TO:	**CHAIR AND MEMBERS STRATEGIC PRIORITIES AND POLICIES COMMITTEE MEETING ON JULY 24, 2017**
FROM:	**KELLY SCHERR, P.ENG., MBA, FEC MANAGING DIRECTOR ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER**
SUBJECT:	**SHIFT RAPID TRANSIT MASTER PLAN AND BUSINESS CASE**

RECOMMENDATION

That on the recommendation of the Managing Director, Environmental and Engineering Services & City Engineer, the following actions **BE TAKEN** with respect to the Shift Rapid Transit Master Plan:

(a) The Rapid Transit Master Plan, executive summary attached as Appendix A, **BE APPROVED** in accordance with the Municipal Class Environmental Assessment process requirements;

(b) The Rapid Transit Master Plan Notice of Completion, attached as Appendix B, **BE FILED** with the Municipal Clerk;

(c) The Richmond Street Municipal Underground Utilities Realignment Environmental Assessment Study Notice of Completion, attached as Appendix C, **BE FILED** with the Municipal Clerk;

(d) The Rapid Transit Master Plan Report **BE PLACED** on public record for a 45-day review period;

(e) The updated Shift Rapid Transit Business Case, executive summary attached as Appendix D, **BE APPROVED**;

(f) The Infrastructure Ontario **BE REQUESTED** to undertake a Procurement Option Analysis for the Rapid Transit initiative;

(g) The Shift Rapid Transit Business Case **BE SUBMITTED** to the Provincial and Federal Governments and Civic Administration continue to pursue all available funding opportunities; and

(h) The Shift Rapid Transit capital budget and forecast, estimated at $500 million shown in Schedule A, attached as Appendix E, **BE APPROVED**, noting that appropriate capital budget adjustments will be reflected in the 2018 Annual Corporate Budget Update.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

- Civic Works Committee – June 19, 2012 – London 2030 Transportation Master Plan
- Civic Works Committee – October 7, 2013 – Bus Rapid Transit Strategy
- Civic Works Committee – July 21, 2014 – Rapid Transit Corridors Environmental Assessment Study Appointment of Consulting Engineer
- Civic Works Committee – June 2, 2015 – Rapid Transit Funding Opportunities
- Civic Works Committee – August 24, 2015 – Shift Rapid Transit Initiative Appointment of Survey Consultants

- Strategic Priorities and Policy Committee – November 9, 2015 – Shift Rapid Transit Update
- Strategic Priorities and Policy Committee – January 28, 2016 – Downtown Infrastructure Planning and Coordination
- Strategic Priorities and Policy Committee – May 5, 2016 – Shift Rapid Transit Business Case
- Strategic Priorities and Policy Committee – September 12, 2016 – Rapid Transit Implementation Working Group
- Strategic Priorities and Policy Committee – May 3, 2017 – Rapid Transit Alternative Corridor Review
- Strategic Priorities and Policy Committee – May 15, 2017 – Rapid Transit Corridors
- Civic Works Committee – July 17, 2017 - Shift Rapid Transit Additional Engineering and Legal Survey

COUNCIL'S 2015-2019 STRATEGIC PLAN

Municipal Council has recognized the importance of rapid transit and improved mobility in its 2015-2019 – Strategic Plan for the City of London (2015-2019 Strategic Plan) as follows:

Strengthening Our Community
- Healthy, safe, and accessible city.

Growing Our Economy
- Local, regional, and global innovation; and
- Strategic, collaborative partnerships.

Building a Sustainable City
- Robust infrastructure;
- Convenient and connected mobility choices;
- Strong and healthy environment;
- Beautiful places and spaces; and
- Responsible growth.

Leading in Public Service
- Collaborative, engaged leadership; and
- Excellent service delivery.

BACKGROUND

Context

Rapid transit is the primary recommendation of the Smart Moves Transportation Master Plan (TMP), is identified in the current Official Plan, and represents a cornerstone of The London Plan and Council's 2015 - 2019 Strategic Plan.

The Shift Rapid Transit initiative has been undertaken to create a Rapid Transit Master Plan (RTMP) that adheres to the legislative requirements of the *Environmental Assessment Act*. The Master Plan will provide a strategy for building a Rapid Transit system that will help meet the City's economic development, mobility, environmental and community building objectives while still beg operationally feasible and economically viable.

The implementation of a rapid transit system will not only result in significant improvement in London's public transit system, it is a central component of London's land use and transportation policy. It will help shape the city's future pattern of growth,

encourage intensification and regeneration, and stimulate economic growth for decades to come.

Rapid transit corridors integrated with a strong conventional transit system, supportive land use planning policies and appropriate service coverage and frequency will facilitate more transit trips, reduce traffic volumes and make transit a fast, more reliable, convenient and comfortable transportation option for residents.

Background

On May 16th 2017, Council approved the Bus Rapid Transit Network, with the modifications related to the downtown routing and an at-grade level crossing of the CP Railway with dedicated bus lanes on Richmond Street as the preferred alternative for the completion of the RTMP, the basis for the updated Business Case and the undertaking of a Transit Project Assessment Process (as per Regulation 231/08).

The RTMP has been completed based on this Council direction and the Business Case has been updated to reflect these changes.

Purpose

This report recommends approval of the formalized RTMP and Business Case and filing of the Notice of Completion in accordance with the Environmental Assessment Act. Approval of the RTMP constitutes ratification of the BRT Network and its corridors; the conceptual design will be refined through the next phase of the study.

DISCUSSION

Rapid Transit Master Plan

The Shift Rapid Transit Environmental Assessment has been working towards creating a Rapid Transit Master Plan that adheres to the legislative requirements of the Environmental Assessment Act. The process is based on a phased approach with the level of detail and analysis increasing for each phase. Phase 1 and Phase 2 of the process included the identification of the problem or opportunity and assessment of alternative solutions, including the identification and evaluation of alternative corridors. The RTMP addresses Phases 1 and 2 of the Municipal Class Environmental Assessment Process and with Council Approval of the Master Plan, the EA process will continue following the Transit Project Assessment Process (TPAP). Figure 1 illustrates the EA Study Process.

Five guiding principles were adopted early in the study process based on consultation with Londoners. Shift applied a multi-step Alternatives Assessment Framework that took the rapid transit RT plan from a long list of high-level corridor segments to the recommended preferred corridor network. The ability for each solution to achieve the five overarching goals has been the basis for measurement and evaluation throughout the study.

- Economic Development and City Building
- Community Building and Revitalization
- Transportation Capacity and Mobility
- Ease of Implementation and Operational Viability
- Natural Environment and Climate Change

Affordability and Fiscal Responsibility was an overarching consideration and key aspect of the Rapid Transit Business Case.

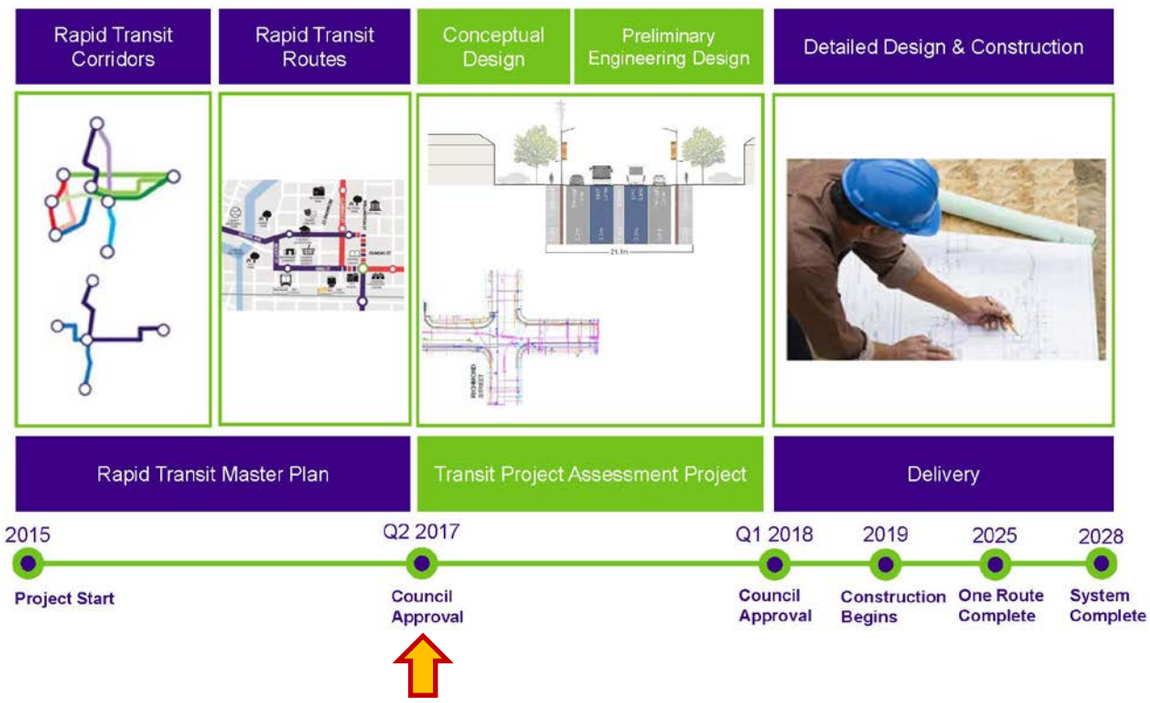


Figure 1 – EA Study Process

The preliminary preferred Full BRT Network was presented at Public Information Centre #4, which was held on February 23rd 2017. In response to the Council direction from April 2017, Civic Administration reviewed alternative route options in the downtown, including an east-west corridor and a north-south corridor, as well as alternatives to the proposed Richmond Row tunnel.

On May 3rd 2017, administration brought forward a Rapid Transit Alternative Corridor Review technical memo for SPPC consideration. Recommendations for the preferred BRT Network were presented at the following SPPC meeting on May 15th 2017. The key recommendations for the preferred BRT Network included the King/Queen Couplet in the downtown and the modification of the Richmond Street corridor to include an at-grade crossing of the CP Railway with dedicated bus lanes. On May 16th 2017, Council approved the BRT Network is shown in **Figure 2**.

With Council's approval of the alternative corridors, the Shift project team has formalized the Rapid Transit Master Plan for approval and initiation of the Public Review period in accordance with the Environmental Assessment Act. The RTMP Executive Summary is attached in Appendix A. The complete RTMP documentation, including all technical appendices is available for download at http://www.shiftlondon.ca/reports.

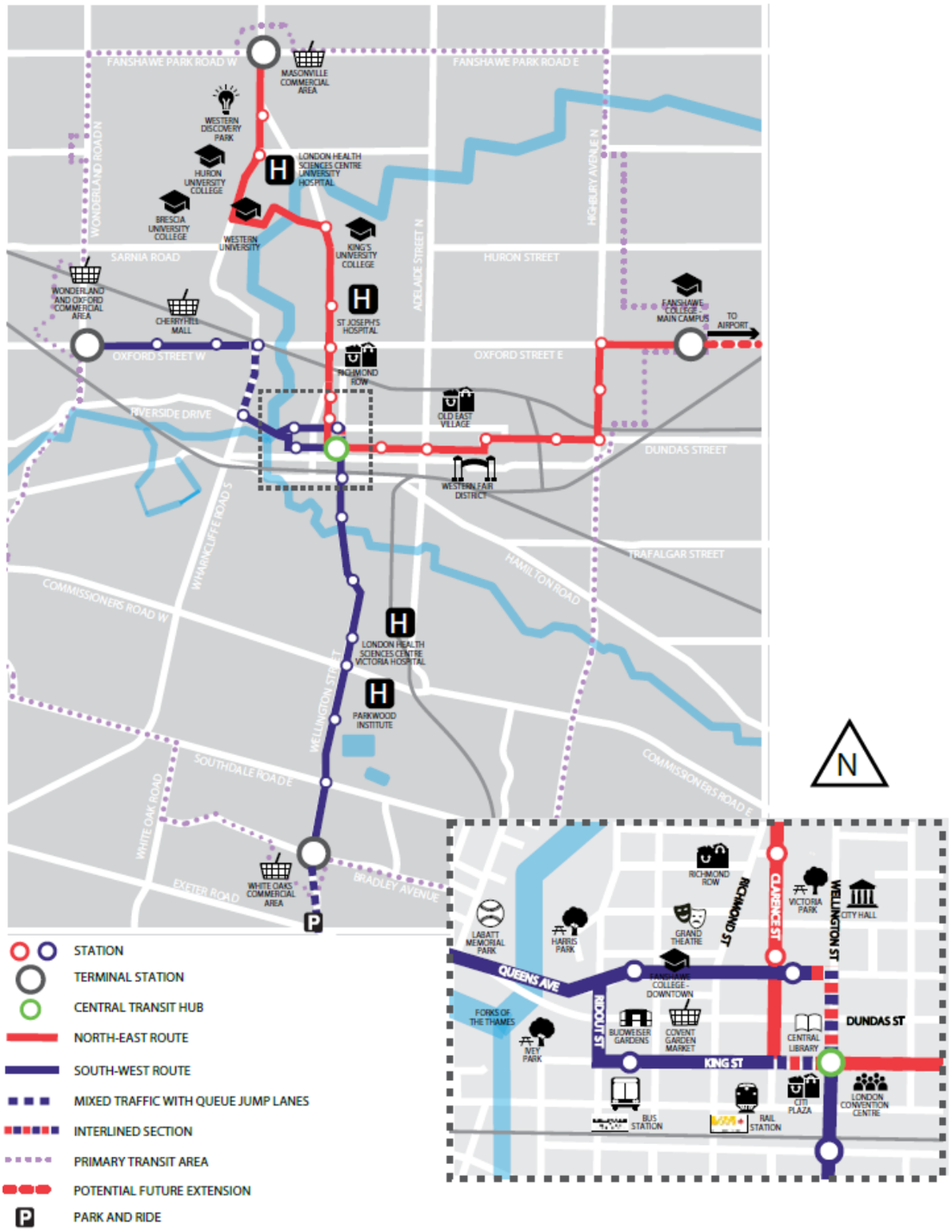


Figure 2 – Approved Bus Rapid Transit Network (May 2017)

Updated Business Case

Concurrent with development of the Rapid Transit Master Plan, a Business Case was prepared to evaluate broad network and technology options. The Business Case model has been updated to evaluate the preferred Bus Rapid Transit Network identified through the master planning process. The Business Case is captured in the RTMP and the executive summary is attached in Appendix B. The full Business Case is available for download at http://www.shiftlondon.ca/reports.

