

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: April 1, 2008	Prepared by: Jillian Stephen Extension 6392

**SUBJECT: Rapid Transit Feasibility Study
(PW08043) - (City Wide)**

RECOMMENDATION:

- (a) That the General Manager, Public Works, be authorized and directed to release the findings of the Rapid Transit Feasibility Study for public consultation;
- (b) That upon the completion of the Rapid Transit Feasibility Study public consultation program, the General Manager, Public Works, be authorized and directed to prepare a report to Public Works Committee outlining the findings of the public consultation process.

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

EXECUTIVE SUMMARY:

In February 2007, Public Works Committee and Council endorsed the Hamilton Transportation Master Plan (HTMP). Included in the HTMP was a rapid transit strategy, which included 3 rapid transit corridors:

- King/Main between Eastgate Square and McMaster University
- James/Upper James between Downtown and Rymal Road: and
- An East-West route across the Mountain.

At the time that the HTMP was completed, 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. The June 2007 MoveOntario 2020 announcement has allowed

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for accelerated rapid transit planning in Hamilton. The MoveOntario 2020 funding may also make LRT in the short term more feasible than it appeared in February 2007 when the HTMP was presented to Public Works Committee.

Rapid transit can help reduce single occupancy vehicle use, help achieve HTMP targets of 20% reduction in vehicle kilometres travelled over current trends and of increasing the transit modal share to 15%, and is often credited with being a catalyst to economic development and growth. Significant financial gains could result from the implementation of a rapid transit network in Hamilton. The Metrolink (BRT) system in Halifax, and the LRT system in Portland, Oregon are examples of recently implemented rapid transit systems that have been seen as drivers of economic development in these communities. In Hamilton, it needs to be determined which type (or types) of rapid transit is (are) most appropriate. In determining that, the flexibility of BRT and the permanency of LRT both need to be evaluated.

The Metrolinx (formerly GTTA) Board is charged with implementing the MoveOntario 2020 plan, and has approved Hamilton “quick win” proposals for 6 articulated hybrid buses for the James/Upper James corridor, at a total cost of \$5.5 million; \$17.4 million to be used for 12 new hybrid articulated buses, and for customer waiting areas for the BLine between McMaster University and Eastgate Square; \$6.9 million for passenger amenities on the ALine; and \$3.0 million for GO/VIA platform at James Street North.

Concurrent with the November 2007 Metrolinx Board announcement of “quick win” project approval for the ALine and BLine, Public Works staff initiated a Rapid Transit Feasibility Study (RTFS). The RTFS was to investigate major considerations in rapid transit planning, including such things as land use, existing transit service, rights of way, timing, signal priority, dedicated lanes, and a summary of Class Environmental Assessment requirements, as well as an analysis of the feasibility and requirements for implementation of rapid transit on each route identified in the Hamilton TMP, with a focus on the two routes identified in MoveOntario 2020.

It is important to note that the RTFS provides the general opportunities and constraints with respect to providing rapid transit in Hamilton, and it will allow Public Works Committee and Council to have a clear understanding of opportunities and obstacles prior to determining whether to move forward with rapid transit planning, and what type (or types) of technology (BRT or LRT) is (are) best for Hamilton.

The RTFS contains both overall observations about the opportunities and constraints of providing rapid transit, and a section-by-section breakdown of what each corridor would look like if rapid transit is provided. For the RTFS, it was assumed that the existing right-of-way widths would not be significantly changed, and that the same corridor design would be used for either BRT or LRT. This study was meant to be a starting point in the discussions about the type (or types) of rapid transit to pursue for Hamilton, and not a detailed analysis of alternative routes or exact design details. A Class Environmental Assessment will still need to be completed, once the decision of whether to use LRT or BRT is made, and alternatives for design and routing will be examined at that stage.

The capital costs for BRT are estimated at \$6.5 million/km for one-way streets, and \$9.0 million/km for two-way streets. Providing BRT services along the two identified routes is estimated to have a capital cost of \$900,000 each for new articulated hybrid buses.

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BRT operating costs are in the area of \$80/revenue hour/vehicle. The capital costs of providing LRT are estimated at of \$15 million/km for one-way streets and \$25 million/km for two-way streets, plus \$4 million for each LRT vehicle required. Operating costs are estimated at \$175/revenue hour/vehicle. LRT vehicles can carry approximately double the passengers that BRT vehicles can.

The RTFS has shown that there are some sections in the corridor where it is not possible to provide dedicated lanes for rapid transit without either eliminating on-street parking and loading, or acquiring significant amounts of property. An example of this is the section of Queenston Road/Main Street from Eastgate Square to the Delta. In this section, rapid transit would need to operate in mixed traffic. In other areas, such as the section of King Street between Bay Street and Dundurn Street, rapid transit can be provided in dedicated lanes. In areas such as the portion of Upper James Street from Fennell to the Airport, rapid transit can be provided in a median transit way.

When determining how to provide rapid transit in Hamilton, an evaluation of the benefits of each type of rapid transit will need to be weighed against the constraints. For example, LRT is often thought of as being more permanent than BRT and as being able to provide greater economic spinoffs than BRT. LRT may also attract riders who, for whatever reason, will not commute by bus, helping to reduce single occupancy vehicle trips. However, BRT provides greater flexibility than LRT and has fewer operating constraints, including lower vehicle heights (a constraint for LRT at the TH&B bridge and the pedestrian bridge over King Street at Summers Lane) and the ability to handle the grade of James Mountain Road.

