



**REGION OF WATERLOO**

**TRANSPORTATION AND ENVIRONMENTAL SERVICES  
Commissioner's Office**

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

**DATE:** May 12, 2009 **FILE CODE:** D10-20/RT

**SUBJECT: RAPID TRANSIT ENVIRONMENTAL ASSESSMENT PHASE 2, STEP 3b –  
PREFERRED RAPID TRANSIT SYSTEM OPTION AND STAGING PLAN  
INFORMATION IN ADVANCE OF PUBLIC CONSULTATION CENTRES**

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**RECOMMENDATION:**

For information.

**SUMMARY:**

The Region of Waterloo continues to plan for significant population and employment growth over the next two decades. The Provincial Growth Plan for the Greater Golden Horseshoe projects the Region's population will increase by 45 per cent to 729,000 people by 2031, and that employment will increase by 44 per cent to 366,000 by 2031.

A rapid transit system has the potential to encourage a more compact urban form, which will help prevent sprawl and protect sensitive environmental landscapes and farmlands from urban encroachment. Rapid transit also provides a sustainable transportation solution to meet our community's future transportation needs.

The Region began the Rapid Transit Environmental Assessment (EA) in 2006 to find the best possible rapid transit system for Waterloo Region. The Rapid Transit Project Team recently completed three years of study and analysis with the conclusion of a Multiple Account Evaluation (MAE).

The MAE measured the benefits and costs of a Light Rail Transit (LRT) system and a Bus Rapid Transit System (BRT). Both systems would travel from St. Jacobs Farmers' Market in north Waterloo to the Ainslie Street Terminal in downtown Cambridge. Two route variations in Waterloo, where the system would follow either King Street, University Avenue and the Region-owned rail spurline from Conestoga Mall to Uptown Waterloo or take the rail spurline from Northfield Drive to Uptown Waterloo, were also considered.

The results of the MAE indicate that:

- LRT delivers the greatest transportation, environmental, land-use and economic development, and social and community benefits to the Region;
- LRT best supports the objectives of the Regional Growth Management Strategy;
- BRT is less expensive, but delivers significantly less benefits;
- The projected ridership and intensification potential along the route is significantly higher in the north (Conestoga Mall to Fairview Park Mall) than in the south;
- BRT would reach capacity around 2030 on the north portion of the route because of operational difficulties associated with high frequency buses;
- Ridership to St. Jacobs Farmers' Market by 2031 is not high enough to support rapid transit; and

- The construction costs for systems are almost evenly split between the north portion of the route and the south portion.

Based on these results, the Project Team concluded that a Light Rail Transit (LRT) system from Conestoga Mall in the City of Waterloo to the Ainslie Street Terminal in the City of Cambridge provides the best long-term, environmentally sustainable solution to help manage our community's future growth and transportation needs.

However, the Project Team is also recommending a staged approach to implementing a full LRT system that would allow the Region to best meet ridership demand and growth potential and provide the greatest balance of costs and benefits for our community. The first stage would include:

- LRT from Conestoga Mall in Waterloo to Fairview Park Mall in Kitchener;
- Adapted Bus Rapid Transit (aBRT) from Fairview Park Mall in Kitchener to Ainslie Street Terminal in downtown Cambridge;
- Re-aligned Grand River Transit (GRT) bus service to provide an expanded level of service to the rapid transit stations along primary feeder corridors;
- Express bus service, modeled after the current iXpress service, to high ridership centres throughout the Region (i.e. Conestoga College); and
- Connections to intercity transit such as GO Bus, GO Train, Greyhound and VIA.

This report summarizes the work completed within the Rapid Transit Environmental Assessment, the complete methodology and results of the MAE and a discussion of the results that lead to the Preferred Rapid Transit System Option and Implementation Staging Plan. It also outlines the scope and schedule of public consultation activities planned for the next three months (including Public Consultation Centres on May 19, 21 and 26), and describes the key next steps in the Rapid Transit Initiative.

## **REPORT:**

### **Background**

Waterloo Region is one of the fastest growing communities in Canada, with a population of more than 500,000, and expected growth to 729,000 within the next 25 years. The Regional Growth Management Strategy (RGMS), adopted by Region of Waterloo Council in 2003, sets out strong and innovative goals for managing growth in urban areas and townships of the Region. It also identifies rapid transit as a key element that will help to shape the future growth of the community.

Rapid transit is also a significant part of the Province's Growth Plan for the Greater Golden Horseshoe. The Plan designates the core areas of the Cities of Cambridge, Kitchener and Waterloo as Urban Growth Centres (UGC's), where much of the anticipated future population and employment growth will be directed. It also calls for the development of a rapid transit system to connect the UGC's to the larger provincial transportation network, and recommends that priority funding be given to infrastructure projects that support an integrated regional transportation system for the movement of people and goods throughout the Greater Golden Horseshoe.

### **Why Rapid Transit**

The Region continues to plan for significant population and employment growth over the next two decades. Both the Regional Growth Management Strategy and the Province's Growth Plan for the Greater Golden Horseshoe identify rapid transit as a key element to help meet future growth and transportation needs.

With little opportunity to add or expand the road networks in our core areas, and an expected increase in population in the Central Transit Corridor alone of 100,000 people, Regional Council chose rapid transit as the most sustainable transportation solution to meet our community's future transportation needs.

Rapid transit also facilitates intensification, which makes it an important tool to help direct development to our urban areas where services like water, sewers, garbage collection and transit already exist. This will help protect our countryside and environmentally sensitive areas from future development.

Rapid transit also benefits the community by:

- Improving air quality by helping to reduce auto use, and therefore greenhouse gas emissions;
- Promoting economic development by attracting job growth and the talented people who contribute to our nationally significant economy;
- Improving public health through the development of more compact urban communities that reduce travel distances and promote pedestrian and cycling activity.

The Region is currently carrying out an Environmental Assessment to find the best possible rapid transit system for Waterloo Region.

### **Environmental Assessment Process**

The Region of Waterloo Rapid Transit Environmental Assessment is a phased process that will help Regional Council and the community to select the rapid transit technology, routes and station locations that will best meet the RGMS goals, as well as the Region's future transportation needs and land-use objectives. A significant component of the Rapid Transit EA involves ongoing consultation with the public and stakeholders throughout each phase and step of the study.

The EA is being conducted in accordance with a Terms of Reference approved by the Ontario Minister of the Environment in July 2005:

*Phase 1:* Evaluation and selection of a preferred transportation system strategy

*Phase 2:* Evaluation of alternative route designs and technologies and the identification of a preferred rapid transit system including station and route locations

*Phase 3:* Preliminary design of the preferred rapid transit system

NOTE: Following completion of Phase 2, Step 3b, the Rapid Transit Initiative will transition into O.Reg 231/08, the new environmental assessment process for transit projects, and seek approval for the project from the Ministry of the Environment under this regulation.

