



REGION OF WATERLOO

TRANSPORTATION AND ENVIRONMENTAL SERVICES Rapid Transit

TO: Chair Jim Wideman and Members of the Planning and Works Committee

DATE: June 19, 2012

FILE CODE: A02-30/PW

SUBJECT: STAGE 1 LIGHT RAIL TRANSIT: VEHICLE PROCUREMENT

RECOMMENDATION:

THAT the Regional Municipality of Waterloo take the following actions regarding the procurement of light rail vehicles for the rapid transit project, pursuant to report E-12-064, dated June 19, 2012.

- a) authorize staff to negotiate with Metrolinx to use their existing contract with Bombardier for the delivery of light rail vehicles; and
- b) direct staff to report back to Council following the completion of negotiations and prior to executing the light rail vehicle procurement contract.

SUMMARY:

As part of the staged implementation plan for the Region of Waterloo rapid transit system, Light Rail technology will initially serve the 19 kilometre transit corridor from Conestoga Mall in Waterloo to Fairview Park Mall in Kitchener. Based on light rail ridership forecast, 14 light rail vehicles (LRVs) will be required to provide service in early 2017. In order for this in-service date to be achieved, the Region must, as soon as possible, determine an effective procurement process that would allow the vehicles to be delivered in time and within budget.

To support the procurement decision-making process, staff evaluated three reasonable options:

- Option A: Initiate a vehicle procurement process through the Council approved Design Build Finance Operate Maintain (DBFOM) delivery model.
- Option B: Initiate a vehicle procurement process independently; and
- Option C: Secure the LRVs through a contract assignment from another transit agency.

For each of these options, staff considered the relative advantages and disadvantages including commercial issues and the ability to obtain competitive pricing.

Given the fleet size required for the Region of Waterloo rapid transit system, the number of potential railcar manufacturers capable of delivering cost effective and proven low floor LRVs compliant with current provincial Canadian domestic content requirements will be very small. This will potentially limit the competitive field for DBFOM contractors. In addition, by combining the LRV scope with the DBFOM contractor scope the procurement process may result in a compromise situation in which the Region does not select the preferred LRV or the preferred contractor but rather the proposal which has the best overall score. For these reasons, Option A is not recommended.

Additionally, there are no significant civil or vehicle performance requirements that would necessitate a unique LRV design for this project. Therefore, the development of an independent detailed design Request for Proposal is not prudent. Moreover, with the small fleet size requirement, the Region may not be able to acquire the vehicles at a competitive price. The adverse impacts to schedule and the procurement costs will be considerable under this approach and therefore, Option B is not recommended.

The provincial crown agency responsible for developing and implementing an integrated transportation system, Metrolinx, is currently procuring LRVs for transit system expansion in the Greater Toronto and Hamilton Area and has a contract with Bombardier for a significant number of low floor LRVs, which would be well suited for the requirements of the Region's rapid transit system. Under the *Metrolinx Act, 2006*, the objectives of this crown corporation include the responsibility "to act as the central procurement agency for the procurement of local transit system vehicles, equipment, technologies and facilities and related supplies and services on behalf of Ontario municipalities." Therefore, in order to maximize the level of competition for the DBFOM contract, mitigate schedule risk and reduce cost to the overall project, it is recommended that the Region of Waterloo proceed with Option C. Recognizing the potential benefits for future operations and maintenance, the Region could achieve maximum value through direct negotiations with Metrolinx and Bombardier team.

Staff recommend that the Region enter into commercial negotiations with Metrolinx to secure the delivery of LRVs through their existing contract assigned to Bombardier. Staff will report back to Council with recommendations subsequent to the completion of these negotiations.

REPORT:

1. Background

In June 2011, Council approved the technology, route, stations, staging and funding of Stage 1 of the Region's rapid transit project. As part of Stage 1, 19 kilometers of light rail will be constructed from Conestoga Mall to Fairview Park Mall.

Based on ridership projections, operational parameters and initial service headways of 7.5 minutes, 14 LRVs will be required at the start of revenue service in 2017. With planned population and employment growth over the next 20 years, the level of light rail service will need to be improved resulting in an expansion of the vehicle fleet. It is anticipated that approximately 30 – 35 LRVs may be required by 2031.

The approved project budget of \$818 million accounts for the purchase of initial 14 vehicles and this cost will be shared with the senior funding partners. However, as a requirement of the provincial funding, the procurement of LRVs will need to comply with the Canadian content policy. Under this policy, the overall Canadian content of a transit vehicle must match 25% of the total final costs of the manufacturer, less any applicable taxes. Eligible costs include labour, subcomponents and components, project management, engineering, manuals, special tools, test equipment, freight and warranty.

2. Trends in North America

The market for LRVs in Canada has been relatively small in recent years. Both Calgary and Edmonton opened new Light Rail Transit (LRT) systems in the late 1970s/early 1980s which have expanded gradually over the years. The LRVs designed and built for both of these cities were of

the high floor type. This required the construction of high level platforms. More recent North American LRT projects, due to advances in LRV design, use a low floor design which is more conducive to the urban landscape in the Region of Waterloo.

