

Date: 2021-05-20

Subject: **Recommendation Report: Light Rail Transit (LRT) Extension Study along Main Street from Brampton Gateway Terminal to Brampton GO Station – Preferred LRT Alignments**

Contact: **Compton Bobb, LEL, MCSCE, ENV SP**, Senior Project Engineer, Higher Order Transit – EA’s, Brampton Transit, (905.874.2581)

Report Number: Brampton Transit-2021-744

Recommendations:

1. That the report titled: **Recommendation Report: Light Rail Transit (LRT) Extension Study along Main Street from Brampton Gateway Terminal to Brampton GO Station – Preferred LRT Alignments – Wards #1, 3 & 4 (File IA.A (16-3130-101))**, to the Committee of Council Meeting of June 23, 2021, be received; and
2. That staff be directed to take both preferred LRT Extension Options to the 30% Preliminary Design & Draft EPR Phase of the LRT Extension Study; and
3. That a budget amendment be approved in the amount of \$650,000 to top-up Project #174115-001 – Light Rail Transit Extension Study, with funding of \$650,000 coming from the Community Investment Fund Reserve #110; and
4. That Council endorse that the relocation of the LRT stop from the south side to the north side of the Steeles and Hurontario intersection, be incorporated into future design work for the LRT Extension Study.

Overview:

- **Council directed staff to update the 2014 Hurontario-Main Light Rail Transit Environmental Assessment Study (2014 HMLRT EA) and consider options for a Main-George one-way loop, tunneling, and the original HMLRT EA approved route, and incorporate enhanced streetscaping from Downtown Reimagined where possible.**

- **The project team developed and evaluated a long-list of LRT alignments along the Main Street corridor and refined this list to create a short-list of alignments. The short-list were evaluated using the Metrolinx Preliminary Design Business Case criteria. The preferred LRT alignments for the surface and tunnel alignments were presented at Virtual Public Open House # 2 between April 22 to May 13, 2021 to obtain public feedback.**
- **There has been comprehensive stakeholder engagement, including meetings with Metrolinx, TRCA, Peel Region and DBBIA. Feedback and issues brought up by the stakeholders were considered and addressed as part of the development of the options.**
- **Through the feedback and evaluation process, one surface alignment and one tunnel alignment emerged as preferred options. Both options have distinct benefits. While the preferred surface option is stronger in the Economic and Financial Cases, the underground option is stronger in the Strategic and Deliverability and Operations Cases.**
- **While it was initially envisioned that one single preferred option would be moved forward to the 30% Preliminary Design & Draft EPR phase of the project, given that neither preferred surface or tunnel option has been identified as distinctly superior than the other, staff are recommending that both preferred options are moved forward into this next phase of the project.**
- **Developing the 30% Preliminary Design & Draft EPR for both preferred options will help further differentiate between the two preferred options and help to inform which option is carried forward into the formal TPAP process. To move forward with this approach, an additional \$650,000 in funding will be required and there would also be a modest increase in the overall project schedule of approximately four months. Given the importance of ensuring the best solution is advanced into the TPAP process, staff consider the additional costs and time associated with the approach warranted.**

Background:

At its May 22, 2019 meeting (Committee of Council May 15, 2019), Council approved funding and provided direction to staff to update the 2014 Hurontario-Main Light Rail Transit Environmental Assessment Study (2014 HMLRT EA) with consideration for a Main-George one-way loop, tunneling options, the original 2014 HMLRT EA approved surface route, and incorporation of the elements of enhanced streetscaping for Downtown Reimagined where possible. Council also directed that

the need for rapid transit routes on Kennedy Road and McLaughlin Road be examined as part of the next update to the Brampton Transportation Master Plan.