Business case analysis (BCA) includes both quantitative and qualitative impact information that collectively indicate the expected performance of a proposed investment.

BCA puts a proposed investment decision into a strategic context and provides the information necessary to make an informed decision about whether to proceed with the investment and in what form. It is also the basis against which continued funding of the project will be compared and evaluated. The importance of the BCA in the decision-making process continues throughout the entire life cycle of an investment: from the initial decision to proceed to the decisions made at scheduled investment lifecycle gates to continue, modify, or terminate the investment. The Shift Rapid Transit BCA uses a Multiple Account Evaluation (MAE) approach, the standard by which the Province reviews transit projects.

Based on the results of this BCA, it can be concluded that implementation of the Full BRT alternative with the approved corridors provides a positive financial return on investment and is the best overall value solution from a mobility, city building, economic development and financial affordability perspective. At a capital cost of $500 million in nominal dollars, this alternative would produce a benefit cost ratio of 1.18 in transportation, environmental and economic benefits over the project life span. The system can be implemented in a phased approach and can be adapted to other technologies over the longer term as ridership grows, technologies and trends advance, and as funding becomes available.

The City has been working with the Ministry of Transportation to complete a technical review of the Business Case. After the completion of the technical review, the Province will be in a position to determine funding timelines based on their budget timeframes.

In addition, the City has been engaging with Infrastructure Ontario to undertake a Procurement Options Analysis. This analysis will be required as part of the submission to the federal government.

The Business Case will be submitted to the federal government following the technical review by the Province and a funding request will be submitted later this year through Phase 2 of the Public Transit Infrastructure Program (PTIF) program.

Public Engagement

As part of the Master Plan process, there were four public information centres, numerous community engagement events, individual corridor meetings and a public participation meeting held by Council in May which satisfies the legislated MEA engagement requirements. A complete record of public consultation for this project is included in Appendix A of the RTMP.

As the study moves forward with the next phase of the study, the City and study team are committed to ongoing consultation with stakeholders. A detailed engagement plan is being be developed for the TPAP.

RTMP Notice of Completion

The Notice of Completion of the Rapid Transit Master Plan satisfies the mandatory point of contact with the public and review agencies at the conclusion of the second phase of the Class EA process. A public review period of at least 30 days is required for comment and input. The civic administration recommends an extended review period of 45-days given the current level of engagement with Londoners, and given the timing of review over the summer months. The RTMP Notice of Completion is attached in Appendix B.

Upon approval by Council, the RTMP is proposed to be available on-line, at City Hall, the LTC Office and select City Library branches from Thursday, August 3, 2017 to Monday, September 18, 2017.

The 45 day review period provides the public an opportunity to review the finalized RTMP and provide comment on the approved BRT Network to be considered during the pre-planning activities for the Transit Project Assessment Process and future implementation. The public review period will not include further consideration of alternative technologies or corridors. Going forward, the RTMP will provide the basis for further studies carried out towards the implementation of Rapid Transit, specifically the pre-planning activities and Transit Project Assessment Process.

Richmond Street Municipal Underground Utilities Realignment Environmental Assessment Study Notice of Completion

The Underground Utilities Realignment Class Environmental Assessment (EA) was initiated to examine alternatives for the realignment of storm and sanitary sewers that would have been impacted by the Richmond Street transit tunnel alternative. As the tunnel was not included in the Rapid Transit Master Plan BRT Network, there are no anticipated impacts to these storm and sanitary sewers. The preferred solution has been confirmed to constitute a Schedule A+ project, as outlined in the Municipal Engineers Association Municipal Class EA guidance document, and is therefore pre-approved. The Richmond Street Municipal Underground Utilities Realignment Environmental Assessment Study Notice of Completion is attached in Appendix C.

FINANCIAL IMPLICATIONS

The total system cost (including vehicles, contingencies and the quick start project) for the revised BRT network described in this report is estimated at $500 million, including a 50 percent contingency. The $500 million represents the cost of the project over the construction period including an estimate for inflation, which is consistent with the City's Capital Financing and Budgeting Policy.

Capital projects that take multiple years to complete, like London's Rapid Transit project, are valued two ways: real dollars and nominal dollars. The Ministry of Transportation requires that the City use nominal dollars in the business case and when discussing any request for funding. Nominal dollars represent the cost of the project over the construction period including an escalation for inflation. London's Rapid Transit project is $440 million in real dollars and $500 million in nominal dollars. From this point forward, the City of London will reference the nominal value of $500 million and that will be referred to simply as the "project cost".

The Approved 2016 – 2019 Multi-Year Budget and ten year capital plan included a number of projects that together fund a Rapid Transit initiative of approximately $380 million. The plan was contingent on 2/3 funding from Federal/Provincial governments. The municipal contribution of $130 million is fixed, with most coming from development charges.

With the revised total project cost now estimated at $500 million, the City is seeking an additional $120 million in Federal/Provincial funding, as outlined in the schedule below. The construction period in the current business case has also changed since the original budget was put in place. The capital plan and forecast will be revised through the 2018 Budget Update to reflect the increased funding requirement from the Federal and Provincial governments and timing changes in the revised business case.

Schedule A

Rapid Transit Budget ($ millions)

	Approved Budget			Adjustments Increase/(Decrease)			Revised Budget		
	2016-2019 Multi-Year Budget	2020-2025 Forecast	10 Year 2016-2025 Total	2016-2019 Multi-Year Budget	2020-2025 Forecast	10 Year 2016-2025 Total	2016-2019 Multi-Year Budget	2020-2025 Forecast	10 Year 2016-2025 Total
Expenditures [1]	**270**	**110**	**380**	**(150)**	**270**	**120**	**120**	**380**	**500**
Municipal Contribution:									
- Capital Levy	8	4	**12**	(5)	5	**0**	3	9	**12**
- Development Charges [2]	84	34	**118**	(56)	56	**0**	28	90	**118**
Federal/Provincial	178	72	**250**	(89)	209	**120**	89	281	**370**
Source of Financing	**270**	**110**	**380**	**(150)**	**270**	**120**	**120**	**380**	**500**

(1) The City of London's Capital Financing and Budgeting Policy requires that projects in the capital budget be included with all reasonably known or anticipated costs, including inflation.

(2) New provincial regulations on Development Charges recovery for transit projects may change the growth/non-growth splits on the municipal contribution. A consultant's study on this issue will be completed in the coming months.

New provincial regulations for Development Charges (DC) recovery for transit projects may change the growth/non-growth splits based on the new scale of the project and the service standard (ridership), but the impact is unknown at this time. The City has retained a consultant to provide the methodology for DC rate calculation purposes, which will be completed in the coming months.

NEXT STEPS

Transit Project Assessment Process (TPAP)

Once the RTMP is adopted by City Council, the environmental assessment process will continue following the Transit Project Assessment Process. The TPAP provides a defined approvals process for transit projects that has been successfully followed by many transit authorities across the province since its introduction in 2008. The TPAP focuses on the assessment of potential impacts of the selected transit project, in this case the 24-km BRT Network.

Pre-planning activities will be undertaken to develop a preliminary engineering design, conduct public and stakeholder consultation, identify impacts and propose mitigation measures. The pre-planning activities will also include additional assessment of impacts to natural, cultural, archaeological and socio-economic environments and develop appropriate mitigation measures including monitoring. The entirety of the BRT Network will be assessed in the development of the preliminary engineering design. Table 2 illustrates what to expect in the next phase of the study.

Table 2

TPAP Pre-Planning Activities	Formal TPAP Process	Detailed Design
Engage with residents, businesses, Indigenous communities (or First Nations), Metis, review agencies, and other stakeholders Alternative transit lane configurations Alternative intersection lane configurations Active transportation facilities Refine station locations Mitigate impacts to property, cultural and natural features Utility and public servicing strategy Complete preliminary engineering design Update cost estimates Update phasing strategy Prepare a draft Environmental Project Report	Notice of Commencement for 120-day TPAP Formal public engagement with residents, businesses, Indigenous communities (or First Nations), Metis, review agencies, and other stakeholders Agency review of draft Environmental Project Report 30-day public review of Environmental Project Report 35-day Ministerial Review	Detail design drawings Mitigating construction impacts Construction phasing and traffic management plans Property acquisition plans Utility relocation plans Tree protection plans Environmental and cultural monitoring plans Travel demand management plans Parking and access plans Final cost estimates

Before distributing the Notice of Commencement and starting the time-limited transit project assessment process, there will be continued engagement with the Environmental Approvals Branch of the Ministry of Environment and Climate Change. Upon the Minister's review and decision, if an objection is received or not, the RT project can proceed to detailed design, implementation and construction.

Updated Work Plan for TPAP

The next step for the Shift rapid transit team will be to prepare an updated work plan outlining and scheduling all deliverables required to complete the EA process including completion of the TPAP.

The updated TPAP work plan will consider:

- MOECC consultation; and
- Rapid Transit Implementation Office launch;
- Community and stakeholder engagement;
- Additional natural, cultural, archaeological and socio-economic assessments;
- Infrastructure Ontario procurement options analysis;
- Preliminary engineering design; and,
- The formal TPAP process.

The TPAP Work Plan and Communications Plan will be brought forward to Council in September and will act as a roadmap to kick-off the TPAP pre-planning activities in October following the 45-day public review period.

Procurement Options Analysis – Infrastructure Ontario

The City has been engaging in discussions with Infrastructure Ontario in reviewing appropriate delivery models for the project. Infrastructure Ontario has partnered with municipalities across Ontario to deliver transit projects on-budget and on-time while meeting high standards for design, quality, and health and safety.

Infrastructure Ontario uses an approach to modern project delivery called Alternative Financing and Procurement (AFP). The AFP model is guided by a government policy framework. Infrastructure Ontario AFP approach is used for public sector projects with a capital cost over $100 million or projects that involve significant risk and complexity. IO works closely with public sector project owners and sponsors to deliver projects successfully in partnership with the private sector.

Province uses a tool called a value for money (VFM) assessment to compare the total project costs for different delivery models (e.g. AFP vs. traditional methods) and ensure the choice of proceeding with AFP remains the best value proposition. Value for money assessments are commonly used in this way around the world.

With Council direction, the City will work with Infrastructure Ontario to complete a Procurement Options Analysis which will help facilitate the City's decision making for the selection of a preferred delivery model that should be used for the project (i.e. design build, traditional procurement). Infrastructure Ontario has significant experience with AFP, development of performance based specifications, project agreements, and payment mechanisms.

Status of Intergovernmental Financial Partnerships

Federal Budget 2017 provided additional details on how the $81 billion, 11 year *Investing In Canada Plan*, announced in the 2016 Fall Economic Statement, will be invested. For the transit, green and recreational and cultural component of the social infrastructure fund, the next step is for the federal government to negotiate bilateral agreements with the provinces and territories on the design and delivery of these funds. London's Rapid Transit initiative will be submitted under the PTIF Phase II envelope alongside other important transit-related municipal projects (such as the Adelaide Grade Separation project) that will be identified as additional federal and provincial program design details are made public.

Bilateral negotiations officially began on July 6th 2017, when the Honourable Amarjeet Sohi, Minister of Infrastructure and Communities announced the federal government's position and sent letters to each province and territory outlining the process. The announcement of the start of bilateral agreements suggests that the Government of Canada is on target to meet its previously communicated timeline. Bilateral negotiations will continue through the end of 2017 with agreements expected to roll out in Spring 2018, potentially in time for Budget 2018.

There are two federal funding streams which are of particular relevance to London's Rapid Transit plan: Public Transit and Green Infrastructure. For both these streams of funding, the Government of Canada will cover up to 40% of total project costs. Importantly, the federal government has signalled its interest in ensuring that provinces

provide 33% of project funding at a minimum. The minimum provincial share represents a positive and important development for cities.

To meet the new provincial requirements under the Phase 2 bilateral discussions, Civic Administration anticipates that the Province of Ontario will fund its share of projects through its *Moving Ontario Forward* program. This program includes up to $15 billion for municipal infrastructure projects outside of the Greater Toronto and Hamilton Area (GTHA). It is also important to note that Ontario's 2017 budget included a formal commitment to advance London's Rapid Transit initiative.

Public Transit Infrastructure Fund (PTIF) Stream

The Public Transit stream includes a total of $20.1 billion funding over 11 years (2019-2029) for "construction, expansion, and improvement of public transit infrastructure, and support active transportation projects that integrate "first-mile, last-mile" connectivity with a public transit system."

For projects which fall into the Public Transit stream, the federal government has committed to providing up to 40% for expansion projects; and 50% for rehabilitation projects, although rehabilitation projects can only form up to 15% of total expenditures.

Funding under the Public Transit stream was allocated to provinces based on ridership (70%) and population (30%), and will be allocated to cities based 100% on ridership. The Public Transit stream allocation for Ontario is $8.34 billion.

Green Infrastructure Fund Stream

The Green Infrastructure stream totals $21.9 billion over 11 years (2019-2029) and will be composed of three funding areas: Greenhouse Gas Mitigation; Adaptation, Resilience, and Disaster Mitigation; and Environmental Quality. The Greenhouse Gas Mitigation category includes a number of transportation-related items, including electric vehicles and alternative fuel infrastructure, active transportation infrastructure, higher order rapid transit (including heavy rail, subway, light rail transit, and bus rapid transit), and public transit fleet electrification.

Further, a minimum of 45% of a province's allocation under the Green Infrastructure stream will need to be invested in projects under the Greenhouse Gas Mitigation category. Ontario's allocation for Green Infrastructure is $2.84 billion.

The federal government has clearly indicated their intention that bilateral agreements will incorporate a "Climate Lens" into the selection of projects, meaning that preference will be given to projects which fulfill desired outcomes in their target funding stream while also providing climate change mitigation or adaptation benefits.

Civic Administration is confident that London's Rapid Transit initiative will meet the eligibility parameters of the soon to be determined federal and provincial infrastructure programs.

