



LONDON TRANSIT COMMISSION

Transit Network Rapid Transit Integration Framework

FINAL REPORT

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Submitted by:



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1.0 INTRODUCTION

Dillon Consulting Limited (Dillon) was retained by the London Transit Commission (LTC) to update the 2016 Rapid Transit Integration Strategy and Financial Plan.

The purpose of this study is to:

- Identify any modifications to the local route network that are required to better integrate into the proposed Bus Rapid Transit network; and
- Confirm high-level capital (fleet) requirements and costs, operating costs, and passenger revenue projections in 2035 for both the Bus Rapid Transit Network and modified local route network.

With the approval of the Rapid Transit Master Plan in July 2017, a number of things have changed which warrant an update to the 2016 Rapid Transit Integration Strategy and Financial Plan. Bus Rapid Transit (BRT) was selected as the preferred technology and some modifications were made to the downtown routing of BRT. In addition to this, the 2019 base local route network (used as a starting point for analysis in the 2016 Rapid Transit Integration Strategy and Financial Plan) has also changed as a result of LTC's annual service planning process.

Based on these changes, recommendations from the 2016 Rapid Transit Integration Framework document were reviewed and reconciled with changes to the 2018 bus network that have since been implemented, proposed adjustments to the 2019 local route network that is anticipated to be modified next year, and modifications to the approved BRT network.

Note:

The 2035 LTC bus network recommended in this report will be subject to further in-depth analysis and review by LTC staff as part of the annual service planning process. Given the extended nature of the forecast (and the number of variables that can change between 2020 and 2035), it is anticipated that the annual service plan process will lead to a number of changes to the recommendations set out in this strategy. The value of this document is to provide a strategic direction of how the LTC network should integrate with BRT and to identify the order of magnitude investment required to get there.

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2.0 PROPOSED BRT NETWORK AND ASSUMPTIONS

2.1 Bus Rapid Transit Network Assumption

The City of London started an environmental assessment branded “Shift” in 2015 which assessed alternatives and defined where Rapid Transit (RT) will go, how it will look and how it will be implemented. The Rapid Transit Master Plan (RTMP) was approved by Council on July 25, 2017 and included a modification to the Rapid Transit corridors that were being considered at the time of writing the 2016 report. Some modifications from the 2016 plan include:

- a. Assume BRT is built and operating on both corridors;
- b. Assume local transit service should be provided on BRT corridors to improve accessibility to stops not being used by BRT;
- c. Change to downtown configuration of BRT corridors;
- d. Change in how buses access Western University, with BRT and limited local vehicles operating on campus.

The approved BRT network is illustrated in Figure 1.

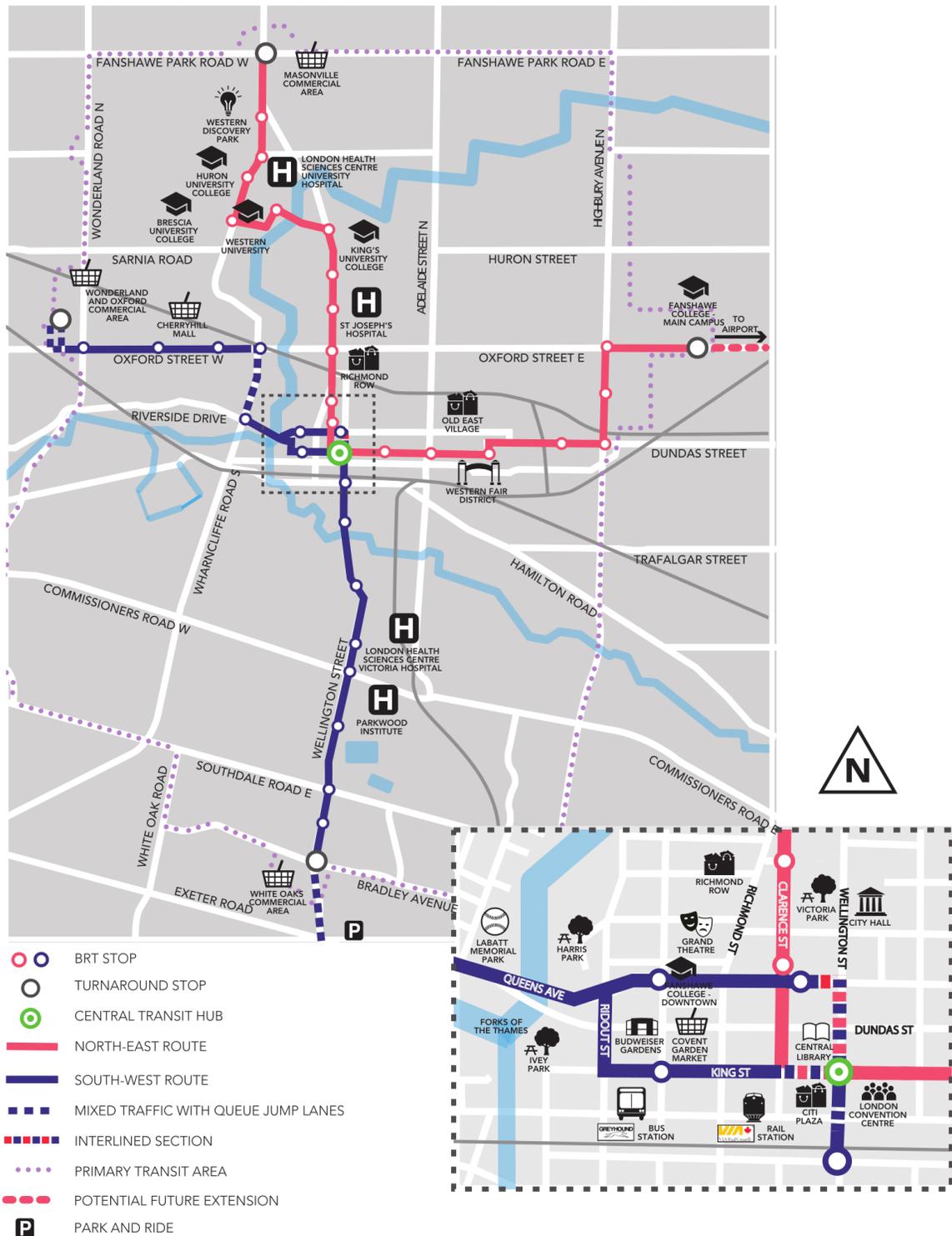
For the purposes of this report, assumptions will need to be made on the service hours and headways for BRT routes. An assumption was made that the BRT corridors would operate during the same timeframe as local routes for the purpose of this analysis.

BRT service is scheduled to be implemented between 2020 and 2028.

2.1.1 New Terminal / Transfer Point on Western Road

A new transit terminal/transfer point was assumed to be in place on Western Road between Sarnia Road and Windermere Road. The new terminal will accommodate transfers between the North-east BRT route and local routes. With the terminal in place, it was assumed that only the North-east BRT route and limited local routes (to provide a connection the University Hospital) will travel through the campus. The remaining local routes would connect to the terminal via Western Road (from the south and north-west) or Windermere Road (from the southeast or east).

Figure 1 – Approved BRT Corridors



2.2 BRT Network Design Assumptions

There are two types of network design approaches that can be used to integrate local services with BRT: “Through-routing” and “Connection-based” networks. “Through-routing” is employed where local routes are permitted to use the BRT corridor, including the exclusive lane which provides transit vehicles priority on the network. In this design, local routes can feed into local residential areas and then connect to the BRT corridor on route to their final destination (completes full set of “feeder,” “line haul,” and “distribution” functions). This approach provides a high proportion of passengers with direct, “one-seat” travel and eliminates the unreliability associated with transfers.

A “connection-based” approach mimics the network design required for fixed-rail services. In this approach, BRT routes operate only in the BRT corridor and are protected from traffic congestion by transit priority measures. In suburban areas outside the downtown, passengers must rely on feeder bus networks, park-and-ride lots, and active transportation to access service at the stations on the BRT corridor.

For London Transit, the Rapid Transit Master Plan has recommended the use of a connection-based network outside of the downtown and a through-routing network within the downtown area (bounded by Oxford Street to the north, Waterloo Street to the east, York Street to the south and Wharncliffe Road to the west). However, this should not preclude having some services branch off from the BRT corridors and operating as through-routing services.

Based on this network philosophy, the following “guidelines” were applied when assessing potential modifications to the proposed 2019 LTC network to better connect to the approved BRT corridors:

1. Within the downtown area, local routes are permitted to operate on exclusive BRT lanes, however, they will only be permitted to stop at designated BRT stations.
2. Outside of the downtown area, local routes will be encouraged to connect to a BRT station to allow passengers to complete their trip on BRT.
3. On six-lane roadways that include an exclusive BRT lane, local routes are permitted in the mixed traffic lane to provide a more local service while BRT vehicles would operate in a dedicated right-of-way. This allows greater stop spacing for BRT and allows better access to transit stops using a local parallel local route.
4. On four-lane roadways that include an exclusive Rapid Transit lane outside of the downtown, local routes will be permitted to use short sections of the rapid transit corridors where no other roadway option exists. When this occurs, the assumption is that local routes will only stop to pick-up/drop off passengers where bus bays have been created or at a designated Rapid Transit station.

3.0 RECOMMENDED LOCAL ROUTE STRUCTURE WITH BRT IN PLACE

The following section of the report describes the recommended service strategy for the local route network with the full implementation of BRT. The LTC service strategy builds on the existing 2018 service plan and proposed 2019 service modifications, and identifies:

- Routes that duplicate the BRT corridors that can be eliminated or maintained for local connections;
- Routes that need to be restructured to fit within the “Connection-based” network design concept assumed for BRT;
- Potential secondary routes that will help increase transit mode share; and
- Service level enhancements to the proposed 2019 network for improving connectivity to the BRT network.

3.1 Service Design Principles

Six primary service design principles have been established to guide the overall assessment of local routes and their interaction with BRT services. Using these principles, as well as the above noted BRT Network Design assumptions as a guide (**Section 2.0**), each of the proposed 2019 local routes were assessed to identify potential modifications to the local route network to better integrate with the approved BRT network. The principals were presented at a Public Open House to obtain feedback and included in an online survey. As well, LTC operators and front line staff were surveyed as they have first-hand experience about day-to-day operations. Feedback from the public and operator consultation is included in **Appendix B**.

The six principles are described in more detail below:

3.1.1 Principle #1 – Ability to Maintain Connections

Transit routes are most successful when they connect origins and destinations together. The best routes connect people directly between where they live and places where they can work, shop, learn, socialize, and take care of their personal business. They also easily connect with other routes to broaden these opportunities and do so without taking people too far out of their way. The specific application of this connectivity principle for LTC means that:

When making a decision to modify an existing local route to connect to a BRT corridor, it is important to understand whether the change will improve or worsen the ability for customers to conveniently get to an existing destination along the route. For example, if a proposed route to connect to BRT results in the route no longer stopping at other key destinations (e.g. shopping centre, medical facility, school, etc.), a decision will need to be made regarding the benefit of the modification to the customer. If more than two local connections are no longer conveniently made as a result of the proposed route modification, there may be merit in maintaining the route alignment as is.

On the other hand, existing local routes that lack a variety of destinations (serve mostly residential areas, for example) would likely benefit from a direct and more frequent connection to BRT services that provide these connections.

3.1.2 Principle #2 – Ability to Meet Policy-Based Headways

For the purposes of this study, it was assumed that London's approved North-east BRT Route is planned to operate every 5 minutes during weekday peak periods and South-west BRT Route is planned to operate every 10 minutes during weekday peak periods. These are good frequencies that will generally not require customers to use a timetable, either when boarding the service directly or transferring from local routes.