Study Purpose

The purpose of this study is to ultimately recommend a preferred alignment for the LRT Extension from the Brampton Gateway Terminal to Brampton GO station following the Main Street corridor. As part of the evaluation of LRT alignments, this study will:

- Develop and evaluate LRT route alignment alternatives including two-way surface, one-way loop (along Main Street and George Street), and tunneling options, with the LRT vehicles operating on dedicated or shared right-of-way or a mix of the two, as such to:
 - Avoid or mitigate any adverse effects on areas with constraints or sensitivities
 - Minimize potential effects on the environment
 - Support opportunities to revitalize Downtown Brampton including elements of enhanced streetscaping for Downtown Reimagined
 - Incorporate visioning, planning and urban design principles to address issues relating to land use, public realm, transportation
- Complete technical agency and public consultation
- Complete transportation modelling and analysis to confirm timing and appropriate configuration of the alternative LRT alignments
- Complete related technical studies such as hydrogeology, geotechnical, noise and vibration, etc.
- Recommend the preferred LRT alignment including preliminary design
- Complete a business case analysis in cooperation with Metrolinx
- Complete the requirements of Ontario's Transit Project Assessment Process (TPAP) to satisfy Ontario Environmental Assessment (EA) Act requirements

In early November 2019, an update notice for the LRT Extension Study was mailed to residents, businesses and other stakeholders along McLaughlin Road, Kennedy Road, and Main Street corridors as well as those individuals on the previous project mailing list.

Current Situation:

Short-List of LRT Alignments

The project team developed an initial long-list of alternative LRT alignments along Main Street consisting of surface, one-way loop (on Main Street and George Street), and tunneling options. To facilitate the development of LRT alignments, the Main Street corridor was divided into three segments based on existing right-of-way width, lane configurations, or adjacent land use. The long-list of LRT alignments was screened to determine a short-list of seven (7) LRT alignments based on a set of indicators

consistent with the high level evaluation criteria used by Metrolinx towards preliminary design business cases.

The long-list of LRT and proposed short-list of LRT alignments and potential stops were presented at Virtual Public Open House #1 from June 22 to July 31, 2020 for public and stakeholder input. A comprehension Feedback report was prepared and is published on the project's webpage. Below is an outline of the key messages from Virtual Public Open House #1:

- Expedite the project
- Minimize impacts to Main Street
- Provide express service with fewer stops
- Create a transit hub at Brampton GO Station
- Support businesses and revitalize Downtown
- Retain heritage character and mature tree canopy on Main Street South
- Provide a pedestrian friendly environment and ease of transfer between travel modes
- Calm traffic along surrounding residential streets
- Protect for future northward extension
- Secure Provincial funding for the project

The loop options presented in virtual open house #1 were not advanced to the short-list for further assessment due to physical constraints (i.e. issues accommodating longer light rail vehicles and impacts to property).

Appendix A contains the proposed LRT station locations, short-list surface and underground options, with the evaluation summary.

Metrolinx Business Case

The six (6) short-list options were evaluated using the Metrolinx Business Case framework. Business Case analyses are required by Metrolinx for all capital projects slated to obtain financial contributions from higher levels of government.

The Preliminary Design Business Case (PDBC) was used to assess the short-listed options and the goal of the PDBC is to identify the best performing alternative for the extension of the Hurontario LRT. The analysis was completed for four (4) cases as follows:

- Strategic Case: addresses how the project (with its investment options) will achieve strategic transportation objectives.
- Economic Case: evaluates the life-time economic costs, benefits and impacts of the proposed investment project to establish its economic benefits to society, net benefits, and the benefit-cost ratio.
- Financial Case: establishes the costs to deliver the project, provides an overview of life-cycle costs and revenues related to the project and its overall financial performance.

- Deliverability and Operations Case: provides a discussion on the feasibility and constructability of the project alternatives and considers risks.

Metrolinx staff have also been involved in the development of the PDBC and have reviewed and commented on the final report. The complete PDBC is published on the LRT Extension project webpage and the Executive Summary is attached to this report as Appendix B.

Recent Consultation and Engagement

The project is being coordinated with other Downtown Brampton projects and initiatives. The interdependencies of the LRT Extension project with the other projects in the Downtown Brampton that are currently under various stages of planning or implementation cannot be overstated, and the project is coordinating with the appropriate stakeholders to ensure potential alignment of infrastructure recommendations.

