TO:	**CHAIR AND MEMBERS STRATEGIC PRIORITIES AND POLICY COMMITTEE MEETING ON MAY 5, 2016**
FROM:	**ART ZUIDEMA CITY MANAGER**
SUBJECT:	**SHIFT RAPID TRANSIT BUSINESS CASE**

RECOMMENDATION

That on the recommendation of the City Manager, the following actions **BE TAKEN** with respect to the Shift Rapid Transit initiative:

a) that the Full Bus Rapid Transit Network Alternative **BE APPROVED** as the preferred option, based on the cost benefit analysis and other findings of the Rapid Transit Environmental Assessment and Business Case;

b) that a Rapid Transit conversion to Light Rail Transit technology **BE ENDORSED** as a strategic direction subject to a review of transit technologies undertaken as part of future updates to the Transportation Master Plan and confirmation through a new business case;

c) the Civic Administration **BE DIRECTED** to design the Full Bus Rapid Transit Network Alternative taking into consideration a future transition to a Light Rail Transit technology and utility infrastructure lifecycle renewal requirements;

d) the Civic Administration **BE DIRECTED** to utilize the Full Bus Rapid Transit Network Alternative, as the preferred alternative for the completion of the Rapid Transit Environmental Assessment Master Plan;

e) the Shift Rapid Transit Business Case, attached in Appendix A, **BE APPROVED**;

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

g) the Financial Model for the Full Bus Rapid Transit Network Alternative **BE RECEIVED,** noting that the costs and expenses for the plan were provided by the consultant, IBI, further noting that the plan will be subject to update and revision as a result of the ongoing Environmental Assessment process, analysis on the impact of Bill 73 on the contribution from Development Charges, and commitment of funding from other levels of government; and

h) the Civic Administration **BE DIRECTED** to provide a future report detailing the needs and approach to establishment of a Rapid Transit Implementation Office.

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 – April 7, 2014 – Timelines for Major Environmental & Engineering Reports

- Planning and Environment Committee – 1st Draft of The London Plan
- Civic Works Committee – July 21, 2014 – Rapid Transit Corridors Environmental Assessment Study Appointment of Consulting Engineer
- Planning and Environment Committee – 2nd Draft of The London Plan
- 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 – January 28, 2016 – Downtown Infrastructure Planning and Coordination
- Strategic Priorities and Policy Committee – November 9, 2015 - Shift Rapid Transit Update

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

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

Growing our Economy
- Local, regional, and global innovation
- Strategic, collaborative partnerships

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

EXECUTIVE SUMMARY

Transportation is a key part of London's social, economic, and environmental vitality, with a major impact on the quality of life for Londoners. There is longstanding recognition that investments are needed to improve public transit in London. For nearly a decade, the City of London, London Transit Commission and many community partners have advocated for Rapid Transit in London.

In September 2014, Council initiated an Environmental Assessment (EA) process to identify and examine options for Rapid Transit in London. The EA process examined potential routes, and technology – namely Bus Rapid Transit (BRT) and Light Rail Transit (LRT). Four main Rapid Transit options were identified: Base BRT, Full BRT, a Hybrid (BRT/LRT), and Full LRT. This processes has included significant community consultation and engagement.

In November 2015, Council received information on the first phase of the Rapid Transit EA, and selected the Hybrid option as the preliminary preferred alternative for further public consultation.

Based on Council's direction, a significant amount of work has occurred since November 2015. Community consultation has continued, including meetings with numerous stakeholders and partner organizations for feedback on the preliminary preferred alternative. The Mayor and Civic Administration have engaged with Federal and Provincial Government officials, with an overwhelmingly positive response. Technical work to examine the four options and develop the Business Case has continued.

On the basis of this work, this report recommends the Full Bus Rapid Transit (BRT) Network as the preferred alternative. Based on the attached draft Business Case, the Full BRT Network option emerges as the recommended alternative because it offers the greatest value for Londoners as it meets the city's ridership needs, provides benefits in terms of economic growth, community development and revitalization, delivers considerable air quality and GHG emission reductions and modernizes the transit system by making it more attractive, reliable and convenient for residents to move around the city and is the best value solution from an affordability and financial return on investment perspective.

It is important to recognize that London will undoubtedly change over the coming decades. Some of these changes can be projected with the best available information, such as demographic shifts and forecasted population growth, while others cannot be anticipated which may impact on how London grows and the needs of the community.

Technology may also significantly alter the transportation landscape over the course of the next 20 years with the introduction of new transportation technologies. A future conversion to a higher capacity technology, such as LRT, is appropriate once ridership levels are better matched to the capacity of the technology. At this time, it is appropriate to establish a long term strategic direction to convert the Full BRT network to introduce LRT when such ridership levels are achieved. Design and development of the BRT should incorporate this long term view allowing for an efficient and easy conversion to LRT in the future. This long term direction will be considered through periodic monitoring via the Transportation Master Plan, to assess the needs of the community and ensure both current and anticipated future needs are being met by London's transit system. Any future transition would require its own Business Case at an appropriate time in the future.

With Council approval of the recommendations, work towards implementing Rapid Transit in London will proceed, including continued conversations with Londoners, community stakeholders, and Federal and Provincial officials, and technical work towards completing the Rapid Transit Environmental Assessment Master Plan.

BACKGROUND

Purpose

The purpose of this report is to provide Committee and Council with an update regarding the Shift: Our Rapid Transit Initiative (Shift), and seek direction on the next steps in the Rapid Transit Environmental Assessment process, submission of the business case and related funding requests.

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 implementation of a Rapid Transit system is a central component of London's land use and transportation policy, which will help shape the city's future pattern of growth, encourage intensification and regeneration, and stimulate economic growth for decades to come. Rapid Transit, combined 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 quicker, more convenient and comfortable option for residents.

The Rapid Transit Environmental Assessment (EA) is being undertaken to create a Rapid Transit Master Plan (Master Plan) 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 being operationally feasible and economically viable.

The EA is progressing towards the stage of determining a preferred Rapid Transit system network structure (routes) and identifying the types of rapid transit technology (vehicles) to be used for each route. This report provides an overview of the work undertaken to date and recommends the next steps in the process.

DISCUSSION

For nearly a decade, the City of London, London Transit Commission and many community partners have advocated for Rapid Transit in London. The Rapid Transit Environmental Assessment began in September of 2014. The community engagement component of the process was initiated in early January of 2015 with the launch of the Shift branding for the study.

An extensive community engagement effort has been undertaken to assist in the planning and impact assessment process for Shift. The engagement was undertaken by a multi-disciplinary team that included staff from Engineering and Environmental Services, Planning, Communications and London Transit. Formal Public Information Centres (PIC) were held in February and May of 2015.

In November 2015, Council identified the Hybrid Network, which uses a combination of bus and light rail vehicles, as the preliminary preferred alternative and the basis for the next round of community engagement and public input for the Rapid Transit Environmental Assessment.

