

## **GREEN LINE QUARTERLY UPDATE AND CENTRE CITY RECOMMENDATION**

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### **EXECUTIVE SUMMARY**

This report provides the third quarterly update for the Green Line program and includes the recommended alignment from 24 Avenue North to 10 Avenue South, which includes the Bow River crossing connecting downtown.

This report also presents the options currently under evaluation for the Beltline with the intent of providing an alignment recommendation by 2016 December.

### **ADMINISTRATION RECOMMENDATIONS:**

That the SPC on Transportation and Transit recommends that Council:

1. Receive this quarterly report for information;
2. Approve the recommended underground alignment (Option D) for the Bow River crossing connecting downtown from 24 Avenue North to 10 Avenue South (Attachment 1);
3. Direct Administration to report back with a Green Line quarterly update at the 2016 December SPC on Transportation and Transit; and
4. Direct that Attachment 2 remain confidential pursuant to Section 24(1)(a)&(b) of the Freedom of Information and Protection of Privacy Act until all Green Line contracts and legal agreements are signed.

### **RECOMMENDATION OF THE SPC ON TRANSPORTATION AND TRANSIT, DATED 2016 SEPTEMBER 21:**

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That Council:

1. Receive this quarterly report for information;
2. Approve the recommended underground alignment (Option D) for the Bow River crossing connecting downtown from **north of 16 Avenue North** to 10 Avenue South (Attachment 1);
3. Direct Administration to report back with a Green Line quarterly update at the 2016 December SPC on Transportation and Transit;
4. Direct that Attachment 2 remain confidential pursuant to Section 24(1)(g) and 25 (1)(c)(ii) of the *Freedom of Information and Protection of Privacy Act* until all Green Line contracts and legal agreements are signed; and
5. **Direct Administration to continue to investigate an underground alignment option for 12 Avenue South, include this option in public engagement conversations, and continue to co-ordinate with area stakeholders to ensure the Green Line is integrated with future developments.**

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Oppositions to Recommendation 2:

Opposed: A. Chabot, P. Demong

Excerpts from the Minutes of the Regular Meeting of the SPC on Transportation and Transit,  
Held 2016 September 21:

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“AMENDMENT TO AMENDMENT, Moved by Councillor Pincott, that Councillor Woolley’s proposed amendment be amended by adding the words “and remove the 10 Avenue at grade option”, following the words “for 12 Avenue South,” and further, by adding the words “12 Avenue South”, following the words “Include the”.

ROLL CALL VOTE

For:

B. Pincott, S. Keating

Against:

G-C. Carra, A. Chabot, S. Chu, P. Demong, D. Farrell, R. Jones, B. Pootmans, E. Woolley

MOTION LOST

AMENDMENT, Moved by Councillor Woolley, that the Administration Recommendations contained in Report TT2016-0705 be amended by adding a Recommendation 5, as follows:

5. Direct Administration to continue to investigate an underground alignment option for 12 Avenue South, include this option in public engagement conversations, and continue to co-ordinate with area stakeholders to ensure the Green Line is integrated with future developments.

Opposed:

S. Chu, S. Keating

CARRIED

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AMENDMENT, Moved by Councillor Carra, that the Administration Recommendation 2 contained in Report TT2016-0705 be amended by deleting the words “24 Avenue North”, following the words “connecting downtown from”, and substituting with the words “north of 16 Avenue North”.

**ROLL CALL VOTE:**

For:

G-C. Carra, D. Farrell, R. Jones, B. Pincott, R. Pootmans, E. Woolley

Against:

A. Chabot, S. Chu, P. Demong, S. Keating

**CARRIED**

And further, that the distributions received with respect to Report TT2016-0705 be attached to the report prior to being forwarded to Council.”

**PREVIOUS COUNCIL DIRECTION/POLICY**

At the 2015 December 14 Regular Meeting of Council, Report TT2015-0881 (Green Line Funding, Staging, and Delivery) was approved as follows:

REFER, Moved by Councillor Carra, Seconded by Councillor Pootmans, that Recommendation 11 contained in Report TT2015-0881, as follows, be referred to the 2016 January 18 Strategic Meeting of Council:

“That Council direct Administration to:

11. Report back to Council through SPC on Transportation and Transit during 2016 on a quarterly basis beginning in March 2016.”

