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

DATE: April 12, 2011

FILE CODE: A02-30/PW

SUBJECT: PRELIMINARY PREFERRED RAPID TRANSIT IMPLEMENTATION OPTION

RECOMMENDATION:

For information.

SUMMARY:

The Region of Waterloo continues to pursue the development of a Rapid Transit system. Through February and March 2011, staff undertook public consultation that asked the public for their views on which rapid transit option would provide the best value to our community. Well over 1,000 people attended the public consultation centres and information booths, and over 700 submitted written comments. Of these, 78 per cent stated support for rapid transit in general and 66 per cent stated support for light rail transit (LRT) in particular. The most common comment pertained to lower costs and lower taxes while maintaining value, regardless of the preferred rapid transit technology. The most preferred LRT implementation options were option L3 (LRT from Conestoga Mall to Fairview Park Mall and adapted bus rapid transit (aBRT) from Fairview Park Mall to the Ainslie Street Transit Terminal) and option L9 (LRT from Conestoga Mall to the Ainslie Street Transit Terminal).

In evaluating the rapid transit implementation options and considering the recent public input, staff have identified that:

- Rapid transit is preferred over business-as-usual;
- An LRT system provides the best long-term environmentally and financially sustainable solution to help manage our community’s future growth and transportation needs;
- It is realistic and achievable for the Region to consider building an LRT system in affordable stages;
- The long-term vision for rapid transit should be option L9 (LRT from Conestoga Mall to the Ainslie Street Transit Terminal);
- As a Stage 1 implementation option, staff have identified option L3 (LRT from Conestoga Mall to Fairview Park Mall and aBRT from Fairview Park Mall to the Ainslie Street Transit Terminal) as the preliminary technically-preferred rapid transit implementation option;
- Option L3 is basically the same implementation option that was approved by Regional Council in June 2009. Further analysis and public input have reinforced and confirmed that original choice;
- Stage 2 would add LRT from Fairview Park Mall to the Ainslie Street Transit Terminal;
- If Council considers option L3 to be too costly, option L1 (LRT from Conestoga Mall to Ottawa Street and aBRT from Ottawa Street to the Ainslie Street Transit Terminal) has been identified as a second choice for LRT implementation because it provides some of the benefits of option L3 with lower tax impacts;
- Implementation of option L3 (or L1) needs to include increases in conventional transit service as identified in the Region Transportation Master Plan (RTMP). To ensure that both can be implemented in an affordable way, the RTMP can be staged over a longer time.
period with 40 to 65 per cent of the RTMP proposed transit service hours implemented between 2012 and 2018; and

- Rapid transit can be implemented in combination with varying amounts of additional transit service. Deferral of some parts of the RTMP would result in the RTMP plan taking 22 or 23 years to complete instead of the planned 20 years.

The three most feasible options for implementing a rapid system and phasing in the Regional Transportation Master Plan identified by staff are:

1) Option L3a – building L3 and implementing 65 per cent of the RTMP between 2012 and 2018;
2) Option L3b – building L3 and implementing 40 per cent of the RTMP between 2012 and 2018; and
3) Option L1a – building L1 and implementing 65 per cent of the RTMP between 2012 and 2018.

The following table illustrates some of the differences between the options.

**Options for LRT/RTMP Implementation**

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<tr>
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</thead>
<tbody>
<tr>
<td>L3a</td>
<td>65%</td>
<td>211,000</td>
<td>2.0%*</td>
<td>$33.12*</td>
</tr>
<tr>
<td>L3b</td>
<td>40%</td>
<td>138,000</td>
<td>1.5%*</td>
<td>$24.84*</td>
</tr>
<tr>
<td>L1a</td>
<td>65%</td>
<td>211,000</td>
<td>1.5%*</td>
<td>$24.84*</td>
</tr>
</tbody>
</table>

* Annual property tax increase over seven years (2012 to 2018) assuming all costs are funded by property tax levy. Tax levy impacts may be reduced through financing options (e.g. contribution from development charges, reduction of debt charges and upload savings from the Province).

** Based on average property assessment of $225,000 ($2010).

Options L3b and L1a result in a 1.5 per cent annual property tax increase, or approximately $25 per year increase per average household for seven years. Option L3a results in a 2.0 per cent annual property tax increase, or approximately $33 per year increase per average household for seven years.

**Staff is proposing option L3b as the preliminary preferred rapid transit implementation option. This would result in a 1.5 per cent annual property tax increase, or about $25 increase per year for seven years for the average household. Staff believe that this option provides the best value. Construction and the benefits of LRT are maximized in Stage 1. An adequate conventional transit expansion is implemented and implementation of the RTMP is extended by three years to approximately 23 years.**

Regional staff will seek public input on all three options in a number of ways over the next two months including public consultation centres, information booths, public input meetings and opportunities for on-line comments. Comments should be submitted by May 27, 2011. Staff will be submitting a report with recommendations for Council’s approval on June 15, 2011.
REPORT:

1. Background

The Region faces a major decision with respect to rapid transit. High-quality rapid transit has been identified as a crucial component in managing growth, facilitating intensification and minimizing/reducing future “urban sprawl”. The rapid transit system being considered in the Region has the multiple goals of providing transportation choice, meeting future transportation needs, and building a viable, vibrant and sustainable community.

2. Rapid Transit Implementation Options

Staff considered 11 rapid transit implementation options, as summarized in Table 1. Each of the rapid transit options would proceed in the context of the Moving Forward Transit Program, an integrated rapid transit project that combines rapid transit with the re-oriented and expanded Grand River Transit bus system as identified in the RTMP. It includes improvements ranging from integration with GO and VIA to road improvements in support of rapid transit and park ‘n ride facilities.

Table 1: Rapid Transit Implementation Options

<table>
<thead>
<tr>
<th>Option</th>
<th>BRT or aBRT</th>
<th>LRT</th>
<th>Total Rapid Transit</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>LRT from Conestoga Mall to Ottawa St &amp; aBRT from Ottawa St to Ainslie St Transit Terminal</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>L2</td>
<td>LRT from Conestoga Mall to Block Line Rd &amp; aBRT from Block Line Rd to Ainslie St Transit Terminal</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>L3</td>
<td>LRT from Conestoga Mall to Fairview Park Mall &amp; aBRT from Fairview Park Mall to Ainslie St Transit Terminal</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>L4</td>
<td>LRT from Conestoga Mall to Sportsworld Dr &amp; aBRT from Sportsworld Dr to Ainslie St Transit Terminal</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>L5</td>
<td>LRT from Northfield Dr to Ottawa St &amp; aBRT from Ottawa St to Ainslie St Transit Terminal</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>L6</td>
<td>LRT from Northfield Dr to Block Line Rd &amp; aBRT from Block Line Rd to Ainslie St Transit Terminal</td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td>L7</td>
<td>LRT from Northfield Dr to Fairview Park Mall &amp; aBRT from Fairview Park Mall to Ainslie St Transit Terminal</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>L8</td>
<td>LRT from Northfield Dr to Sportsworld Dr &amp; aBRT from Sportsworld Dr to Ainslie St Transit Terminal</td>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>L9</td>
<td>LRT from St Jacobs Farmers’ Market to Ainslie St Transit Terminal</td>
<td>0</td>
<td>39</td>
</tr>
<tr>
<td>B10</td>
<td>BRT from St Jacobs Farmers’ Market to Ainslie St Transit Terminal</td>
<td>38</td>
<td>0</td>
</tr>
<tr>
<td>BU11</td>
<td>Business-as-Usual (road expansion)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
3. Public Consultation Process February-March 2011

In the public consultation process in February and March 2011, staff asked the public for their views on which rapid transit option would provide the best value to our community. Staff presented and received feedback from the public on the rapid transit implementation options. Staff hosted 12 events including:

- Tuesday, March 1, 2011  
  o PCC at Calvary United Church, 48 Hawkesville Road, St. Jacobs;

- Wednesday, March 2, 2011  
  o Interactive webcast;

- Thursday, March 3, 2011  
  o PCC at Albert McCormick Community Centre, 500 Parkside Drive, Waterloo;  
  o PCC at Waterloo Region of Waterloo, Front Lobby, 150 Frederick Street, Kitchener;

- Saturday March 5, 2011  
  o Information booth at Fairview Park Mall, 2960 Kingsway Drive, Kitchener;  
  o Information booth at Kitchener Farmers Market, 300 King Street East, Kitchener;

- Wednesday March 9, 2011  
  o PCC at First United Church, 16 William Street West, Waterloo;  
  o PCC at Region of Waterloo, 150 Main Street, Cambridge;

- Thursday March 10, 2011  
  o PCC at United Kingdom Club, 35 International Village Drive, Cambridge;  
  o PCC at Faith Lutheran Church, 247 Westmount Road East, Kitchener;

- Saturday March 12, 2011  
  o Information booth at Conestoga Mall, 550 King Street North, Waterloo; and

- Saturday March 19, 2011  
  o Information booth at Cambridge Centre, 355 Hespeler Road, Cambridge.

4. Results of Public Consultation February-March 2011

The number of people signing in at each public consultation centre ranged from 60 to 260. The number of people attending in total was well over 1,000, with 984 people signing in. In addition, staff distributed more than 500 information packages through information booths at malls and the Kitchener Farmers Market and at speaking events.

In summarizing the public responses, staff looked for common themes with respect to issues mentioned and looked at whether the responses indicate:

- A preference for one rapid transit option over another;
- Where there is a preference for an option, whether it is for LRT, BRT, business-as-usual or other; and
- Where there is support for LRT, which LRT implementation option is preferred.
Staff have received and compiled written comments from 705 respondents. Full copies of the written comments are available in the library of the Regional Councillors or upon request from Regional staff. Of these 705 respondents, 615 (87 per cent) indicated support for one or more of the options including BRT, LRT or business-as-usual. The preference for the remaining 90 (13 per cent) is other or unknown. Of the 615 respondents who indicated support for LRT, BRT or business-as-usual:

- 451 (73 per cent) support LRT;
- 74 (12 per cent) support BRT;
- 64 (10 per cent) prefer business-as-usual; and
- 26 (4 per cent) are open to more than one choice.

