

CITY OF HAMILTON

***PUBLIC WORKS DEPARTMENT
Capital Planning & Implementation Division***

Report to: Chair and Members Public Works Committee	Submitted by: Scott Stewart, C.E.T. General Manager Public Works Department
Date: September 12, 2008	Prepared by: Lisa Zinkewich Extension 1473 Jillian Stephen Extension 6392

SUBJECT: Rapid Transit Feasibility Study - Phase 2 (PW08043c) - (City Wide)

RECOMMENDATION:

- (a) That report PW08043c be received for information purposes.
- (b) That the General Manager, Public Works be authorized to and provide a copy of report PW08043c to the Metrolinx CAO and Chair of the Metrolinx Board for their information and consideration in the development of the final Regional Transportation Plan, Investment Strategy and 2009 – 2013 (5-year) Capital Budget.

Scott Stewart, C.E.T.
General Manager
Public Works

EXECUTIVE SUMMARY:

In June 2007, the Province of Ontario released their MoveOntario 2020 plan. This plan, which included the identification of two City of Hamilton corridors, is a \$17.5 billion plan for rapid transit in the Greater Toronto and Hamilton Area (GTHA).

This announcement allowed Hamilton to accelerate rapid transit planning and to seriously consider Light Rail Transit (LRT).

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In November 2007, the Rapid Transit Feasibility Study (RTFS) was initiated. This study identified that either Bus Rapid Transit (BRT) or LRT could be implemented on the A-Line and B-Line, but that there were some constraints that required further investigation.

Two previous Staff Reports and an Information Report submitted to Council have provided additional background on the Transportation Master Plan, MoveOntario 2020, the findings of the Rapid Transit Feasibility Study, and the results of public consultation undertaken to date. Phase 2 of the Rapid Transit Feasibility Study, which has been in progress since the approval of PW08043a in June 2008, has focused on LRT, with a review of the potential to use the Claremont Access for LRT, the impact of lane reductions, a staging analysis evaluation and the preparation of the Terms of Reference for future studies and functional designs.

Phase 2 of the Rapid Transit Feasibility Study has determined that it is technically feasible to use the Claremont Access to address the constraint of the grade of James Mountain Road. It would likely be more economical to use the Claremont Access as well. However, there is not enough demand along this route to warrant frequent LRT service, and key nodes including St. Joseph's Healthcare (James Street North and St. Joseph's Drive site) and the Hunter Street GO Terminal would be missed. Additional analysis is recommended prior to determining either a preferred rapid transit corridor or a preferred rapid transit vehicle for the A-Line.

The preliminary staging evaluation suggests that overall the east/west corridor (B-Line) would be the best initial investment in terms of its cost effectiveness, providing the highest return in terms of transit mobility. With a maintenance facility in the north end (technically preferred option), the connection of the facility to the east/west corridor, along the A-Line, would be required and cost effective.

Staff has also undertaken a review of the potential for economic spinoffs of an LRT system through internet research, as well as through conference calls with various North American municipalities. Key points from this review include:

The implementation of LRT has great potential to influence urban growth and revitalize a city's central area.

LRT can strengthen existing neighbourhoods, rejuvenate declining areas and also attract new clusters of development around station sites, and has its strongest development potential in a city's downtown area, revitalizing downtown cores.

Appropriate land use policies are required to optimize the return on the investment for developments along the LRT corridor. The implementation of the LRT system is not just about a new transit system, but rather creating a synergy with the City as a whole.

LRT can also assist with increasing population and employment densities adjacent to the line and specifically in the vicinity of the LRT stations (reflective of the nodes and corridors land use planning concepts developed through GRIDS).

The effect of Light Rail Transit on land values can develop as soon as the decision to move forward with the implementation of a system is announced, before the system is actually built.

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Planning of an LRT system should not be done in isolation. Planning policies, engineering principles, economic development and tourism must continue to be involved in the process.

Indirect benefits such as increased property taxes and direct benefits such as public-private partnerships or betterment taxes translate into revenues for the municipal sector. When this is coupled with provincial and federal investment in capital, light rail is a feasible transit option.

Light rail and transit oriented development, aid in transportation demand management, including reduction of car travel trips and increased transit ridership.

Light rail and its relationship with air quality and environmental sustainability can have a significant impact on health and lead to a reduction in health care spending and mitigation of the effects of climate change.

Staff and City Officials also recently returned from site visits to Calgary Alberta, Charlotte North Carolina and Portland Oregon. These visits included meetings with City Officials involved in decision making around LRT, planning, engineering and economic development staff and the opportunity to ride the LRT and visit maintenance and operational facilities. In addition, participants gained valuable information in regards to how the systems were planned in order to maximize the economic potential of LRT, how to build communities around the system and in particular around the station, what policies need to be in place and the importance of cross-departmental collaboration. It was made clear that with the development of GRIDS and the Transportation Master Plan, the public consultation done to date and the on-going collaboration between City departments in regards to the undertaking of the Rapid Transit Feasibility Study, the City of Hamilton is on the right track.

The rapid transit investigations undertaken to date and the proposed future work are supported by Provincial policies including the Metrolinx Regional Transportation Plan process and Places to Grow, Municipal policies including the Hamilton Transportation Master Plan and GRIDS, and the Public Works Strategic Plan.

Although much of the planning support rapid transit in Hamilton, the magnitude of the decisions Council is making in regards to Rapid Transit is clearly understood and staff have attempted to ensure that information available is presented in a clear, concise and timely manner, however as a result of Provincial timelines, which impact the potential funding for rapid transit projects in Hamilton, it has been made clear by Metrolinx that Provincial project priorities, will in part, depend on projects that have strong political support and that can be completed under aggressive timelines. Rapid Transit Team Staff are dedicated, from a technical standpoint and subject to Council approval at a future date, of making rapid transit in Hamilton happen with an anticipated ground breaking scheduled for Spring 2011, subject to Provincial and Federal funding commitments through the MoveOntario 2020 plan.