### **Status of the Environmental Assessment Process**

#### **Phase 1 – Completed July 2006**

Phase 1 of the EA determined that Rapid Transit is the preferred transportation strategy for Waterloo Region as compared to expanding the road network or improving conventional transit. Using 15 criteria based on the Regional Growth Management Strategy, the evaluation concluded that Rapid Transit:

- Best achieves the goals of the Regional Growth Management Strategy;

- Is consistent with the Provincial Policy Statement and conforms with the Provincial Places to Grow Growth Plan for the Greater Golden Horseshoe;
- Supports reurbanization objectives, downtown revitalization and innovative urban design;
- Increases transportation choice and transit ridership;
- Is the least expensive form of motorized transportation when considering personal transportation costs;
- Contributes to the Region's countryside protection goal by facilitating reurbanization and reducing the pressure to expand urban boundaries;
- Provides a safe mode of transportation and promotes an active and healthier lifestyle; and
- Utilizes the least amount of land and minimizes the impact on air quality and greenhouse gas emissions.

Two Public Consultation Centres were held on April 5 and 6, 2006, and were attended by 145 individuals. The public feedback from these sessions indicated that the majority who provided comment recognized the Rapid Transit Initiative as the most effective transportation strategy for meeting the Region's RGMS goals and future transportation needs.

Regional Council approved Rapid Transit as the Region's transportation strategy in July 2006.

### **Phase 2 – Steps 1, 2 and 3a**

#### **Step 1 – Completed February 2007:**

Phase 2, Step 1 began with a Public Information Session and Workshop on Sept. 21, 2006 to discuss potential rapid transit destinations, routes and station locations, as well as those characteristics of rapid transit the public feels are most important. More than 140 community members came together to provide ideas.

Using the EA Terms of Reference and the input from the Sept. 21 workshop, the Rapid Transit Project Team developed criteria to evaluate 10 rapid transit technologies and their associated route designs. Based on the results of the evaluation BRT and LRT operating on a mix of on/off road route designs were short-listed because they had the greatest potential to:

- Support the Region's redevelopment and intensification objectives
- Optimize the use of existing off-road routes and serve major destinations using on-road routes
- Be compatible with existing and planned built neighbourhoods

The results of the evaluation, and the recommended short-list of rapid transit technologies and route designs, were presented to the public and stakeholder groups for input at a series of Public Consultation Centres (PCCs) and presentations throughout January 2007. More than 350 community members attended the PCCs and took the opportunity to review the information presented. The majority of those who provided comments agreed with the results of the evaluation and the proposed short list or stated a preference for BRT or LRT.

In February 2007, Regional Council approved BRT and LRT operating on a Mix of On/Off Road route designs as the short list for further evaluation.

#### **Step 2 – Completed February 2008:**

The second step of Phase 2 began in March 2007 with a public workshop to help identify the list of route and station locations alternatives that would be evaluated for both BRT and

LRT that provide the greatest benefits (e.g. reurbanization potential, ridership, travel time savings, ability to serve concentrations of employment) and lowest impacts. More than 450 community members came together to provide ideas, with more than half identifying themselves as property owners along routes. Of those who commented, more than 60 per cent agreed with the proposed route and station locations.

In consultation with the Local Municipalities and the public, the Region finalized a list of 91 route, station location and technology alternatives in the seven segments of the Study Area and began an in-depth evaluation based on 21 different criteria approved in the Terms of Reference by the Ontario Minister of the Environment. These criteria were grouped in four different categories:

- Transportation;
- Social and Culture Environment;
- Natural Environment; and
- Economic Impact

The evaluation resulted in more than 5,000 individual pieces of data using different units of measurement (hectares, dollars, ridership, greenhouse gas emissions). The Project Team used the results to rank each alternative. The results of the ranking demonstrate how each route and technology alternative perform against the other alternatives in the same segment in each of the four broad categories. Those alternatives that provided the greatest benefits and the fewest impacts were ranked highest. For the complete results, please see Appendix A of Report P-08-006.

The rankings were then presented at a series of Public Consultation Centres in January 2008, which were attended by approximately 1,350 people. The majority of public comments received indicated general support for the top ranked route alternatives, a strong preference for light rail transit (LRT) technology over bus rapid transit (BRT) technology, and the importance of servicing core areas and areas of high employment, commercial, retail and institutional land-uses.

### **Step 3a – Completed August 2008**

The rankings of the route and technology options from Step 2, together with public input, were used as input to Step 3a to assemble a short list of complete BRT and LRT system alternatives for the entire study area.

Each system alternative also had a number of different route variations. A field review was conducted along each variation to identify engineering considerations that could pose obstacles to construction or implementation of a final system. The purpose of this review was to look for engineering challenges that could impact the feasibility of the rapid transit system alternatives. Those rapid transit route variations that had multiple challenges or severe constraints considered too great to reasonably overcome were eliminated from further consideration.

The Rapid Transit Project Team presented the details of the technical analysis and the short-listed LRT and BRT system alternatives at a series of three public consultation centres in June 2008.

Approximately 880 people attended the public consultation centres. The majority of public comments received indicated support for the Rapid Transit Initiative and a strong preference for LRT over BRT. In August 2008, the final short list was presented to Regional Council, which included one BRT option and one LRT option. For a complete description of the evaluation results and the short-listed system alternatives, see Appendix A of Report E-08-

054.

**Summary of Public Consultation during the EA process:**

The Region has undertaken extensive consultation with and outreach to the public, agencies, community stakeholders, property owners, and the business community both within and outside of the EA process over the course of the past three years using a variety of formats:

- Rapid Transit newsletters have been sent to more than 250,000 residential and business addresses on four different occasions;
- The Rapid Transit InfoLine (phone), the Rapid Transit InfoBox (e-mail [rtinfo@region.waterloo.on.ca](mailto:rtinfo@region.waterloo.on.ca)) and the Rapid Transit website are advertised widely on all rapid transit related communications and the public is encouraged to contact us with their questions and comments. The Rapid Transit website has an average of approximately 40 to 50 new visitors each day, and the InfoBox has received more than 2,000 e-mails;
- The Rapid Transit Facebook page has 190 Fans: 11 per cent are aged 13 to 17, 40 per cent are aged 18 to 24, and 25 per cent are aged 25 to 34, and 24 per cent are over 35;
- Rapid Transit videos appear on YouTube and the Waterloo Region Record's website;
- There have been 66 newspaper news stories, features, editorials and letters to the editor since the Environmental Assessment began in 2005;
- Approximately 3,500 people have attended 33 Public Consultation Centres (PCCs), Workshops and Focused Consultation events and provided 1,039 official formal comments;
- Information about the Rapid Transit Initiative has also been provided at an additional 63 different public outreach events such as community stakeholder meetings, public events, presentations to groups, and educational displays where attendance was not recorded.

