

## **NORTH CENTRAL LRT – CENTRE CITY OPTIONS**

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### **EXECUTIVE SUMMARY**

The route of the North Central LRT on Centre Street North was approved at the Combined Meeting of Council on 2015 January 12. Administration was directed to produce this follow-up report, which provides information on the options that were investigated for connecting the North Central LRT and Southeast LRT in the Centre City from approximately 24 Avenue N to 10 Ave South. The four options being presented are:

- Option A: use the existing Centre Street bridge and build at-grade;
- Option B: new bridge west of the Centre Street bridge;
- Option C: new bridge west of the Centre Street bridge and remaining elevated through the Centre City; and
- Option D: tunnel from 24 Avenue N to 10 Avenue S.

### **ADMINISTRATION RECOMMENDATION**

That the SPC on Transportation and Transit recommends that Council directs Administration to investigate each of the four options in further detail to refine our understanding of various factors including; construction costs and quality of operations and return to the SPC on Transportation and Transit in Q4 2015.

### **RECOMMENDATION OF THE SPC ON TRANSPORTATION AND TRANSIT, DATED 2015 FEBRUARY 18:**

That the Administration Recommendation contained in Report TT2015-0149 be approved.

Excerpt from the Minutes of the Regular Meeting of the SPC on Transportation and Transit, held 2015 February 18:

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“2. That the Distributions be attached to the Report prior to being forwarded to Council.”

### **PREVIOUS COUNCIL DIRECTION/POLICY**

The *North Central LRT Route Planning Study Recommendations* report (TT2014-0916) was presented at the 2014 December 17 Standing Policy Committee (SPC) on Transportation and Transit. Recommendations 1 and 3 were approved. Recommendation 2, directing “Administration to conduct a functional planning study for the Centre Street alignment, including further analysis of the two alignment options presented south of 24 Avenue North (at-grade on the existing Centre Street bridge, and tunnelled)”, was referred, moved by Councillor Demong, to the 2015 February 18 SPC on Transportation and Transit.

At the 2015 January 12 Combined Meeting of Council, the *North Central LRT Route Planning Study Recommendations* report was adopted, after amendment. The item was moved by Councillor Keating, and Seconded by Councillor Farrell. The amended recommendations “direct Administration to provide information on each of the four options for the North Central LRT route in and near the Centre City, at the 2015 February 18 Regular Meeting of the SPC on Transportation and Transit and provide options for Council’s consideration.”

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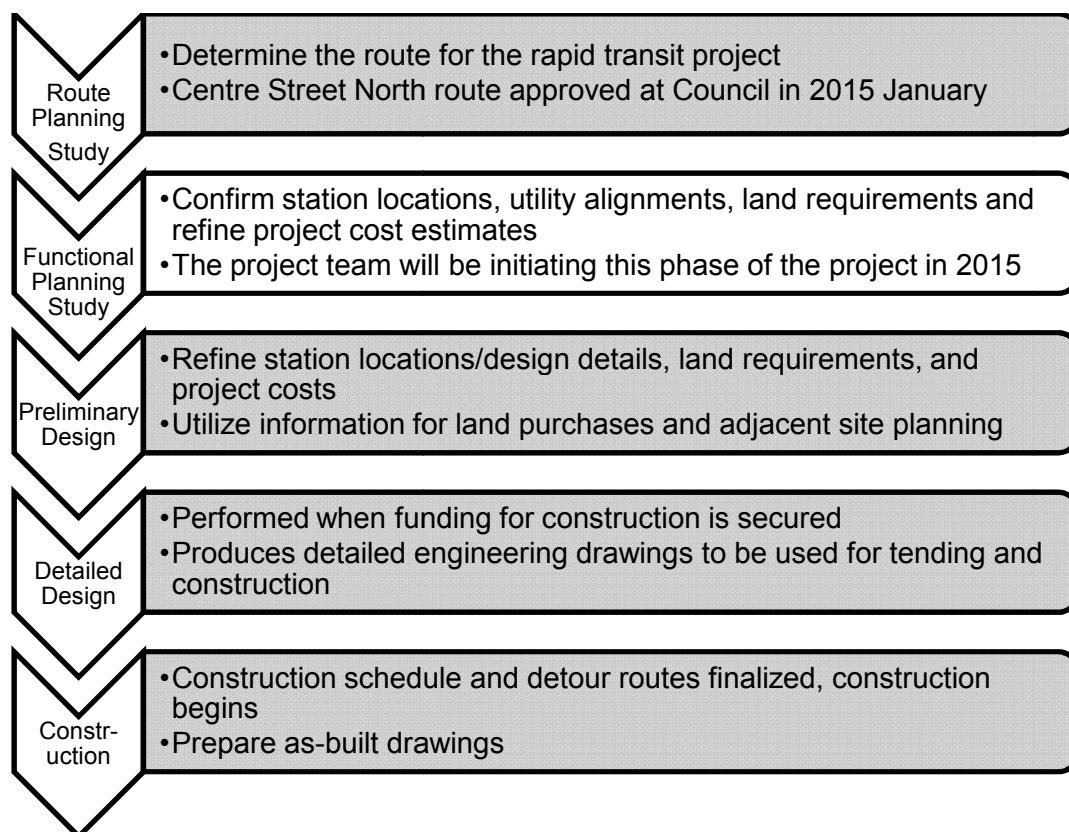
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### BACKGROUND

