City Shaping Light Rail Transit: The Hamilton, Ontario Project and Lessons for Other North American Cities

Jillian Stephen, P.Eng., Director – Rapid Transit, City of Hamilton Justin Readman, Manager – Rapid Transit, City of Hamilton (Presenter) Christine Lee-Morrison, MCIP RPP, Manager – Nodes and Corridors Planning, City of Hamilton Ashley Curtis, Associate, Steer Davies Gleave

Paper prepared for presentation

at the Successes in Integrating Sustainable Transportation and Land Use Session

of the 2011 Annual Conference of the Transportation Association of Canada Edmonton, Alberta

Abstract

Hamilton, Ontario has ambitious plans for a 5-Line rapid transit network to be constructed and implemented over the next 30+ years. For the City, Rapid Transit is about much more than just moving people; it is considered to be a catalyst for economic development and revitalization. The first line of the network - the B-Line - is undergoing a Planning, Design and Engineering (PDE) study and, to maximize economic, social and environmental benefits, the PDE study is integrated with a concurrent Corridor Land Use Planning study. Issues to be addressed include the development of a land use plan that will identify appropriate transit supportive land use and development patterns, and the PDE study that will bring the B-Line LRT design to a maximum state of implementation readiness (approximately 30%) based on a series of best practice design principles.

The objectives of the studies are to integrate land-use planning and higher order transit to promote high quality, sustainable development along the corridor. In addition, the studies are closely examining the economic uplift potential and how Light Rail Transit can be used as a city shaper.

The study methodology includes coordinated consultation efforts for the technical and land-use planning components. Consultation activities include focus groups, workshops, social networking tools, comprehensive government and media relations strategies, door-to-door visits and traditional public information centres. Strong cross-departmental collaboration and a flexible planning approach assists in strengthening the responsiveness of the plan components to ensure project success. As for process, the studies begin with feasibility (for the technical components) and visioning (for the land use components) and are aligned to ensure that appropriate land use and urban design plans are tied to transit elements along the corridor with a strong focus on nodes and station areas.

The paper will present the wider corridor design approach which has been used, including lessons learned, how this has been applied elsewhere in North America and a framework for Canadian municipalities.

Introduction

The City of Hamilton is currently planning a 13.5km Light Rail Transit (LRT) Line along the B-Line corridor from McMaster University via Main Street West, King Street, Main Street East and Queenston Road to Eastgate Square. The City is using LRT as a city shaper, rather than a congestion buster. This is encapsulated in the Rapid Transit Vision statement developed in consultation with various city departments, the public and Council. Rapid Transit's Vision is:

Rapid transit is about more than just moving people from place to place. It is about providing a catalyst for the development of high quality, safe, environmentally sustainable and affordable transportation options for our citizens, connecting key destination points, stimulating economic development and revitalizing Hamilton.

To deliver that Vision the City is coordinating land use and rapid transit planning to maximize revitalization benefits.

A number of municipal and provincial policy documents have supported the City's plan for Light Rail Transit and have been summarized in this paper. In addition, a Benefits Case Analysis was completed looking at three transit options for the B-Line, including full Light Rail Transit, phased Light Rail Transit and Bus Rapid Transit.

Once LRT was selected as the preferred transit mode, work began on a Planning, Design and Engineering study to bring the design to a 30% design level. This work is being undertaken as a network-wide approach which emphasises "putting the passenger first" following an iterative, consultative design approach.

This paper discusses the wider corridor approach which has been used as well as elements considered in making the case to ensure that the project Vision is delivered and concludes with lessons learned that can be transferred to other Canadian municipalities who are planning Light Rail Transit.

Policy Context

The Rapid Transit Vision statement written by the cross-departmental working team, approved by the public and endorsed by Council drives all project decisions and ensures an integrated approach to rapid transit and land use planning is being undertaken. This will allow the City to promote a complete package that will facilitate the capture of benefits resulting from rapid transit investments including both economic uplift and quality of life improvements. Through the City of Hamilton's integrated approach, the critical relationship between land use, mobility and infrastructure is recognized and factored in to the design to maximize overall benefits.

The *Hamilton B-Line Value Uplift & Capture Study* (June 2010) suggests that the most successful examples of transit oriented development have occurred where transit design, land use and urban design have been integrated. It emphasizes that comprehensive planning policies should be in place for redevelopment to reach its full potential.

Over the past several years, the City has been developing a supportive policy framework for corridor growth and revitalization, which add to the integrated approach being taken. The following is a summary of supportive municipal policy documents.