In addition to the various points of public contact conducted within the EA process as described above, the Rapid Transit Project Team has initiated a concurrent outreach program to groups who may be more directly impacted by the implementation of a rapid transit system, including the business community and property owners and tenants located along the proposed short-listed routes.

A Business Outreach Program began in the summer of 2007 and continued again in the summer of 2008. This program was first carried out in July and August 2007 and again from May through August 2008, and consisted of personal visits to all businesses directly along the proposed short-listed rapid transit routes, in addition to those businesses located within a 200-metre radius of proposed rapid transit stations. An effort was made to speak with the owner or manager of each business at each visit, and a comprehensive information package was left with employees if the owner or manager was not present. More than 2,500 businesses were contacted within Cambridge, Kitchener and Waterloo, and the Township of Woolwich.

In an effort to increase awareness of the Rapid Transit EA and facilitate participation in the consultation process on the part of property owners and tenants living and/or working directly adjacent to the short-listed rapid transit routes released in June 2008, staff conducted 12 Focused Public Consultation meetings during the weeks of September 15 and 22. Four sessions were held in each of Waterloo, Kitchener and Cambridge.

Sessions were offered in both the morning and evening to better accommodate the schedules of local business owners. More than 9,500 invitations were mailed to 2,867 property owners and 6,639 residential and business tenants.

## **Phase 2, Step 3b – Underway**

The Region's Rapid Transit Project Team has recently completed the technical analysis for Phase 2, Step 3b of the Rapid Transit Environmental Assessment and have identified a Preferred Rapid Transit System and Implementation Staging Plan.

### **Identification of a Preferred Rapid Transit System**

As part of Phase 2, Step 3b, the Region's consultants completed a Multiple Account Evaluation (MAE) to evaluate the costs and benefits of the rapid transit systems short-listed in Step 3a. The purpose of this evaluation is to determine which rapid transit system would best meet the goals of the Regional Growth Management Strategy and provide the greatest transportation, environmental, land-use and economic development, and social and community benefits to the Region.

### **Rapid Transit System Options**

Waterloo Region's Multiple Account Evaluation was used to evaluate two rapid transit systems – one LRT and one BRT – that were short-listed earlier through the Environmental Assessment process. The Project Team also evaluated two route options for each technology in Waterloo portion of the system. Maps showing the system options and routing variations can be seen in Appendix A and are described below:

- **Light Rail Transit Option:**
  - Beginning at St. Jacobs Farmers' Market, the route would follow King Street to Conestoga Mall. After the mall, the route would either follow the Region-owned rail spurline from Northfield Drive through the Research + Technology Park or follow King Street North, University Avenue and the rail spurline.
  - In Uptown Waterloo, it would split into a one-way system going north on King Street and south on Caroline Street, and along Allen Street to rejoin as a two-way system along King Street;
  - In Downtown Kitchener, the route would split into a one-way system going north on Duke Street and south on Charles Street, and back to a two-way system at Frederick Street;
  - From downtown, the route would follow Charles Street, Ottawa Street, the CN rail right of way, Hayward Avenue, Courtland Boulevard and Fairway Road (or an adjacent Hydro corridor) to the Fairview Park Mall.
  - The LRT option would then take the CPR rail line, Eagle Street, Hespeler Road and Water Street into Downtown Cambridge.
- **Bus Rapid Transit Option:**
  - The BRT Option would follow the same route as the LRT option to Fairview Park Mall.
  - From Fairview Park Mall, the BRT route would follow Highway 8 and 401, using bus by-pass shoulder lanes to avoid congestion, to Hespeler Road and Water Street into Downtown Cambridge.

### **MAE Methodology and Accounts**

The Multiple Account Evaluation process examines the economic costs and benefits of a transportation investment within a series of separate accounts. This type of evaluation considers a broader range of benefits, or metrics, than traditional cost-benefit analysis, and includes aspects of both a traditional cost-benefit analysis and the "triple bottom line" evaluation approach that considers environmental, economic and social drivers.

The Multiple Account Evaluation is currently the approach being used to evaluate transit projects in British Columbia and in the Greater Toronto Area, for projects associated with the Metrolinx Regional Transportation Plan. The Federal Government is also accepting MAE results as the basis for the business case that is required for project funding.

The MAE provides for flexibility in measuring benefits because:

- Quantitative measures of benefits are not restricted to monetized metrics only;
- Benefits that are difficult or impossible to translate into dollars can be considered;
- A relative assessment of the project's impacts on different aspects of the economy and society can be made; and
- A broader and more targeted representation of the project's benefits can be considered by decision makers.

Five accounts were selected for evaluation within the MAE to specifically reflect the objectives of the Regional Growth Management Strategy (RGMS). They are:

- **Direct Project and Transportation Account:** This account evaluated complete capital, and operating and maintenance costs; farebox revenue based on the ridership projections; net yearly operating costs
- **Direct Transportation User Benefits Account:** This account evaluated travel time savings, vehicle operating cost savings, and accident avoidance savings.
- **Environmental Account:** The reduction of Greenhouse Gas Emissions (GhG) and Criteria Air Contaminants (CAC) were evaluated. GhG reductions are reported in tonnes per year for a given year and in terms of a monetary value using a per-tonne dollar value, while CAC emissions reductions are reported in tonnes per year for a given year and in terms of a monetary value using a per-tonne dollar value.
- **Land Use/Economic Development Account**  
This account evaluated:
  - Residential Development – measured as the number of new residents within 600 metres of a proposed rapid transit station
  - Non-Residential Development – measured as the number of new jobs within 600m of a proposed rapid transit station
  - Land Value Uplift – premium on property values resulting from the presence of transit
  - Support to Regional Land Use Objectives – a relative measure of the degree to which the options reflect the Regional Growth Management Strategy's land use objectives
  - Employment Generated – the number of Direct, Indirect, and Induced jobs, produced using an input-output analysis to calculate economic impact of construction for each of the project cases.
  - Taxes Generated – the amount of Federal, Provincial, and Municipal taxes generated by the capital spending associated with the option
- **Social and Community Benefits Account:**  
This account evaluated
  - Public Health Benefits - Air Quality – reduced vehicle kilometres travelled (VKT) and the reduction in hospital admissions
  - Public Health Benefits - Active Transportation – increased use of active transportation