Table 3: Summary of Potential Eligible Federal Program Streams

Infrastructure Category	Amount (Term)	Notes
Public Transit Infrastructure Fund – Phase 2	$20.1 billion/ 11 years (2019-2029) Ontario's share is ~$8.34 billion	Federal government has committed to providing up to 40% for expansion projects; and 50% for rehabilitation projects (up to 15% of total expenditures) Provincial Allocation: 70% ridership, 30% population; money to be allocated by 100% ridership to municipalities in each province
Green Infrastructure Fund – Phase 2	$21.9 billion/ 11 years (2019-2029) Ontario's share is ~$2.85 billion	Provincial allocation will flow through a base ($200 million/province) plus per cap (based on 2016 Census data) mechanism

Adelaide Grade Separation Project

A key recommendation that Council approved in May 2017 was to move the implementation of the grade separation, subject to the approval of the environmental assessment, to a five year window prior to the implementation of the northern corridor. The trains on the CPR line create road blockages and traffic congestion in the downtown.

The implementation of the grade separation is considered a necessary element for the implementation of the rapid transit system as it provides transit reliability along the corridor, reduces travel delays to transit and car when trains are shunted at the CPR railway yard, will reduce GHG emissions due to idling and provides additional capacity along the north south routes. It will also be critical to the implementation of rapid transit along the northern route as part of the overall construction traffic mitigation plan.

The environmental assessment was commenced in February 2016 and is anticipated to be completed in late 2017. The preliminary preferred solution is to lower the road beneath the rail line. The construction of the project is a complex undertaking due to geotechnical and groundwater conditions, stormwater management, proximity to the CPR rail yard, property impacts and utilities.

The preliminary cost of the project has been estimated at $60 million. The project is currently scheduled for 2031 at a cost of $25 million ($3.75 million funded by CPR, $7 million funded by development charges). In order to undertake the implementation of the grade separation, funding will be requested through the Public Transit Infrastructure Fund Phase II program or any other applicable funding programs.

SUMMARY

This report provides Committee and Council with the Rapid Transit Master Plan and updated Business Case which reflects Council approved direction regarding the preferred Bus Rapid Transit Network.

The recommendations in this report support approval of the Rapid Transit Master Plan for the purpose of initiating the legislated 45-day Public Notice period that will complete the Environmental Assessment Master Plan process. Comments received during the final public review period related to the preferred Bus Rapid Transit Network will be reviewed and considered with respect to future implementation.

The Rapid Transit Master Plan will form the basis for design and analysis during the Transit Priority Assessment Process and the updated Business Case will be submitted to our provincial and federal partners for funding consideration.

The recommendations of this report also request approval to retain Infrastructure Ontario to undertake a Procurement Option Analysis for the Rapid Transit initiative.

The Shift Project team is preparing to initiate the next phase of the Environmental Assessment process with a commitment to ongoing community and stakeholder engagement.

Acknowledgements

This report was prepared with the assistance of Financial Planning & Policy and Government & External Relations with input and support from the Rapid Transit Steering Committee.

SUBMITTED BY:	**REVIEWED & CONCURRED BY:**
JENNIE A. RAMSAY, P.ENG. **PROJECT DIRECTOR, RAPID TRANSIT**	**EDWARD SOLDO, P.ENG.** **DIRECTOR, ROADS AND TRANSPORTATION**
CONCURRED BY:	**RECOMMENDED BY:**
ALAN DUNBAR, CPA, CGA **MANAGER,** **FINANCIAL PLANNING & POLICY**	**KELLY SCHERR, P.ENG., MBA, FEC** **MANAGING DIRECTOR,** **ENVIRONMENTAL AND ENGINEERING SERVICES & CITY ENGINEER**

Attach: Appendix A – Rapid Transit Master Plan Executive Summary
Appendix B – Rapid Transit Master Plan Notice of Completion
Appendix C – Richmond Street Municipal Underground Utilities Realignment Environmental Assessment Study Notice of Completion
Appendix D – Business Case Executive Summary
Appendix E – Schedule A: SHIFT Rapid Transit capital budget and forecast

cc. London Transit Commission
Rapid Transit Implementation Working Group
Transportation Advisory Committee

shift

MOVING LONDON FORWARD

London's Rapid Transit Initiative Master Plan

London CANADA

London transit

PREPARED BY

IBI

wsp

With London forecasted to add 77,000 new residents and 43,000 new jobs over the next 20 years, the City's new growth management strategy aims to rethink how the city will grow by focusing on growing up, rather than out, to make efficient use of infrastructure, protect prime agricultural lands, and create a more sustainable and livable urban form. Rapid Transit (RT), along with a complementing land use strategy, will facilitate this shift, helping to reduce traffic congestion and make transit a convenient, comfortable, and reliable travel option for residents.

SHIFT: London's Rapid Transit Initiative Master Plan provides a strategy for building a RT network that meets the City's economic development, mobility and community buildings objectives, while still being operationally feasible and economically viable.

The Preferred Alternative is a Bus Rapid Transit (BRT) Network:

- 22.5 km dedicated median transit lanes
- 1.5 km of transit operating in mixed traffic
- 35 RT stations, serving north, east, south and west corridors, including 1 Central Transit Hub, where the corridors all meet, near King Street and Wellington Street
- 28 articulated buses, forming a new RT fleet, which may include diesel-electric hybrid or fully electric buses
- Local intersection improvements for pedestrians and cyclists, plus traffic signal priority measures to facilitate the movement of people.

The BRT network provides the best financial return on investment and is the best overall value solution from a mobility, city building, economic development and financial affordability perspective.

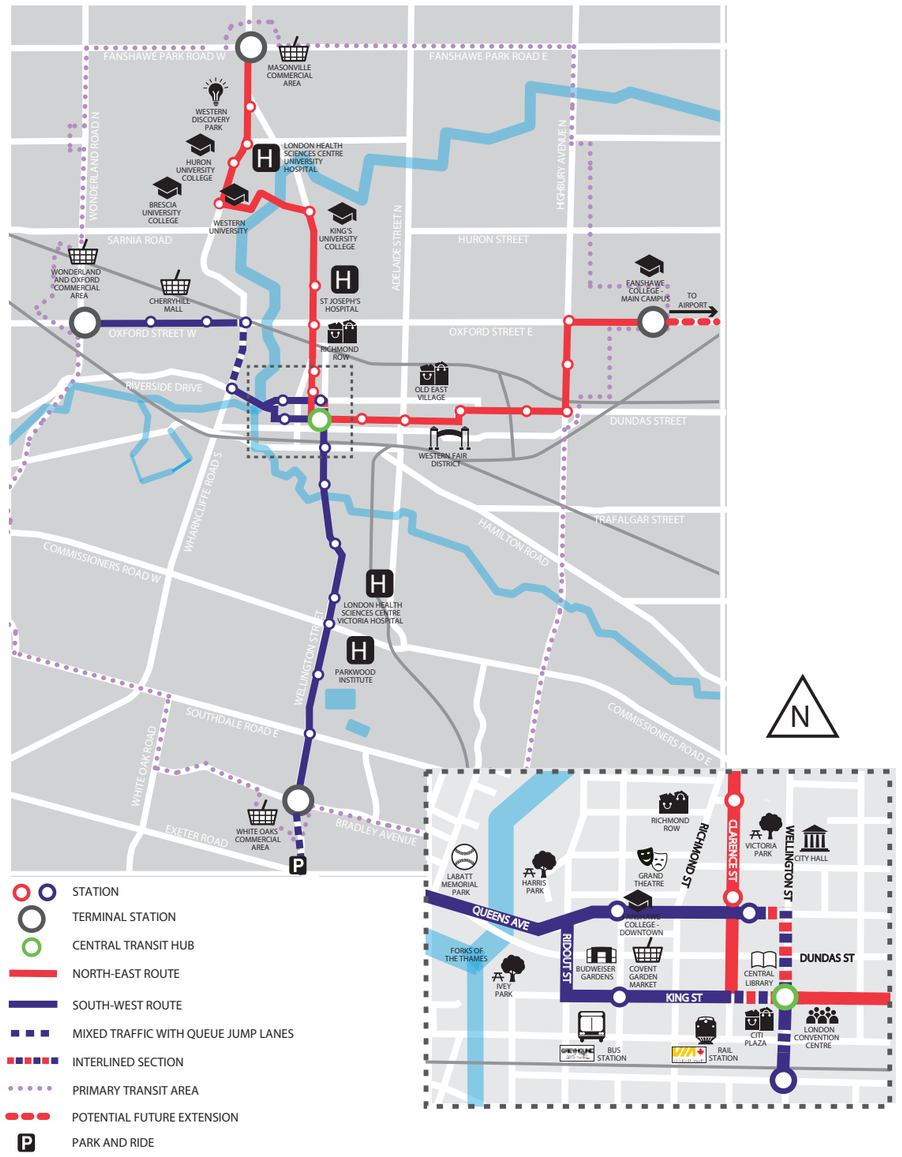
At a capital cost of $500 million in nominal dollars, the BRT network is expected to produce over $724 million in transportation, environmental and economic benefits over the project lifespan. Operating costs are estimated to be $12.8 million per year at full implementation. The City of London has already committed $130 million towards the capital costs.

The system can be implemented in a phased approach

The BRT network can be adapted to rail-based or other technologies over the longer term as ridership grows, technologies and trends advance, and as funding becomes available.

The preferred network alternative is illustrated in *ES.1*.

ES.1: Bus Rapid Transit Network



Moving London Forward

The London Plan recognizes the inextricable links between land use and mobility, and between transportation design, land use intensity and form of development.

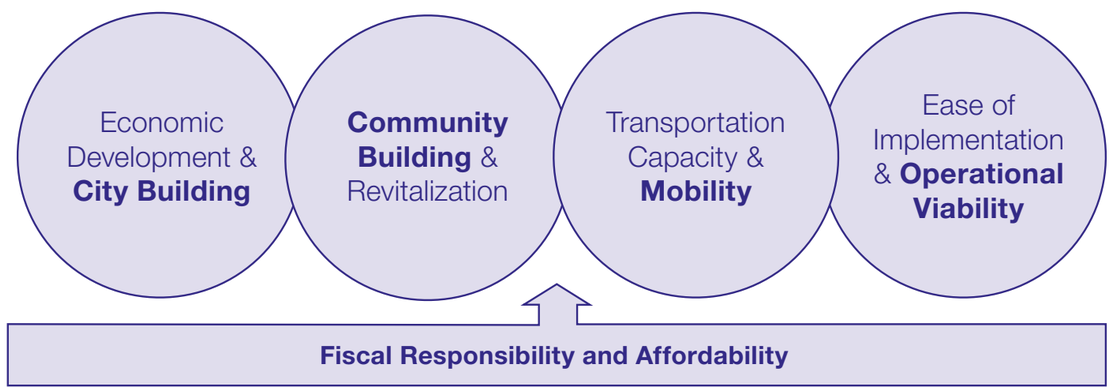
The vision for RT is intertwined with The London Plan, the City's newly approved Official Plan. How streets are planned will dictate the quality of neighbourhoods, the ability to facilitate positive infill and intensification along RT corridors, and the success in promoting and supporting a viable transit system.

The vision for RT is unified with the integrated mobility goals of The London Plan. A survey conducted early in the study highlighted that RT needs to address more than just transportation and mobility; it represents an opportunity to transform the city.

Five guiding principles

These principles were adopted early in the study process based on consultation with Londoners, and were used to drive every step of this Master Plan (*ES.2*). The prioritization of these principles and the ability for each solution to achieve these objectives has been the basis for measurement throughout the study.

ES.2: The Five Guiding Principles for London's Rapid Transit



The following transit and transportation strategies build on the City Building Policies for Mobility in The London Plan to help achieve the Rapid Transit Vision through the Guiding Principles described above. These strategies may be implemented through the RT project, or developed into parallel initiatives by the City before, during and after implementation of RT.

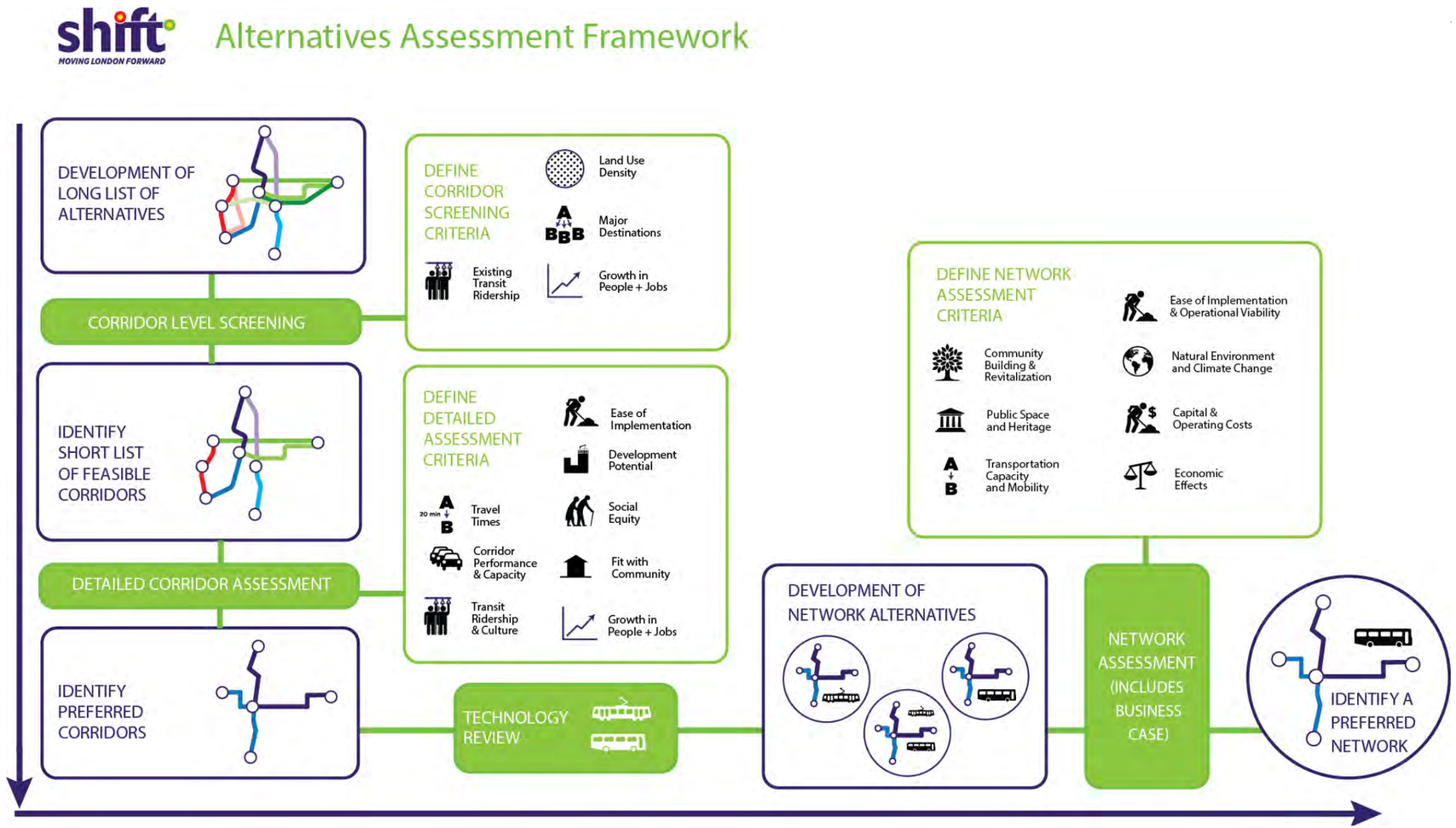
1. Provide effective regional connections to enhance the mobility network.
2. Design to attract and stimulate intensification, urban regeneration and economic development.
3. Increase transit ridership by creating a viable alternative to the personal automobile and attracting riders who have a choice of modes.
4. Integrate transit with active transportation modes, with a focus on enhancing the street-level experience for pedestrians.
5. Increase the person-carrying capacity of the RT corridors.
6. Balance person-carrying capacity with access and movement of goods and services.
7. Create a transit-focused multimodal RT Boulevard.
8. Support the urban place types of Downtown, RT corridor, and Transit Villages.
9. Provide RT stations based on reasonable pedestrian access distances.
10. Stakeholder Engagement and Support
11. Mitigate construction impacts with City-wide Travel Demand Management plans
12. Mitigate construction impacts with localized and station area Travel Demand Management plans
13. Communications and Real-Time Information
14. Quick Start Implementation

