

# Southeast LRT Concept Plan

## Downtown to Mill Woods

### Recommendation:

That Transportation and Public Works Committee recommend to City Council.

That the Southeast LRT Concept Plan for Downtown to Mill Woods, as outlined in Attachments 1 and 2 of the December 8, 2010, Transportation Department report 2010TD6407, be approved.

### Report Summary

This report details the concept planning work completed for the Southeast LRT from Downtown to Mill Woods.

### Report

#### Background

- In December 2009, City Council approved the Southeast LRT Corridor which was the first of two steps in completing the concept plan. Since that time, Administration has been developing more details to refine the alignment of the LRT within the corridor.
- The development of the recommended concept plan has involved additional engineering and considerable public involvement to evaluate various options of the alignment within the corridor. Details of the Southeast LRT Concept Plan is outlined in Attachments 1 and 2.

#### Alignment

- Similar to the corridor selection process, three major inputs influenced the recommended concept plan: technical analysis,

public input, and principles from the City's LRT Network plan. In developing the recommended alignment, the project team utilized an approach that promoted consistency with the corridor to help guide the planning process.

- The general approach for the Southeast LRT alignment involves primarily a centre running system as it balances the impacts and benefits along the corridor in terms of access management and traditional intersection operation. However, there are areas along the corridor that lend themselves to a side-running LRT alignment and those include suburban areas, major activity centres, and transit centres.
- Utilizing this approach creates consistency for users and drivers which is a major consideration for an in-street urban LRT system. A consistent alignment creates consistent driver expectations and allows for easier LRT operations. The challenge is to limit the number of alignment shifts, while optimizing the alignment location based on local conditions.
- Using this approach, the Southeast LRT corridor was divided into areas referred to as touchstone points that influenced the alignment and preferred location of the LRT. The touchstones are described as follows:
  - *North Side of Connors Road* – Remaining north of Connors Road in order to avoid impact to Connors Road
  - *Bonnie Doon Traffic Circle* – Reconfiguring the traffic circle and respecting the primary traffic movements by remaining on the east side of the intersection

- *Bonnie Doon Mall* – Placing LRT on the west side of 83 Street to provide direct access to the mall site
- *Whyte Avenue/83 Street* - Respecting the primary traffic movements by keeping LRT on the west side of intersection
- *Railway Crossings and 75 Street* – Accounting for the grade-separation needed across freight rail corridors and the Inner Ring Road
- *Whitemud Drive Park and Ride* – Direct connection to transit centre and park and ride facilities by having alignment on the east side of 75 Street
- *Mill Woods Town Centre* – Integrating strongly into transit centre by providing a south running alignment on 28 Avenue
- As the alignment leaves the downtown it enters a tunnel and travels along 95 Street. The tunnel ends adjacent to Louise McKinney Park and the alignment switches to a bridge crossing the North Saskatchewan River replacing the existing Cloverdale pedestrian bridge. There is an impact to future developments of Louise McKinney Park and as the design proceeds every effort will be made to minimize the impact by developing integrated design solutions.
- The Southeast LRT Corridor described in the Transportation System Bylaw does not extend south of 31 Avenue into the Mill Woods Town Centre. Through the concept planning process and more detailed evaluation, the recommended alignment extends to 28 Avenue with the terminal station located east near Youville Drive. If the recommended concept plan is approved, Administration will bring forward an amendment to the Transportation System Bylaw to reflect this extension.
- Through the concept planning for the combined Southeast and West LRT alignment, the location for a maintenance facility was assessed. From the analysis the most suitable location is along the Southeast LRT line. The feasibility would accommodate Light Rail Vehicle's serving the combined Southeast and West LRT line. The location of the facility is adjacent to the Whitemud/75 Street station and the design is being finalized.
- A detailed description of the alignment is provided in the Southeast Light Rail Transit Downtown to Mill Woods Concept Planning Report Executive Summary (Attachment 1).

### Station Location and Configuration

- Station locations were developed primarily during the 2009 corridor selection process and refined through the alignment section process. Station locations were influenced by appropriate station spacing, existing/future activity centres, population densities, transit centres, and active or potential redevelopment areas.
- The configuration of the stations was developed to minimize property acquisition and impact to LRT and traffic operations. Side platform stations have been identified to promote easy access for pedestrians and to create a consistent track alignment which in turn reduces potential property requirements.

