was ranked as most favourable.

10 Avenue S tunnel + surface option ranked the highest as it is mostly grade separated with assumed bored tunnel construction. In the area where the LRT is on the surface the alignment is mostly adjacent to the CPR in privately owned land, which would not require the same type of staging as surface running LRT on 12 Avenue S.

Impacts to Residences and Businesses

Consideration of impacts to neighbourhoods, business operations and traffic flow during construction.

Construction impacts to neighbourhoods and existing business operations as well as changes to access and circulation during the construction period will be different for each option.

The following two metrics were included in the metrics used to assess options against this criterion:

- **Construction disruption to residences and businesses**

Construction of tunnel portals, underground stations, and surface LRT components, are assumed to have the highest disruption to nearby residences and businesses. Both tunnel options ranked highest because they have localized disruptions only at stations and portals with less surface impacts.

- **Accesses for residences and businesses**

Integrating the LRT into the Beltline may introduce new accesses that benefit nearby residences and businesses, but may also replace or remove previous accesses. In general, if access were removed the property would be flagged for potential acquisition and would be included under land cost for the project in both 10 Avenue S and 12 Avenue S options. Thus, all the options ranked the same as remaining properties would have access maintained.

Archaeological and Heritage Impacts

Consideration of potential effects on land or buildings with historical or architectural significance.

As referenced in the Heritage Buildings and Sites document, historical sites are classified as either “Evaluated Historic Resource” or “Legally Protected/Federally Recognized”. “Legally Protected/Federally Recognized” properties are weighted more heavily than others. The number and type of effects resulting

from construction or operation of the LRT system on properties with local or regional heritage value, architectural merit or known archaeological sites, or that are community facilities were considered for this criterion.

The following three metrics were included in the metrics used to assess options against this criterion:

- **Number of heritage sites close to the LRT alignment**

Options with more heritage sites fronting onto the alignment will require more care and attention during LRT construction and operations. 10 Avenue S tunnel + surface option ranked highest because it has the fewest heritage sites along the corridor.