BACKGROUND:

In June 2007, the Province of Ontario released their MoveOntario 2020 plan. This plan, which included the identification of two City of Hamilton corridors, is a \$17.5 billion (2/3 Provincial funding, 1/3 Federal funding) plan for rapid transit in the Greater Toronto and Hamilton Area (GTHA).

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This announcement allowed Hamilton to accelerate rapid transit planning in our community. Previously, when the Hamilton Transportation Master Plan (HTMP) was endorsed by Council in February 2007, it was envisioned that Bus Rapid Transit (BRT) lines would be used in Hamilton, with the potential to move to Light Rail Transit (LRT) in the long term. At the time that the HTMP was completed, Provincial and Federal funding at the levels indicated in MoveOntario 2020 were not anticipated.

In November 2007, as a result of the MoveOntario 2020 announcement, Public Works staff, together with Planning and Economic Development staff, initiated a Rapid Transit Feasibility Study (RTFS) to review the constraints and opportunities for the development of either a BRT or LRT higher order transit system in the City of Hamilton.

The Rapid Transit Feasibility Study, which focused on the existing B-line and the proposed A-line corridors identified as part of the MoveOntario 2020 announcement, investigated the major considerations in route selection including such things as land use, existing transit service, rights of way (widths, users, infrastructure [surface and subsurface], construction impacts), timing, signal priority, dedicated lanes, as well as an analysis of the feasibility and requirements for the implementation of a rapid transit system to assist in the determination of the type of technology, Light Rail Transit or Bus Rapid Transit that should ultimately be implemented.

The Rapid Transit Feasibility Study was meant to be a starting point in the discussions about the type of rapid transit to pursue for Hamilton, and not a detailed analysis of alternative routes or exact design details. Class Environmental Assessments will still need to be completed, once the decision of whether to use LRT, BRT, or a combination of both, is made, and alternatives for design and routing will be examined at that stage.

The above was all presented in Staff Report PW08043, which was presented to Public Work Committee on April 14, 2008 and was approved at Council on April 23, 2008 and in Staff Report PW08043a, which was presented to Public Works Committee on June 16, 2008 and approved at Council on June 25, 2008. Information Report PW08043b was submitted to Public Works Committee on September 15, 2008 and will be received at Council on September 24, 2008. In addition to providing additional background on the Transportation Master Plan, MoveOntario 2020 and the findings of the Rapid Transit Feasibility Study, the Staff and Information Reports also outlined the initial results of public consultation and recommended that staff not only continue with public consultation, but that Phase 2 of the Rapid Transit Feasibility Study look at means to address the constraints identified as part of Phase 1. It was also recommended that Phase 2 focus on LRT. The support for rapid transit and more specifically LRT was clearly evident by the more than 1300 additional responses received on the rapid transit initiative (totalling more than 1600 responses to date) and representation from each Hamilton ward was sought and received. As of August 2008, the support for rapid transit in general is 94%. The results can be further broken down by support for each mode, resulting in 66% for Light Rail Transit and only 8% for Bus Rapid Transit. 20% supported either mode and 6% did not support rapid transit in any form.

A chronology of key dates and events is detailed in Table 1 of this report.

Table 1: Chronology of Events

EVENT	DATE	OUTCOME
Transportation Master Plan (TMP)	February 2007	- Rapid Transit in the form of BRT endorsed by Council along three (3) City of Hamilton Corridors with long term vision of LRT
MoveOntario 2020 Plan	June 2007	- \$17.5 billion plan for Rapid Transit in the GTHA, including two (2) corridors in Hamilton that had previously been identified in the TMP.
Rapid Transit Feasibility Study (RTFS) (Phase 1)	November 2007 - May 2008	- Study to investigate the major considerations in route selection, technology (LRT or BRT) and the identification of opportunities and constraints of each type of system. - Discussions with the Province (Metrolinx) in regards to MoveOntario 2020 and what this means for Hamilton.
Public Works Committee / Council	April 14 / April 25 2008	- Staff Report PW08043 endorsed. - Recommendation approved to release findings of the RTFS to the public and initiate public consultation.
Public Consultation (Phase 1)	April - June 2008	- Participation in Hamilton Light Rail Workshop on May 1 - Public Information Centres (PICs) held May 6 and May 8. - Extensive media coverage (print, radio and TV) - Stakeholder consultation (Chamber of Commerce, Hamilton Burlington Real Estate Association, BIA's, Hamilton International Airport etc)
Public Works Committee / Council	June 16 / June 25 2008	- Staff Report PW08043a endorsed. - Recommendation to continue with Phase 2 of the RTFS with focus on LRT, continued public consultation and continued communication with Metrolinx in regards to their proposed 5-year Capital Budget (Nov 2008).
Rapid Transit Feasibility Study (Phase 2)	June – September 2008	- Study to investigate alternatives to using James Mountain Road, focus on LRT, project priorities and staging. - Preliminary economic review of other municipalities and system development research. - Discussions with the Province (Metrolinx) in regards to MoveOntario 2020 and what this means for Hamilton.
Public Consultation (Phase 2)	June – September 2008	- Extensive outreach using the media for solicitation of public input (print and radio); surveys made available on-line, and at public offices, municipal service centres and public facilities. - June 2008 Newsletter Update to mailing list - Lunch & Learn Sessions (July 24 & July 25) - Lunch Public Information Sessions (July 28) - Attendance at Community Events and Fairs - Stakeholder consultation (HHHBA, Eastgate Square, Lime Ridge Mall, St. Joseph's Health Care, BIA's, Hamilton Roundtable for Poverty Reduction) - Continued media coverage (print, radio, TV)
Rapid Transit Road Trip	September 2 – September 5 2008	- Rapid Transit Study Team and City Officials visit Charlotte North Carolina, Portland Oregon & Calgary Alberta
Public Works Committee / Council	September 15 / September 17 2008	- Information Report on Public Consultation - received
Metrolinx	September 26 2008	- draft RTP and draft Investment Strategy released
Public Works Committee / Council	October 6 / October 15 2008	Today