Growth Related Integrated Development Strategy (GRIDS) (2006) is the City's growth management study and sets out the nodes and corridors urban structure as the basis for change and growth in the City, confirming both the B-Line (Main-King-Queenston) and A-Line (James, Upper James) as major corridors.

Transportation Master Plan (2007) reflects the nodes and corridors framework and relies on aggressive transit improvements and an urban fabric with a high degree of connectivity. The Transportation Master Plan shifted the transportation hierarchy to focus on pedestrians first, followed by cyclists, transit, goods movement and general purpose traffic. The plan recognized the importance of providing more transit and

included increased service on the existing B-Line (a limited stop, express bus service) and the addition of two more limited stop, express bus routes.

Urban Official Plan (OP) (2009) established the City's corridors as a significant opportunity for creating vibrant pedestrian and transit oriented places through investment in infrastructure, residential intensification, infill and redevelopment and careful attention to urban design. To implement the City's new OP, a new Comprehensive Zoning By-law is also under preparation.

Economic Development Strategy 2010–2015 (2010) was approved to address dramatic changes in the local, provincial, national and global economies. While the Strategy continues to promote the development of existing key industry sectors such as advanced manufacturing, it also introduces two new areas of focus for development, clean-tech businesses and creative industries. One such newly developing employment sector, the West Hamilton Innovation District, is located along the B-Line corridor.

Transit Oriented Development (TOD) Guidelines (2010) were approved to be used as a tool to foster transit supportive development along transit corridors and routes.

B-Line Opportunities and Challenges Study (2010) was completed and the B-Line Nodes and Corridors Land Use Planning Study was initiated and is being closely integrated with rapid transit planning. The purpose of this study is to develop a long term land use plan to guide future growth and change along the B-Line Corridor. The Corridor Plan will include Urban Design Guidelines for Station Areas that will help ensure appropriate, transit supportive urban forms while providing for appropriate transitions to adjoining neighbourhoods. An Implementation Strategy that identifies future programs and incentives for corridor revitalization will be an important outcome of the study.

Regional Policy

In June 2007, the Province of Ontario released its *MoveOntario 2020* plan; a rapid transit plan for more than 50 projects from Hamilton, through Halton, Peel, Toronto, York and Durham. This plan identified two rapid transit lines in Hamilton. This was the impetus for Hamilton to dream bigger than the limited stop bus services included in the *Transportation Master Plan* and, as a result, feasibility studies were initiated to look at full rapid transit options for two corridors; the B-Line (east-west) and the A-Line (north-south) (Figure 1).



Figure 1: BLAST Network

Through 2008 and 2009, Hamilton completed feasibility studies for the B-Line and A-Line and selected LRT as the preferred mode for the B-Line. These studies were multi-disciplinary, looking at transit and transportation, but also at land use and planning, economic uplift and community acceptance. MoveOntario 2020 and the Hamilton Transportation Master Plan were key documents in these studies. As important as these transportation documents were, Provincial Policies such as Places to Grow, the Greenbelt Plan, the Provincial Policy Statement, and The Big Move, and local policies and plans including the Urban Official Plan, Vision 2020, the Transit Ridership Growth Plan and the City's Corporate Strategic Plan were equally vital in setting the context for Light Rail Transit along the B-Line corridor. From an early stage the City assembled a team of staff from a number of departments including Transit, Design, Community Planning, Heritage Planning and Economic Development. This team was established so that Rapid Transit and its Vision were embedded in each departments work and future service delivery plans. This provides strong City-wide support from all departments and ensures that the project is successful.

Benefits Case Analysis

On November 28, 2008, the Metrolinx Board approved *The Big Move*, the Regional Transportation Plan for the Greater Toronto and Hamilton Area, which included Rapid Transit in Hamilton's east-west King-Main B-Line corridor as a "Top 15" priority project. The Board directed staff to undertake Benefits Case Analysis (BCA) work for all unfunded Top 15 priorities to help inform the project funding decision-making process.

The BCA identifies, at a strategic level, the best-performing project scope and implementation phasing options for Rapid Transit investments within each of the Top 15 corridors. The Metrolinx BCA extends beyond traditional transportation costbenefit analysis through the Multiple Account Evaluation (MAE) process. In addition to measuring the transportation user and financial impacts of each option, the BCA also addresses long-term economic, environmental and social impacts – consistent with the three foundation pillars of the Metrolinx *Big Move* document.