- Community Liveability – the degree to which the system helps to create a more “liveable” urban environment by reducing noise, fumes, and increasing walkability
- Construction Disruption – disruption to existing residences and businesses during construction

### **MAE Results**

Each rapid transit option was evaluated against a Base Case scenario, which assumed a gradual expansion of the existing iXpress bus system. The full results of the MAE evaluation are presented in Appendix B. Below is a summary of the results:

- The LRT option delivers the greatest benefits to the community, and best meets the goals of the Regional Growth Management Strategy;
  - Reduction in GhG emissions by up to 22,260 tonnes per year by 2031 compared to up to 12,210 tonnes per year for BRT
  - Up to 23,000 new jobs to station areas compared to just over 11,500 for BRT
  - Up to \$370 million in increased land-values, compared to up to \$75 million for BRT
  - \$523 million in transportation user benefits, compared to \$360 million for BRT
- 70 per cent of the projected ridership on a rapid transit system in Waterloo Region (between opening day and 2031) is between Conestoga and Fairview Park Malls
- BRT between Conestoga and Fairview Park Malls would be at capacity by 2030 because of the operational difficulties that would result (especially north of downtown Kitchener) with articulated buses running every two to three minutes;
- 74 per cent of the projected development potential is between Conestoga and Fairview Park Malls;
- Ridership to the St. Jacobs Farmers’ Market in 2031 would not be high enough for either BRT or LRT;
- The capital costs associated with each rapid transit system and the route variations in Waterloo are shown in detail in Table 1. In summary:
  - LRT: \$1.3 billion
    - 52 per cent of this cost is for the north portion of the route, 47 per cent for the south
  - BRT: \$559-584 million
    - The cost range reflects the two Waterloo route variations

**Table1. Cost and Revenue Estimates**

<b>Project Costs (2009\$M)</b>		<b>LRT Spurline</b>	<b>LRT King Street</b>	<b>BRT Spurline</b>	<b>BRT King Street</b>
Capital (2014)		1,340	1,320	585	560
	Annual O&M	23.5	23.0	17.0	16.5
Operating (2014)	Annual Revenue	8.5	8.5	7.5	7.5
	Net Operating	14.0	14.5	9.5	9.0
	Annual O&M	29.0	27.5	22.5	21.0
Operating (2031)	Annual Revenue	18.0	17.0	16.0	15.0
	Net Operating	11.0	10.5	6.5	6.0

### Discussion of MAE Results

The MAE analysis demonstrated that LRT has the highest capital and operating costs. However, LRT also deliver significantly higher community benefits compared to the BRT options. The LRT options also best support the objectives of the RGMS.

Given the dual goals of the Rapid Transit Initiative of providing greater transportation choice and efficiency, and promoting intensification in urban areas in order to manage future growth, **the conclusion of the MAE is that LRT provides the best long-term, environmentally sustainable solution to help manage our community's future growth and transportation needs.**

A map showing the preferred rapid transit system can be seen at Appendix C of this report.

### Additional Considerations

Although the MAE results demonstrate that the LRT option using the routing variation on the rail spurline in Waterloo is the best performing system, there are other significant considerations associated with the two route variations in this portion of the system. These include:

- The Spurline option includes a station at University of Waterloo (UW) only, while the King Street option has stations at both UW and Wilfrid Laurier University (WLU)
- Expected development potential is slightly greater along King Street
- Ridership potential is greater for the Spurline option

Due to the fundamental nature of the trade-offs between the two options, a final selection will be deferred to allow for the consideration of public and stakeholder input on the choice between the two route variations.

### **Implementation Staging Plan**

The Project Team also looked at two staged options for implementing rapid transit that would bring the greatest benefits to the community while providing the rapid transit technology that best meets

the ridership potential in different sections of the route.

- Staging Option A - LRT from Conestoga Mall to Fairview Park Mall and BRT from Fairview Park Mall to Ainslie Street Terminal in Cambridge; and
- Staging Option B - LRT from Conestoga Mall to Fairview Park Mall and Adapted BRT (aBRT) from Fairview Park Mall to the Ainslie Street Terminal in Cambridge

Adapted BRT would operate in mixed traffic, but could include operational features typically used in bus rapid transit systems such as HOV or bus lanes, bus by-pass shoulders, queue jumping, signal priority, additional stations, RT buses, automated ticketing, real-time passenger information systems and associated urban design improvements at stations such as streetscaping, bicycle and pedestrian amenities, and connections to intercity transit.

In order to evaluate the performance of the staging options against the short-listed system options and each other, the MAE analysis was completed for each of the staging options. After comparing the benefits and costs of the staging options to the full LRT and BRT options, the Project Team concluded that implementing the system in stages, starting with the LRT/Adapted BRT as the first stage, is the preferred option for the following reasons:

- Best matches the ridership potential with the rapid transit technology to meet future growth and transportation needs of the Region;
  - Provides most of the benefits of a full LRT system at about 60 per cent of the cost
- Provides the best value when considering benefits and costs (The costs and revenues for each staging option are summarized in Table 2 below)
  - Lower capital cost (approximately 11%) and lower annual operating costs (approximately 10%) than the LRT/full BRT staging option;
- Can be implemented faster than the LRT/full BRT option;
- Adapted BRT has the most flexibility to convert to a full LRT system in the future.

To prepare for future stages of the preferred rapid transit system, the Region will also begin the process of buying the land needed to protect key transportation corridors for future LRT expansion, and investigate planning tools and incentives that will help attract the type of intensified development needed to build ridership in the area. The Region will review ridership and demand in the system at regular intervals to determine the best timing to undertake future stages, such as expanding LRT south from Fairview Park Mall.

**Table 2. Cost and Revenue Estimates**

Project Costs (2009\$M)		Staging Option A. LRT/BRT	Staging Option B. LRT/aBRT
Capital (2014)		890	790
	Annual O&M	20.3	18.1
Operating (2014)	Annual Revenue	7.9	7.7
	Net Operating	12.4	10.5
	Annual O&M	23.3	19.8
Operating (2031)	Annual Revenue	16.6	16
	Net Operating	6.7	3.8

### Expert Panel Review

A panel of third party experts in the fields of transportation planning and urban planning and policy development reviewed the fundamental assumptions, methodology and conclusions of the technical work completed as input to the MAE and the MAE itself.