- **Level of risk to heritage sites**

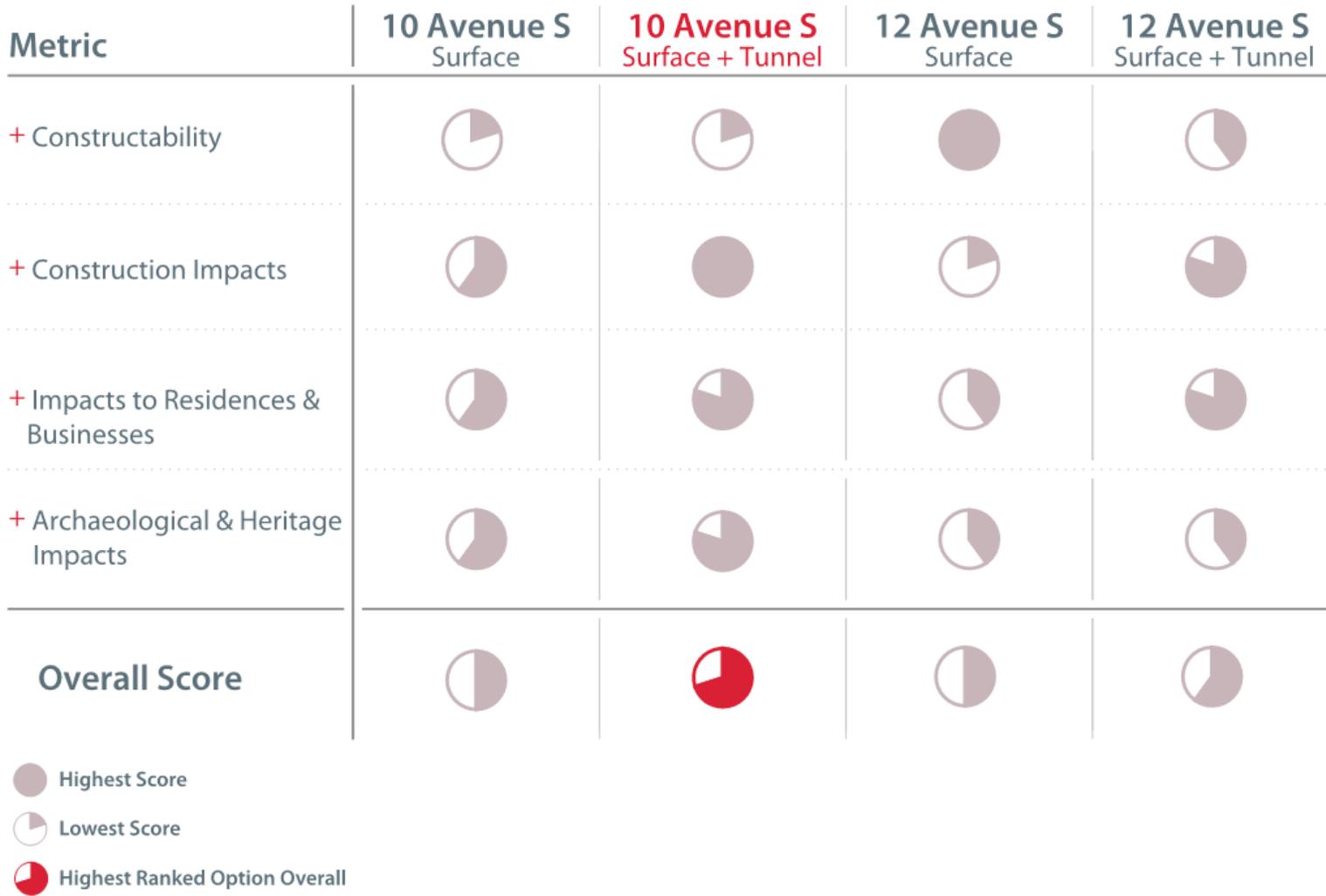
The level of risk to heritage sites is judged based on the how affected the site will be. In general, there are no locations where a heritage site is required to be removed and as a result 10 Avenue S surface option has the highest risk. The location of the portal on 10 Avenue S between 2 Street SW and 1 Street SW is adjacent to heritage sites with minimal buffer space available for sidewalks.

- **Number of archaeological or paleontological sites affected**

Archaeological or paleontological sites are anticipated to be located adjacent to the CPR corridor or near the Elbow River valley. However, because all options need to cross this location, the options were ranked the same.

Beltline Multiple Account Evaluation Summary Report

The following chart summarizes the evaluation results for the Feasibility and Deliverability account.





Stakeholders

***A service that reflects the values and priorities
of communities.***

5.7 STAKEHOLDERS

GOAL

To provide a service that reflects the values and priorities of the communities it runs through.

EVALUATION RESULTS

Based on public and stakeholder input collected to date it is anticipated that there is high public preference for the 12 Avenue S tunnel + surface option. As a corridor there is generally more interest in 12 Avenue S, however, it is anticipated that concerns with traffic displacement suggest that tunnel options would be more preferable.