In close collaboration with the City of Hamilton, Metrolinx developed a BCA work plan for the B-Line corridor. Metrolinx and Hamilton staff agreed with the BCA research methodology, planning and technical inputs, and key findings. The BCA identified three project options for evaluation:

- Bus Rapid Transit (BRT) from McMaster University to Eastgate Square: estimated capital cost: \$220 million
- Light Rail Transit (LRT) from McMaster University to Eastgate Square: estimated cost: \$830 million
- A phased variant of Option 2, with the initial 9.3-km phase of LRT from McMaster University to Ottawa Street, and BRT improvements for the balance of the corridor from Ottawa Street to Eastgate Square: \$600 million

It was recognized that these costs (in 2008 base) were order-of-magnitude estimates for high-level project appraisal purposes only. Refined cost estimates, phasing strategies and implementation timelines are subject to the current phase of work, termed Planning, Design, and Engineering (PDE), currently underway and supported by a \$3 million Province of Ontario grant administered through Metrolinx.

The BCA demonstrated that all three options - full BRT, full LRT and partial LRT would generate net benefits for Hamilton and the region and that all three would also be capable of accommodating long-term travel demand growth in the corridor.

However, although full LRT is the highest-cost option, it also generates the highest transportation user benefits in terms of travel time savings, ridership attraction and overall "qualitative" travel experience. LRT also carries a stronger potential to reduce greenhouse gas emissions and generates more significant economic development impacts such as employment, income and Gross Domestic Product (GDP) growth for the City and region. The BCA also identifies LRT as having greater potential to shape land uses and uplift land values along the King-Main corridor.

BRT is a lower capital cost option and thus generates a strong benefit-cost ratio. At the same time, however, BRT delivers less total benefits and its secondary benefits are less extensive than LRT.

The PDE work enables the City to build on the BCA results and continue to refine the case for LRT on the B-Line corridor, including:

- Detailed route alignment and identification of transit stop locations;
- Ridership, level-of-service forecasts and traffic impact modelling;
- Detailed capital and operating costs;
- Detailed functional planning and route analysis; and

• Environmental Assessment (EA) process and public consultation.

Design Approach

In 2010, Hamilton in partnership with Metrolinx retained Steer Davies Gleave (SDG) to complete the Planning, Design and Engineering work for the B-Line corridor. SDG brings a European perspective that is appropriate for our built up corridor and narrow rights of way and the "city-shaping" Vision. This work, to be complete by the end of 2011, includes confirmation of the B-Line LRT route, track location within the corridor, traffic modelling, development of a complementary local bus service strategy, and filing of the Environmental Project Report. The B-Line provides improved connectivity and travel options for our citizens for travel within the City. Hamilton also recognizes the importance of inter-regional connectivity and, simultaneously, is working with Metrolinx (GO Transit) on bringing all-day, two-way regional GO train service to Hamilton. The planned rapid transit and local bus networks will connect with the proposed GO rail stations to ensure improved connectivity and choice both within the City and between the City and the rest of the Greater Toronto-Hamilton Area (GTHA).

One of the primary goals set out for the Study is to "take the project to a maximum state of implementation readiness". To this, Steer Davies Gleave has added a network-wide approach which emphasises "putting the passenger first".

This sits within the context of a hierarchy of users of the roadway and other public space, as identified in the Hamilton Transportation Master Plan. The hierarchy responds to the Rapid Transit Vision, and is particularly appropriate for the Downtown areas of Hamilton.

Concurrent with the technical rapid transit planning, the team is developing a corridor land use plan (secondary plan) for the B-Line (Figure 2). The Corridor Plan will establish land use policies to guide future revitalization and public and private investments in the corridor. The corridor consists of key nodes established in GRIDS and the Urban Official Plan including the primary Urban Growth Centre (the downtown) for the City, a sub-regional node (second in scale to the Downtown) at the eastern terminus of the corridor, and a major employment centre (McMaster University, McMaster Innovation Park and McMaster Children's Hospital) at the western terminus of the planned LRT line.

A key element of the Corridor Plan will be establishing land uses and policies to facilitate residential intensification in the corridor. Background work based on urban design principles has focused on analyzing existing lot fabric along the corridor to identify intensification opportunities and appropriate scales of intensification for individual parcels (Figures 3 and 4). This work allows for an analysis of varying intensification scenarios and will, in part, form the basis of land use and development options. Intensification numbers are being evaluated to ensure that the development projections are realistic and deliverable. Ultimately, the chosen option and the heights and densities that form that option will be built into new zoning regulations for the corridor.