- There are 10 station locations identified along the corridor and the recommended station location and configuration are detailed below and on the LRT concept plans (Attachment 2).
  - *Muttart Station* – This station is located just west of the Muttart Conservatory and configured as a side-loading platform. The station serves the Cloverdale community and special events in the area.
  - *Strathearn Station* – The Strathearn station is located between 89 and 88 Street and configured as a side-loading platform. This station serves the mature neighbourhood and the future redevelopment in Strathearn Heights.
  - *Holyrood Station* – Located south of 93 Avenue this station is a split platform side-loading station accommodating controlled turn bays onto 93 Avenue. This station offers opportunities for redevelopment and revitalization in the Holyrood neighbourhood.
  - *Bonnie Doon Station* – This station is located north of 82 Avenue on the west side of 83 Street offering direct access to the Bonnie Doon Mall with a side loading platform.
  - *73 Avenue Station* – Two options were assessed for the neighbourhood station serving the King Edward Park/Avonmore community and the 73 Avenue location was selected based on station spacing and it requires less property than the 76 Avenue station option. The recommended configuration is a split intersection side-platform which accommodates left-turn lanes.
  - *Wagner Station* – Administration is pursuing an opportunity purchase of the auction mart site west of 75 Street south of Wagner Road and with this potential purchase the Wagner Road station has been identified to be sited in the middle of this property and serves the neighbouring school and local businesses.
  - *Whitemud Station* – This station is a major connection point between LRT, bus and auto traffic. As such, the station is geared to accommodate major peak-hour transfers. The station configuration is a side-loading platform with a wider platform on the east side offering more flexibility in accommodating peak-hour flows.
  - *38 Avenue Station* – Like the 73 Avenue station, this is a neighbourhood station that serves northern edge communities in Mill Woods and is located just north of 38 Avenue.
  - *Grey Nuns Station* - This station is located just north of 31 Avenue serving the Grey Nuns Hospital and the adjacent businesses.
  - *Mill Woods Town Centre Station* – The terminal station for the SELRT line will provide an opportunity for a major interchange along with the ability to serve the Mill Woods Town Centre, surrounding businesses and high density residential developments. The existing Transit Centre will be relocated to provide a direct interchange with the terminal station.

- Through the ridership evaluation phase, some LRT stations were found to experience low to moderate boardings and alightings. The ridership benefits of these stations will increase over time as redevelopment and infill opportunities present themselves. Should City Council wish to stage the implementation of some of the LRT stations an assessment can be completed during the preliminary engineering phase. This will result in a modest decrease in initial capital construction costs and travel time.

### Roadway and Access Modifications

- With the Urban LRT System the trains will be more integrated into the existing traffic corridors. The Southeast LRT will utilize a dedicated Right of Way but with low profile (curb) barriers or tactile delineators between the trains and adjacent traffic lanes. The operation will also move towards a system with limited use of crossing gates and bells at intersections (except where needed to address specific safety concerns).
  - In consideration of moving towards the Urban LRT System, staff will create an integrated LRT/automobile signal system. The principles for the operation of the proposed urban style LRT is to provide a high level of priority to the LRT. The priority can be adjusted depending on the LRT's performance to its schedule, road conditions, and time of day. At critical intersections, the LRT/automobile signal system will adjust the timing of arrival of trains to assist in traffic operations. This can be accomplished by holding the LRT at an adjacent station slightly longer so it will arrive at a critical signalized intersection at the most opportune time. Determining the optimal signal timing will continue to be refined well after the LRT is operational.
- Implementing a predominately at-grade Urban LRT system into developed areas results in impacts to existing road networks. Considering the benefits offered by LRT and the City's robust Transportation Network, an approach to reduce travel lanes at strategic locations to accommodate the LRT was utilized to develop the recommended alignment.
  - Reduction in travel lanes is not required along the entire corridor, and where possible the existing roadway configuration was retained although modified to accommodate the LRT. The following are highlights of the modifications to the existing network along the corridor:
    - *102 Avenue (96 Street to Jasper Avenue)* – Working with the Quarters Development team, 102 Avenue will be reduced to two travel lanes connecting to Jasper Avenue as a right in/right out. Separating the 102 Avenue connection from the existing five-legged intersection at Jasper Avenue simplifies operation and accommodates a more controlled access between 102 and Jasper Avenue.
    - *95 Avenue (Connors Road to 85 Street)* – Parking lanes on 95 Avenue would be removed to accommodate the LRT and reduce property requirements.
    - *Cloverdale Hill Road* – To accommodate the LRT and reduce the complications with the connection at Connors Road,