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Throughout the course of this process, through individual meetings with Councillors and through Public Works Committee and Council question periods, a number of questions have been asked of staff that to date, given the stage of the process, staff have been unable to answer in detail. Some of these questions have included:

- 1 Need for lane reduction and impact on vehicle travel across the City Of Hamilton
- 2 True costs as they relate to both operating and capital. Concern with lack of concrete financial details.
- 3 How much funding is the Province and the Federal Government committing? How will Hamilton ultimately fund?
- 4 Quantification of economic benefits for Hamilton and social costs
- 5 What does the public support, not just transit enthusiasts
- 6 Chicken/egg theory in regards to provision of transit (i.e. to Airport)

Although this report attempts to address these questions, it is necessary to understand that where the rapid transit initiative is in terms of process restricts the detailed amount of information that is available. This is not to say that staff will not provide the details required during the appropriate stage for Council's approval, but rather without undertaking more detailed and technical analysis through studies that would take a year or so to complete, it is impossible to understand the true impacts of the proposed Rapid Transit initiative.

The magnitude of the decisions Council is making in regards to Rapid Transit is clearly understood and staff have attempted to ensure that information available is presented in a clear, concise and timely manner, however as a result of Provincial timelines, which impact the potential funding for rapid transit projects in Hamilton, it has been made clear by Metrolinx that Provincial project priorities, will in part, depend on projects that have strong political support and that can be completed under aggressive timelines. Rapid Transit Team Staff are dedicated, from a technical standpoint and subject to Council approval at a future date, of making rapid transit in Hamilton happen with an anticipated ground breaking scheduled for Spring 2011, subject to Provincial and Federal funding commitments through the MoveOntario 2020 plan.

ANALYSIS/RATIONALE:

Rapid Transit Feasibility Study – Phase 2

In order to further review the opportunities and constraints of implementing rapid transit in Hamilton along the proposed A-Line and B-Line Phase 2 of the Rapid Transit Feasibility Study investigated the following:

- 1 Review of Claremont Access
- 2 Lane Reduction Impact
- 3 Staging Analysis Evaluation
- 4 Preparation of Terms of Reference for future studies and functional design

Terms of Reference

Once a rapid transit project in Hamilton has been identified the Rapid Transit Study Team will focus on the preparation of the Terms of Reference required to undertake the required studies

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that will allow staff to seek authorization for implementation in accordance with the Transit Project Assessment Process outlined under the Transit Projects Regulation 231/08.

The potential assignment will be broken down into 3 phases that will include extensive public and stakeholder consultation and are expected to take approximately 24 months for each corridor (studies may take place concurrently). The 3 phases include:

- 1 Functional Planning & Route Analysis
- 2 Preliminary Design
- 3 Environmental Project Report.

Claremont Access

The Claremont Access has been reviewed in terms of structures and crossings and the suitability of accommodating LRT on this access in order to traverse the escarpment. In general, it has been determined that using the Claremont Access would be feasible from an engineering perspective, with some improvements and widenings required. At a minimum, 2 lanes would be maintained in each direction for vehicular traffic and the West 5th ramp would be required to be restricted to exclusive one-way transit vehicles.

However, there are significant impacts to the overall rapid transit system in terms of utilizing the Claremont Access over James Mountain Road. There would be a significant increase (6 minutes) in route timing and the key nodes of St. Joseph's Healthcare (James Street North and St. Joseph's Drive site) and the Hunter Street GO Terminal would be missed. There is a significant cost to utilizing the Claremont Access in terms of the additional 3.5 km of track required for this alternative routing, as well as costs associated with required widenings, and the loss of potential ridership associated with missing the Hunter Street GO Terminal and St. Joseph's Healthcare. However, this option would be approximately \$100M less to implement than using James Mountain Road as an LRT route.

Lane Reduction Impact

Further review of the impact of losing vehicular travel lanes along the A-line and B-Line corridors was undertaken in part to address concerns related to the reduction of lanes to accommodate rapid transit. This review identified that there are few areas that are truly impacted by the reduction of lanes and that there may be some opportunities for alternative lane configurations, particularly if LRT is the mode of choice as there is less width typically required for LRT over BRT. The area surrounding the downtown would be most constrained, particularly due to pinch points in areas between Highway 403 and downtown.

Specifically in regards to the B-line, the review undertaken reveals that the impact is relatively minor in terms of vehicle displacement and that, given the available capacity on adjacent corridors, there may be further opportunity to investigate full rapid transit lane exclusivity in areas that were previously believed to be more constrained, such as the corridor between the Queenston road traffic circle and Eastgate Square.

In regards to the A-line, particularly where the median transitway concept has been proposed, the system will require elimination of the centre turn lane and median, with all left turns and u-turns occurring at signalized intersections. This is similar to what is being practiced in other

municipalities, regardless of BRT or LRT technologies being implemented. The median transitway will also require some limited property acquisition to achieve the ultimate 36m right of way (ROW) as designated in the Official Plan and where a shift in the alignment is required to avoid heritage properties and cemeteries along this corridor.

The greatest property impacts in terms of maintaining both adequate traffic flow and exclusive transit operations would be along Fennell Avenue between West 5th Street and Upper James Street. This impact would be primarily to the homes located on the south side.

Although this preliminary analysis has positive implications on the ability to accommodate LRT within the identified corridors, staff is continuously aware that the impact of lane reductions and other potential traffic impacts on both the A-line and B-line will be critical to the success of the overall system. The impacts and the ability to accommodate both rapid transit and traditional traffic, cyclists and pedestrians within these same corridors will continue to remain at the forefront of future detailed engineering studies.

Staging Analysis Evaluation

It is assumed that a project of this magnitude (both the A-Line and the B-Line corridors) is unlikely to be funded in its entirety from day one. The objective of the staging analysis is to provide guidance on how to best implement the LRT system to ensure that the greatest value is gained by the community in the shortest time.