In addition to analysis of intensification opportunities, land use planning for the corridor is focused on the principles of transit oriented development, specifically planning for appropriate density and mixed uses, in proximity to transit stops to create unique, pedestrian oriented streets and public spaces. These elements form a critical role in re-establishing the corridor as a focus of activity for the many neighbourhoods adjacent to the corridor. The integration of the corridor with the neighbourhoods and ensuring connectivity to the corridor is a fundamental principle for corridor revitalization.



Figure 2: B-Line Land Use Planning Study Area



Figure 3: Downtown Residential Densities



Figure 4: Downtown Parcel Sizes

The City also established a Corporate Working Team, which consists of staff from all City Departments to help identify risks and rewards of LRT to all City activities. This has allowed the team to identify operations, maintenance and capital improvements that should be considered early in the process to ensure that they are properly designed into the system and that surprises are minimized as the project develops.

LRT Alignment Development

Working within the hierarchy of users the approach was to seek to design an LRT alignment that features a series of "best practice" Design Principles to produce a comprehensive Integrated Transit Solution.

In this context it was agreed that the LRT alignment should have the following attributes:

- Competitive journey times;
- Journey time reliability;

- Affordable capital and operating costs; and
- Minimize adverse impacts on:
 - The environment;
 - The urban realm;
 - Frontage property owners and occupiers; and
 - Other traffic.

Measures which help to achieve these attributes are:

- 100% segregation from other traffic (i.e. dedicated Rapid Transit only lanes), or as close as can be achieved;
- Minimize property acquisition;
- Consider the access requirements of frontages;
- Develop complementary road traffic measures such as:
 - Network changes to accommodate traffic displaced from the LRT route;
 - Changes to bus routes (to provide a complementary and integrated transit network); and
 - Provision for pedestrians/cyclists.



Figure 5: King Street West Light Rail Transit Rendering

Corridor Design Philosophy

The introduction of rapid transit and the removal of major traffic movements from the route also provides an opportunity for improving the urban realm of the transit corridor. This can improve the environment for local residents and businesses, provide better conditions for pedestrians, cyclists and public transit users and create opportunities for mixed use development and new public spaces. A System Design Guide, containing system specification details along with the urban design approach to be taken along the corridor, is being produced.

Examples of measures which may be appropriate include:

- Improvements to the pedestrian network to achieve efficient and practical circulation and movement patterns;
- Wider sidewalks and improved road crossings for pedestrians;
- Improved sidewalk lighting, sightlines and connections to surrounding areas;
- Dedicated cycle lanes;
- Physical integration of transit infrastructure with the existing built environment;
- Provision of hard and soft landscaping (including grass LRT track if appropriate) pocket parks and community gardens;
- Identification of new public spaces and development opportunities;
- Minimizing street clutter;
- Pedestrian way finding; and
- The introduction of public art.

Route Description

The B-Line route extends westwards from Eastgate Square, to the downtown and then out to McMaster University. Much of the B-Line route is currently four-lane road, comprising two lanes in each direction at the western and eastern ends and four lanes which travel in a westbound direction for about half of the route length. In designing the LRT layout along such sections two key requirements are:

- Provision of fully segregated LRT alignment; and
- Provision of roadway which is ideally at least two lanes wide, but otherwise provides for one through traffic lane together with space for frontage parking, loading, bus stops, etc. over the majority of the length.

Together these requirements suggest that the optimum layout should comprise of two LRT lanes on one side of the road, with two traffic lanes on the other side. If the two traffic lanes operate in the same direction, and are arranged such that vehicular traffic travels in the same direction as in the adjacent LRT lane, then no separating median is required between the LRT and the traffic lanes. This minimizes the overall width required. Also, provision of two traffic lanes in the same direction allows the offside lane to be available for through traffic at all times (Figure 6), while the nearside lane may be occupied by stationary vehicles. This layout also provides more flexibility for dealing with utility works, road repairs and similar obstructions. Where two full traffic lanes cannot be provided then the offside lane should be designated for through traffic, with the curbside lane marked for parking and loading.

Figure 6: Gore Park Cross Section

Note that over much of the B-Line route, the existing width, while marked as four traffic lanes at present, is not wide enough to allow for two segregated LRT lanes and two traffic lanes. In these sections, only one full traffic lane, plus a curbside parking and loading area can be provided.