- Cloverdale Hill Road has been modified to one-way southbound to 98 Avenue. Removing the southbound movement on Cloverdale Hill Road simplifies the intersection treatment.
- *85 Street (95 Avenue to 90 Avenue)* – Reduced from four lanes to two lanes to reduce property requirements. With the proximity to Connors Road and 75 Street, the network will accommodate the reduced capacity.
  - *Bonnie Doon Traffic Circle* - The concept design proposes that the Bonnie Doon traffic circle be replaced with a traditional four-legged major signalized intersection splitting the east/west travel patterns between 90 Avenue and 82 Avenue. The 85 Street connection to Connors Road will be reduced to right in/right out.
  - *83 Street (Whyte Avenue to Argyll Road)* – Reduced from four lanes to two lanes. 83 Street between 82 Avenue and 76 Avenue is a narrow roadway and to accommodate the LRT and maintain current lane configuration requires significant property acquisition. 83 Street between Whyte Avenue and Argyll Road is not a high volume arterial, and there is sufficient north-south arterial capacity in the network to accommodate the reduction to two travel lanes, one in each direction.
  - Accommodating existing access patterns to communities and businesses are also impacted with the implementation of the street running LRT. For the approach to accesses, management utilized the assumption that all crossings of the LRT tracks occur at a controlled intersection and turning movements require a protected turning signal.
  - Existing accesses that can be maintained but are not signal controlled are converted to right in/right out movements.
  - This philosophy requires a continued assessment of the larger transportation network and incorporating a series of “off route” intersection improvements to enhance capacity for routes paralleling the LRT corridor or provide better neighbourhood access/egress from/to the arterial road network. Specific to the Southeast LRT, improvements to 75 Street are a major element for the supporting road network.
  - Additional details on the impact of the Southeast LRT on traffic is presented in Administration’s report 2010TD9422 on the December 8, 2010 Transportation and Public Works Committee agenda.

### Pedestrian Circulation and Multi-use Trail

- Pedestrian access to and from stations is key to the success of the LRT systems. A system developed to accommodate enhanced pedestrian movements and access to station areas offers the best opportunity for success.
- The concept plan continues to accommodate multi-use trail /bicycle route and existing surface pedestrian crossings. Pedestrian access from the station to all major activity centres will also be maintained.
- In establishing the recommended access management plans, provision



of direct neighbourhood connections to and from the LRT alignment was the primary objective. The approach to accommodate pedestrian crossings of the LRT for the concept plan is to provide traffic signals, either at an intersection (with limited vehicular movements) or at midblock locations.

- Connectivity and improvement to existing walk links have been considered within the proposed concept design and will be examined in more detail in future design phases. Some examples of proposed improvements include:
  - enhancing the shared-use path along Connors Road adjacent to the LRT
  - improving pedestrian access at locations along 66 Street by constructing a shared-use path on the west side of 66 Street and improving connections to proposed stations locations

### Property Acquisition

- Minimizing property acquisition has been a guiding principle for the design of the urban LRT system. However, there were several instances where additional property is required to accommodate the system.
- Typically, land would be required to help accommodate the following:
  - insufficient ROW available to fit the critical elements
  - insufficient space at station locations
  - turning movements at intersections
  - smoothed curvature of the track at tight turns

- systems infrastructure such as sub-stations and maintenance facilities
- The approach used in assessing property needs involved first examining the potential for a partial taking. Where it was determined that the partial taking required was detrimental to the property or a building was impacted, the entire parcel was identified.
- During the development of the concept plan there have been properties that sellers have placed on the market, and Administration has pursued. The property requirements have been identified in Attachment 2. Typically a two-year lead time for property negotiations is required in order to allow the owner's sufficient time to negotiate an agreement.

### Noise and Vibration

- Noise measurements and modelling has been conducted for the Southeast LRT alignment. Calculated noise levels exceed the 65 dBA Leq<sub>24</sub> thresholds stipulated in the *Urban Traffic Noise Policy* (C506). Noise attenuation requirements are based on 20-year model projection of noise levels in comparison to the allowable threshold.
- Adjacent to Connors Road there are properties that may require attenuation based on the proximity of the LRT. Similarly some properties along 83 Street between Whyte and 76 Avenue are showing projected levels over the threshold. Along 66 Street south of Whitemud Drive there are select locations that show noise levels over 65 dBA Leq<sub>24</sub>. The analysis indicated that these areas

can be attenuated with a 2.5 – 3 metre high barrier with the density characteristics of a double boarded wooden fence. However, the details of the type of attenuation will be determined under future design phases.

