

Rapid Transit North Corridor and Downtown Alternatives

Introduction

On April 4th 2017, London Council approved a motion from the Rapid Transit Implementation Working Group (RTIWG) from its meeting held on March 9th 2017. The motion directed Civic Administration to review alternative route options in the downtown including an east-west corridor and a north-south corridor. It also directed Civic Administration to review alternatives to the proposed Richmond Row tunnel.

At its meeting held on April 18th 2017, Council requested additional information on options to mitigate potential impacts during construction, means to maintain access for businesses during construction and opportunities to provide for rapid transit through mixed traffic on King Street.

The purpose of this Technical Memo is to respond to the direction by Council.

Rapid Transit Master Plan and Environmental Assessment Process

The London Shift Rapid Transit Initiative project is following the provincially regulated Environmental Assessment (EA) process. This 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 include the identification of the problem or opportunity and assessment of alternative solutions. This includes the identification and evaluation of alternative corridors. The results of these phases and the analysis of impacts will be documented in a final Rapid Transit Master Plan (RTMP) which will be presented for Council consideration in July 2017.

Following the approval of the Rapid Transit Master Plan, the project will move to a Transit Project Assessment Process (TPAP) which will include analysis of specific design alternatives for each of the preferred corridors.

As part of the RTMP, a total of 13 different corridor segments were evaluated. This long list was then screened and short-listed to eight corridor segments for further evaluation, and ultimately resulted in a preferred rapid transit network. Included in

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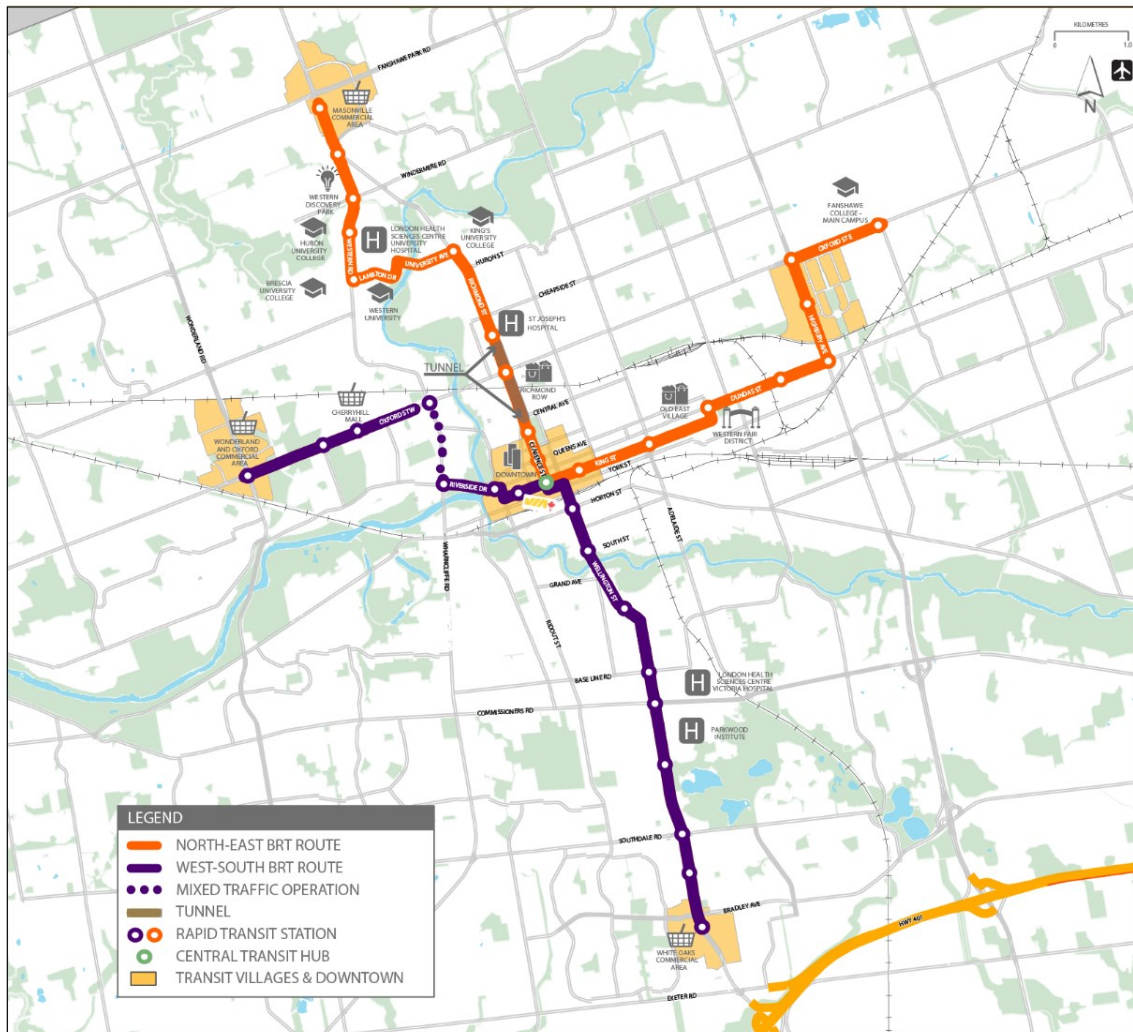
this evaluation was a number of sub-analyses focused corridor alternatives including alignments through Western University, the Richmond Street Rail Crossing, south tunnel portal options, downtown routings and Old East Village routings. The resultant preferred network was presented for public input at Public Information Centre #4 held on February 23rd 2017. The preferred network is shown on **Figure 1**.

During and following the February 23rd 2017 PIC #4, a number of comments and concerns were raised on the downtown routing options and north corridor routings along with their associated impacts. As a result, further information was brought to the Rapid Transit Implementation Working Group (RTIWG) on March 9th, 2017. This included two Technical Briefings on the Downtown and alignments from Downtown to Western University. These Technical Briefings are included as **Attachment 1** and **Attachment 2** to this report.

The remainder of this report is intended to address the April 4th 2017 and April 18th Council resolutions, and specifically the assessment of an alternative north-south corridor from downtown to Western University and an east-west corridor through downtown. The analysis is not intended to replace the Master Plan process, but the feedback received will inform the final Master Plan.

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Figure 1 – Rapid Transit Network (February 2017)



Overview of Alternatives

Based on feedback from the RTIWG, Council direction and considering comments received on the preferred network, the following alternatives were identified for further analysis and evaluation.

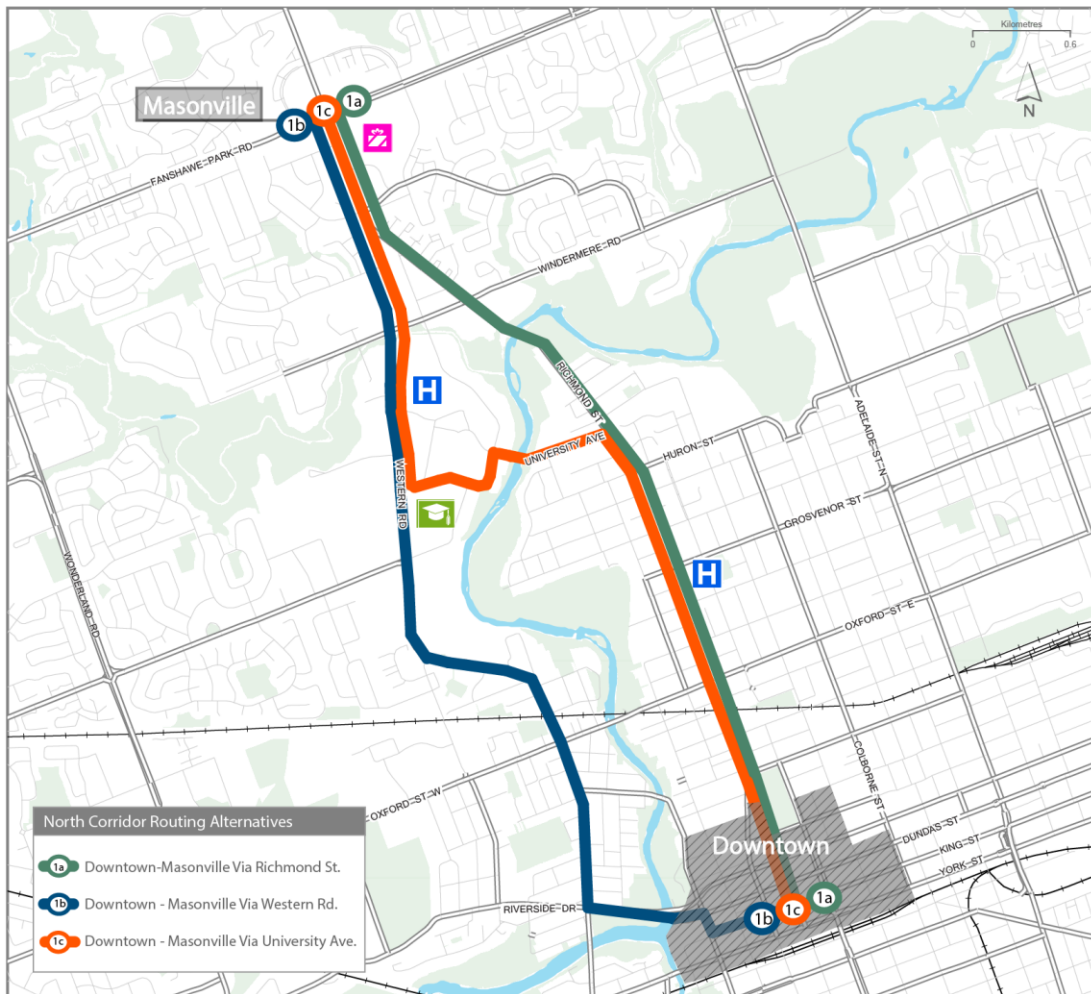
a. Alternative North-South Corridor (Figure 2):

- Downtown to Fanshawe Park Road via Riverside Drive, Wharncliffe Road and Western Road (Alternative 1b on Figure 2).
- Richmond Street Corridor with at-grade crossing of CP Rail tracks (i.e. no tunnel)
- Richmond Street Corridor with combined road and rapid transit underpass

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Each of these alternatives is compared to the Richmond Street corridor with tunnel alternative (Alternative 1c on **Figure 2**) which follows a routing from Downtown to Fanshawe Park Road via Clarence Street, Richmond Street, University Drive/Lambton Drive and Western Road. This alternative includes a transit only tunnel on Richmond Street under the CP Rail tracks.