At the 2016 June 20 Regular Meeting of Council, Report TT2016-0483 (Green Line Quarterly Update and Centre City Alignment) was approved as follows:

“ADOPT, Moved by Councillor Keating, Seconded by Councillor Chu, that SPC on Transportation and Transit Recommendations 1, 2 and 4 be adopted, as follows:

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That Council:

1. Receive this quarterly report for information; and
2. Direct Administration to Report back to the SPC on Transportation and Transit no later than 2016 September with one recommended option for the Centre City alignment (excluding the Beltline) crossing the Bow River to be able to continue public engagement, refine design, risks, and cost estimating, and prepare for anticipated funding application submissions in early 2017.
4. Keep the Distribution and In Camera Discussions confidential pursuant to Sections 23(1)(b), 24(1)(a), 24(1)(g), 25(1)(b) and 25(1)(c) of the Freedom of Information and Protection of Privacy Act.

ADOPT, Moved by Councillor Keating, Seconded by Councillor Chu, that SPC on Transportation and Transit Recommendation 3 be adopted, as follows:

That Council:

3. Direct Administration to proceed with land acquisition for the full Green Line program from North Pointe to Seton based on the Green Line North route study and the Green Line Southeast preliminary design, with the exception of those properties which have already been approved for acquisition in LAS2016-05 – LAS2016-40.”

### **BACKGROUND**

With the concurrence of Council, Administration evaluated five alignment options through the Centre City to connect the Green Line North, and the Council approved Green Line Southeast. Centre City was divided into the Downtown and Beltline sections for analysis and public engagement. The focus of this report is on the Downtown section from 24 Avenue N to 10 Avenue S including the Bow River crossing. Multiple alignment options for the downtown were evaluated starting in 2015 December and the short-list of options were presented to Council in 2016 June (TT2016-0483).

Funding for the Green Line continues to come in increments. In 2016 June an announcement was made for the Province of Alberta's third call for GreenTRIP projects and the Government of Canada's Public Transit Infrastructure Fund (PTIF) Phase 1. In 2016 July, Council approved the project list (TT2016-0237) to be submitted for these funds including Green Line. The funding applications included an initial investment in Green Line and are in preparation for the larger anticipated funding commitments. Until the terms of the funding and the formal application process are released by the Province of Alberta and the Government of Canada, this initial investment, if approved, will allow The City of Calgary to advance design, land acquisition, and early works contracts for Green Line.

### **INVESTIGATION: ALTERNATIVES AND ANALYSIS**

The Green Line LRT will help shape the future growth of the city. Identifying the optimal alignment today is essential to realizing the long term city-shaping vision. An investment in Green Line will lay the foundation and will enable the future potential for development, place-making, connectivity and community cohesion.

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The 2016 June report to Council (TT2016-0483) provided a detailed summary of the alternatives and evaluation for the Centre City downtown section. The recommendations brought forward in this report are based on the evaluation presented to Council in 2016 June and have been further validated. Attachment 2 provides a summary of risks associated with each of the five downtown alignment options. Attachment 3 provides further data to quantify the economic implications of elevated and underground options substantiating the evaluation previously presented.

The Bow River crossing through the Downtown represents a critical segment of the Green Line as it determines the connection points for the North, Beltline, and the Council-approved Southeast alignments. Administration is bringing forward the underground option (Option D, Attachment 1) as the recommendation for the Bow River crossing through the downtown.

### **Green Line Centre City**

This segment is from 24 Avenue N to 10 Avenue S and includes the Bow River crossing.

#### Design

Downtown is more than just the critical link for transportation connectivity, it is Calgary's economic engine. This is where the headquarters of global corporations locate, where business activity occurs throughout an ever-growing neighbourhood of skyscrapers and where over 120,000 Calgarians travel to work every day. Downtown is also home to over 18,000 residents, and many retail, dining, cultural, and recreation venues. Integration of the Green Line into this dense urban core must give particular consideration to the opportunities the downtown environment presents for all Calgarians. In order to continue to attract corporations, residents, and visitors in a competitive global marketplace, Calgary's downtown must continue to develop into a place of attractive business, recreation and residential destinations.