Since November 2015, significant public consultation has occurred regarding the Hybrid Network alternative. A third PIC was held in December 2015. Consultation has been undertaken with technical, municipal advisory committees, First Nations, major institutions (Western University and Fanshawe College), property owners, Business Improvement Associations (BIAs), community groups, student councils and the general public.

In total, over one hundred (100) engagement events have been held in addition to the PICs and over 14,000 Londoners have engaged in the process. In addition, technical and information sessions have been undertaken with staff from the Ministry of Transportation (MTO), Infrastructure Ontario (IO) and the Ministry of Finance.

Throughout these consultations, there has been near unanimous support for Rapid Transit. There is also strong consensus on the preferred corridors, though some members of the public would like to see a larger rapid transit network extending to other areas of the City. The reduction of automobile traffic capacity along the rapid transit routes, in particular along Richmond Street, was raised as an issue to be examined in further detail.

Input received on technology options was varied. Many members of the public and key stakeholders expressed strong support for BRT technology on the basis that it provides significant transportation benefits, meets the projected ridership requirements, has less construction related implementation impacts and is less expensive. Other members of the public and stakeholders feel that LRT technology could provide a higher quality service and is important from a city-building and economic development perspective.

Rapid Transit Network

The two main discussion points throughout the Rapid Transit consultations to date have focused on:

1. Proposed rapid transit corridors
2. Proposed rapid transit technology (type of vehicles)

This following section provides a summary for each of these topic areas from a mobility and transportation capacity perspective while recognizing affordability, city-building, regeneration and community development goals are key principles underlying the rapid transit initiative, and the need to align rapid transit plans and Council's land use plans.

Rapid Transit Corridors

The preferred Rapid Transit routes serve major destinations including the Downtown, transportation hubs, retail centres, post-secondary institutions, research centres, office areas, hospitals, entertainment destinations and large employers. It integrates with the larger transportation network that includes automobiles, local buses, inter-city travel, potential future High Speed Rail, cyclists, pedestrians and goods movement.

The implementation of a Rapid Transit system, together with a strong base transit system with appropriate service coverage and levels of service, will improve travel time performance, increase the passenger capacity of the transit network and improve the quality of service for transit passengers. This will be achieved by providing:

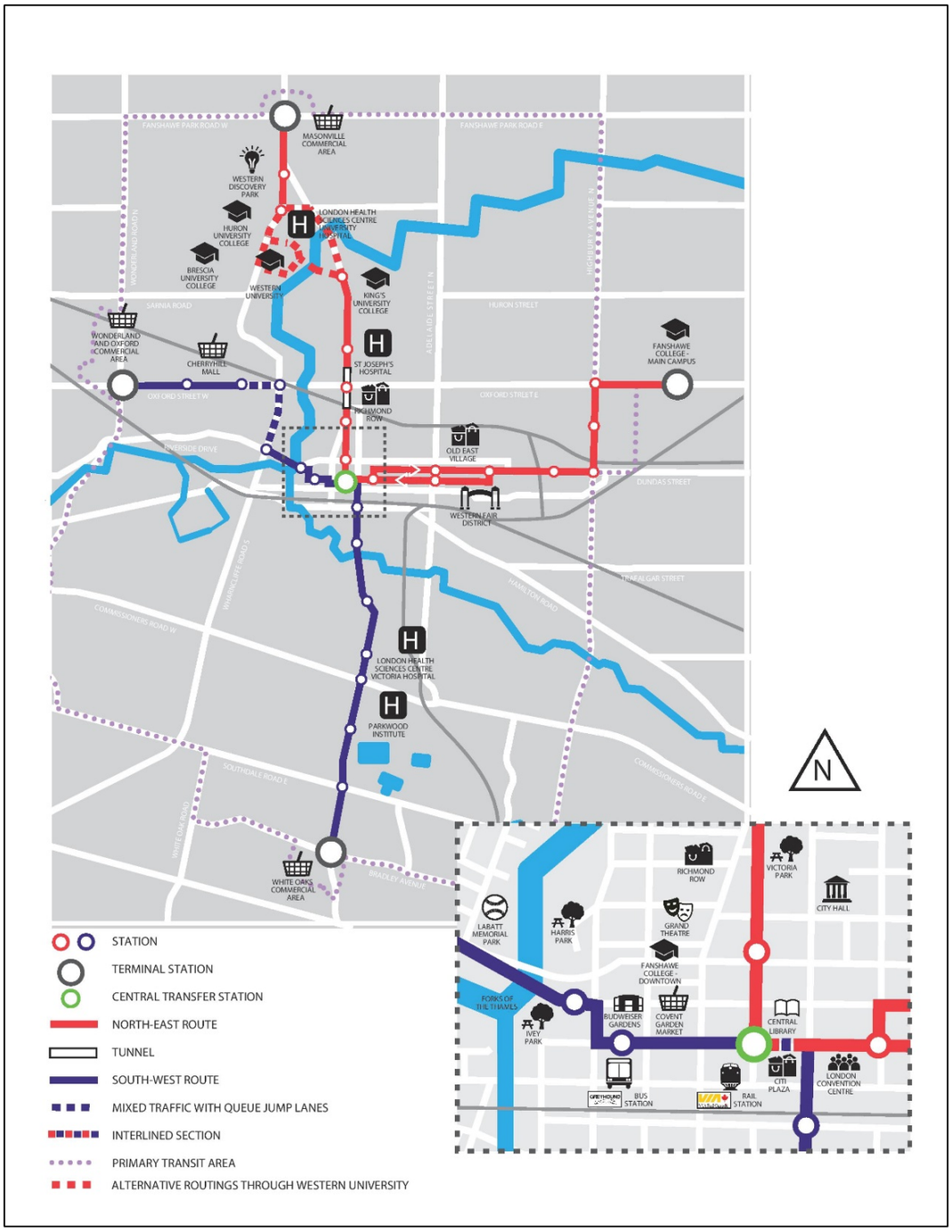
- Frequent and reliable service along the Rapid Transit corridors, allowing riders to use the service without needing to consult a schedule
- Optimized stop locations at major activity generators along the Rapid Transit corridors to ensure high operating speeds
- Dedicated lanes for Rapid Transit, separated from other traffic where feasible
- Timing traffic signals to improve efficiency for transit vehicles
- Enhanced stations: that is, transit stops with larger, more prominent waiting areas, larger shelters, seating, and potentially an enclosed heated waiting area integrated with urban uses (within transit-oriented building forms)
- Utilization of vehicles with enhanced passenger amenities and comfort features
- Real-time information for passengers

The preliminary preferred rapid transit network has been further refined since November 2015 to incorporate a modification to the potential location of the entrance to the tunnel under the CP Railway and Oxford Street. The location has been moved to Clarence Street and the previous north south couplet on Clarence and Richmond has been consolidated into a single route along Clarence Street. This allows for the existing four lane cross section of Richmond to remain south of Oxford and reduces the staging and construction impacts.

North of Oxford, a similar review will need to be undertaken as part of the next phase in terms of road widening versus the conversion of travel lanes to provide for the rapid transit only lanes.