When transferring from the BRT service to a local route, it is important that the frequencies of the local route are enough that customers will not need to wait for excessive amounts of time during most time periods. For key local routes, service headways of no more than twice those of the BRT service are suggested, particularly during key travel periods. This means that routes that connect to the periphery of a BRT route should aim to have a minimum 10 to 20 minute service during peak periods and no less than twice the frequency of the BRT route during the midday period on weekdays and shopping hours on weekends. *For local routes that are projected to have lower ridership, decisions to adjust headways based on this principle will be based on demand and meeting minimum productivity standards in LTC's service standards document (particularly outside the weekday peak and midday periods).* Principal #6 – Exploring Alternative Service Delivery Models, could also apply for some of the low ridership areas where it will be a challenge to meet this principle, and should be explored further.

More frequent service can be operated if warranted by ridership demand. Outside of these time periods (e.g. late evenings), service frequency should be demand-based and aligned with ridership to ensure the system continues to be cost-effective. All routes will be assessed through annual reviews, and headways may be increased or decreased to suit demand as appropriate.

Table I illustrates the proposed headways for local routes that connect to the approved BRT routes. Each potential connecting route was assessed to meet the headway guidelines identified below. The assessment of route structure modifications to integrate with the approved BRT routes (presented in **Section 3.8** of this report) also evaluates the effectiveness of implementing the 'policy-based' headway noted in **Table I** below. For example, infrequent routes with low ridership may not warrant the policy-based headways noted below if the route were restructured to connect to the BRT network. In certain cases, it may be more cost effective to continue the route downtown with lower headways than it would be to short-turn the route at a BRT station and implement the policy-based headways noted below. This formed part of the evaluation process.

Table I – Proposed Headways for Local Routes connecting to BRT

Operating Period	Proposed Headway LTC Bus Connections
Weekday	
Early AM	Demand-based
AM Peak	North-east Route - 10 South-west Route - 20
Midday (Half the Frequency of Peak BRT)	20
PM Peak	North-east Route - 10 South-west Route - 20
Early Evening (Half the Frequency of Peak BRT)	20
Late Evening	Demand-based
Saturday	
Early Morning	Demand-based
Midday (Half the Frequency of Peak BRT)	20
Late Evening	Demand-based
Sunday / Statutory Holiday	
Early Morning	Demand-based
Midday (Half the Frequency of Peak BRT)	20
Late Evening	Demand-based

3.1.3 Principle #3 – Directness of Service (Travel Time)

The introduction of BRT service and the resulting restructuring of local routes should not take customers too far out of their way to complete their journey or increase their overall travel time. Backtracking more than a short distance or increasing the amount of time is to be discouraged when assessing the need to restructure a local route to connect to a new BRT route.

The evaluation of local routes in **Section 3.8** of this report took into account the amount of backtracking required to make a connection to BRT and compared the change in travel time of routes from the furthest point of the route and the final destination (typically downtown London). It was assumed that the BRT routes would travel at a faster speed than local routes and that a waiting time of half of the difference between the local and BRT peak period headway would be applied (e.g. if local route headway is 10 minutes and BRT headway is 5 minutes, the average wait time would be 2.5 minutes).

As a general rule of thumb, route modifications that connect to BRT that increase travel time by more than 10 percent (or 5 minutes) from end to end were not considered to be a benefit to passengers. In this situation, consideration was made to maintain the existing alignment with service directly to the primary final destination (e.g. downtown).

3.1.4 Principle #4 – Minimize Duplication with BRT

The design philosophy of the BRT corridors is to operate a connection-based network with local routes. This means there is preference to connect local transit routes and operate a feeder/line haul service, where local routes merge and connect to BRT stations and allow passengers to complete the rest of their trip on a faster and higher frequency service. Since BRT stations are typically spaced farther apart, operating local buses on these corridors with stops located between stations can slow down the progression of BRT vehicles if buses and BRT vehicles share the same right-of-way.

The 2019 network was reviewed to assess routes that overlap and provide service on the approved BRT routes. Where this occurs, the objective was to minimize this overlap by eliminating the route or short-turning the route at a BRT station. However, this would remove a significant number of local stops if local service were removed entirely along BRT routes.

Where appropriate, service should be designed with an emphasis on maintaining connections to key destinations, serving existing local stops with high activity (Principle #1), and minimizing travel-time (Principle #3). Where this occurs, local routes will operate in mixed-traffic lanes to ensure bus stops located between BRT stations do not delay BRT vehicles.

3.1.5 Principle #5 – Ability to Maintain Effective Operations

With any proposed change to a route, it is important that the change continue to maintain effective operations and integration into the entire network. These system-wide operating principles include connectivity to other routes, good schedule adherence and the ability to interline and provide an efficient transit service. Each route modification was also evaluated based on the ability to maintain an effective operation.

3.1.6 Principle #6 – Explore Alternative Service Delivery Models for Low-Demand Areas

Alternative Service Delivery (ASD) models are another way municipalities and transportation operators can provide public transportation service. ASDs are typically characterized by one or more of the following:

1. The use of technology, such as a mobile application to book, pay and track trips;
2. The use of smaller vehicles that provide demand-responsive service in lower demand neighbourhoods, employment areas or off-peak periods of the day; and
3. The use of third-party providers on an emergent or dedicated basis.

There are many different types of ASD models municipalities can introduce. For example, LTC could explore types of dynamic service through a taxi operator for first-mile last-mile connections between a neighbourhood transit stop and a major BRT terminal. Conversely, LTC could dedicate an existing community bus to provide demand-responsive service to/from their place of residence or employment to a BRT station. Transportation Network Companies (TNCs) such as Uber or Lyft, have also been used to provide demand-responsive service in cities across North America.

The criteria to introduce an ASD model in a new area or as a replacement to an existing fixed route service is noted below:

- The relative cost of the service should not exceed the cost of operating a conventional fixed-route in the same area;
- The removal of fixed-route service in a potential ASD area would not result in a disconnect between two fixed conventional transit services; and
- The productivity of the existing fixed route that the ASD model would replace must be less than 50% of the minimum productivity target for the majority of consecutive periods.

For areas of new growth (with the exception of infill development), ASD should be explored if the following criteria are met:

- The planned development area will be low-density, which is anticipated to result in low-ridership demand; and/or
- The planned development area is located on the fringe of the urban area.

3.2 Proposed Route Modifications and Application of Service Design Principals

The six principles identified above were applied to each of the proposed 2019 local routes and service levels to create a recommended 2035 network, integrated with the approved BRT system. This is presented in **Table 2** below. The table identifies any potential issues or opportunities that would result with the introduction of BRT. Where applicable, a recommendation is made to modify the route or frequency of service. This is evaluated based on the six principles noted above.

It should be noted that the focus on these recommendations and evaluation is to integrate the 2019 local network with BRT. This does not represent a full assessment of other potential modifications that would be required in the fullness of time to the local network. LTC staff will still be required to undertake periodic strategic reviews every five-years and more detailed annual service plans to address capacity and schedule adherence issues, the need to service growing areas of the municipality, accommodating passenger requests or responding to complaints and adjusting services that do not meet the adopted service standards.

Table 2 – Evaluation Summary of Local Routes with BRT in Place

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 – Alternative Service Delivery Model		
Route 1	<p>The route serves as a primary north-south connection through the core area from the Ridgeview Heights neighbourhood and St. Joseph's Hospital in the north to the Chelsea Green neighbourhood and Victoria Hospital in the south operating on Richmond Street, Colborne Street, and Wellington Street.</p> <p>The route is proposed to be modified in 2019 to provide a continuous connection on Colborne Street between Huron Street and Dufferin Avenue. The route operates at a 15 min peak headway. The route splits into two branches (A/B) at Thompson Road and King Edward Avenue.</p> <p>With the implementation of BRT, the route will continue to connect with the downtown via Colborne Street (pursuant to the proposed 2019 plan)</p>	<ol style="list-style-type: none"> Maintain route as proposed in the draft 2019 plan to connect to downtown along Colborne Street to South Street Hospital. Maintain Route 1A/B alignment to the south. Reduce weekday peak headway from 15 min to 10 min (7:00am to 9:00am and 2:00pm to 6:00pm). Reduce Saturday base headway and early evening headway from 30 min to 20 min (8:00am to 10:00am; 5:00pm to 9:00pm). Reduce Sunday base and Peak headway from 30 min to 20 min (9:00am to 7:00pm). 	N/A	Minimal change in travel time to the downtown core	Already meets service frequency target. Route expected to grow ridership, warranting more frequent service to the downtown.	Some duplication on Wellington Road corridor allowing some local connections for customers.	Maintained	N/A	<p>Noted reduction in 2019 results in reduction of -3,980 hrs and -1 bus.</p> <p>+6,140 Annual revenue service hours from 2020 to 2035</p> <p>+3 Peak Period buses from 2020 to 2035</p>	Implement as proposed
Route 2	<p>The route services Dundas Street and Wharncliffe/Western Road, connecting Western University and Argyle Mall through the downtown. The 2A/B branches service residential neighbourhoods east of Highbury Avenue. The existing service has Route 2 operating at 10 min peak headways to the University and along Dundas Street. Route 2A/2B operates at 20 min peak headways. The 2019 plan proposed reducing the headway to 15 min during peaks (30 min on each branch).</p> <p>The route duplicates the approved BRT service along Dundas Street and along Wharncliffe Road south of Oxford. The route could be modified to eliminate the duplication with BRT. The route would continue to serve the areas east of Highbury Avenue.</p> <p>The service between downtown and Western moves a high number of students to Western University. This portion of the route will be accommodated by Route 102 (which would require an increase in frequency to accommodate student demand).</p>	<ol style="list-style-type: none"> Eliminate portion of route between Western University and Highbury Avenue. Continue operation of route east of Highbury Avenue with connection to the North-east BRT station at Highbury and Dundas. Improve headways on each branches to operate at 17 min AM peak, 20 minute base, 20 min PM peak headways. 	Connections are maintained	Minimal change in travel time to the downtown core, however a transfer to BRT is required	N/A	Eliminated duplication with BRT	Maintained	N/A	<p>Noted reduction in 2019 result in -8,030 hrs and 4 buses saved (reallocated to route 94).</p> <p>-19,130 Annual revenue service hours from 2020 to 2035</p> <p>-3 Peak Period buses</p>	Implement as proposed

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 - Alternative Service Delivery Model		
Route 102/106	<p>The route provides bi-directional service between the downtown and Western University via Western Road / Wharncliffe Road (102) and Richmond Street (106).</p> <p>The route operates only on weekdays in the fall and winter, at a high frequency due to a significant student residential population with 10 min headways in the AM peak, 12 min headways in the base and PM peak, and 35 min headways in the late evening. This service began operations on weekends effective September 2018. The shortening of Route 2 requires Route 102 be improved to offset the loss in service to the University.</p> <p>Route 106 duplicates the approved BRT service along Richmond Street. There is potential to remove this route once the BRT service is operational.</p>	<ol style="list-style-type: none"> Unlink Route 102 and 106. Increase frequency of Route 102 to every 3-4 min during the weekday AM peak, midday PM peak to account for removal of Route 2 to Western University. Operate Saturday base and peak service at 10 min headways and 20 minute late evening service to account for removal of Route 2 to Western University. Operate Sundays service with peak 10 minute, and 20 minute base and evening service to account for removal of Route 2 to Western University. Operate Route 102 in the Spring/Summer at the existing Route 2 headways Eliminate Route 106 to avoid duplication of the North-east BRT route. 	Connection between Western University and downtown is maintained with both Route 102 and the North-east BRT route.	No change to travel time along Route 102. Route 106 is replaced with the North-east BRT route, offering rapid service along the Richmond corridor.	Frequency along the Western Road / Wharncliffe Road corridor increases to every 3-4 min to continue to maintain the same combined frequency with Route 2 to Western.	Elimination of Route 106 when BRT is operational to avoid duplication with Richmond BRT service.	Maintained.	N/A	<p>No change in 2019</p> <p>102: +19,280 Annual revenue service hours from 2020 to 2035</p> <p>+11 Peak Period buses</p> <p>106: -9,760 Annual revenue service hours due to removal of route</p> <p>-5 Peak Period Buses</p>	Implement as proposed
Route 3	<p>The route serves Hamilton Road and Clarke Road, connecting to the BRT network in the downtown and residents to Argyle Mall in the east end. The route operates at 15 min peak headways (30 min branch headway).</p> <p>There is no opportunity to modify this route to better integrate with BRT without sacrificing coverage on Hamilton Road. Improvements to frequency should be demand-based.</p>	<ol style="list-style-type: none"> Increase frequency of Route 3 from 25min to every 15 min during early AM 	N/A	N/A	Improved early morning service.	N/A	Interline with Route 5 is removed.	N/A	<p>No change in 2019</p> <p>+530 Annual revenue service hours from 2020 to 2035 (extended service hours)</p> <p>No change in Peak Period buses</p>	Implement as proposed