In order to do this, the evaluation criteria that have been reviewed include the following:

- 1 Land Use and Economic Development (support and reinforcement of the Official Plan objectives for enhancement of existing development and economic activity and providing a catalyst for promoting the desired reconfiguration of planned development in each corridor);
- 2 Effectiveness of LRT Service as a Transit Service (minimizing capital costs; optimizing on-going operating costs; importance of link connectivity and provision of consistent and reliable service); and
- 3 Impact on the Broader Transportation Network (delay to other traffic, parking and loading impacts).

Table 2 outlines the result of the staging analysis evaluation using the above noted criteria. The corridors were broken down into realistic segments, should the corridors be staged.

Table 2 – Staging Analysis Evaluation

Hamilton Rapid Transit Feasibility Study Staging Analysis Evaluation								
	Land Use and Economic Development		Effectiveness of Transit Service					Impact on Other Traffic
	Development in Place (2021)	Re-development Opportunities	Capital Cost-effectiveness	Operational Cost-effectiveness	Network Connectivity	Connection to Rail Yard	Transit Reliability	
McMaster University Plaza - CBD	●	◐	●	●	◐	◐	◐	○
Eastgate - CBD	●	○	●	●	◐	◐	◐	○
Waterfront - CBD	●	●	◐	◐	○	●	○	◐
CBD - Mohawk College	◐	◐	○	●	●	◐	●	◐
Mohawk College - Rymal Road	◐	●	◐	●	◐	○	●	●
Rymal Road - Airport	○	◐	○	○	○	●	●	●
Mohawk College - Lime Ridge	○	○	◐	●	◐	○	●	●

The staging plan is based on a blend of the evaluation factors with the practical realities of implementation. This includes where the maintenance facility should be constructed and the ability to construct continuous sections.

Realistically, the ability to service the downtown (to and from) is the key to this system, hence suggesting that a location for the maintenance facility in the north end is most desirable from a technical perspective, with the ideal location being in the vicinity of the Stuart CN rail yard. It is important to note that the maintenance facility is something that can be built into the community in a manner that addresses the needs of the surrounding areas, such that the facility itself blends into the adjacent land uses.

The preliminary evaluation suggests that overall the east/west corridor (B-Line) would be the best initial investment in terms of its cost effectiveness, providing the highest return in terms of transit mobility. With a maintenance facility in the north end, the connection of the facility to the east/west corridor, along the A-Line, would be required and cost effective.

In terms of building east of the downtown (to Eastgate) or west of the downtown (to University Plaza), both sections, based on the evaluation are good corridors to invest in first, however in practical terms, it does not make sense to divide the east-west line and build only the east section or the west section since this would introduce a transfer for many people in the central area and significantly reduce the attractiveness of the service. As such, the construction of the entire B-Line corridor is recommended, rather than staging the construction of this line, plus the connection to a maintenance facility in the north end.

Staff is in the process of undertaking an aggressive timing exercise, in collaboration with staff from every City department that would be involved in the Class EA study, which outlines key milestones and studies that would need to be completed prior to constructing the B-Line. It is anticipated that construction, subject to funding and Council approval, could commence in Spring 2011.

A-Line Analysis

Additional analysis is recommended prior to determining either a preferred rapid transit corridor or a preferred rapid transit vehicle for the A-Line. There are opportunities for LRT to be a catalyst for development in the portions of the route between Mohawk College and Rymal Road, but there are limited development opportunities in other sections of the corridor.

On the A-Line, the sections from Downtown to Mohawk College, Mohawk College to Rymal and Mohawk to Lime Ridge Mall all have good ratings for operational cost-effectiveness. The link from Downtown to Mohawk College has poor capital cost-effectiveness, due to the significant costs of crossing the escarpment using the James Mountain Road tunnel alignment.

Service frequencies for LRT on the A-Line would also be low, with 30 minute headways between the Waterfront and Downtown and from Rymal Road to the Airport. The most frequent LRT service is from Downtown to Mohawk College, operating 8 trips an hour. These low frequencies, while reducing operating costs, would have a negative impact on ridership, making the operational cost-effectiveness assessment optimistic for the A-Line.

It is recommended that a more detailed analysis comparing BRT, LRT using James Mountain Road and LRT using the Claremont Access be carried out. The analysis should include ridership potential, costs, service frequency, development potential/impacts, and traffic impacts.

This additional analysis will be considered Phase 3 of the Rapid Transit Feasibility Study, with a focus strictly on the A-line and will continue to move forward in line with the more detailed planning and EA component for the B-line. Subject to funding, it is anticipated that the A-line detailed planning and construction would take place immediately following the completion of the required process to ensure that the B-line is ready for construction in Spring 2011, such that once the B-line is operational, the construction for the A-line would commence.

In addition, as a result of the endorsement of report PW08074 by Council on June 25, 2008, the A-line BRT (lite) will be initiated in fall 2009 in the form similar to the existing B-line service as a result of Metrolinx funding received earlier this year. This new route will serve the key destinations identified as part of the Rapid Transit Feasibility Study, including the Airport, Mohawk College, St. Joseph's Hospital, GO Transit bus and rail station on Hunter Street, the downtown core and ultimately the waterfront. The proposed service will initially operate on limited service hours, but is expected to expand to full 24/7 all day service comparable to the existing B-line. This service will begin to attract new ridership and will aid in the cost effectiveness in constructing the A-line, once some initial ridership along this corridor has been established.

Rapid Transit Road Trip

The Rapid Transit Study Team, along with City Officials also visited Portland, Oregon; Charlotte, North Carolina and Calgary, Alberta during the week of September 2 through 5, 2008. These city visits included meetings with City Officials involved in decision making around LRT, planning, engineering and economic development staff and the opportunity to ride the LRT and visit maintenance and operational facilities. In addition, participants gained valuable information in regards to how the systems were planned in order to maximize the economic potential of LRT, how to build communities around the system and in particular around the station, what policies need to be in place to maximize economic impacts and the importance of cross-departmental collaboration. It was made clear that with the development of GRIDS and the Transportation Master Plan, the public consultation done to date, meeting with key community and business stakeholders and the on-going collaboration between City departments in regards to the undertaking of the Rapid Transit Feasibility Study, the City of Hamilton is on the right track.