The panelists included:

- **Dr. Jeff Casello:** Assistant Professor at the University of Waterloo, specializing in urban transportation systems, transportation modeling, and transportation and land use impacts, and a member of the Region's Public Advisory Committee for the Regional Growth Management Strategy and Rapid Transit Initiative;
- **George Dark:** A partner at Urban Strategies Inc., a Toronto-based full-service planning and urban design firm, with an expertise in urban designer and landscape architecture.
- **Melanie Hare:** A partner at Urban Strategies Inc., a Toronto-based full-service planning and urban design firm, with an expertise in sustainable urban planning and transit-oriented development;
- **Eric Miller:** Professor at the University of Toronto, Director of the Urban Transportation Research and Advancement Centre, Director of the University of Toronto Cities Centre and Chair of the International Association for Travel Behaviour Research;
- **Glenn Miller:** Director of Education and Research at Canadian Urban Institute, a Toronto-based non-profit organization dedicated to providing solutions to important issues that have an impact on the quality of life in cities, such as land use, growth management, transportation, economic development and sustainable buildings;
- **Glen Murray:** Former Mayor of Winnipeg and chair of the Canadian National Round Table on the Environment and the Economy, currently President of the Canadian Urban Institute;

The Region invited the panel to meet in Waterloo Region on March 31, 2009 to discuss the Region's preferred Rapid Transit option. In advance of the meeting, all panel members were asked to review the results of the studies completed during the Environmental Assessment, including the latest results from the Multiple Account Evaluation.

Panel members were unanimous in their endorsement of Light Rail Transit from Waterloo to Cambridge, as an innovative transportation and urban planning solution that will help Waterloo Region achieve its growth management goals. The panel noted that the Region may have, in fact, underestimated the benefits of LRT:

*"The ability for LRT to catalyze change and focus city-building initiatives over the long term far outweighs the cost difference. LRT should be a long-view project constructed both to take immediate advantage but also as a pre-investment to force positive urban change and economic investment."*

The Panel encouraged the Region and its residents to think of an investment in rapid transit as:

*"a significant first step in the creation of a robust regional and intercity transit system that will extend to, and connect with, Guelph, Hamilton, Pearson Airport, the GTA and beyond."*

The panel commended the Region for the significant amount of solid technical review and analysis completed within the Rapid Transit EA, and noted:

*"This creates a strong foundation to understand the feasibility, range of alternatives and implications of this significant investment in rapid transit for Waterloo Region."*

A summary of additional key comments and recommendations is included in Appendix E of this report.

### **Integration of Rapid Transit with Grand River Transit and Intercity Transit**

A key feature of a Regional rapid transit system will be its ability to connect with and be served by both Grand River Transit (GRT) and Intercity Transit.

As the implementation of the rapid transit system proceeds, key feeder corridors to the rapid transit alignment will be identified and the required service frequencies will be determined. Once the rapid transit system is operational, a re-aligned and expanded GRT system will also be in place to provide circulation outside of the rapid transit alignment and direct frequent connections to rapid transit stations.

It is also envisioned that an expanded express bus network, modeled after the current iXpress service, will operate along prime feeder corridors to service key ridership hubs such as Conestoga College.

In addition, the Region is also working with GO Transit, VIA Rail, Ministry of Transportation Ontario, Transport Canada, Metrolinx and all local Members of Parliament and Members of Provincial Parliament to ensure Waterloo Region is also adequately served by intercity transit. Regional staff is involved in or providing input to the following initiatives:

- Cambridge to Greater Toronto Area Rail Passenger Feasibility Study
- GO Transit Georgetown to Waterloo Region Extension Environmental Assessment:

- Bus service is being reviewed to Waterloo Region with possible implementation in 2009
- Rail Passenger service to Cambridge and Kitchener is also being reviewed
- VIA Rail infrastructure study along the North Mainline to consider additional service in this corridor and is considering investment in the infrastructure in 2009/2010.
- The Greater Toronto and Hamilton Area Regional Transportation Plan, which illustrates “possible” Regional Rail extensions to Cambridge and Kitchener/Waterloo
- High Speed Rail study to review the potential for high speed rail in the Windsor to Quebec City corridor.

### **Upcoming Public Consultation**

The Rapid Transit Project Team is preparing to present the details of the preferred Rapid Transit System and Staged Implementation Plan for public input at a series of three Public Consultation Centres (PCCs) on May 19, 21 and 26, 2009.

The PCCs will be held from 2 to 8 p.m. in three locations:

- Tuesday, May 19, 2009, St. Andrew's Presbyterian Church, 54 Queen St. N., Kitchener
- Thursday, May 21, 2009, The United Kingdom Club, 35 International Village Drive, Cambridge
- Tuesday, May 26, 2009, First United Church, 16 William St., Waterloo

The PCC dates were widely advertised throughout our community in local media, the Regional Rapid Transit website, e-mail, road signs and a newsletter sent via e-mail and mail to all households within the Region.

In addition, the Rapid Transit website at [www.region.waterloo.on.ca/transitea](http://www.region.waterloo.on.ca/transitea) has been enhanced with a consultation portal that will allow the public to:

- Participate in on-line discussions about the Rapid Transit Initiative and the latest study reports and results with other members of the public;
- Get updates on the project through videos and web casts;
- Attend “virtual” public consultation centres; and
- Participate in web-based surveys about rapid transit that will be used to stimulate discussion about upcoming recommendations on the preferred system

Region staff will also have rapid transit displays at three community events:

- Uptown Public Square Opening Ceremony – May 30, 2009 at King Street and Willis Way, Waterloo
- Cambridge Riverfest – June 6, 2009 at Riverbluffs Park, George Street, Cambridge
- K-W Multicultural Festival – June 20 and 21, 2009, Victoria Park, Kitchener

In order to provide additional opportunities for business and property owners along the propose route to ask questions and provide comments, Regional staff will also be hosting three “storefront” locations during the months of June and July at:

- 150 King Street West, Kitchener
- 30 Main Street, Cambridge
- Waterloo location to be determined

Regular office hours will be posted at each location and advertised on the rapid transit website, and sidewalk signs will be used to encourage drop-in visitors. All input gathered at the storefronts will be included as part of the public consultation for the new environmental assessment process.

## **Next Steps**

On June 10, 2009, a public meeting will be held to allow interested parties to provide their comments on the Rapid Transit EA directly to Council. The meeting will be held in the Region's Council Chambers at 150 Frederick Street, Kitchener starting at 6 p.m. No decision will be made at this meeting.

On June 24, 2009, a report incorporating any changes resulting from the most recent public consultation and recommendations for the preferred technology, route and staging option will be presented to Regional Council for consideration. The report will include a recommendation for transition to the Accelerated Transit Environmental Process. If the recommendations are approved by Council it is staff's intention to start the accelerated EA process in July 2009. Details of the accelerated EA process are summarized in Report E-08-070.