- Vibration modelling has not been completed and if there are areas of concern vibration analysis will be completed under the future design phases. Any vibration issues will be mitigated through the design and construction phase.

### Cost Estimate

- The conceptual cost estimate for the extension is approximately \$1.52 billion in 2010 dollars. The estimated cost including inflation is approximately \$1.78 billion based on completing construction by 2016. This estimate includes property acquisition, a maintenance facility, vehicles, engineering, and construction administration. A cost breakdown is presented in Attachment 3.

### Land Use Opportunities

- The opportunity to intensify land use around stations is an important element of LRT expansion. Administration is working to better plan land use and development around LRT stations by developing Transit Oriented Development Guidelines. As development occurs around LRT stations, these Guidelines will set future land use expectations and guide development proposals and the creation of station area plans.
- Along the corridor there are a number of opportunities to compliment current and future land

use plans with LRT. Future land use opportunities could be accelerated with the implementation of LRT acting as a catalyst.

- In the Strathearn neighbourhood the future development of the Strathearn Heights Apartments would be directly served with an LRT station on 95 Avenue. The Holyrood station would support redevelopment of the Holyrood Gardens row housing complex.
- The Bonnie Doon station is configured to directly serve the Bonnie Doon Mall but there is also a considerable potential for transit oriented development in the vicinity of the station.
- The Wagner Station is situated on land that offers potential to allow commercial/industrial development to take place around the station. Currently, the site is an auction site that in time could in time develop into a commercial node around the LRT station.
- The Mill Woods station serves an existing Town Centre that is currently suburban in character although there are a number of medium density developments within the vicinity of the station. The LRT is expected to trigger redevelopment and the Town Centre could evolve into a more urban, pedestrian oriented community centered around the LRT station and transit centre.

### **Policy**

LRT planning and construction is consistent with polices identified in the Transportation Master Plan.

### **Focus Area**

LRT planning and construction aligns with the City's 10-year strategic goals of

shifting its transportation mode and transforming Edmonton's urban form.

### Public Consultation

- A public involvement process was completed to support the Concept Planning process in accordance with the Public Involvement Policy C513. Over 691 participants attended workshops, open houses, presentations, and small group meetings that were held as part of the process to support this study. A detailed outline of the public involvement activities and themes is provided in Attachment 4.
- The process for the Southeast LRT Project included two major stages. In spring 2010, a number of options were presented and discussed at location specific workshops. This input was considered along with a technical study and the City's long-term policy goals to develop a draft LRT Concept Plan that was presented for further feedback through a questionnaire at open houses held in September 2010.
- There was significant involvement by participants throughout the process. Of those who completed the September questionnaire, 56% indicated they had participated in one of the spring 2010 workshops. More than half of the respondents (56%) indicated they were satisfied with the draft LRT Concept Plan, with 18% indicating they were neutral, and 23% indicating they were dissatisfied.
- Participants who were satisfied with the draft Concept Plan noted a desire to expand the LRT to service the area, and they noted they felt the plan was balanced and well thought out. Those who indicated concerns

most frequently stated concerns about traffic disruption and congestion, and concerns about neighbourhood and residential impacts.

- Issues raised through public involvement are similar to the previous LRT planning projects. These include concerns about noise, traffic, safety, and community impacts. The information obtained through the consultation helped refine the concept plan and develop appropriate mitigation measures.

### Budget/Financial Implications

- The budget for the Southeast LRT Extension has not been identified in the Capital Budget and budget requirements will be reviewed as part of the upcoming 2012-2014 budget process or through supplementary budget adjustments in 2011. Administration will be presenting a report to City Council on December 10, 2010, identifying options to fund the fast tracking construction of the west to southeast LRT line.



### **Justification of Recommendation**

The recommended plan is consistent with the Transportation Master Plan and the LRT Network Plan. It meets the objective of connecting several major activity centres to the LRT system and supports intensified development at appropriate locations along the corridor. Approval of the concept plan allows Administration to seek budget approval to proceed with preliminary engineering and property acquisition, and initiate utility relocations.

### **Attachments**

1. Southeast Light Rail Transit – Downtown to Mill Woods Concept Planning Report
2. Southeast LRT Concept Plans
3. Cost Estimate
4. Public Involvement Summary

### **Others Reviewing this Report**

- M. Koziol, General Manager, Capital Construction and A/General Manager, Asset Management and Public Works Department
- R. G. Klassen, General Manager, Planning and Development Department
- L. Rosen, Chief Financial Officer and Treasurer