Table 2 summarizes the most frequent comments, with the 705 respondents divided into those who supported LRT only, BRT only, or business-as-usual only, and those whose preference was other, unknown, undecided or open to more than one technology. The most common comment pertained to lower costs and lower taxes while maintaining value, regardless of the preferred rapid transit technology.

**Table 2: Frequent Comments**

<table>
<thead>
<tr>
<th>Comment</th>
<th>Support LRT</th>
<th>Support BRT</th>
<th>Support Business-as-usual</th>
<th>Other / Unknown / Undecided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of respondents</td>
<td>451</td>
<td>74</td>
<td>64</td>
<td>116</td>
</tr>
<tr>
<td>Costs, taxes or value</td>
<td>68</td>
<td>52</td>
<td>45</td>
<td>64</td>
</tr>
<tr>
<td>Rapid transit route or stations</td>
<td>65</td>
<td>9</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Need to improve existing bus system</td>
<td>21</td>
<td>10</td>
<td>11</td>
<td>36</td>
</tr>
<tr>
<td>Need good feeder bus and intercity connections with rapid transit</td>
<td>56</td>
<td>4</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Fairness to Cambridge and the Townships</td>
<td>39</td>
<td>11</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Need to think of our children, grandchildren or the future</td>
<td>64</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

At the PCCs, Region staff provided the following responses to the frequent comments noted above:

**Costs, taxes or value:**

The options being considered provide a range of benefits and costs. Value and affordability will be a significant factor in the selection of an option. Implementation of the business-as-usual option (which is not considered a feasible option) would result in a property tax increase on an average household of approximately $25 per year for six years.

**Rapid transit route or stations:**

Staff responded to questions concerning station location and routing at the open houses. In some cases this addressed the concerns raised; in others the issues have not yet been resolved. Staff are reviewing the various remaining comments regarding routing and stations and will provide additional information during the upcoming public consultations.
Need to improve existing bus system/Need good feeder bus and intercity connections with rapid transit:

Improved existing bus/feeder system and intercity connections are vital to the success of rapid transit. All of the options being considered include expansion of the existing bus system and reconfiguring to function with the rapid transit system. The multimodal hub proposed at King and Victoria Streets will provide connections to intercity buses, GO rail and VIA.

Fairness to Cambridge and the Townships:

The LRT staging options are all considered a first step in implementing an LRT system between Conestoga Mall and the Ainslie Street Transit Terminal. The options match existing and projected ridership and development potential with the appropriate technology. Changing development patterns and increasing ridership in Cambridge will create the conditions required to implement LRT. The Region has and will continue to increase transit service in Cambridge and work with Cambridge to create the conditions for implementation of LRT. Implementation of a rapid transit system will benefit the Townships by limiting urban sprawl and protecting high quality farm land. The Townships are not contributing to the cost of a rapid transit system and the Region’s GRT Business Plan will consider additional conventional transit to the outlying urban areas.

Need to think of our children, grandchildren or the future:

Implementation of a rapid transit system is a long-term project that will influence the Region for decades.

Table 3 summarizes the number of respondents who supported each LRT implementation option. Of the 464 respondents who identified support for LRT, 106 (23 per cent) supported more than one LRT implementation option. Equal numbers, 190 respondents or 41 per cent, supported options L3 and L9 while 102 (22 per cent) supported L4. In total, 380 (82 per cent) supported one or more of L3, L4 and/or L9. Support for each of options L1, L2, L5, L6, L7 or L8 was 4 per cent or less. Another 51 (11 per cent) stated support for LRT but did not identify any specific option.

**Table 3: Public Support for LRT Implementation Options**

<table>
<thead>
<tr>
<th>LRT Implementation Option</th>
<th>Number of Respondents</th>
<th>Per Cent of 464 Respondents Who Support LRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>19</td>
<td>4%</td>
</tr>
<tr>
<td>L2</td>
<td>18</td>
<td>4%</td>
</tr>
<tr>
<td>L3</td>
<td>190</td>
<td>41%</td>
</tr>
<tr>
<td>L4</td>
<td>102</td>
<td>22%</td>
</tr>
<tr>
<td>L5</td>
<td>9</td>
<td>2%</td>
</tr>
<tr>
<td>L6</td>
<td>7</td>
<td>2%</td>
</tr>
<tr>
<td>L7</td>
<td>20</td>
<td>4%</td>
</tr>
<tr>
<td>L8</td>
<td>18</td>
<td>4%</td>
</tr>
<tr>
<td>L9</td>
<td>190</td>
<td>41%</td>
</tr>
<tr>
<td>Any LRT option</td>
<td>51</td>
<td>11%</td>
</tr>
</tbody>
</table>

In summary, of all 705 respondents:

- 78 per cent stated support for rapid transit; and
- 66 per cent stated support for LRT.

Based on the above response, there is strong public support for rapid transit, and in particular for
LRT. The strongest preference is for implementation options L3, L4 or L9, which all include LRT from Conestoga Mall to Fairview Park Mall or further south. There is little support for the options that include less LRT. Respondents from Cambridge in particular appear to prefer L9 because it would bring LRT to Cambridge.

5. **Peer Review Panel**

A peer review panel consisting of third-party experts in the fields of rapid transit planning, engineering and city-building investment initiatives reviewed work completed by the rapid transit project team since 2009. The five panellists included:

- George Dark, Partner at Urban Strategies Inc.;
- Eric Miller, Professor of Civil Engineering and Director of the University of Toronto Cities Centre, University of Toronto;
- John Hubbell, Associate Vice President with HDR iTrans and former general manager of transportation for the City of Calgary;
- Ashley Curtis, Associate with Steer Davies Gleave; and
- Alan Jones, Director with Steer Davies Gleave.

The panel met on Monday March 7 to discuss the Region’s rapid transit implementation options and their evaluation, as well as the refined rapid transit functional design plans. Appendix A contains biographies for the panellists and a summary of their comments and recommendations. The peer review panel concluded that:

“Overall, the Peer Review Panel felt that an investment in RT and in particular an investment in LRT represents a critical step towards meeting the Region’s growth and revitalization objectives, increasing transit ridership and creating more liveable and economically competitive communities.”

“The Region should not be surprised, or disheartened, that it is unable to deliver the full LRT system ultimately envisaged from day one. All transit systems are built in phases from areas of greatest ridership demand to areas of developing demand. The development of an LRT system in a series of phases, delivered over time and as demand and funding allow, is entirely normal and to be expected.”

6. **Evaluation of Options**

6.1 **Rapid Transit**

The Region continues to plan for significant population and employment growth over the next two decades. To provide for the projected growth, the Region will have to either continue its pattern of outward growth or encourage greater intensification in existing developed areas. High-quality rapid transit has been identified as a crucial component in managing growth, facilitating intensification and minimizing/reducing future “urban sprawl”. A high-quality rapid transit system is vital for the Region to evolve into a more compact urban form, helping to prevent sprawl and protect sensitive environmental landscapes and high quality farmlands from urban encroachment. A high-quality rapid transit system will also reduce the need for the construction of new or expanded roads in existing mature neighbourhoods and reduce road congestion. The peer review panel notes that:

“Waiting to implement rapid transit or deferring in favour of the Business as Usual option is not a viable alternative and will inhibit the Region’s ability to meet intensification objectives and jeopardize the countryside line. Without improved connectivity and alternatives to the private car for travel, the Region’s economic attractiveness and competitiveness will suffer due to increased congestion.”
“The addition of rapid transit along the central transit corridor is seen as a key strategy towards meeting the region’s intensification targets, accommodating employment and residential growth, while minimizing the need for urban expansion and promoting downtown revitalization.”

Staff have identified that rapid transit is preferred over business-as-usual, to provide transportation choice, to meet future transportation needs, and to build a viable, vibrant and sustainable community. This is supported by the public response, with 78 per cent of all respondents stating support for rapid transit.

6.2 Technology

The evaluation of technologies addresses the issue of which rapid transit technology is preferred for the long term, LRT or BRT.

6.2.1 Multiple Account Evaluation

In 2005, the Region completed a transit technology review and considered both BRT and LRT in the analysis. This involved a review of the North American experience over the past 25 years. Some of the key findings from this study included:

- LRT is much more likely to achieve the objectives of the Regional Growth Management Strategy (RGMS) than BRT;
- LRT has higher capital and net operating costs than BRT, but provides significantly greater benefits;
- LRT has much greater potential to attract transit ridership and to shape urban form than BRT; and
- LRT has a demonstrable influence on land values by stimulating intensification and development and is recognized as a planning tool that can support and encourage the development of more sustainable land use patterns.

These initial findings from the 2005 study are reinforced by the Multiple Account Evaluation (MAE) analysis. The findings from the MAE were previously presented to Regional Council on June 24, 2009 (Report E-09-073). The Project Team used the MAE to compare BRT and LRT because the process provided for flexibility in measuring benefits, allowing decision makers to consider quantitative measures for benefits that were difficult or impossible to translate into dollars and a broader and more targeted representation of project benefits. The MAE examined the economic costs and benefits of the proposed transportation investment within a series of separate accounts including environmental, economic and social drivers. The MAE findings demonstrated that LRT has a higher cost to install than BRT, but delivers the greatest benefits to the community, and best accomplishes the goals of the RGMS.

Figure 1 presents the MAE results incremental to the business-as-usual scenario for full implementation of the two technologies. Business-as-usual means a gradual expansion of roads and bus service. LRT was rated better than BRT for user benefits, environmental benefits, land use benefits and social and community benefits. This information was also previously presented to Council on June 24, 2009 (Report E-09-073).
6.2.2 Costs

BRT is cheaper per kilometre to install and to operate than LRT. LRT costs approximately twice as much per kilometre as BRT to install. More details about capital and net operating costs are provided in Table 4. Operating costs are shown net of fare box revenue. LRT would have higher fare box revenues than BRT given that LRT (Conestoga Mall to the Ainslie Street Transit Terminal) is expected to have higher ridership than BRT.

6.2.3 Capacity

For BRT, the fleet would be a mixture of standard and articulated buses, with full standing capacity of approximately 75 and 115 passengers respectively. For LRT, the stations would be designed to accommodate two-car trains, with full standing capacity per train of up to 450 passengers, based on new vehicle designs now available. The train would have approximately four times the capacity of an articulated bus and six times the capacity of a standard bus.