The Alternatives

The Alternatives Assessment Framework developed and applied for Shift was a multi-step process.

Each step of the framework identified and evaluated alternatives to ensure they demonstrated attributes to support RT and the five overarching goals of the project using specific evaluation criteria. The process took the RT plan from a long list of high-level corridor segments to a recommended network, including a preferred vehicle technology. The framework is illustrated in *ES.3*.

ES.3: Assessment Framework



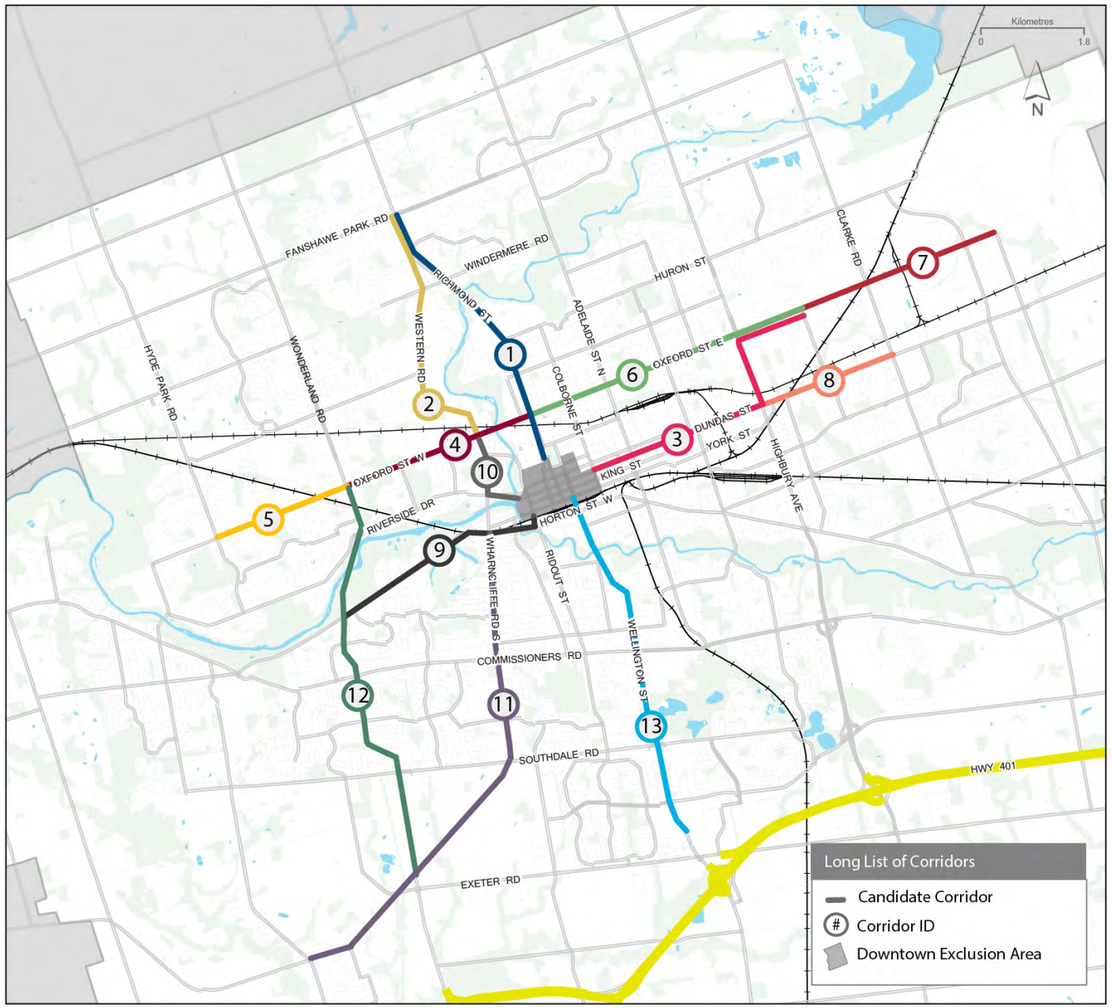
Identifying and Selecting Rapid Transit Corridors

The Long List of Alternatives included 13 corridor segments.

ES.4 illustrates the long list of corridor segments that were evaluated. These corridors were evaluated through the corridor level screening phase of the assessment framework, based on:

- Land Use Density
- Growth in People and Jobs
- Major Destinations
- Existing Transit Ridership

ES.4: Long List of Corridor Segments



The Short List of Corridors included alternatives for each of the North, South, East, and West corridors.

The short list of corridors were compared using the following criteria:

- Does current density support transit ridership?
- Does future growth support ridership increases?
- Is there an existing transit culture?
- What is the current corridor performance?
- Are there road capacity issues?
- Are there major engineering challenges?
- Does the corridor provide social equity and benefit disadvantaged populations?
- Are there opportunities to intensify or redevelop the corridor?
- Does transit fit with the community?

The preferred corridor segment for each of the North, South, East and West corridors was identified through technical evaluation and consultation.

The following corridor segments, from the Downtown area to the outer areas of London, were selected as the preferred corridors to implement RT:

- North: From Downtown via Richmond Street to Western University to Western Road to Richmond Street at Masonville Place;
- East: From Downtown along King Street to Dundas Street to Highbury Avenue to Oxford Street East at Fanshawe College;
- South: From Downtown via Wellington Road to White Oaks Mall; and,
- West: From Downtown via Oxford Street to Wonderland Road.

Technology Review

Various rapid transit technologies were reviewed and evaluated for application in London. Bus Rapid Transit (BRT) and Light Rail Transit (LRT) were selected as appropriate technologies for evaluation.

ES.5: Example of BRT Articulated Bus

Four Network Alternatives

The preferred corridor segments were carried forward to develop four network alternatives, as illustrated in ES.6. The following elements required further technical analysis to develop the network alternatives:

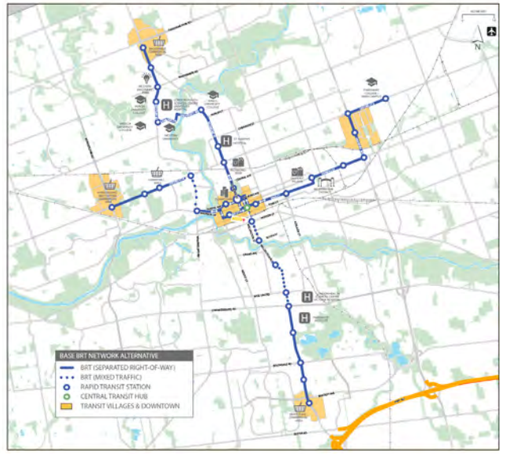
- Developing the four corridors into operational routes
- RT station locations
- North corridor route through Western University
- North corridor rail crossing of Richmond Street
- East corridor route through Old East Village
- Connection of the four corridors in Downtown London and the placement of a Central Transit Hub

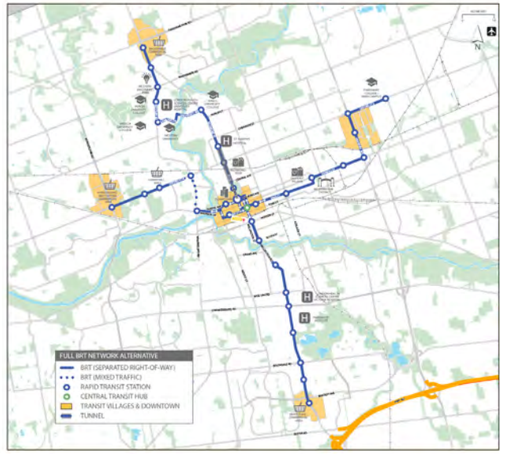
The preferred corridor segments and the two technology options were combined to develop network alternatives. This process included:

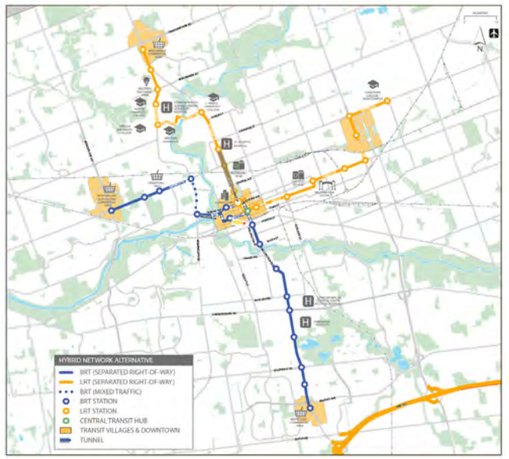
- Review of capacity and operational considerations in order to combine the four preferred corridor segments into transit routes with appropriate station locations and the placement of a Central Transit Hub.
- Technical analysis of special areas including: Downtown London, Western University, Old East Village, and the Richmond Street rail crossing south of Oxford Street.

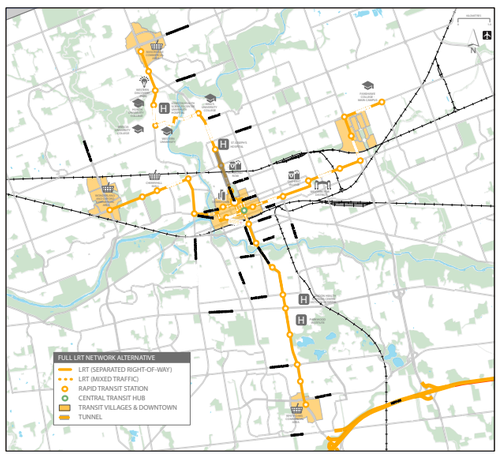
Based on the projected **future** ridership demand, higher frequency service is required in the north and east corridors, while lower frequency service is appropriate in the south and west corridors. As a result, the north and east preferred corridor segments, and the south and west preferred corridor segments, were combined into two operational routes, the North + East corridors and South + West corridors, respectively.

ES.6: Four Network Alternatives









Network evaluation criteria

The network alternatives were evaluated using detailed criteria in support of the five guiding principles shown in *ES.2*.

- **Economic Development and City Building** - RT has been shown to spur new development, attract new jobs and help draw and retain millennial talent. It is a city-building catalyst that can help to build London's image in Canada and abroad.
- **Transportation Capacity and Mobility** - The current transportation and transit network has already experienced overcrowding due to the growing ridership and population. RT offers an opportunity to reduce congestion by attracting latent transit demand, and by helping to address overcrowding that current users experience.
- **Community Building and Revitalization** - Encouraging growth through intensification will create vibrant new communities in under-utilized areas of the city. Transit will help revitalize existing neighbourhoods and reduce pressures to develop in rural areas.
- **Ease of Implementation and Operational Viability** - The preferred RT network must be practical to build and operate without negatively impacting the environment, heritage areas, or existing communities. Infrastructure and budget requirements must be aligned with the needs of London. Similarly, the long-term needs to operate the system must ensure it is economically viable, provides a balance between time savings with service coverage, and integrates within the city-wide transportation system.
- **Affordability and Fiscal Responsibility** – Fiscal responsibility will be achieved by considering the return on RT corridor investments in terms of ridership, transit user time savings and other transportation and environmental benefits. Affordability means considering the financial resources required over the life of the project to maintain a healthy financial position. With this in mind, the business case for the RT project was developed in parallel with, and used to inform the RTMP.

Preliminary Preferred – Full BRT Network

The preliminary preferred Full BRT network was presented at Public Information Centre (PIC) 4, which was held on February 23, 2017. The PIC allowed the public to interact with staff, ask questions, and provide feedback.