Portland, Oregon led the way with the successful introduction of low floor LRVs in 1997 and every new start light rail transit system built since this time has utilized low floor LRV technology. The benefits of this technology are significant: faster boarding times, limited civil impacts in downtown areas and improved accessibility for people utilizing mobility devices.

In evaluating these new systems and other recent developments in the transit industry, a number of clear trends have emerged:

- The initial fleet sizes for new start light rail systems tends to be rather small – on average between 15 to 25 LRVs.
- With few exceptions, transit agencies have opted for “off the shelf” LRV technology because the design costs associated with new LRV developments are prohibitive.
- Railcar manufacturers have moved towards modular, flexible and adaptable base designs to reduce design costs and offer a base design to as many customers as possible.
- While there are a number of LRV manufacturers active in the North American market, there are only few that have been successful in securing recent orders for low floor LRVs in the United States (Bombardier, Siemens and Kinki-Sharyo). Only three rail car manufacturers, Alstom, Bombardier and Siemens have expressed interest in recent Canadian LRV procurements.

Based on the above noted factors, there is a definite trend towards “piggybacking” where one transit agency assigns the contractual rights of option LRVs to another transit agency to reduce procurement, design and manufacturing costs. Some examples of “piggybacking” are:

- Salt Lake City exercised options under a contract with San Diego Trolley, Inc. for their initial fleet of LRVs;
- City of Atlanta assumed an option for low floor LRVs from the Utah Transit Authority for the Atlanta Streetcar Project; and
- Hampton Roads secured their initial fleet of LRVs based on an option under an existing contract held by the City of Charlotte.

3. Vehicle Procurement Options for the Region of Waterloo

To support the vehicle procurement decision-making process, staff evaluated three reasonable options:

- Option A: Initiate a vehicle procurement process through the Council approved Design Build Finance Operate Maintain (DBFOM) delivery model.
- Option B: Initiate a vehicle procurement process independently; and
- Option C: Secure the LRVs through contract assignment from another transit agency

For each of these options, staff considered the relative advantages and disadvantages based on the following criteria:

- The competitive environment for rolling stock in Canada
- Project budget and market prices

- LRV Features
- Canadian Content Policies
- Vehicle Commonality for Operation, Maintenance and Training
- Schedule

The findings of the evaluation are summarized below.

Option A: Procure the LRVs through the DBFOM Contract

Under this approach, the DBFOM contractor would pre-select an LRV supplier as part of their overall proposal to the Region of Waterloo. The advantage of this approach is that it leads to improved overall coordination between the DBFOM contractor and the railcar manufacturer. However, it should be stated that although the interfaces between the vehicle and other system/civil elements are not overly complicated, the LRV typically drives the design of the other systems. The primary disadvantage of this approach is that it could limit competition. While there are a significant number of national and international general contractors that would compete for this project, there is likely to be very few railcar manufacturers that have an applicable vehicle and business interest in what is considered a small fleet.

In addition, LRVs have long delivery lead times and have typically been problematic for project schedules. This factor, coupled with the competition limitations noted above, are the most significant disadvantages associated with this approach.

Also, when combining the LRV scope with the contractor scope the procurement process may result in a compromise situation and additional cost (due to compressed LRV delivery schedule) in which the Region does not select the preferred LRV or the preferred contractor but rather the proposal which has the best overall score. When a project has two separate and equally critical components, such as the LRV and the contractor, the risk of having to manage the interface between two separate contracts is often outweighed by the benefit of selecting the best LRV provider and the best contractor.

Option B: Procure the new LRVs utilizing a separate RFP

Under this approach, the Region of Waterloo would develop a detailed performance specifications and RFP to procure its fleet of LRVs and this procurement process would have to be completed before the DBFOM RFP is finalized.

Separating the LRV from the DBFOM contract will not adversely impact future operations and maintenance assumptions of the DBFOM contractor. Railcar manufacturers typically utilize sub-suppliers for most sub-systems and there is very little variation in the life cycle of the individual systems (doors, couplers, braking systems, etc.). As part of a separate procurement, the LRV supplier would provide critical life cycle data to the Region of Waterloo that would become part of the DBFOM procurement documents. Knowing the LRV selected would also enable the Region to provide critical civil and systems data to the proposing contractors in the DBFOM procurement documents and reduce risk significantly.

However, the costs associated with developing a detailed design RFP and procurement effort will be significant. These procurements tend to be rather lengthy and could adversely impact the project schedule. In this approach the successful LRV supplier is often determined by price rather than technical approaches or other factors.

Option C: Secure the LRVs through contract assignment from another transit agency

Under this approach, the Region of Waterloo would seek the right of contractual assignment from another transit authority for LRVs that have been designed and possibly in production and which meets its civil and performance requirements. This approach has been employed successfully in the United States market where there has been a greater proliferation of light rail vehicles and new systems and where initial fleet requirements have been considered small (less than 25 vehicles). This approach significantly reduces time and costs for transit agencies and provides other benefits.