The project team has met individually with Metrolinx, CN Rail, TRCA, Peel Region, and other internal and external stakeholders. Feedback and issues brought up by the stakeholders were considered and addressed as part of further development of the options. There has also been some outstanding potential design issues brought up by some of the stakeholders and these will be further reviewed and addressed through the next stages of the study.

The Downtown Brampton Business Improvement Association (DBBIA) also provided the following key messages as input into the study:

- Strong support for more space dedicated to pedestrians, patios and event programming.
- Concerns about bike lanes hindering business community's ability to provide space for other street elements.
- The DBBIA envision a pedestrian-focused Main Street with wider sidewalks and more outdoor space.
- Members of the DBBIA's board shared their preference for the emerging preferred underground option (U1) as it eliminates conflicts between LRT and civic events in the downtown.
- Members of the DBBIA's board voice their desire for the City to implement public realm in the downtown as soon as possible.
- DBBIA members called for the development of a downtown parking and deliveries strategy to review the availability, safety, and accessibility of existing and future parking space.

Feedback during the Council Workshop held on March 5, 2021, generated the addition of a 7th surface option that involved operating the LRT in mixed traffic and the inclusion of cycle track in segment "B" (between Nanwood and Wellington). This options was then simulated through the Metrolinx Business Cases Analysis and presented at the 2nd Virtual Open House.

Virtual public open House #2 was held online between April 2 and May 13, 2021. The purpose of this open house was to share:

- An update on the study since the last virtual open house in summer 2020;
- The findings of the evaluation of the short-list options; and
- A summary of the emerging preferred options.

The public feedback from Virtual Open House #2 is documented in the Public Feedback Report published on the project's webpage.

During the Open House period, the public was able to view the display boards at their own pace and provide input. The website was visited 714 times and 132 community members provided input through a survey form completed after viewing the material. The survey was composed of six questions and was designed to seek specific input on the evaluation of the short list and feedback on the two emerging preferred options – Underground option U1 and Surface Option S3.

Key Messages from Virtual Open House #2:

- Ability to extend the LRT northward in the future.
- Revitalized Downtown with a vibrant pedestrian realm and streetscape.
- Transit Hub at Brampton GO.
- Maintaining the character and opportunities for reimagining Downtown Brampton as a vibrant pedestrian area.
- 54 % of respondents showed a preference for Underground option U1, 46 % showed a preference for Surface option S3.
- Maintenance of the mature tree canopy on Main Street and less disruption to surface conditions.
- Securing funding from Province.
- Importance of making a decision on which option to take forward.

Summary of Business Case Evaluations

The following presents the overall conclusions drawn from the PDBC for each of the strategic, economic, financial, and deliverability and operations case. One preferred surface and one preferred underground option were identified from this process.

Surface Options Evaluation

All Surface options perform relatively similar. However, Option S3 is preferred as it best fulfils the objectives of the strategic case, generates the second highest economic case outputs and achieves financial case results that are better than most other surface options. Driveway access impacts are the greatest for S3, however, this trade-off was considered acceptable to minimize transit travel times along the corridor.

Option S3 is also supportive of vision from the 2018 Downtown Reimagined (e.g. wider sidewalks, streetscaping and cycle tracks), while also minimizing overall transit travel

time. Driveway accesses will be modified as a result of the dedicated LRT right-of-way, but this will ensure safe and efficient travel for all users of the street.

Underground Options Evaluation

Overall, Option U1 (via Main Street) and U2 (via George Street) perform similarly from a strategic perspective with U1 have certain marginal benefits related to transfer and LRT travel time. However, Option U1 is more preferred than U2 as it is less costly, located closer to the heart of Downtown Brampton, requires less property takings and is more easily extended north in the future.

Option U1 also provides the greatest opportunity to help revitalize Downtown Brampton as it would not significantly impede on any of the various improvements/initiatives considered for Downtown Brampton.

Comparison of Two Preferred Options

The preferred surface and underground options S3 and U1 were compared and their key differences summarized in table 1 below.