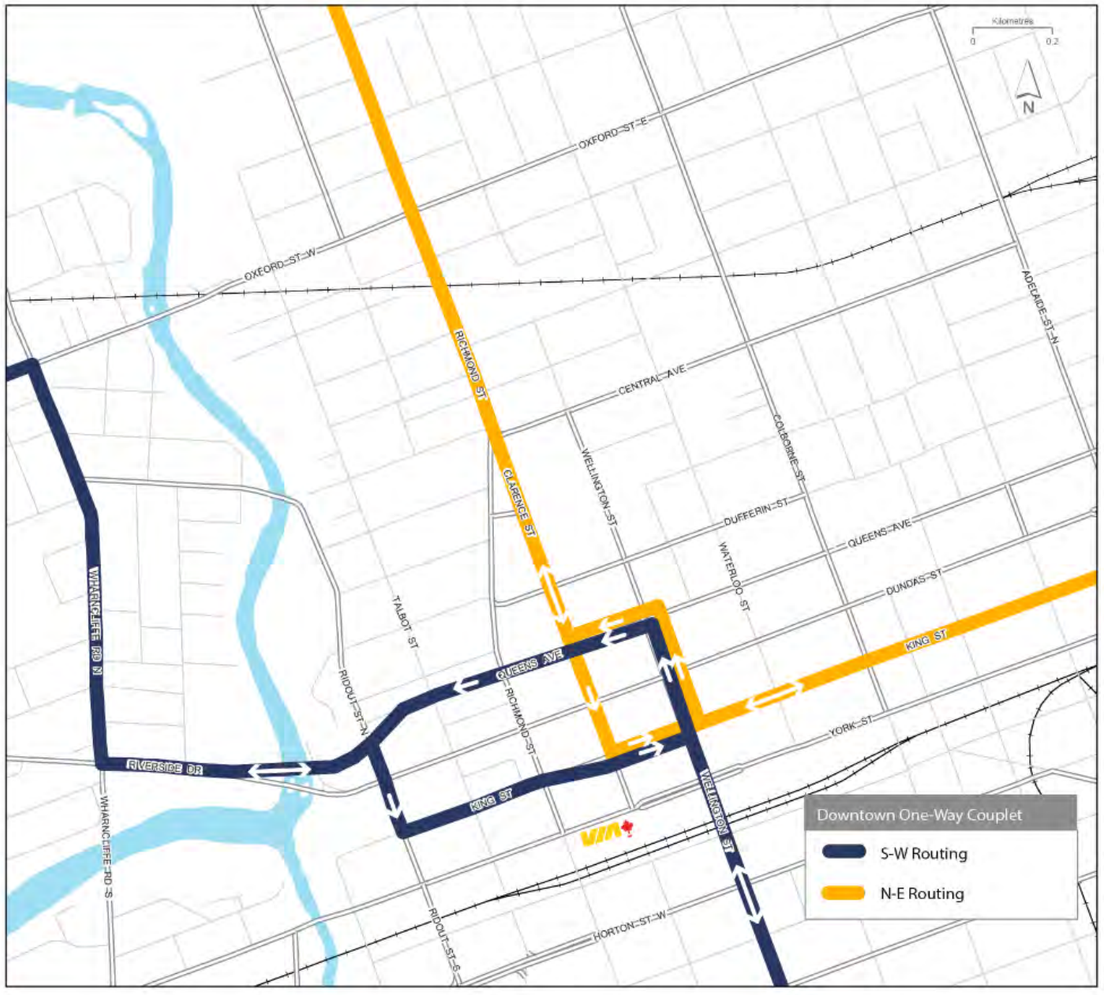
Network Refinements

After PIC 4, refinements were made to the network based on the feedback received at the PIC and direction from Council. The result was refinements to the Downtown and North Corridor.

Downtown

A one-way transit couplet on King Street (eastbound) and Queens Avenue (westbound) emerged as the preferred downtown corridors, as depicted in *ES.7*.

ES.7: Downtown Transit Couplet



North Corridor

Richmond Street remains the preferred north corridor route for BRT.

An overarching goal of rapid transit is to provide frequent, reliable, attractive service that connects people and places. Richmond Street with a transit tunnel best achieves that goal and most fully supports the objectives of the London Plan, Our Move Forward: London's Downtown Plan and the desire to protect for future LRT. While the Richmond Street at-grade option also scored well, there are two primary disadvantages to remaining at-grade at this time: the reliability of rapid transit when a train is present and the removal of two traffic lanes on Richmond Street.

Constructing the Richmond Street corridor at-grade does not preclude future construction of a tunnel on Richmond Street. There is also merit in deferring the construction of the tunnel as London establishes the rapid transit network, re-structures local bus routes to connect with rapid transit, and implements other planned transportation and transit network improvements. Deferring the tunnel also provides future flexibility as transit vehicle technologies, including automated vehicles, evolve along with London's transit needs.

An at-grade solution was selected as the preferred alternative to allow for future study of alternative solutions to crossing the rail corridor. The resulting preferred alternative is at-grade on Richmond Street from Central Avenue to University Drive, with dedicated RT lanes.

Preferred Alternative - BRT Network

The preferred alternative is the BRT network, as illustrated in *ES.8*. This network consists of:

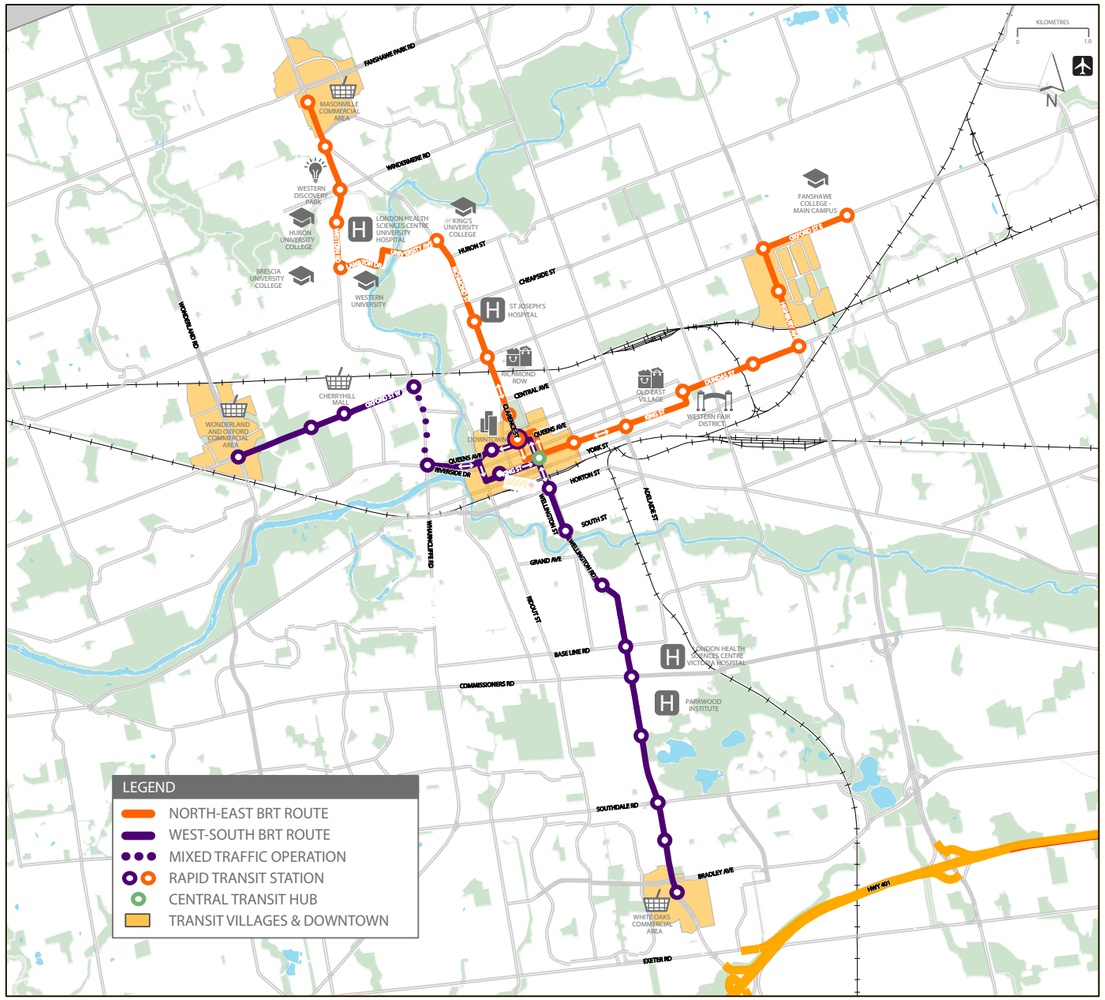
- 22.5 km dedicated median transit lanes
- 1.5 km of transit operating in mixed traffic
- 35 RT stations, serving north, east, south and west corridors, including
- 1 Central Transit Hub, where the corridors all meet, near King Street and Wellington Street
- 28 articulated buses, forming a new RT fleet, which may include diesel-electric hybrid or fully electric buses
- A potential park'n'ride facility at the south end
- Local intersection improvements for pedestrians and cyclists, plus traffic signal priority measures to facilitate the movement of people.

Options for future expansion include:

- Extending Rapid Transit on Clarence Street south of King Street with a new tunnel under the CN Rail corridor as part of the introduction of High Speed Rail to London; and,
- Extending Rapid Transit in dedicated lanes along Oxford Street East to the London International Airport.

The proposed station locations are provided in *ES.9*.

ES.8: BRT Network with Proposed Rapid Transit Stations



ES.9: Proposed Rapid Transit Stations

NORTH CORRIDOR, FROM NORTH TO SOUTH	SOUTH CORRIDOR, FROM NORTH TO SOUTH
Masonville Place (Terminal)	Central Transit Hub**
Western Rd at Richmond St	Wellington St at Horton St
Western Rd at Windermere Rd	Wellington St at South St
Western Rd at Elgin Rd	Wellington Rd at Bond St
WU Campus Centre****	Wellington Rd at Baseline Rd
Richmond St at University Dr	Wellington Rd at Commissioners Rd
Richmond St at Grosvenor St	Wellington Rd at Wilkins St
Richmond St at Oxford St	Wellington Rd at Southdale Rd
Clarence St at Central Ave	Wellington Rd at Montgomery Gate
Clarence St and Queens Ave	White Oaks (Terminal)
Central Transit Hub**	
EAST CORRIDOR, FROM WEST TO EAST	**WEST CORRIDOR, FROM WEST TO EAST**
Central Transit Hub**	Wonderland Rd and Oxford St (Terminal)
King St at Colborne St	Oxford St at Beaverbrook Ave
King St at Adelaide St	Oxford St at Cherryhill Blvd
Ontario St at Dundas St	Oxford St at Wharncliffe Road
Dundas St at McCormick Blvd	Wharncliffe Rd at Riverside Dr
Dundas St at Highbury Ave	EB: King St at Talbot St (WB: Queens Ave at Talbot St)
Highbury Ave at LPH access	EB: no stop (WB: Queens Ave at Clarence Ave)
Highbury Ave at Oxford St	Central Transit Hub**
Fanshawe College (Terminal)	

Notes:
**The Central Transit Hub is proposed to be located at or near King Street and Wellington Street to provide on-street transfers.
**** RT station on Western University Campus to be determined in consultation with Western University.

With a total length of approximately 24km, the RT corridors will be constructed in phases.

The timing of construction phases requires consideration of several factors including: identifying short-term solutions to start attracting new riders, coordination with other planned construction, transportation network connectivity and access, lead time for utility relocations and significant construction such as grade separations, and feasible construction targets.

In addition to the above, Western University has on-going capital improvements and the timing of construction on campus requires co-ordination and approvals from the University.

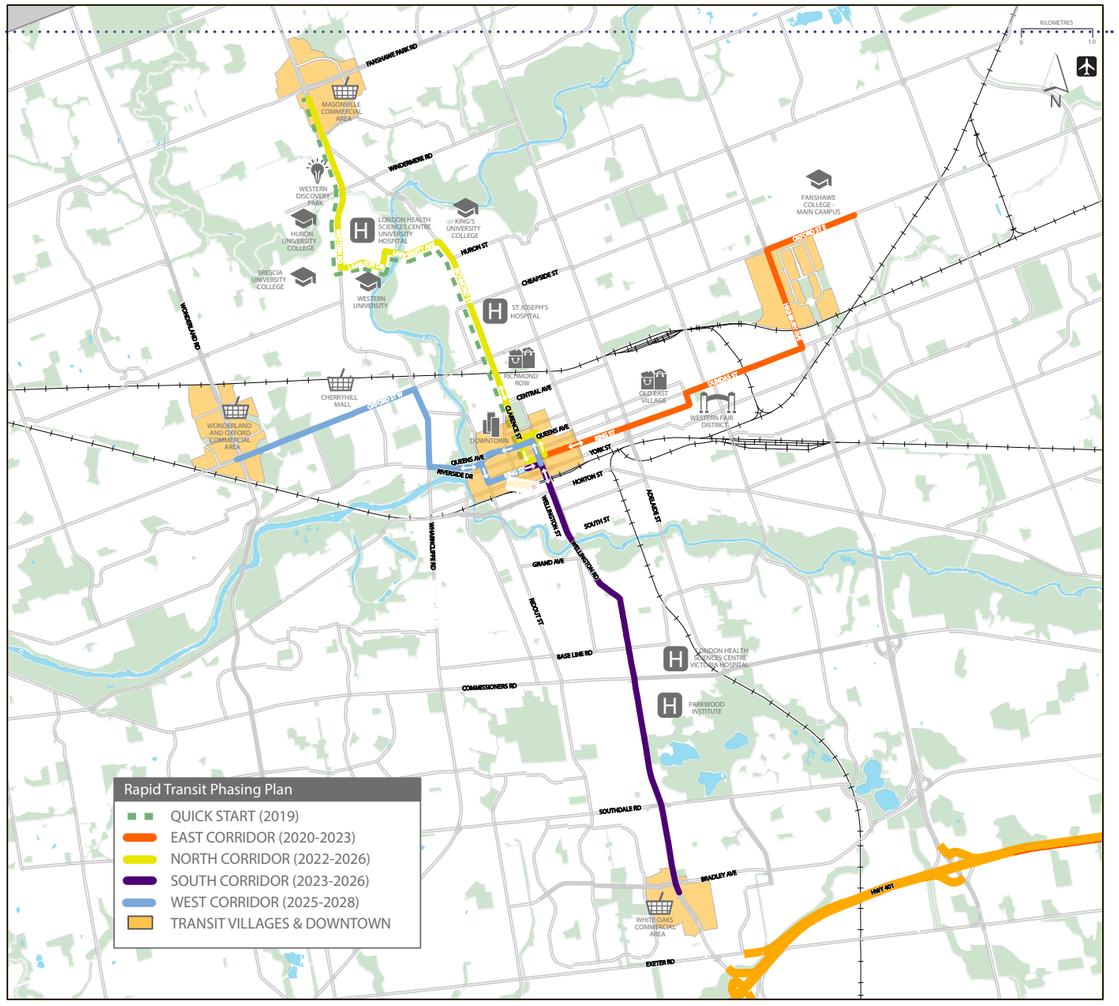
A Quick Start service is proposed on the North corridor utilizing buses in mixed traffic, with transit signal priority, localized intersection improvements, and rapid transit station spacing and service headways.

