

West LRT Concept Plan

Lewis Estates to Downtown

Recommendation:

That Transportation and Public Works Committee recommend to City Council:

That the West LRT Concept Plan: Lewis Estates to Downtown, as outlined in Attachments 1 and 2 of the December 8, 2010, Transportation Department report 2010TD9339, be approved.

Report Summary

This report details the concept planning work completed for the West LRT from Lewis Estates to Downtown.

Previous Council/Committee Action

- At the June 9, 2010, City Council meeting, the following motion was passed:

That the following motion passed at the December 15, 2009, Special City Council Public Hearing:

1. That Administration provide an information report on the following impacts related to the West LRT and describe how they will be mitigated through the concept planning and design process:
 - traffic impact, specifically accommodating the displaced traffic from Stony Plain Road
 - removal of access from abutting properties to the LRT alignment

2. That Administration work with businesses along Stony Plain Road and bring forward a process to understand and mitigate their issues.

be amended by adding the following third and fourth clauses:

3. That the configuration of Stony Plain Road between 124 Street and 156 Street will include the West LRT right of way and no more than one continuous through lane of vehicular traffic in each direction.
 4. That Administration confirm, as part of the concept planning, that long-term (2041) vehicular traffic can be accommodated in this configuration and on adjacent arterial roadways, as was indicated verbally at the December 15, 2009, Special City Council Public Hearing.
- At the December 15, 2009, City Council meeting, the following motion was passed:
 1. That Administration provide an information report on the following impacts related to the West LRT and describe how they will be mitigated through the concept planning and design process:
 - Traffic impact, specifically accommodating the displaced traffic from Stony Plain Road
 - Removal of access from abutting

properties to the LRT alignment

2. Administration work with businesses along Stony Plain Road and bring forward a process to understand and mitigate their issues.

Report

Background

- In December 2009, City Council approved the West 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 West LRT Concept Plan are 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 guidance from the 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 West 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 maximizes 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 West 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:
 - *Park and Ride and Transit Centre at Lewis Estates* – Direct connection into the transit centre and park and ride facilities resulting in the alignment on the south side of 87 Avenue.
 - *West Edmonton Mall* – Provide opportunities for direct second level access to this major activity centre, direct vertical integration with the existing West Edmonton Mall transit centre, and the ability to minimize numerous access conflicts is addressed with an elevated alignment on the north side of 87 Avenue.
 - *170 Street* – Accounting for the grade-separation over inner ring road goods movement corridor.
 - *Misericordia Hospital* – Provide opportunities for direct access to facility is best addressed with an

- elevated alignment on the north side of 87 Avenue.
 - *Stony Plain Road Business District* – Balancing benefits and impacts to businesses on both sides of the corridor by placing the LRT in the centre.
 - *142 Street Traffic Movements* – Considering the primary, bi-directional peak-hour traffic patterns the alignment on the north side of Stony Plain Road minimizes disruptions to auto traffic.
 - *Significant Commercial Access Areas Near Downtown* – Balancing benefits and impacts to businesses on both sides of the corridor by placing the LRT in the centre.
 - The West LRT Corridor described in the Transportation System Bylaw identified using Meadowlark Road between 87 Avenue and 156 Street. Through the concept planning process and a more detailed evaluation, the recommended alignment shifts to 156 Street offering opportunities to serve higher density areas near the intersection of 87 Avenue and 156 Street. This also provides front door access to Meadowlark Mall. If the recommended concept plan is approved, Administration would bring forward an amendment to the Transportation System Bylaw.
 - 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 facility would accommodate light rail vehicles serving the combined Southeast and West LRT line.
 - A detailed description of the alignment is provided in the West Light Rail Transit Lewis Estates to Downtown Concept Planning Report (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 14 station locations identified along the corridor and the recommended station location and configuration are detailed below and on the LRT concept plans (Attachment 2).
 - *Lewis Estates Station* – The terminal station for the West LRT line will provide opportunity for a major interchange for local and regional commuters. The station is designed to accommodate major peak-hour transfers and is configured as a centre loading platform offering more flexibility in accommodating peak-hour flows. The LRT alignment and station is located between Lewis Estates