For the Region’s rapid transit system, LRT would have more capacity than BRT because the trains would have more room for passengers, and more doors to quickly load and unload passengers with shorter dwell times at stations. Trains running on 5-minute frequencies could reasonably expect signal priority at intersections, so that trains would generally only stop at stations.

With BRT, the number of buses required to meet passenger demand is projected to exceed road capacity north of Fairview Park Mall in the peak period within 20 years. With bus frequencies every 2 to 3 minutes north of Fairview Park Mall, the buses would likely bunch up and signal priority would be impractical. With no spare road capacity, there would be no opportunity to expand passenger capacity by adding more buses. At that point, the Region would be facing replacement of the BRT with alternate rapid transit technology such as LRT, at considerable expense and disruption.

6.2.4 Urban Form

Both BRT and LRT would generate increased demand for lands near stations, increasing land values and generating new jobs. The estimated increase in land values and jobs is greater for LRT.
with up to 23,000 new jobs in station areas compared to just over 11,500 for BRT, and up to $370 million in increased land values, compared to up to $75 million for BRT.

6.2.5 Transportation Benefits

Transportation benefits include savings in travel time, vehicle operating cost, accident avoidance and parking cost. LRT provides a smoother, quieter, more comfortable ride than BRT with greater passenger capacity. LRT is generally preferred by riders. LRT is estimated to generate $523 million in transportation user benefits, compared to $360 million for BRT. The peer review panel notes that:

“Experience in other jurisdictions suggests that LRT has the potential to attract riders that would otherwise refuse to take bus transit.”

6.2.6 Environment and Public Health

LRT is projected to result in a reduction in greenhouse gas emissions of 22,260 tonnes per year by 2031 compared to 12,210 tonnes per year for BRT. LRT is projected to result in better environmental and public health.

6.2.7 Conclusion Regarding Technology

Based on these results, the project team concluded that an LRT system provides the best long-term environmentally-sustainable and financially responsible solution to help manage our community’s future growth and transportation needs. This conclusion is supported by the public response. Of those 551 respondents who support rapid transit, 84 per cent support LRT. This conclusion is also supported by the Region’s peer review panel, who noted that:

“Of the two rapid transit options, LRT has greater capacity, higher ridership development potential and a greater ability to shape growth and redevelopment patterns to support the Region’s growth management strategy.”

6.3 LRT Stage 1 Implementation Option

6.3.1 LRT Staging

In considering LRT technology, it is also important to consider a staged transit system as a cost-effective way to allow transit to grow steadily. Rapid transit projects are usually implemented in stages to:

- allow for the efficient establishment of the rapid transit system and future extensions to the system as demand for public transport in the Region grows;
- enable the Region to cost-effectively deliver a staging option that meets the most immediate public transport needs;
- lessen the initial impact of the construction on the local community and road users by deferring the construction of certain sections; and
- allow a level of flexibility so that future stages can be refined and tailored to meet the growing needs of the Region as it continues to develop.

It should be noted that there are no LRT systems in North America that were built in their entirety right at the start. Edmonton and Calgary were frontrunners in building LRT in North America, starting with 7 km and 11 km respectively. Generally LRT systems are expanded in steps, as little as one kilometre at a time. It would be unrealistic for the Region to plan construction of an entire 39-kilometre LRT system all at once, whether that construction starts now or in the future. It is realistic and achievable for the Region to consider building an LRT system in affordable stages.
Therefore the LRT implementation options consist of a combination of LRT and aBRT, with the intent of expanding to a full LRT system in steps. The Peer Review Panel notes:

“While the extension of LRT to Cambridge may not be viable in the short term, the addition of aBRT will provide excellent service in a financially prudent manner that is well matched to the developing nature of Cambridge’s transit market.”

When Calgary first started building LRT in 1978, it had a population of 506,000. The population of Edmonton was just over 445,000 when the City started LRT construction in 1974. Currently, Waterloo Region has a population of 535,000. Calgary and Edmonton both started with LRT lines from their downtown to a point in the suburbs, with the major activity point being downtown. In comparison, Waterloo Region has many activity points concentrated in a linear corridor along its central transit corridor. This gives the Region the advantage of generating trips in both directions along our rapid transit route, rather than a commuter route that runs peak-direction full and off-peak direction empty. It also gives the Region the advantage of serving a much higher proportion of its population and employment than Calgary and Edmonton were able to with their first LRT lines.

The LRT implementation options consider sections of LRT in the northern half of the central transit corridor, with aBRT from the south end of the LRT to the Ainslie Street Transit Terminal, based on existing and projected ridership. Currently, passenger boardings per weekday in the central transit corridor include 29,200 passengers from Fairview Park Mall north and 6,400 passengers south of Fairview Park Mall. More than 80 per cent of the passenger activity is from Fairview Park Mall north and less than 20 per cent is south of Fairview Park Mall. There is four times more passenger activity from Fairview Park Mall to the north compared to the south.

In the first five to ten years, GRT services would be expanded with new and more frequent routes that would provide fast, convenient connections with the rapid transit system. This improved service would translate into a broader transit user base to promote expanded LRT services. Introduction of LRT service in stages would allow the system to grow and bus services to adjust to provide the best connections.

This approach would also provide the necessary time for the Region, area municipalities and private land owners to collaborate on planning initiatives for increasing densities, improving walkability, controlling parking and enhancing the overall public environment for using public transit in the planned rapid transit station areas. In areas where aBRT is implemented, initiatives to increase ridership would be implemented with a goal of converting to LRT as soon as possible.

6.3.2 Costs of LRT Implementation Options

Table 4 summarizes the costs of the LRT implementation options in 2014 dollars, assuming construction inflation of 12.5 per cent from 2011 to 2014. The table includes construction costs, the level of senior government funding and the additional Regional funding required to construct the different rapid transit options, as well as the anticipated net operating and maintenance costs. Note that other related projects would be included in the Moving Forward Transit Program to optimize the available Federal funding. The net operating and maintenance costs are net of the anticipated farebox revenue, and are expected to decrease over time as rapid transit ridership increases.
Table 4: LRT Implementation Option Costs (2014 $ millions)

<table>
<thead>
<tr>
<th>Option</th>
<th>Construction Costs</th>
<th>Provincial Funding</th>
<th>Federal Funding</th>
<th>Region’s Share</th>
<th>2031 Net Operating &amp; Maintenance Costs per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
</tr>
<tr>
<td>L1</td>
<td>$644</td>
<td>$300</td>
<td>$215</td>
<td>$129</td>
<td>$12.4</td>
</tr>
<tr>
<td>L2</td>
<td>$770</td>
<td>$300</td>
<td>$257</td>
<td>$213</td>
<td>$13.4</td>
</tr>
<tr>
<td>L3</td>
<td>$818</td>
<td>$300</td>
<td>$265</td>
<td>$253</td>
<td>$13.7</td>
</tr>
<tr>
<td>L4</td>
<td>$960</td>
<td>$300</td>
<td>$265</td>
<td>$395</td>
<td>$16.1</td>
</tr>
<tr>
<td>L5</td>
<td>$608</td>
<td>$300</td>
<td>$203</td>
<td>$105</td>
<td>$12.0</td>
</tr>
<tr>
<td>L6</td>
<td>$733</td>
<td>$300</td>
<td>$244</td>
<td>$189</td>
<td>$13.0</td>
</tr>
<tr>
<td>L7</td>
<td>$773</td>
<td>$300</td>
<td>$258</td>
<td>$215</td>
<td>$13.3</td>
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<tr>
<td>L8</td>
<td>$922</td>
<td>$300</td>
<td>$265</td>
<td>$357</td>
<td>$15.6</td>
</tr>
<tr>
<td>L9</td>
<td>$1550</td>
<td>$300</td>
<td>$265</td>
<td>$985</td>
<td>$19.8</td>
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</table>

6.3.3 Evaluation of LRT Implementation Options

Staff have evaluated the LRT implementation options based on ridership, level of intensification, transit integration and affordability. Transit integration includes the operation and convenience of passenger transfers between rapid transit and local or express routes and between LRT and aBRT. Table 5 summarizes the evaluation factors.

Table 5: Evaluation Factors for LRT Implementation Options

<table>
<thead>
<tr>
<th>Option</th>
<th>2031 Annual Ridership (millions)</th>
<th>Increase in Population in Station Areas (thousands)</th>
<th>Increase in Employment in Station Areas (thousands)</th>
<th>Transit Integration</th>
<th>Annual Property Tax Increase per 6 Years</th>
<th>Annual Incremental Household Impact for 6 Years**</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>12.6</td>
<td>19.8</td>
<td>12.7</td>
<td>Fair</td>
<td>0.97%*</td>
<td>$16.01*</td>
</tr>
<tr>
<td>L2</td>
<td>14.3</td>
<td>20.3</td>
<td>12.8</td>
<td>Fair</td>
<td>1.27%*</td>
<td>$20.98*</td>
</tr>
<tr>
<td>L3</td>
<td>15.0</td>
<td>20.3</td>
<td>13.1</td>
<td>Good</td>
<td>1.37%*</td>
<td>$22.63*</td>
</tr>
<tr>
<td>L4</td>
<td>15.4</td>
<td>20.3</td>
<td>13.7</td>
<td>Good</td>
<td>1.90%*</td>
<td>$31.46*</td>
</tr>
<tr>
<td>L5</td>
<td>12.2</td>
<td>19.3</td>
<td>11.6</td>
<td>Poor</td>
<td>0.88%*</td>
<td>$14.63*</td>
</tr>
<tr>
<td>L6</td>
<td>13.9</td>
<td>19.7</td>
<td>11.7</td>
<td>Poor</td>
<td>1.13%*</td>
<td>$19.04*</td>
</tr>
<tr>
<td>L7</td>
<td>14.7</td>
<td>19.7</td>
<td>12.0</td>
<td>Fair</td>
<td>1.25%*</td>
<td>$20.70*</td>
</tr>
<tr>
<td>L8</td>
<td>15.0</td>
<td>19.7</td>
<td>12.6</td>
<td>Fair</td>
<td>1.78%*</td>
<td>$29.53*</td>
</tr>
<tr>
<td>L9</td>
<td>18.0</td>
<td>22.6</td>
<td>16.9</td>
<td>Excellent</td>
<td>3.71%*</td>
<td>$62.65*</td>
</tr>
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</table>

* Annual property tax increase over six years (2012 to 2017) assuming all costs are funded by property tax levy. Tax levy impacts may be reduced through financing options (e.g. contribution from development charges, reduction of debt charges and upload savings from the Province).