Although the proposed ALine and BLine routes do not run through Wards 6, 10, 12, 14 or 15, this report has City-wide implications because of the magnitude of the decision regarding the provision of rapid transit in Hamilton, and because of future opportunities to provide other rapid transit routes in the longer term.

There is also significant public interest in rapid transit and sustainable transportation in Hamilton, and thus it is proposed to present the Rapid Transit Feasibility Study to the public for their input. Strategic Planning staff will report back to Public Works Committee in June 2008 with the findings of the public consultation process, and for direction from Public Works Committee and Council on the type (or types) of rapid transit to be implemented.

BACKGROUND:

In February 2007, Public Works Committee and Council endorsed the Hamilton Transportation Master Plan (HTMP). Included in the HTMP was a rapid transit strategy, which included 3 rapid transit corridors:

- King/Main between Eastgate Square and McMaster University
- James/Upper James between Downtown and Rymal Road: and
- An East-West route across the Mountain.

At the time that the HTMP was completed, it was envisioned that Bus Rapid Transit (BRT) lines would be used in Hamilton. The BRT lines could be phased such that the network started with a "BRT-lite" version (similar to the existing BLine), and then expanded to full BRT, with the potential to move to Light Rail Transit (LRT) in the long term.

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In June 2007, the Province of Ontario released their MoveOntario 2020 plan. MoveOntario 2020 is a \$17.5 billion plan for rapid transit in the Greater Toronto and Hamilton Area (GTHA), an area that stretches from Hamilton to Durham Region. Fifty-two projects were identified, including 2 that impact Hamilton directly:

- Rapid transit along the King/Main Corridor, between Eastgate Square and McMaster University; and
- Rapid transit along the James/Upper James Corridor between King Street and Rymal Road.

Of the \$17.5 billion, approximately two-thirds of the funding will come from the Province, and the remaining one-third is to come from the Federal Government. In total, there is approximately \$300 million estimated for Hamilton-area rapid transit projects.

At their August 24, 2007 meeting, the GTTA (now Metrolinx) Board approved a Hamilton “quick win” proposal for 6 articulated hybrid buses for the James/Upper James corridor, at a total cost of \$5.5 million. This project will increase service levels on the Downtown-GO terminal - Mohawk College - Airport route by 2009, as a precursor to future rapid transit improvements on Upper James Street. This project has also been approved by the Province in an announcement made in December 2007, although funds have not yet been received. The funding is for capital only; no operating funds were included in this announcement.

Subsequently, at their November 23, 2007 meeting, the GTTA (now Metrolinx) Board approved three additional “quick win” proposals for Hamilton. The first was \$17.4 million to be used for 12 new hybrid articulated buses, and for customer waiting areas for the BLine between McMaster University and Eastgate Square. This project will result in more frequent service, more capacity, and more comfort provided by a dedicated fleet of high-tech, hybrid articulated buses. This is seen as a foundation investment towards ultimate rapid transit on the BLine corridor. The second project includes \$6.9 million for passenger amenities on the ALine. This will build on \$5.5 million “quick win” commitment for 6 new articulated hybrid buses dedicated to this corridor and is a foundation investment towards ultimate rapid transit on the ALine corridor.

Thirdly, the Board approved \$3.0 million for GO/VIA platform at James Street North. Works would include a new platform, passenger amenities and park-and-ride lot. This would offer Hamiltonians more choice in travel modes and more convenient access to GO and VIA inter-regional train networks, and would enable two-way rail commuting potential. Provincial approval of the capital funding for these projects was included in the March 2008 Provincial budget announcement. No operating funding was included in the announcement.

Concurrent with the November 2007 Metrolinx Board announcement of “quick win” project approval for the ALine and BLine, Public Works staff initiated a Rapid Transit Feasibility Study (RTFS). The RTFS was to investigate 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, and a summary of Class Environmental Assessment requirements, as well as an analysis of the feasibility and requirements for implementation of rapid transit on each route identified in the Hamilton TMP, with a

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focus on the two routes identified in MoveOntario 2020. It will also provide guidance on requirements for Transit Oriented Development policies. This work was undertaken by McCormick Rankin Corporation (MRC), and project managed by Public Works staff. A staff technical advisory team with representation from Planning and Economic Development and Public Works was assembled to provide information and guidance to MRC throughout the course of the study. Finance has provided a key link to Metrolinx (and therefore the MoveOntario 2020 projects) prior to, and throughout, this process.

Rapid transit can help reduce single occupancy vehicle use, help achieve HTMP targets of 20% reduction in vehicle kilometres travelled over current trends and of increasing the transit modal share to 15%, and is often credited with being a catalyst to economic development and growth. Considerable financial gains, in terms of redevelopment and assessment growth, could be the result of the implementation of a rapid transit network in Hamilton. Health gains, such as increased physical activity and improved air quality can also be achieved. There are numerous North American examples of BRT and LRT systems that have been seen as drivers of economic development, revitalization and assessment growth. In Hamilton, it needs to be determined which type (or types) of rapid transit is (are) most appropriate. In determining that, the characteristics of each system, including the flexibility of BRT and the permanency of LRT, need to be evaluated.

Of primary importance, is the fact that the RTFS will provide the general opportunities and constraints with respect to providing rapid transit in Hamilton, and it will allow PW Committee and Council to have a clear understanding of opportunities and obstacles prior to determining whether to move forward with rapid transit planning, and what type of vehicle (BRT or LRT) is best for Hamilton.