The following provides the key distinctions between the five options evaluated for the Bow River crossing:

#### **Option A: Existing Bridge**

*(Surface LRT using the existing Centre Street N Bridge between Chinatown and Crescent Heights, underground through downtown)*

- Due to tight corners turning onto 3 Avenue S, there is no possibility of having a station in the northern part of downtown near Chinatown or Eau Claire
- Reduces traffic capacity on Centre Street bridge

#### **Option B: New Bridge and Shallow Tunnel**

*(Tunnel under Centre Street N, with a new bridge over Prince's Island Park, underground through downtown)*

- Public concern due to impacts to Prince's Island Park and Eau Claire
- Portal in Downtown creates a barrier in the local area

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**Option C: Shallow Tunnel and Elevated**

*(Tunnel under Centre Street N, with a new bridge over Prince’s Island Park, remaining elevated through downtown)*

- Difficult to integrate elevated LRT with existing residential buildings in Eau Claire
- Public concern due to impacts to Prince’s Island Park and Eau Claire
- Urban realm impacts to 2 Street SW with elevated LRT

**Option D: Tunnel**

*(Fully tunneled under the river and Downtown)*

- Public and stakeholder support
- Provides the most opportunity for development integration
- Maintains road network capacity within the downtown
- Highest estimated cost
- Long construction period and associated disruptions

**Option E: Hybrid**

*(Surface LRT in Crescent Heights with new bridge over Prince’s Island Park, underground through downtown)*

- Public concern due to possible impacts to Prince’s Island Park and Eau Claire with new bridge
- Reduces traffic capacity on Centre Street bridge

Cost Estimate

The opinion of probable costs for the five Bow River crossing options through the Downtown are based on functional level of design which are a Class 3 estimate (-30% to +50%). Costs have been validated using statistical analyses, referred to in industry as the Monte Carlo method, whereby a value is placed on the identified risks and the probabilities of occurrence are determined. The cost validation exercise provides additional confidence and advances the estimate from a Class 4 (-40% to +75%) in 2016 June, to Class 3 (-30% to +50%) for this quarterly report. The cost estimates for each of the options are shown below.

<b>Option A</b> <i>Existing Bridge</i>	<b>Option B</b> <i>New Bridge &amp; Shallow Tunnel</i>	<b>Option C</b> <i>Shallow Tunnel &amp; Elevated</i>	<b>Option D</b> <i>Tunnel</i>	<b>Option E</b> <i>Hybrid</i>
\$1.50B	\$1.80B	\$1.56B	\$1.95B	\$1.55B

Public Engagement

Public engagement has indicated general support for the tunnel (Option D) crossing the Bow River to minimize disruption in the Downtown, and to provide a system that will serve Calgarians into the future.

Land

Administration continues to assess the value of the land impacts. Assessment of land impacts includes meetings with external stakeholders and land owners/building managers along the recommended alignment to seek out opportunities for collaboration and integration.

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### Risks

All five options involve elements of tunneling, including the elevated option (Option C), which has a tunnel on the north side of the Bow River. A thorough utilities, geotechnical and hydro-technical investigation was undertaken to inform the functional designs and to understand the risks for all five options. As a result of this analysis, it was determined that all options were technically feasible.

In accordance with the Corporate Project Management Framework, Administration undertook a series of risk workshops attended by a multi-disciplinary group of technical experts, to identify and quantify the risks associated with each of the five Centre City options. This assessment was used to determine the potential cost and schedule impacts to the five options.

Each of the options include significant length of underground tunnel alignment and, as a result, exhibit similar risks, constructability impacts, and challenges. Although the vast majority of tunnel construction projects are completed safely, there is risk associated with the unknowns of subsurface construction.

The risk assessment determined that the underground option (Option D) was one of the options with the least amount of risk associated with utility conflicts (other than at station locations). This is due to the fact that the tunnels provide the opportunity for the Green Line to pass below the depth of utilities and therefore avoid the utilities to a greater extent. However, Option D was deemed to carry the highest risk of variations in geotechnical and hydrotechnical conditions due to the greater length of underground infrastructure.