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 - Alternative Service Delivery Model		
Route 4	<p>The route provides a direct connection from Fanshawe College to south-western neighbourhoods. This route is well utilized.</p> <p>North of downtown, the route duplicates the North-east BRT corridor on Richmond Street between downtown and Oxford Street. The route also provides a direct connection between downtown and Fanshawe College, duplicating the same origin-destination pair as the North-east BRT corridor. The 2019 plan has service extended later in the evening on weekdays and Saturday.</p> <p>There is potential to short turn this route in the downtown.</p>	<ol style="list-style-type: none"> Maintain alignment south of downtown and eliminate section on Oxford Street to Fanshawe College (origin/destination served by North-east BRT route). Re-align the route within the downtown to provide a turn-around (instead of continuing north to Oxford Street). 	Minimal impacts to passengers making connections along Richmond Street and Oxford Street.	<p>Transfer now required for trips to Fanshawe College.</p> <p>There is adequate service provided on Oxford Street with connections to the North-east BRT.</p>	Modifications to frequency should be demand based only.	Modification eliminates origin-destination pair between downtown and Fanshawe College.	Maintained.	N/A	<p>Minor increase in RSH (+450 hrs) in 2019.</p> <p>-8,070 Annual revenue service hours from 2020 to 2035</p> <p>-3 Peak Period buses</p>	Implement as proposed
Route 104	<p>The route provides a direct service from downtown to Fanshawe College during the school year. While not operating on the same corridor, the route will duplicate the North-east BRT corridor for downtown students going to Fanshawe College.</p>	<ol style="list-style-type: none"> Eliminate route due to duplication with North-east BRT origin/destination pair 	Connection to Fanshawe College maintained through East BRT corridor	<p>Travel time should be slightly improved with transit priority in place on North-east BRT corridor.</p> <p>Transfers may be required for some passengers at the current route 104 goes as far south as Ridout and Grand. These passengers will now have to take Route 4 or Route 6 and then transfer to the BRT to get to Fanshawe College</p>	Improved service frequency on North-east BRT corridor.	No direct duplication on corridor, but is the same Origin and Destination pattern as the North-east BRT corridor.	N/A	N/A	<p>No change in 2019</p> <p>-4,370 Annual revenue service hours when route is eliminated</p> <p>-2 Peak Period buses</p>	Eliminate Route
Route 5	<p>The route serves Commissioners Road and Springbank Drive, connecting into downtown at the eastern route terminus.</p> <p>Demand on this route is low during the off-peak periods, however overall productivity is fairly good during the weekday peak periods. This should increase when BRT is introduced.</p> <p>The 2019 plan proposes a small alignment modification on Boler Road.</p> <p>With the modified Route 24 running along Commissioners Road West (based on an assumed reconstruction of 'Snake Hill') to Griffith and Boler Road, connections to North Byron would no longer be warranted.</p>	<ol style="list-style-type: none"> Remove service on Commissioners Road West, Boler Road and Griffith Street in north Byron. Reduce Saturday base and early evening headway from 60 min to 30 min. Reduce Sunday peak headway from 60 min to 30min (12:00pm to 6:00pm). 	Connections are maintained south of Baseline Road. Service north of Baseline Road is provided by Route 24.	Minor decrease in travel time	Ridership on route does not warrant significant service increase. Weekend increase eliminates 60 min service.	N/A	Maintained.	N/A	<p>No change in 2019</p> <p>+500 Annual revenue service hours from 2020 to 2035</p> <p>No change in Peak Period buses</p>	Implement as proposed

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 - Alternative Service Delivery Model		
Route 6	<p>The route services Richmond Street, connecting Western University to downtown and the London Health Sciences Centre/Victoria Hospital/Parkwood Hospital, St Joseph's Hospital and University Hospital. The route operates at 30 min peak headways.</p> <p>The proposed 2019 plan has Route 6 no longer serving Natural Science and instead completing a counter-clockwise loop from Richmond Street to Windermere Road to Perth Drive to University Drive to Richmond Street southbound.</p> <p>South of the downtown, the route would run along Wellington Road instead of High Street south of the downtown as residents in this area will still be within a 400 metre walk from the route.</p> <p>With the introduction of BRT, a local route is required on both the Richmond Street and Wellington Road corridor to provide service to stops that are not BRT stations. Direct service to Western University would no longer be required with the local route.</p>	<ol style="list-style-type: none"> 1. Introduce service along the route to duplicate service on the North-east BRT route on Richmond Street and the South-west BRT route on and parallel to Wellington Road between Masonville Mall and White Oaks Mall. 2. Remove service within Western University campus with service maintained along Richmond Road within the bounds of the University. 3. Reduce weekday peak headway from 30 min to 15 min. 4. Reduce weekday midday headway from 30 min to 20 min. 5. Reduce weekday early evening headway from 30 min to 20 min. 6. Reduce Saturday base headway from a 30 min to a 20 min headway. 7. Reduce Sunday peak headway from a 30 min to a 20 min headway. 	<p>Local connections are maintained along the North and South BRT corridors.</p> <p>Service to the Western University is provided with BRT</p>	<p>Maintained Travel Time. Passengers wishing a faster service would use the BRT.</p>	<p>Improved headways to maintain good connections between local stops and BRT stations along the same corridor.</p>	<p>The route duplicates the North-east and South-west BRT corridors along Richmond Street and Wellington Road, however, provides a local service with closer stop spacing on the same corridor.</p>	<p>Maintained.</p>	<p>N/A</p>	<p>Minor reduction in RSH (-260hrs) 2019.</p> <p>+7,670 Annual revenue service hours from 2020 to 2035</p> <p>+2 Peak Period buses</p>	<p>Implement as proposed</p>
Route 7	<p>The route connects Argyle Mall in the east to downtown. Route 7 operates at a 20 min peak headway.</p> <p>The current alignment for the route travels in close proximity to the North-east BRT corridor along Dundas Street, but does not directly connect to it. Therefore, it provides a parallel local service to the North-east BRT corridor and a direct connection to downtown from Argyle Mall and surrounding neighbourhoods.</p>	<ol style="list-style-type: none"> 1. As a future modification, the ridership on this route should be monitored closely. If the route attracts little ridership on Florence Street/York Street between Highbury Avenue and the downtown, consideration should be made to short turn this route at Highbury Avenue and Dundas Street and operate as a true 'feeder' service for residents along Wavell Street. 	<p>N/A</p>	<p>N/A</p>	<p>Service frequency improvements already made as part of the 2015 London Transit Route Network and Service Guidelines document.</p>	<p>N/A</p>	<p>Maintained.</p>	<p>N/A</p>	<p>No change in RSH in 2019</p> <p>No change from 2020 to 2035</p> <p>No change in Peak Period buses</p>	<p>No change but monitor ridership</p>

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Route 9	<p>The route services the Whitehills neighbourhood with a direct connection to downtown via Sarnia Road and Platt's Lane. Route 9A and 9B runs counterclockwise and clockwise around the Wonderland/Aldersbrook loop, respectively. The route operates at a 15 min peak headway.</p> <p>The proposed 2019 plan has Route 9 no longer serving Aldersbrook Road, and instead serving Blackacres Boulevard, Fanshawe Park Road and Wonderland Road with a one-way loop, and a new branch routing through Wychwood Park.</p>	<ol style="list-style-type: none"> 1. Improve Saturday base and peak headway from 30 min to 20 min. 2. Improve Sunday peak headway from 30 min to 20 min. 	Service is maintained	Travel times are not impacted	Ridership warrants increase in off-peak frequency.	N/A	Maintained.	N/A	<p>Minor increase in RSH in 2019 (+190hrs)</p> <p>+1,010 Annual revenue service hours from 2020 to 2035</p> <p>No change in Peak Period buses</p>	Implement as proposed
Route 10	<p>The route operates from the White Oaks Mall to Western University, with limited service extending to Masonville Mall. It is noted that the 2019 proposed changes include the provision of service to Masonville Mall during mall hours.</p> <p>Ridership is busiest north of Oxford Street to Western University and on the weekends to Masonville Mall. Route 10 operates at 20 min peak headways.</p> <p>There is an opportunity to increase the frequency of Route 10 to accommodate existing demand and support ridership growth.</p> <p>The service north of the University duplicates North-east BRT and other local services on Richmond Street. The route could terminate at the station at Western University.</p>	<ol style="list-style-type: none"> 1. Short-turn route at Western University transit terminal to avoid duplication to Masonville Mall. 2. Reduce weekday base and early evening headway from 30 min to 20 min. 3. Reduce Saturday peak and base headway from 30 min to 20 min. 4. Reduce Sunday evening headway from 60 min to 30 min. 	Passengers can still connect to Masonville Mall during mall hours or by transferring to the North-east BRT service or other local routes at the Western University.	Minimal transfer time with both BRT and other local routes providing service to Masonville Mall.	Improved service in many off-peak time periods.	Duplication is eliminated	Maintained.	N/A	<p>Minor increase in RSH in 2019 (+580 hrs)</p> <p>+3,650 Annual revenue service hours from 2020 to 2035</p> <p>-1 Peak Period Bus</p>	Implement as proposed
Route 11	<p>The route connects Westmount Mall to the downtown, traveling along Commissioners Road, Base Line Road, Emery Street, Wharncliffe Road, and York Street. Route 11 operates at 20 min peak headways.</p> <p>Due to the modifications to Route 24, service no longer runs to Talbot Village. Route 11 should be extended to connect residents in this area to the downtown.</p>	<ol style="list-style-type: none"> 1. Realign Route 11 to connect with Talbot Village (roughly bounded by Colonel Talbot Road, Raleigh Boulevard, Tillman Road and Southdale Road). 	By revising this Route to Talbot Village, these residents will still be able to connect to the activity centre at Wonderland Road South / Southdale Road West and will now have a direct connection to the downtown.	No change to existing passengers. Improved for people formally served by Route 24.	N/A	N/A	<p>Modified to replace Route 24 connection in Talbot Village to the downtown.</p> <p>Slightly modified to connect with downtown station at Clarence Street and Queens Avenue (no change in travel time)</p>	N/A	<p>No change in RSH in 2019</p> <p>+4,500 Annual revenue service hours from 2020 to 2035</p> <p>+1 Peak Period bus</p>	Implement as proposed