It was clearly identified in the all three municipalities that were visited that the public prefers trains, both the avid transit enthusiast, those that are transit riders by choice and those that use transit because they have limited transportation options. The existing LRT ridership in each of the municipalities also far exceeds the expectations of the system and each municipality has additional corridors that are presently being planned for. In many cases the debate between BRT and LRT was had, however although the capital costs are higher, operational costs are generally lower and the total impacts of an LRT system to the community always far exceeded BRT.

Economic Impact of LRT

Given the amount of discussion that has focused on the potential for economic spinoffs of an LRT system, an attempt has been made by staff to quantify the potential benefits of LRT on land values and development. In order to quantify this benefit, staff have undertaken a review of North American cities that have implemented LRT systems, reviewed the impact on urban development within these cities (urban growth, land-use, intensification and revitalization), policies required for successful implementation and the overall impact of LRT on land values. This review was undertaken both through internet research of available material from municipalities that utilize various forms of LRT technologies, as well as through conference calls with municipalities such as Minneapolis and St. Paul Minnesota, the North County Transit District in San Diego, Halifax, Nova Scotia, Kenosha, Wisconsin, Edmonton, Alberta, and Buffalo, New York. Additional conference calls are being arranged with Denver, Colorado and Norfolk, Virginia.

In the case of Hamilton, the recent Economic Summit and resulting agenda looks at “early wins” and a long-term vision to boost the City’s image and continue to foster interest in Hamilton, with growing momentum in the community at large. Rapid Transit was specifically discussed as a goal, which supports the principles of bringing LRT to Hamilton now to be a catalyst to growth, and encourage the continued interest in development in Hamilton.

A summary of some of the economic results can be found in Table 3 and the report Executive Summary is attached as Appendix A. This analysis is not to be confused with the Alternative

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Financing and Procurement (AFP) Workplan that is being developed by Metrolinx as part of the development of the Regional Transportation Plan and their Investment Strategy. The purpose of Metrolinx’s process, is to help decision makers balance the total benefits of a project with it’s cost, so that the right project for the right corridor is eventually recommended for implementation. The purpose of staff’s review was to provide a summary of the economic spin-offs that have been attributed to the implementation of LRT systems in other North American cities only and determine what aspects need to be in place for Hamilton to see similar benefits if LRT systems are constructed in Hamilton.

Table 3 - Summary of LRT and Economic Impacts

Rail System	Impact
<p>Dallas Area Rapid Transit (DART) (Dallas, Texas)</p>	<p>Property values increased by 32% near stations while properties further from the station only increased by 20% (Weinstein & Clower, 2002). Proximity to DART line has become competitive advantage for investors Over \$1.3 Billion in new development</p>
<p>MAX (Portland, Oregon)</p>	<p>Average house values increase at a faster rate closer to stations (Dueker & Bianco, 1999). Starting at 100m, property values decreased by \$32.00 per meter further from the station (Chen et al., 1998). Property value increased \$76/sq ft for every 100 feet closer to stations (Lewis-Workman & Brod, 1997). Value of land located nearer to stations rise with decreasing distance; however, land values increase with distance from tracks in between stations (Knaap et al., 1996). Increase in rents; lower vacancy rates; emergency of retail hubs Over \$2 Billion of development surrounding downtown station areas</p>
<p>Metro (Washington, DC)</p>	<p>Every thousand feet further from a station, the price per square foot of a commercial property decreases \$2.30 (FTA, 2000) Rents decreased 2.5% every 150 m further from the station (Benjamin & Sirmins, 1996).</p>
<p>MetroLink (St. Louis, Missouri)</p>	<p>Property values increased 32% (\$140 every 10 feet closer to the station beginning at 1500 feet) (Garret, 2004).</p>
<p>San Diego Trolley (San Diego, California)</p>	<p>10% - 17% increase in value for multi-family homes (Cervero & Duncan, 2002). Property value increased \$272 every 100 m closer to the station (Landis et al, 1995). Development of new commercial zones next to stations</p>
<p>Santa Clara County LRT (Santa Clara, California)</p>	<p>Within 0.5 Km from a station office space sold for 2 to 5 cents more per square foot than other areas. Office space sold within 0.5 Km of a station was \$5.00 more per square foot in revenue than other areas (Weinberger, 2001, 2000; Cambridge Systematics, 1999).</p>
<p>Denver LRT (Denver, Colorado)</p>	<p>Lower Downtown (LoDo) has been recognized as one of the USA’s most successful new urban neighbourhoods with the implementation of LRT in part due to connectivity to key nodes</p>
<p>C-Train LRT (Calgary, Alberta)</p>	<p>Tool to encourage intensification of densities and land use development along their chosen corridors Development has taken place on most of their former surface lots downtown</p>

Additional highlights of this research include:

The implementation of LRT has great potential to influence urban growth and revitalize a city's central area.

LRT can strengthen existing neighbourhoods, rejuvenate declining areas and also attract new clusters of development around station sites, and has its strongest development potential in a city's downtown area, revitalizing downtown cores.

Appropriate land use and political policies are required to optimize the return on the investment of development and an LRT system. The implementation of the LRT system is not just about a new transit system, but rather creating a synergy with the City as a whole.

Development investments influenced by the implementation of a LRT system can include the creation of new housing, offices and shops. The development of LRT systems has an immediate influence and directs where, how and what kind of growth takes place.

LRT can also assist with increasing population and employment densities adjacent to the line and specifically in the vicinity of the LRT stations (reflective of the nodes and corridors land use planning concepts developed through GRIDS).