Figure 2: Alternative North-South Corridors (Master Plan Alternatives)



b. Alternative East-West Downtown Corridor:

King Street /Queens Avenue transit couplet comprised of an eastbound transit lane on King Street and a westbound transit lane on Queens Avenue.

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This alternative is compared to the current alternative which utilizes King Street for both eastbound and westbound rapid transit movements. More detailed descriptions of each of these alternatives is provided further in the report.



For the purpose of this analysis, each general area is examined independently. Depending on the direction of Council, the overall preferred network could consist of

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a combination of alternatives. For example, the preferred alternative for the North Corridor could be combined with either the King Street corridor alternative or the King Street/Queens Avenue couplet alternative.

Description of Alternative North-South Corridors

i. Wharncliffe Road/Western Road Corridor

Under this alternative, both north-east and south-west rapid transit vehicles would follow an alignment across the Queens Avenue Bridge and Riverside Drive to Wharncliffe Road. Between Riverside Drive and Oxford Street, Wharncliffe Road would be widened to accommodate median rapid transit lanes and one lane of regular traffic in each direction. This differs from the current preferred south-west corridor where rapid transit would run primarily in mixed traffic. However, given that this corridor will need to accommodate both the south-west and north-east rapid transit routes, dedicated lanes are recommended due to the more than tripling of the number of buses per hour. Effective headways for the combined routes would be one bus every 3 minutes in each direction.

North of Oxford, Wharncliffe Road and Western Road is planned to be widened to four lanes north to Platts Lane. The potential alternative would modify this planned widening to provide for median rapid transit lanes plus one lane in each direction for regular traffic. Widening to accommodate four lanes for regular traffic plus rapid transit is not considered feasible due to major property impacts. North of Platts Lane, the roadway would be widened to four lanes for general traffic and two median rapid transit lanes.

A concept plan for this alternative is provided as Attachment 3 to this report and can be found on the Shift website (<http://www.shiftlondon.ca/reports>).

ii. Richmond Street Corridor At-grade Alternative

This concept was developed as an alternative to constructing a rapid transit tunnel on Richmond Street. It would follow the same alignment as the current preferred alternative from Clarence Street northward along Richmond Street. Dedicated lanes for rapid transit would be created by re-allocating space from existing road lanes.

The corridor would consist of median rapid transit lanes plus one lane in each direction for regular traffic. Widening would be required for dedicated left turn lanes and stations. Unlike the current preferred alternative which includes widening to

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accommodate four lanes for regular traffic from St. James Street (north tunnel portal) to Grosvenor Street, two traffic lanes (one in each direction) would be maintained on Richmond Street from Clarence northward. This is due to the fact the additional widening would be redundant given Richmond Street south of Oxford would be one lane in each direction.

A concept plan for this alternative is provided as Attachment 4 to this report and can be found on the Shift website (<http://www.shiftlondon.ca/reports>).

iii. Richmond Street with Combined Transit-Vehicle Underpass

This alternative would be similar to the Richmond Street Corridor with Transit Tunnel alternative with the exception that the proposed station at Angel Street would be moved north to Central Avenue. The roadway configurations would remain the same in both the northern and southern extremities in this alternative.

North of Angel Street rapid transit would continue at grade with a station located at Central Avenue. North of Central Avenue the two centre lanes of Richmond Street would be captured by Rapid Transit leaving one lane in each direction for general traffic.

Starting at John Street the alignment of Richmond Street would need to shift either to the west or the east to permit the construction of the underpass. From John Street to Oxford Street one side of Richmond Street would need to be completely demolished for the underpass construction because of the required width for the underpass:

- Sidewalks on both sides on the surface fronting the adjoining properties
- Service lanes on the surface on both sides permitting fire access to the adjoining properties which would need to be a minimum of 5m to permit fire truck access
- Four lanes beneath the railway underpass – two for traffic and two for rapid transit

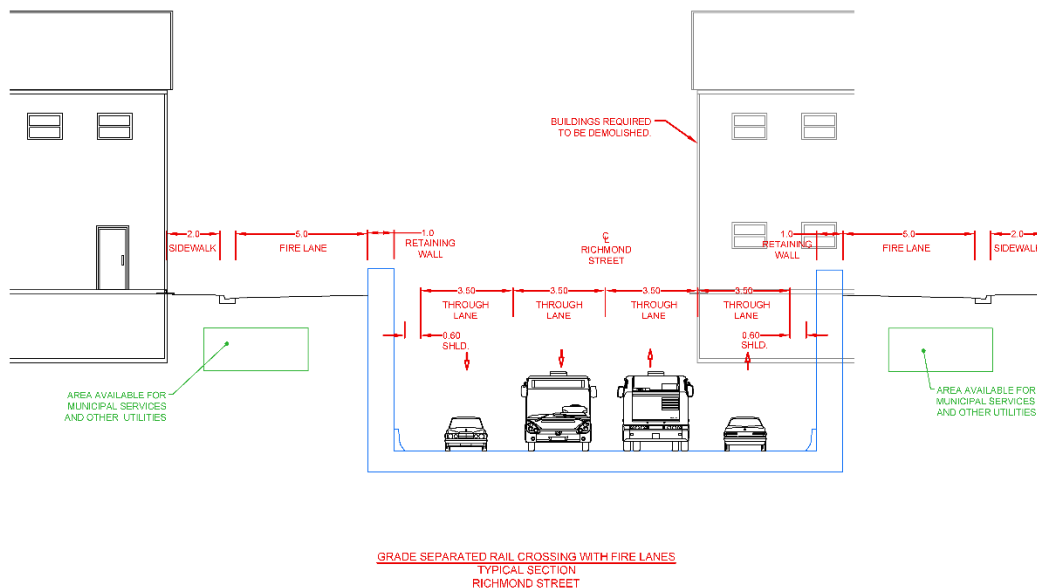
The underpass would begin to descend at Pall Mall and would return to grade just before Oxford Street. North of Oxford Street the alignment of Richmond Street would shift back onto the existing centre line to return to the existing roadway alignment just south of Sydenham Street. North of Sydenham Street, Richmond Street would have two centre-running rapid transit lanes with one

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lane of traffic in each direction. This continues to Grosvenor where a station is located.

The impacts to Richmond Row of this alternative is very significant with one side of Richmond Street being completely demolished between John Street and Oxford Street (see cross-section below). Due to the size of the disruption of this impact to adjoining properties this alternative is considered to have a very significant impacts.

Figure 3 - Richmond Street Grade Separated Crossing



A concept plan for this alternative is provided as Attachment 5 to this report showing the alignment from Hyman Street to Sydenham Street and can be found on the Shift website (<http://www.shiftlondon.ca/reports>). The concept shown is based on widening to the east. An alternative with widening to the west would have similarly large impacts.

iv. Richmond Street Corridor with Transit Tunnel (1c)

This alternative starts in Downtown London and terminates at the University Drive gates on Richmond Street. The alignment of this alternative follows Clarence Street starting at King Street. Along Clarence the alternative would have a two-way transitway with one-way northbound traffic on Clarence Street from King Street to

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Queens Avenue. On-street parking would also be eliminated along this section. Clarence Street from Queens Avenue to Dufferin Avenue would permit two-way traffic as well as the two-way transitway in the centre of the street. Clarence Street north of Dufferin Avenue to Angel Street would accommodate southbound traffic only along with the two-way transitway. Stations would be provided at Queens Avenue and Angel Street along this portion of the alignment.

North of Angel Street, Clarence Street would be closed to traffic and the rapid transit lanes would begin to descend into the rapid transit tunnel. The tunnel would commence at Central Avenue and would continue completely underground until St James Street. For this portion from Central Avenue to St James Street the surface condition on Richmond would be very similar if not identical to today allowing on-street parking where it exists and four lanes of vehicular traffic (two in each direction). An underground station located at Oxford Street would be included in order to provide connections to the heavily used Oxford Street bus services. At St James Street, a ramp in the centre of Richmond Street would commence to bring the rapid transit vehicles back to grade just before Grosvenor Street. This portion of Richmond Street from St James to Grosvenor would also include two lanes in each direction for traffic.

At Grosvenor Street, a station would also be provided. North of Grosvenor Street the concept reduces the total number of lanes along Richmond Street to four: two centre running lanes for rapid transit and two for traffic (one in each direction on either side of rapid transit). This may need to be increased to four lanes for traffic as the study progresses, but this would mean significant property impacts north of Huron Street. At the University Drive gate, the rapid transit lanes would turn onto the campus. A concept plan for this alternative is provided as Attachment 6 to this report and can be found on the Shift website (<http://www.shiftlondon.ca/reports>).

Description of Alternative Downtown East-West Corridors

i. King/Queens Couplet

Under this alternative King Street would be reconfigured to provide for one dedicated eastbound lane for rapid transit on the south most lane, two eastbound lanes for regular traffic and one lane on the north side for parking and loading. A similar design would be adopted for Queens Avenue with rapid transit running in the north most lane and parking on some segments on the south side. North-south transitions between King Street and Queens Avenue would occur on Clarence Street and

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Wellington Street. Ridout Street would include one dedicated southbound lane for rapid transit.