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Route 12	<p>The route provides service along Wharncliffe Road, connecting residential and commercial/industrial areas in southwest London to the downtown.</p> <p>The 2019 proposed plan calls for service to be reduced from 20 minute frequency to 30 minute frequency.</p>	No Modifications	N/A	N/A	N/A	N/A	Maintained.	N/A	<p>Decrease in RSH in 2019 due to a frequency reduction (-1,250 hrs)</p> <p>No change in Annual revenue service hours or Peak Period buses from 2020 to 2035</p>	No change proposed
Route 13	<p>The route operates along Richmond Street and Wellington Road, connecting Masonville Mall, Western University, the London Health Sciences Centre/Victoria Hospital/Parkwood Institute, and White Oaks Mall. Route 13 operates at a 15 min peak headway, and Route 13A operates at a 30 min peak headway.</p> <p>The route duplicates the North-east BRT corridor on Richmond Street (north of Queens Avenue) and South-west BRT corridor on Wellington Road (south of Queens Avenue).</p> <p>The service along Richmond Street and Wellington Road should be eliminated to avoid duplication with the North-east and South-west BRT routes. Route 6 is proposed to provide local service on both of these corridors.</p> <p>Only the 13A loop needs to be maintained to provide local service. The Jalna Boulevard loop currently on Route 26 can also be incorporated.</p>	<ol style="list-style-type: none"> Eliminate Route 13 between Masonville Mall and White Oaks Mall. Modify the 13A branch to serve the Jalna loop and create one continuous bi-directional loop route, connecting to the South-west BRT station at White Oaks Mall. Improve peak Sunday service from 30 min to 20 min. 	<p>Direct connection to White Oaks Mall maintained, at the BRT station.</p> <p>Connection to all other destinations maintained through a transfer to the BRT service.</p>	<p>A transfer to BRT is required for service downtown. Service frequency on the route is improved to minimize transfer times.</p>	<p>Enhanced service with bi-directional loop. Improved frequency in off peak periods.</p>	<p>Modification eliminates duplication of BRT on Richmond Street and Wellington Road.</p>	<p>Round trip time decreased to 60 min (from 90-120 min with full headways on the loops, not half).</p>	N/A	<p>Slight increase in RSH in 2019 (+450 hrs)</p> <p>-18,930 Annual revenue service hours between 2020 and 2035 due to an alignment reduction</p> <p>-5 Peak Period buses</p>	Implement as proposed

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Route 14	<p>The route services Highbury Avenue, connecting the Ridgeview Heights neighbourhood in the north to White Oaks Mall in the south. The route is also interlined with Route 10, providing a continuous two-way peripheral route in south London. Route 14 operates at a 20 min peak headway. The 2019 plan proposal includes a route change to connect with Adelaide Road.</p> <p>There is an opportunity to improve service as the route is a Base Arterial Route and provides connection to South-west BRT corridor at White Oaks Mall and North-east BRT corridor at Oxford Street and Highbury Avenue.</p>	<ol style="list-style-type: none"> 1. Reduce weekday base and early evening headway from 30 min to 20 min. 2. Reduce Saturday peak and base headway from 30 min to 20 min. 3. Reduce Sunday evening headway from 60 min to 30 min. 	N/A	N/A	Improved service frequency at many time periods.	N/A	Maintained.	N/A	<p>Minor increase in RSH in 2019 (+960)</p> <p>+4,180 Annual revenue service hours between 2020 and 2035</p> <p>No change in Peak Period buses</p>	Implement as proposed
Route 15	<p>Due to revisions to Route 24, connections to areas along Route 15B will be satisfied. Therefore, Route 15B should be removed to ensure local service is not duplicated. To improve local connections to the Westwood power centre at Wonderland Road and Southdale Road, there should be no frequency distinction between Route 15 mainline and Route 15A. Therefore, for simplicity the 15A title should be removed.</p> <p>The 2019 plan proposal include extended hours of service on weekdays and Saturday late evenings.</p>	<ol style="list-style-type: none"> 1. Delete Route 15B. 2. Reassign 15A as Route 15 and provide more service on this corridor. 3. Reduce weekday early evening headway from 30 min to 20 min. 	<p>Connections along Route 15B to the downtown will be maintained via the revised Route 11 (Viscount Road) and Route 24 (Commissioners Road) via connection to the South-west BRT corridor (requires a transfer). Service on Cranbrook Road removed, but within walking distance of either Route 11 or 24.</p>	<p>No impact to passengers on existing 15A. Passengers on 15B are provided with new service on 24 to connect with BRT, or local routes 17.</p>	N/A	N/A	Maintained.	N/A	<p>Minor increase in RSH in 2019 (+300 hrs)</p> <p>+500 Annual revenue service hours between 2020 and 2035</p> <p>No change in Peak Period buses</p>	Implement as proposed
Route 16	<p>The proposed 2019 plan has Route 16 operating at a 15 min peak and 17 min and base headway.</p> <p>With new service on Commissioners Road (Route 24), Route 16 can be modified and no longer serve Victoria Hospital or the Summerside area.</p>	<ol style="list-style-type: none"> 1. Remove branches(Route 16B), connecting to Wellington Commissioners BRT Station. 2. Improve weekday base headways from 17 min to 15 min. 3. Reduce Saturday morning mainline headway to 20 min (8:00am to 10:00am). 4. Reduce Sunday base headway to 20 min. 	<p>Connection to Victoria Hospital is eliminated on route 16. Transfer required onto route 24 or use route 6.</p>	<p>Improved travel times for service to downtown. Passengers destined to Victoria hospital will require a transfer</p>	<p>The frequency increase improves connections to both BRT corridors.</p> <p>Ridership on this corridor is high and frequency improvement expected to maintain productivity targets.</p>	N/A	Maintained.	N/A	<p>+3,400 RSH included in the 2019 proposal and 1 Peak Period bus</p> <p>+1,090 Annual revenue service hours between 2020 and 2035</p> <p>No change in Peak Period buses between 2020 and 2035</p>	Implement as proposed

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Route 17	<p>The route primarily services Oxford Street between Argyle Mall to the east and the Riverbend and Byron neighbourhoods to the west. Route 17 operates at a 20min peak, midday and early evening headway. Oxford Street experiences high ridership.</p> <p>There is opportunity to improve service as the route forms part of the Frequent Transit Network.</p>	<ol style="list-style-type: none"> 1. Reduce headway from 20 minute to 15 minute frequency on weekdays during the AM peak, base, PM peak, early evening and late evening. 2. Reduce Saturday base, peak, early evening and late evening from 30 min to 20 min frequency. 3. Reduce Saturday early morning headway to from 40 min to 30 min frequency. 4. Reduce Sunday to 20 min headway during early AM, 15 during the day, and 15 during the evening 	N/A	Maintaining the route provides direct east-west travel on a major corridor.	Improved	Duplicates part of both BRT corridors between Wharncliffe and Wonderland, and Highbury and Fanshawe College (on Oxford Street). This is considered acceptable because of the direct east-west connection provided.	Maintained.	N/A	<p>+610 RSH in 2019</p> <p>+12,820 Annual revenue service hours between 2020 and 2035</p> <p>+2 Peak Period buses</p>	Implement as proposed
Route 19	<p>The route provides a direct connection between the Hyde Park Power Centre and downtown London via Hyde Park Road and Riverside. The proposed 2019 plan has Route 19 interline with Routes 38 and 39, operating at a 30 min base and peak headway.</p> <p>There is an opportunity to connect the route to the South-west BRT corridor at Wonderland Road.</p>	<ol style="list-style-type: none"> 1. Reduce headway from 30 minute to 15 minute frequency on weekday peaks, improve base from 30 min to 20 min, early evening from 40 min to 30 min and late evening from 55 min to 30 min 2. Reduce Saturday early evening from 60 min to 30 min frequency 3. Reduce Sunday peak from 60 min to 30 min frequency 4. Extend service hours to Sunday evening 	N/A	N/A	N/A	N/A	Interline maintained with route 38 and 39.	N/A	<p>+360 RSH in 2019</p> <p>+6,560 Annual revenue service hours between 2020 and 2035. For improved service frequency (no change to alignment)</p> <p>+2 Peak Period buses</p>	Implement as proposed

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Route 20	<p>The route connects Fanshawe College to downtown and residential areas to the west of Western University. Route 20 operates at a 15 min peak headway.</p> <p>The route also duplicates much of the South-west BRT route between Wonderland Road and downtown, and the North-east BRT route between downtown and Fanshawe College.</p> <p>To minimize duplication of both BRT corridors between Wonderland Road Street and Fanshawe College, a route re-alignment was investigated, providing a direct service on Oxford Street between Quebec Street and Wharncliffe Road (avoiding the downtown connection).</p>	<ol style="list-style-type: none"> Add one roundtrip at 12:00am. Reduce Saturday early morning headway from 45 min to 40 min (6:00am to 8:00am). Reduce Saturday base headway from 30 min to 20 min. 	N/A	N/A	Improved Saturday service	There is duplication with BRT, however to provide service on Quebec Street, this route is maintained. Local service has been requested on Dundas Street between Wellington and Quebec.	Maintained.	N/A	<p>+450 RSH in 2019</p> <p>+180 Annual revenue service hours between 2020 and 2035.</p> <p>No change in Peak Period buses</p>	Maintain proposed 2019 route to Downtown along Dundas Street. Improve service frequency as proposed.
Route 21	<p>The route serves residential neighbourhoods in northeast London, and connects directly to downtown. Route 21 operates at a 15 min peak headway.</p> <p>This route will benefit from removing service from Richmond Street to the downtown to better connect passengers to the University and the North-east BRT corridor. The revised corridor will connect to a BRT station on Richmond Street. The corridor also runs parallel to the North-east BRT corridor near Oxford Street at Fanshawe College. Opportunities to connect this route to this corridor should be explored.</p>	<ol style="list-style-type: none"> Re-structure route to begin route at Fanshawe College, travel north to Beckworth Avenue and loop around the Huron Heights neighbourhood, travel west along Huron Street, south on McNay Street to Cheapside Street. At the intersection of Cheapside Street and Richmond Street, head north on Richmond Street to Windermere Road and south on Western Road to the new transit terminal. Increase weekday peak frequency to a 10 min headway and weekday early evening frequency to a 15 min headway. 	Connections are improved with link to Fanshawe College and Western University. Downtown connection is maintained through link to North-east BRT corridor (at two stations).	Transfer to BRT is required for downtown destinations.	Service frequency increased	Modification would eliminate duplication of BRT service along Richmond Street.	Round trip time increased to 90-105 min (from 60 min).	N/A	<p>+310 RSH in 2019</p> <p>+11,360 Annual revenue service hours between 2020 and 2035.</p> <p>+3 Peak Period buses</p>	Implement as proposed

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Route 24	<p>The route services Viscount Road and Baseline Road, providing connections from the Talbot Village neighbourhood to the London Health Sciences Centre/Victoria Hospital/Parkwood Institute.</p> <p>The proposed 2019 plan proposes a routing modification to realign the route to serve Victoria Hospital and the Summerside neighbourhood. The proposal also has Route 24 operating at 40 min weekday peak headway and the introduction of Sunday service during the day and early evening (9:00 am to 7:00pm).</p> <p>Commissioners Road West is slated for reconstruction within the five-year horizon. Therefore, the entrance to Byron on Commissioners Road (Snake Hill) which was once inoperable for buses, can potentially service Byron on this route. The route has thus been realigned to serve the area in replacement of part of Route 5 to better connect residents on the south-west side of the city – including South-west BRT corridor and Victoria/Parkwood Hospitals. Route 11 to be realigned to service previous section of Talbot Village.</p>	<ol style="list-style-type: none"> 1. Modify Route 24 to service Byron via Commissioners Road West. 2. Reduce weekday peak period headway from 40 min to 20 min (7:00am to 9:00am and 2:00pm to 6:00pm). 3. Reduce weekday base headway from 60 min to 30 min (9:00am to 2:00pm). 4. Introduce Saturday early AM, evening and Sunday evening service at a 40 min headways 	<p>Customers can still connect directly to the downtown core in northern Byron on Routes 5 and 17A.</p> <p>Customers in south Byron can connect to the downtown via a modified Route 11.</p>	N/A	Frequency to be improved to provide 20 min weekday service during peaks and 30 min off-peak.	N/A	N/A	N/A	<p>+4,420 RSH in 2019</p> <p>+10,680 Annual revenue service hours between 2020 and 2035.</p> <p>+3 Peak Period buses</p>	Implement as proposed
Route 25	<p>The route services Highbury Avenue and Fanshawe Park Road, connecting Fanshawe College with Masonville Mall. Route 25 operates at a 30 min peak headway.</p> <p>There is an opportunity to improve service as the route connects to North-east BRT corridor at Masonville Mall and Fanshawe College.</p>	<ol style="list-style-type: none"> 1. Reduce weekday peak period headway from 30 min to 15 min. 2. Reduce weekday late evening headway from 60 min to 30 min (9:00pm to 12:00am), and reduce midday and early evening headway from 30 min to 20 min. 3. Reduce Saturday late evening headway to 30 min (8:00am to 10:00am and 9:00pm to 12:00am). 5. Reduce Sunday peak headway from 60 min to 30 min. 6. Introduce new service Sunday morning at a 60 min headway (7:00am to 9:00am). 	N/A	N/A	Improved service frequency during many time periods.	N/A	N/A	N/A	<p>+1,000 RSH in 2019, and 1 peak bus.</p> <p>+5,450 Annual revenue service hours between 2020 and 2035</p> <p>+1 Peak Period buses</p>	Implement as proposed