The conversion of two existing traffic lanes to segregated LRT removes two or three traffic lanes from the existing road network, and reduces the vehicular capacity (although not the person-capacity) of the roads along the route.

The Design Workbook Process

The development of the B-Line LRT alignment required an iterative approach, with inputs from a Corporate Working Team and across disciplines of planners, engineers, transit designers & operators, urban designers and economic development specialists. This helps to achieve an Integrated Transit Solution that meets the City's objectives, and which retains a strong business case that will secure project funding. To reach this end point a series of Design Workbooks were developed and produced which document the development of the project, setting out options and choices considered as the project evolved.

Using the design principles outlined above the first Design Workbook was produced early in the process, in August 2010. This documented the first set of alignment plans, along with a commentary on the issues, impacts and opportunities that result. The initial alignment design was prepared to a level of detail that allowed the identification and documentation of a range of factors - cross-section impacts, revisions to traffic lane layouts, intersection arrangements, junctions requiring transit signal priority, urban development opportunities, pedestrian and cycling improvement opportunities and the scope to improve the urban realm. These plans formed the basis for discussion on all aspects of the project, from area-wide traffic and bus changes to detailed LRT design issues. However, over one section of the route, between Wellington Street and Parkdale Avenue, it highlighted the need for some more detailed assessment of options.

An initial set of possible alternatives for this section were formulated, and following further discussions 14 alternative conceptual layouts for the section from Wellington

Street to Parkdale Avenue were set out in the "*Options between Wellington Street* and Parkdale Avenue" report. The report gave a background to the issues arising in this section and set out the strengths and weaknesses of each alternative against a set of criteria agreed to by the City and Metrolinx.

Views on each section of the transit corridor were collected during discussions with the City of Hamilton, Metrolinx, their partners and stakeholders. The proposals were amended to arrive at an initial design scheme which formed the basis of public consultation in early 2011.

Following consultation and a number of suggested detail level changes the initial alignment was considered "fixed" and design to 30% was able to commence.

Making the Case

Rapid Transit in Hamilton is about more than moving people. It is seen as a catalyst to wider city urban regeneration, as highlighted by the Project's Vision Statement. The aim is to produce an Integrated Transit Solution – comprising transit, land use, and transportation demand management measures. More than that, the key is to try to ensure that the desired development happens, in the right place, at the right time and of the appropriate type.

The project team's focus of the PDE work has been on developing the design and specifications for the project always questioning:

How will LRT in Hamilton achieve its goals of growth, revitalization, intensification, etc. and what actions are required to maximize the chances of securing the benefits?

Figure 7: Example of Intensification on King Street West

To answer this, the team is undertaking a more detailed assessment of the wider case for the project, reviewing the overall project Vision, and considering the following aspects:

- The wider benefits that the project will generate;
- The mechanisms that need to be developed to procure the transit project and to capture the wider "city-shaping" outputs required from the project; and
- The overall project costs, eligibility criteria and affordability.

This wider case work will help to get the project to a "maximum state of implementation readiness". In particular, by considering how and what are the best

mechanisms for trying to ensure that the desired economic development occurs through working with the development sector and potential funding agencies. This includes ensuring that the particular design attributes of the Hamilton project, with an emphasis on wider station area plans to act as a catalyst for TOD, are addressed and appreciated by funders and investors alike. The work also includes investigating and drawing initial conclusions on appropriate funding and delivery mechanisms for the completion of the rapid transit component and options to deliver the land use with Rapid Transit.

Stakeholder Approach/Public Involvement

City staff have used a number of mechanisms to engage the community, including:

- Public Information Centres/Open Houses;
- Establishing a Citizen Advisory Committee;
- Corridor Walks;
- Community Focus Groups and Interviews;
- Social Media (Facebook, Twitter);
- A Project Website; and,
- Monthly Newsletters.

Public Information Centres (PICs) have been held since 2008. These meetings have been used to disseminate information about the project and to obtain feedback to help shape the project. Each round of PICs has consisted of a number of events arranged during different times of the day and at locations both along the corridor and in other parts of the City. The purpose of holding events at different locations and at different times is to engage as many people as possible. Rapid Transit projects have the ability to make large scale changes to the community so it is important to inform and hear from as many people as possible. Attendance numbers at PICs have been consistently high with strong support for the project.