- Transit Centre and park and ride facility, just south of 87 Avenue.
- *182 Street Station* – This is a neighbourhood station that serves the Aldergrove and Belmead communities. It is located immediately west of 182 Street and is configured with a side-loading platform.
 - *West Edmonton Mall Station* – At West Edmonton Mall the elevated station is on the north side of 87 Avenue directly adjacent to the existing transit centre. This provides opportunities for direct access into the second level of the mall and is configured as a centre-loading platform offering flexibility to accommodate considerable traffic at this major interchange point. The station will be placed directly above the existing West Edmonton Mall bus terminal.
 - *Misericordia Station* – Similar to West Edmonton Mall, this station is elevated on the north side of 87 Avenue with a centre-loading platform. Future plans of the Misericordia site offer opportunities for a direct connection to the second level of the hospital.
 - *Meadowlark Station* – Through the concept planning the recommended alignment shifted to 156 Street. As a result the station is located north of 87 Avenue on 156 Street with a side-platform configuration offering a connection to the front door of the Meadowlark Mall.
 - *95 Avenue Station* – Similar to 182 Street, 95 Avenue is a neighbourhood station serving the Sherwood, Glenwood, Meadowlark Park and West Jasper Place communities. It is a split side-loading platform across 95 Avenue which accommodates left-turn bays.
 - *Jasper Place Station* – This station uses a 'diagonal' layout across the block bounded by 156 and 155 Streets and 100 A Avenue and Stony Plain Road. The station acts as the western anchor for the Stony Plain Road Business District and provides a connection to the West Jasper Place Transit Terminal.
 - *149 Street Station* – As the eastern anchor station for the Stony Plain Road Business District, this station is west of 149 Street in the centre of Stony Plain Road with a split-platform configuration.
 - *142 Street Station* – This station serves the Grovenor neighbourhood and commercial areas on Stony Plain Road. A side-loading platform located on the east side of 142 Street north of Stony Plain Road may be integrated into the proposed "Vision on the Corner" redevelopment.
 - *Glenora Station* – A neighbourhood station that was originally not identified in the LRT line but through concept planning and consultation this station was added based on community feedback. Configured as a side-loading split platform station across 133 Street, permits pedestrian access to all ends of the station.
 - *124 Street Station* – A side-loading split-platform station

- across the 124 Street intersection, reduces impact to property on the south side of Stony Plain Road and allows for a westbound left-turn bay. It serves a mix of residential and commercial areas.
- *120 Street Station* – This station was added as a result of the concept planning process and has been identified as a future station. Situated between the old Molson Brewery and former Crosstown Motors site which offers development potential supportive of LRT.
 - *116 Street Station* - A side-loading split platform station across the 116 Street intersection allowing left-turn bays. This station offers convenient interchange to the strong bus service on 116 Street along with the adjacent residential and commercial sites.
 - *112 Street Station* – This station serves the western edge and the future expansion plans at Grant MacEwan. A side-loading split platform station across the 112 Street intersection allowing left-turn bays.
 - 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 West LRT will utilize a dedicated ROW, 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 the highest 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 train arrivals 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 required along parts of the corridor. 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:
 - *87 Avenue (170 Street to 156 Street)* – The number of lanes is not reduced along this section of 87 Avenue but the service roads must be removed. Where possible parking is provided and the speed of the roadway is reduced to 50 km/hr.
 - *156 Street (87 Avenue to Stony Plain Road)* – Reduced from four lanes to two lanes to reduce property requirements and with the proximity to 142 Street, 149 Street, 163 Street and 170 Street the network will accommodate the reduced capacity.
 - *Stony Plain Road/104 Avenue (156 Street to 120 Street)* – Reduced from four lanes to two lanes to reduce property requirements and with the supporting network offering capacity on Yellowhead Trail, 118 Avenue, 111 Avenue, 107 Avenue and 102 Avenue the network will accommodate displaced traffic. The LRT alignment at 142 Street aligns to the north to remove the train vehicle conflict from the strong AM and PM commuter movement between 142 Street and 102 Avenue.
 - *104 Avenue (120 Street to 109 Street)* – Reduced from six lanes to four lanes to reduce property requirements.
- Existing access patterns to communities and businesses are also impacted with the implementation of the street running LRT. For the approach to the access, management utilized the assumption that all crossings of the LRT tracks occur at a controlled intersection and turning movements require a protected phase.
- 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 West LRT improvements on 107 Avenue are a major element for the supporting road network. Intersection improvements have been identified at 142 Street and 149 Street removing the traffic circles and replacing with traditional intersection configuration. Construction of these “off-route” improvements should be completed prior to construction along the LRT corridor.
- The residences in the Groat Estates area west of Groat Road and south of Stony Plain Road do not have the ability to utilize a supporting network as the only access/egress is onto Stony Plain Road. To address this specific issue, the project team examined a number of different