The North Central LRT is the north leg of Calgary's next LRT line, named the Green Line. As outlined in RouteAhead, a 30-year strategic plan for transit in Calgary, the Green Line will include LRT from North Pointe in North Central Calgary (and Keystone in the long term) to Seton in the Southeast. The first planned infrastructure improvement for the rapid transit network in the North Central corridor is the Centre Street Transitway which will provide improved travel times and schedule punctuality for existing bus service in the corridor. Construction of the Centre Street Transitway is planned to commence in the spring of 2019.

The North Central LRT planning and design process involves multiple phases (see Figure 1). The route planning study is the first of many phases. Now that the general route has been approved, the functional planning study will begin. The functional planning study includes refining station locations, utility alignments, land requirements, and project costs identified as part of the route planning study (2013-2014).

**Figure 1: Planned steps in the North Central Corridor planning and design process:**



### INVESTIGATION: ALTERNATIVES AND ANALYSIS

Approval: Logan, Malcolm concurs with this report. Author: Lea, Jonathan  
City Clerk's: D. Williams

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The Council-approved *Downtown LRT Feasibility Study* (LPT2006-27) identifies an underground alignment for the Southeast LRT along 2 Street SW, between Riverfront Avenue SW (Eau Claire) and 10 Avenue/1 Street SE (Beltline). Proposed station locations are identified at 2 Avenue SW, 7 Avenue SW, and on 10 Avenue at Centre Street S.

The North Central LRT Route Planning Study project team investigated a number of possible alignments in the Centre City. 2 Street SW is the preferred alignment for the north-south corridor because it:

- offers a relatively direct connection between the North Central and Southeast LRT;
- is close to the geographic centre of downtown
- is close to the centre of employment and retail density
- supports previously approved municipal plans, such as the *Centre City Plan* (2007), and *Downtown LRT Feasibility Study* (2006)
- supports public and private development occurring in the close proximity to 2 Street SW since the previous approval of the underground LRT corridor

Initially, 18 different options were considered for this segment to connect the North Central LRT with the Centre City, the Southeast LRT, and respond to the project vision. The four options that are presented in this report are considered to be the best from all of the options that were considered. A multiple account evaluation (MAE) was used to rank each of the options against each other. The criteria used in the MAE were developed during a workshop for City staff from a wide cross-section of City departments. The criteria included, but were not limited to: pedestrian and cyclist mobility, transit travel speed, impact on vehicle traffic, sustainable environment, and construction cost.

The Centre City segment of the route has a number of factors that must be considered, including, but not limited to:

- previous decisions regarding the alignment of North Central LRT and the Southeast LRT;
- grade separating (going over or under) the existing 7 Avenue LRT service to optimize operations and for safe operations;
- grade separating the future 8 Avenue LRT subway;
- grade separating the existing CPR tracks;
- grade separation at 16 Avenue N
- impacts to pedestrian, cyclist, and motorized vehicle mobility;
- environmental impacts of crossing the Bow River;
- grade change introduced by the escarpment north of the Bow River; and
- station depth, ability to access stations, and emergency evacuations.

**Option A** - the strength of this option is the lowest capital construction costs by using the existing Centre Street bridge to cross the Bow River. A tunnel would still be required between 2 Avenue S and 10 Avenue S to grade separate the future North Central LRT from the future 8

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Avenue S tunnel, and existing LRT and CP Rail tracks. The primary weakness is speed of operations particularly along Centre Street N and the physical impacts in the narrow right of way.

**Option B** – this option would have better operations and less impact on Centre Street N. The option includes a new bridge over the Bow River to carry the LRT. Tunnels would be required between 20 Avenue N, and the Bow River escarpment on the north side of the river, and between 2 Avenue S and 10 Avenue S on the south side of the river. The primary weakness of this option includes increased costs and the impacts on the Bow River valley.

**Option C** – this option offers the improved Centre Street N operations with a different approach to the downtown core service. The option includes a new bridge over the Bow River to carry the LRT, and an elevated structure south of the Bow River. A tunnel would be required between 20 Avenue N, and the Bow River escarpment on the north side of the river. A new bridge would carry the LRT over the river connecting to an elevated structure through the Centre City, passing above existing +15 bridges. The primary weakness of this option includes increased costs and the impacts on the Bow River valley similar to Option B, along with uncertainty of how well an elevated structure would serve customers in the core.