For the purposes of the RTFS, BRT is defined as a rubber-tired rapid transit service that combines stations, vehicles, running ways, a flexible operating plan and technology into a high quality, customer focused service that is frequent, fast, reliable, comfortable and cost efficient. LRT is usually runs at street-level, is typically propelled by overhead electrical wires, and offers the frequent, fast, reliable, and comfortable service that BRT does. LRT is seen by many as a more permanent system than BRT because the rails make it difficult to re-route the service without considerable effort and expense.

The RTFS sets out the requirements for each of the above noted routes for both BRT and LRT. It does not examine alternate routes. Its primary purpose is to provide Council, staff and the public with an initial view of the opportunities that rapid transit can present, and the opportunities and constraints that need to be evaluated in making the decision to pursue rapid transit in general, as well as in making the decision about the type (or types) of rapid transit that is (are) right for Hamilton. Future Class EA studies will examine staging, alternate routes, and property constraints in greater detail.

Although the proposed ALine and BLine routes do not run through Wards 6, 10, 12, 14 or 15, this report has City-wide implications because of the magnitude of the decision regarding the provision of rapid transit in Hamilton, and because of future opportunities to provide other rapid transit routes in the longer term.

There is also significant public interest in rapid transit and sustainable transportation in Hamilton, and thus it is proposed to present this report to the public for their input. Strategic Planning staff will report back to Public Works Committee in June 2008 with

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the findings of the public consultation process, and for direction from Public Works Committee and Council on the type of rapid transit to be implemented.

ANALYSIS/RATIONALE:

The RTFS contains both overall observations about the opportunities and constraints of providing rapid transit, and a section-by-section breakdown of what each corridor would look like if rapid transit is provided. For the RTFS, it was assumed that the existing right-of-way widths would not be significantly changed, and that the same corridor design would be used for either BRT or LRT. This 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 MoveOntario 2020 announcement allows Hamilton to accelerate rapid transit planning beyond what was considered in the HTMP, and to consider the use of LRT in the short term, instead of starting with BRT and moving to LRT in the longer term. At the time that the HTMP was completed, Provincial and Federal funding at the levels indicated in MoveOntario 2020 was not anticipated. Public interest in rapid transit in Hamilton, and LRT in particular has grown to the point that there is even a group called Light Rail Hamilton who advocates for LRT in Hamilton.

As stated above, an important aspect of the RTFS is that it provides an overview of the general opportunities and constraints with respect to providing rapid transit in Hamilton. It does not provide a detailed review of each and every alternative corridor, nor does it make a recommendation of which type of vehicles (LRT or BRT) should be used in Hamilton. What the RTFS does do, is to indicate the opportunities, cost estimates and operating requirements that PW Committee, Council and the public need to understand when determining if and how to move forward with rapid transit planning, and what type of vehicle (BRT or LRT) is best for Hamilton.

The RTFS was undertaken using the following assumptions. First, the corridors used were the ones shown in the HTMP (see Appendix A), with one exception; a link to Limeridge Mall was also included (see Appendix B). It was also assumed that the corridors would look same regardless of the type of rapid transit vehicle (BRT or LRT); that is, the lane distribution and configurations did not differ based on the provision of either BRT or LRT.

A section by section review of the BLine and ALine corridors is included in Appendix C. The RTFS has shown that there are some sections in the corridor where it is not possible to provide dedicated lanes for rapid transit without either eliminating on-street parking and loading, or acquiring significant amounts of property. An example of this is the section of Queenston Road/Main Street from Eastgate Square to the Delta. In this section, rapid transit would need to operate in mixed traffic, with some operational improvements such as traffic signal priority, queue jump lanes or some reduction in parking or loading areas.

There are some areas where rapid transit can be provided in dedicated lanes, such as the section of King Street between Bay Street and Dundurn Street. Here, dedicated

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rapid transit lanes could be provided by reserving the right lane for right turns, parking and loading; reserving the second lane for transit vehicles; and using the third and fourth lanes for general traffic. Loading could occur overnight in the fourth lane. This arrangement would reduce the number of lanes from 5 (of marginal width) to 4 (of standard width) in some areas.

And then there are areas, such as the portion of Upper James Street from Fennell to Hamilton International Airport, where rapid transit can be provided in a median transitway. Sample cross-sections illustrating the median transitway concept can be found in Appendix D.

The RTFS identifies some major points to consider when determining if, and how, to provide rapid transit in Hamilton, including:

- Implementing “higher order” transit in the lower city east-west corridor will likely preclude conversions of section of King or Main from one-way to two-way.
- Safety and space considerations will preclude the provision of separate bike lanes on any of the routes.
- There are many lanes on major routes in the lower city that are narrow, sometimes less than 3m wide. Narrow lanes affect operations, reduce capacity and result in lower usage of the curb lanes. To improve lane distribution and reduce friction between lanes, standard 3.5m lane widths are proposed. This will result in a decrease in the number of lanes in some sections of the corridors.
- A number of terminals or off-road platforms and shelters will be required: Eastgate Square (enhancement or expansion of existing), Downtown, McMaster University, Mohawk College or Hamilton Health Sciences site at West 5th and Fennell, Hamilton International Airport, University Plaza, and Lime Ridge Mall (enhancement or expansion of existing).