Following the immediate next steps the project schedule is as follows:

- Complete Building Canadian Fund Application Fall 2009
- Completion of Accelerated Transit EA & MOE Approval December 2009
- Design 2010
- Procurement 2010-2011
- Contract Award late 2011
- Construction 2012-2014
- Opening 2014

## **Area Municipal Consultation/Coordination**

The Rapid Transit Project Team includes representation from the Cities of Cambridge, Kitchener and Waterloo. Consultation with Area Municipal staff and other Stakeholder Groups continues to be a priority at each step of the EA.

## **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:**

The capital cost of the alternatives being considered range from \$560 million to \$1.3 billion and net operating costs range from \$9 million to \$15 million per year. Both the Federal and Provincial governments have indicated support for the capital cost of a rapid transit project in Waterloo Region. More specifically the province has said:

- June 2007: Move Ontario 2020
  - "The Government of Ontario will fund up to two-thirds of the project costs for Kitchener-Waterloo's rapid transit plan."

- Budget 2008
  - “Waterloo Region is one of Ontario’s fastest growing and most innovative communities. The Government is committed to working with its municipal, regional and federal partners to complete technical studies and the environmental assessment for a new rapid transit system and to supporting up to two-thirds of the project costs.”

The federal government has said:

- July 2008: Building Canada Framework Agreement Announcement
  - “The Governments of Canada and Ontario also identified...rapid transit in Kitchener-Waterloo as initial priorities that the two governments will work together on under Building Canada.”

Region staff has initiated discussions with the Federal and Provincial Governments concerning funding of the capital cost of the Rapid Transit project. Staff will be continuing these discussions and making an application under the Building Canada Fund during Summer/Fall 2009. Securing both federal and provincial funding is essential for the Rapid Transit Project to be constructed. As a minimum, the Region will be responsible for paying for ineligible costs (land purchase, internal staff time etc).

Operating costs are the responsibility of the Region of Waterloo. For the June 24, 2009 report to Council staff will be developing potential property rate impacts for the recommended option. These rate changes will be developed for different levels of Regional Capital contribution to the construction of the rapid transit system.

#### **OTHER DEPARTMENT CONSULTATIONS/CONCURRENCE:**

The Rapid Transit Project Team and Steering Committee 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:**

Attachment #1 – Appendix A: Maps of Rapid Transit System Options and Routing Variations  
Attachment #2 – Appendix B: Multiple Account Evaluation (MAE) Results  
Attachment #3 – Appendix C: Map of Preferred System Option  
Attachment #4 – Appendix D: Map of Implementation Staging Plan  
Attachment #5 – Appendix E: Additional Comments and Recommendations from the Expert Panel

**PREPARED BY:** *Thomas Schmidt*, Commissioner of Transportation and Environmental Services

**APPROVED BY:** *Thomas Schmidt*, Commissioner of Transportation and Environmental Services

### Appendix A Maps of the Rapid Transit System Options and Routing Variations Light Rail Transit Option



### Bus Rapid Transit Option



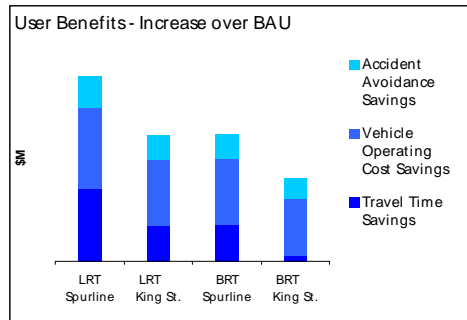
## Appendix B Multiple Account Evaluation Results

# Transportation User Benefits

### Direct Transportation User Benefits Account

Metric	Unit	LRT Spurline	LRT King St.	BRT Spurline	BRT King St.
Travel Time Savings	Minutes, AM Peak Hr, 2031	42,234	21,537	22,104	6,555
Travel Time Savings	\$M (NPV)	\$203	\$99	\$102	\$16
Vehicle Operating Cost Savings	\$M (NPV)	\$232	\$187	\$187	\$158
Accident Avoidance Savings	\$M (NPV)	\$88	\$70	\$71	\$60
<b>Summary Metric: NPV of Annual Benefits</b>	<b>\$M (NPV)</b>	<b>\$523</b>	<b>\$356</b>	<b>\$360</b>	<b>\$233</b>

- Incremental travel time savings clearly strongest for LRT Spurline option
- LRT King St. does not perform as well as BRT Spurline (delays on King St, lower ridership)
- Vehicle operating cost savings and accident avoidance savings strong in LRT Spurline option, marginal difference among LRT King St, BRT Spurline option
- Overall, LRT Spurline provides highest total user benefits; but BRT provides higher benefits per dollar spent



**NOTE: ALL RESULTS SHOWN ARE INCREMENTAL TO THE "BUSINESS AS USUAL CASE" (GRADUAL EXPANSION OF THE IXPRESS SERVICE).**



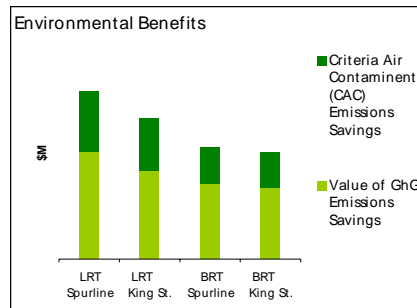
Waterloo Rapid Transit EA  
Evaluation of Economic Benefits

# Environmental Benefits

### Environmental Account

Metric	Unit	LRT Spurline	LRT King St.	BRT Spurline	BRT King St.
GhG Emissions Savings	Tonnes/Year, 2031	22,260	17,780	12,210	11,280
Value of GhG Emissions Savings	\$M (NPV)	\$12.4	\$10.2	\$8.8	\$8.3
Criteria Air Contaminants (CAC) Emissions Savings	Tonnes/Year, 2031	690	440	350	200
Criteria Air Contaminants (CAC) Emissions Savings	\$M (NPV)	\$7.0	\$6.1	\$4.1	\$4.0
<b>Summary Metric: NPV of Annual Benefits</b>	<b>\$M (NPV)</b>	<b>\$19.4</b>	<b>\$16.3</b>	<b>\$12.9</b>	<b>\$12.4</b>

- Incremental emission reductions again strongest for LRT options, particularly with CAC's
- LRT Spurline performs stronger than LRT King St. due to higher ridership, lower congestion impacts on existing roadways
- Overall, BRT has slightly higher benefits per dollar spent, but has lower overall benefits than LRT