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Route 26 / Route 93	<p>The route connects residential neighbourhoods in the south directly to downtown, traveling mainly along Wharncliffe Road, Highview Avenue, Homeview Road, and White Oak Road. In the proposed 2019 plan, the route is replaced with Route 93 operating at a 25 min peak headway.</p> <p>Route 93 extends the existing Route 26 up Wharncliffe Road. Wharncliffe Road has been identified as an Urban Corridor in the London Plan. Urban Corridors are designated as future potential BRT corridors. Intensification is expected along the corridor in the future. The purpose of this new Express Route is to provide passengers with a direct north-south connection on the west side of London without travelling through the downtown core (similar to the Route 92 - EXPRESS Adelaide corridor). The Express Route will provide residents on the west end of London with a direct connection to the White Oaks Transit Village, Western University and the Masonville Transit Village. The corridor also intersects with the South-west BRT corridor at White Oaks Mall.</p>	<ol style="list-style-type: none"> 1. Re-align Route 93 to traverse from Wharncliffe Road to Wellington Road via Highview Avenue, Ferndale Avenue, Dundalk Drive, Jalna Boulevard, and Bradley Avenue. The remaining Jalna loop is serviced by 13A modifications and direct connection to downtown proposed as part of the 2019 plan. 2. Operate peak service between 7:00am and 10:00am and 3:00pm and 7:00pm with a 15 min headway, 20 min headways in the Early AM and from 10:00am to 3:00pm, and 30 min headways in the early and late evening. 3. Operate Saturday service with 20 min headways during the day and 40 minute service in the Early AM and Late Evening periods. 4. Operate 20 minute Sunday Day service with 40 min headways in the Base AM and Evening. 	<p>Connection to White Oaks Mall maintained, and service to residential neighbourhoods continued.</p> <p>Direct connection to downtown no longer available, and passengers will be required to transfer to the South-west BRT corridor or a local route on Wharncliffe Road.</p>	<p>Express service is maintained for majority of route (local service is provided south of Commissioners Road only).</p> <p><i>Southbound:</i> +5 min (15%) from northern terminal (Masonville Mall) to southern terminal (White Oaks Mall)</p> <p><i>Northbound:</i> +9 min (28%) from southern terminal (White Oaks Mall) to northern terminal (Masonville Mall)</p>	<p>Corridor still provides a high frequency with extension of Route 93.</p>	<p>Modification will encourage more connections to the Wellington BRT corridor from Southdale, reduce duplication of service on Wharncliffe Road and provide a direct express connection to Western University</p>	<p>No operations issues identified</p>	<p>N/A</p>	<p>Removal of Route 26 in 2019 results in -11,240 RSH, but addition of route 93 results in +16,350 hrs, a net increase of +5,110 hrs and 1 bus</p> <p>+4,160 Annual revenue service hours from 2020 to 2035</p> <p>+2 Peak Period buses</p>	<p>Eliminate Route 26 Implement Route 93 as proposed</p>
Route 27	<p>The route is short, and provides service between Fanshawe College and the residential neighbourhoods to the northwest. Route 27 operates at a 15 min peak headway.</p> <p>The route has a good connection to the North-east BRT corridor, and there is opportunity to improve service as the route is a Base Arterial Route with high ridership during the school semester.</p> <p>The 2019 plan propose an increase in spring/summer frequency from 20 to 13 minute headways.</p>	<ol style="list-style-type: none"> 1. Increase fall/winter weekday peak headway from 15 min to 10 min (7:30am to 9:00am and 2:00pm to 6:00pm). 	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>+980 RSH in 2019</p> <p>+800 Annual revenue service hours between 2020 and 2035.</p> <p>+1 Peak Period bus</p>	<p>Implement as proposed</p>

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Route 28	<p>The route provides service primarily along Wharnclyffe Road and Wonderland Road, connecting Westmount Mall to a smaller residential area to the southwest.</p> <p>The proposed 2019 plan has Route 28 operating at 40 min peak headways to serve the Exeter/White Oak Industrial area and connect to White Oaks Mall. The route will connect to the South-west BRT corridor at White Oaks Mall.</p>	<p>1. Ridership is very low on this route and does not warrant an increase in service. Ridership on this route may be subject to increase in the future and should be monitored closely over time.</p>	N/A	NA	NA	N/A	NA	N/A	<p>No change in RSH for 2019</p> <p>No change in annual revenue service hours from 2020 to 2035</p> <p>No change in Peak Period buses</p>	<p>No change proposed</p> <p>Monitor Ridership</p>
Route 29	<p>Route 10 provides service between Western University and a residential area near Oxford Street and Wonderland Road, traveling mainly on Sarnia Road and Wonderland Road. Route 29 operates at a 12 to 13 min peak headway and is required to move a large number of students to the University. The 2019 plan further improves service frequency during the peaks.</p>	<p>1. The route is modified slightly to terminate at the Western University Transit Terminal.</p> <p>2. Ridership should be monitored on Sarnia Rd Due to the routing modification on route 9 no longer serving the area</p>	N/A	N/A	N/A	N/A	N/A	N/A	<p>+880 RSH in 2019</p> <p>No change in annual revenue service hours from 2020 to 2035</p> <p>No change in Peak Period buses</p>	<p>Implement as proposed</p> <p>Monitor Ridership</p>
Route 30	<p>The route services predominantly employment areas, connecting to White Oaks Mall in the west.</p> <p>The proposed 2019 plan has Route 30 operating at a 40 min peak headway.</p>	<p>1. Reduce weekday early morning and AM and PM peak headway from 40 min to 20 min.</p>	N/A	N/A	Area is growing. Increased frequency will help accommodate new demand and better connect to the South-west BRT.	N/A	N/A	<p>Due to ridership growth anticipated on this route, an ASD model is not warranted.</p>	<p>+380 RSH in 2019</p> <p>+2,130 Annual revenue service hours from 2020 to 2035</p> <p>+1 Peak Period bus</p>	<p>Implement as proposed</p>

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 - Alternative Service Delivery Model		
Route 31	<p>The route connects residential areas in the northwest to Western University. Route 31 operates at a 30 min peak headway and interlines with Route 32.</p> <p>The proposed 2019 plan revises the route to run on Sarnia Road, Aldersbrook Road and Fanshawe Park Road with PM peak headways of 25 minutes and Sunday peaks with 45 minutes and extended evening service.</p> <p>With both route 31 and route 9 travelling to Western University, there is opportunity to modify route 31 to better connect with BRT. The route would provide a major north south connection to BRT. As such improved frequencies should be explored.</p>	<ol style="list-style-type: none"> 1. Realign route 31 to travel on Wonderland Road to connect with BRT. Route 9 maintains connections to Western University. 2. Reduce weekday peak headway to 15 min (7:00am to 9:00am and 2:00pm to 6:00pm). 3. Reduce weekday base headway to 20 min (9:00am and 2:00pm). 4. Reduce weekday evening headway to 30 min. 5. Add new service Saturday early morning at 45 min headway (6:00am to 8:00am). 6. Reduce Sunday peak headway from 45 min to 30 min. 7. Add new service Sunday evening service at 60 min headways. 	Connections to Western are maintained with route 9,	N/A	Improved service frequency on route connecting to BRT	N/A	Route will no longer interline with route 32.	N/A	<p>+700 RSH in 2019</p> <p>+7,010 Annual revenue service hours from 2020 to 2035</p> <p>+3 Peak Period buses</p>	Implement as proposed
Route 32	<p>The route connects the Ridgewood Heights and Stoneybrook Acres neighbourhoods to Western University. Route 32 operates at 30 min peak headways and is connected with Route 31.</p> <p>The 2019 plan has Route 31 operating two-way service on University Drive and Huron Street instead of Windermere Road connecting to Western University. Service on Windermere Road provided by Route 40.</p>	<ol style="list-style-type: none"> 1. Reduce weekday peak headway from 30 min to 15 min (7:00am to 9:00am and 2:00pm to 6:00pm). 2. Reduce weekday base headway from 30 min to 20 min (9:00am and 2:00pm). 3. Reduce weekday evening headway to 30 minutes. 4. Add new service Saturday early morning at 45 min headway (6:00am to 8:00am) 5. Reduce Sunday peak headway from 60 min to 30 min. 6. Add new service Sunday evening service at a 60 min headway. 	N/A	N/A	Improved service, and extended operating hours on weekends.	N/A	Route 32 no longer interlined with route 31.	N/A	<p>+550 RSH in 2019</p> <p>+5,380 Annual revenue service hours from 2020 to 2035</p> <p>+2 Peak Period buses</p>	Implement as proposed

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 - Alternative Service Delivery Model		
Route 33	The route travels south from Western University along Western Road and Platt's Lane, through the Cherryhill neighbourhood and Village Mall, and continues on to Proudfoot Lane and Farrah Road. Route 33 operates at a 13 min PM peak headway. The 2019 plan proposes a small modification to provide two-way service on Proudfoot Lane. This route was modified slightly to connect directly with local transit terminal at Western University.	1. Reduce peak and midday headway during the Fall/Winter Schedule from 17 / 13 min to 10 min (7:45am to 6:00pm).	N/A	N/A	N/A	N/A	N/A	N/A	+660 RSH in 2019 +3,170 Annual revenue service hours from 2020 to 2035 +1 Peak Period bus	Implement as proposed
Route 34	The route connects Masonville Mall to Western University, serving residential streets to the west of Masonville Mall as well. The proposed 2019 plan has Route 34 operating in the Sunningdale area on Planetree Drive and Pinnacle Parkway on a 45 min peak headway. The route overlaps with the proposed North-east BRT route along Richmond Street, and therefore there is potential to eliminate the portion of the route along Richmond Street. There is also potential to reroute the alignment north of Fanshawe Park Road and improve service to provide improved connection to North-east BRT corridor.	1. Modify the route to eliminate the connection to Western University. This will shorten the route with a direct connection to the BRT corridor at the Masonville terminal. 2. Reduce weekday peak period headway from 45 min to 30 min (7:30am to 9:00am and 2:30pm to 6:30pm), reduce base and early evening headway from 60 min to 30 min. 3. Improve Saturday peak service from 40 min to 30 min headways.	Transfer required at the North BRT to access Western University.	N/A	Improved service during many time periods.	Modification of the route will eliminate duplication of BRT along Richmond Street	Roundtrip time decreased to 20-30 min (from 30 min). Route able to operate using a clock-face headway.	N/A	+2,350 RSH in 2019 +3,000 Annual revenue service hours from 2020 to 2035 +1 Peak Period buses	Implement as proposed
Route 35	The route connects Argyle Mall to residential streets to the southeast. The proposed 2019 plan has Route 35 operating at a 30 min peak headway.	1. No Change.	N/A	N/A	N/A	N/A	N/A	N/A	No change	No change proposed
Route 36	The route services Oxford Street east of Fanshawe College, providing connections to the College and the airport. Route 36 operates at a 30 min peak headway. There is potential to improve service to meet growing demand to the Airport, particularly from Fanshawe College students. Route 36 also provides connection to North-east BRT corridor at Fanshawe College.	1. Reduce weekday peak period headway from 30min to 15 min (7:00am to 9:00am and 2:30pm to 6:00pm). 2. Extend weekday service to the early evening period at a 30 min headway (6:00pm to 12:00pm). 3. Weekend ridership should be monitored to determine if additional service is required on route 36.	N/A	N/A	Improved peak service, and extended service hours.	N/A	N/A	N/A	No change in 2019 +1,630 Annual revenue service hours from 2020 to 2035 +1 Peak Period bus	Implement as proposed