options and developed a plan that utilizes signal controlled U-turns at 129 and 127 Street to allow the residents to permit east and west access/egress opportunities.

- Additional details on the impact of LRT on traffic is presented in Administration's report 2010TD9422 on the December 8, 2010 Transportation and Public Works Agenda.

Pedestrian Circulation and Multi-use Trails

- 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 a midblock location.
- 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.

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 right of way available to fit the critical elements
 - insufficient space at station locations
 - turning movements at intersections
 - smoothed curvature of the track at tight turns and
 - 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 are properties that sellers have placed on the market and Administration has pursued. The property requirements are 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 West LRT alignment. Calculated noise levels do not exceed the 65 dBA Leq₂₄ thresholds stipulated in the *Urban Traffic Noise Policy (C506)*.

Noise attenuation requirements are based on a 20-year model projection of noise levels in comparison to the allowable threshold.

- 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 \$1.06 billion in 2010/2011 dollars. The estimated cost including inflation is approximately \$1.24 billion based on completing construction by 2016. This estimate includes property acquisition, vehicles, engineering, and construction administration. A cost breakdown is provided 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.

- The stations at the Misericordia Hospital and the Meadowlark Mall provide direct access to these activity centres but they also offer opportunities for transit oriented development.
- A revitalization strategy has been developed for West Jasper Place area and the City intends to develop a station area plan complete with an urban design concept for the Stony Plain Road Business District. These initiatives would mesh well with the LRT and present an exciting opportunity to fully integrate transportation and land-use planning.
- The former Molson Brewery and Crosstown Motor sites offer substantial transit oriented redevelopment opportunities.
- The section of 104 Avenue between 118 Street and 112 Street is currently auto-oriented although there are a number of higher density developments in the vicinity of the 116 Street and 112 Street stations. The LRT is expected to trigger redevelopment of such sites as Oliver Square and could evolve into a more urban, pedestrian oriented community centered around the LRT station.

Policy

LRT planning and construction is consistent with policies 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 in accordance with the Public Involvement Policy C513. Over 1,211 participants attended workshops, open houses, presentations, and small group meetings. A detailed outline of the public involvement activities and themes is provided in Attachment 4.
- The process for the West 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 participant involvement throughout the process. Of those who completed the September questionnaire, 42% indicated they had participated in one of the spring 2010 meetings. Almost half of the respondents (45%) indicated they were satisfied with the draft LRT Concept Plan, with 17% indicating they were neutral, and 34% indicating they were dissatisfied.
- Participants who were satisfied with the draft LRT Concept Plan most frequently stated it was a good plan and that West LRT was needed. Those who indicated dissatisfaction most frequently stated concerns about traffic disruption and re-routing, and non-support of the east-west route along Stony Plain Road.

- 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 West 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 to proceed with preliminary engineering and property acquisition, and initiate utility relocations.

Attachments

1. West Light Rail Transit – Lewis Estates to Downtown Concept Planning Report
2. West 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