The effect of Light Rail Transit on land values is something that can develop as soon as the decision to move forward with the implementation of a system is announced and typically continues through the actual planning of the system where complimentary transit (TOD) land development policies thereby influence land values before any tracks are actually laid.

Many studies indicate that land values increase at LRT station nodes one year before station construction begins or approximately three years after station plans are announced. It was also found that plans for LRT improve the coordination of public and private investments which can improve social welfare with increased investment and direct spending into dedicated transportation infrastructure. As land proximity to stations increases, so does the land value. These higher land values discourage low density development in favour of high density residential and commercial development.

In addition to commercial benefits, local government can benefit from value added effects from light rail such as increased property taxes, benefits assessment programs and joint development initiatives.

Planning of an LRT system should not be done in isolation. Planning policies, engineering principles, economic development and tourism must continue to be involved in the process. The proposed rapid transit lines in Hamilton are linked to major nodes (i.e. Downtown, Hamilton International Airport, Eastgate Square, Limeridge Mall, McMaster, Mohawk College) as well as GO Transit, providing inter-regional connectivity to the rest of the GTHA.

The economic value of light rail should take into account the resultant revenue streams which occur due to increased access, increased land values and public-private partnerships in developments along transit nodes.

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The question of who will pay for new transit systems is a reoccurring concern amongst civic leaders and businesses.

Indirect benefits such as increased property taxes and direct benefits such as public-private partnerships or betterment taxes translate into revenues for the municipal sector. When this is coupled with provincial and federal investment in capital, light rail is a feasible transit option.

Light rail and transit oriented development, aid in transportation demand management, including reduction of car travel trips and increased transit ridership.

Research has clearly shown that although cities that have implemented Bus Rapid Transit instead of Light Rail Transit experience some economic benefits, the impacts are not as significant as the impacts of LRT.

ALTERNATIVES FOR CONSIDERATION:

An alternative to the recommendations of this report would be not to forward this report to Metrolinx for their information and consideration as they continue with their process of preparing the Regional Transportation Plan and Investment Strategy. This alternative is not recommended. Forwarding this report to Metrolinx will ensure that both the Board and Metrolinx staff are aware of Hamilton's readiness to proceed with rapid transit and the desire to be included in their first 5-year Capital Budget.

FINANCIAL/STAFFING/LEGAL IMPLICATIONS:

There are no staffing implications associated with the recommendations of this report.

In consultation with other municipalities, staff has learned that successful rapid transit projects have dedicated Rapid Transit Offices or Special Project Offices. The size of these offices varies from municipality to municipality.

Rapid transit planning is currently undertaken by Strategic Planning staff, with support of Transit, Finance and various sections of Planning and Economic Development. No staff members are dedicated solely to rapid transit initiatives. Depending on the amount of funding received from Metrolinx, the formation of a Rapid Transit Office/Special Projects Office with dedicated staff will be brought forward in a future report to Public Works Committee. If funding is received for one corridor only, it is anticipated that 7 dedicated staff will be required (rapid transit planning, communications and planning/policy analysis), with support from Finance and other staff. If funding is received for multiple corridors, it is anticipated that 10 or more dedicated staff will be required.

Legal Implications

There are no legal implications associated with the recommendations of this report.

POLICIES AFFECTING PROPOSAL:

As previously outlined in staff reports PW08043 and PW08043a, there are a number of significant policies in place that impact the proposal.

Provincial Policies

- 1 *Regional Transportation Plan (RTP)* (draft expected July 2008 has been delayed to September 2008) for the Greater Toronto Hamilton Area (GTHA)
- 2 *MoveOntario 2020*
- 3 *Places to Grow (2007)*

Hamilton Policies

- 1 *Transportation Master Plan (TMP) (2007)*
- 2 *Growth Related Integrated Development Strategy (GRIDS)*
- 3 *Vision 2020*
- 4 *Hamilton Transit Ridership Growth Plan*

The *Public Works Strategic Plan* includes the goal of being a leader in greening our community. By providing sustainable transportation options that reduce dependency on single occupancy vehicles, this goal is achieved.

Light Rail Transit would also advance the work of Clean Air Hamilton and help satisfy the recommendations of the Air Quality and Climate Change Strategic Plan (PED06336a) which recommends LRT as an important component of improving the health of the community and complements the Corporate Energy Policy (PW070127) by displacing vehicles from the roadway and lessening dependence on oil.

RELEVANT CONSULTATION:

There has been a lot of interest in the community since initial discussions regarding Rapid Transit began in April 2008, following the release of the Public Works Committee agenda that included staff report PW08043. Since that time, as a result of the media coverage and community interest, excitement for the initiative has grown and staff have been able to keep the momentum high through the execution of an aggressive communications plan. Staff has been able to maintain an excitement in the community in regards to this initiative and have kept rapid transit at the forefront of discussions.

Following the approval the recommendations of PW08043, which included that staff be authorized and directed to release the findings of the Rapid Transit Feasibility Study for public consultation, staff has been aggressive in attempting to reach out to all residents of the City of Hamilton and solicit their input, including both the general public and stakeholder groups. At present, more that 1600 formal comments on the rapid transit initiative have been received (over a 4 month period extending over the summer).

Staff will continue to move forward with its continued public and stakeholder consultation. Staff has indicated to the public that comments on Rapid Transit are always welcome either through the project website www.hamilton.ca/rapid-transit, direct project e-mail rapidtransit@hamilton.ca or in person.