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation	
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 - Alternative Service Delivery Model			
Route 37	The route services Dundas Street, Veterans Memorial Parkway, and Sovereign Road, connecting to Argyle Mall in the north terminus. Route 37 operates at a 30 min peak headway.	1. No Change.	N/A	N/A	N/A	N/A	N/A	N/A	Consideration should be given to an ASD if ridership does not improve.	No change	No change proposed
Route 38	The route connects Masonville Mall to surrounding residential neighbourhoods. Route 38 operates at a 30 min peak headway and the 2019 draft plan proposes the route be interlined with Route 19 as well as Route 38. There is opportunity to improve service as route provides connection to North-east BRT corridor at Masonville Mall. The 2019 plan proposes a reduction in evening service from 30 minutes to 40 minutes and 55 minutes during the early and late evening periods.	1. Reduce weekday peak period headway from 30 min to 15 min (7:00am to 9:00am and 2:00pm to 6:00pm). Reduce weekday base from 30 min to 20 min to match Route 19. Operate at 30 min headways during the weekday evening periods. 2. Reduce Sunday base and peak headways from 60 min to 30 min (9:00am to 7:00pm).	N/A	N/A	Improved service in weekday peak periods and on Sundays.	N/A	Interline with route 39 and 19 is maintained.	N/A	Minor reduction in RSH in 2019. (-30 hrs) +2,630 Annual revenue service hours from 2020 to 2035. + 1 Peak Period bus		Implement as proposed
Route 39	The route services Fanshawe Park Road west of Richmond Street, connecting to Masonville Mall at the eastern terminus. Route 39 operates at a 30 min peak headway and the 2019 draft plan proposes the route be interlined with Route 19 as well as Route 38. There is opportunity to improve service as route provides connection to North-east BRT corridor at Masonville Mall. The 2019 plan proposes a reduction in evening service from 30 minutes to 40 minutes and 55 minutes during the early and late evening periods.	1. Reduce weekday peak period headway from 30 min to 15 min (7:00am to 9:00am and 2:00pm to 6:00pm), Reduce weekday base from 30 min to 20 min to match Route 19. 2. Reduce Sunday Day headway from 60 min to 30 min (9:00am to 7:00pm) and introduce Sunday Early AM service at a 30 min headway.	N/A	N/A	Improved service in weekday peak periods and on Sundays.	N/A	Interline with route 39 and 19 is maintained.	N/A	Minor reduction RSH in 2019. (-70 hrs) +2,640 Annual revenue service hours from 2020 to 2035. + 1 Peak Period bus		Implement as proposed

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 - Alternative Service Delivery Model		
Route 40	<p>The route services Fanshawe Park Road east of Richmond Street, connecting to Masonville Mall at the western terminus. Route 40 operates at a 40 min peak headway.</p> <p>In 2019, the route is proposed to be realigned to serve Phillbrook Drive, Grenfell Drive, Glenora Drive and Doon Drive connecting with Western University with 45 minute peak frequencies and 60 minute off-peak frequencies.</p> <p>The route is proposed to connect to the North-east BRT corridor at Masonville Mall, and there is opportunity to improve service to better serve this connection.</p>	<ol style="list-style-type: none"> Reduce weekday peak period headway from 45 min to 25 min (7:00am to 9:00am and 2:00pm to 6:00pm). Improve peak Saturday headways from 40 minutes to 30 minutes. 	N/A	N/A	Improved service in weekday peak periods and on Sundays.	N/A	N/A	N/A	<p>+4,910 RSH in 2019 and +1 Peak Period bus</p> <p>+3,710 Annual revenue service hours from 2020 to 2035</p> <p>+1 Peak Period buses</p>	Implement as proposed
Route 51, 52, 53, 54, 55, 56	<p>These community bus routes serve three loops – the Proudfoot Loop, Cherryhill Loop, and Wonderland Loop.</p> <p>No modifications are required to these routes.</p> <p>In the proposed 2019 plan, a new community bus Route 56 is proposed that would operate for 4 hours one day a week throughout the year.</p>	<ol style="list-style-type: none"> No Change 	N/A	N/A	N/A	N/A	N/A	N/A	<p>+208 RSH in 2019</p> <p>No change from 2020 to 2035</p>	No change proposed
Route 90	<p>This express route operates on the Richmond-Wellington corridor between Masonville Mall and White Oaks Mall, duplicating much of the approved BRT service on Richmond Street and Wellington Road.</p> <p>The route should be eliminated once BRT is introduced. Elimination of the route will be phased in accordance with completion of construction on both BRT corridors.</p>	<ol style="list-style-type: none"> Eliminate the northern half of the route once BRT is introduced on the North-east BRT corridor from downtown London to Masonville Mall. Eliminate the southern half of the route once BRT is introduced on the South-west BRT corridor from White Oaks Mall to downtown London. 	<p>BRT will provide service to areas currently covered by Route 90.</p> <p>Currently there is no BRT stop proposed at Windermere or Grand. The closest proposed stations to these are Richmond/ Ambleside or Richmond/ University Drive, and Wellington/ South and Wellington/Bond. Local service will be provided at these locations by Route 6.</p>	<p>Travel time will be the same or reduced on BRT. A transfer will be required if travelling south of downtown to north of downtown, but the transfer time will be minimal due to the high frequency of both BRT corridors.</p>	<p>Frequency will be increased on BRT, from 20 min peak service to 10 min peak service on the South-west BRT corridor and 5 minute peak service on the North-east BRT corridor.</p>	<p>Modification eliminates duplication of both BRT corridors on Richmond Street and Wellington Road.</p>	N/A	N/A	<p>No change in 2019</p> <p>-19,630 Annual revenue service hours when route is eliminated</p> <p>-6 Peak Period buses</p>	Implement as proposed

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 - Alternative Service Delivery Model		
Route 91	The route offers express service along Oxford Street from Wonderland Road to Fanshawe College. Route 91 operates at a 15 min peak headway. The service does not operate during the early evening periods, yet provides an important east-west connection in London.	<ol style="list-style-type: none"> During the weekday, frequencies will improve greatly to ensure frequent service. Therefore, 15 min early AM, 10 min AM peak, 12 minute base, 10 min PM peak, 15 min early evening, and 30 min late evening service are proposed. On Saturday, 24 min early AM, 15 min base, and 12 min peak, early evening and late evening service is proposed On Sunday, all day 10 minute service is proposed 	N/A	N/A	N/A	N/A	N/A	N/A	<p>No change in 2019</p> <p>+7,780 Annual revenue service hours from 2020 to 2035</p> <p>+2 Peak Period bus</p>	Implement as proposed
Route 92	The route offers express service along Adelaide Street, connecting to Masonville Mall in the north and the London Health Sciences Centre/Victoria Hospital/Parkwood Institute in the south. Route 92 operates at a 25 min peak headway.	<ol style="list-style-type: none"> Increase frequency from 25 minutes to 15 minutes during weekday peak periods 	N/A	N/A	Improved frequency on major north-south corridor with connections to BRT at both termini.	N/A	N/A	N/A	<p>-3,560 RSH in 2019</p> <p>+2,930 Annual revenue service hours from 2020 to 2035</p> <p>+2 Peak Period bus</p>	Implement as proposed
Route 94	The express route is proposed in 2019 to serve the main stretch of Route 2 with limited stops. The route is not included in the 2035 network as it will duplicate much of the North-east BRT corridor on Dundas Street.	<ol style="list-style-type: none"> Eliminate Route 	Connections maintained with BRT	Improved travel times with BRT due to transit priority.	BRT to provide adequate frequency to offset the loss of service	This route would duplicate BRT and is therefore eliminated.	N/A	N/A	<p>+5,520 RSH in 2019 and 4 Peak buses</p> <p>-5,520 Annual revenue service hours when route is eliminated</p> <p>-4 Peak Period buses</p>	Implement as proposed

Route	Issue / Proposal	Proposed Modification	Evaluation						Impacts to Service Hours & Bus Requirements	Recommendation	
			#1 - Ability to Maintain Connections	#2 - Directness (Travel Time)	#3 - Service Frequency	#4 - Duplication with BRT	#5 - Effective Operations	#6 – Alternative Service Delivery Model			
Sunningdale Route – New ASD Area	There is currently no transit service north of Fanshawe Park Road to the west of Richmond Street. There is opportunity to provide an alternative service delivery model in this area due to the circuitous and low-density built character. The route should connect with the North-east BRT service at Masonville Mall. An ASD route is proposed in the 2019 plan to serve this area.	<ol style="list-style-type: none"> 1. Implement alternative service delivery model in the area to connect with North-east BRT service at Masonville Mall. 2. Operate service for 6 hours per weekday 	Provides additional connection from residential neighbourhoods in north London to BRT.	N/A	N/A	N/A	N/A	N/A	Due to the circuitous nature of the road network and the low-density character, an alternative service delivery model would be an effective mode of transportation in this area.	+2,010 RSH and 1 ASD required in 2019 No changes from 2020 to 2035	Implement as proposed
Innovation Park – New ASD Area	There is currently no transit service in this area. There is opportunity to provide an alternative service delivery model in this area due to the circuitous and low-density built character.	<ol style="list-style-type: none"> 1. Implement alternative service delivery model in the area to connect with local transit service or BRT. 2. Operate service for 6 hours per weekday 	N/A	N/A	N/A	N/A	N/A	N/A	Due to the circuitous nature of the road network and the low-density character, an alternative service delivery model would be an effective mode of transportation in this area.	No route in 2019 +2,010 Annual revenue service hours from 2020 to 2035 +1 ASD bus	Implement as proposed
Sharon Creek / North Lambeth – New ASD Area	There is currently no transit service in this area. There is opportunity to provide an alternative service delivery model in this area due to the circuitous and low-density built character.	<ol style="list-style-type: none"> 1. Implement alternative service delivery model in the area to connect with local transit service or BRT. 2. Operate service for 6 hours per weekday 	N/A	N/A	N/A	N/A	N/A	N/A	Due to the circuitous nature of the road network and the low-density character, an alternative service delivery model would be an effective mode of transportation in this area.	No route in 2019 +2,010 Annual revenue service hours from 2020 to 2035 +1 ASD bus	Implement as proposed

3.3 Summary of Service Hours and Vehicle Impacts

Based on the service analysis above, **Table 3** below provides a summary of the proposed annual revenue service hour and peak vehicle modifications that are required to operate the recommended service plan with the full implementation of BRT for the 2035 horizon year. **Figure 2** illustrates the recommended 2035 LTC network with BRT in place. **Figure 3** highlights whether routes have been modified with revised alignments, revised headways, or both. It should be noted that the 2035 network includes modification to several routes covering most of the LTC service area. This suggests that many customers are anticipated to see improved service, even if they are not making use of the BRT routes. Individual maps for each route is included in **Appendix A**.