The Quick Start concept will be explored in the next study phase, and could include queue jump lanes and enhanced shelters. The Quick Start service would be designed to minimize throw-away costs. Existing route operations may also benefit from corridor upgrades. To accelerate the construction timing, Quick Start capital improvements would be limited to intersections where property is not required and utility impacts are very limited.

Completion of the entire BRT network is expected to take 7 to 8 years.

The initial phasing concept is illustrated in *ES.10*. Construction phasing will be reviewed and refined in the next study phase as the design progresses.

ES.10: Proposed Construction Phasing



Study Process and Consultation

This study has been conducted as a Master Plan, in accordance with the Municipal Class Environmental Assessment process.

This Rapid Transit Master Plan addresses the first two phases of the Municipal Class EA process: identifying the problem or opportunity, and identifying and selecting a preferred solution.

Consultation efforts followed an Engagement Strategy and was carried out through a combination of City of London staff, LTC staff and the consulting team.

Consultation was conducted with technical and government agencies, municipal advisory committees, Indigenous communities, major institutions and property owners, Business Improvement Associations (BIAs), community groups and the general public.

Technical and Government Agencies

Technical agency consultation was guided by a Project Steering Committee. This committee met regularly throughout the study.

Additionally, the Rapid Transit Implementation Working Group was formed in Spring 2016 to review and advise Council on matters related to the Rapid Transit Initiative and participate in broader community engagement at key points.

Municipal Advisory Committees

Consultation with City of London citizen advisory committees was conducted to understand the needs of the various interests they represented. Invitations to participate in the study were sent to:

- Accessibility Advisory Committee
- Agricultural Advisory Committee
- Cycling Advisory Committee
- Environmental and Ecological Planning Advisory Committee
- London Advisory Committee on Heritage
- Transportation Advisory Committee

Aboriginal Consultation

Notification was sent to Aboriginal communities by mail, informing them of the project commencement and of each information session. This was followed by phone calls to confirm that the appropriate contact had been identified and to determine if the community wished to be involved and the preferred method of engagement.

Property Owners and BIAs

Major property owners including Western University and Fanshawe College were engaged through multiple targeted meetings. BIAs representing individual businesses and property owners were also consulted.

General Public, Community Groups and Other Property Owners

Consultation with the public, community groups and other property owners occurred through public events and digital media, including:

- Public Information Centres (PICs) (four PICs held),
- Outreach at public events (69 events attended),
- Project website,
- Contacting the project team (phone, e-mail, fax, regular mail),
- Project eNewsletter (issued five times),
- Project surveys, and
- Social media (Twitter, Facebook and YouTube).

Business Case

A business case was developed in parallel with this RTMP to compare the economic and financial impacts of rapid transit over the project lifecycle. Both the financial and economic outputs from the business case were used to help evaluate the network alternatives and to arrive at the preferred alternative - The BRT Network. The cost components of the business case, including the costing methodology of operating and capital costs of the BRT Network are summarized in this section.

Operating Costs

Peak period service levels will be 5 minutes for the North and East corridors and 10 minutes for the South and West corridors.

Service levels were developed based on ridership forecasts and assumed capacities of 70-110 passengers per vehicle for BRT.

The estimated fleet size for the Full BRT Network is 28 vehicles.

Based on route length, revenue service hours, articulated buses, and includes spare vehicles.

The total annual operation and maintenance cost is estimated to be $12.8 million.

The assumptions used to estimate the operating costs of the RT networks were based on a combination of sources, including averages from other systems, LTC statistics, and system operating assumptions. Annualized operating costs were determined for every year until 2050 and account for a phased implementation of RT, and timelines for construction.

Capital Costs

The total capital cost is estimated to be $500 million in nominal dollars.

Capital costs were estimated based on a combination of cost per kilometre taken from a review of other RT projects in Canada, and preliminary cost were applied to major network items and structures. New BRT vehicles were assumed to cost $1 million based on recent purchases by LTC. Each route segment was costed by applying these input assumptions.

The capital costs for the BRT Network are provided in *ES.11*. These costs are based on 2017 dollars. The phased implementation of these elements over the construction phase of the project was considered and the present value of the capital costs were determined and reported in the business case.

ES.11: BRT Capital Cost Summary

SUMMARY OF CAPITAL COSTS (Rounded in Millions 2017 Dollars)	
COST COMPONENTS	BRT
Segment Total	$196,854,743
Maintenance Facility	$12,500,000
Engineering (15%)	$29,528,211
Project Management (10%)	$19,685,474
Contingency (50%)	$129,284,214
Vehicles	$28,000,000
Quick Start	$21,909,141
TOTAL	**$437,761,783**

Note: These costs are not reflective of future year costs based on inflation.

The BRT network is expected to produce over $724 million in transportation, environmental and economic benefits over the project lifespan.

By switching to public transportation from driving, a transit user can save money, improve their health and reduce their impact on the environment.

As the number of kilometres an individual travels by private automobile (VKT) is reduced, the benefits accumulate in cost savings. A transit user saves money in the operating costs of a vehicle, which includes fuel, maintenance and tires. Additionally, transit users reduce their likelihood of vehicle collisions.

Compared to driving, transit users can achieve 25% more of their daily physical activity requirements through their commute.

Greenhouse gas emissions are reduced through a mode shift from automobiles to transit. The emissions intensity of bus-based transit can be as much as half that of a typical passenger car depending on how well transit is utilized.

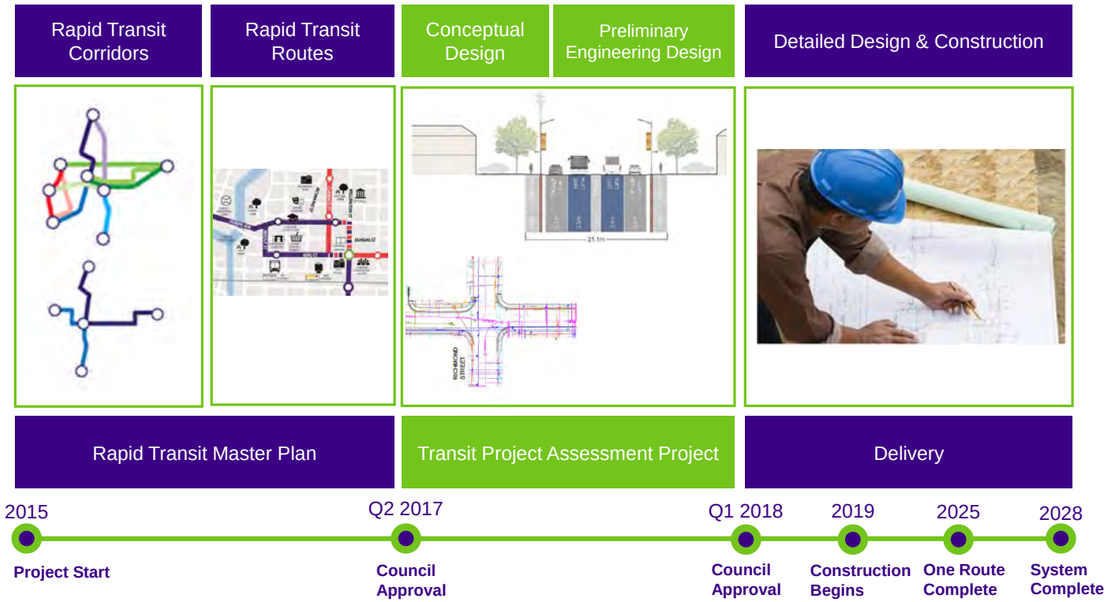
Over the next 30 years, Bus Rapid Transit will reduce GHG emissions by about 233,000 tonnes. This is the equivalent to planting 46,000 trees.

Next Steps

The proposed next steps for the project (illustrated in *ES.12*) include preparing for and completing the Transit Project Assessment Process (TPAP; Ontario Regulation 231/08). TPAP is a proponent-driven environmental assessment process intended specifically for transit-related projects. Pre-planning is undertaken, prior to the formal notice of commencement of the TPAP, to develop and evaluate design alternatives, complete technical studies to assess potential impacts, identify mitigation and monitoring requirements, and consult with stakeholders. Recommended pre-planning phase exercises include:

- Continuing to engage with the Director of the Ministry of the Environment and Climate Change, Environmental Assessment and Approvals Branch;
- Updating the Communications and Engagement Plan;
- Conducting additional technical studies, such as more detailed natural environment, archaeological and built heritage assessments; stormwater management; noise assessment; and traffic analysis;
- Meeting with Municipal Advisory Groups and the Rapid Transit Implementation Working Group;
- Consultation activities, including but not limited to meetings with property and business owners along the RT corridors; public open houses; design charrettes; outreach to community groups, business improvement, and neighbourhood associations; social media and project website; electronic newsletters and surveys;
- Identifying potential matters of provincial importance;
- Preparing a preliminary engineering design, which will refine the conceptual design included in this report (Appendix J) including intersection lane configurations, on-street parking, property impacts, streetscape design, utility impacts, station locations and design; and,
- Preparing a draft Environmental Project Report including preliminary engineering design, supporting technical documents, and a pre-planning consultation summary.

ES.12: Project TImeline



NOTICE OF STUDY COMPLETION
RAPID TRANSIT INITIATIVE MASTER PLAN

The City of London has prepared a Rapid Transit Master Plan following Phases 1 and 2 of the *Municipal Class Environmental Assessment* process. The foundations for Rapid Transit were established through *The London Plan* (the Official Plan) and *Smart Moves 2030: A New Mobility Transportation Master Plan*.

On May 16, 2017, the City of London Council approved the corridors that will form the City's Rapid Transit network. The Rapid Transit corridors will consist of:

- North corridor: Dedicated transit lanes on Richmond Street from Central Avenue, with an at-grade crossing at the Canadian Pacific Railway, to University Drive, through Western University campus to Western Road, and on Western Road and Richmond Street to Fanshawe Park Road;
- East corridor: Dedicated transit lanes on King Street from Wellington Street, via Ontario Street to Dundas Street East, continuing on Highbury Avenue and on Oxford Street East to Fanshawe College Boulevard;
- West corridor: Dedicated transit lanes on Queens Avenue from Ridout Street, continuing on Riverside Drive, with transit in mixed traffic on Wharncliffe Road to Oxford Street West, then dedicated transit lanes on Oxford Street West to Wonderland Road;
- South corridor: Dedicated transit lanes on Wellington Street from King Street, continuing on Wellington Road to approximately 400m south of Bradley Avenue with a potential park-and-ride facility near Exeter Road; and,
- Downtown: A one-way east-west couplet system with one dedicated transit lane on Ridout Street, King Street, Wellington Street, Queens Avenue, and Clarence Avenue.

The City intends to proceed to the next study phase following the Transit Project Assessment Process (Ontario Regulation 231/08). Separate notices for the next study phase will be issued accordingly.

The Rapid Transit Master Plan will be available for public viewing at the following locations from Thursday, August 3 to Monday, September 18, 2017:

- City Hall, 300 Dufferin Avenue: open Monday to Friday, 8:30am to 4:30pm.
- London Public Library, Central Branch, 251 Dundas Street: open Monday to Thursday, 9am to 9pm, Friday 9am to 6pm, and Saturday 9am to 5pm.
- The following London Public Library branches, open Tuesday to Thursday 9am to 9pm, Friday 9am to 6pm, Saturday 9am to 5pm: Beacock, 1280 Huron Street; Byron, 1295 Commissioners Road West; Cherryhill, 301 Oxford Street West; Jalna, 1119 Jalna Boulevard; Masonville, 30 North Centre Road; and Carson, 465 Quebec Street: open Tuesday and Thursday 1pm to 5pm and 6pm to 9pm, Wednesday, Friday and Saturday 9am to 12pm and 1pm to 5pm
- London Transit Commission, Downtown Information Office, 150 Dundas Street: open Monday to Friday, 7:30am to 7:00pm, Saturday 8:30am to 6:00pm.

The Rapid Transit Master Plan is also available on the project website, **www.shiftlondon.ca**. Any questions concerning the Rapid Transit Master Plan should be directed to:

Jennie Ramsay, P. Eng.
Project Director, Rapid Transit
City of London
Tel: (519) 661-2489 x 5823
jaramsay@london.ca

Brian Hollingworth, P. Eng.
Director
IBI Group
Tel: (519) 472-7328
bhollingworth@IBIgroup.com

Please note that comments will be maintained for reference for the next study phase and will become part of the public record. Information will be collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) and the Environmental Assessment Act, and all comments will become part of the public record. Any personal information such as name, address and telephone number included in a submission will become part of the public record unless the commenter specifically requests that such personal details not be included in the public record.

This Notice first issued: August 3, 2017.

RICHMOND STREET MUNICIPAL UNDERGROUND UTILITIES REALIGNMENT ENVIRONMENTAL ASSESSMENT STUDY NOTICE OF STUDY COMPLETION

The City of London with IBI Group and WSP Global have completed a Class Environmental Assessment (EA) to examine alternatives for the realignment of stormwater and sanitary sewers that were to be impacted by the proposed Richmond Street transit tunnel in Downtown London. Four municipal sewers were included in the study: Carling Creek Trunk Storm Sewer, Oxford Street Trunk Sanitary Sewer, Pall Mall Trunk Sanitary Sewer, and Sanitary Relief Sewer in the vicinity of Pall Mall and Mill streets.

On May 16, 2017, City Council passed a number of motions related to Rapid Transit, including that an at-grade level crossing at the CP Railway with dedicated transit lanes be approved as the preferred cross section on the Richmond Street corridor at this time. As such, the Richmond Street transit tunnel is not included in the Rapid Transit Master Plan, and there are no anticipated impacts to the these stormwater and sanitary sewers.