In addition, consultation on the Rapid Transit Initiative has included the following City Departments, who are in support of this work:

- 1 Public Works (Transit, Capital Planning & Implementation, Energy, Fleet & Facilities , Operations & Maintenance)

- 2 Planning and Economic Development (Development Planning, Community Planning, Downtown and Community Renewal, Strategic Services and Special Projects, Real Estate, Parking and By-law Services)

Public Works has continued to work collaboratively with Planning and Economic Development in this process as the project is of true importance to the City as a whole with great economic potential and has implications to the Nodes and Corridors Policies of the Official Plan, Zoning By-laws and the Urban Structure Plan. There will also be a role for Public Health Services to play, especially in the area of improved air quality as a result of rapid transit implementation. The economic review has strengthened the need for this continued collaboration between internal City departments, stakeholders and the general public. To complement the public consultation done to date as part of Phases 1 and 2 of the Feasibility Study, staff will continue stakeholder and public consultation as part of all future rapid transit studies. Consultation is imperative to the success of the rapid transit initiative and will be an on-going and evolving process with all interested parties, stakeholders and the general public.

CITY STRATEGIC COMMITMENT:

By evaluating the “**Triple Bottom Line**”, (community, environment, economic implications) we can make choices that create value across all three bottom lines, moving us closer to our vision for a sustainable community, and Provincial interests.

Community Well-Being is enhanced. **Yes** **No**

Community well-being is enhanced through the support of increased use of transit and other sustainable modes of transportation. Public health is improved through a reduction in emissions and an increase in active transportation.

Environmental Well-Being is enhanced. **Yes** **No**

A sustainable transportation network provides many options for the movement of people; single-occupancy vehicle-dependency is reduced.

Economic Well-Being is enhanced. **Yes** **No**

Compact, mixed use development minimizes land consumption and servicing costs. Rapid Transit lines can initiate higher levels of economic development.

Does the option you are recommending create value across all three bottom lines?

Yes **No**

Municipal Class EA process by its very nature considers natural, social and economic impact.

Do the options you are recommending make Hamilton a City of choice for high performance public servants? **Yes** **No**

A highly functional and sustainable transit system provides a viable transportation option for those commuting to/from work and has been shown to attract creative and ambitious staff to live and work in the same community.

Appendix A



City of Hamilton
Rapid Transit Office

Economic Development Potential of Light Rail Transit



Peter Topalovic
Danielle Tobey

September 2008
Executive Summary

Strategic Planning
Public Works
City of Hamilton

Executive Summary

Hamilton's historical roots as an electric, industrial and transportation-oriented city make a region well suited for rapid transit, especially when coupled with its growing population, developing economy, redeveloping downtown core and progressive sustainable vision. This paper explores the economic, social and environmental potential of light rail, a component of the city's rapid transit initiative, and performs a comparative analysis with other major North American cities who have successfully implemented the technology. The analysis concentrates on five main areas: urban development, land value effects, health, environment and municipal benefits.

Urban Development and Light Rail Transit

The implementation of light rail transit (LRT) has great potential to influence urban growth and revitalize a city's central area. It can strengthen existing neighbourhoods, rejuvenate declining areas and attract new clusters of development around station sites; however its strongest development potential is in a city's downtown area, revitalizing downtown cores.

Development investments affected by the implementation of a LRT system can include the creation of new housing, offices and shops. Furthermore the development of LRT systems can have an immediate influence in directing where, how and what kind of growth can take place. The implementation of LRT can also assist with increasing population and employment densities adjacent to the line and specifically in the vicinity of LRT stations.

Yet in order to reap these economic development benefits appropriate land use policies must be in place to optimize the return on investment. The implementation of a LRT system is not just about a new transit system, but rather creating a synergy between all City departments including Planning, Engineering, Transit and Economic Development.

Land Values and Light Rail Transit

The effect of light rail transit (LRT) on land values is something that can begin to develop as soon as the decision to move forward with the implementation of a system is announced and typically continues through the actual planning of the system and after the system is in place. Many studies indicate that land values increase at LRT station nodes one year before station construction begins or approximately three years after station plans are announced. It was also found that plans for LRT improve the coordination of public and private investments which can improve social welfare with increased investment and direct spending into dedicated transportation infrastructure. As land proximity to stations increases, so does the land value. These higher land values discourage low density development in favour of high density residential and commercial development.

In addition, local government can benefit from light rail's additional value such as increased property taxes, benefits assessment programs and joint development initiatives. The economic value of light rail should further take into account the resultant revenue streams which occur due to increased access, increased land values and public-private partnerships in

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developments along transit nodes. Indirect benefits such as increased property taxes and direct benefits such as public-private partnerships or betterment taxes translate into revenues for the municipal sector. When this is coupled with provincial and federal investment in capital, light rail is a feasible and desirable transit option. Evidence is provided in table E-1.

Table E1: Summary of LRT and Land Value Effects

Rail System	Property Type	Result – Effect on Land Value
Dallas Area Rapid Transit (DART) (Dallas, Texas)	Assessed Values	<ul style="list-style-type: none"> Property values increased by 32% near stations while properties further from the station only increased by 20% (Weinstein & Clower, 2002).
Eastside MAX (Portland, Oregon)	Sales Prices and Assessed Values	<ul style="list-style-type: none"> Average house values increase at a faster rate closer to stations (Dueker & Bianco, 1999). Starting at 100 m, property values decreased by \$32.00 per meter further from the station (Chen et al., 1998). Property value increased \$76/sq ft for every 100 feet closer to stations (Lewis-Workman & Brod, 1997).
Westside Max (Portland, Oregon)	Residential land values	<ul style="list-style-type: none"> Value of land located nearer to stations rise with decreasing distance; however, land values increase with distance from tracks in between stations (Knaap et al., 1996).
Metro (Washington, DC)	Apartment Rents and Land values	<ul style="list-style-type: none"> Every thousand feet further from a station, the price per square foot of a commercial property decreases \$2.30 (FTA, 2000) Rends decreased 2.5% every 150 m further from the station (Benjamin & Sirmins, 1996).
MetroLink (St. Louis, Missouri)	Sales Prices	<ul style="list-style-type: none"> Property values increased 32% (\$140 every 10 feet closer to the station beginning at 1500 feet) (Garret, 2004).
San Diego Trolley (San Diego, California)	Sales Prices	<ul style="list-style-type: none"> 10% - 17% increase in value for multi-family homes (Cervero & Duncan, 2002). Property value increased \$272 every 100 m closer to the station (Landis et al, 1995).
Santa Clara County LRT (Santa Clara, California)	Commercial Land values	<ul style="list-style-type: none"> Within 0.5 Km from a station office space sold for 2 to 5 cents more per square foot than other areas. Office space sold within 0.5 Km of a station was \$5.00 more per square foot in revenue than other areas (Weinberger, 2001, 2000; Cambridge Systematics, 1999).