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

Public and Stakeholder Acceptability

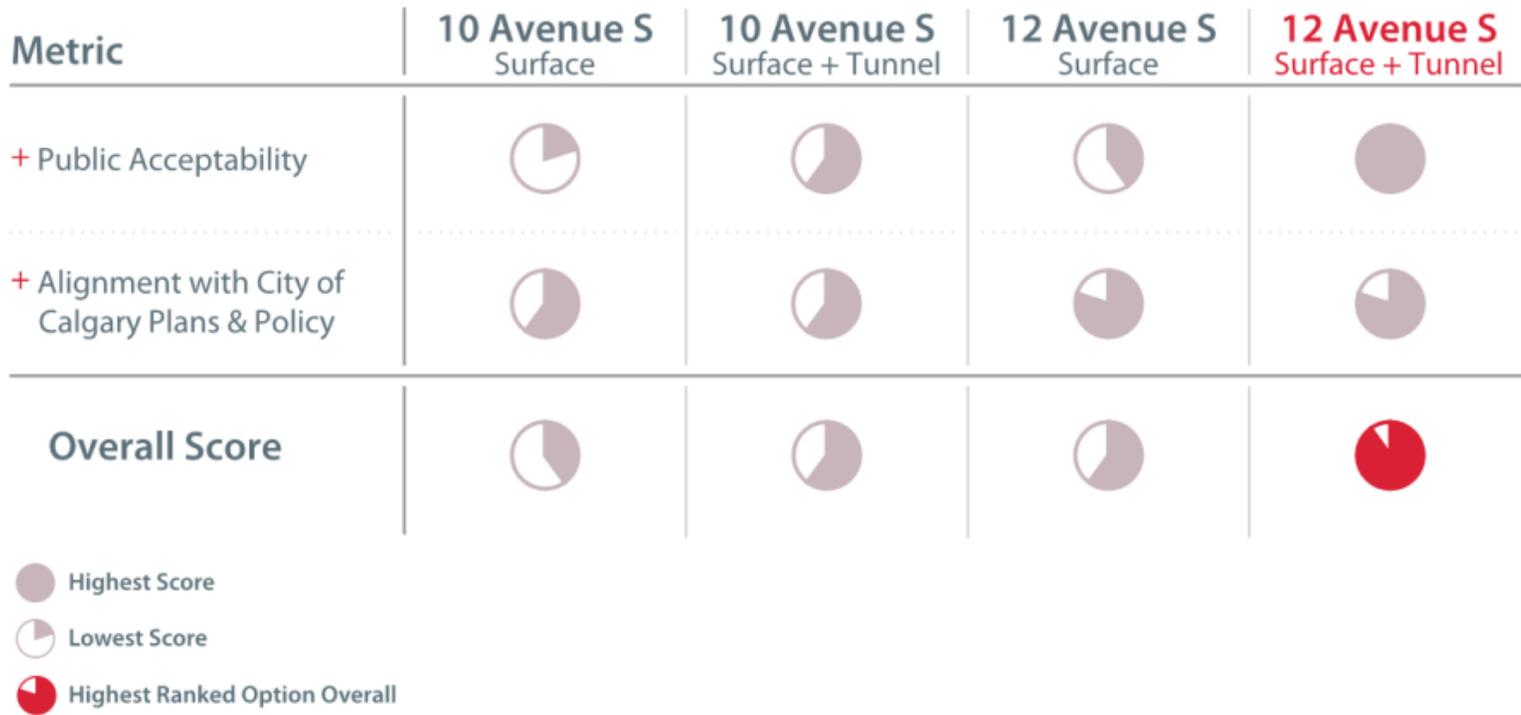
Consideration of public and stakeholder input gathered on the Beltline options.

The input gathered throughout the engagement process was included as a criterion for the evaluation process to provide a means for including stakeholder feedback as part of the trade-off analysis. 12 Avenue S tunnel + surface option was ranked the highest based on stakeholder and public feedback. Both surface options on 10 Avenue S and 12 Avenue S had concerns access and circulation from both the public and stakeholders. As outlined in section 4.3, principles have been developed with local area stakeholders to address the integration of transit with future redevelopment in the Beltline.

Alignment with City of Calgary Plans and Policies

Based on policy reviews done to date, 12 Avenue S as a corridor seems to meet the objectives of area redevelopment plans in the Beltline. Thus, the 12 Avenue S corridor options, ranked slightly higher than the 10 Avenue S corridor options.

The following chart summarizes the evaluation results for the Stakeholders account.



6 RECOMMENDATION & NEXT STEPS

Based on the multiple account evaluation the 12 Avenue S options, the surface, and the tunnel + surface options ranked as the highest and should be carried forward for further analysis. In the Centre City MAE, the results of the evaluation provided a clearer indication for one highest ranked option.