Unlike the King Street Two-way alternative, this alternative would require the use of the Queens Avenue Bridge for rapid transit (plus westbound traffic) and the Kensington Bridge for eastbound traffic.

A concept plan for this alternative is provided as Attachment 7 to this report and can be found on the Shift website (<http://www.shiftlondon.ca/reports>).

ii. King Street Two-way Transit

This alternative starts at Riverside Drive and continues to the intersection of King Street and Wellington Street in the Downtown core. Starting at Riverside Drive rapid transit has a dedicated right-of-way that allows Rapid Transit vehicles to access the Kensington Bridge. The Kensington Bridge would be dedicated to Rapid Transit, pedestrians and cyclists only. The Queens Avenue Bridge would be modified to accommodate four lanes of traffic: two westbound and two eastbound. To accommodate four lanes of traffic the Queens Avenue Bridge the bridge would be reconfigured to have one sidewalk on the north side and the elimination of the south side sidewalk.

Once crossing the Kensington Bridge the rapid transit lanes turn onto Ridout Street. Ridout Street from Dundas Street to King Street would include one rapid transit lane in each direction and three traffic lanes southbound. The southbound traffic lanes would include two southbound through lanes and one southbound left turn lane towards King Street.

Rapid transit continues along King Street from Ridout Street to Wellington Street. The alignment along King Street would include one-lane in each direction for rapid transit in the curbside lanes. One general purpose traffic lane in the eastbound direction would be provided between the two rapid transit lanes. At Richmond Street, Clarence Street, Wellington Street and at the Covent Garden Market left-turn lanes would be provided for traffic. Stations will be provided at Talbot Street and Clarence Street. The intersection at Clarence Street/King Street would be the transfer location between the two rapid transit routes. Also at Clarence Street the northbound rapid transit branch connects and at Wellington Street the southbound direction branches off.

A concept plan for this alternative is provided as Attachment 8 to this report and can be found on the Shift website (<http://www.shiftlondon.ca/reports>).

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iii. King Street Two-way Transit with Mixed traffic

At its meeting held on April 18th 2017, Council added an additional motion to examine “potential opportunities to provide for rapid transit routes through mixed traffic on King Street between Ridout Street North and Richmond Street.” This sub-alternative is discussed following the evaluation of the main east-west downtown route alternatives.

Evaluation Criteria and Alternatives Analysis

The Rapid Transit Master Plan applied a comprehensive evaluation framework based on five categories:

- 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.

These guiding principles were used to develop more specific evaluation criteria to evaluate network alternatives. Since some of the criteria would not vary significantly for the alternatives being considered in this report, a short list of criteria were selected for further analysis. These respond to key issues in the Council motion including high level costs, residential and business impacts, parking, access and property impacts.

North Corridor Alternatives Analysis

a. Capital Costs

High level capital costs were developed for the new alternatives using the same unit cost assumptions as the current preferred alternative. Costs include preliminary order of magnitude estimates for property.

It should be noted that the analysis of property compensation cost estimates are based on a preliminary analysis of the corridors, extraordinary assumptions, and will

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require further detailed and independent consultation and analysis once the preferred corridor is selected.

A breakdown of the costs by alternative is shown in the table on the following page. These costs include an allocation of the total project contingencies as a percentage of the segment costs. Costs for vehicles, maintenance facilities and the potential Quick Start project are excluded. As a reference, the total system cost for the current preferred alternative (including vehicles, contingencies and quick start project) is \$560 million in 2016 dollars.

The most significant differences between the alternatives relate to the grade separation of the CP Rail tracks. The Richmond Street tunnel represents a major cost component. Initial costing for the RTMP and Business Case estimated the cost of the tunnel at \$90-100 million, excluding contingencies. This estimate was based on very conceptual level designs for the tunnel.

There is a high level of uncertainty for this cost until design options are developed and detailed engineering work completed, this includes mitigation measures for major underground utilities, fire, life, safety requirements and soil conditions. It is also imperative to note that major construction projects in the Greater Toronto Area have had the impact of increasing material and labour prices in recent years, especially related to major civil works such as tunnels.

For the Wharncliffe-Western alternative, there would be some savings by avoiding the tunnel, but additional costs would be incurred for property acquisition.

Capital cost for the combined Richmond Street underpass reflects the shorter length of excavation compared to the tunnel option, but significant property costs. As discussed under property impacts below, this alternative would require some 16-18 commercial properties between John Street and Oxford Street. Similarly, the Richmond Street at-grade alternative would require some properties in order to accommodate left turn lanes and stations through Richmond Row.

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High Level Capital Cost (\$millions)

Segment	Richmond Street Corridor with Transit Tunnel at CPR	Wharncliffe Road / Western Road	Richmond Street Corridor with At Grade Rapid Transit	Richmond Street Combined Grade Separation
Wharncliffe Road (Riverside to Oxford)*	-	\$25-35	-	-
Wharncliffe/Western (Oxford to Lambton)	-	\$55-75	-	-
Western Road (Lambton to Fanshawe Park)	\$56	\$56	\$56	\$56
Clarence/Richmond (King to Central)	\$10	-	\$10	\$10
Richmond/University (Central to Western Road)	\$192	-	\$45-55	\$160-180
Total corridor cost	\$258	\$136-166	\$111-121	\$226-246

* Note: Costs for new segments and alternatives are shown as ranges

** Incremental cost over south-west corridor cost due to additional widening to accommodate both south-west and north-east routes

b. Impacts to Businesses during Construction

As discussed in more detail under the downtown alternatives section of this report, field surveys were undertaken to inventory businesses along the alternative routes. Businesses were classified in terms of their tolerance for construction impacts.

Generally, food service, entertainment and retail oriented business would be more sensitive to the impacts of construction on retail activities than stable office uses. Based on the inventory, there are approximately 145 businesses located along Richmond Street between Central Avenue and Oxford Street. A relatively high portion (28%) of these businesses are considered to have low tolerance for construction disruption, with another 39% considered to have just moderate tolerance for construction disruption. The remainder of the businesses are considered to have medium-high or high tolerance for construction disruption.

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Of the three alternatives evaluated, the Richmond Street corridor with the tunnel would have the longest duration of construction. The Richmond Street at grade alternative would require a shorter construction period, but there would still be impacts. As there are fewer businesses along Wharncliffe Road, this alternative would have the least short term construction impacts on businesses.

c. Effects on Adjacent Commercial Uses (Post Implementation)

The implementation of rapid transit will have both positive and negative effects on businesses in the longer term. Rapid transit will improve access to businesses for existing and new transit users. It will also facilitate intensification in the corridors, which in turn increases the customer base. However, changes to the road corridors will eliminate on-street parking in some areas and change traffic patterns.

On Richmond Street, the tunnel alternative maintains the current number of traffic lanes between Central and Grosvenor and also maintains on-street parking where currently permitted.

The Richmond Street at-grade alternative would eliminate approximately 16 on-street parking spaces. The Richmond Street at-grade alternative, assuming median transit, will also require changes to access with vehicles needing to utilize signalized intersection to access businesses opposite the median lanes via a U-turn movement. It will also have property impacts on 6 commercial buildings on Richmond.

The Wharncliffe-Western option would have impact to business located at Oxford and Wharncliffe and will require property from at least 12 commercial properties, some of which may require full property acquisitions.

For the Richmond Street combined underpass alternative, the impacts on commercial uses would be significant. A high level design concept (see Attachment 5) illustrates the potential impacts. As shown, the underpass would require the demolition of properties on one side of Richmond Street from Pall Mall to Oxford Street.

d. Effects on Property

The construction of rapid transit lanes and stations will require road widening in some areas. The table below summarizes the number of sites where addition property may be required along each corridor. For this comparison, only the

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portions of the corridors that are different are included (i.e. Western Road north of Lambton is not included). It is also noted that the Wharncliffe-Western alternative includes additional widening south of Oxford to accommodate both rapid transit routings.

These impacts should be considered indicative as they are based on preliminary concept designs. More detailed design alternatives for the preferred corridor will be developed as part of the Transit Project Assessment Process.

Of the three alternatives, the Wharncliffe-Western alternative is likely to have the most significant requirements for additional property. As noted above, the Richmond Street combined underpass alternative will have very significant property impacts for Richmond Row and would require the acquisition of some 16-18 major commercial properties depending which side of the road is widened.

Impacts on Property

	Richmond Street Corridor with Transit Tunnel at CPR	Wharncliffe Road / Western Road	Richmond Street Corridor with At Grade Rapid Transit	Richmond Street Combined Grade Separation
Number of properties where PARTIAL property may be required	22	147	26	22
Number of properties where FULL property may be required	4	48	8	17-24

All figures indicative subject to development of design alternatives and mitigation measures

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e. Effects on Access

The proposed configuration for rapid transit along the north-south corridors is referred to as centre-running rapid transit. Placing Rapid Transit in the centre or median of roadways provides a very high quality level of service for transit. The major benefits of this configuration are as follows:

- Placing transit lanes to left of general purpose travel lanes improves enforcement and respect of the Rapid Transit lanes thereby ensuring a high levels of reliability and speed for the system
- Centre-running lanes do not have any traffic crossing the rapid transit corridor except at signalized intersection where conflicts are managed by the traffic signals thereby improving reliability and safety
- Centre-running transit lanes have low to no risk of vehicles parking, double parking or making deliveries from these lanes again increasing system reliability
- Having transit lanes in the centre of roadways reduces the impact of snow clearing operations on the lanes and allows for the system to be more robust during snow fall events
- Centre-running systems also have little impact on street-cleaning and garbage and recycling pick-up operations
- Centre-running lanes do not conflict with driveways and therefore there are no risks with manoeuvres coming in and out of driveways, including vehicles reversing thereby increasing safety and speed

However centre-running Rapid Transit does have some direct impacts on local access and intersection management, notably:

- The centre-running lanes will have a median or other measure to stop any traffic from crossing it except at signalized intersections, this means all driveways along the corridor will be right-in/right-out without the ability to make left-turns in or out. In order to access these properties U-Turns will be permitted at most signalized intersections or traffic must use the adjacent road network.
- The centre-running lanes will have a median or other measure to stop any traffic from crossing it except at signalized intersection, the means all unsignalized intersections along the corridor will be right-in/right-out without the ability to make left-turns in or out. In order to access these properties U-Turns will be permitted at most signalized intersections or traffic must use the adjacent road network.