Table 3 – Summary of Annual Revenue Service Hours & Vehicle Impacts

Route	Annual Revenue Service Hours					PM Peak Period Bus Requirements (Fall)				
	2018	2019	2035	Change 2018-2019	Change 2019-2035	2018	2019	2035	Change 2018-2019	Change 2019-2035
1	33,180	29,200	35,340	-3,980	6,140	8	7	10	-1	3
2	50,760	42,730	23,600	-8,030	-19,130	12	8	5	-4	-3
3	23,240	23,240	23,770	0	530	5	5	5	0	0
4	30,200	30,650	22,580	450	-8,070	8	8	5	0	-3
5	10,160	10,160	10,660	0	500	2	2	2	0	0
6	19,760	19,500	27,170	-260	7,670	4	3.6	6	0	2
7	13,530	13,530	13,530	0	0	3	3	3	0	0
9	20,700	20,890	21,900	190	1,010	5	5	5	0	0
10	28,930	29,510	33,160	580	3,650	7.3	7.3	6	0	-1
11	13,650	13,650	18,110	0	4,460	3	3	4	0	1
12	12,580	11,330	11,330	-1,250	0	4	3	3	-1	0
13	40,100	40,550	21,620	450	-18,930	9	9	4	0	-5
14	21,350	22,310	26,490	960	4,180	4.8	5	5	0	0
15	19,460	19,760	20,260	300	500	4.5	4.5	4	0	-1
16	27,720	31,120	32,210	3,400	1,090	6	7	7	1	0
17	33,200	33,810	46,630	610	12,820	7	7	9	0	2
19	9,250	9,610	16,170	360	6,560	2	2	4	0	2
20	30,170	30,620	30,800	450	180	8	8	8	0	0
21	20,020	20,330	31,690	310	11,360	4.5	4.5	7	0	3
23	0	0	0	0	0	0	0	0	0	0
24	5,670	10,090	20,770	4,420	10,680	1.5	2.5	5	1	3
25	9,810	10,810	16,260	1,000	5,450	2	3	4	1	1
26	11,240	0	0	-11,240	0	3	0	0	-3	0
27	9,640	10,620	11,420	980	800	3	3	4	0	1

Route	Annual Revenue Service Hours					PM Peak Period Bus Requirements (Fall)				
	2018	2019	2035	Change 2018-2019	Change 2019-2035	2018	2019	2035	Change 2018-2019	Change 2019-2035
28	2,130	2,130	2,130	0	0	1	1	1	0	0
29	8,180	9,060	9,060	880	0	4	5	5	1	0
30	2,260	2,640	5,100	380	2,460	1	1	2	0	1
31	8,780	9,480	16,490	700	7,010	2	2.4	5	0	3
32	8,780	9,330	14,710	550	5,380	2	2.4	4	0	2
33	7,970	8,630	11,800	660	3,170	3	3	4	0	1
34	4,540	6,890	9,890	2,350	3,000	1	1.4	2	0	1
35	5,200	5,200	5,200	0	0	1	1	1	0	0
36	3,390	3,390	5,020	0	1,630	1	1	2	0	1
37	940	940	940	0	0	1	1	1	0	0
38	4,570	4,540	7,170	-30	2,630	1	1	2	0	1
39	4,450	4,380	7,020	-70	2,640	1	1	2	0	1
40	4,970	9,880	13,590	4,910	3,710	1	1.7	3	1	1
90	19,630	19,630	0	0	-19,630	6	6	0	0	-6
91	12,950	12,950	20,730	0	7,780	4	4	6	0	2
92	10,540	6,980	9,910	-3,560	2,930	4	3.2	5	-1	2
93	0	16,350	20,510	16,350	4,160	0	4	6	4	2
94	0	5,520	0	5,520	-5,520	0	4	0	4	-4
102	10,070	10,070	29,350	0	19,280	4	4	15	0	11
104	4,370	4,370	0	0	-4,370	2	2	0	0	-2
106	9,440	9,760	0	320	-9,760	5	5	0	0	-5
Total	627,480	646,140	704,090	18,660	57,950	162	166	181	4	16

Existing Community Bus routes and future ASD areas are included separately.

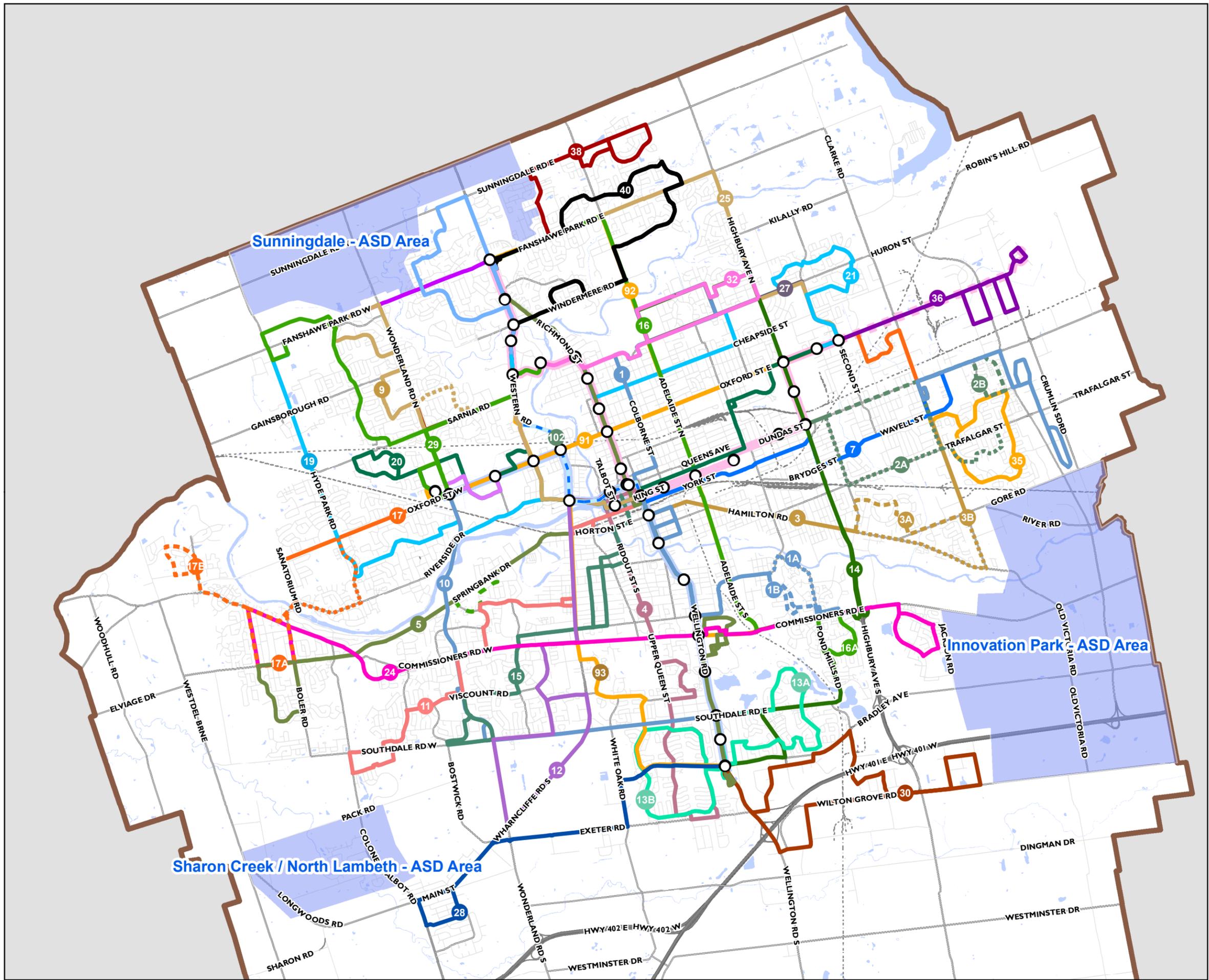


Figure 2
RAPID TRANSIT INTEGRATION REVIEW

**LONDON TRANSIT NETWORK
 2035 Network**

- LTC Bus Route
- BRT Station
- Alternative Service Delivery Areas
- Municipal Boundary
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody

0 0.5 1 km



MAP DRAWING INFORMATION:
 DATA PROVIDED BY LTC

MAP CREATED BY: KS
 MAP CHECKED BY: DAK
 MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:\GIS\163037



PROJECT: 188035
 STATUS: FINAL
 DATE: 10/25/2018

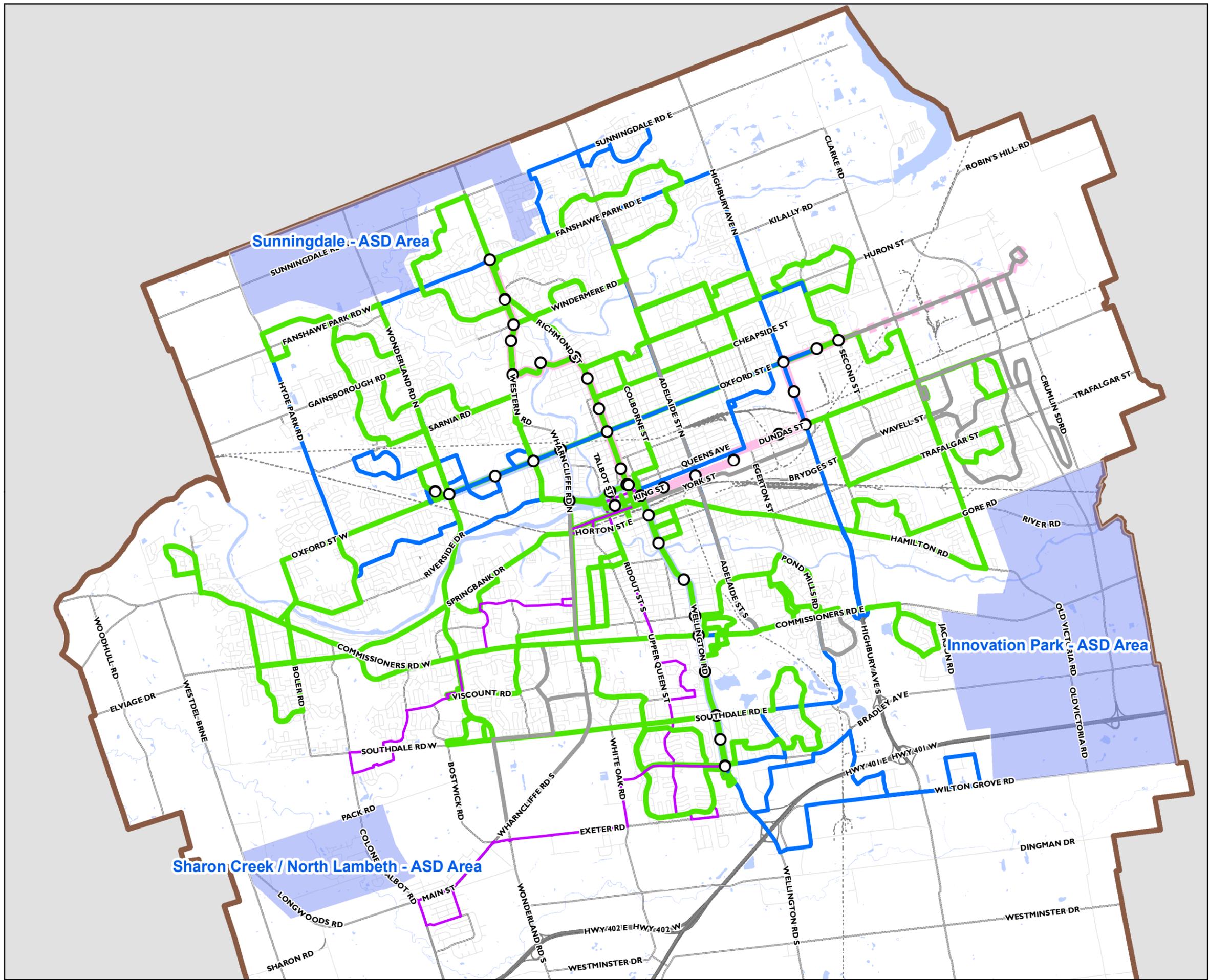
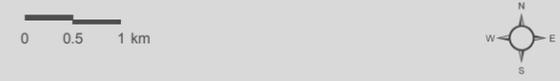


Figure 3
RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
 Summary of 2035 Route Modifications

- BRT Station
- Change in Frequency and Distance
- Change in Frequency
- Change in Distance
- No Change
- Alternative Service Delivery Areas
- Municipal Boundary
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody



MAP DRAWING INFORMATION:
 DATA PROVIDED BY LTC

MAP CREATED BY: KS
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PROJECT: 188035
 STATUS: FINAL
 DATE: 10/25/2018

4.0 FINANCIAL PLAN

The following section of the report details the fleet requirements and costs, service hours, operating costs, projected ridership and revenue between 2019 and 2035.