Using the same approach at the Centre City MAE, all criteria are ranked equally which results in both the surface and tunnel + surface options on 12 Avenue S closely ranked. Additional design development, evaluation of the associated risks, refinement of cost estimates, economic impacts assessment and further engagement with key stakeholder to integrate the LRT into the emerging Victoria Park redevelopment plans will be studied further before a recommendation on the LRT configuration can be made in early 2017.

The evaluation found that the trade-offs between the 12 Avenue S Surface option and the 12 Avenue S tunnel + surface option are significant. The surface option would introduce LRT and traffic delays in the Beltline and could require substantive changes to the road network in the area. However, the tunnel + surface option has a higher cost and introduces challenges where the LRT surfaces with the portal placement on 12 Avenue S east of 4 Street / Olympic Way SE.

For both the options, additional assessment of the 12 Avenue S alignment east of 6 Street SE will continue to be reviewed to refine the geometric constraints around the Victoria Park Transit Facility and assess trade-offs in the area. For the 12 Avenue S tunnel + surface option, continued effort on integrating the portal and station with redevelopment plans in the area will be undertaken, and optimize the portal placement such that it is less disruptive. A closer plan and profile of both 12 Avenue S options are shown on figures 5 and 6.

Prior to making a final recommendation to the Standing Policy Committee on Transportation and Transit in 2017 March, additional work will be done on the 12 Avenue S options including a quantitative risk assessment (QRA), economic analysis and continued stakeholder engagement. A recommendation for an alignment will be based on maximizing the total return on investment for Calgarians.