	Evaluation Criteria	Option S3 (DDS)	Option U1 (via Main Street)
Strategic Case	Strong Connections	<ul style="list-style-type: none"> 9 minute transit travel time Does not improve multi-modal level of service as much as option U1. 	<ul style="list-style-type: none"> 7 minute transit travel time Improves multi-modal level of service more than option S3.
	Complete Travel Experiences	<ul style="list-style-type: none"> Does not provide the same opportunity for improving pedestrian and cycling at the surface. Lack of dedicated cycling facilities in Segment B creates a discontinuous cycling network More opportunity for conflicts between modes 	<ul style="list-style-type: none"> Improves pedestrian and cycling facilities/level of service at the surface. Continuous cycling network. Less opportunity for conflicts between modes
	Sustainable and Healthy Communities	<ul style="list-style-type: none"> Restricted ability to close streets for civic events in Downtown. Greater temporary and permanent impacts to natural and cultural environment (especially in Segment B). 	<ul style="list-style-type: none"> Provides opportunity to close streets for civic events in Downtown. Fewer impacts to natural and cultural environment (especially in Segment B).
Economic Case	Net Present Value	\$66.9 million	-\$965 million
	Benefit-Cost-Ratio	1.18	0.33
Financial	Capital Costs	\$353 million	\$1.43 billion ¹

¹ Construction costs for underground options do not include streetscape or road configuration improvements at the surface. These were assumed to be undertaken as a separate City of Brampton initiative. Property acquisition are not included.

	Evaluation Criteria	Option S3 (DDS)	Option U1 (via Main Street)
	Net Financial Impact	- \$324 million	- \$1.5 billion
Deliverability and Operations Case	Impacts to Road Operations	<ul style="list-style-type: none"> More impact to emergency and service vehicle operations 	<ul style="list-style-type: none"> Fewer impact to emergency and service vehicle operations
	Impacts to Property	<ul style="list-style-type: none"> More property impacts (up to 5,100 m² property required) 	<ul style="list-style-type: none"> Fewer property impacts (~2,700m² property required)
	Impacts to Driveways	<ul style="list-style-type: none"> More driveway and access impacts/restrictions (73 driveways) 	<ul style="list-style-type: none"> Fewer driveway and access impacts/restrictions (9 driveways)
	Impacts to Utilities	<ul style="list-style-type: none"> More utility impacts (24 major utility conflicts) 	<ul style="list-style-type: none"> Limited utility impacts
	Schedule	<ul style="list-style-type: none"> Up to 6 years from design to opening day. 	<ul style="list-style-type: none"> 7 to 8 years from design to opening day.

Table 1: Comparison of Preferred Surface and Underground Options.

Both options have distinct benefits. While the preferred surface option is stronger in the Economic and Financial Cases, the underground options is stronger in the Strategic and Deliverability and Operations Cases. Comparing the two preferred options further:

- Both options provide comparable auto and transit travel times and have similar opportunities for economic development within the City and in the downtown. However, the tunnel options provides a greater opportunities for place-making and accommodation of future design elements in the downtown.
- The surface option has a lower cost, and be constructed more quickly. However, it has more impacts to driveway access, utility, and property.
- The surface option doesn't allow for a continuous cycling network along Main Street (gap in segment B) and limits the City's ability to have civic events (such as farmers market) on Main Street in the Downtown without impacting LRT operations.
- The underground option provides many of the benefits that the surface option lacks while minimizing impacts at the surface. However, the underground option takes longer to construct and has a higher construction cost.
- While feedback from consultation and engagement indicates credible support for both options, the tunnel option has garnered slightly more support from the community compared to the surface option.

Brampton Gateway Stop

The City of Brampton has been advocating as part of the current HuLRT construction, to locate the Brampton Gateway LRT Stop to the north side of Steeles Avenue for the past 2 years. Unfortunately, these requests have been repeatedly declined by Metrolinx and the Minister of Transportation. There continues to be distinct benefits of relocating the LRT Brampton Gateway Stop north of Steeles Avenue, namely its proximity to the existing Gateway Transit Terminal to accommodate safe and convenient passenger transfers. To continue to support this relocation, it is recommended that the relocation of the LRT stop be incorporated into future work for the LRT Extension Study. This will allow the city to protect for a possible relocation of the stop at some point in the future.