**NOTE: ALL RESULTS SHOWN ARE INCREMENTAL TO THE "BUSINESS AS USUAL CASE" (GRADUAL EXPANSION OF THE IXPRESS SERVICE).**



Waterloo Rapid Transit EA  
Evaluation of Economic Benefits

## Land Use/Economic Development Account

### Land Use/Economic Development Account

Metric	Unit	LRT	LRT	BRT	BRT
		Spurline	King St.	Spurline	King St.
Residential Development (Incremental)	Pop'n within 600m	16,532	16,834	8,051	7,524
Non-Residential Development (Incremental)	Jobs within 600m	21,458	23,078	10,277	10,732
Land Value Uplift (Incremental)	\$M - Premium	\$361.1	\$370.8	\$73.7	\$74.8
Support to Regional Land Use Objectives	Qualitative	●	●	○	○
Employment Generated (Incremental)	Jobs	9255	9174	4362	4223
Taxes Generated (Incremental)	\$M (NPV)	\$396.8	\$392.2	\$186.1	\$180.0

**NOTE: ALL RESULTS SHOWN ARE INCREMENTAL TO THE "BUSINESS AS USUAL CASE" (GRADUAL EXPANSION OF THE IXPRESS SERVICE). THERE WILL BE CONSIDERABLE INTENSIFICATION IN THE BAU CASE.**

- Important to note that while LRT is anticipated to support more intensification, considerable intensification is forecast to occur even in the BAU case. Transit "tops up" intensification by the amounts shown above.
- Residential and employment intensification strongest in LRT options; LRT King Street performs slightly better than LRT Spurline due to routing
- Land value uplift strongest in LRT options
- Jobs and taxes generated through capital spending is a measure of employment generated by the construction of the option (direct - construction, indirect, imputed employment)



Waterloo Rapid Transit EA  
Evaluation of Economic Benefits

## Social and Community Benefit Account

### Social and Community Benefit Account

Metric	Unit	LRT	LRT	BRT	BRT
		Spurline	King St.	Spurline	King St.
Public Health - Air Quality	Hospital Visits Avoided	61	49	35	31
Public Health - Air Quality - Economic Impact	\$M (NPV)	\$16.6	\$13.5	\$9.7	\$8.7
Public Health - Active Transportation	Qualitative	●	●	●	○
Community Liveability	Qualitative	●	●	○	○
Construction Disruption	Qualitative	●	●	●	●

- Hospital admissions avoided strongest in LRT Spurline option; function of reduced emissions
- All options promote active transportation, but strongest performance is where land use promotes more biking, walking)
- Impact of LRT technology on communities considered better than BRT;
  - technology is more conducive to producing attractive urban environments as noise, fumes reduced
  - stronger support for transit oriented development

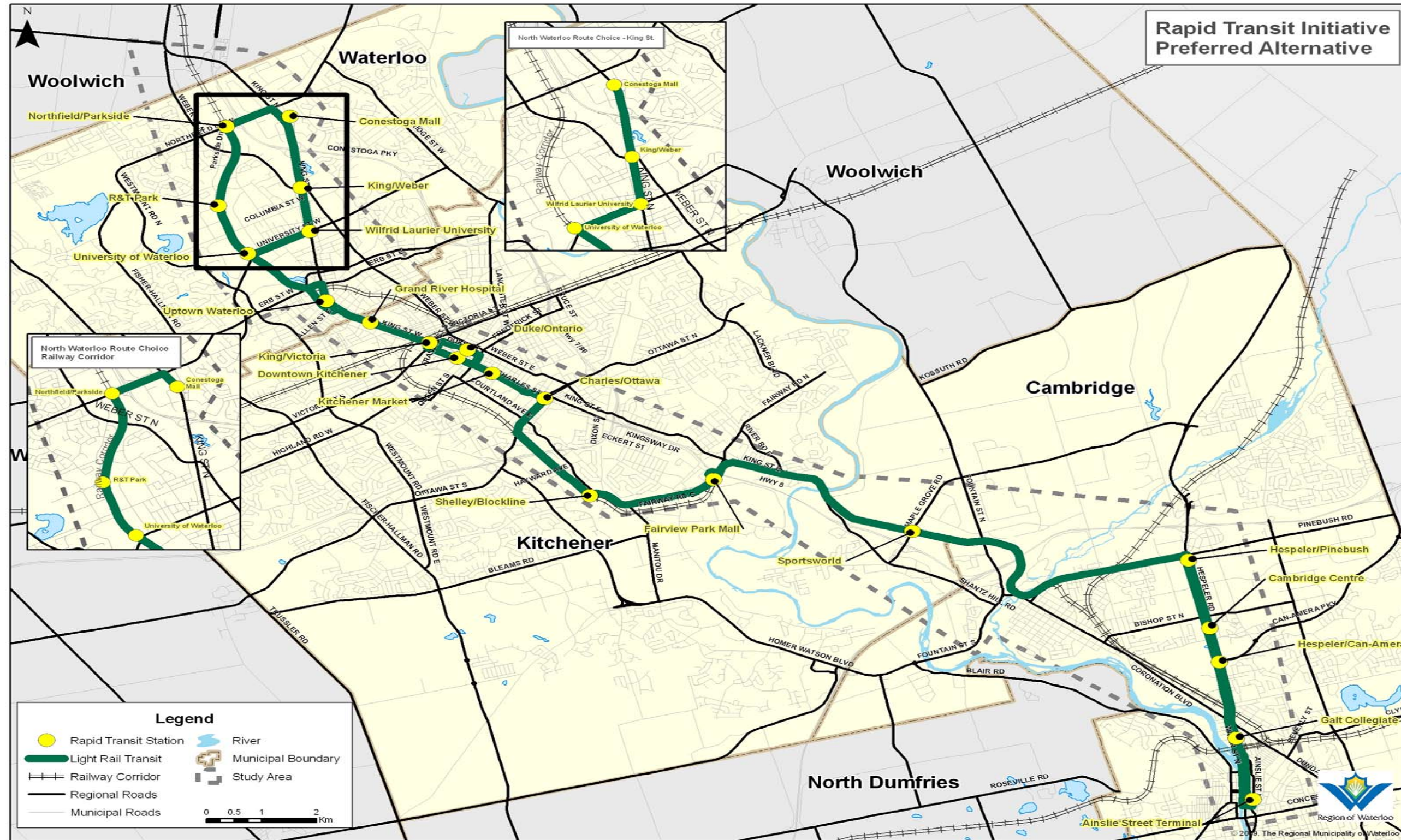
- Strongly supportive
- Moderately supportive
- Weakly supportive