Overall Rankings





Green Line LRT Centre City 12 Avenue S Surface Option

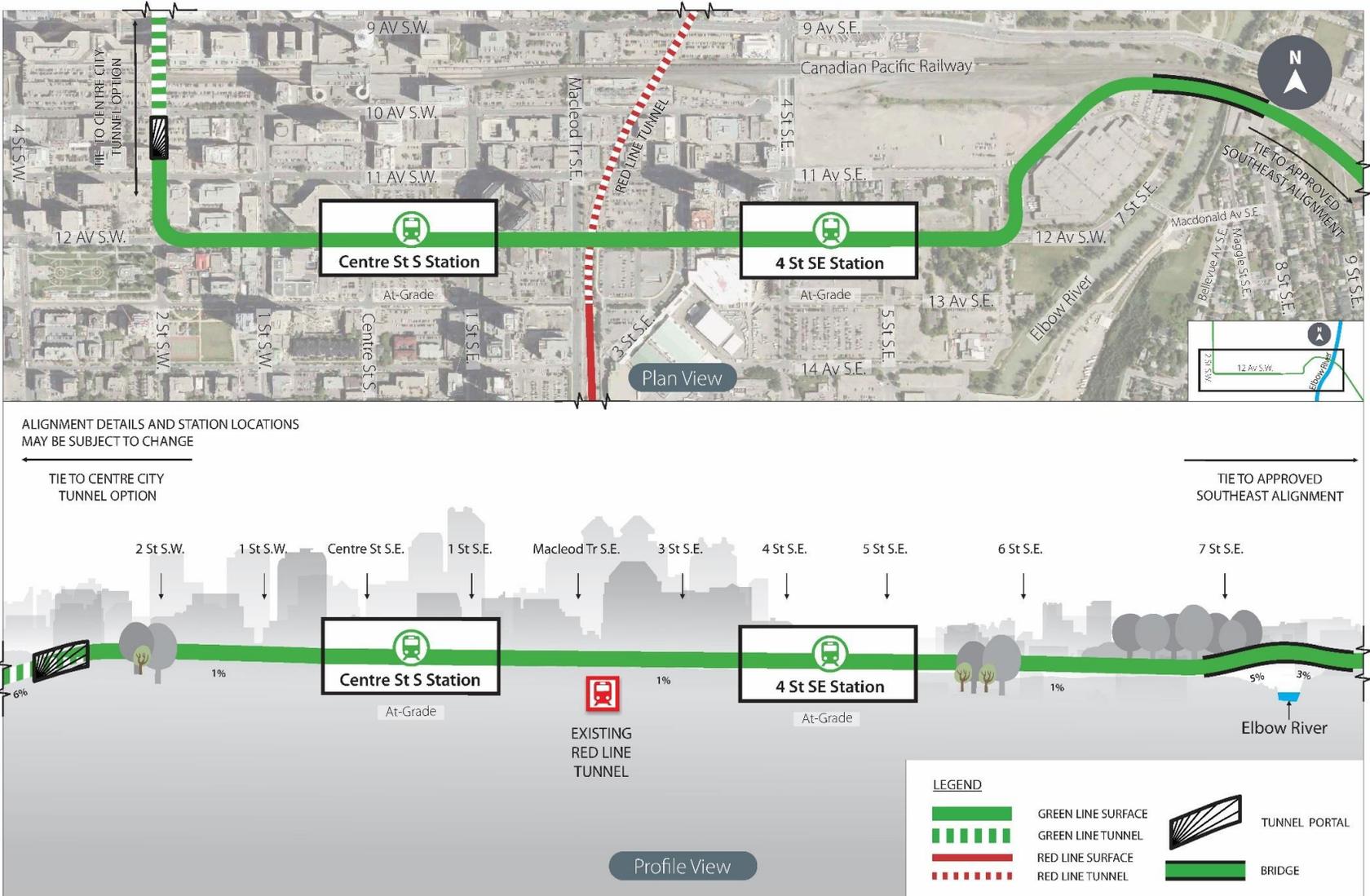


FIGURE 5 12 AVENUE S SURFACE OPTION

Green Line LRT Centre City 12 Avenue S Tunneler + Surface Option

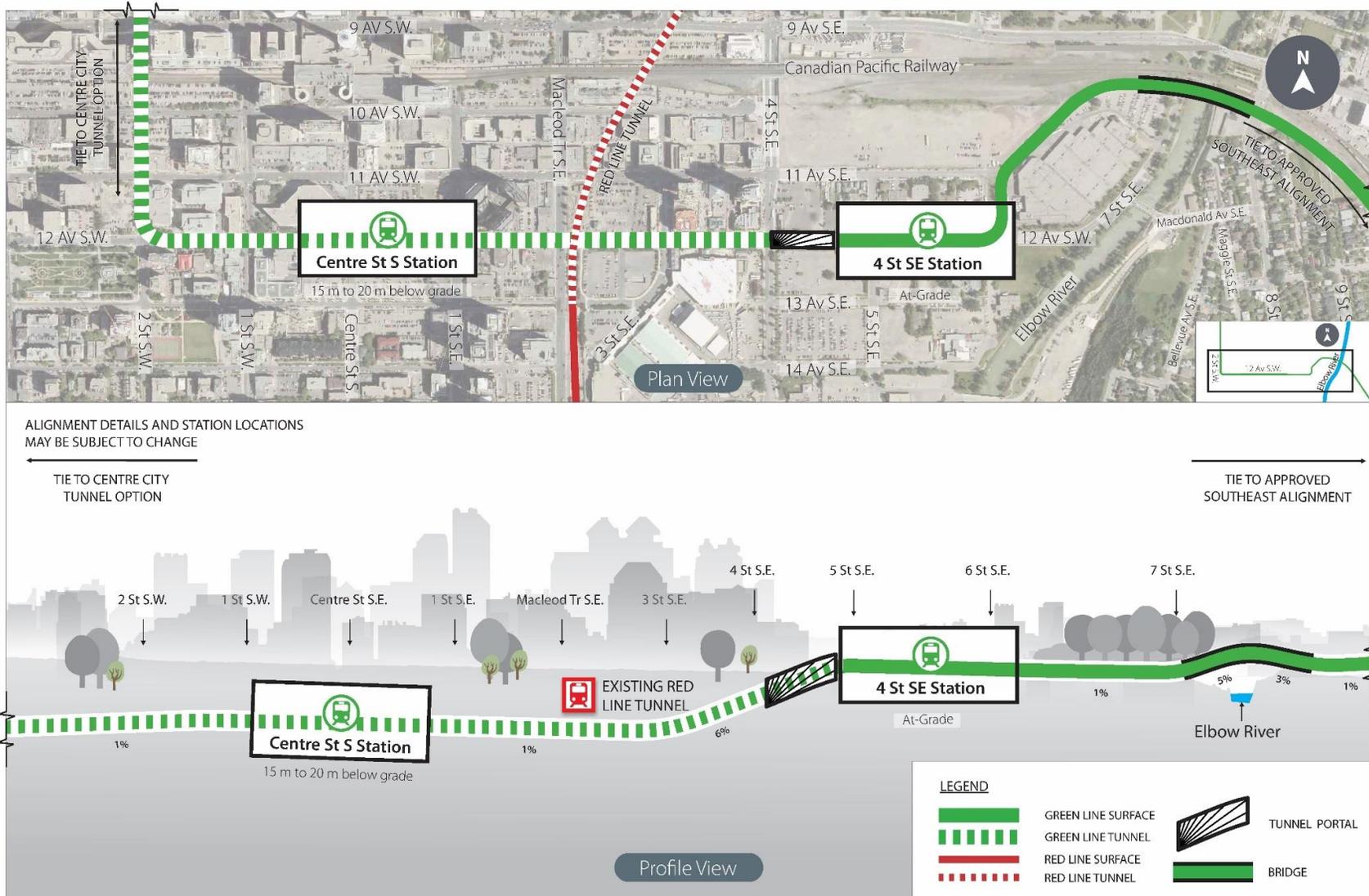


FIGURE 6 12 AVENUE S TUNNEL + SURFACE OPTION

Appendix A - DETAILED MAE SUMMARY

Major Accounts	Project Objective	ID #	Evaluation Criteria	Expanded Description	Representative Metric	10 Avenue S Surface	10 Avenue S Tunnel + Surface	12 Avenue S Surface	12 Avenue S Tunnel + Surface		
Financial Capacity / Sustainable Corporation	An affordable and cost effective service, a service that has cost that are achievable, sustainable in the long term and provide value for money.	1	Capital Cost	Consideration of full costs to construct the options based on the latest cost estimates.	\$ Million	4	2	5	1		
		2	Land Impact	Consideration for the cost of land to be purchased to accommodate the LRT and other required infrastructure.	\$ Million	1	3	5	4		
		3	Operating and Maintenance Cost	Consideration of the overall life cycle costs to operate and maintain LRT infrastructure.	Life cycle costs based on length of alignment that is at-grade or underground.	5	2	5	1		
Financial Capacity / Sustainable Corporation TOTAL						10	7	15	6		