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- Left-turns at signalized intersections parallel to Rapid Transit will require dedicated left-turn lanes and will have exclusive left-turn phases for left-turns and U-turns. This is necessary for safety considerations due to the fact buses approach from a driver's blind-spot.

Impacts along Richmond Street with Transit Tunnel

The specific impacts along Richmond Street with the Transit Tunnel are as follows:

- From Central to St James Street there would be little to no impacts to property access and local road access along this segment
- From north of St James Street to University Drive all driveway access along Richmond Street would become right-in / right-out, it should be noted that the segment from Grosvenor to Cheapside has almost no driveways onto Richmond
- Left-turns and U-turns would be provided at all signalized intersection along this segment (Grosvenor, Cheapside, Victoria, Huron and University)
- Unsignalized local streets will become right-in/right-out (College, Cromwell, Bridport, Sherwood, Regent, Broughdale)

Impacts along Richmond Street At-Grade

The impacts of the Richmond Street At-Grade option would include all the impact enumerated for the Transit Tunnel, in addition to the following supplemental impacts:

- From Central to St James Street all driveway access along Richmond Street would become right-in / right-out, however almost no driveways exist south of Oxford Street
- Left-turns and U-turns would be provided at most signalized intersection along this segment (St James, Oxford and Pall Mall) but the southbound left turn would be prohibited at Central Avenue
- Unsignalized local streets will become right-in/right-out (Hyman, John, Mill, Piccadilly, Sydenham)

Impacts along Richmond Street with Combined Transit-Vehicle Underpass

The impacts of the combined Transit-Vehicle Underpass would be include all the impacts of the Transit Tunnel, in addition to the following supplement impacts:

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- From Central to St James Street all driveway access along Richmond Street would become right-in / right-out, however almost no driveways exist south of Oxford Street
- Left-turns and U-turns would be provided at most signalized intersection along this segment (St James, Oxford and Pall Mall) but the southbound left turn would be prohibited at Central Avenue
- Unsignalized local streets will become right-in/right-out (Hyman, John, Sydenham)
- Mill and Piccadilly would become right-in/right-out at a new service road running along the service adjacent to the underpass
- The service lanes running adjacent to the underpass would U-turn at the railway tracks

Impacts along Wharncliffe Road/Western Road Corridor

The specific impacts along the Wharncliffe Road/Western Road Corridor are as follows:

- From Riverside Drive to north of Sarnia / Philip Aziz Avenue all driveway access along Wharncliffe/Western would become right-in / right-out
- Left-turns and U-turns would be provided at all signalized intersection along this segment (Riverside, Mt Pleasant, Barrington, Blackfriars, Oxford, McDonald, Essex, Hollywood Crescent, Platt's Lane, Sarnia/Philip Aziz)
- Unsignalized local streets will become right-in/right-out (Kensington, Rogers, Moir, Lexington, Paul, Empress, Palmer, Saunby, Beaufort, Cedar)

f. Growth Management Objectives

The Council-approved and Ministry-approved London Plan establishes our City's plan for growth and development in London. **Figure 4** shows a map of Place Types from the London Plan, which establish the permitted range and intensity of uses to those lands where they are applied. The preferred north-south BRT option, having Bus Rapid Transit run along Clarence Street and Richmond Street to the University Gates is well aligned with Place Types that have been applied to permit highly urban land uses – primarily the Downtown and Rapid Transit Corridor Place Types.

These two Place Types allow for a broad range and mix of commercial, residential and office uses. Within significant stretches along this corridor, substantial heights and densities are permitted. In fact, the London Plan applies minimum heights to

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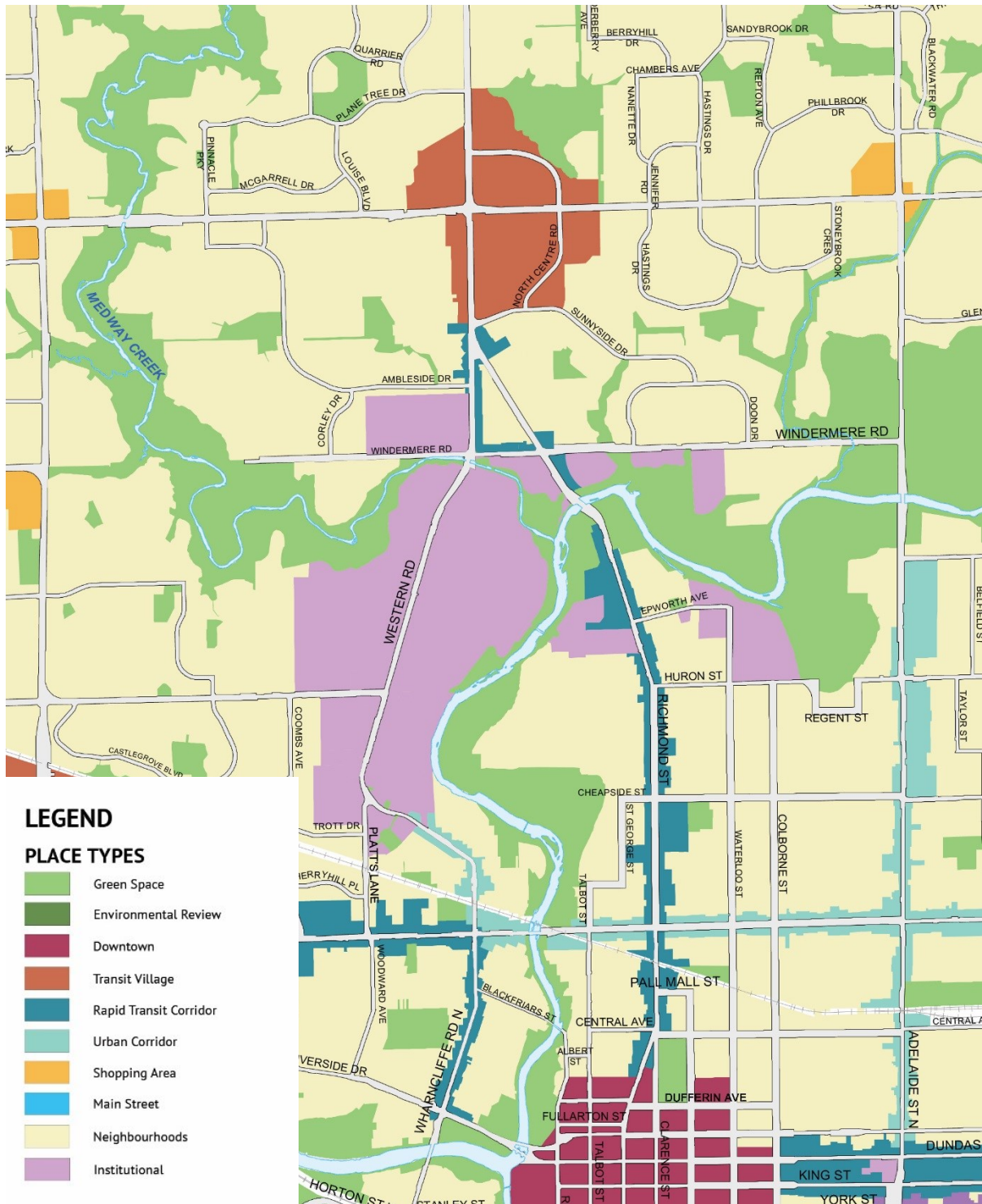
certain segments of this corridor, to ensure an urban form and intensity of development is achieved through new development. Transit-oriented forms of development are encouraged, to support high quality pedestrian environments and densities that support rapid transit ridership and Downtown/Core Area revitalization.

More specifically, there is significant development potential along this corridor for high rise residential and office towers along this corridor within the Downtown Area (Clarence Street from Kent Street to King Street) and the Rapid Transit Corridor Place Type (particularly along the Richmond Row Main Street segment from Oxford Street to Kent Street). Furthermore, this alignment captures Victoria Park – the City’s premier gathering place for large events – shown in the London Plan as a large green space adjacent to Richmond Street at Central Ave.

This north-south option connects the large institutional uses shown in the Rapid Transit Corridor at Grosvenor Street – St. Joseph’s Hospital and the Lawson Health Research Institute which cumulatively represent employment of more than 6,000 people. It also connects Kings College to both the Downtown and, north, to the Transit Village at Masonville. Finally, the Rapid Transit Corridor applied to Richmond Street, north of Huron Street, could support intensification where it can be demonstrated that the proposed height and intensity of development is appropriate. Substantial opportunity within this segment likely exists at the Western Gates.

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Figure 4 - Excerpt from Map 1 – Place Types (Council-approved London Plan)



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In comparison, the Western Road/Wharncliffe Road corridor has significantly less opportunity for growth and development as set out in the London Plan. While the Rapid Transit Corridor Place Type has been applied to the portion of this corridor along Wharncliffe Road, this segment is entirely within the Thames River Floodplain and intensification is not permitted in accordance with the Provincial Policy Statement. These lands are correspondingly within the Upper Thames River Conservation Area permit limit – permits are not supported by the UTRCA for intensification within this area. As noted below, these lands are also within the Blackfriars-Petersville Heritage Conservation District.