The preferred Rapid Transit routes are illustrated on **Figure 1**.

Figure 1 - Preferred Rapid Transit Corridors



The next phase of the EA will further refine the preferred network alternative in terms of lane configurations, station designs, right-of-way widths, utility work, property impacts and requirements. It should be noted that for comparison purposes, the rapid transit system has many similar characteristics, notwithstanding the technology. The look and design of the stations and corridors is not dependent on the type of vehicle or system.

The design and development of the BRT corridors and stations throughout the route should recognize the long term strategic direction to introduce LRT technology in the

future. This will allow for a cost effective and efficient transition to a LRT or future technology. As noted above, administration will continue to monitor emerging technologies and adjust accordingly.

The draft London Plan has been prepared to closely integrate with London's rapid transit system. It plans for four Transit Villages at the terminus of each rapid transit corridor (north, west, south and east) that allow for substantial residential densities, a significant amount of office space, and a broad range of land uses. The Plan calls for these Transit Villages to be developed over time using transit-oriented development (TOD) principles, supporting the integration of these urban areas with the rapid transit corridors that connect them to the Downtown.

The draft London Plan identifies rapid transit boulevards and applies the Rapid Transit Corridor Place Type (land use designation) to lands fronting onto these boulevards allowing for a mix of land uses and for a substantial intensity of development. The permitted development height and density rises at the rapid transit stations.

At the hub of all four rapid transit corridors is the Downtown. The draft London Plan allows for the widest range of uses in the Downtown Area and the greatest height, residential density, and office floor space. Parking requirements are substantially relaxed in the Downtown, recognizing the high level of transit services offered in the core.

"Our Move Forward: London's Downtown Plan" sets the stage for rapid transit connections to the train station, the Dundas Flex Street, the Forks, the Budwieser Gardens and other key destinations in the core. Further supporting the plan for intensification at strategic locations, Council's financial incentives encourage Downtown development, helping to create a strong and vital Downtown destination that will fuel rapid transit ridership. The proposed movement of the planned portal to the Richmond Street rapid transit tunnel south, to Clarence Street, is preferable to support a quality pedestrian environment along Richmond Street.

The London Plan sets an aggressive target of 45% intensification within the Built Area Boundary. 75% of this intensification is to occur in the Primary Transit Area (a relative large area within the centre of the City), with the intent of encouraging inward and upward growth that will support rapid transit ridership. The lands within the Primary Transit Area are planned to offer the highest level of transit service in the City. The proposed rapid transit corridors are all located within this Primary Transit Area.

The proposed rapid transit corridors connect key institutions that have been recognized and planned for in the draft London Plan, including three hospital complexes, various research centres, Fanshawe College and Western University and its affiliated colleges. The routes also connect some of London's important historic main streets, including Richmond Row, SoHo and the Old East Village.

The preferred rapid transit routes align very well with the draft London Plan and will effectively support Council's strategic goals for building a sustainable city.

Rapid Transit Route Integration

The Rapid Transit network will consist of the two main corridors that will operate in conjunction with the local transit routes. The London Transit Commission is currently undertaking a route structure review to assess the overall system structure and to provide a high level implementation plan on how to:

- modify the planned local bus network to connect to the rapid transit corridors to support transit ridership growth
- enhance service levels on routes connecting to rapid transit corridors
- eliminate/modify routes that duplicate rapid transit corridors
- modify routes to better connect to rapid transit and other destinations

The assessment will include the final recommended route structures including travel frequencies during peak and nonpeak operating hours as well as a high level implementation plan associated with establishing the desired transit network.

Western University Corridor Options

The preferred corridor alignment through Western University requires special consideration in order to ensure the campus is conveniently serviced while maximizing potential rapid transit system ridership, maximizing service efficiency and minimizing environmental and social impacts.

Various corridor alignments have been reviewed with the Western University Administration. Options include utilizing University Drive and going along Middlesex Drive to Elgin Drive, then on to Western Road, a second route utilizing University Drive, along Lambton Drive through Alumni Circle and on to Western Road, and the third option is to remain off the university property, continuing on Richmond, along Windermere Road and then onto Western Road. Options that route rapid transit through the campus would maximize ridership potential for rapid transit, however with BRT technology there is an option to operate a spur service into campus.

Western is undertaking an extensive process of analysis and consultation with the campus community to understand the potential implications to all activities on campus, including academia, research and leisure. Concerns related to the impact on pedestrians, vibration, electromagnetic interference associated with LRT technology have been identified as concerns. The reconstruction of major portions of the campus to accommodate the underground requirements for LRT technology pose a significant impact to the operations of the campus.

A preferred rapid transit alignment option has not been determined by Western University through the campus property. Civic Administration continues to be in regular dialogue with Western Administration and other stakeholders in the campus community as options are reviewed.

Rapid Transit Technology

In every community that has or is exploring Rapid Transit, there are a variety of perspectives regarding route and technology alternatives. London is not unique in this respect. There are ‘pros’ and ‘cons’ to all potential alternatives, and it is imperative that every angle be considered in making a final decision.

Although the consultations have included healthy debate about routes and technology, there is broad consensus that any Rapid Transit technology, BRT or LRT, will improve transportation mobility and the quality of transit service in London. The implementation of a Rapid Transit system, together with a strong base transit system with appropriate service coverage and levels of service, will improve travel time performance, increase the passenger capacity of the transit network and improve the quality of service for transit passengers.

As acknowledged in the Environmental Assessment, it is also important to consider how different technologies contribute to Council's plans for growth and development, community building and economic development.

Input received regarding technology options has varied. Based on this feedback, the following qualities and benefits of the Full BRT Network can be confirmed:

- provides a high quality service
- meets the projected ridership requirements
- allows for the optimization of routes and service levels to match demands and travel patterns
- can be integrated with local transit
- has less construction related implementation impacts

Bus Rapid Transit meets and exceeds all the technical requirements from a transit and mobility perspective by providing an efficient and higher capacity transit system. BRT allows for more frequent service due to the smaller capacity of the vehicle. The 20 year projected ridership demands for the city are well within the capacity of a BRT system and its scalable incremental manner allows for higher utilization rates.

While LRT technology would be underutilized at implementation and within the 20 year planning analysis horizon, a future conversion is appropriate as a long term direction once ridership levels are better matched to the capacity of the technology.

The preferred Rapid Transit network must be practical to build and operate, minimizing and mitigating impacts on the environment, heritage areas, and 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, providing a balance between time savings with service coverage, and integrate within the city-wide transportation system.

BRT technology provides a good balance of capital and operating investment with the potential ridership and fare revenue recovery as it better matches capacity to transit demand. The implementation of BRT technology will have less impact from a constructability perspective as it can be phased to impose less disruption. LRT technology requires a continuous corridor to be built in one phase prior to operation and includes the requirement for a new maintenance facility situated on the rail line.