** Based on average property assessment of $225,000 ($2010).

The options rank from excellent to poor for transit integration as follows:

- Option L9 ranks as excellent because it connects LRT to the existing transit terminals at Conestoga Mall, Fairview Park Mall and Ainslie Street, and requires no transfer between aBRT and LRT.
- Options L3 and L4 rank as good because the LRT connects to both Conestoga Mall and Fairview Park Mall, two key existing transit terminals. Option L4 has the further advantage of
connecting to GO bus service at Sportworld Drive. These options provide a transfer between LRT and aBRT at either Fairview Park Mall or at Sportsworld Drive. The peer review panel noted that ending the LRT short of Fairview Park Mall would result in a missed opportunity to capture the existing higher density apartments in and around the mall and more significantly, limit the potential for intensification in and around the LRT/aBRT transfer point. Achieving LRT to Fairview Park Mall was viewed by the panellists as a prerequisite for the extension of LRT into Cambridge at a future date. To the north, Conestoga Mall represents an important point of access to the transit system for residents north of the city. Ending LRT at Northfield Drive was viewed as a missed opportunity to serve an existing key destination and provide connectivity to the wider transit network.

- Options L1, L2, L7 and L8 rank as fair because the LRT connects to only one of Conestoga Mall or Fairview Park Mall (existing transit terminals and connection points to conventional transit).
- Options L5 and L6 rank as poor because the LRT does not connect to either Conestoga Mall or Fairview Park Mall. If a roundabout is constructed at the intersection of Block Line Road with Courtland Avenue, this could provide a means for buses to turn around at this transfer point. However, an LRT terminus at any of Northfield Drive, Ottawa Street or Block Line Road will provide a challenge in terms of providing a satisfactory transit terminal.

6.3.4 Long-Term Vision

Option L9 would perform the best in terms of ridership, transit integration and level of intensification, however it would have a significant impact on property taxes, particularly if implemented all in one stage and fully funded over a six-year period. Public response is strong and equally supportive for options L9 and L3. Staff support the long-term vision of implementing option L9, with LRT from Conestoga Mall to the Ainslie Street Transit Terminal.

6.3.5 Technically Preferred Implementation Option

As a Stage 1 implementation option, staff have identified option L3 as the preliminary technically-preferred rapid transit implementation option because it provides good transit integration at the lowest cost, connecting LRT to both Conestoga Mall and Fairview Park Mall. The peer review panel notes that:

> “Of the 10 choices, option L3 (LRT from Conestoga Mall to Fairview Park Mall) has the greatest integrity as a first stage in the implementation of regional rapid transit. This is based on its ability to support the wider network and catalyze redevelopment in and around the two anchoring station areas. Option L3 has the greatest potential to “build success in the first phase of development” by linking key origins and destinations along the corridor and connecting them to key existing anchor points (Conestoga Mall and Fairview Park Mall) within the Regional Transit System.”

Option L3 is basically the same implementation option that was approved by Regional Council in June 2009. Further analysis and public input (41 per cent of the respondents that supported LRT supported L3 and 41 per cent supported L9) have reinforced and confirmed that original choice.

There may be concerns about the affordability of option L3 particularly in the context of the additional costs required to implement the RTMP. Appropriate integration of the rapid transit system with local and express bus routes and road improvements is essential to the overall success of the LRT. Decisions on rapid transit and the RTMP are related and impact each other. The following section provides information on the implementation of the RTMP.
6.3.6 Region Transportation Master Plan (RTMP)

The RTMP is a set of policy directions, priorities and plan that guides how people and goods will be moved around our community by car, truck, transit, walking and cycling for the next 20 years. The plan includes increments in conventional transit over the entire 20-year period. The reconfiguration, expansion and integration of the conventional transit system with the LRT system will contribute to the ridership potential and success of the LRT as well as serving the broader community. The RTMP includes the required expansion in conventional transit to support the rapid transit system.

During the 2012 to 2018 time frame, the RTMP included transit service hour expansions totaling 328,000 hours. Implementation of the RTMP between 2012 and 2018 would have required a property tax increase of approximately 1.1 per cent per year. Implementation of the RTMP is also important for the establishment of the feeder system for the LRT.

Recognizing that affordability of the rapid transit system and the RTMP are linked, Region staff feels that some deferral of the RTMP can occur without significantly impacting the rapid transit system. It would result in some increase in road congestion, initially poorer integration with LRT, possibly lower ridership and delay improvements in conventional transit. Implementing approximately 65 per cent (211,000 transit service hours) of the total additional hours proposed from 2012 to 2018 would create a conventional system that could adequately support the rapid transit system, although there may be some broader transportation system implications. Delaying the planned RTMP improvements by this amount would lengthen the time to implement the whole RTMP from 20 years to approximately 22 years.

Decreasing the amount of conventional transit expansion to 40 per cent of that originally anticipated would further impact the performance of the rapid transit system. It is important to note that the amount of additional transit service required to reach the 65 per cent level is similar to the amount approved in the 2011 budget. It could take one budget cycle following the completion of the first stage of LRT to increase the level of transit service to the 65 per cent level. With this scenario, the time period to implement the whole RTMP would lengthen from 20 years to approximately 23 years.

In either case, it is important to note that the decrease in additional transit service hours is a deferral of that increase and that continued RTMP implementation would result in the increases being implemented in the years following completion of the first stage of LRT. The overall impact to the 20-year RTMP would be to delay completion by approximately two or three years.

To address the issue of affordability, staff are proposing that an L3 option with implementation of either 65 per cent or 40 per cent of the RTMP be considered. Staff are also proposing that an L1 option with 65 per cent of the RTMP be considered. This option provides a reasonable but significantly lower level of LRT with a higher amount of RTMP for the same cost as L3 with 40 per cent RTMP. It is also proposed that the period to implement property tax increases for rapid transit be changed to seven years to better integrate with the 20-year RTMP financing strategy.

Therefore, the three implementation options considered most feasible by staff are:

4) Option L3a – building L3 and implementing 65 per cent of the RTMP between 2012 and 2018;
5) Option L3b – building L3 and implementing 40 per cent of the RTMP between 2012 and 2018; and
6) Option L1a – building L1 and implementing 65 per cent of the RTMP between 2012 and 2018.
6.3.7 Financial Analysis

Staff have prepared financing strategies for the three options (L1a, L3a and L3b). These financing strategies are based on tax rate increases for the next seven years, which form the basis of the ongoing contributions to the RTMP Reserve Fund and will be used to finance the capital expenditures and operating expenses of both the expansions to GRT service and the implementation of the rapid transit option selected.

Table 6 presents options and financial impacts for proceeding with LRT Stage 1 and staged implementation of the RTMP.

Table 6: Options for LRT/RTMP Implementation

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</tr>
</thead>
<tbody>
<tr>
<td>L3a</td>
<td>65%</td>
<td>211,000</td>
<td>2.0%*</td>
<td>$33.12*</td>
</tr>
<tr>
<td>L3b</td>
<td>40%</td>
<td>138,000</td>
<td>1.5%*</td>
<td>$24.84*</td>
</tr>
<tr>
<td>L1a</td>
<td>65%</td>
<td>211,000</td>
<td>1.5%*</td>
<td>$24.84*</td>
</tr>
</tbody>
</table>

* Annual property tax increase over seven years (2012 to 2018) assuming all costs are funded by property tax levy. Tax levy impacts may be reduced through financing options (e.g. contribution from development charges, reduction of debt charges and upload savings from the Province).

** Based on average property assessment of $225,000 ($2010).

Table 6, above, indicates that a tax rate increase of 1.5 per cent per year, or approximately $25 per average household annually, for seven years provides sufficient funding to implement either option L3 with 40 per cent of the proposed RTMP or option L1 with 65 per cent of the proposed RTMP. If Council wishes to implement option L3 with 65 per cent of the proposed RTMP, the annual tax rate impact rises to 2.0 per cent. Each of these options maximizes the use of the Federal and Provincial funding that has been provided. The property tax impacts shown are relatively conservative estimates of the potential tax rate impacts. These property tax impacts may be mitigated by other funding allocations or mechanisms, such as development charges or upload savings.

Development charges have been used by other municipalities to reduce the tax rate impacts of similar transit projects. Currently, the Region has achieved the maximum development charge collectible for transit services. Development charges could only be collected for the LRT project if the Province amended the Development Charges Act to permit the Region to calculate the development charges for the project based on the increased level of service to be provided by the rapid transit extension. The Region’s consultants have calculated that, if a similar provision was made available to the Region, approximately $70 million of development charges could be collected over a 20-year period to offset the costs of construction of option L3, with an estimated increase in development charges of $975 per single detached dwelling (residential) and $0.78 per square foot for non-residential development. This would reduce the tax rate increases noted in Table 6, above, by approximately 0.15 per cent per year.

Financial capacity also becomes available to the Region from the completion of the Region’s debt servicing payments for the Regional buildings at 150 Frederick and 99 Regina Street in 2012 to 2014, which amounts to 1.41 per cent of the tax levy in those years. As well, the continuing uploading of social assistance costs to the Province provides capacity from 2012 to 2018 of approximately 2.55 per cent in tax levy in those years. This totals approximately 4 per cent of budget
capacity which could be utilized to offset the impact of LRT. This could reduce the tax rate increases noted in Table 6, above, by approximately 0.57 per cent per year.

The financial calculations do not include the potential impacts of land value uplift. The evaluation of rapid transit systems shows that there is significant land value uplift that is projected to occur. It is difficult to model the impacts on property taxes of land value uplift. Land value uplift is assessment growth. When a property is developed so that its value increases, the taxes collected also increase. These additional taxes that are collected on the increased value could be used to reduce future tax increases.

6.3.8 Preliminary Preferred Option

Staff is proposing option L3b as the preliminary preferred rapid transit implementation option. This would result in a 1.5 per cent annual property tax increase, or about $25 increase per year for seven years for the average household. Staff believe that this option provides the best value. Construction and the benefits of LRT are maximized in Stage 1. An adequate conventional transit expansion is implemented and implementation of the RTMP is extended by three years to approximately 23 years.