LRT is often thought of as being more permanent than BRT and as being able to provide greater economic spinoffs than BRT. LRT may also attract riders who, for whatever reason, will not commute by bus, helping to reduce single occupancy vehicle trips. However, there are also some operating characteristics of LRT that do not make it well suited to operating in older areas of the lower city or on the Escarpment crossings, including:

- Electrical supply and overhead catenary systems cannot serve both directions at the same time on one-way streets. This results in increased cost and visual impact.
- Increased vertical clearance is required for LRT vehicles and their pantographs than for BRT vehicles. Two structures, the TH&B bridge over James Street South (3.9m vertical clearance) and the pedestrian bridge over King Street West at Summers Lane (4.2m) are too low to allow LRT vehicles to pass under them, as LRT vehicles require 4.8m vertical clearance.
- The ability of LRT vehicles to handle grades, such as those found on Hamilton’s Escarpment crossings is more limited than that of BRT vehicles. James Mountain Road has grades up to 10.7%; BRT vehicles can handle

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these grades with some impacts to their operating speed, but the use of LRT vehicles on steep slopes like these is precluded. To allow LRT vehicles to cross the Escarpment in this location, twin 6.5m diameter tunnels at 5% grades would be required. These tunnels would extend from approximately St. Joseph's Hospital to Mohawk College.

- Implementing reserved transit lanes will result in a reduction of general purpose lanes, in order to address above noted concerns regarding existing lane widths, and to allow on-street parking and loading activities to continue at a reasonable level.
- Operating in mixed traffic provides extra challenges for LRT vehicles. If a general purpose vehicle parks, stalls, or stops to load or unload, in the lane used by rapid transit, the LRT vehicles have no way to get around the stopped vehicle. BRT vehicles are able to manoeuvre around such obstacles.

A major consideration that is unique to BRT is that this alternative would see James Mountain Road restricted to transit vehicles and emergency vehicles. General purpose traffic would be diverted to the Claremont Access or to the Jolley Cut. Existing transit routes would likely be diverted from the Jolley Cut to James Mountain Road as well.

ALTERNATIVES FOR CONSIDERATION:

Alternative 1 - Postpone public consultation until the Class Environmental Assessment Stage

As noted above, there is significant public interest in rapid transit and sustainable transportation in Hamilton. It is important to have public input into the findings of the RTFS to understand the views of the public before such an important decision (BRT or LRT) is made. This alternative is not recommended.

Alternative 2 - Expand the proposed public consultation program, and report back to PW Committee in September 2008.

Following completion of the RTFS, and direction from Council regarding whether to pursue BRT or LRT in Hamilton, Class Environmental Assessment (Class EA) studies will be completed. Public information centres will be held during the Class EA process, and public involvement will be encouraged throughout the Class EA studies. Expanding the public consultation program for the RTFS delays the decision on whether to pursue BRT or LRT, and also delays the Class EA studies and subsequent design, construction and implementation stages. This alternative is not recommended.

FINANCIAL/STAFFING/LEGAL IMPLICATIONS:

Financial Implications

There are no financial implications, at this stage, with regards to the two recommendations of this report.

The estimated costs outlined below are to allow for order of magnitude comparisons, and will need to be refined as further studies progress.

Providing BRT services along the two identified routes is estimated to have a capital cost of \$480 million, including for construction and maintenance, and servicing and

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storage facility (improvements), and 25 additional articulated hybrid buses (estimated cost of \$900,000 each). Operating costs are estimated to be \$80/revenue hour/vehicle. Based on MoveOntario 2020, Provincial and Federal funding for capital for rapid transit along these two corridors could be expected, but the amount to be expected is still to be determined.

The construction costs for BRT are based on an estimate of \$6.5 million/km for one-way streets, and \$9 million/km for two-way streets.

Providing LRT services along the two identified routes has an estimated capital cost of \$1.1 billion, including construction, bridge improvements, Escarpment crossing tunnels and a new garage or storage facility. The cost for Light Rail Vehicles is estimated to be \$4 million each. Operating costs are estimated at \$175/revenue hour/vehicle. Funding from the MoveOntario 2020 initiative is also expected, at the levels indicated above for BRT.

The construction costs for LRT are based on estimates of \$15 million/km for one-way streets and \$25 million/km for two-way streets.

It should be noted that Hamilton can request additional funding from Metrolinx, or other Provincial or Federal programs as appropriate.

It should also be stressed that there are opportunities for positive financial implications resulting from the implementation of a rapid transit network, including new development, redevelopment and assessment growth.

Staffing Implications

There are no staffing implications associated with the recommendations of this report, but there could be significant staffing implications associated with providing rapid transit in Hamilton.

Legal Implications

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

POLICIES AFFECTING PROPOSAL:

Provincial Policies

Metrolinx is developing a **Regional Transportation Plan (RTP)** for the Greater Toronto and Hamilton Area (GTHA), including the Cities of Hamilton and Toronto, and the Regions of Durham, York, Peel and Halton. While it is still draft, and not officially a policy document, the Regional Transportation Plan will provide a strategic, long-term vision for a coordinated transportation system across the GTHA and will guide decision making about future infrastructure investments.

The first stage of the RTP process is the development of Green Papers. Seven Green Papers have been released for public comment, including:

- Towards Sustainable Transportation
- Mobility Hubs
- Active Transportation
- Transportation Demand Management
- Highways and Roads

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- Transit
- Moving Goods and Delivering Services

The Green Papers are also being reviewed by an Advisory Committee and a Multi-Disciplinary Expert Review Panel. The Green Papers will become White Papers, then a draft RTP, followed by the Final RTP. The draft RTP is anticipated in June 2008 and the Final RTP is expected in the fourth quarter of 2008.