The current Official Plan establishes a policy framework for rapid transit. Rapid transit is a fundamental cornerstone of the draft London Plan. It establishes a city structure with rapid transit at its core. Land use designations allow for, and encourage, transit oriented forms of development along these corridors to support transit and take advantage of the demand for residential development that rapid transit can generate. In order for the London Plan to be implemented successfully, a high quality rapid transit service will be required.

Ability to stimulate residential development

From a transit technology perspective, LRT technology has an incremental advantage to BRT in its ability to stimulate residential intensification. This is because rail is fixed and the rail lines and associated catenary are highly visible, clearly defining a rapid transit corridor. This element, together with a high quality ride experience, can generate a residential demand that is very attractive to development investment.

Well-designed BRT corridors, such as the VIVA RT in York Region, have also demonstrated the ability to spur new development. The primary factor in attracting development is the permanency of corridors. A design that incorporates designated lanes, enhanced station design and traveler information systems provides assurance to the development industry that the service will remain. The longer-term direction for introducing LRT technology on these same corridors further enhances the investment attraction.

In both cases, to stimulate residential development, it is critical that land use policies are aligned with rapid transit corridors to allow for intense forms of development and a broad mix of uses.

Ride Quality and Attractiveness – Attracting Choice Riders

Previous background information has identified that 2/3 of auto trips currently start in the proposed rapid transit corridors and 50 % end within these corridors. This is an untapped market for new riders who have the choice of using automobiles. For choice riders, the quality of a transit travel experience is critical in determining whether they will, or will not, use the service. BRT vehicles provide a ride experience that is superior to that of a conventional bus. This encourages choice ridership. LRT vehicles provide a superior ride quality to BRT and, as a result, is more likely to generate a higher capture rate of choice riders.

A key consideration for the BRT would be the implementation of an all-electric BRT system in order to provide an enhancement which could be showcased as an example of the city's environmental focus and build London's image in Canada as a sustainable community.

Urban Regeneration

The regeneration of London's Downtown, urban main streets and neighbourhoods is extremely important for London's future. These areas are important assets for attracting the burgeoning tech sector and will factor significantly in London's future knowledge-based economy. While both BRT and LRT will help to regenerate urban neighbourhoods, as noted above, LRT is more effective at stimulating residential development investment that supports revitalizing urban neighbourhoods.

Strategic and Sustainable Growth

The work completed through the ReThink London process showed that growing inward and upward has many important benefits. Rapid transit is one of the most powerful tools that the City has at its disposal to encourage inward and upward growth. While both BRT and LRT provide significant benefits, options that include an LRT component have an advantage on stimulating intensification, allowing Council greater opportunity to meet its 45% intensification target.

In the longer term, the implementation of LRT technology will lead to increased long-term cost savings from a city growth perspective – savings relating to the initial construction costs of growth-related infrastructure and the ongoing operating costs to maintain this infrastructure. The additional intensification stimulated by the LRT technology could also help to reduce energy consumption and greenhouse gas emission, support healthy communities, make active transportation more convenient to more people and reduce encroachment into agricultural lands.

Transit-oriented Forms of Development

Transit is most viable when supported by forms of development that create positive environments for walking, cycling and transit use – known as transit-oriented development. Such development can increase ridership, which in turn creates demand for even more housing and commercial development along rapid transit corridors. The four rapid transit options being considered have different abilities to stimulate this kind of development. As shown in the business case, the LRT technology provides an incremental advantage to BRT technology as catalysts for transit oriented forms of development.

City Image – Attracting and Retaining Talent and Investment

Rapid transit is an important part of a city's ability to attract talent and investment through the image that it conveys. As noted in the business case, those options that include an LRT component provide an advantage in generating a positive image for a City. The benefits for branding and image building offered by rapid transit are not limited to the City alone. Rapid transit can also be used in this way by businesses and institutions promoting their own image and amenities. Many such institutions are located along the proposed rapid transit corridor.

Contributions to Streets and Quality of Place

It is difficult to know exactly what kind of BRT or LRT vehicles may be used in the future when London's system is ultimately implemented. However, under current conditions, LRT vehicles are more amenable to integrating with, and supporting, high quality urban environments. While LRT vehicles are generally quieter than diesel buses, have no emissions, a future all electric BRT vehicle would provide similar qualities.

In summary, BRT and LRT technology each provide unique advantages and in some qualities have an incremental benefit over the other. The determination of the appropriate technology takes into account these advantages, coupled with the mobility requirements and financial affordability to determine the best value system alternative in the medium and longer term for the City.

Rapid Transit Business Case

The EA process requires the assessment of all public undertakings on the potential to affect the environment from a natural, social, cultural, constructed and economic perspective. The guiding principles for the network assessment of the rapid transit system include:

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

These guiding principles are considered along with financial affordability and responsibility to guide the evaluation.

Transit investments that are funded by the Province and Federal government are subject to the development and approval of a business case. This allows for evidence based decision-making in order to maximise the benefits of investments and to ensure investments are made in projects that best address critical problems.

Business cases allow for objective comparisons of proposals for investment within and between projects and investment types, with sufficient flexibility to accommodate project specific information of interest. They are built around clearly defined problem and opportunity statements, which set out what problems and opportunities the investment will help address.

Business case analysis (BCA) includes both quantitative and qualitative impact information that collectively indicate the expected performance of a proposed investment. This includes analysis of alternatives to ensure potential and different project options are considered. Sufficient information must be generated to ensure the decision to discard an option is robust and defensible. BCA identifies the costs, benefits and risks of a project. Key decision-making criteria include:

- Is the investment supported by a robust explanation of how it fits with wider public policy, planning and strategic objectives?
- Does the investment demonstrate value for money measured in economic terms and does it make sense financially (i.e., is it affordable?)
- What are the commercial procurement options and risks, and the deliverability implications (e.g., engineering issues, use of alternative finance and procurement, operational issues, etc.)?

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. It examines several different high-level transit options within the context of a spectrum of considerations:

- transportation user benefits compared to the financial impact;
- good value for tax-payer dollars;
- environmental, economic and social benefits of the various alternatives;
- the impacts that a project has on communities; and
- alignment with the current policy objectives.