(Hess & Almeida, 2006)

Light Rail Transit and its Effect on Health and Environment

Implementing a light rail transit (LRT) system can help achieve goals set forth by transportation demand management policies, including reduction of car travel trips and increased transit ridership. There is a direct correlation between urban sprawl and increased negative health consequences for those living further from the urban centre and those who are dependent on car travel. LRT promotes intensification and pedestrian friendly streetscape

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design therefore curbing sprawl. It also plays an important part in decreasing health care costs related to these health issues caused by poor proximity to transit and reliance on the car.

Light rail transit also has a major role to play in reducing the costs of air pollution due to transportation sources. Its ability to carry large numbers of passengers and cargo, reduce congestion and increase accessibility makes it a lucrative tool for reducing pollution. However, the largest benefit of LRT over other forms of transit such as rapid buses is that LRT is an integral component of transit oriented development, mixed-use land development policies and walkable cityscape designs.

Implementing LRT can help curb the effects of climate change and the negative effects a car centric culture has on the environment. Auto emissions have a large effect on air, water and soil quality. Light rail transit emits less greenhouse gasses, requires less pavement (or no pavement if tracks are placed on semi-permeable surfaces) and lessens a household's dependence on automobiles, especially in sprawl areas. This helps to mitigate the costs and negative externalities that are imposed on the surrounding ecosystem. Furthermore, it can help households reduce the percentage of their income that goes to transportation costs associated with automobile dependence. The environmental, social and economic benefits are highly evident.

While health and environmental effects are hard to quantify, a variety of research has been conducted indicating that the costs of health and environmental effects attributed to the transportation sector are valued in the billions. Table E2 highlights some of this research as it relates to health and air pollution.

Table E2: The Health and Environmental Costs of Transportation Use (in dollars per year)

Health Effects from Automobile Use	Cost	Health Effects from Transportation in Ontario	Cost
Direct costs of obesity (heart disease, premature death, etc.)	\$75 billion (USD)	Premature Deaths	\$5 829
		Hospital Admissions	\$16 807
Indirect Costs of Obesity (chronic illness, loss of work time, etc)	\$1 Trillion (USD)	Emergency Room Visits	\$59 696
		Minor Illnesses	\$29 292 100
Air Pollution Costs	\$2.2 Billion (CDN)		

Municipal Benefits of Light Rail Transit

Implementing light rail transit can have numerous positive effects on the local economy. The external costs of automobile use, such as air pollution and congestion, are proven to negatively impact the economy. A market value which fails to account for externalities does not provide the market with the proper information to base decisions on; which can severely impact natural resources and the economy. If the total costs of car travel were charged to the vehicle owner, the costs of travel would outweigh the benefits, considerably reducing the motorist's willingness to pay. Currently, a significant portion of automobile economic externalities are

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charged to municipalities and tax payers. The use of light rail transit helps to eliminate these externalities by decreasing the need and benefit of auto use, in favour of accessible transit.

Furthermore, servicing populations in the outlying areas of the city with efficient transportation systems such as light rail transit will help lessen dependence on the automobile. Hamilton, like most North American cities, occupies a large area comprised of outlying communities which are disconnected from the downtown core and have limited bus service. This type of urban development increases dependence on the automobile and has negative impacts on the City's downtown core. Controlling the growth in car use, through transit oriented development and light rail networks, can therefore improve the municipal economy by bringing people to the core and revitalizing areas around transit nodes, along rail corridors and in related residential and commercial developments that are near walkable, bikeable, transit connected networks.

Research presented in this analysis indicates that light rail and transit oriented development increase access to municipal, commercial and employment areas. A well planned and convenient transit system has the ability to attract new ridership by improving accessibility. This expanded source of income can help fund the day to day operation of the system and sustain future upgrades and maintenance.

LRT also has a great effect on employment and lifestyle which is part of a larger movement towards smart growth and transit oriented development in city planning and streetscape development. Light rail transit can help satisfy the needs of employers who require access to a large pool of employees and employees who want to live in urban areas that are close to their places of employment. This new and developing trend has made some companies re-evaluate their strategy to build campus-style workplaces on the outskirts of city centres and begin to consider urban offices located within the central business district of a larger municipal centre.

The economic success of the City of Hamilton in the coming years will depend less on its manufacturing base and more on its academic and technical industry, such as the McMaster Innovation Park and biotech industry. The strategies to attract a cultural and creative workforce, which will become a key component to building this new economy, depend on the ability of the City to attract and retain workers and employers. Downtown core renewal, heritage building preservation, smart growth, inner urban area investment, space conversion, park and trail design, efficient rapid transit and growth in the entertainment and tourism sectors are amongst the list of strategies necessary to attract and retain a creative workforce. Hamilton's rapid transit strategy, coupled with development planning will help move the economy into an era of prosperity and civic-oriented lifestyles.

Results of the Analysis

The research on the light rail transit and its possible benefits indicates overwhelming support for the economic, environmental and social benefit of LRT, especially when compared to bus rapid transit. This report recommends that LRT be considered as a viable and desirable transit option; a catalyst for transit oriented, high density, mixed use development; an economically sound investment opportunity, providing a return on investment to property owners, business and the municipality; and a catalyst for social change, improving the health, environment and connectivity of the community.

A graphical summary of this research can help the reader visualize the interconnection between these major research areas in which LRT has the greatest impact. See Figure E1 for a diagrammatic view.

Figure E1 – LRT’s Effect on Development, Health, Environment and the Municipality