The RTP is built around *Places to Grow - A Growth Plan for the Greater Golden Horseshoe* and the Urban Growth Centres (UGCs) identified in *Places to Grow*. Places to Grow supports revitalized downtowns and urban areas, and sets minimum density targets in order to support increased transit usage, and financial viability of transit; a key theme that is carried through the Green Papers. The Green Papers recognize that, to meet the growth targets set in *Places to Grow*, an integrated and sustainable transportation will be required, as will a plan to guide future infrastructure investments

In June 2007, the Province of Ontario announced their \$17.5 billion **MoveOntario 2020** plan which will deliver 52 rapid transit projects, including 2 rapid transit lines for Hamilton. The “quick win” projects described in this report for the BLine and the ALine are on MoveOntario 2020 corridors.

Hamilton Policies

The Hamilton **Transportation Master Plan (TMP)** identified 3 routes for future rapid transit: the existing BLine along the Main/King corridor from Eastgate Square to McMaster University, the James/Upper James corridor from Downtown to the Airport (now known as the ALine), and an east-west Mountain route. The Hamilton Transportation Master Plan also sets goals of 20% reduction in vehicle kilometres travelled over current trends by 2031, and increasing the modal share for transit to 15% by 2031: providing rapid transit will help achieve these goals, as well as the goals of reducing single occupancy vehicle use and encouraging the use of transit and active transportation. Active transportation, in turn, can lead to improved overall health.

The Hamilton Transportation Master Plan (and the Master Plans for Water and Wastewater, and for Stormwater) was completed as part of the **GRIDS** process. GRIDS identified a “Nodes and Corridors” approach as the preferred growth strategy. The ALine and BLine are primary corridors connecting key nodes, including Downtown, McMaster University, Mohawk College, and Hamilton International Airport.

Key theme areas of **Vision 2020** which are supported by providing rapid transit are: Local Economy, Consuming Less Energy, Improving Air Quality, Changing our Mode of Transportation, Land Use in the Urban Area, Personal Health and Well-Being, and Community Well-Being and Capacity Building.

The guiding principles of the **Hamilton Transit Ridership Growth Plan** are supportive of providing rapid transit in Hamilton. These guiding principles are:

- The need to improve services and safety for existing riders so they become ambassadors for transit;
- Adoption of strategic approach that considers transit’s role in the larger transportation, social, economic and environmental context, including the ability for transit to facilitate the City’s growth management objectives and policies for a more balanced transportation system;

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- The need to pursue initiatives that are cost-effective with high visibility, and those that improve the image of the transit system;
- The benefits of marketing the transit system as an important city service and one that requires attention to position Hamilton for future economic success, community well-being, affordability for passengers and environmental sustainability.

Public Works Strategic Plan

Participating in the Regional Transportation Plan process helps us to achieve our strategic priority of being the leader in the “greening” and stewardship of the City. Providing rapid transit will improve air quality and the environment through the reduction in greenhouse gas emissions, and the reduction of single occupancy vehicle use.

RELEVANT CONSULTATION:

To date, consultation on the Rapid Transit Feasibility Study has included the following City Departments, who are in support of this work:

- Public Works (Transit, Capital Planning & Implementation, Operations & Maintenance)
- Planning and Economic Development (Development Planning, Community Planning, Downtown and Community Renewal, Strategic Services and Special Projects, Real Estate, Parking and By-law Services)

Staff have also met regularly with Ward 1 Councillor Brian McHattie, and Mayor Eisenberger and his staff.

As the rapid transit planning process moves forward, Public Works staff will continue to involve the above noted Departments and Divisions, particularly as it relates to any implications to the Nodes and Corridors Policies of the Official 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 proposed consultation plan, subject to Council approval of this report is:

- Rapid Transit Feasibility Study posted on the City of Hamilton website on April 24, 2008. Information regarding how to submit comments, as well as Public Information Centres, will also be posted on the City’s website at this time.
- Two Public Information Centres regarding the Rapid Transit Feasibility Study to be held May 6 and 8, 2008. It is proposed to hold one in the lower city, and one on the Mountain. The same information will be presented at both Public Information Centres.

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.

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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

**Appendix A
ALine and BLine as shown in the Hamilton Transportation Master Plan**



**Appendix B
Routes Investigated in the Rapid Transit Feasibility Study**



**Appendix C
Section-by-Section Review of ALine and BLine Corridors**

Lower City East-West Route (King/Main - Existing BLine Corridor)

Queenston Road / Main Street: Eastgate Square to the Delta

This section currently has two lanes of reasonable width in each direction. Between Eastgate Square and the Traffic Circle, there is also a centre turn lane. Parking and loading occurs in the curb lane in off-peak hours. The proposed concept for rapid transit includes operating in mixed traffic, and operational improvements, which could include reduction or removal of parking and loading (depending on the area), traffic signal priority and queue jump lanes. In this section, transit will be limited to speed of regular traffic, so travel time benefits relative to the existing operation will not be realized.

King Street: The Delta to Wellington Street/Main Street – Catherine Street to the Delta

In these sections, there are four or five physical lanes within a 20m ROW. Lane widths vary, and are marginal in many areas, resulting in lower usage of curb lanes and friction between lanes. Parking and loading occurs in curb lanes in off-peak periods, and on one side in some sections in the peak hours.