Since November 2015, the BCA was updated to follow the new Business Case Development Handbook from Metrolinx. The purpose of the updated procedures is to ensure a consistent approach to undertaking BCA in an evidence based decision-making process in order to maximize the benefits of investments that the Province is funding. The summary of costs and benefits is identified on **Figure 2.**

Figure 2 - Business Case Summary of Costs and Benefits

DESCRIPTION	BASE BRT	FULL BRT	HYBRID	FULL LRT
FINANCIAL CASE ($2016)				
Total Capital Costs (2016$)	270	500	880	1,150
Total Capital Costs (NPV 2016$)	249.8	440.2	781.5	1022.7
Total Operation Costs (NPV 2016$)	264.2	234.9	215.6	224.0
Total Costs (NPV 2016$)	514.1	675.1	997.1	1246.7
Total Additional Revenue (NPV 2016$)	45.6	73.1	83.1	85.6
Net Revenue-Costs (NPV 2016$)	-468.5	-602.0	-914.0	-1161.0
ECONOMIC CASE (NPV $2016)				
Internal Benefits				
Transit User Time Savings	520.3	787.9	787.9	787.9
External Benefits				
Unperceived Automobile Costs Savings	13.5	21.7	24.6	25.4
Network Wide Road User Savings	41.1	65.9	75.0	77.2
Safety Savings	6.7	10.8	12.3	12.7
GHG Emissions	12.8	20.5	23.3	24.0
Air Quality	0.4	0.7	0.8	0.8
Health (Walking)	23.8	38.2	43.4	44.7
Sub-total	98.3	157.8	179.4	184.8
Total Benefits (Internal+External)	618.6	945.7	967.3	972.7
B/C Ratio (External/Internal Benefits)	1.3	1.6	1.1	0.8
Wider Economic Benefits (NPV $2016)				
Short Term GDP Gains	150.7	272.9	482.6	626.0
Long Term GDP Gains	9.9	8.8	8.0	8.3
Land Value Uplift	80.0	90.0	110.0	115.0
Sub-total	258.8	406.8	661.5	822.2
Total B/C Ratio	1.8	2.2	1.7	1.5
Additional Qualitative Benefits				
Catalyst for Transit Oriented Development	✓	✓✓	✓✓1/2	✓✓✓
Ease of Implementation and Constructability	✓✓✓	✓✓1/2	✓✓	✓1/2
Potential Impact on City Image	✓	✓✓	✓✓1/2	✓✓✓
Urban Regeneration Benefits	✓	✓✓	✓✓1/2	✓✓✓
Operational and Infrastructure Flexibility	✓✓	✓✓	✓1/2	✓
Qualitative User Benefits (Ride Quality and Attractiveness)	✓	✓	✓✓	✓✓✓

Note: ✔= slightly positive impacts - ✔✔= positive impacts - ✔✔✔= very positive impacts.
NPV = Net Present Value (Life Cycle Costing)

Recognizing the four guiding principles and financial affordability, the assessment considers the following categories:

- Financial considerations which consist of the net capital and net operating costs (transportation and maintenance) associated with the Rapid Transit alternatives;
- Direct transit travel time savings;

- Transportation user considerations which measures auto operating cost savings, network wide road user saving, safety benefits from reduced road traffic, environmental consideration which captures the impact on greenhouse gas (GHG) emissions, and air quality and health;
- Wider economic development which captures land use uplift as well as the impact of capital spending on employment and output in the short-term and the impact of additional services and operations associated with the Rapid Transit Strategy over the long term; and

Qualitative city building and social/community considerations, which describes the impacts of the Rapid Transit Strategy on land use shaping and City Building potential, as well as the ease of implementation and constructability.

Preferred Rapid Transit Alternative

The determination of a recommended preferred rapid transit alternative for consideration has been based on a number of factors. As illustrated on **Figure 2**, all of the options are an improvement to the delivery of transit from the existing system. The options provide varying degrees of benefits in the various categories. The Full BRT system consistently provides the best value for money preposition as the benefit cost ratio is the highest at every stage of the evaluation. A full copy of the draft BCA is included in **Appendix A**.

The benefit-cost analysis has identified that the economic case for the Full BRT alternative is expected to generate $1.60 of benefits for every $1 investment in the net capital and net operating costs required to deliver the transformation of London's transit service. The net incremental capital investment required for the Full BRT alternative in terms of net present value is $440 million. Net new operating and maintenance costs for the BRT Strategy are estimated at $162 million over a 30 year period. Both the capital and operating costs – which amount to $602 million – excludes all capital and operating spending which would have otherwise occurred in the base case scenario in order to provide a continuation of the current transit service.

The benefits from the Full BRT alternative consist of the $945.7 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 $20.5 million of GHG emissions savings. Together, the combined benefits exceed the capital and operating costs associated with the Full BRT alternative by $343.7 million in terms of net present value or by a ratio of 1.6:1.

When the benefits of wider economic benefits are included in the process (economic uplift, GDP as a result of jobs in London and Ontario), the benefits ratio for Full BRT alternative increase in 2.2:1.

A key consideration in the evaluation is existing and future ridership as this metric speaks to the problem statement and opportunity that the Rapid Transit EA is addressing.

Existing peak passenger loads on local transit is under 2,000 riders in the peak direction in the peak time period along the northern corridor. BRT and LRT are capable of accommodating all of these passengers. A BRT technology can handle up to 10,000 passengers per hour, a planning capacity for BRT in London of 2,250 passengers per hour was evaluated. LRT technology using larger vehicles can achieve a capacity up to 13,000 passengers per hour, a planning capacity for LRT of 5,100 passengers per hour was evaluated in order to utilize similar frequency and service levels.

Integration, consolidation and reorganization of local London Transit bus routes will help feed the rapid transit system. Future ridership projections take into account growth, intensification of development along the Rapid Transit corridors and an increase in transit use modal share. When rapid transit is implemented, the transit ridership will be split between local bus service and the rapid transit depending on the origin and destination of residents travel. Based on the future projections on 10 and 20 year horizons, the ridership projections can be accommodated within the planning capacity of a Full BRT system.

The application and implementation of BRT technology continues to improve as best practices in their design and operations evolve. One of the key advantages of BRT from a passenger perspective is that it minimizes the number of transfers required. For example, a BRT route could be extended to the airport using the same vehicle, but in mixed traffic. A Full BRT system would also provide more flexibility to design routes to minimize transfers in the downtown.

There are several new technologies and services emerging and making their way into the mobility marketplace, such as ridesharing, on demand micro-transit, and eventually 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 Full BRT 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.

The Full BRT alternative also provides significant benefits from a constructability and ease of implementation perspective. It can be implemented in a sequential linear scalable order versus an entire corridor at once and will have a lower construction impact along the corridors. Full BRT eliminates the additional implementation risk presented by the complexity of rail signal and communications systems required for LRT technology.

There are several variables in the BCA that are forecasts of future year conditions based on the industry standard assumptions of today. Given the uncertainty of the economic climate, the trends that are emerging in transportation technology and user preferences, a sensitivity analysis was undertaken of these variables and assumptions to see what the impact will be on the benefits and costs of the business case.

The sensitivity analysis (Exhibit 5.1 of the BCA) included changes to a higher intensification along the corridors, higher rates of land value uplift, ridership attraction differences between technology alternatives, energy costs and GHG emissions savings.

It is important to note that changes in the variables identified in the sensitivity analysis do not result in significant changes to the total benefits/net costs ratio and confirm that the economic case for the Full BRT alternative provides the highest benefit cost ratio.

Based on the results of the assessment done as part of the EA and the business case analysis, it has been identified that a Full BRT alternative provides the best value, highest return on investment and can accommodate the transit ridership demands. At a capital cost of $500 million ($440.2 million in Net Present Value), this alternative would produce over $1.3 billion in transportation, environmental and economic benefits over the next two decades.