6.4 LRT Stage 2 Implementation

Public support is strong for option L9, with LRT from Conestoga Mall to the Ainslie Street Transit Terminal. If the Region proceeds with implementation option L3 for Stage 1, then Stage 2 would complete option L9, with LRT from Fairview Park Mall to the Ainslie Street Transit Terminal. As in other communities in North America, a LRT system would be implemented in stages. From Fairview Park Mall, the next stations are located at Sportsworld Drive, then Preston, followed by stations along Hespeler Road at Eagle Street/Pinebush Road, the Cambridge Centre, CanAmera Parkway, Coronation Boulevard/Dundas Street, and the Ainslie Street Transit Terminal. To facilitate the implementation of Stage 2 as soon as possible, staff propose to:

- Begin the Transit Project Assessment for LRT from Fairview Park Mall to the Ainslie Street Transit Terminal in 2014;
- Acquire property for the implementation of Stage 2 as properties come on the market;
- Undertake measures to encourage transit-supportive development, to enhance transit ridership throughout the urban service areas and to expedite the development of LRT south of Fairview Park Mall;
- Implement transit-supportive strategies in Cambridge;
- Pursue additional Federal and Provincial funding for Stage 2. With the successful implementation of LRT Stage 1, it is reasonable to expect that additional Federal and Provincial funding would become available for LRT Stage 2; and
- Explore the location of a future multi-modal transit facility in Cambridge to link to future GO rail service.

7. Draft Staff Recommendations

Regional staff have drafted the following recommendations, proposed to be presented to the public for their comment through the next series of public consultation, and then presented to Council in June 2011:

THAT the Regional Municipality of Waterloo take the following action regarding the Region’s proposed rapid transit system:

a) Approve Light Rail Transit (LRT) as the preferred technology;
b) Approve the LRT route as follows:

- Along King Street from Conestogo Road to Northfield Drive;
- Along Northfield Drive from King Street to the Region-owned Waterloo Spur rail line;
- Along the Region-owned Waterloo Spur rail line from Northfield Drive to Erb Street;
- Southbound along Caroline Street from Erb Street to Allen Street and along Allen Street from Caroline Street to King Street;
- Northbound along King Street from Allen Street to Erb Street and along Erb Street from King Street to Caroline Street;
- Along King Street from Allen Street to Victoria Street;
- Southbound along Victoria Street from King Street to Charles Street and along Charles Street from Victoria Street to Benton Street;
- Northbound along Benton/Frederick Street from Charles Street to Duke Street, along Duke Street from Frederick Street to Francis Street, along Francis Street from Duke Street to King Street, and along King Street from Francis Street to Victoria Street;
- Along Charles Street from Benton Street to Borden Avenue;
- Southbound along Borden Avenue from Charles Street to the Huron Park Spur rail line and along the Huron Park Spur rail line from Borden Avenue to Ottawa Street;
- Northbound along Ottawa Street from the Huron Park Spur rail line to Charles Street and along Charles Street from Ottawa Street to Borden Avenue;
- Along the Huron Park Spur rail line from Ottawa Street to Hayward Avenue;
- Along Hayward Avenue from the Huron Park Spur rail line to Courtland Avenue;
- Along Courtland Avenue/Fairway Road from Hayward Avenue to Wabanaki Drive (note: this section of the LRT route would change should the hydro corridor route become available);
- Along Wabanaki Drive from Fairway Road to the CP Waterloo Subdivision rail line;
- Along the CP Waterloo Subdivision rail line from Wabanaki Drive to Eagle Street;
- Along Eagle Street from the CP Waterloo Subdivision rail line to Hespeler Road;
- Along Hespeler Road from Eagle Street to Water Street;
- Along Water Street from Hespeler Road to Bruce Street;
- Along Bruce Street from Water Street to Ainslie Street; and
- Along Ainslie Street from Bruce Street to the Ainslie Street Transit Terminal;

c) Approve the LRT stations along the LRT route as follows:

- on King Street at Conestogo Road at Conestoga Mall;
- on the Region-owned Waterloo Spur rail line at Northfield Drive, at the Research and Technology Park, at the University of Waterloo, and at Seagram Drive near Wilfrid Laurier University;
- on Caroline Street at Willis Way;
- on King Street at Willis Way, at the Grand River Hospital, and at the multi-modal transit hub;
- on Duke Street at Young Street;
- on Frederick Street at Duke Street;
- on Charles Street at Gaukel Street, at Benton Street, at Cedar Street, at Borden Street, and at Ottawa Street;
- on Courtland Avenue at Block Line Road;
- on Fairway Road at the signalized entrance to Fairview Park Mall (note: this station location would change should the hydro corridor route become available);
- on the CP Waterloo Subdivision rail line at Sportsworld Drive and at Eagle Street;
- on Hespeler Road at Eagle Street/Pinebush Road, at the Cambridge Centre, at CanAmera Parkway, and at Coronation Boulevard/Dundas Street; and
- along Ainslie Street at the Ainslie Street Transit Terminal;
d) Approve the implementation of option L3b as Stage 1 of the LRT system including LRT from Conestoga Mall to Fairview Park Mall and adapted bus rapid transit from Fairview Park Mall to the Ainslie Street Transit Terminal (note: the description of Stage 1 would change if Council approves option L1 rather than L3). A 1.5 per cent per year increase to the annual budget would be established as a long-term funding source for LRT and RTMP over a seven-year period beginning in 2012;

e) Direct staff to pursue a Regional development charge legislative exemption in order to assist with funding the LRT project;

f) Approve an allocation of $1,000,000 annually, for a 10-year period to implement transit-supportive strategies in Cambridge, subject to final approval during the 2012 budget process. Details of the program to be developed in conjunction with the City of Cambridge and to be presented to Regional Council for approval in a subsequent report; and

g) Direct staff to pursue the following steps to expedite Stage 2 of the LRT system including LRT from Fairview Park Mall to the Ainslie Street Transit Terminal (note: the description of Stage 2 would change if Council approves option L1 rather than L3), including:

- Undertake measures to encourage transit-supportive development, to enhance transit ridership throughout the urban service areas and to expedite the development of LRT south of Fairview Park Mall, including (but not limited to) developing incentives for transit-oriented developments and supporting and developing transportation demand management strategies for new and existing business and residents;
- Begin the Transit Project Assessment for LRT from Fairview Park Mall to the Ainslie Street Transit Terminal in 2014;
- Acquire property for the implementation of Stage 2 of the LRT system as property needs are defined and properties come on the market;
- Pursue additional Federal and Provincial funding for Stage 2 of the LRT system; and
- Explore the location of a future multi-modal transit facility in Cambridge to link to future GO rail service.

8. Next Steps

Regional staff are on track with and continue to follow the rapid transit project schedule adopted by Council on January 25, 2011. In February/March, staff undertook public consultation regarding implementation options. Continuing to follow that schedule, staff anticipate that steps leading up to the Transit Project Assessment for the rapid transit project will include:

- April/May: public consultation regarding the preliminary preferred rapid transit implementation option and draft recommendations;
- June: Council approval of the preferred rapid transit system;
- July/August/September: completion of the Environmental Project Report; and
- October: commencement of the six-month Transit Project Assessment (the expedited Provincial environmental assessment process for transit projects).

Following Council approval of the preferred rapid transit system in June, staff will look in more detail at procurement options for the rapid transit project, and report back to Council by the end of 2011 regarding a preferred procurement strategy.
9. Upcoming Public Consultation Program

Staff will hold 16 public consultation events in April and May 2011, including 10 public consultation centres, four information booths at malls and the Kitchener Farmers Market, and two public input meetings. For this round of public consultation, staff have added three more public consultation centres to provide a public consultation centre in each of the Townships. Plans for the upcoming public consultation include:

- **Saturday, April 30, 2011**
  - Information booth at Cambridge Centre, 355 Hespeler Road, Cambridge;
  - Information booth at Kitchener Farmers Market, 300 King Street East, Kitchener;

- **Tuesday, May 3, 2011**
  - PCC at Calvary United Church, 48 Hawkesville Road, St. Jacobs, Township of Woolwich;

- **Wednesday, May 4, 2011**
  - PCC at Waterloo Region of Waterloo, Front Lobby, 150 Frederick Street, Kitchener;
  - PCC at Albert McCormick Community Centre, 500 Parkside Drive, Waterloo;

- **Thursday, May 5, 2011**
  - PCC at Cambridge Centre for the Arts, 60 Dickson Street, Cambridge;
  - PCC at First United Church, 16 William Street West, Waterloo;

- **Tuesday, May 10, 2011**
  - PCC at United Kingdom Club, 35 International Village Drive, Cambridge;
  - PCC at Kitchener Gospel Temple, 9 Conway Drive, Kitchener;

- **Thursday, May 12, 2011**
  - PCC at Ayr Fire Hall, 501 Scott Street, Ayr, Township of North Dumfries;
  - PCC at St. Agatha Community Centre, 1791 Erb’s Road, St. Agatha, Township of Wilmot;

- **Saturday, May 14, 2011**
  - Information booth at Fairview Park Mall, 2960 Kingsway Drive, Kitchener;
  - Information booth at Conestoga Mall, 550 King Street North, Waterloo;

- **Wednesday, May 18, 2011**
  - PCC at St. Clements Community Centre, 1 Green Street, St. Clements, Township of Wellesley;

- **Tuesday, May 31, 2011**
  - Public Input Meeting starting at 6 p.m. in Regional Council Chambers, 150 Frederick Street, Kitchener; and

- **Wednesday, June 1, 2011**
  - Public Input Meeting starting at 6 p.m. in Regional Council Chambers, 150 Frederick Street, Kitchener.
Staff propose to provide information on the rapid transit project in general and the preliminary preferred rapid transit implementation option at each event. The public will be able to submit their comments in person, by mail, by email, or through the website.

The public will have multiple opportunities to obtain information or to provide input to the rapid transit project. Staff will notify the public of these opportunities through television advertisements running for two weeks, through email or regular mail notices to the rapid transit contact list of more than 3,400 addresses, through roadside signs and website updates, and through newspaper advertisements placed in seven different newspapers.