Community Well-Being	A safe secure and socially inclusive service that improves access to key community destinations and encourages walking and cycling.	4	Community Cohesion	Consideration for the different level of visual intrusion and severance on neighbouring properties, as well as ease of station integration of options into existing urban form, particularly around portals.	(1) Physical disruption of ramps & portals	1	3	3	3		
					(2) Access to view and protection of residential & commercial privacy	3	3	3	3		
					Criteria No. 4 Total	2	3	3	3		
		5	Impact to Recreational Uses	Consideration for ability of the LRT to serve community events or high profile festivals after the system has been constructed.	Number of high profile community events that are served by the LRT	3	3	3	3		
		6	Safety, Security and Emergency Access	Consideration for the safety of the system, including ease of application of CPTED design principles, as well as time for emergency response services to access different areas of the system to address any emergency incident.	(1) Perception of safety & security - eyes on the street based on CPTED principles	4	2	5	3		
					(2) Distance for emergency response teams to reach emergency location on system	4	1	5	2		
					Criteria No. 6 Total	4	2	5	3		
		7	Accessibility	While all options will be made accessible to all users, different options present a different level of ease of accessibility to station platforms. Consideration for the distance for a person with disabilities to gain access to a station platform.	Distance for system user to access the station platform	3	1	5	4		
		Community Well-Being TOTAL						12	9	16	13