Public consultation was undertaken throughout the study to solicit input from the general public (residents), businesses, Indigenous communities (or First Nations), Metis, review agencies, and other stakeholders. A Public Information Centre was held on February 23, 2017. Information on the study was made available at www.shiftlondon.ca.

Alternatives were developed and investigated should the Richmond Street transit tunnel proceed at some future time. The study concluded that the preferred solution of inverted siphons could be accommodated within existing road allowances, utilize existing downstream infrastructure, and would not require a new outlet to the Thames River. The alternatives evaluation undertaken for this assessment and the preferred solution are documented in the Rapid Transit Master Plan.

The preferred solution falls under a Schedule A+ project, as outlined in the Municipal Engineers Association Municipal Class EA guidance document, and is therefore pre-approved and not subject to the formal public appeal process to the Minister of the Environment and Climate Change (i.e. Part II Order Request procedure). As a Schedule A+ project, the public is to be advised prior to project implementation; this is a notice of completion and not a notice of implementation. To ensure that all those interested in the study are kept informed, the Rapid Transit Master Plan will be made available to the public for review. A separate notice of completion for the Rapid Transit Master Plan will be issued and posted at www.london.ca.

Comments or questions regarding the Richmond Street Municipal Underground Utilities Realignment Study should be directed to:

Jennie Ramsay, P. Eng.
Project Director, Rapid Transit
City of London
Tel: (519) 661-2489 x 5823
jaramsay@london.ca

Joe Heyninck, P. Eng.
Associate Director
IBI Group
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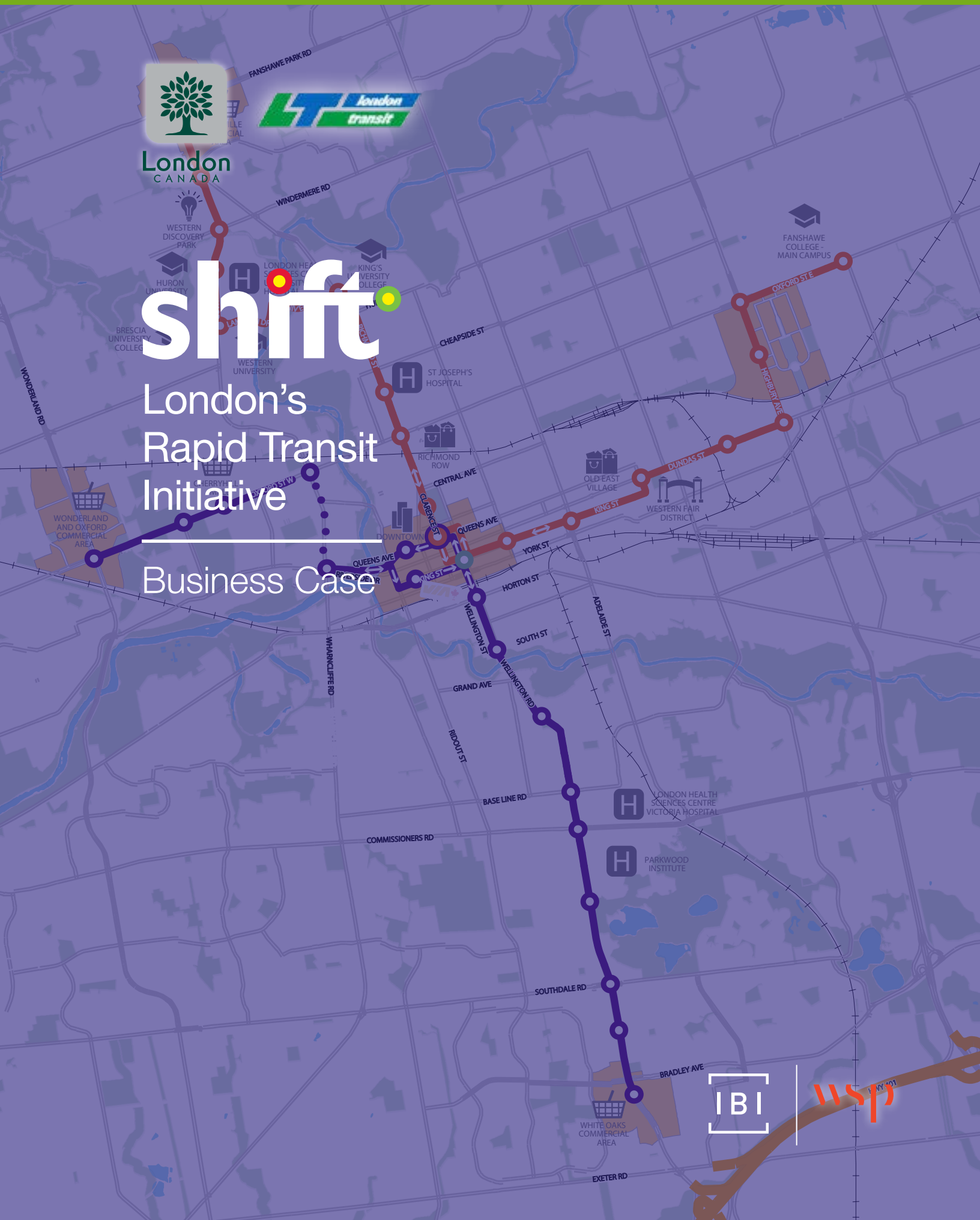
This Notice first issued August 3, 2017.



London
CANADA

london transit

shift

London's Rapid Transit Initiative

Business Case

IBI

WSP

NOTE TO READER: The City of London prepared an initial business case in May 2016 and an updated business case in January 2017. This version provides the business case analysis for the Bus Rapid Transit network, approved by City Council on May 16, 2017

Executive Summary

Shift is a bold and important transportation and city-building initiative for London. It focuses on developing Rapid Transit as a core mobility option in a multi-modal transportation system that will help London continue to grow towards a prosperous and sustainable future.

Rapid Transit is a natural evolution of the transit system in London. The current transit system provides more than 22 million trips per year, but is unable to keep up with current demand, let alone projected future need. London is Canada's 11th largest city, and the largest city in Canada without a Rapid Transit system.

London's Municipal Council has set aggressive targets for infill and intensification, and Rapid Transit will play a major role in helping the City to achieve these targets, growing inwards and upwards. This form of growth will reduce infrastructure requirements, minimize intrusion into agricultural lands, reduce energy consumption and greenhouse gas production, offer walkable and healthy communities and help to revitalize urban neighbourhoods, main streets and the Downtown.

Considerable work has gone into identifying a Rapid Transit system that is right for London. This includes a comprehensive Transportation Master Plan (TMP), which established the transportation need for Rapid Transit, and The London Plan (Official Plan), which sets out complimentary land use policies and an urban structure plan that builds upon and supports Rapid Transit. A Rapid Transit Master Plan (RTMP) is currently underway to identify the preferred corridors and technology for the rapid transit system through a detailed evaluation of several alternatives. Consultation has been central to all of these planning processes.

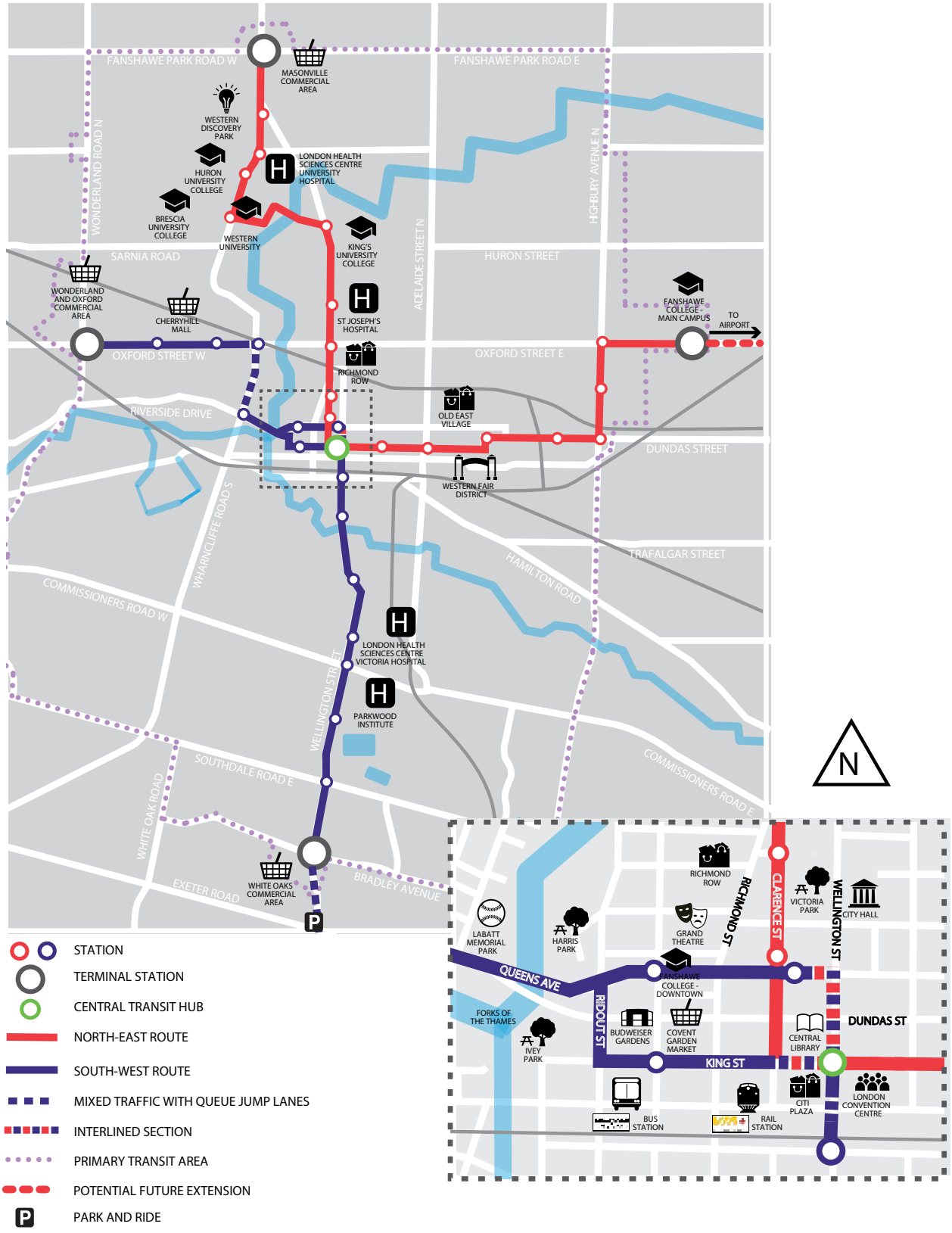
Through the RTMP, four network alternatives were shortlisted for detailed evaluation. These alternatives consist of different combinations of Bus Rapid Transit (BRT) and Light Rail Transit (LRT) ranging from Full BRT to Full LRT. The business case analysis of these four network alternatives is documented in a separate report. The Full BRT network was presented as the preliminary preferred network at a Public Information Centre in February 2017.

In April 2017, City Council approved various motions directing the development and analysis of alternatives in the downtown and at the Richmond Street / CP Railway crossing. A Public Participation Meeting was held on May 3, 2017 with over 1000 people in attendance; the event was also broadcast on local television and the internet. The renewed consultation process has provided Londoners with additional opportunities to be engaged in the project and the key to the successful implementation of rapid transit will be the continued involvement of residents and business.

On May 16, 2017, City Council approved the Bus Rapid Transit network with refinements including the King/Queens Couplet in the downtown and the modification of the Richmond Street corridor to an at-grade crossing of the CP Railway with dedicated bus lanes. The BRT network alternative is evaluated in this business case against a Business as Usual (BAU) scenario.

The system consists of two Bus Rapid Transit (BRT) corridors that will connect key hubs across the city: a North-East line, and a South-West line. These corridors are identified on Figure 1.

Figure 1: Rapid Transit Corridors



Economic Environmental Scan

Both the Government of Canada and the Government of Ontario have signaled that municipalities should be looking for both "shovel ready" and "shovel worthy" projects that can be implemented immediately while also providing longer term economic benefits to Canadian families and businesses.

Shift is shovel ready. A partnership with the federal and provincial government will kick- start significant pre-engineering and design work that will draw on private sector expertise in London and across Southwestern Ontario. Construction can commence immediately following Environmental Assessment approvals and detailed design. As a result, significant construction activities could start as early as 2020.

Shift is shovel worthy. Rapid Transit forms the cornerstone of the City of London's long-term Official Plan, the London Plan, and will serve as a catalyst for job creation, city-building, and improvement in the quality of life for the 2.5 million Ontarians living in the Southwest. Fundamentally, Rapid Transit will put Ontarians to work and keep them there over the long-term.

Key Benefits of London's Rapid Transit Initiative

With a metropolitan population approaching half a million people, London is the urban hub of Southwestern Ontario, a region with 2.5 million people. Between 2015 and 2035, London will grow by an estimated 77,000 new residents and 43,000 more jobs. The existing transportation system does not have the capacity to accommodate this growth nor is transit currently an appealing choice for many residents. Rapid Transit is a tool for shaping growth while providing enhanced capacity and improved travel options.

Implementing a Rapid Transit network in London will:

- **Connect major economic activities –** Western University, Downtown London, Fanshawe College, hospitals, financial institutions, manufacturing and a rapidly growing high-tech industry all stand to benefit from Rapid Transit. London is quickly becoming a centre for innovation in the knowledge based economy. Strengthening inter and intra-city connectivity through Rapid Transit will help businesses recruit and retain skilled talent in London's growing economy.
- **Address existing and increasing transit capacity shortfalls -** Corridors where Rapid Transit is planned currently have numerous bottlenecks, a result of the presence of rivers and railways, which limit the movement of transit vehicles. The Rapid Transit network will address these bottlenecks, improving transit speeds, transit service frequency, reliability and capacity. Along the rapid transit corridors, certain LTC routes are operating above capacity during peak periods. This has resulted in crush loading and a requirement for passengers to wait for the next bus in some instances. This has significant impacts on existing service quality and can deter transit ridership over the long term. Rapid Transit will address this issue by providing more vehicle capacity, improved service frequency, and improved headway consistency.