This corridor runs through the BIGS (Beaufort, Irwin, Gunn Streets) Secondary Plan area where there is some potential for intensification. Much of this area has already been intensified, but there is opportunity for some amount of low-to-mid-rise development. Further north, most of the lands are designated for an Institutional Place Type in the London Plan. It is expected that these lands will be primarily developed for institutional purposes – and not mixed use non-institutional development. Much of this Institutional land east of Western Road, south of Platt's Lane, is undevelopable due to the Thames River Floodplain (see Figure 6). North of Platt's Lane the Western/Wharncliffe option converges with the Richmond Street option that traverses Western's campus and connects with Western Road northward.

Overall, the Richmond Street corridor provides both the ridership opportunities by way of connecting significant employment and activity generators and the capacity to intensify the corridor and support the transit infrastructure investment. The Western/Wharncliffe option provides very little value from this perspective and does not viably connect major employment nodes such as St. Joseph's hospital and Kings College, major urban mainstreets such as Richmond Row, city-wide event spaces such as Victoria Park and significant development opportunities such as those in the Downtown and Rapid Transit Place Types. It also does very little to encourage Downtown revitalization as it results in a rapid transit system that substantively skirts the northern part of the Downtown and the Richmond Row area.

g. Cultural Heritage

The City of London places a strong emphasis on protecting cultural heritage resources. Cultural heritage resources include tangible elements such as buildings, monuments, streetscapes, landscapes, books, artifacts and art, and intangible aspects such as folklore, traditions, language, and knowledge.

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As part of the RTMP, a preliminary review of background information on cultural heritage resources was completed to identify constraints up to 350 m from the preliminary preferred rapid transit corridor (**Figure 5**).

Cultural heritage resources can be protected under the Ontario Heritage Act and can include:

- Archaeological Resources;
- Built Heritage Resources;
- Cultural Heritage Landscapes;
- Heritage Conservation Districts;
- Provincially Significant Areas/Easement Properties; and
- National Historic Sites.

The assessment impacts of rapid transit on cultural heritage resources, and potential mitigation measures, is an iterative process with the level of assessment increasing as designs are developed. Overall, the goal is to avoid potential impacts.

At the RTMP stage, there are a number of key comparators to evaluate corridor options including presence of Heritage Conservation Districts and individual listed and designated heritage properties. Within the corridors being evaluated in this report, there are four Heritage Conservation Districts.

- Bishop Hellmuth Heritage Conservation District
- Blackfriars/Petersville Heritage Conservation District
- Downtown Heritage Conservation District
- West Woodfield Heritage Conservation District

Two additional Heritage Conservation Districts, Great Talbot and Gibbons Park, have been endorsed by Council but have not been designated under Part V of the *Ontario Heritage Act* at present.

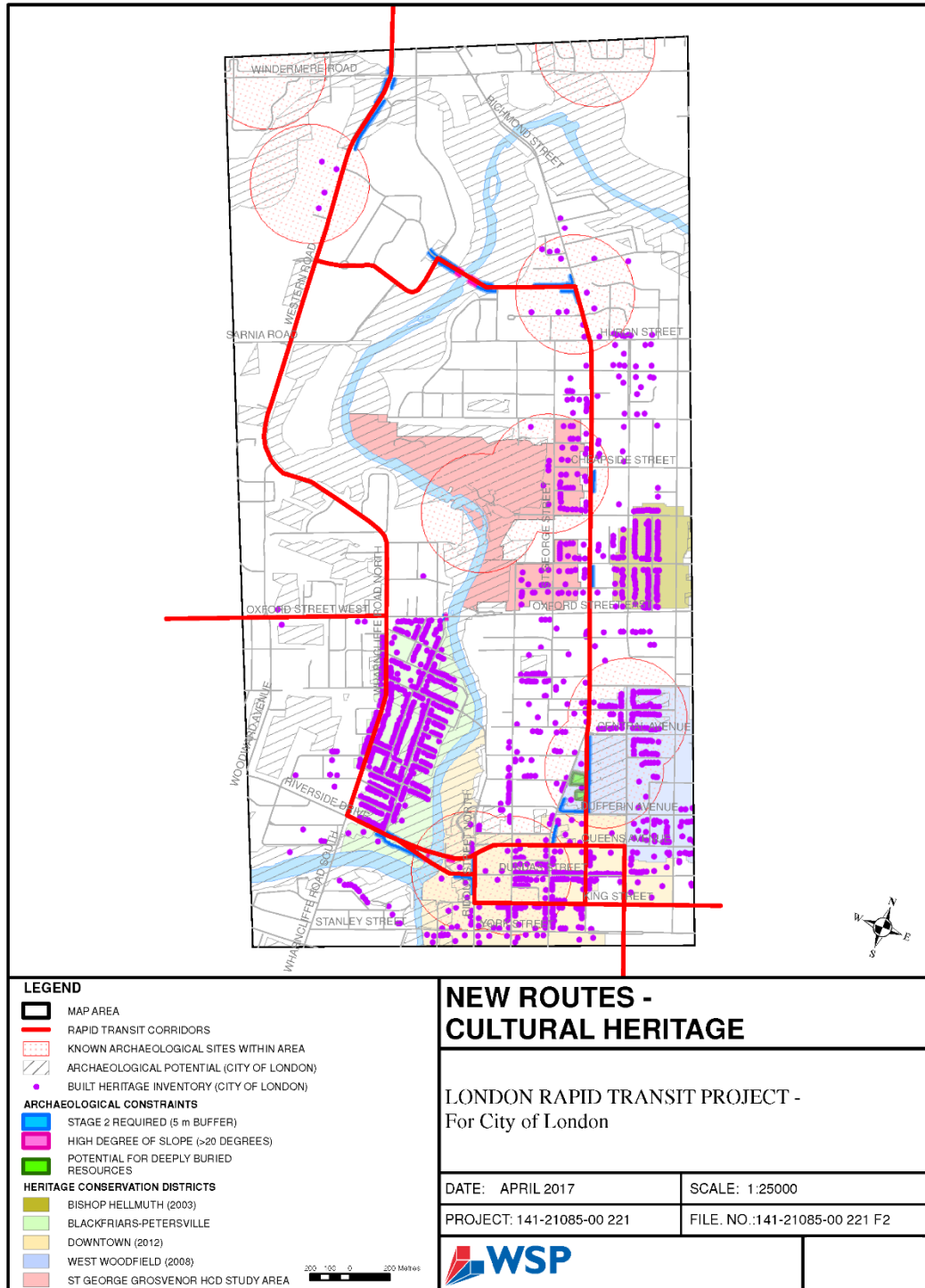
One consideration in comparing the alternatives is the number of listed and designated heritage properties, including those within a Heritage Conservation District, along the corridor options. The table below provides a summary by corridor. Listed properties are shown in (brackets). It should be noted that construction of rapid transit may not affect any or all of these properties.

For the Wharncliffe-Western alternative, there would be significant greater potential for impacts to heritage designated properties in the Blackfriars/Petersville Heritage Conservation District. Because Wharncliffe would need to be widened considerably to accommodate dedicated bus lanes (recognizing that bus traffic on this corridor

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would triple compared with the Richmond Street option and would no longer be feasible/functional within mixed traffic).

Figure 5: Cultural Heritage Features Map



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If the Richmond Street corridor is utilized, the south-west corridor rapid transit would also utilize Wharncliffe Road North, but the potential impacts on heritage designated properties would be less given the rapid transit would be in mixed traffic given the reduced headways and number of transit vehicles.

A concern for the Richmond Street alternatives is the proximity to Victoria Park and the archeological significance of this site. The Victoria Park site was home to the British Military Garrison from 1839 to 1869. This site represents a very significant historic and archaeological resource and the unexcavated portions of the Victoria Park site have immense cultural heritage value. Excavations for the tunnel portal at Clarence Street and Angel Street have a high potential for impacts. This requires archaeological assessment to determine the impact and what, if any mitigation measures can be applied. It would not preclude, however, the construction of the tunnel at this location.

Impacts on Cultural Heritage

	Richmond Street Corridor with Transit Tunnel at CPR	Wharncliffe Road North / Western Road	Richmond Street Corridor with At Grade Rapid Transit	Richmond Street Combined Grade Separation
Number of heritage properties on corridor (excluding Wharncliffe Road North south of Oxford Street West)	27 (50)	1 (3)	27 (50)	27 (50)
Number of heritage properties on Wharncliffe Road North (Riverside Drive to Oxford Street West)	94 (0)	94 (0)	94 (0)	94 (0)

Heritage designated properties (heritage listed properties)

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The following table combines the data relating to heritage listed and designated property and a conceptual assessment of properties where the full property may be required. It illustrates the impact of the widening on Wharncliffe Road, which will require demolition of many buildings within the Blackfriars-Petersville Heritage Conservation District. The Richmond Street combined underpass alternative would also require several heritage properties depending on which side of the street was widened.

	Richmond Street Corridor with Transit Tunnel at CPR	Wharncliffe Road / Western Road	Richmond Street Corridor with At Grade Rapid Transit	Richmond Street Combined Grade Separation
Number of DESIGNATED HERITAGE properties where full property may be required	-	24	1	1
Number of LISTED HERITAGE properties where full property may be required	-	-	1	2-7

All figures indicative subject to development of design alternatives and mitigation measures

h. Network Capacity

Each of the alternatives under consideration in this report will involve impacts roadway capacity to varying degrees. The table below illustrates the changes in the number of lanes between three screenlines (note: a screenline is a line that cuts across multiple streets and includes both Richmond Street and Western/Wharncliffe):

- Lambton Drive / University Drive
- Platt's Lane / Grosvenor Street
- Oxford Street

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- Riverside Drive / Central Avenue

The table illustrates the number of lanes provided for northbound traffic, southbound traffic and rapid transit for all four north-south alternatives as well as the existing condition.