All options were considered to carry a medium construction risk. This is due to the risk associated with tunnel contractors encountering unexpected ground and ground water conditions as well as the potential for mechanical failure of the tunnel boring machine (TBM). These risks can be mitigated within project contingencies and/or covered within contractual obligations.

Additional information on the risks specific to the options are included in Attachment 2.

### Next Steps

With Council approval of the underground option (Option D), Administration will be able to refine the design and cost estimates for this section of Green Line. Approval will also provide stakeholders with certainty as to the outcome of the evaluation process and clarity as to the community connections on the north and southeast segments of the Green Line.

### **Green Line Beltline**

This segment is from 10 Avenue S to Inglewood/ Ramsay Station.

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### Design

The Beltline segment of the route is very different from the Downtown and Bow River crossing segment in terms of opportunities and challenges. The Beltline segment is undergoing a thorough analysis of the route options on 10 Avenue S, 11 Avenue S and 12 Avenue S. The initial analysis included the following eight options:

- 10 Avenue S: elevated, surface, and underground
- 11 Avenue S: surface, and underground
- 12 Avenue S: surface, and underground
- 11 and 12 Avenues S: surface couplet (LRT operates one-way on 11 Avenue S, and in the opposite direction on 12 Avenue S)

Technical analysis, public, developer, and stakeholder engagement has narrowed the Beltline alignment options to the following:

- 10 Avenue S surface, connecting to previously approved alignment adjacent to Canadian Pacific Railway (CPR)
- 10 Avenue S partial tunnel/partial surface, connecting to previously approved alignment adjacent to CPR
- 12 Avenue S surface, connecting to previously approved alignment adjacent to CPR via the north side of The City's Victoria Park Transit Facility

Administration will complete a full evaluation of the above noted options using a similar method as the Bow River crossing to Downtown. After further public engagement and analysis, Administration will return to committee with a recommendation in 2016 December.

The Beltline area has a unique context for consideration and evaluation which is different from the downtown. Key considerations in the Beltline include:

- Station locations to optimize access to public transit
- Access to public and private parking structures on both the north and south sides of 10 Avenue S
- Contested land ownership along the 10 Avenue S alignment from approximately 4 Street SE to the Elbow River
- Impact to north-south traffic capacity with surface LRT
- Current and anticipated land use and development changes in the study area
- Coordination with cycle track network (currently in pilot project stage)
- Heritage buildings

Attachment 4 provides a concept map for each of the remaining Beltline alignment options that are still being considered.

### Cost Estimates

Cost estimates for the Beltline options continue to be refined as design progresses and will be presented to committee with the same level of certainty as the Bow River crossing options in 2016 December.

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### **Public Engagement**

Administration is working closely with stakeholders in Inglewood, Ramsay and the Beltline to coordinate the planning and design of the Green Line Beltline section. Key stakeholders engaged in the process include community and neighbourhood associations, Calgary Municipal Lands Corporation (CMLC), Calgary Sports and Entertainment Corporation (CSEC), Calgary Stampede, area landowners, and developers. Administration is also working closely with City projects, such as the cycle track network pilot project, and 9 Avenue SE bridge replacement project to ensure a coordinated approach to infrastructure delivery. Ongoing engagement will inform the evaluation of the three remaining alignment options. The first Beltline event held in 2016 June had over 100 Calgarians in attendance to share thoughts on the opportunities for 10 Avenue S, 11 Avenue S, and 12 Avenue S.

Additional engagement with public stakeholders and with developers in Inglewood, Ramsay, and the Beltline, will be ongoing during the fall of 2016.

### **Land**

Two remaining 10 Avenue S alignment options require land with contested ownership that may impact the Green Line project schedule. Additionally, there are planning applications underway adjacent to the remaining alignment options. Administration is meeting with development applicants to discuss integration opportunities.

### **Risks**

Prior to this report, an option had been developed to carry the 12 Ave S surface alignment through Ramsay. Recent discussions between The City and CPR indicate a future closure of 8 St SE at the CPR tracks. In anticipation of this closure this option was amended to connect with the CPR alignment on the west side of Elbow River.

The contested lands associated with the 10 Ave S alignment options pose a potential risk to project schedule. Both of the 10 Ave S alignment options would require purchase of those lands.