In these sections, the proposed concept includes reserving the right lane for right turns, loading, and parking, with reinforcement by sidewalk extensions. The second lane would be reserved for transit vehicles. The third and fourth lanes would be general purpose lanes. Loading in the curb lane would be restricted to overnight. At major intersections, spot improvements might be required to provide additional capacity.

The section of King Street between Sherman and Stirton would have narrower lanes, and potentially a lower speed limit, because of the restricted road allowance.

This proposal would reduce the number of general purpose lanes from four or five to two, but those two lanes would be free from transit, parking and loading. Lane widths would also be improved. Parking and loading would be available at all times on one side of the street, but businesses may be concerned about the loss of parking and loading on the left side of the road. Intersection improvements will also impact existing development in almost every case.

King Street - Wellington Street to Bay Street/Main Street - Bay Street to Catherine Street

In these sections, there are four or five physical lanes through the Downtown area, except for the section of King Street East between Wellington Street and Mary Street. Lane widths in some areas on Main Street are marginal, which results in friction between lanes and lower usage of curb lanes. Parking and loading occur in curb lanes in off-peak periods; in some sections, parking and loading also occur on one or both sides in the peak hours as well. On King Street East, between Wellington Street and Mary Street, there are two through lanes with parking and loading in bays on both sides of the street.

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The proposed concept includes a reserved transit lane within the existing road platform, and restriping or reconstruction of Main Street to provide four 3.5m wide lanes within the 20m right-of-way.

On King Street, between Wellington and Mary, the diversion of a westbound lane would be required.

King Street - Bay Street to Dundurn Street/Main Street - Dundurn Street to Bay Street

There are 4 or 5 physical lanes in these sections, but some lane widths are marginal, and as a result, there is friction between the lanes and a lower usage of the curb lanes. In some sections, there is parking and loading in the peak hours; in off-peak hours, parking occurs in the curb lanes.

Between Queen Street and Bay Street, it is proposed to have the right lane reserved, at all times, for right turns, parking and loading. The second lane would be reserved for transit vehicles. The third and fourth lanes would be general purpose lanes. Loading in the fourth lane would be restricted to overnight.

This concept would improve lane widths and reduce friction, but would also reduce the number of general purpose lanes from four or five (some marginal) lanes to two or three lanes closer to Dundurn Street. Parking and loading would be available on one side of King Street, even in peak periods, between Bay and Queen Streets. Spot improvements at major intersections would be required and would impact existing development.

Main Street: Paradise Road to McMaster University

In this area, there are three lanes eastbound, two lanes westbound, and centre turn lanes or medians between Paradise Road and Haddon Avenue, and three lanes in each direction plus median and turn lanes between Haddon Avenue and McMaster University. It is proposed to provide median transit lanes with left turn lanes and station platforms at major intersections, two general purpose lanes (GPL) in each direction between Paradise Road and Haddon Avenue, and three GPL in each direction between Haddon Avenue and McMaster University. A grade-separated station concept would also be included at McMaster University entrance to separate some vehicle and pedestrian movements.

Property is restricted between Paradise Road and Haddon Avenue, so the provision of left turn lanes and station platforms will require widening. Also, the centre median adjacent to McMaster would be removed, but there are opportunities for other median treatments.

Main Street: McMaster University to University Plaza

In this section, there are:

- three lanes in each direction plus median and turn lanes between the McMaster University entrance and Cootes / Leyland
- two lanes in each direction plus centre turn lane between Cootes / Leyland and Rifle Range Road
- two lanes in each direction plus turn lanes at major streets between Rifle Range Road and Osler Drive
- two lanes in each direction to the University Plaza

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It is proposed to provide median transit lanes with left turn lanes and station platforms at major intersections, three GPL in each direction between McMaster University and Cootes/Leyland, and two GPL in each direction between Cootes / Leyland and the University Plaza. At McMaster University, there is a grade-separated station concept to separate some vehicle and pedestrian movements

Property is restricted in this area, so the provision of left turn lanes and station platforms will require widening. In addition, centre turn lanes would be removed but there are opportunities for providing U-turns wherever there are left turn opportunities.

North-South Corridor: Waterfront to Hamilton International Airport

James Street North - Waterfront to Main Street

In this area, there are numerous sidewalk extensions, implemented as part of the James Street Downtown Action Plan reconstruction projects. As a result, there is one through lane in each direction for most of the section from Murray Street to the Downtown. There is one lane in each direction plus parking and loading on each side between the Waterfront and Murray Street.

In this area, it is proposed to operate in mixed traffic. Operational improvements would be implemented, including reduction or removal of parking and loading (depending on the area), traffic signal priority, and queue jump lanes. This would mean that transit will be limited to speed of regular traffic; accordingly there will be no improvement in travel time relative to the existing operation.

James Street South - Main Street To James Mountain Road

In this section there are four narrow physical lanes, with two being one general purpose lane in each direction and two for turn lanes and some parking and sidewalk extensions. Here, it is proposed to widen the street to four lanes with suitable boulevard and sidewalk. This may require a narrower section at, and approaching, the TH&B bridge, and could require reconstruction of the TH&B structure in both alternatives but certainly if LRT selected. reserved transit lanes would be implemented either at the curbs or in the centre lanes

The implications of this proposal are the removal of on-street parking and loading, with replacements either off-street or on side streets. Some turn restrictions may be required. General purpose lanes would be primarily for local access and circulation. Local access and access to the hospital would be maintained, and emergency vehicles could use reserved transit lanes.