- **Richmond Street Corridor with Transit Tunnel:** This alternative provides reduced overall traffic capacity north of the Platt's Lane / Grosvenor Street screenline where one less lane would be provided for traffic in each direction. However for the other segments overall roadway capacity would be conserved while providing a continuous two lanes for rapid transit.
- **Wharncliffe Road /Western Road:** This alternative reallocates the planned widening on Wharncliffe Road/Western Road to rapid transit. Therefore the only traffic capacity reduction would be south of the Oxford Street screenline where one less lane would be provided for traffic in each direction. However north of Oxford Street overall roadway capacity would be comparable while providing two continuous lanes for rapid transit.
- **Richmond Street Corridor with at-grade crossing:** This alternative would result in reduced capacity south of the Oxford Street screenline and north of the Platt's Lane / Grosvenor screenline of one lane in each direction.
- **Richmond Street Corridor with combined grade separation:** This alternative would result in reduced capacity south of the Oxford Street screenline and north of the Platt's Lane / Grosvenor screenline of one lane in each direction. However there would be the benefit of no additional delays for traffic at the CPR grade crossing at Richmond Street.

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Screeline	Existing Condition			Richmond Transit Tunnel Alternative			Wharnccliffe/Western			Richmond At-grade Alternative			Richmond Combined		
	Wh-W	Rich.	Total	Wh-W	Rich.	Total	Wh-W	Rich.	Total	Wh-W	Rich.	Total	Wh-W	Rich.	Total
Lambton Dr/University Dr															
Northbound	2	2	4	2	1	3	2	2	4	2	1	3	2	1	3
Southbound	2	2	4	2	1	3	2	2	4	2	1	3	2	1	3
Rapid Transit	-	-	-	-	2	2	2	-	2	-	2	2	-	2	2
Platt's Lane/Grosvenor St															
Northbound	1	2	3	2	2	4	1	2	3	2	1	3	2	1	3
Southbound	1	2	3	2	2	4	1	2	3	2	1	3	2	1	3
Rapid Transit	-	-	-	-	2	2	2	-	2	-	2	2	-	2	2
Oxford St															
Northbound	2	2	4	2	2	4	1	2	3	2	1	3	2	1	3
Southbound	2	2	4	2	2	4	1	2	3	2	1	3	2	1	3
Rapid Transit	-	-	-	-	2	2	2	-	2	-	2	2	-	2	2
Riverside Dr/Central Ave															

i. Transit Ridership

For the Richmond Street with a tunnel alternative, peak hour ridership in the north corridor (all routes) is estimated at 1,800-1,900 passengers per hour in 2034. For the Wharnccliffe-Western alternative, total peak point transit ridership in the corridor is forecast to drop by at least 5%. In addition, the distribution of ridership between rapid transit and local routes would be affected with ridership on the RT corridor being lower for the Wharnccliffe-Western alternative (note that at the time of this report a review of the optimal local service structures for the Wharnccliffe-Western alternative had not been completed).

The Wharnccliffe-Western alternative would be more aligned with post-secondary student travel patterns, and by-pass major destinations including Richmond Row, St. Joseph's Hospital and King's University College. Because the Richmond Street corridor includes a greater mix of uses, it has a higher potential for ridership throughout the day and evenings and is less impacted by the seasonal variations due to Western University.

On a system wide basis, the differences between the alternatives are less pronounced. A key differentiator for the rapid transit tunnel and underpass alternatives is that there would be a higher level of reliability for transit users as the impacts due to train crossings are eliminated.

j. Natural Heritage Features

As part of the Rapid Transit Master Plan, natural heritage features of significance that were within 300m of the preliminary preferred rapid transit corridor were

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identified through a Subject Lands Status Report. The types of features reviewed include:

- Vegetation
- Wildlife (Birds, Herptofauna, and Mammals and General Wildlife)
- Aquatic Habitat

The review identified Species at Risk and Species of Conservation Concern, as well as significant and sensitive areas including:

- Designated Areas
- Significant Wetlands
- Significant Valleylands
- Significant Woodlands
- Wildlife Habitat

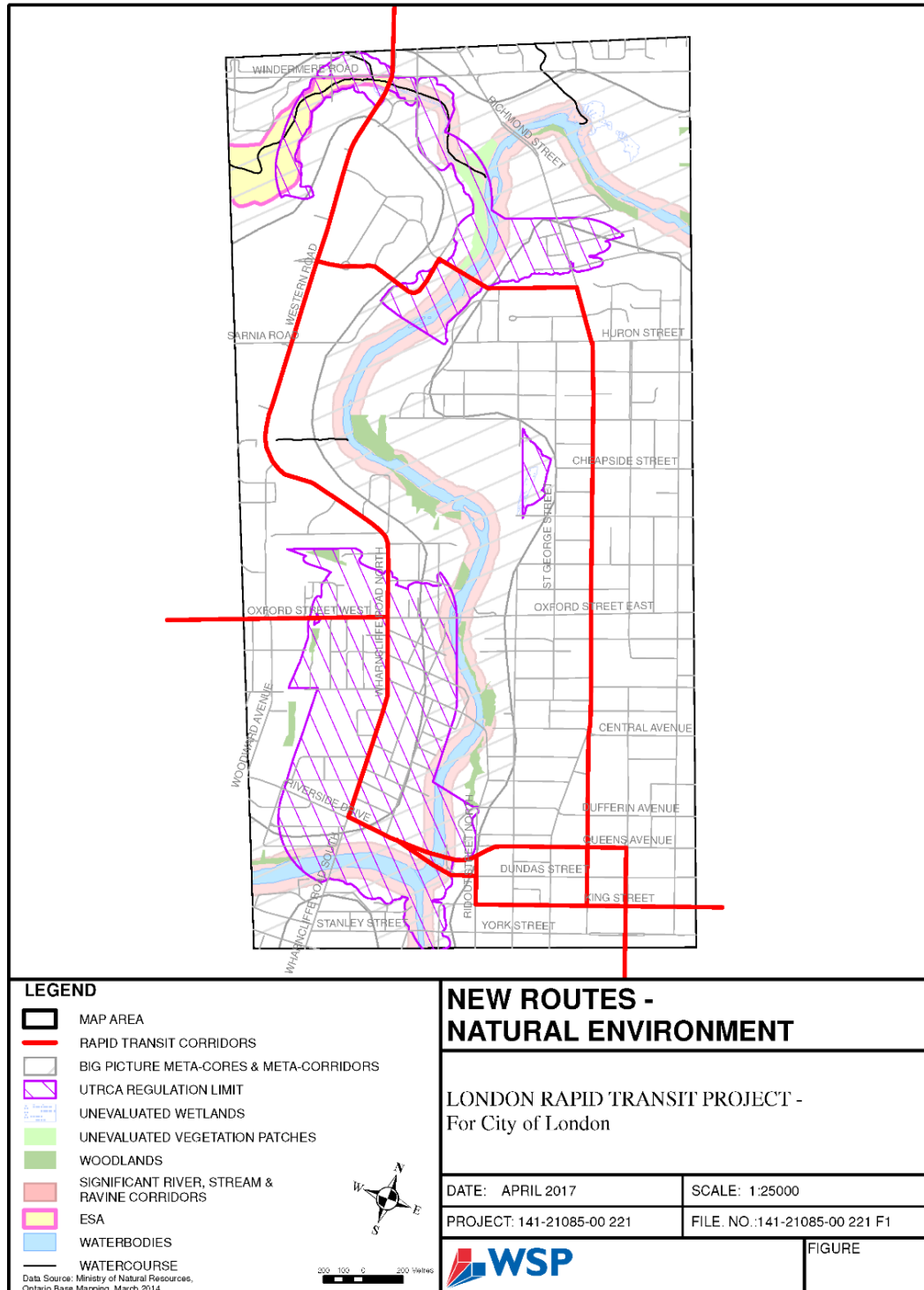
The assessment of impacts of rapid transit on natural heritage features, and potential mitigation measures, is an iterative process with the level of assessment increasing as designs are developed. Overall, the goal is to avoid impacts.

The majority of the corridors fall within developed urban areas, and the potential interactions with Natural Heritage Features are limited. However, seven locations along the preferred routes have been identified that overlap with Natural Heritage Features identified in the City of London Official Plan (2006). These sites were the primary focus of the Subject Lands Status Report (**Figure 6**) provides a mapping of Natural Heritage Features and the key natural features.

- Site 1: Woodlands Along Oxford Street West and tributary of the Thames at Oxford Street West
- Site 2: North Thames Crossing on Riverside Drive and Queen's Avenue
- Site 3A: Crossing of Medway Creek on Western Road;
- Site 3B: Woodlands Along Western Road
- Site 4: North Thames Crossing on University Drive
- Site 5: Thames Crossing on Wellington Road
- Site 6: Westminster Ponds East of Wellington Road

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Figure 6: Natural Heritage Features



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Of the seven Sites identified, Sites 2, 3a, 3b, and 4 could potentially be impacted by one of the three alternatives for the north corridor. It should be noted that at the time the Subject Lands Status Report was completed, the alternative to have the north corridor run along Wharncliffe/Western was not assessed. Though some of this corridor was covered by the overlap with the West Corridor, the portion along Wharncliffe Road/Western Road north of Oxford Street West and south of Elgin Drive was not assessed in detail.