The Full BRT alternative meets London's ridership needs, provides benefits in terms of economic growth, community development and revitalization, delivers considerable air quality and GHG emission reductions and modernizes the transit system by making it more attractive, reliable and convenient for residents to move around the city and it the best solution from an affordability and financial return on investment perspective.

The Full BRT alternative should be implemented in a manner that will allow for a cost effective transition to a future LRT technology – the long term direction - when warranted and ridership levels are better matched to the capacity of the technology.

The design of the BRT system should be undertaken with this future transition in mind, in particular with the design of the tunnel, stations, bridge requirements and supporting infrastructure. The design should take into account the medium to long term utility infrastructure lifecycle renewal requirements to ensure their placement and upgrades needs are assessed and taken into consideration.

The BCA is an iterative process which is refined at the various steps in the EA, detail design and construction phases. Further assessment of the benefits and refinement of the capital and operating/maintenance costs will be undertaken at key junction points in the implementation process.

Preliminary Network Implementation

As part of the Rapid Transit EA, a preliminary implementation plan was developed taking into account constructability, financing constraints, land acquisition and the greater coordination with other construction projects. The implementation is dependent on the approval of the BCA, funding commitments and transfer of funds.

Through the City's Smart Moves Transportation Master Plan, a number of transportation growth projects have been identified over the 2015-2025 timeframe that are fundamental to the implementation of the Rapid Transit network. Improvements at the Canadian National (CN) and Canadian Pacific (CP) railway grade separations along Wharncliffe and Western Road are critical to the viability and implementation of the Rapid Transit network. Rehabilitation to the Queens Street and Kensington bridges is required in the short term to deal with deficiencies and potential modification of travel lanes to accommodate Rapid Transit. The potential grade separation of the Adelaide/CP railway crossing is also a key consideration and will need to be considered through future capital program updates.

Providing construction relief traffic capacity and detours for current London Transit routes during the implementation of the rapid transit network is critical to ensure mobility in the downtown and parallel transportation corridors. In addition, several initiatives related to water and wastewater projects and the Downtown Plan (Dundas Place) are scheduled for potential implementation during that timeframe. All these projects require coordination with utility companies, in particular London Hydro, as utility companies have numerous upgrades being planned.

A key consideration is the need for improved transit service in the short term. The implementation of a “Quick Start” program along a number of key corridors to allow for a growth in transit ridership is being proposed, similar to the implementation plans in other municipalities. This would be similar to the semi-express service implemented with LTC Routes 90 and 91 with additional queue jump lanes and transit signal priority.

The initial stages of implementation will feature semi-express service along the planned rapid transit corridors, utilizing technologies such as transit signal priority to improve travel times. Providing a higher overall quality service in the early stage of implementation is critical to start building ridership and immediately increasing transit modal share.

The approval of the BCA, completion of the EA for all corridors (2017), funding commitment, detail design and property acquisition all require time prior to the implementation of construction. It is anticipated that construction on the corridors would not start until 2019, with a “Quick Start” program construction being implemented in 2018.

FINANCIAL

Capital Costs

To lay the foundation for future investment, Rapid Transit has been included in the 10-year capital plan and the 2014 Development Charges background study. It should be noted, however, that the dollar figures used in these documents were based on best available information at the time – specifically, the preliminary cost estimates for a base BRT system, which did not include significant capital works, nor were the estimates based on a detailed Environmental Assessment. Therefore, based on available information at the time, the amount included in the budget is approximately $380 million, with an assumption of $250 million in Provincial and Federal dollars (yet to be confirmed); $117 million from Development Charges; and, $12 million tax rate supported.

To date, London City Council has planned for approximately $129.6 million to invest in Rapid Transit implementation. This contribution is considered to be fixed, regardless of which Rapid Transit option is ultimately selected. It should be expected that the City of London will also bear additional costs during and after the implementation of Rapid Transit, including the ongoing operating expense and the cost of capital and related upgrades such as coordinated underground service life cycle renewals and streetscape improvements. Combined, this represents a significant municipal investment, ready to be leveraged with funding from other orders of government.

The 2016-2019 Multi-Year Budget and Future Year Forecast includes the $129.6 million, sourced from development charges and the tax levy in the 10 year Capital budget and forecast.

Operating Costs

A Financial Model for Rapid Transit was developed based on Full BRT and the Hybrid alternative for comparison purposes. The evaluation is based on a tentative construction start timing of 2019, with the implementation of the Quick Start program in the interim that will begin to grow ridership and allow for the reorganization and integration of the local bus service. It does not examine nor portray the existing transit related gap in service funding for the London Transit Commission.

The financial model analysis (Appendix B) is based on a number of key assumptions:

- Summarized capital and operating costs are based on a detailed analysis provided by the consultant, IBI.
- Capital costs are totals of engineering, property, utility relocation cost sharing and construction.
- Expenditures indicated in the approximate year of required financial commitment. Cash flow commitments would span multiple years.
- Operating costs are incremental to local transit costs. Operating costs do not include incremental fare revenue for Rapid Transit routes.
- LTC incremental operating costs/savings) are not yet available and will be determined by LTC's route structure review. Impact will be included upon completion of the study.
- Approved existing capital budget assumed 2/3 senior government funding.
- City's capital contribution capped at $129.6 million, including Development Charges. Assumes that remainder of capital funding funded by other levels of governments.
- The potential tax levy % increase is provided as a guide. Capital costs and operating expenses for the plan were provided by the consultant, IBI, and are subject to update and revision as a result of the ongoing Environmental Assessment process, analysis on the impact of Bill 73 on the contribution from Development Charges, and commitment of funding from other levels of government. Incremental operating costs and capital financing costs could be funded through a mix of tax levy increases, assessment growth funding and/or user fees.

Estimated Rapid Transit Operating Costs		
Cost Items	**Full BRT**	
Labour and Administration Costs	$	4,933,000
Fuel and Energy Costs	$	1,986,000
Vehicle and Plant Maintenance Costs	$	4,089,000
Service Cost Sub Total (LTC Cost)	$	11,008,000
Line Maintenance Cost (City Cost)	$	1,185,000
Total O+M Cost	**$**	**12,193,000**

The net increase for the annual operating costs associated with the Full BRT Network alternative based on the key assumptions would be $12.2 M annually upon implementation in 2026, which translates to a 34% increase over the projected $32 million in transit operating costs of the existing system.

These costs will need to be accommodated in future years' property tax operating budgets once the Rapid Transit system is operational. Possible sources of funding could be through a mix of tax levy increases, assessment growth funding and/or user fees.

It should also be noted that, as with any business plan, the Rapid Transit system may require an infusion of tax subsidy in the initial years to build ridership, so the optimal level of operating cost can be attained over the long term; this would further impact operating budgets.

The numbers used in the financial analysis were provided by IBI and are high level based on long term projections and will be refined through the EA process and future budget cycles.