**NOTE: ALL RESULTS SHOWN ARE INCREMENTAL TO THE "BUSINESS AS USUAL CASE" (GRADUAL EXPANSION OF THE IXPRESS SERVICE).**

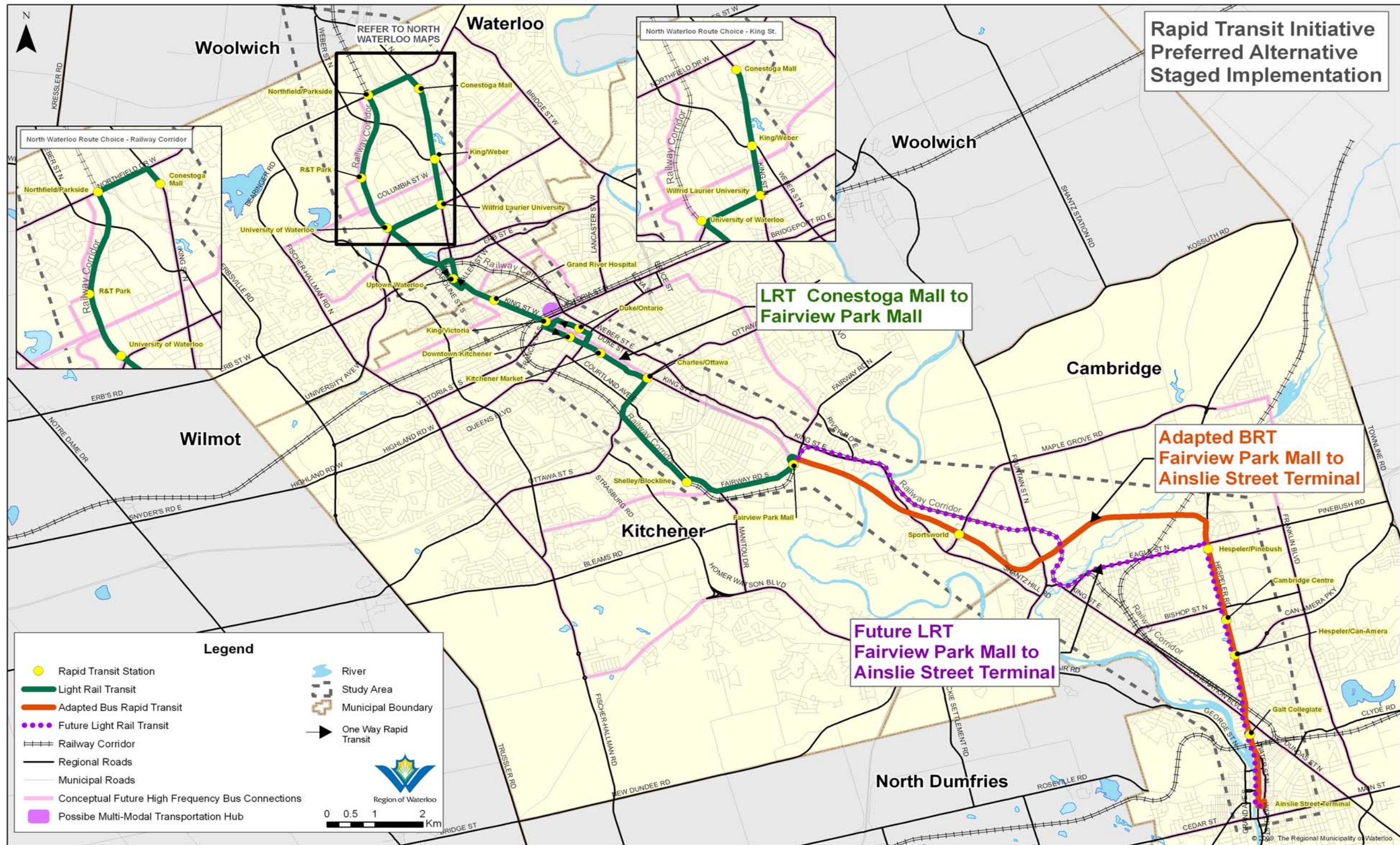


Waterloo Rapid Transit EA  
Evaluation of Economic Benefits

### Appendix C Map of Preferred Rapid Transit System Option



### Appendix D Map of Implementation Staging Plan



## Appendix E

### Additional Comments and Recommendations from the Expert Panel

- The Transportation Account should be expanded in order to take into consideration the full impacts of RT with respect to: auto ownership, the ability to foster active forms of mobility, the impact of issues such as intersection delays on transit use or the potential for the emergence of a more intensified urban environment to contribute to a change in movement patterns.
- The system being considered is expected to serve the Region for the very long term - perhaps the century. Given the permanence and magnitude of investment, the panel strongly advocates that short-term considerations such as difficult traffic engineering challenges or utility relocations should not dictate the RT alignment. Further, the panel recognizes that some short to mid-term automobile capacity reductions (or more generally auto disincentives) are desirable to fully achieve the goals of the RT investment.
- The economic account is too “cost” focused and does not account for the long-term return on investment in RT. These include the implications of dispersion or intensification on city finances, the potential to capture new investments taxes and the value of “city-building” initiatives along the corridor.
- It was agreed that the RT system should not extend to the Farmers Market.
- The relative weighting given to the impact of construction disruption should be minimized, as the magnitude of the negative impact is greatly overshadowed by the long term rewards of the project.
- The greater potential for reurbanization associated for LRT was not adequately reflected in the modelling and that this was biasing the results. The PLUM allocations seem to spread the regional growth evenly across the corridor not referencing the desirable nature of location to real estate development, resulting in a more conservative estimate of ridership potential and benefits.
- The environmental account should be expanded to consider not only new emissions but also the potential for the RT alternatives to facilitate more proactive environmental initiatives such as operation through renewable resources, a reduction in energy consumption, investment in alternative energy or the potential for district energy.
- The LRT should be a long view project constructed both to take immediate advantage but also as a pre-investment to force positive urban change and economic investment.
- The preferred Cambridge alignment along Hespeler Road does not have the same city-building and regeneration potential of an alignment directly linking the historic cores of Preston and Galt. It is felt that in practice, reurbanization of such an auto-oriented strip would be difficult and long-term at best.
- The Waterloo Spur alternatives should not be treated as opposing alternatives but as an operations issue which should be seeking to serve both corridors over the long-term. As currently structured, the alternatives create a fundamental choice between a more “hidden” LRT system and one that is open and public along the King Street alignment. There was concern that the physical environment and walking distances in the R&T Park were not currently supportive of transit use, whereas the King Street alignment had the potential to contribute to the ongoing intensification along the corridor and capture ridership from Sir Wilfrid Laurier University. It was noted that if the initial investment were to occur along King Street, a potential branch along the Waterloo Spur could be created at anytime in the future and that this could be tied to development within the R&T Park.