In 2010, a Rapid Transit Citizen Advisory Committee (RTCAC) was established to act as a sounding board to the project team, providing advice and perspectives that have helped shaped the project. Members applied to the City and were selected to ensure that there was representation from along the entire corridor. The committee also reviews presentation material before they are presented to the broader public.

Since there will be significant changes to the look and feel of this corridor – as it transitions from auto oriented to transit oriented – there will be changes for existing residents and businesses. Focus groups were held with neighbourhood associations and business groups along the corridor to hear from residents and business owners. City staff also conducted corridor walks to build awareness for the project.

A project webpage on the City of Hamilton website was launched in November, 2010. The webpage contains project information and the ability for people to register on the project mailing list. Since there are limitations with the project webpage a new Rapid Transit website is being developed. This website will incorporate video capabilities and be much more interactive and user friendly. In addition to the project website, the team has used Youtube, Facebook and Twitter to disseminate information in an effort to more fully engage the youth in the planning process. Monthly newsletters (Figure 8) are distributed to our mailing list, which provide updates on the project and general transportation information. In 2011, the newsletters were transitioned from mainly print distribution to electronic format using technology that allows us to track whether the newsletters are being read, forwarded and social media tracking (Facebook Likes, and Twitter Retweets).

Overall, the project team has been following a broad approach to stakeholder consultation and are adaptable of new communications trends to ensure that the project remains a point of discussion within the community, as the planning progresses.

Lessons Learned

Figure 8: Rapid Transit Newsletter

The importance and value of integrating land

use and transportation planning cannot be under-estimated. Hamilton's *Transportation Master Plan* was completed together with the City's growth plan (*Growth Related Integrated Development Strategy*, or *GRIDS*), ensuring that land use and transportation decisions were not made in isolation of each other. *GRIDS* formed the basis of the City's urban structure, a fundamental component of the *Urban Official Plan*. Having been informed by the *Transportation Master Plan*, the *Urban Official Plan* includes the A- and B-Lines as Primary Corridors, and key destinations along those routes as Nodes. Both the A- and B-Lines connect to the Downtown, an Urban Growth Centre in *Places to Grow*. Supportive zoning was developed before we began the PDE work and will be updated as required through the ongoing Corridor Planning work.

It is important to define what is trying to be achieved through the implementation of LRT early and to reflect on the key goals whenever tough decisions have to be made. Hamilton developed a Vision Statement, before beginning the PDE work, and whenever meetings are held with our Corporate Working Team, the public or Council, the Rapid Transit Vision Statement is the first information presented to set the stage for the presentation that day.

It is equally important to define what is meant by "rapid transit" and to clearly communicate that early and often. Is the rapid transit project a bus-based system or on rail? Is LRT/BRT in a segregated right-of-way or in lanes shared with traffic like a streetcar? Will it be underground, at street level or above the street?

Know who the supporters and detractors are, and communicate with them often and in a number of ways. The more the team knows about what people think about the project and the earlier it is found out, the easier it is address concerns or to explain why changes cannot be made. Even if there is nothing new to say, say that: don't leave people guessing. Make sure there are a number of ways for people to participate or share their views. Hold public meetings, use social media, have workshops, use the Internet, talk to service groups and special interest groups, use Councillor's newsletters and project specific newsletters, take advantage of any opportunity to make a presentation, walk along the corridor and talk to the people who live and work there. Communicate often and in many different ways.

A challenge for a project of this magnitude is that planning and design can take years to complete and may spread across Council terms. While there may be strong support during one term, the priorities of the following Council may change and some project support may be lost. Ensuring that the project has a strong financial case and reasonable funding mechanisms help ensure project delivery. Funding options should be included in any "making the case" planning for rapid transit projects.

Funding typically requires commitment from various levels of governments and can even include private sector partnerships. Project Champions are needed and, ideally, they are not the immediate members of the planning and design team. Senior staff from the municipality, Councillors, the Mayor and community leaders are champions that are able to keep the potential funding partners' focus on the project and to communicate the importance that these types of projects can bring to a community.

Conclusion

Hamilton, Ontario, together with Metrolinx and Steer Davies Gleave, has taken a holistic approach to planning its B-Line corridor and LRT scheme. Sticking to the Rapid Transit Vision and the principle of "putting the passenger first", the PDE and land use planning work has resulted in a corridor plan focused on connectivity, people, economic development and revitalization.

By including a wide range of stakeholders and all City departments in all phases of planning and design, the Rapid Transit team ensures that rapid transit construction and operation is embedded in service delivery plans in all areas, and received buy-in across the corporation and community.