The Beltline neighbourhoods of Victoria Centre and East Victoria are experiencing development pressures. Administration is meeting with key stakeholders to ensure the project has current information on private developments, public developments, master planning exercises, and potential changes on the Stampede grounds.

### **Next Steps**

Additional public engagement and analysis will be conducted in the fall before a recommendation for the Beltline alignment is brought to SPC on Transportation & Transit in 2016 December.

### **Green Line North**

This segment is from 24 Avenue N to Keystone.

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### Design

Design is progressing based on technical input, design requirements, and the results of public engagement to date.

### Cost Estimates

Current cost estimates remain within a Class 5 (-50% to +100%) as per the 2016 June report to SPC on Transportation and Transit (TT2016-0483). Additional project cost estimates will be forthcoming in the 2017 March Green Line quarterly update.

### Public Engagement

A report back on the outcome of the 64 Avenue N charrette was held on 2016 June 16 to share the concepts and solutions developed with members of the community who were unable to participate in the process. The concepts presented received widespread support from participants. Comments collected will inform the final transit oriented development concept plan.

### Transit Oriented Development and Land Use Policy

The Mount Pleasant/Crescent Heights (9/16/28 Avenue Stations corridor) charrette and 40 Avenue N station charrette are in the final stages of planning. Coordination for the 40 Avenue N charrette includes the Highland Park Community Association, Thorncliffe-Greenview Community Association, Planning and Development, and the developer of Highland Village Green.

96 Avenue N charrette is still in development with the anticipated date of 2016 November.

### Land

Land impacts and costs continue to be assessed based on the developing functional design. Administration continues to review each of the proposed design options in order to identify properties that will be required in all scenarios either for construction or strategic acquisition purposes. Administration has commenced land acquisition on 42 properties identified through this process and will continue to do so as design refinements advance.

### Risks

The upcoming 40 Avenue N charrette area includes sections of the Highland Park Golf Course redevelopment site. This development application approval has been deferred to 2017 January in order to evaluate the outcomes of the charrette. There is a risk that the charrette is expected to resolve competing community and stakeholder expectations. Administration is working to ensure the charrette process is coordinated and understood with the various stakeholders in the area.

### Next Steps

A report back on the technically preferred Green Line North alignment will be presented to the public in 2016 December including station locations, access and circulation, grade separation, and track alignment. The recommended alignment is anticipated to be presented to Council through SPC on Transportation and Transit in Q1 2017.

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### **Green Line Southeast**

This segment is from Inglewood/ Ramsay Station to Seton.

#### **Design**

Design efforts are progressing towards development of procurement documents. This includes continued refinement of the preliminary design, discussions with developers and adjacent land owners, and further coordination with adjacent City projects.

#### **Cost Estimates**

Cost estimates for the Southeast segment of the Green Line LRT remain at 80% certainty based on preliminary design, and are within a Class 3 (-30% to +50%) cost range.

#### **Public Engagement**

Planning is underway for public engagement events to provide project updates. Broader public engagements for the local area policy plans will resume in September to discuss draft proposals and collect feedback from the public. A need has been identified to increase the coordination of community engagement across the multiple City projects in the planning and design phase. Community representatives have expressed concerns with the multiple requests on their time.

#### **Transit Oriented Development and Land Use Policy**

On 2016 July 25 (PUD2016-0631) Council approved a deferral of the delivery of the land use policy planning in the three transit oriented development (TOD) areas of Inglewood/Ramsay and 26 Avenue SE, Lynnwood/Millican and Ogden, and South Hill to "no later than the end of Q1 2017". The deferral was requested to allow for further engagement to occur with communities, and industry.

Upon Council's approval of the policy plans, implementation of the concepts through City-initiated land use redesignation will occur in 2017.

#### **Land**

Administration continues to actively engage in negotiations with property owners along the southeast alignment between 4 Street SE and Shepard Station, with the goal of reaching a higher percentage of negotiated agreements and limiting the number of expropriations that are ultimately required. To date, Administration has finalized negotiations on 12 property acquisitions with several others expected to be concluded in the short term. Negotiations will continue throughout 2017 and, if required, expropriation proceedings will likely commence in mid-2018 to ensure that The City has possession of all required properties by the targeted construction start date.