- **Support healthy communities and active transportation -** Almost 40% of London's future population and 60% of London's jobs would be within walking distance of the proposed Rapid Transit system. Rapid transit stands to significantly change the transportation mode choice of Londoners as they move to and from their homes and their places of employment. Public Transit and active transportation are closely connected. Since every transit trip starts and ends with an active transportation component, the success of a Rapid Transit system is dependent on the pedestrian and cycling connections approaching the stations. London's Cycling Master Plan, London ON Bikes, which will be completed this year, will provide a focus on connecting people to transit by improving cycling and pedestrian connections to stations.

- **Help strengthen London's connectivity across Ontario** by rail, road, air and intercity bus. Rapid Transit would provide the local connections to these broader provincial networks supporting travel to London's major employers and institutions, as well as allowing greater access to other parts of Ontario for London residents. With the implementation of potential High Speed Rail in the Toronto-Windsor Corridor, these benefits would be significantly amplified. Ontarians from Windsor to Brampton and Waterloo to Sarnia will benefit from more convenient and efficient access to London's world class amenities, including access to health and education services provided by the Province.

- **Reduce costs needed to expand the road network -** London's Transportation Master Plan identifies a strategic program of road improvements representing a constrained approach to road widening, contingent on the implementation of Rapid Transit. This road program represents a savings over what would be required under a do-nothing scenario.

- **Support broader city-building in London -** The approved London Plan envisions a city that grows in a compact way – taking advantage of existing infrastructure, minimizing energy costs, reducing emissions, allowing for healthy lifestyles and minimizing intrusion into our agricultural lands. Municipal Council has established an intensification target of 45%, with 75% of that intensification to occur within the central portion of the city (defined as the Primary Transit Area). Rapid transit is a fundamental requirement to support and stimulate this shape of growth. Rapid transit will allow for urban regeneration and the Downtown Vision to be realized. This, more compact, form of growth is less costly to service – both in terms of the required infrastructure investment and the ongoing operating costs of maintaining this infrastructure.

- **Help Achieve Provincial and Federal greenhouse gas reduction goals -** Rapid transit will reduce greenhouse gas emissions by shifting trips from automobiles to more energy efficient rapid transit. Over the evaluation period, the project will save some 233,728 tonnes of CO_2 emissions. Rapid transit also better enables London's ability to respond to the emerging carbon-pricing market.

Plan Foundation: The Strategic Case

Rapid Transit is identified in the current Official Plan, and also represents a cornerstone of the planned city structure in *The London Plan* (draft). Rapid Transit is also a key strategic initiative within City Council's 2015 – 2019 Strategic Plan. The 2015 – 2019 Strategic Plan identified the Rapid Transit Implementation Strategy as a means to deliver convenient and connected mobility choices as part of a strategic area of focus called "Building a Sustainable City."

The Rapid Transit initiative was built on four guiding principles as summarized in Table 1. The prioritization of these objectives throughout the study has influenced the preliminary preferred plan. Overlaid on these guiding principles is the overarching goal of ensuring fiscal responsibility and affordability.

These guiding principles were adopted early in the study process and influenced both the development of the problem statement as well as the identification and evaluation of alternatives. A survey of residents served to highlight that London's Rapid Transit plan needed to address more than just transportation and mobility, and represents an opportunity to transform the city.

The process to generate and short-list alternatives was iterative in that alternative corridors were initially evaluated independent of technology. Criteria at the early stages focused on land use, growth, connecting destinations, and the potential to increase transit ridership. Alternatives were then refined and assessed against more detailed criteria including travel times, potential for reducing congestion, ease of implementation, ability to influence development, social need, and fit with surrounding community.

The corridor evaluation was then followed by an evaluation of technology options, namely Light Rail Transit (LRT) and Bus Rapid Transit (BRT), to develop the four network alternatives. These technologies have been widely proven as effective transportation solutions in areas where current buses are operating in mixed traffic are at capacity. The application and implementation of these technologies also continues to improve as best practices in their design and operations evolve.

There are several new technologies and services emerging and making their way into the mobility marketplace, such as ridesharing, on-demand micro-transit, and driverless mobility. Although these represent user-friendly and innovative transportation solutions, these services, even with their most idealistic application, are not recognized as being capable of substituting the need for high capacity rapid transit between major origins and destinations. In the case of London, the corridors that are recommended for rapid transit represent the highest capacity corridors in the city for moving people. These corridors will continue to form the main arteries of transportation in the city as the land uses within them continue to intensify.

The rapid transit system that is built will be one that is flexible and adaptive and that will hold relevance by integrating with and optimizing emerging and future transportation technologies and services to ultimately improve transportation services across the city. As new technologies and the services emerge, the City will have an opportunity to leverage them to ensure that they become part of an integrated mobility system, with rapid transit as the backbone.

This iterative process ensured the rationale for Rapid Transit, and the ability to address the four guiding principles, was not unduly influenced by stakeholder biases toward a particular technology. The initial Business Case (May 2016) evaluated the Business-as-Usual (BAU) scenario against four different network alternatives. In May 2017, City Council approved one preferred Bus Rapid Transit network. This alternative is the basis for evaluation against the BAU scenario in this Business Case.

Table 1: Guiding Principles and Objectives

PRINCIPLES	OBJECTIVES
ECONOMIC DEVELOPMENT & CITY BUILDING FOCUS	- Attract talent, employment and external investment - Enhance London's ability to attract in-migration - Stimulate and promote infill and intensification - Growth management – reduce sprawl - Downtown revitalization - Connect and invigorate institutions - Job growth to sustain economic prosperity - Lift property values along corridors and at stations
TRANSPORTATION CAPACITY & MOBILITY FOCUS	- Congestion mitigation and prevention - Improve mobility options for all residents - Shift mode choices away from personal automobiles - Improve travel times - Improve service reliability and user experience - Integration with active modes - Connections to regional transportation hubs - Improve transportation safety
COMMUNITY BUILDING & REVITALIZATION FOCUS	- Accessibility for all residents - Improve walkability and the public realm - Develop a stronger sense of place - Develop stronger civic pride - Improve air quality and CO2 emissions reduction - Create walkable and healthy communities - Regenerate urban environments (urban neighbourhoods and main streets)
EASE OF IMPLEMENTATION & OPERATIONAL VIABILITY	- Minimize disruptions and impacts during construction - Maintain operational flexibility - Maintain infrastructure adaptability - Minimize ongoing operating costs

Project Costs: The Financial Case

Capital costs for the Bus Rapid Rapid Transit network were developed and include allowances for infrastructure, vehicles, estimated property impacts, transit facilities and contingencies. The estimated total capital cost of the system is $500 million in nominal dollars. Operating costs were developed for each year to 2050 taking into account a phased implementation of the system. In current dollars, operating costs are estimated to be $12.8 million per year at full implementation

It is assumed that capital costs will be shared by federal, provincial and municipal government with the City paying for all of the ongoing operating and maintenance costs.

The City of London has already committed $130 million towards the capital costs. The City is also investing approximately $85 million in projects that will support the implementation of Rapid Transit including:

- Adelaide Street new grade separation; and,
- Western Road/ Wharncliffe Road widening from Oxford Street to Platt's Lane.

These two projects will provide traffic relief during construction, remove bottlenecks in the delivery of local transit services, and help mitigate auto capacity impacts from the implementation of dedicated lanes for Rapid Transit. The Adelaide Street / CP railway grade separation is considered a necessary element of the rapid transit system.

Value of Rapid Transit: The Economic Case

London is the largest economic centre in Southwestern Ontario outside of the Greater Golden Horseshoe. The city is within two hours of downtown Toronto by rail – a time that will improve as planned improvements to intercity rail are made (including the potential for high speed rail).

London is home to major financial, education and health care institutions including the world renowned Western University, Fanshawe College and London Health Sciences Centre. These institutions and many of London's major employers are well served by the rapid transit corridor, thus serving as a critical means for moving London's labour force in the future.

As the urban hub of Southwestern Ontario, investments in to the city will improve the economic, social and environmental conditions across the entire region. Rapid Transit will better link Londoners and those in the region to various provincial and federal services in areas such as health, education, immigration settlement, social housing as well as to their jobs, families and communities.

London's economy is also in transition and has seen rapid growth in technology-focused companies moving to the city. Finding employees to fill these jobs has been a challenge, as millennials want to live in cities that provide attractive urban neighbourhoods and a range of transportation options including Rapid Transit.

This Business Case serves to quantify the key economic costs and benefits of Rapid Transit for London, highlighted in Exhibit 3.

Rapid Transit produces benefits in terms of transit user time savings and other transportation and environmental benefits. The BRT network yields an estimated $1.18 in benefits for every $1.0 spent.

The benefits from the system include $724.4 million from the internal, transportation and environmental user account (social cost savings from reduced transit travel times, reduced auto-operating costs, safety benefits etc.) including $19.7 million of GHG emissions savings. Together, the combined benefits exceed the capital and operating costs by $109 million in terms of present value.

In addition to these benefits are wider economic benefits including GDP gains (as a result of jobs in London and Ontario) and land value uplift.

Implementation Plan: Delivery and Operations Case

The Rapid Transit system will be implemented in a phased approach. Following the completion of the RTMP, followed by the Transit Project Assessment Process, and identification of preferred procurement methods, construction would commence on the east corridor in 2019, and the north corridor in 2022 with the opening of these corridors in 2025. Implementation of rapid transit in the west-south corridor targeted to open by 2027. In the interim, a Quick Start service would be implemented on the north corridor utilizing buses in mixed traffic, with transit signal priority, localized intersection improvements, and rapid transit station spacing and service headways.

The City of London will implement the Rapid Transit Initiative in partnership with senior levels of government. As a major funding partner, it is anticipated that the Province of Ontario, through Infrastructure Ontario, will assist with the detailed planning, design and delivery of the Rapid Transit system. Roles and responsibilities will be confirmed as discussions on funding advance.

Table 2: Summary of Costs and Benefits (In $Millions)

DESCRIPTION	BRT
FINANCIAL CASE	
Total CAPEX (Nominal Dollars)	498.5
Total Capex (Real Dollars 2017$)	437.8
Total CAPEX (PV 2017$)	374.3
Total OPEX (PV 2017$)	209.0
Total Lifecycle costs (PV 2017$)	35.6
Total Costs (PV 2017$)	618.9
Additional Revenues (PV 2017$)	71.7
Total Costs - Additional Revenues	547.3
ECONOMIC CASE (PV 2017$)	
Internal Benefits	
Transit User Time Savings	525.1
NPV (Internal Benefits-Costs)	-90.44
External Benefits	
Vehicle Operating Cost Savings	62.5
Network Wide Road User Savings	51.3
Safety Savings	27.8
GHG Emissions	19.7
Air Quality	0.7
Health (Walking)	37.4
Sub-total	199.4
BENEFIT - COST RATIO (PV 2017$)	
Total Benefits (Internal + External)	724.4
Total Costs (For BC Ratio)*	615.5
NPV (Net Benefits-Costs)	108.9
Benefit - Cost Ratio	1.18
WIDER ECONOMIC BENEFITS (Real Dollars)	
Short Term GDP Gains	$262
Land Value Uplift	$90
Sub-total	$352
Long Term GDP Gains (annual)	$9
ADDITIONAL QUALITATIVE BENEFITS	
Catalyst for TOD	✓✓
Ease of Implementation and Constructability	✓✓ 1/2
Potential Impact on City Image	✓
Urban Regeneration Benefits	✓
Operational and Infrastructure Flexibility	✓✓
Qualitative User Benefits (Ride Quality and Attractiveness)	✓

✓= Slightly positive impacts ✓✓ = Positive Impacts ✓✓✓ = Very Positive Impacts
NOTE: Based on costs and assumptions as of May 2017.
*Costs for the economic case are calculated using a real discount rate which differs from the financial case.

Public and Stakeholder Feedback

Significant public and stakeholder engagement has occurred as part of the Shift Rapid Transit Initiative. Formal Public Information Centre events were held at four points leading up to the selection of the preliminary preferred alternative in addition to wide ranging stakeholder engagement from youth groups to business leaders.

The Rapid Transit project has also been presented to, and informed by Council at various stages.

While there is strong support for rapid transit across the City, there are also concerns related to construction impacts, access, property impacts, parking and loading, and traffic operations. As the project moves forward to the next stage of the Environmental Assessment Process, it will be important to continue to engage London residents in a meaningful way to both communicate information on what rapid transit means as well as discussing on design alternatives which seek to maximize benefits while minimizing impacts.

Conclusion

London's Rapid Transit Initiative will be a transformational project that creates local, regional, provincial and national economic benefits. London's Rapid Transit project achieves the goals of improving mobility, building strong communities and promoting economic development.

Based on the results of this Business Case, it can be concluded that implementation of the preferred BRT alternative in the preferred corridors would provide the best financial return on investment and is the best overall value solution from a mobility, city building, economic development and financial affordability perspective. At a capital cost of $500 million in nominal dollars, this alternative would produce over $724 million in transportation, environmental and economic benefits over the project lifespan. The system can be implemented in a phased approach and can be adapted to other technologies over the longer term as ridership grows, technologies and trends advance, and as funding becomes available.

Appendix E-Schedule A

Rapid Transit Budget ($ millions)

	Approved Budget			Adjustments Increase/(Decrease)			Revised Budget		
	2016-2019 Multi-Year Budget	2020-2025 Forecast	10 Year 2016-2025 Total	2016-2019 Multi-Year Budget	2020-2025 Forecast	10 Year 2016-2025 Total	2016-2019 Multi-Year Budget	2020-2025 Forecast	10 Year 2016-2025 Total
Expenditures [1]	**270**	**110**	**380**	**(150)**	**270**	**120**	**120**	**380**	**500**
Municipal Contribution:									
- Capital Levy	8	4	**12**	(5)	5	**0**	3	9	**12**
- Development Charges [2]	84	34	**118**	(56)	56	**0**	28	90	**118**
Federal/Provincial	178	72	**250**	(89)	209	**120**	89	281	**370**
Source of Financing	**270**	**110**	**380**	**(150)**	**270**	**120**	**120**	**380**	**500**

(1) The City of London's Capital Financing and Budgeting Policy requires that projects in the capital budget be included with all reasonably known or anticipated costs, including inflation.

(2) New provincial regulations on Development Charges recovery for transit projects may change the growth/non-growth splits on the municipal contribution. A consultant's study on this issue will be completed in the coming months.