Of the three alternatives, the Western/Wharncliffe corridor has one less site that could potentially be impacted, as it does not cross the North Thames Crossing on University Drive.

k. Business Case Implications

Concurrent with the development of the Rapid Transit Master Plan, a Business Case was prepared to evaluate broad network and technology options. The Business Case served as the basis for the recommended city-wide rapid transit alternative comprised of Bus Rapid Transit.

The Business Case model has been re-run to provide a high level indication of the potential implications of new alternatives for the north corridor. Note that a range is shown for the new alternatives as less detail went into the development of costs and benefits than for the Richmond Tunnel alternative.

As shown below, based on preliminary analysis, the new alternatives would have a benefit cost ratio in the same range as the current preferred alternative. For the Richmond At-Grade alternative, the lower capital costs would be off-set somewhat by reduced travel time savings for transit users and higher operating costs for transit. It is also important to note that the potential for land use uplift, which is not included in the base benefit-cost ratios, would be less for the Wharncliffe-Western corridor.

	Richmond Street Corridor with Transit Tunnel at CPR	Wharncliffe Road / Western Road	Richmond Street Corridor with At Grade Rapid Transit	Richmond Street Combined Grade Separation
Benefit Cost Ratio *	1.13	1.05-1.15	1.1-1.20	1.05-1.15

* Excludes wider economic benefits

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Downtown East-West Corridor Alternatives Analysis

a. Capital Costs

As a percentage of the overall project costs, the difference in capital costs between the King Street Two-way alternative and the King – Queens Couplet are relatively small. The King-Queens Couplet alternative would have a higher cost due to the transition segment on Wellington Street. However, the cost to mitigate impacts on loading and access are likely to be lower.

b. Construction Impacts (Impacts to Businesses during Construction)

Based on the City of London 2013 State of the Downtown report (latest report available), there were 711 businesses in downtown London. Retail and service industries represent the largest share of the downtown businesses, with 140 retail establishments and 132 eating establishments respectively.

<https://www.london.ca/business/Planning-Development/downtown/Pages/DowntownBackgroundStudies.aspx>

For the purpose of categorizing the impacts along the potential downtown east-west rapid transit corridor alternatives businesses fronting onto the following streets are analyzed:

- Queens Avenue between Wellington Street and Ridout Street North
- Clarence Street between Queens Avenue and King Street
- Wellington Street between Queens Avenue and King Street
- King Street between Wellington Street and Ridout Street North

As part of the Rapid Transit EA, an inventory of businesses fronting these corridors was undertaken. Based on the field surveys, which should be considered approximate, there are 120 businesses fronting the alternate routes on Queens, Clarence, Wellington and King. The majority are retail and services with some office and larger scale malls along the routes. It should be noted that large office towers and Malls, such as One London Place and Citi Plaza, is listed as one business.

The impact of construction on downtown businesses will depend on the level of disruption as well as the nature of businesses that are affected by construction. The level of disruption would depend on factors such as duration of construction, the

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extent of road closures and restrictions on access. Since a detailed construction phasing plan is not part of the EA, the construction duration that is assumed in this study should be considered preliminary and approximate.

Certain types of businesses will also be more affected by construction than others. For example, the impact of construction on office uses is less likely severe than that on retail uses, since office uses are generally less dependent on customer visits. Similarly, retail uses that cater to specific purposes, e.g., a special item of clothing, are less likely affected by construction than retail uses that meet daily/local needs, e.g., milk, fruit, etc.

IBI Group categorized the different types of businesses seen in Downtown London, using North American Industry Classification System (NAICS) Codes, which are described in the table below.

Business Category	Notes
Food Store Retail	Supermarkets, Convenience Stores, Specialty Food Stores
Non-Food Store Retail	Furniture/Home Furnishings/Electronics, Building and Outdoor Supply Stores, Pharmacies and Personal Care Stores, Clothing and Accessories Stores, Other General Merchandise Stores
Service (Entertainment/Food/Drinking)	Entertainment, Food services and drinking places
Services (Other)	includes Consumer services rentals, Selected office administrative services (i.e. employment services, business service centres, collection agencies, credit bureaus, travel agents), Health care services, Personal and household goods repair and maintenance, and Personal care services
Office - Private Sector	Professional/Business office
Office - Public/Not for Profit	Government/Heritage/Institutional/Community
Others	Mall, Department Stores

These business categories were then assessed according to their tolerance toward business interruptions, typical of downtown transportation projects including:

- Lack/Removal of street parking;
- Road closures;
- Signage and visibility issues;
- Noise and Vibration
- Sidewalk closures; Etc.

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The types of businesses and the assumed sensitivity to construction disruptions are detailed in the following table.

Business Type	Level of Tolerance for Construction Interruptions
Office Public/Not for Profit	High
Office Private Sector	Medium-High
Services (Other)	Medium
Non-Food Store Retail	Medium
Food Store Retail	Medium -Low
Service (Entertainment/Food/Drinking)	Low

Based on the business inventory that was taken during the in-person field review, the number of businesses from each tolerance category was assessed. The findings are summarized below.

		Two-way on King and Clarence	Couplet on Queens and King, and Clarence and Wellington
Businesses by Tolerance Category	Low & Low-Medium	56	62
	Medium	28	37
	High & Medium-High	7	17
	Total	93	118
Impact Period (approximate)*		1 Year	6 months
Total Years of Business Impacts		93	59
Total Years of Business Impacts to Low Tolerance businesses		56	31

** A number of factors affect duration of construction including phasing (full vs. partial road closure), underground utilities and weather. Durations shown are indicative and intended to account for the potential shorter duration of construction if only one lane of rapid transit is provided on each street.*

Since the King-Queens Couplet alternative would require construction over multiple streets, more businesses are impacted. However, the difference in impacts to low-tolerance businesses is small (62 vs 56). This is because the types of business on Queens Ave and Wellington Street are mostly offices, which are considered to have higher tolerance for interruptions from construction.

It is also important to consider the duration and level of impacts from construction. Since the couplet includes rapid transit on one side of the street, instead of two, it

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will be more feasible to implement a construction phasing strategy that impacts the business on a given section of roadway for a shorter period of time.

c. Effects on Adjacent Commercial Uses – Parking

As of 2014, there were 15,436 parking spaces in downtown London, 711 of which were on-street parking spaces and 14,725 of which are various types of off-street parking supply. Of the off-street supply, 10,952 are available to the public, while the remaining are reserved private spaces (Source: Downtown London Parking, Study 2014 Update, MMM Group, April 2015). Of the total available public supply of parking downtown (10,952 spaces), 6% is on-street parking.

The construction of rapid transit in the downtown will require a reallocation of road space, including parking. Based on the current concept plans, the potential number of spaces impacted was estimated. The following table shows existing and estimated future spaces by alternative and the resulting reductions after construction. The limits for this assessment is follows:

- Queens Avenue between Wellington Street and Ridout Street North
- Clarence Street between Queens Avenue and King Street
- Wellington Street between Queens Avenue and King Street
- King Street between Wellington Street and Ridout Street North

Street	King Street Two-way			King-Queens Couplet		
	Existing	Remaining	Reduced	Existing	Remaining	Reduced
Clarence Street	30	0*	30*	30	15	15
King Street	59	0	59	59	32	27
Wellington Street	9	9	0	9	9	0
Queens Avenue	61	61**	0**	61	26	35
Total	159	70	89	159	82	77

* Future parking loss due to north-east corridor

** On-street parking on Queens Avenue would be affected by the planned cycle track project. The King Street Two-way would allow for the cycle track, or retention of on-street parking on Queens Avenue.

Although the loss of on-street parking is perceived as a negative impact to businesses, once the Rapid transit system is operational and construction is complete, businesses along the rapid transit corridor could stand to benefit from

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improved access, increased pedestrian traffic from increased transit ridership and increased presence of residents in the area as a result of residential intensification around stations.

One of the primary objectives of rapid transit is to support the revitalization of London's Downtown. As the downtown becomes more attractive destination, businesses that are located in the downtown and that locate in the downtown in the future will benefit.

d. Connectivity to Business Areas

Each of the east-west downtown alternatives would provide connectivity to the London Downtown area for transit users. The King Street Two-way alternative would provide a more direct connection to the VIA Station and is more intuitive from a transit user perspective.

The King Street Two-way alternative would, however, have a greater impact on vehicular access and loading for major downtown uses including the Covent Market and Budweiser Gardens.

e. Consistency with other City Policies and Plans

Our Move Forward: London's Downtown Plan, adopted by Council on April 15, 2015, identifies a number of Strategic Directions including: Make Dundas Street the most exciting place in London and Reconnect with the Thames River. It also identifies ten key transformational projects including the Dundas Place Flex Street and Forks of the Thames improvements (now referred to as Back to the River). In addition, the implementation of cycle tracks on Queens Avenue and Colborne Street in Downtown London is a premier feature of the new cycling master plan that was approved by Council in September 2016.

Both the King Street Two-way and King-Queens Couplet alternatives accommodate the Dundas Place project from Wellington to Ridout. However, the King-Queen Couplet alternative will require auto traffic to be maintained on the Kensington Bridge, thereby potentially changing the dynamic of the space for the My Dundas Place project and Back to the River initiative. While it is not expected that this will lead to significant changes to these two projects, the change in traffic type and volume will need to be assessed and addressed through the detailed design processes for these two projects.