CORPORATE STRATEGIC PLAN:

The report supports several objectives of Council’s Strategic Focus. These include:

Focus Area 1: Environmental Sustainability: Protect and enhance the environment.
Focus Area 2: Growth Management: Manage and shape growth to ensure a livable, healthy, thriving and sustainable Waterloo Region.
Focus Area 5: Infrastructure: Provide high quality infrastructure and asset management to meet current needs and future growth.

FINANCIAL IMPLICATIONS:

Capital and operating and maintenance costs of the L3 rapid transit option would result in a annual property tax increases of 1.37 per cent for six years. The initial stages of the RTMP also need to be implemented at the same time. Full implementation of the RTMP would result in an additional tax rate increase of 1.1 per cent per year. Full implementation of both option L3 and RTMP over the next six years is clearly not affordable.

In order to integrate rapid transit and the RTMP, staff have prepared financing strategies for the three options (L1a, L3a and L3b). The financing strategies are based on tax rate increases for the next seven years, which form the basis of the ongoing contributions to the RTMP Reserve Fund and will be used to finance the capital expenditures and operating expenses of both the expansions to GRT service and the implementation of the rapid transit implementation option selected. The financial impacts of the three options are shown in Table 7 below.

Table 7: Options for LRT/RTMP Implementation

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<tbody>
<tr>
<td>L3a</td>
<td>65%</td>
<td>211,000</td>
<td>2.0%*</td>
<td>$33.12*</td>
</tr>
<tr>
<td>L3b</td>
<td>40%</td>
<td>138,000</td>
<td>1.5%*</td>
<td>$24.84*</td>
</tr>
<tr>
<td>L1a</td>
<td>65%</td>
<td>211,000</td>
<td>1.5%*</td>
<td>$24.84*</td>
</tr>
</tbody>
</table>

* Annual property tax increase over seven years (2012 to 2018) assuming all costs are funded by property tax levy. Tax levy impacts may be reduced through financing options (e.g. contribution from development charges, reduction of debt charges and upload savings from the Province).
** Based on average property assessment of $225,000 ($2010).

Table 7 indicates that a tax rate increase of 1.5 per cent per year, or approximately $25 per average household annually, for seven years provides sufficient funding to implement either option L3 with
40 per cent of the proposed RTMP or option L1 with 65 per cent of the proposed RTMP. If Council wishes to implement option L3 with 65 per cent of the proposed RTMP, the annual tax rate impact rises to 2.0 per cent. Each of these options maximizes the use of the Federal and Provincial funding that has been provided. The property tax impacts shown are relatively conservative estimates of the potential tax rate impacts. These property tax impacts may be mitigated by other funding allocations or mechanisms, such as development charges, reductions in debt servicing costs or upload savings.

If the Province changed the Development Charges Act to allow collection of a development charge for LRT, the Region could collect approximately $70 million of development charges over a 20-year period to offset the costs of construction of option L3. The estimated increase in development charges would be approximately $975 per single detached dwelling (residential) and $0.78 per square foot for non-residential development. The tax rate increases to implement option L3 would be reduced by approximately 0.15 per cent per year.

Between 2012 and 2018, upload savings and completion of debt servicing payments totalling 3.96 per cent of the tax levy in those years will occur. This tax room could be used to reduce the tax rate increases for option L3b by approximately 0.57 per cent per year.

Assessment growth due to intensification and development could also be used to reduce future tax increases.

OTHER DEPARTMENT CONSULTATIONS/CONCURRENCE:

The rapid transit project team includes representatives from Regional Council, the CAO’s office, Communications, Community Planning, Finance, Legal, Public Health, Social Services, Transit Development, Transportation and Environmental Services, Transportation Planning and Transit Services.

ATTACHMENTS:

Appendix A – Summary of Comments and Recommendations from the Peer Review Panel
Appendix B – Rapid Transit Maps

PREPARED BY: Nancy Button, Director, Rapid Transit

APPROVED BY: Thomas Schmidt, Commissioner, Transportation and Environmental Services
APPENDIX A

Report: E-11-044

Summary of Comments and Recommendations from the Peer Review Panel

Members of Peer Review Panel

John Hubbell

Mr. Hubbell is an Associate Vice President with HDR, an Adjunct Associate Professor with The University of Calgary’s Department of Civil Engineering and has over 40 years of public sector experience in planning, building and operating multi-modal transportation systems. Mr. Hubbell was the General Manager of Transportation for the City of Calgary, and was the co-lead (2006 – 2010) of Calgary’s Municipal Development Plan and the Calgary Transportation Plan which are the integrated land use and transportation master plans that will direct Calgary’s future development. He has extensive experience in the planning and operation of pedestrian, cycling, taxi, paratransit, road, urban bus and light rail transit (LRT) systems, and was instrumental in establishing Calgary as a leader in LRT, creating one of the most successful LRT systems in North America. He has also managed major operating and capital budget programs. Mr. Hubbell is experienced in developing consensus-based plans that integrate land use and transportation, and incorporate the sustainability principles that are required to build strong communities today.

Eric J. Miller

Eric Miller is the inaugural Director of the University of Toronto Cities Centre. He has B.A.Sc. and M.A.Sc. degrees from the University of Toronto and a Ph.D. from M.I.T. He has been a faculty member in the Department of Civil Engineering, University of Toronto since 1983, where he served as Acting Chair in 1998-99, 2003 and 2007. Prof. Miller is Chair of the U.S. Transportation Research Board (TRB) Committee on Travel Behavior and Values and past-Chair of the International Association for Travel Behaviour Research. He is past-Chair of the TRB Sub-Committee on Integrated Transportation – Land Use Modeling and Member Emeritus of the TRB Transportation Demand Forecasting Committee. He served on the TRB Task Force on Moving Activity-Based Approaches to Practice and the US National Academy of Sciences Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting as well as on numerous travel demand peer review assignments.

Eric’s research interests include: integrated land use transportation modelling; analysis of the relationship between urban form and travel behaviour; modelling transportation system energy use and emissions; and microsimulation modelling. He is the developer of GTAModel, a “best practice” regional travel demand modeling system; TASHA, a state-of-the-art activity-based travel microsimulation model; and ILUTE, an integrated land use – travel demand model system for the GTA. He is co-author of the textbook Urban Transportation Planning: A Decision-Oriented Approach, the second edition of which was published in 2001.

George F. Dark

George Dark, FCSLA, FASLA, partner at Urban Strategies, is an urban designer, landscape architect and Fellow with the Canadian Society of Landscape Architects and the American Society of Landscape Architects. George has over 30 years of professional experience and, since joining the firm in 1987, has led a variety of projects including new community plans, urban regeneration strategies, campus master plans, open space master plans, streetscape designs, design guidelines and public policy documents. George’s work focuses on the quality of urban environments and he regularly coordinates large groups of diverse professionals and excels at guiding projects through complex approval and consultation processes.
George was co-lead on the APA and CIP award winning Saint Paul Central Corridor LRT Development Strategy examining the city-building potential resulting from the creation of an 11-mile LRT linking downtown Minneapolis and downtown Saint Paul. He assisted the University of Ottawa and the City of Ottawa to analyze the Development Potential of the Arts Court Site to capitalize on the LRT investment while integrating with the historic buildings and surrounding. As well, he examined the long term effect of the LRT on the whole area and how it could evolve and be transformed over time.

Alan Jones

Alan Jones has BSc and MSc qualifications and is Steer Davies Gleave’s Director leading the company’s North American Urban Transit business. Before joining Steer Davies Gleave he worked for the Netherlands Transport Research Institute in The Hague, and the Long Term Transportation Planning Dept of the City of Westminster, Central London, UK. He has over 30 years transportation/urban transit experience in the UK, Europe and North America and has extensive experience in the development and delivery of a wide range of urban transit technologies including rail, light rail transit, bus rapid transit, bus, metros, and automated people-mover systems. With his transportation planning background he has coordinated all aspects of scheme development including route identification, alignment design, ridership forecasting, financial and economic appraisal, multiple account evaluation, public consultation and stakeholder engagement, environmental assessment, urban design, systems and operations specifications, applications for approvals and powers, procurement specification and contract development. He has also appeared as an expert witness at rapid transit public inquiries. In recent years he has been Steer Davies Gleave’s Project Director for urban transit projects in Vancouver, Edmonton, Calgary, Ottawa, Hamilton, Sacramento and Portland. He has presented at a range of international conferences including Rail-Volution, the Canadian Urban Transit Association (CUTA) Annual Conference and UITP’s Light Rail Conference.

Ashley Curtis

Ashley Curtis, an Associate with Steer Davies Gleave and head of their Toronto Office, is a Chartered transport planner and qualified project manager specialising in leading the development and delivery of transport strategies, urban transit projects and integrated transport solutions from inception through to construction. With 21 years’ experience, 16 of which was spent in the public sector, Ashley is well versed in working closely with local politicians and key stakeholders leading multi-disciplinary, multi-company teams with an emphasis on project leadership, strong relationship building and communication and negotiation skills to arrive at acceptable, deliverable solutions. He has worked and advised on strategy and urban transit projects in the UK, Europe and North America with a focus on integrating land use and transport to deliver wider city and regional objectives. With his transportation planning background he has coordinated all aspects of rapid transit scheme development including route identification, alignment design, ridership forecasting, financial and economic appraisal, public consultation and stakeholder engagement, environmental assessment, urban design, systems and operations specifications, applications for approvals and powers, procurement specification and contract development. He was instrumental in developing and delivering what will be the longest guided bus system in the world, the Cambridgeshire Guided Busway which is currently under construction, the Fastrack rapid transit system in Kent and led advancement of the South Essex Rapid Transit project. He has also advised the City of Edmonton on its long term transit planning and expanding its LRT system and has led the LRT planning, design and engineering work for the City of Hamilton.
Region of Waterloo

Waterloo Rapid Transit Implementation Options: Peer Review Summary Report

April 06, 2011

In association with:

Ashley Curtis, Steer Davies Gleave
John Hubbell, HDR iTrans
Alan Jones, Steer Davies Gleave
Eric Miller, University of Toronto
1.0 INTRODUCTION

Since 2004, the Region of Waterloo has been undertaking a detailed assessment of opportunities and options for the implementation of a proposed Waterloo Rapid Transit (WRT) system linking the three cities of Waterloo, Kitchener and Cambridge. The project is a key component of the Region’s growth strategy, supporting significant re-urbanization and the protection of important countryside and water recharge areas.