James Mountain Road

James Mountain Road provides one lane in each direction for all traffic with maximum 10.7% grade. For the BRT alternative, the proposal is to limit the mountain access to bus rapid transit vehicles and emergency vehicles, including ambulances. For the LRT alternative, it is proposed to construct a 1.5 km long tunnel and keep James Mountain Road open to general traffic.

For BRT alternative, existing general traffic would be diverted to the Jolley Cut and the Claremont Access. Most buses would be removed from the Jolley Cut and relocated to James Mountain Road. For the LRT alternative, there would be limited impact on traffic circulation, but construction of the tunnel would be required.

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West 5th Street - James Mountain Road to Fennell Avenue/Fennell Avenue - West 5th Street to Upper James Street

In this area, there are Four lane roadways with turn lanes at major intersections. Reserved 3.5m median transit lanes with 0.3m rumble strips adjacent to one general purpose lane on each side, plus turn lanes approaching major intersections are proposed. Also proposed, are a terminal at Mohawk College, and a station on Upper James near Fennell Avenue.

There are opportunities for partnerships and redevelopment opportunities with Mohawk College and Hamilton Health Sciences. This proposal assumes that Fennell Avenue could function with one GPL in each direction. The existing 23m ROW on Fennell Avenue is likely insufficient and property may be required if additional east-west capacity is required on Fennell Avenue. Auchmar is a major constraint, and therefore it is likely that additional property would be preferred on the south side.

Upper James Street - Fennell to Hamilton International Airport

In this section, there are two lanes in each direction plus medians or centre turn lanes. Loading activities are limited (primarily car dealerships). The right of way requirement in the Official Plan requirement of 36m ROW, is sufficient, but not all property has been acquired, and there are two cemetery/church constraints south of the LINC.

A median transitway is proposed in this area. Near-side stations, and left turn lanes for opposing traffic would be required. An urban cross-section would be provided south of Rymal Road, and a rural cross-section would be constructed south to the airport.

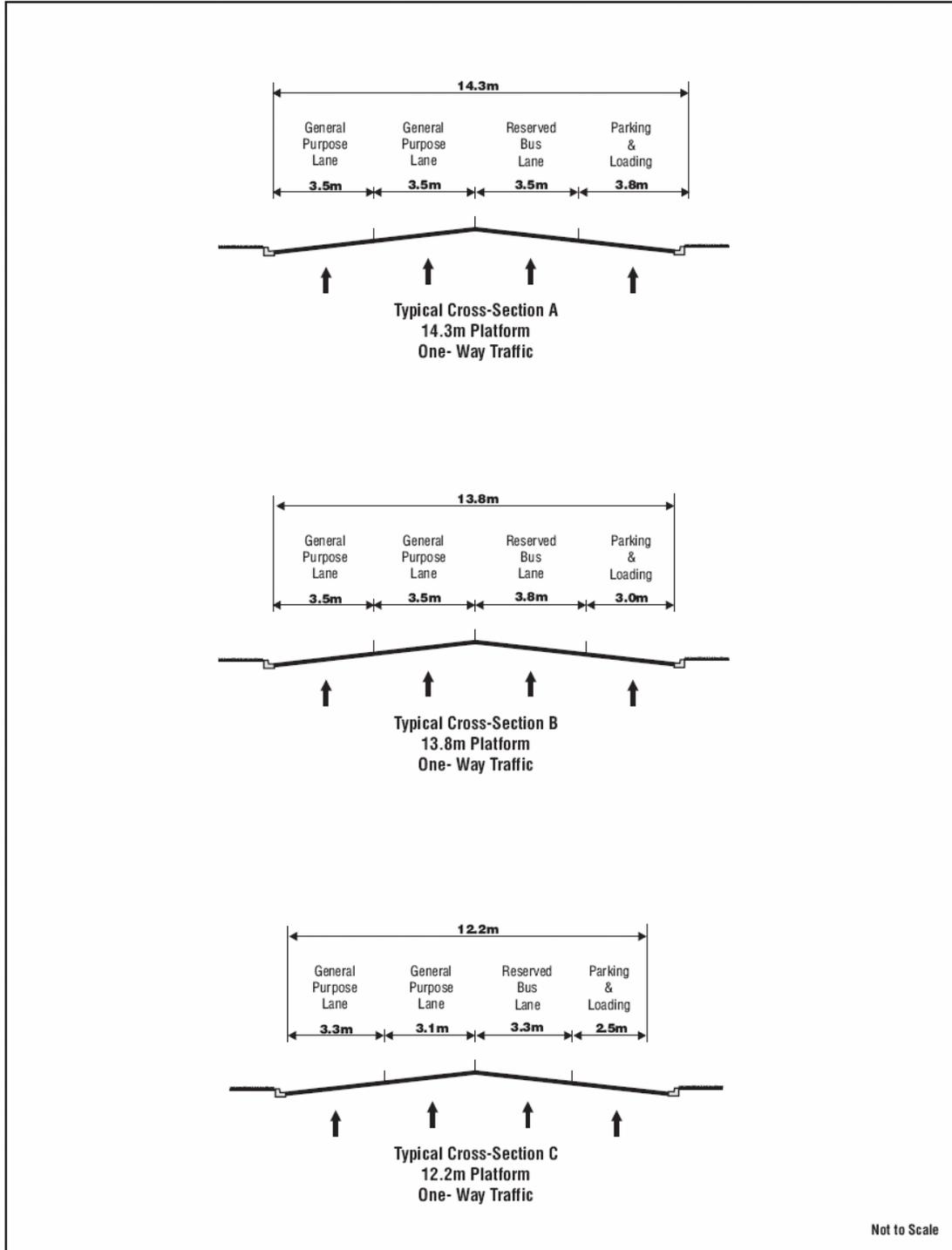
Left turns in and out of abutting commercial developments would be prohibited, but U-turn opportunities would be provided where possible. Property would be required at Stone Church Road to avoid the Barton Stone Church site.