Major Accounts	Project Objective	ID #	Evaluation Criteria	Expanded Description	Representative Metric	10 Avenue S Surface	10 Avenue S Tunnel + Surface	12 Avenue S Surface	12 Avenue S Tunnel + Surface
Transportation	A high priority transit service that attracts transit use, walking & cycling as preferred mobility choices for Calgarians that integrates with, improves customer experience, meets the future demand of, and strengthens the regional & local transit networks.	8	Ride Time for LRT	Consideration for the length of LRV travel time for each alignment.	LRT ride times	3	5	1	3
		9	Transportation Network Reliability	Consideration for traffic impacts throughout the downtown network Consideration for traffic operations along the LRT corridor and on parallel streets for special events access.	(1) Downtown Network Impacts	1	5	1	4
					(2) Traffic impact on special events	5	5	1	3
					Criteria No. 9 Total	3	5	1	4
		10	Integration with Existing & Future Transit Service	Consideration for providing quick and convenient transfers to the existing & future rail network (LRT & HSR)	Path of travel for transfers to other rail lines	3	3	3	3
		11	LRT Service Reliability	Consideration for impact to LRT reliability due to the interaction between LRV and pedestrians or vehicles that may lead to incidents that disrupt transit service.	(1) Number of potential conflict points between the LRV with pedestrians and vehicles at at-grade crossings and intersections.	3	5	1	5
					(2) Provision for special trackwork requirements	5	5	5	3
					Criteria No. 11 Total	4	5	3	4
		12	Catchment Area	Consideration for the catchment area predicted for each option.	Providing new transit service to the Beltline community	1	1	5	5
		13	Complete Streets: Multi-modes, Connectivity, and Accessibility	Consideration for addition of new cyclist or pedestrian facilities along corridor to support active transportation in the City.	(1) Potential to preserve the existing cycle track pilot	5	5	1	4
					(2) Square meters of new or improved public realm (incl. sidewalks, street landscaping, street furniture, lighting, amenities etc.)	1	2	4	5
					Criteria No. 13 Total	3	4	3	5
		Transportation TOTAL						17	23
									✓

Major Accounts	Project Objective	ID #	Evaluation Criteria	Expanded Description	Representative Metric	10 Avenue S Surface	10 Avenue S Tunnel + Surface	12 Avenue S Surface	12 Avenue S Tunnel + Surface		
Urban Development / Urban Realm	A service that support current and future land use, and intensification of development along the corridor, integrating with the communities it passes through.	14	TOD and Development Potential	Consideration for how well station locations and the alignment options integrate into existing land uses, and provide opportunity for future development.	(1) TOD Integration Potential	3	3	5	5		
					(2) Encouragement/ opportunity for near term redevelopment potential	3	3	5	5		
					(3) Number of access agreements required to connect system to existing infrastructure and buildings	3	3	3	3		
					Criteria No. 14 Total	3	3	4	4		
		15	Streetscape and Public Realm	Consideration of the planned improvements for each of the alignments, focusing on urban design goals of : -Memorable Places, - Great Streets and -Quality Buildings. (i.e. amenity spaces, urban landscaping and street design)	(1) Legibility of stations in the existing and future urban realm	4	4	5	4		
					(2) Integration of station into existing and future urban realm	3	4	5	5		
					Criteria No. 15 Total	4	4	5	5		
		16	Impact on Parking	Consideration for the impact on the availability, location and access to parking for the different options.	(1) Net number of on-street parking stalls removed	1	5	1	5		
					(2) Number of parking accesses restricted (removed access, retrofit parkade access)	2	5	1	5		
					Criteria No. 16 Total	2	5	1	5		
		17	Urban Vision	Consideration for the near term ability of the option to capitalize on the local community's assets & potential to create an urban realm that promotes community well-being.	Ability to provide for place making	1	2	5	5		
		Urban Development / Urban Realm TOTAL						10	14	15	19
											✓