INVESTMENT

London's Strategic Outreach with Provincial and Federal Partners

In June 2015, City Council initiated a process to advocate for federal and provincial investment in the City's Rapid Transit initiative. This direction built on several years of advocacy for transit investment, including efforts by the London Transit Commission and through nearly a decade of City of London pre-budget submissions.

Over the past year, the focus of this outreach has been to inform local Members of Parliament (MPs) and Members of Provincial Parliament (MPPs), Cabinet Ministers and party leadership of the economic, social and environmental benefits to London and Southwestern Ontario that would result from transformational investments in London's Rapid Transit Initiative.

In June 2015, the City of London participated in the Ontario Government's *Moving Ontario Forward – Outside the GTHA* consultation, and the Mayor and Administration met with appropriate provincial government officials to build awareness about London's Rapid Transit initiative. Federally, similar outreach occurred in the months leading up to the election in October 2015, including a Council-initiated survey of all local candidates to gauge support for transit investments.

In November 2015, Council endorsed a preliminary preferred Rapid Transit alternative and a formal funding request was submitted to the Federal and Provincial Governments. The Mayor and Civic Administration met with local MPs and MPPs numerous times, and leveraged existing municipal association meetings to inform and profile what rapid transit will mean for Londoners and London businesses.

Leading up to the 2016 provincial and federal budgets, the Mayor met with key Cabinet ministers, and pursued every opportunity during strategic events such as the Federation of Canadian Municipalities (FCM) Big City Mayors' Caucus, the Sustainable Communities Conference and the Ontario Good Roads Association (OGRA) to connect with decision makers about Rapid Transit in London. Provincially, these meetings have primarily targeted the Ministers of Transportation, Finance, Environment and Climate Change, and Seniors. Federally, meetings involved the Ministers of Infrastructure and Communities, Finance, Environment and Climate Change, and Transport.

The federal and provincial budgets both included positive news for Rapid Transit in London, including a specific mention of London's project in the provincial budget, and a commitment in the federal budget to invest up to 50% of the cost of public transit projects in Canada's cities.

Overwhelmingly, the response to the City's advocacy efforts has been positive. With every outreach effort, awareness of and enthusiasm for Rapid Transit in London continues to increase. There have been several affirmations of broad support from federal and provincial officials, but both levels are awaiting a final decision from City Council, and the submission of an approved business case.

Once Council has made this decision, the outreach process will continue. The business case will be submitted to federal and provincial partners and submitted to the Ministry of Transportation for review and approval. The review is an iterative process which includes a technical analysis of the BCA. The advocacy process will continue in effort to secure a transformative investment in Rapid Transit in London.

RISK IDENTIFICATION

The delivery of large infrastructure projects, such as rapid transit, inherently have elements of risk associated with them, at different stages with different levels of importance and impact. A high level risk screening process was undertaken for the project components from project conception to project commissioning and operation phase.

Stage I – Environmental Assessment

The risks associated with the EA are primarily high level and can be categorized as follows:

Long term ridership projections

The basis for the development of a rapid transit system is to mitigate traffic congestion by focusing population and employment growth and shifting more people to transit. The shift to a higher mode split percent for transit and the continued growth of the City and intensification along the rapid transit corridors are fundamental to the ridership projections in order to meet the thresholds for the development of a rapid transit system. Risks include not meeting long term ridership projections which would have an impact on operational expenses.

Key mitigation factors for ridership projections include ensuring that the feeder system is optimized, avoid having local conventional bus routes compete with Rapid Transit and potentially having bus routes extend from RT corridors to maximize ridership catchment areas.

Land Use and Transportation Integration

The efficient integration of transportation and land use is accomplished by maximizing mobility and place-making opportunities to attract and retain citizens and businesses as well as to manage future growth of the region. Given the major investment of building a Rapid Transit system, the City of London needs to be good stewards of this investment by maximizing opportunities to integrate land use with transportation to create higher density, mixed-use developments in existing and future communities serviced by rapid transit. Risks include planning approvals and community opposition to the intensification of lands and higher density developments.

Key mitigation factors include complimentary policies in the new Official Plan that encourage and facilitate growth along the corridors, integrating land use and place making as part of the overall design process.

Approval of Environmental Assessment, Business Case and Funding

The project is an undertaking under the *Environmental Assessment Act* which has it statutory requirements. The BCA will require approval from provincial and federal partners in order to obtain funding.

Key mitigation includes undertaking a comprehensive engagement with the community to minimize and mitigate any concerns, the development of a sound evidence based BCA that aligns with community expectations and the development of a financial model that optimizes expenditures and reduces financial liability. The use of a Transit Project Assessment Process (TPAP) will be reviewed in order to streamline the environmental

assessment approvals to expedite the development and approval of the rapid transit project.

Costing

Project costing was performed at a high level based on concept designs. Estimates were developed using basic quantities and unit costs taking into account corridor conditions, but without the benefit of preliminary engineering plans. Key mitigation includes contingency funding that is appropriate for the level of design in the Environmental Assessment, flexibility with the design to ensure that elements of the system can be simplified to reduce costs and ensuring that the system is scalable from an implementation perspective.

Stage II – Preliminary and Detailed Design

Design risk screening and identifications will need to be carried out at the preliminary engineering level. Risks were identified along the corridor particularly where structural elements (e.g. as bridges and tunnels) interact with the proposed alignments. These elements are risks identified relative to cost or schedule rather than design. It should be noted at the preliminary design level of design, the risk assessment is high level, as it is based on the level of detail of the information currently available.

Stage III – Construction

There are certain risks inherent in the construction phase. Some risks may be associated with design and others are associated with the environment within which the project is being introduced. The risks associated with the design can be minimized once the project heads towards the detailed design phase. The risks associated with the environment are site specific and are generally constant throughout the construction period. Examples include utility protection, traffic management, pedestrian movements, delivery of construction materials and space availability. Risks associated with construction will require further development in the next design phase when more information becomes available, and as more consultations can be carried out with all concerned stakeholders.

Stage IV – Project and Program Operation

During project operations there are two types of risks for the project; one mainly impacts project financial feasibility and is related to the system ridership. The other is related to the provision of a reliable, safe and cost effective operation. If ridership levels are not matched to capacity, there is a risk that service levels would need to be reduced, thereby affecting the attractiveness of the rapid transit system. A more detailed risk assessment will be undertaken regarding the various operating models for rapid transit.

RAPID TRANSIT IMPLEMENTATION

The implementation of a project of this scale requires dedicated resources. The RT project delivery is similar in scale to other entire departmental capital programs. The project is unique in nature, has a limited implementation timeline and needs to be incorporated into a project management structure that minimizes undue risk of project delivery failure.

The creation of dedicated project implementation offices for large undertakings is common. This approach has been used by other municipalities to deliver rapid transit

projects including the Region of Waterloo, City of Hamilton and Peel/Mississauga. In fact, senior government funding agreements sometimes require this as an assurance of project delivery.

The specialties identified in the proposed RT Implementation Office would be guided by the unique nature of the project and project procurement mechanisms. Roles would include transportation, transit planning, underground services (water, wastewater, storm), construction, realty and communications.