Mohawk Road - Upper James Street to Upper Wentworth Street/Upper Wentworth Street - Mohawk Road southerly

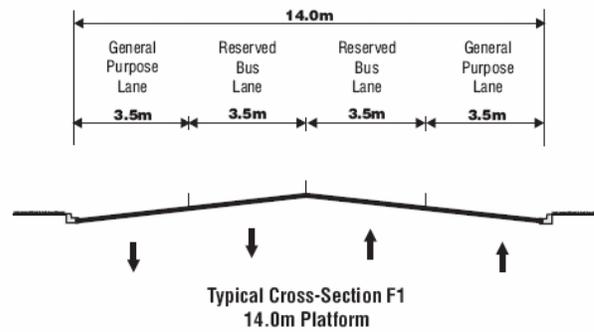
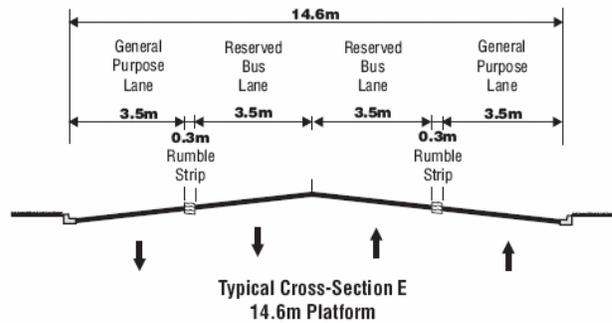
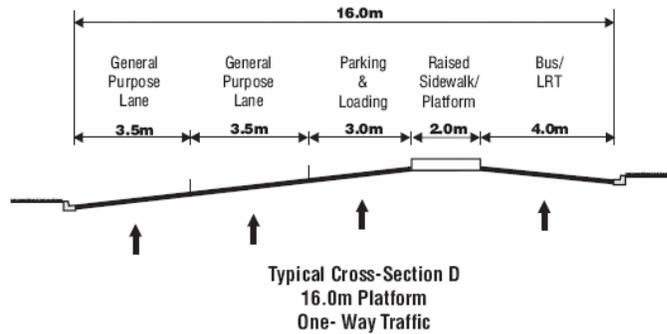
In this area, there are two lanes in each direction plus medians or centre turn lanes. The Official Plan requirements of 30m ROW on Mohawk Road and 36m ROW on Upper Wentworth Street, would be sufficient.

A median transitway is proposed in this area. Near-side stations, and left turn lanes for opposing traffic would be required. Widening to the south side of Mohawk may be required. If additional lanes are required on Upper Wentworth Street, sufficient property is available. Left turns in and out of abutting commercial developments would be prohibited, but U-turn opportunities would be provided where possible

Appendix D - Representative Cross-Sections for the ALine and BLine Corridors

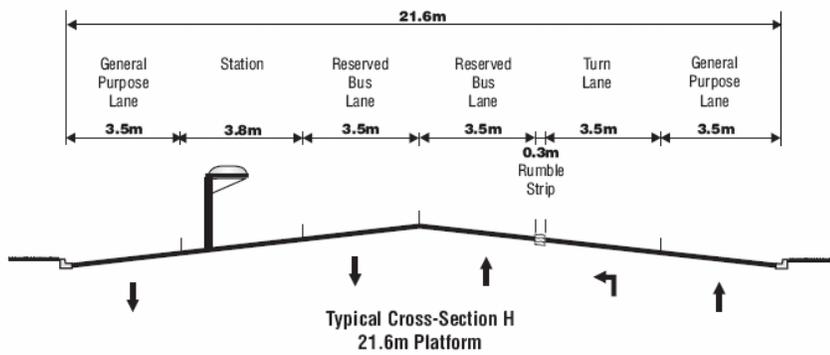
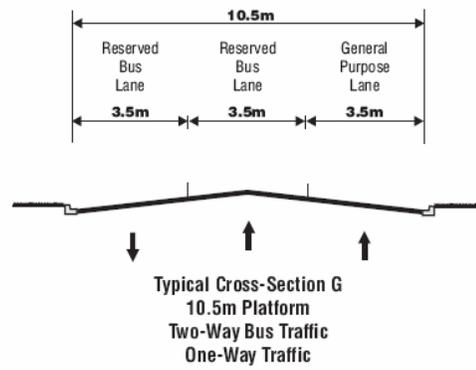
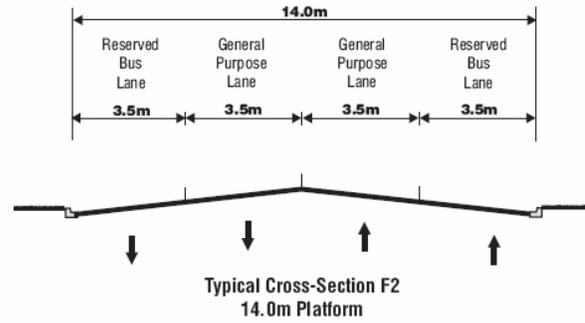


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Not to Scale

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