**Option D** – this option is the most ‘future proof’, offering the best train operations and climate control for riders. The basis of Option D is a tunnel for the entire route from 24 Avenue N to 10 Avenue S, a distance of 3.9 kilometres. This option provides grade separation of the future North Central LRT from 16 Avenue N, the Bow River, the future 8 Avenue S tunnel, and existing LRT and CP Rail tracks. The primary weaknesses of the option are the highest cost by a considerable margin and the depth of a potential station at 9 Avenue N.

Each of the options, including capital cost estimates, is discussed in detail in Attachment 1: North Central LRT Centre City Options. Additional information on the elevated option (Option C) is provided in Attachment 2: Elevated Structure for the Green Line in Calgary’s Centre City.

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

The results of this report are based on the extensive public engagement and communications program undertaken as part of the *North Central LRT Route Planning Study Recommendations* report (TT2014-0916).

In addition, an internal workshop was held with Administration in 2013 December to determine the principles for rapid transit in the Centre City. The workshop was attended by staff from a wide spectrum of the corporation’s departments and business units. Each group at the workshop, working independently, produced the same conclusion: rapid transit in the Centre City should be direct, fast, interconnected and have high capacity. The rapid transit network does not need to serve all destinations, as another vehicle technology (bus, streetcar) can be used to provide local trips.

### **Strategic Alignment**

This report is aligned with the following long-term plans: Calgary Transportation Plan (CTP) and

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Municipal Development Plan (MDP) (2009), RouteAhead: A Strategic Plan for Transit in Calgary(2013) and the Centre City Plan (2007). The project team will continue to coordinate with the Southeast Transitway predesign team, and Planning, Development and Assessment's (PDA) Main Streets project.

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

#### **Social**

High quality public transit service is an essential requirement for the creation of attractive, vibrant and economically competitive cities. Public transit provides affordable mobility and accessibility to people, places, goods and services. The Canadian Urban Transit Association (CUTA) has outlined the public health benefits of public transit, including improving urban air quality, and increasing physical activity which can lower the risk for many diseases, such as heart and vascular disease, strokes and diabetes.

#### **Environmental**

Movement of people on public transit makes the most efficient use of natural resources, allows for a more compact city and offsets the need for motor vehicle travel, resulting in fewer impacts to existing communities. Implementing a network of rapid transit services is a fundamental objective in the MDP and CTP. Options B and C have physical and visual impacts to the Bow River valley.

#### **Economic**

The North Central rapid transit corridor represents a substantial opportunity to positively influence private investment along the corridor. Studies have shown public investment in improving mobility and access increases the attractiveness of adjacent communities for redevelopment (see: *Calgary Transportation Effect* (2013), by the Real Estate Investment Network, Ltd.). The outcome of this report (TT205-0149) will also guide investment in the downtown segment of the alignment, specifically the proposed redevelopment of the Eau Claire Market

### **Financial Capacity**

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

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. Operating cost elements will vary by Option. For example tunnelling eliminates snow and ice control at platforms but introduces security and life safety expenditures.

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

The report includes high level cost estimates of constructing each of the four options. Lifecycle costs for the preferred options will be determined in subsequent phases of this project. Capital cost estimates will be refined in the functional planning phase of this project to help inform Council towards a final design option.

### **Risk Assessment**

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The four options presented in this report include varying degrees of risk. Option D: a tunnel from 24 Avenue N to 10 Avenue S, carries the greatest degree of risk due to the many unknowns such as subsurface soil conditions, and therefore cost variability. A factor has been included in the current cost estimates to account for that risk at this preliminary stage. The functional planning study, which will commence in 2015, will include measures such as geotechnical investigation, to better define the risks, and refine construction costs of each of the options that are carried forward.

Delaying a decision on the Centre City options for North Central LRT can impact the schedule for subsequent phases of the project. Administration is scheduled to start functional design of the Centre Street North Transitway which will be influenced by the future plans for LRT.

### **REASONS FOR RECOMMENDATION:**

Four options are presented in this report to connect the North Central LRT through the Centre City to the Southeast LRT. With the information that is currently available, Administration is confident that each of these four options is technically feasible. Administration is recommending further investigation of the four options in detail to refine numerous factors including; the cost and complexity of each option, the quality of the user experience and comparative operating cost, and then return to the SPC on Transportation and Transit in Q4 2015.

### **ATTACHMENTS**

1. North Central LRT Centre City Options
2. Elevated Structure for the Green Line in Calgary's Centre City
3. **Distributions**