Major Accounts	Project Objective	ID #	Evaluation Criteria	Expanded Description	Representative Metric	10 Avenue S Surface	10 Avenue S Tunnel + Surface	12 Avenue S Surface	12 Avenue S Tunnel + Surface
Sustainable Environment	A service that facilitates reduces GHG emissions while not impacting the city's current natural environment.	18	Impact on Existing Natural Environment	Consideration for the impact on biodiversity and natural environment and during the construction of the option and its ultimate configuration.	(1) Extent of permanent impacts environmental sites / water bodies	3	3	3	3
					(2) Extent of impacts to environmental sites / water bodies during construction	2	2	2	2
					(3) Impact to existing wildlife and wildlife habitat	3	3	3	3
					Criteria No. 18 Total	3	3	3	3
		19	Environmental Soil Conditions and Contamination	Consideration for the number of contaminated sites that may be disturbed for each option and impacts of construction in areas of sub optimal soil conditions.	(1) Number of contaminated sites encountered (negative measure) within the public ROW	2	2	3	3
					(2) Level of remediation required	3	1	3	1
					Criteria No. 19 Total	3	2	3	2
		20	Adaptability to Extreme Climate Conditions	Consideration of the ability of each option to adapt to extreme weather conditions and climate changes.	Probability of flooding / area within floodplain	3	4	3	2
		21	Noise and Vibration Impacts	Consideration for the noise and vibration during operation of the system and its impact on residences, businesses and other sensitive receptors.	(1) Level of noise pollution during operation	3	3	3	3
					(2) Number of high sensitivity vibration receptors along the alignment	3	3	3	3
					Criteria No. 21 Total	3	3	3	3
		Sustainable Environment TOTAL						12	12
						✓	✓	✓	

Major Accounts	Project Objective	ID #	Evaluation Criteria	Expanded Description	Representative Metric	10 Avenue S Surface	10 Avenue S Tunnel + Surface	12 Avenue S Surface	12 Avenue S Tunnel + Surface		
Feasibility / Deliverability	A service that can be constructed and operated without significant technical issues or constraints.	22	Constructability	Consideration for the technical constraints, including geotechnical, archaeological, existing utility infrastructure, as well as physical challenges (gradients, system expandability, etc.) associated with each type of guideway (i.e. elevated, tunnel, at-grade) and the risk premiums related to each.	Risk premium on cost & schedule delay	1	1	5	2		
		23	Construction Impacts	Consideration for the impacts to neighbourhoods and existing business operations during the construction of the option as well as changes to access and circulation	Surface area impacts along the corridor	3	5	1	4		
		24	Impacts to Residences and Businesses	Consideration for the impacts to neighbourhoods and existing business operations during the construction of the option as well as permanent changes to access and circulation.	(1) Severity of disruption to residences, businesses and streets depending on method of construction	3	4	1	4		
					(2) Net number of accesses for residences, businesses and streets	3	3	3	3		
					Criteria No. 24 Total	3	4	2	4		
		25	Archaeological/Heritage Impacts	Consideration for the number and type of impacts on properties with local/regional heritage value, architectural merit or community facilities or known archaeological site, as a result of construction or operation of the option.	(1) Number of historical sites impacted	5	5	1	1		
					(2) Level of risk to heritage sites	1	3	3	3		
					(3) Number of archaeological/paleontological sites impacted	3	3	3	3		
					Criteria No. 25 Total	3	4	2	2		
		Feasibility / Deliverability TOTAL						10	14	10	12
									✓		
Stakeholders	An engagement process that encourages public participation, promotes a shared understanding of the values and priorities, and input into the design development.	26	Public & Stakeholder Acceptability	Perceived/ understood level of public & stakeholder acceptability based on responses at engagement events	Qualitative	1	3	2	5		
		27	Alignment with City of Calgary Plans & Policy	Consideration for how the options align with existing plans and policies and the potential of each option to help achieve those goals. (MDP, CTP, RouteAhead, Complete Streets etc.)	Qualitative	3	3	4	4		
Stakeholders TOTAL						4	6	6	9		
							✓		✓		
OVERALL TOTAL						75	85	90	93		
							✓	✓✓	✓✓✓	✓✓✓	