Following a significant amount of detailed work and comparative assessment exploring a range of Rapid Transit (RT) options, the Region of Waterloo approved Light Rail Transit (LRT) as the preferred technology in June 2009 and identified a two phase staging strategy. The first stage involved the introduction of LRT to Waterloo and north Kitchener with an adapted Bus Rapid Transit (aBRT), similar to Brampton’s Zum system, serving south Kitchener and Cambridge. Stage 2 would see the extension of LRT south to downtown Galt in Cambridge creating a seamless LRT system serving the three cities.

Funding support from both the Federal and Provincial Governments has been secured and the Region is now considering how to achieve the best value from the project, including the most appropriate phasing mix.

In support of the two phase staging strategy, the Region of Waterloo has been exploring 10 detailed staging options to determine the northern and southern extent of the first phase of LRT construction. In order to assist in the assessment of options, the Region assembled a Peer Review Panel to bring fresh eyes of respected professionals who have engaged in rapid transit planning, design, engineering and significant city building investment initiatives.

The Panel was asked to provide advice on how to assess the options, make recommendations as to a preferred option and provide commentary on several detailed aspects of project implementation.

This report provides a summary of the scope, process, key messages and recommendations from the Peer Review Panel for consideration by the Region of Waterloo Council and staff.

Overall, the Peer Review Panel felt that an investment in RT and in particular an investment in LRT represents a critical step towards meeting the Region’s growth and revitalization objectives, increasing transit ridership and creating more livable and economically competitive communities.

To that end, the assessment of implementation options should account for the ability for each option to deliver long-term intensification and place-making, and contribute to the integrity of the regional transit network.

While the extension of LRT to Cambridge may not be viable in the short term, the addition of aBRT will provide excellent service in a financially prudent manner that is well matched to the developing nature of Cambridge’s Transit Market.

In both this review and the previous review, the panel has not seen a very robust exploration of the city-building potential and specifically potential change within the station areas to assess the future growth potential.
2.0 BACKGROUND

On May 15, 2004, the Government of Canada, the Government of Ontario and the Region of Waterloo jointly announced funding for the Region of Waterloo Growth Management Strategy Transit Initiative Technical Studies and an Individual Environmental Assessment (EA) for a regional rapid transit initiative. The implementation of a rapid transit route linking the major centres of activity to create a central transit corridor linking Waterloo, Kitchener and Cambridge was seen as an important component towards managing growth, encouraging re-urbanization and promoting downtown revitalization in the region.

A 3 Phase EA process was commenced in January 2006. Phase 1 comprised an evaluation of transportation alternatives (status quo, improved conventional transit, expanded road network and rapid transit) to determine how each met the goals of the Regional Growth Management Strategy. As an outcome of this phase, Rapid Transit was selected as the preferred alternative to assist in the management of the region's growth.

In Phase 2, a series of alternative transportation technologies were assessed. Of these, Bus Rapid Transit (BRT) and LRT operating at-grade in dedicated on-road and off-road conditions were found to be most capable of accommodating the projected passenger demands and project objectives.

Given the choice of technologies, a series of potential rapid transit routes and station locations were identified. These were evaluated against a series of 21 criteria identified in the project's terms of reference and input was received from the public at a series of workshops. The process followed for establishing potential station locations and for short listing rapid transit route alternatives. From this evaluation a ranked short listed set of five route alternatives was compiled.

As a final step in Phase 2 of the EA process, the identified combinations of route and technology alternatives were assembled to create a series of reasonable system alternatives. These were evaluated under an Multiple Accounts Evaluation (MAE) process which looked at 5 broad categories of assessment. These were:

1. Capital Costs and Operating Fees
2. Direct Transportation Benefits
3. Land Use / Economic Development Benefits
4. Social and Community benefit
5. Environmental Impacts

As an outcome of the MAE a preferred alternative labelled the Hybrid 2 was identified. This consisted of LRT from Farmers' Market Road to Conestoga Mall. From there, the LRT would travel south through the Waterloo and Kitchener Downtowns, west on Ottawa and along the Courtland
Avenue corridor to Fairview Park Mall. From Fairview Park Mall the Hybrid 2 alternative proposes to operate a Priority Bus Route along the shoulders of Hwy. 8 and Hwy. 401 to Hespeler Road and then south to downtown Cambridge. Further details are outlined in the Region of Waterloo Planning and Works Committee Report dated May 12, 2009.

In 2010 the Provincial and Federal Governments announced their funding commitments for the project and the Region initiated a detailed review of the financial implications of the preferred option. In response to concerns raised about the affordability of the project, specifically the region’s share of the costs, staff were directed to identify and objectively review a series of additional implementation options for Council’s consideration. The overall objective being to identify an option that was both affordable and delivered best value to the community.

A total of 10 implementation options were considered exploring various lengths of LRT in the northern half of the LRT corridor and aBRT to the south. A full LRT and full BRT option were also explored. The options were generated based on a number of considerations including:

- affordability;
- likely public transport demand;
- ability to meet public transport service needs;
- economies of scale to capitalize the system; and
- maintenance yard and storage facility locations.

The 10 transit implementation options that were reviewed and subject to the Panel's discussion are detailed in Appendix 1 of this report.
3.0 PEER REVIEW PANEL’S SCOPE

The Panel Composition

The Peer Review Panel, assembled by Region of Waterloo staff, includes a range of professionals with expertise in transportation engineering, transit planning, design and operation, urban planning, urban design and city building initiatives. The five member panellists are: Ashley Curtis, Associate with Steer Davies Gleave; George Dark, Partner with Urban Strategies; John Hubbell, Associate Vice President with HDR iTrans; Alan Jones, Director with Steer Davies Gleave; and Eric Miller, Director of Cities Centre, University of Toronto.

The Scope

The Panel was asked by the Region of Waterloo staff to provide an independent review of the Region’s Implementation Options, to provide feedback on the evaluation factors and make a recommendation on a preferred option. More specifically, the Panel was asked to respond to the following questions:

The Options

1. Considering the evaluation factors used to assess the 8 implementation options as well as the BRT only and LRT only option, are there any additional evaluation factors that are missing and should be accounted for?
2. How should the evaluation factors be prioritized?

3. Of the 10 options in total, is there a preferred implementation option or options?
4. Is there an additional option that has not yet been tabled but should be considered?

Detailed Considerations

5. What are the benefits and trade-offs of the proposed loop in the Ottawa/Borden Area?
6. What are the key considerations for enhancing connections between bus, aBRT and LRT to create a more seamless system?

The Panel Process

The Panellists were provided with background material two weeks prior to meeting. On March 7, the Panel gathered for a day of review and discussion in workshop format. The Panel was offered a detailed presentation by Regional staff on the various options and how they related to the Region’s larger planning initiatives. Following this, the Panel held a roundtable discussion, facilitated by George Dark focusing on the Region’s key questions. Regional staff attended as a resource and as observers to the Panel.

Urban Strategies has prepared this summary report, on behalf of the Peer Review Panel. Each member of the Panel has reviewed and is in agreement with the summary report and outcome related recommendations.
4.0 OUTCOME

The following is a summary of the key directions resulting from the WRT Implementation Options Peer Review Workshop. They represent the key broad thrusts of the discussion and are generally structured in response to the directed scope and questions.

Overall

a) The implementation of RT and in particular LRT, is a fundamental strategy towards achieving the Region’s growth objectives, preserving prime Environmentally Sensitive Areas (ESAs) and countryside lands and maintaining the Region’s economic competitiveness.

• The investment in RT needs to be communicated as a component of a wider regional initiative to manage growth and increase competitiveness.

• Waiting to implement rapid transit or deferring in favour of the Business as Usual (BAU) option is not a viable alternative and will inhibit the Region’s ability to meet intensification objectives and jeopardize the countryside line. Without improved connectivity and competitive alternatives to the private car for travel, the Region’s economic attractiveness and competitiveness will suffer due to increased congestion. The implications of this need to be clearly articulated and presented to members of the public and council so that the “value” of an investment in RT is understood.

b) Of the RT alternatives, LRT is the most appropriate technology to serve the Region.

• Of the two RT options, LRT has greater capacity, higher ridership development potential and a greater ability to shape growth and redevelopment patterns to support the Region’s growth management strategy.

Evaluation Criteria

c) Although not a prerequisite for moving forward with RT, as the project moves forward the route should be analyzed to account for the contribution that adding high order transit will have on the evolution of the urban form of the city and how that change contributes towards delivering the original goals and objectives of Rapid Transit. An assessment of development opportunities along the corridor, through station area and area specific plans will help to identify areas with the greatest potential to benefit from RT service and this can in turn inform the detailed design and planning of the route in a positive way.

• The addition of RT along the central transit corridor is seen as a key strategy towards meeting the region’s intensification targets, accommodating employment and residential growth, while minimizing the need for urban expansion and promoting downtown revitalization.

• As it is at the station areas where the greatest change can be expected to occur, station area plans, identifying the potential of each station to accommodate change will need to be completed. Not all areas along the corridor will attract the same levels of development.
and a detailed exploration of the redevelopment potential around each of the station areas will help to identify areas that will benefit most from higher levels of transit service. In the absence of this work, it is difficult to assess the impacts of various options on the redevelopment and intensification of the corridor and to measure those impacts against the costs of various alternatives.

- While there will not be time to complete this work prior to the selection of a preferred alternative, the initiation of corridor-wide and station area planning represents a critical piece of work that should be used to guide the detailed planning and design stages of the project.

d) The panel encourages the Region to understand that LRT will always have greater acceptance among a broader range of potential riders than BRT.

- Experience in other jurisdictions suggests that LRT has the potential to attract riders that would otherwise refuse to take bus transit.
- It is considered that LRT has a greater ability to shape urban form and density towards meeting the Region’s objectives.

e) Using similar land use assumptions to generate ridership in order to assess each of the alternative options has resulted in a very conservative analysis which is likely to have overplayed the attractiveness of some of the options.

- BRT can be expected to result in a lower level of development and job creation. The case for BRT is therefore likely to have been overstated.
- The shorter lengths of LRT combined with sBRT are unlikely to deliver the level of development investment that full provision of LRT would.

f) The evaluation of implementation options should account for the impact of alternatives on the integrity of the wider regional transit network.