Downtown Revitalization

Both the preferred surface and preferred tunnel options support the various streetscaping components from the 2018 Downtown Reimagined project design. This includes elements such as wider sidewalks with narrowed roadway, bike paths, new street-lighting, new traffic signals, street furniture and boulevard trees. Advancing design work to the 30% level on either of the preferred alignments, will help further inform decisions and design work in Downtown Brampton. The LRT team will continue to work closely with staff involved in advancing and supporting the various improvements/ initiatives in Downtown Brampton.

Corporate Implications:

Financial Implications:

Funding for the Hurontario-Main Street Light Rail Transit (LRT) Environmental Assessment is available from Transit Capital project #174115-001 – Light Rail Transit Extension Environmental Assessment Study:

Approved Budget	Expenditures	Commitments	Balance
\$5,400,000	\$3,370,000	\$1,650,000	\$380,000

However, additional funds in the amount of \$650,000 are required to take both preferred LRT Extension Options to the 30% Preliminary Design & Draft EPR Phase of the LRT Extension Study.

Therefore, a budget amendment will be required to increase Transit capital project 174115-001 in the amount of \$650,000, funded from the Community Investment Fund Reserve #110. There is sufficient funding available to proceed.

Term of Council Priorities:

The LRT Extension study is in alignment with the 2019-2022 Term of Council Priority – Brampton is a Green City – Equalize all forms of transportation. The LRT Extension will provide a key transit link in the regional transit network connecting Brampton to the GTHA.

Conclusion:

As mention above, the S3 Surface option and the U1 Tunnel option are both viable and have distinct benefits. While it was initially envisioned that one single preferred option would be moved forward to the 30% Preliminary Design & Draft EPR phase of the project, given that neither option has been identified as distinctly superior than the other, staff are recommending that both preferred options are moved forward into this next phase of the project.

The benefits of developing the 30% Preliminary Design & Draft EPR for both preferred options are as follows:

- The advancement of the design and additional studies produced in this phase will help further refine the findings from the PDBC.
- Potential issues and subsequent design solution will be explored further, which could influence or enhance benefits and costs for either option.
- Further consultation with internal and external stakeholders will help improve the overall design.
- Current cost estimates have been prepared at a high level and have a high degree of variability. Through this process, cost estimates will be refined and the variability will be reduced, giving more certainty to the estimates.

All of this additional information will help further differentiate between the two preferred options. This interim period when the 30% Preliminary Design & Draft EPR are being prepared, would also allow the City to investigate potential funding sources for the advancement of this project. All of this information will inform future decision making and ultimately, what option is advanced to the formal TPAP process.

To move forward with this approach, an additional \$650,000 in funding will be required to complete the 30% Preliminary Design & Draft EPR for both preferred options. There would also be a modest increase in the overall project schedule with the overall completion of the project extended by approximately four months. A summary outlining the project schedule for this approach is outlined in Table 2 below.

Task Description	Two Options to 30 % Preliminary Design
Prepare 30% Preliminary Design & Draft EPR.	6 months
Agency Review Period and Update Draft EPR	3 months
Recommend Single Preferred Option	
Commence 120 day TPAP Period	4 months
Public and Ministry Review Period	2 months
Total Time	15 months

Table 2: Project Schedule

Given the benefits outlined above of moving forward with 30% Preliminary Design & Draft EPR on both preferred options, and the importance of ensuring the best solution is advanced into the TPAP process, staff consider the additional costs and time with this approach warranted.

Authored by:

Compton Bobb, LEL, MCSCE, ENV SP,
Senior Project Engineer, Higher
Order Transit EA's, Brampton
Transit

Reviewed and Approved by:

Doug Rieger,
Director, Transit Development,
Brampton Transit

Approved by:

Alex Milojevic, General Manager,
Brampton Transit

Submitted by:

David Barrick,
Chief Administrative Officer

Attachments:

Appendix A - Proposed LRT station locations, short-list surface and underground Options, with the evaluation study.

Appendix B - PDBC Executive Summary