The advantages noted earlier in Option B also apply here as it relates to improving and refining the DBFOM procurement documents. In addition, there is significant opportunity for cost reduction for design review and inspection services during the LRV manufacturing process. Because the selection of an existing LRV will require consideration on technical issues between the different existing LRVs, the preferred LRV supplier would be selected after the consideration of technical approach and price. For the size of the Waterloo LRT project, this is the preferred approach.

Under the premise that another transit authority has existing vehicles, which have been procured through a competitive process, the Region could negotiate directly with the transit agency holding the contract to secure the desired number of LRVs. As noted earlier, there is significant precedence in the transit industry for new start LRV contractual assignments (e.g. Atlanta, Utah, Hampton Roads).

The Regional Purchasing By-law under section 24 also allows for cooperative purchasing agreements with other government organizations. For instance, in 2010, the Procurement & Supply Services participated in a similar joint procurement with a number of other major transit services in southern Ontario and Metrolinx for bus parts that resulted in reduced overall costs and risks, and improved management of inventory.

Given the status of the current procurement in Toronto and the potential benefits for future operations and maintenance, the Region could achieve maximum value through direct negotiations with Metrolinx on their existing contract with Bombardier. The Bombardier vehicle was selected by Metrolinx in a competitive procurement process run by Toronto Transit Commission in 2008 and has a lengthy track record of performance throughout Europe. It is important to note that the procurement process was approved by the Metrolinx Board of Directors in 2009 and was also independently reviewed and approved by the Province of Ontario.

This joint procurement approach could provide a number of significant benefits, including:

- **Reduced Non-Recurring Costs:** These costs are typically independent of the procurement size and are associated with the procurement process, design engineering, project management, design qualification, testing, manuals and training, and would be significantly reduced for the Region under this approach. Metrolinx has already invested significant dollars towards these processes and therefore, the Regional contribution is expected to be nominal.
- **Decreased Recurring Costs:** The economy of scale associated with the total LRV quantity for a joint procurement could yield significant cost savings to both the Region and Metrolinx.
- **Compliance with Canadian Regulations:** Metrolinx LRVs are being designed to comply

with all Canadian regulations and requirements with respect to procurement guidelines, e.g., Canadian content, environmental regulations and standards plus accessibility for the physically challenged (Ontario Disability Act).

- **Sharing of Heavy Maintenance Facility and Commonality of Spare Parts:** Metrolinx will have facilities where all forms of heavy maintenance, overhauls and non-routine repairs will be conducted. Use of the same vehicle will allow the Region local access to these facilities. In addition, the economy of scale associated with the total quantities of spare parts required for a joint procurement could yield cost savings to both parties.
- **Schedule Confidence:** At this time the Metrolinx vehicle project is entering the Final Design Review Phase that is anticipated to be completed by the end of 2012. The Metrolinx schedule ensures vehicle deliveries as needed by the Region of Waterloo Project schedule.
- **Joint Pilot Test Program:** The Region can accommodate pilot testing of the vehicles on portions of the Waterloo Spur already designated for the light rail system and that will otherwise need to be modernized in the desired timeframe as part of Stage 1 of the Project. Having the testing occur on the approved rapid transit route will inherently progress qualification and verification of track alignment and vehicle integration. In addition, the joint pilot test program will also reveal and resolve any vehicle issues prior to the start of series production. This will be beneficial to both Metrolinx and the Region.

In light of the above benefits, **it is recommended that the Region of Waterloo proceed with Option C.**

Subject to Council approval and if the parties reach an agreement on the terms and conditions for a joint procurement, staff will report back prior to executing a contract.

4. Next Steps in the Rapid Transit Project

Staff anticipate that the next steps in the rapid transit project will include:

- Fall 2012: report on the vehicle procurement negotiations;
- Fall 2012: issue request for qualifications from potential DBFOM teams;
- February 2013: shortlist qualified DBFOM teams;
- February 2013: complete performance specifications and a draft project agreement;
- February 2013: finalize funding agreements with federal and provincial governments;
- March 2013: issue request for proposals from shortlisted DBFOM teams;
- June 2013: begin aBRT construction;
- January 2014: evaluate and select preferred DBFOM team;
- May 2014: approve final agreement with the preferred DBFOM team;
- 2014: full implementation of aBRT;
- 2014: begin construction of LRT Stage 1; and
- 2014: begin the environmental approval process for LRT Stage 2; and
- 2017: complete construction and begin operation of LRT Stage 1.

CORPORATE STRATEGIC PLAN:

The report supports Focus Area 3.1 of Council's Strategic Focus: Implement a light rail transit system in the central transit corridor, fully integrated with an expanded conventional transit system.

FINANCIAL IMPLICATIONS:

The capital cost of Stage 1 of the rapid transit project is estimated to be \$818 million, in 2014 dollars. The Region's portion of the capital cost is \$253 million. On June 15, 2011, Council approved the funding for the Region's portion of the Stage 1 capital costs, subject to annual budget deliberations.

The project budget includes approximately \$100 million for the initial purchase of LRVs required at start of service in 2017.

OTHER DEPARTMENT CONSULTATIONS/CONCURRENCE:

This report was prepared with input from Finance, from Planning, Housing and Community Services, from Transportation and Environmental Services, from Corporate Resources and from Human Resources.

ATTACHMENTS:

Nil

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