- The implications of various implementation options on the delivery and functioning of the wider regional transit network has not been fully factored into the evaluation of the options.
- Options should be presented in terms of their ability to support the Region’s existing and planned transit initiatives.
g) The evaluation of options should take into account the deliverability of each option.
   • An evaluation of deliverability should cover areas such as political/public acceptability, overall costs (capital and operating) and constructability.

Implementation Options

h) The region has explored a full range of implementation options related to the council approved RT plan and staging options.

i) The ability for options to both catalyze new development and support the wider regional transit network should be the key factors in the selection of a preferred option.

j) Of the 10 choices, option L3 (LRT from Conestoga Mall to Fairview Park Mall) has the greatest integrity as a first stage in the implementation of regional RT. This is based on its ability to support the wider network and catalyze redevelopment in and around the two anchoring station areas.
   • Option L3 has the greatest potential to “build success in the first phase of development” by linking key origins and destinations along the corridor and connecting them to key existing anchor points (Conestoga Mall and Fairview Park Mall) within the Regional Transit System.
   • The larger land areas in and around the mall locations increase opportunities for enhancing inter-modal connectivity at these locations linking LRT, aBRT, regional bus and local bus networks. In addition, their location adjacent to the Conestoga Parkway, positions these stations to capture significant park-n-ride activity.
   • The station areas around each of the malls have significant redevelopment opportunity that could be realized through the investment in LRT. This would build on recent and emerging trends in retailing that are increasingly resulting in the redevelopment and intensification of mall properties.
   • Achieving LRT to Fairview Park Mall was viewed by panelists as a prerequisite for the extension of LRT into Cambridge at a future date.
   • To the south, ending the LRT short of Fairview Park Mall (options L1 and L2) would result in a missed opportunity to capture the existing higher density apartments in and around the mall and more significantly, limit the potential for intensification in and around the LRT/aBRT transfer point.
   • To the north, Conestoga Mall represents an important point of access to the transit system for residents north of the City. Ending LRT at Northfield Drive was viewed as a missed opportunity to serve an existing key destination and provide connectivity to the wider transit network.
k) The Business As Usual or Do Nothing option is not a viable option for the Region and should not be considered further.

- BU/1 is more expensive, has greater environmental impact to the community and would compromise the Region’s long term growth and quality of life objectives.

The Ottawa Loop

l) The Ottawa loop is a preferred alternative to a single alignment which would result in significant impacts to properties on one side of Ottawa Street in order to fit the LRT and accommodate the future widening of Ottawa Street.

- The demolition of housing along either side of Ottawa would be disruptive to the neighbourhood in the short term and limit the long-term redevelopment potential of the area.

- The implications of the Ottawa loop need to be understood in the context of a future plan for the area that identifies the extent and nature of change and its relationship to supporting both the LRT and the regional bus network.

m) A second station should be constructed at the south end of the loop to achieve the full potential of the Ottawa Loop as a catalyst for new development and a key transfer point within the regional transit network.

- A second station located to the south of the loop would place the entire Ottawa street corridor within a 5-10 minute walk of the LRT, supporting the area’s mixed use corridor designation and providing access to several large development sites south of the CN spur line and west of Borden.

- Ottawa Street is an important GRT bus and LRT transfer point. As currently configured, the Charles Street station at Borden Avenue requires eastbound LRT users to walk a block to transfer between the GRT bus network. The addition of a new bi-directional LRT station at the intersection of Ottawa Street and the CN Huron Park Spur would improve walking access to LRT and create a consolidated transfer point between GRT Buses and the LRT.

Enhancing integration between transit systems

n) The integration of LRT with other modes of transit at the Terminus locations needs to be resolved within an understanding of the long-term development and place-making potential of each station area.

- The terminus locations need to be understood and planned to be urban places with integrated transit services and development. In this condition, buildings could be used to help bridge the gap and/or enhance connections between services.
5.0 ADDITIONAL MESSAGES

q) The development of a full BRT system with the intent of converting to LRT over time will result in a costly retrofit and loss of ridership during the period of conversion.

• It has been demonstrated that a BRT system will not be able to support projected levels of ridership into the future at which time it will need to be converted to LRT or some other form of RT to maintain level of service.

• The lesson from the cities of Ottawa and Edinburgh is that conversion of BRT to LRT is costly and can be expected to result in loss of ridership that will need to be re-attracted to the system following reconstruction.

• LRT has the ability to increase capacity with minimal disruption through the addition of a 3rd and 4th car over time and increases in service frequency.

r) Further work should be conducted to quantify the true costs and benefits of the RT investment and investigate alternative methods of financing the project.

• It is understood that the envisaged population, household and business growth and subsequent uplift in tax base resulting from an investment in RT has not been included in calculations of tax increase per household. This has resulted in a worst case scenario being presented. The calculation of these impacts may aid political and public understanding of the true cost, and benefits of an investment in LRT.

• The needs of the passenger should be a primary consideration in transit station and terminus planning. Terminus points should connect with the destination or interchange point as seamlessly and conveniently as possible and be designed to provide a high quality passenger environment.

o) The region’s preferred option of an alignment through the Hydro corridor terminating at the current site of the GRT terminal is the preferred option at Fairview Park Mall.

• The ability for the hydro corridor route to facilitate a seamless connection with the aBRT and existing bus network, its potential to connect riders with the mall and its ability to capture the higher density residential uses north of the corridor make the route a preferred choice over the Courland Avenue/Fairway Road alignment.

p) At Conestoga Mall, explore the implications of a side running LRT which would bring the LRT platform adjacent to the bus station and facilitate the integration of the LRT platform with bus facilities.
• An investigation into alternative financing and construction methods such as P3 or design build may identify additional opportunities to finance the project at less impact to the region.

s) The Region should not be surprised, or disheartened, that it is unable to deliver the full LRT system ultimately envisaged from day one.

• All transit systems are built in phases from areas of greatest ridership demand to areas of developing demand. The development of an LRT system in a series of phases, delivered over time and as demand and funding allow, is entirely normal and to be expected.

• Examples which demonstrate this phased approach to the implementation of LRT include Edmonton, Calgary, Vancouver and Portland.

1) Until ridership demand increases in Cambridge, aBRT will provide excellent service, in a financially prudent manner, that is well matched to the developing nature of Cambridge’s transit market.

• Current patterns of land use, including overall lower densities, longer running distances between destinations and the poor pedestrian environment of the Cambridge alignment create challenges to the introduction of LRT in the short term. In addition, ridership analysis indicates that 70% of total ridership will be generated north of Fairview Mall and 30% south.

• It is considered premature to extend LRT to Cambridge until the community increases population and jobs within station areas.

• The Region should continue to work with Cambridge to identify reasonable density and land use targets that would support the introduction of LRT in the future.
APPENDIX 1: THE 10 RAPID TRANSIT IMPLEMENTATION OPTIONS

**OPTION L1**
14km of LRT from Conestoga Mall to Ottawa St.
22km of sbRT from Ottawa St. to Ainslie Bus Terminal

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**OPTION L2**
17km of LRT from Conestoga Mall to Block Line Rd.
19km of sbRT from Block Line Rd. to Ainslie Bus Terminal

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**OPTION L3**
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17km of sbRT from Fairview Park Mall to Ainslie Bus Terminal

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<td>Regional: $318 Million</td>
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APPENDIX 1: THE 10 RAPID TRANSIT IMPLEMENTATION OPTIONS

**OPTION L4** 24km of LRT from Conestoga Mall to Sportsworld Dr. 12km of aBRT from Sportsworld Dr. to Ainslie Bus Terminal

$960 Million

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**OPTION L5** 12km of LRT from Northfield Dr. to Ottawa St. 23km of aBRT from Ottawa St. to Ainslie Bus Terminal

$608 Million

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**OPTION L6** 15km of LRT from Northfield Dr. to Block Line Rd. 19km of aBRT from Block Line Rd. to Ainslie Bus Terminal

$733 Million

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OPTION L7
17 km of LRT from Northfield Dr, Fairview Park Mall
17 km of BRT from Fairview Park Mall to Ainslie Bus Terminal

$773 Million

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OPTION L8
22 km of LRT from Northfield Dr, to Sportsworld Dr.
12 km of BRT from Sportsworld Dr to Ainslie Bus Terminal

$922 Million

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<td>$500 Million</td>
<td>15.6 Million</td>
<td>7.4 Million</td>
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</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>2021 Annual Costs</th>
<th>2021 Riders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11.2 Million</td>
<td>19.3 Million</td>
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OPTION L9
39 km of LRT from St. Jacobs’ Farmers Market to Ainslie Bus Terminal

$1,550 Million

<table>
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<tr>
<th>Province</th>
<th>Federal</th>
<th>2016 Annual Costs</th>
<th>2016 Riders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$500 Million</td>
<td>18.8 Million</td>
<td>8.2 Million</td>
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</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>2021 Annual Costs</th>
<th>2021 Riders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16.6 Million</td>
<td>18.9 Million</td>
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APPENDIX 1: THE 10 RAPID TRANSIT IMPLEMENTATION OPTIONS

OPTION B10  39km of BRT from St. Jacobs' Farmers Market to Ainslie Bus Terminal

<table>
<thead>
<tr>
<th></th>
<th>$702 Million</th>
<th>Annual Costs</th>
<th>Riders #s</th>
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</thead>
<tbody>
<tr>
<td>Provincial</td>
<td>$300 Million</td>
<td>2016: 7.5 Million</td>
<td>2020: 7.5 Million</td>
</tr>
<tr>
<td>Federal</td>
<td>$334 Million</td>
<td>2020: 9.9 Million</td>
<td>2020: 14.5 Million</td>
</tr>
<tr>
<td>Region</td>
<td>$168 Million</td>
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</tbody>
</table>
Map of Option L1 with LRT from Conestoga Mall to Ottawa Street and aBRT from Ottawa Street to the Ainslie Street Transit Terminal
Map of Option L3 with LRT from Conestoga Mall to Fairview Park Mall and aBRT from Fairview Park Mall to Ainslie Street Transit Terminal.
Map of Option L9 with LRT from Conestoga Mall to the Ainslie Street Transit Terminal