#### **Risks**

Negotiations with Canadian National Railway and Canadian Pacific for land required for the Green Line are ongoing and have not yet been resolved. Infrastructure requirements imposed and amendments to the land use policy plans as a result of negotiations could impact the program cost and schedule. The extension of the policy plan delivery date to Q1 2017 and the opportunity for further engagement will help mitigate this risk.

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### **Construction**

Intersection improvements to Barlow Trail and 114 Avenue SE, and a temporary transit-only connection from 40 Street SE to 126 Avenue SE will be completed by end of 2016. This is part of the Quick Wins project, which provides improvements for the Route 302 BRT Southeast, and other routes. Further evaluation of other transit priority measure improvements along the route are being considered.

### **Next Steps**

Early works projects, as presented to SPC on Transportation and Transit (TT2016-0237) and included as part of the GreenTRIP and Public Transit Infrastructure Fund (PTIF) Phase 1 application will be further planned in anticipation of funding approvals.

### **Program Schedule**

The Green Line stage gate plan (Attachment 5) remains the same as previously presented to Council in the 2016 June quarterly update (TT2016-0483). By 2017 June, Administration will report on the full Green Line recommendations, transit oriented development (TOD) planning, city-shaping metrics, cost estimates, contracting strategy, and staging plan based on available funding.

### **Project Delivery**

Administration is currently evaluating the options for contracting including delivery of detailed design and construction, and operations and maintenance. An update on the contracting strategy will be presented to the 2016 November Strategic Session of Council and recommendations will be presented to Council no later than 2017 June.

### **City-shaping and City-wide policies**

The Green Line provides opportunities to shape communities by planning and building healthy, walkable, integrated, mixed use, and transit supported areas. Administration have undertaken a series of information sessions for City staff to broaden awareness of Green Line. This is intended to encourage the incorporation of this foundational project in all related City projects.

### **Stakeholder Engagement, Research and Communication**

The summer months have been dedicated to raising awareness of the Green Line across the city. Public awareness efforts have included participating in community events in areas along the Green Line, as well as having a presence at major festivals and events. Green Line ambassadors attended over 20 major events and festivals throughout the summer and had over 2,500 interactions with Calgarians. Forty five percent of people indicated they were aware of the project and the majority of interactions were positive.

### **Strategic Alignment**

The Green Line vision is in accordance with Council's priorities and aligned with the Government of Alberta's and Government of Canada's strategic objectives. Key ministerial objectives include Alberta taking on a national leadership role in a lower carbon global energy future with large investment in energy efficiency, public transit and new technologies, and providing opportunities to invest in services to maintain a strong quality of life for all Albertans.

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### **Social, Environmental, Economic (External)**

The Green Line program will result in city-shaping outcomes which include social, environmental, and economic benefits for generations to come.

#### Social

As a city-shaping initiative, Green Line supports mixed-use and mixed income communities to reach community aspirations for vitality, sustainability and affordability. Mixed-use neighbourhoods are the places where people live, work, play, shop and learn. Mixed income communities are financially accessible to all Calgarians. A major benefit of increasing access to rapid transit is the overall lowering of transportation costs, and the fundamental link between cost and affordability of housing, especially lower income households. Consideration for multi-generational communities and the places where residents can transition through all stages of life ensure a long term, sustainable and resilient plan.

#### Environmental

The City of Calgary has committed to reducing greenhouse gases (GHG) from its corporate operations, through energy efficiency and conservation programs and a shift to using lower carbon and renewable energy sources. The City also has a community GHG reduction plan with a broader aim of enabling Calgarians and businesses to reduce emissions, primarily from choices they make in transportation and heating homes and buildings city-wide. The City's targets are for 20% reduction in GHG emissions from a 2005 baseline by 2020, and an 80% reduction by 2050. Green Line presents opportunities to lead Calgary into the next phase of environmental sustainability and accountability through direct reductions in GHGs through the use of renewable energy, emission gains with fewer internal combustion engines in use, facilitating densification around transit villages and our civic facilities being built to LEED standards.