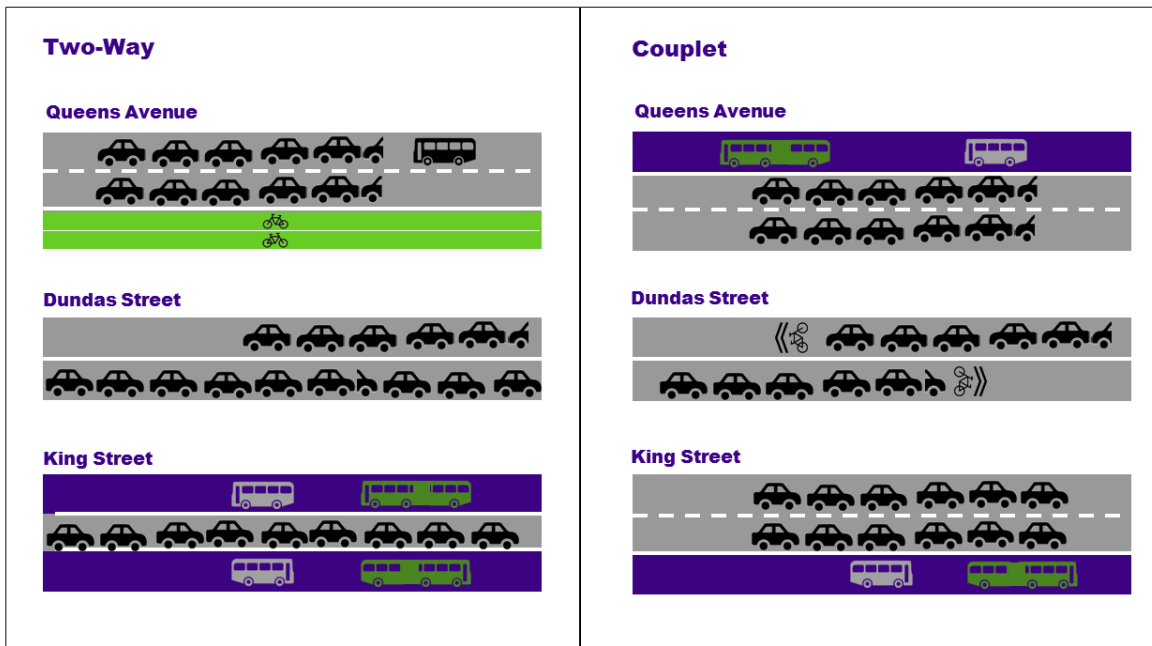
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The King-Queens Couplet alternative also precludes the development of the planned Queens Avenue cycle track.

f. Network Capacity and Impact to Existing Transportation Network

The transportation network within the downtown currently is comprised of 2 major east-west thoroughfares (York Street and Dundas Street) and a one-way pair of Queens Avenue and King Street. The two Rapid Transit routing alternatives that are being evaluated will have different implications on the existing road network as shown in the graphic below.

One of the advantages of the couplet option is that it maintains the balance of traffic lanes on King Street and Queens Avenue.



g. Impacts on Transit Service

Each of the alternatives have different impacts on transit services within the downtown core and offers different advantages to transit operations and transit users. The analysis below focuses only the differences between the two alternatives and does not address the advantages of rapid transit versus existing services.

The key advantages of the King-two way alternative include:

- Single corridor and single station locations are intuitive for transit users

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- Trip lengths in both directions will be similar making scheduling and operations simpler
- Simple connections and transfers along a single corridor
- Westbound rapid transit lane on King Street is fully dedicated for rapid transit due to counter-flow design offering a high degree of reliability
- Local services along King Street can also take advantage of the lanes on King Street

Unique advantages of the couplet option are as follows:

- Local routes benefit from dedicated lanes on both King Street and Queens Avenue
- One-way couplets are more suitable for the coordination of traffic signals and can allow for better progression

h. King Street Mixed Traffic Alternative

In reviewing the viability of providing rapid transit routes through mixed traffic on King Street, between Ridout Street North and Richmond Street, there are several considerations that would need to be addressed.

BRT is a suite of elements that create a high-quality rapid transit experience. As a “premium” service, it is especially important that BRT service be reliable and that the system meet its schedule as often as possible. The service standard for schedule adherence is often higher for BRT than for conventional service. The proportion of a route that operates in mixed traffic has the largest single impact on route reliability.

In terms of the King Street corridor, the re-routing of local LTC service from Dundas Street to King Street will result in increased transit requirements, serving approximately 1 eastbound bus every 1 to 2 minutes during peak hours. When combined with Rapid Transit, the eastbound lane would be severely impacted if other vehicles would be allowed to utilize the lane as a result of turning at intersections, vehicles making drop offs etc.

The utilization of the westbound rapid transit lane on the north side of King Street by non transit vehicles would create operational challenges. Traffic signals would need to take into account two way vehicle travel, outside of transit signal phases, additional turn lanes would be required in the westbound direction to store turning vehicles that are queued for pedestrians to cross, vehicles would be forced to wait behind transit vehicles at stations including during layovers. A summary of the advantages and inconveniences are summarized below.

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Dedicated Rapid Transit Lanes		Mixed Traffic Lanes	
Advantages	Disadvantages	Advantages	Disadvantages
✓ Reliable rapid transit service with few conflicts	➤ Removal of on-street parking	✓ Provision of some on-street parking	➤ Reduced reliability for rapid transit service with due to many conflicts
✓ Easier entrance and exit from Market parking due to less westbound traffic (transit only)	➤ Removal of on-street deliveries	✓ Some delivery areas are retained	➤ More difficult access to and from Market parking due two-way traffic for all users
✓ Travel time savings for rapid transit	➤ One-way traffic for non-transit users	✓ Two-way traffic for all users	➤ Reduced travel time savings for rapid transit
✓ No conflicts with local traffic, parking maneuvers, deliveries and other transit			➤ Conflicts with local traffic, parking maneuvers and deliveries
✓ Left-turn retained at Talbot			➤ Left-turns removed at Talbot
✓ Wider sidewalks provided for pedestrians at many locations			➤ Sidewalks same or narrower than actual
✓ No transition of rapid transit mid-segment from dedicated lanes to mixed traffic			➤ Potentially complex transition of rapid transit mid-segment from dedicated lanes to mixed traffic probably requires special phase queue-jump

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Construction Impacts Mitigation Measures

A major consideration in the implementation of major infrastructure projects is the potential for significant disruption. This can be particularly acute for businesses, as they rely on pedestrian and vehicular access to their premises, and access is generally a significant issue during construction. While noise and dust are also problems associated with large scale construction projects, access for customers, by foot or by car and transit, can be the biggest problem for business.

The following is a listing of best practices of municipal interventions, programs and actions that may assist in mitigating the impact of construction on businesses.

a. Communication and Coordination

- Website - Maintain and constantly update a project-specific website. The site should have live updates, contacts (with minimum response times), project stories, bulletins, events notices, etc.
- Social Media - Live updates/live contacts
- Communications Protocol - Who, what, when and how messages are communicated
- Project office - A physical presence associated with the project-communications office/dedicated staff/community space.
- Business Ambassadors - Staff specifically for businesses in the affected areas-small-scale

b. Marketing and Promotion

- Project Branding - A project brand is a way to market and coordinate all projects and events related to the project; it is also a way to celebrate the project
- Social Media - Live updates/live contacts/share experiences
- Sales and Events - Use construction as a sales and marketing tool
- Downtown dollars - BIA sponsored programs to encourage shopping in the Downtown
- Customer contacts - BIA sponsored notification to customer lists of affected businesses

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c. Programming

- “Talk construction”- Have a worker available over lunch hour/weekends to talk about the project and equipment (kid and family focused)
- Sales and Events - Back door events-periodic sales and events where patrons are encouraged to use the “back door”-walk through restaurant kitchens, business storage rooms, etc.
- Customer Ambassadors - Visible staff “on the street” to direct pedestrians to businesses/how to get around construction

d. Maintenance

- Window Washing - Daily window washing provided by city for businesses in the affected areas
- Dust Control - Rigorous dust control program included in construction tender

e. Creating a Positive Customer Experience

- Reduced/free parking - Free or reduced cost parking at City lots and meters in the construction area, or parking coupons/vouchers for parking at private lots
- Wayfinding signage - Wayfinding signage-needs to be current/able to change with changing conditions
- Coordinated delivery services/schedules (for businesses) - Provide coordinated deliveries for businesses in the project area

f. Financial Incentives and Programs

- Construction Mitigation Reserve Fund - Mitigate impacts of construction through advertising, enhanced maintenance, wayfinding signage, etc.
- Alley Upgrade Program - Upgrade alleys that provide alternate access to affected buildings - resurfacing, lighting, wayfinding signage
- Tax Abatement - Establish differential tax rate associated with project impact area and project impact duration (ex, for a period of 6 months in advance of construction, during construction, and 6 months after construction)
- Temporary Sign Permits - City can issue temporary sign permits for business affected-business access signs/promotions/etc-waive normal requirements for fees/have standard template for acceptable designs/size/etc so that signs can be placed as soon as required without the need for significant city review

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- Discounted/Free Parking - City provides free or discounted parking at city lots and meters in affected area
- Alley Loan Program - Encourage businesses to upgrade their building facades/entrances on the alley frontage for properties where the alleys provide alternate access to affected businesses
- PDC Upgrades – Promote the utilization of the City’s cost-share program to upgrade PDCs during construction
- Façade Loans - Loan program to upgrade facades of properties affected by project (may require a new CIP tied to the project, or to an identified CIP project area identified as project impact area)

Attachments:

Attachment 1: Technical Briefing, Preferred Downtown Routing, March 6, 2017

Attachment 2: Technical Briefing, Preferred North Corridor & Richmond Street Transit Tunnel, March 6, 2017

Attachment 3: Wharncliffe Road/Western Road Concept Plan

Attachment 4: Richmond Street At-grade Concept Plan

Attachment 5: Richmond Street with Combined Transit-Vehicle Underpass Concept Plan

Attachment 6: Richmond Street Corridor with Transit Tunnel Concept Plan

Attachment 7: King-Queens Couplet Concept Plan

Attachment 8: King Street Two-way Transit Concept Plan