The duration of the office would match the implementation schedule of the project. Given the transitional nature of the office, the creation of staff positions would be minimized by the utilization of consultant resources. It is anticipated that the eventual dissolution of the office would be undertaken in phases and this could provide a succession management benefit to the broader organization.

It is recommended that a more detailed report on the development of a Rapid Transit Implementation delivery group be presented to Committee for review and approval.

CONCLUSION

The Rapid Transit Environmental Assessment is delivering on Council's Strategic Plan objective of "Building a Sustainable City" through the implementation of convenient and connected mobility choices. Rapid Transit represents a significant component of the draft London Plan, the Transportation Master Plan, and many other strategic documents approved by Council.

Rapid Transit, combined with a strong local transit service with appropriate service coverage and levels of service, coupled with strong land use policies, will facilitate significant social, economic and environmental benefits for London and Southwestern Ontario, and is arguably one of the most important decisions that this Council will make during its term as it will impact the London community for generations to come. This report and BCA has been prepared with considerable community input and technical analysis to provide Council with the information required to make a critical decision regarding London's future.

Major decisions on transit system infrastructure are best made as part of a comprehensive EA process that follows an evidence based decision-making process in order to maximize the benefits of investments while incorporating broader community related goals and satisfying the primary objective for the project, which is to improve the transportation and transit system.

The Full BRT Network alternative meets London's ridership needs, provides substantial benefits in terms of economic growth, community development and revitalization, delivers considerable air quality and GHG emission reductions and modernizes the transit system by making it more attractive, reliable and convenient for residents to move around the city and it the best value solution from an affordability and financial return on investment perspective.

London will undoubtedly change over the coming decades. Some of these changes can be projected with the best available information, such as demographic shifts and forecasted population growth. However, some changes cannot be anticipated. The introduction of High Speed Rail between Toronto and London, for example, would have significant impacts on how London grows and the needs of the community.

Technology will also significantly alter the transportation landscape over the course of the next 20 years with the introduction of new transportation companies as well as autonomous and connected vehicle technology. A future conversion to a higher capacity technology, such as LRT, is appropriate once ridership levels are better matched to the capacity of the technology.

At this time, it is appropriate to establish a long term strategic direction to convert the BRT network to introduce LRT when such ridership levels are achieved. Design and development of the BRT should incorporate this long term view allowing for an efficient and easy conversion to LRT in the future.

This long term direction will be considered through periodic monitoring via the Transportation Master Plan, to assess the needs of the community and ensure both current and anticipated future needs are being met by London's transit system. Any future transition would require its own Business Case at an appropriate time in the future.

The recommendations in this report envision that London's transit system would grow as the city continues to grow. The objective is to embrace the right option, at the right time.

The approval of the BCA is the next step as a decision on the preferred network alternative will provide a clearer picture on short and long term implementation options, project viability and will advance the dialogue of funding with the other levels of government.

Acknowledgements

This report was prepared with input from the Shift Rapid Transit Steering Committee members, including Kelly Paleczny, General Manager, LTC, John Ford, Director of Transportation & Planning, LTC, Jay Stanford, Director, Environmental Programs, Fleet and Solid Waste, Doug MacRae, Division Manager, Transportation Planning and Design and Alan Dunbar, Manager, Financial Planning and Policy.

SUBMITTED BY:	**REVIEWED & CONCURRED BY:**
EDWARD SOLDO, P.ENG. **DIRECTOR, ROADS AND TRANSPORTATION**	**KATE GRAHAM** **DIRECTOR, COMMUNITY & ECONOMIC INNOVATION**
REVIEWED & CONCURRED BY:	**REVIEWED & CONCURRED BY:**
JOHN BRAAM, P.ENG. **MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER**	**JOHN FLEMING, MCIP, RPP** **MANAGING DIRECTOR, PLANNING AND CITY PLANNER**
RECOMMENDED BY:	
ART ZUIDEMA **CITY MANAGER**	

Appendix A: Shift Rapid Transit Business Case
Appendix B: Financial Model Analysis

cc. Brian Hollingworth, IBI Group
London Transit Commission

Appendix “A”

Shift Rapid Transit Business Case

(under separate cover)

Appendix “B”

Financial Model Analysis

RAPID TRANSIT FINANCIAL MODEL

(000)'s	Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Hybrid Alternative																
Capital Costs [1], [2], [3]	**879,648**	4,926	22,033	58,469	82,371	107,497	46,020	517,426	32,525	2,794	2,794	2,794	0	0	0	0
Capital Plan	**381,451**															
Capital Funding Surplus/(Shortfall) [6],[7]	**(498,196)**															
RT Operating Costs [4], [5]		0	0	0	860	860	860	5,485	5,485	5,485	5,485	11,082	11,082	11,082	11,082	11,082
Potential Tax Levy % Increase Required for Operating Costs [8]		0.00%	0.00%	0.00%	**0.15%**	0.00%	0.00%	**0.76%**	0.00%	0.00%	0.00%	**0.82%**	0.00%	0.00%	0.00%	0.00%
Full BRT Alternative																
Capital Costs [1], [2], [3]	**496,600**	4,469	14,898	20,361	59,592	273,130	64,558	53,633	1,986	1,986	1,986	0	0	0	0	0
Capital Plan	**381,451**															
Capital Funding Surplus/(Shortfall) [6],[7]	**(115,149)**															
RT Operating Costs [4], [5]		0	0	0	860	860	860	5,485	5,485	5,485	5,485	12,193	12,193	12,193	12,193	12,193
Potential Tax Levy % Increase Required for Operating Costs [8]		0.00%	0.00%	0.00%	**0.15%**	0.00%	0.00%	**0.76%**	0.00%	0.00%	0.00%	**0.99%**	0.00%	0.00%	0.00%	0.00%

NOTES:

(1) Summarized capital and operating costs are based on a detailed analysis provided by the consultant, IBI.

(2) Capital costs are totals of engineering, property, utility relocations and construction. Potential for some delivery through alternative procurement methods is accounted for.

(3) Expenditures indicated in the approximate year of required financial commitment. Cash flow commitments would span multiple years.

(4) Operating costs are incremental to local transit costs. Operating costs do **NOT INCLUDE** incremental fare revenue for RT routes.

(5) LTC incremental operating costs/(savings) not yet available. To be determined by LTC's Service Review. Impact will be included at future time.

(6) Approved capital budget assumes 2/3 senior government funding.

(7) City's capital contribution capped at $129.6 million, including Development Charges. Assumes that remainder of capital funding funded by other levels of governments.

(8) **The potential tax levy % increase is provided as a guide**. Capital costs and operating expenses for the plan were provided by the consultant, IBI, and are subject to update and revision as a result of the ongoing Environmental Assessment process, analysis on the impact of Bill 73 on the contribution from Development Charges, and commitment of funding from other levels of government. Incremental operating costs and capital financing costs could be funded through a mix of tax levy increases, assessment growth funding and/or user fees.