Recent travel behaviour surveys in Calgary have demonstrated developments within easy walking distance to LRT have a significantly higher percentage of transit trips than similar land use without access to LRT.

#### Economic

Economic analysis indicates proximity to rail transit has a positive impact on property values. While there are localized challenges with noise and visual impacts, as well as fluctuating rental rates based on market conditions, the overall benefits are to the wider community.

Despite the numerous economic studies on the positive property value implications of light rail, there has been limited research performed specifically on how different light rail configurations (i.e. tunneled, elevated, at-grade) impact property and business activity.

For the purposes of the five Bow River crossing options to Downtown, Administration has analyzed the impacts to property and area businesses by evaluating two metropolitan areas where both elevated and tunneled rail systems operate. Specifically, the analysis evaluated Vancouver's TransLink and Chicago Transit Authority rail systems (Attachment 3). The analysis considered:

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- The shadowing and noise pollution impacts to surrounding commercial properties (both office and retail);
- The potential impacts due to reduced visibility and/or access from at-grade systems; and
- The potential impacts from reduction in on-street activity, be it automobile or pedestrian, due to reduction in the right of way capacity.

The analysis included interviews with local businesses, developers and landowners, and reviewing rents, occupancy rates, and transaction history of commercial buildings to identify any differences between builds near versus buildings directly abutting an elevated rail line.

### **Financial Capacity**

#### **Current and Future Operating Budget:**

In order to be ready for funding applications to the Federal and Provincial governments, the Green Line vision for the full alignment including planning and design must advance. These deliverables can only be met if an investment of operating funds/resources by several City business units is dedicated. The impact has been incorporated into the 2016 work plans of several business units, however resource efforts are a draw on the Green Line capital fund. This is particularly acute in 2016/2017 in light of the need to evaluate contracting strategies in advance of the 2017 June stage gate milestone. This is being addressed at the Administrative Leadership Team level.

Impact on the future operating budget is dependent on which option is ultimately constructed. Some options will require more funds to operate and maintain. Operating cost estimates will be refined in subsequent phases of this project and presented in 2017 June.

#### **Current and Future Capital Budget:**

The impact of borrowing costs is very significant and could reduce the available budget for construction by approximately 1/3 of the cost of the project depending on the timeline of grants and borrowing. Staging options that meet the available funding will be provided as additional funding program information becomes available.

The current City of Calgary Green Line funds of \$520 million are being used to continue land acquisition and design to be ready for construction using any procurement option. Use of the Green Line funds ahead of a signed commitment of funding from the Federal and Provincial government erodes the matching contribution limit; however, this erosion of funds will be reduced if the application for funds through GreenTRIP and PTIF Phase 1 are approved.

### **Risk Assessment**

The project has many risks that are being tracked and actioned. The following risks are the focus of Administration's ongoing risk management:

#### **Public Engagement**

- The scale of the Green Line project, compounded with ongoing projects across the city, is creating pressure on stakeholders, and communities. Administration is taking steps to meaningfully engage stakeholders in discussions relating to the overall vision.

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### Funding

- Full funding may not be available to deliver the full Green line program from Keystone to Seton. Staging of Green Line and value engineering needs to be considered in order to balance the available funding to the project scope.

### Timeline

- If key milestones as identified in Attachment 5, such as the approval of the full alignment are not reached, funding approvals may be delayed or lost. It is critical that The City of Calgary be first in line for funding applications as there will be competition from other municipalities for similar mass transit projects of national significance.

### Land Acquisition

- Land acquisition continues to present one of the highest risks to the project schedule and cost estimates. Total land cost estimates continue to be reviewed and refined as negotiations proceed and design advances.

### **REASONS FOR RECOMMENDATIONS:**

To provide Council and the public with an update on the status of Green Line activities, including the evaluation of the Beltline options. Council decision on the underground alignment of the Bow River crossing (Option D) as it is required to advance planning, design, and cost estimation in preparation for funding applications.

### **ATTACHMENTS**

1. Underground Alignment of the Bow River Crossing (Option D)
2. Relative Risks for the Bow River Crossing Options (Confidential)
3. Centre City: Economics Analysis
4. Beltline Alignment Options
5. Green Line Program Stage Gates and Milestones
6. **Distributions**