4.1 Service Hour Assumptions

Service hours were calculated based on the recommendations contained in the recommended route structure outlined in **Section 3.0** of this report. **Table 4** illustrates the revenue service hours projected for operating the 2035 recommended service. **Table 5** shows the total service hours (includes 8.7% non-revenue vehicle hours applied to fixed, community and ASD routes, such as the time buses travel to and from the transit garage based on existing 2017 data). For the BRT routes, revenue service hours and total service hours were provided by the Shift team.

Table 4 – Summary of Annual Revenue Service Hours

System	2018	2019	2035
Local-Fixed Routes	627,480	646,140	704,090
Community Bus	15,297	15,505	15,505
Local ASD Services I	-	2,008	6,024
North-east BRT Route	-	-	50,630
South-west BRT Route	-	-	32,760
Total	642,777	663,653	809,009

Table 5 – Summary of Annual Total Service Hours

System	2018	2019	2035
Local Fixed-Routes	682,090	702,380	765,370
Community Bus	16,630	16,850	16,850
Local ASD Routes	-	2,180	6,550
North-East BRT Route	-	-	54,480
South-East BRT Route	-	-	35,250
Total	698,720	721,410	878,500

4.2 Operating Costs Assumptions

Operating costs for the various service strategies started with a base cost of \$97.14 per Total Vehicle Hour in 2017². The annual operating cost was applied to the proposed platform hours (revenue and auxiliary). Costs were escalated each year to reflect anticipated operating increases reflective of past

¹ Alternative Service Delivery (ASD) assumed to operate for 8 hours per day, weekdays only.

² Does not include reported “Contribution to Reserves”

trends. **Figure 4** shows the existing hourly operating costs breakdown from 2012 to 2017 as well as the projection for estimating future 2035 hourly operating costs.

There are five general components that go into the calculation of total hourly costs for bus services:

- Driver salary and benefits;
- Vehicle fuel;
- Vehicle maintenance;
- Administration and supervisor costs (e.g. salary and benefits); and
- Transit garage maintenance.

The marginal rate only takes into account those elements that see a direct increase resulting from increased service hours. These are driver salary and benefits, vehicle fuel, vehicle maintenance and transit garage maintenance. However, given the amount of expansion that is projected to occur, the Full Direct Hourly Cost was used to cost any local transit service improvements for 2035. This reflects the need to potentially expand administration costs (e.g. hire new on-road supervisors, etc.).

Figure 4 – Estimated Growth in Hourly Operating Costs

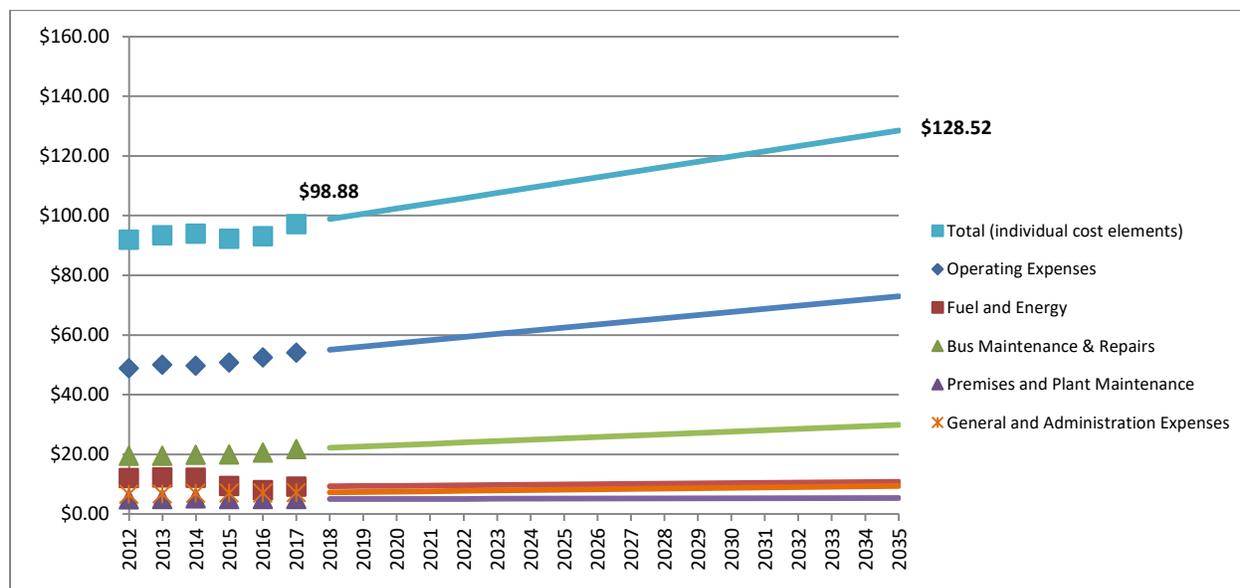


Table 6 provides the hourly operating cost that was applied to local bus services each year based on the estimated service hours in **Section 3.0** above.

Table 6 – Summary of Hourly Operating Cost for Local Bus Services (2017 – 2035)

2017	2018	2019	2035
\$97.14	\$98.88	\$100.62	\$128.52

Total annual costs based on the above rates are represented in **Table 7** below. For the BRT system, cost estimates were provided by the Shift team.

Table 7 – Summary of Annual Operating Cost (2018 – 2035)

System	2018	2019	2035
Local Fixed-Routes	\$67,445,000	\$70,675,000	\$98,368,000
Community Bus	\$1,644,000	\$1,696,000	\$2,166,000
Local ASD Routes ³	-	\$220,000	\$842,000
North-east BRT Route	-	-	\$12,193,000.00
South-west BRT Route			
Total	\$69,089,000	\$73,451,000	\$113,569,000

4.3 Ridership Forecasts

A ridership forecasting exercise for the 2035 horizon year was conducted using a first principles methodology in the previous 2016 Rapid Transit Integration Framework Report. This represents the completion of the full BRT network along with corresponding service improvements to the local route network as identified in **Section 3.0**.

Ridership forecasts for the BRT network was based on research conducted from other municipalities across North America that have implemented a BRT service. Growth rates from these municipalities were applied to the traffic zones in London that will have a future BRT station, and applied to existing local route ridership. Since there was no change in the BRT network service hours, the forecasted BRT ridership was maintained from the 2016 report.

To calculate the impact of service level enhances to local routes, the 2016 Rapid Transit Integration Framework report used a service elasticity formula to assess impact on ridership. The service elasticity rate was applied to the average service frequency change to determine any impact on ridership from service level improvements. Ridership growth due to population and employment growth, external factors beyond transit’s control (i.e. changing societal attitudes around transit), and system-wide improvements not related to service enhancements (i.e. improved customer service and marketing, increase in use of technology, etc.) were also incorporated into previous forecast.

Local route ridership was also based on the 2016 Report, with a slight increase made due to the change in recommended total service hours for local routes required by 2035. The 2016 Report identified that 708,044 total service hours would be in operation by 2035. The adjustments made to local routes and services undertaken as part of this 2018 Report will result in a slight increase in total service hours from the 2016 Report (17,575 revenue service hours). This represents a 2.5 percent increase in recommended service hours. Since local route ridership estimates were based on a service elasticity formula of 0.3, a 0.75% increase in ridership was conservatively assumed from the previous ridership forecasts.

³ Alternative Service Delivery (ASD) assumed to operate for 6 hours per day, weekdays only

Table 8 represents the existing 2017 ridership and the forecasted 2035 ridership.

Table 8 – Projected Annual Transit Ridership (2035)

System	2017	2035
Local Routes and ASD Services	22,918,096	24,474,373
BRT Routes	-	7,287,697
Total	22,918,096	31,762,070

4.4 Passenger Revenue

London receives revenue from three sources: passenger fares, U-pass revenue and other operating revenue (e.g. advertising).

Passenger fares are calculated by multiplying the average fare by the projected ridership. The average fare is calculated by dividing the total passenger revenue by the total revenue passengers. The current average fare along with the projected increase (due to fare increases) is illustrated in **Table 9**.

Table 9 – Summary of Annual Average Fare

2017	2018	2019	2035
\$1.37	\$1.39	\$1.41	\$1.79

The average fare noted above assumes both an increase in fares charged to customers as well as U-Pass rate, and incorporates a 1.5 percent annual increase.

The projected revenue for the forecast 2035 horizon year is illustrated in **Table 10**. Other operating revenue was also added to the passenger revenue projections. In 2017, London Transit received \$1.03 million in non-farebox operating revenue. This was held constant to 2035.

Table 10 – Projected Passenger Revenue (Forecast 2035 year)

System	2017	2035
Fare Revenue	\$31,304,260	\$56,718,204
Other Revenue	\$1,028,940	\$1,028,940
Total	\$32,333,200	\$57,747,143

4.4.1 Financial and Operating Performance

Table 11 presents a summary of the forecasted 2035 financial and operating performance with the implementation of RT.

Table 11 – Projected Transit Ridership and Financial Performance

System	2017	2035
System Performance		
Population	389,000	458,698
Annual Revenue Service Hours	614,210	809,009
Revenue Passengers	22,918,096	31,762,070
Boardings Per Capita	58.92	69.24
Boardings Per Revenue Service Hour	37.31	39.26
Financial Performance		
Annual Revenue	\$32,333,199	\$57,747,143
Annual Operating Cost	\$64,854,162	\$113,569,000
Total Revenue/Total Operating Cost Ratio	49.86%	50.85%
Net Operating Cost	\$32,520,963	\$55,821,857

4.5 Capital Requirements

The only capital cost represented for LTC is for fleet. Fleet requirements for LTC were calculated based on the recommendations contained in the recommended route structure and phasing plan outlined in **Section 3.0** of this report. Fleet requirements for LTC were estimated based on existing allocation of articulated 60-foot buses between routes, and a spare ratio of 20%. It has been assumed that regular 40-foot buses are used as spares for articulated buses. A separate vehicle has been identified for the ASD service. **Table 12** illustrates LTC’s fleet requirements under each horizon year. Fleet requirements for BRT routes are not noted in this table.

Table 12 – Summary of Annual LTC Fleet Requirements (2018 – 2035)

System	2018	2019	2035
Local Routes (40ft buses)	194	199	217
Local Routes (60ft buses)		13	16
ASD Routes	-	-	4
Total	194	212	237

LTC will require fleet expansion to continue to increase service to better integrate with the BRT corridors. This should be phased in with the phasing of BRT services.

A capital cost for each vehicle type was obtained from LTC, and has been assumed to be \$550,000 for a 40-foot bus, \$400,000 for a smaller bus to serve the ASD areas, and \$872,000 for an articulated (60-foot) bus. The capital costs of vehicles are more closely tied to Canadian-United States exchange rates than inflation, and have not been escalated in the future as these rates are difficult to predict.

Total capital costs based on the above unit costs and requirements are represented in **Table 13** below. For the BRT system, cost estimates were provided by the Shift team.

Table 13 – Summary of Annual Capital Cost (2015 – 2035)

System	2019	2035
Local Fixed Routes	\$2,750,000	\$9,900,000
LTC ASD Routes	\$400,000	\$1,200,000
BRT Routes	\$22,289,667	\$101,646,050
Total	\$25,439,667	\$112,746,050

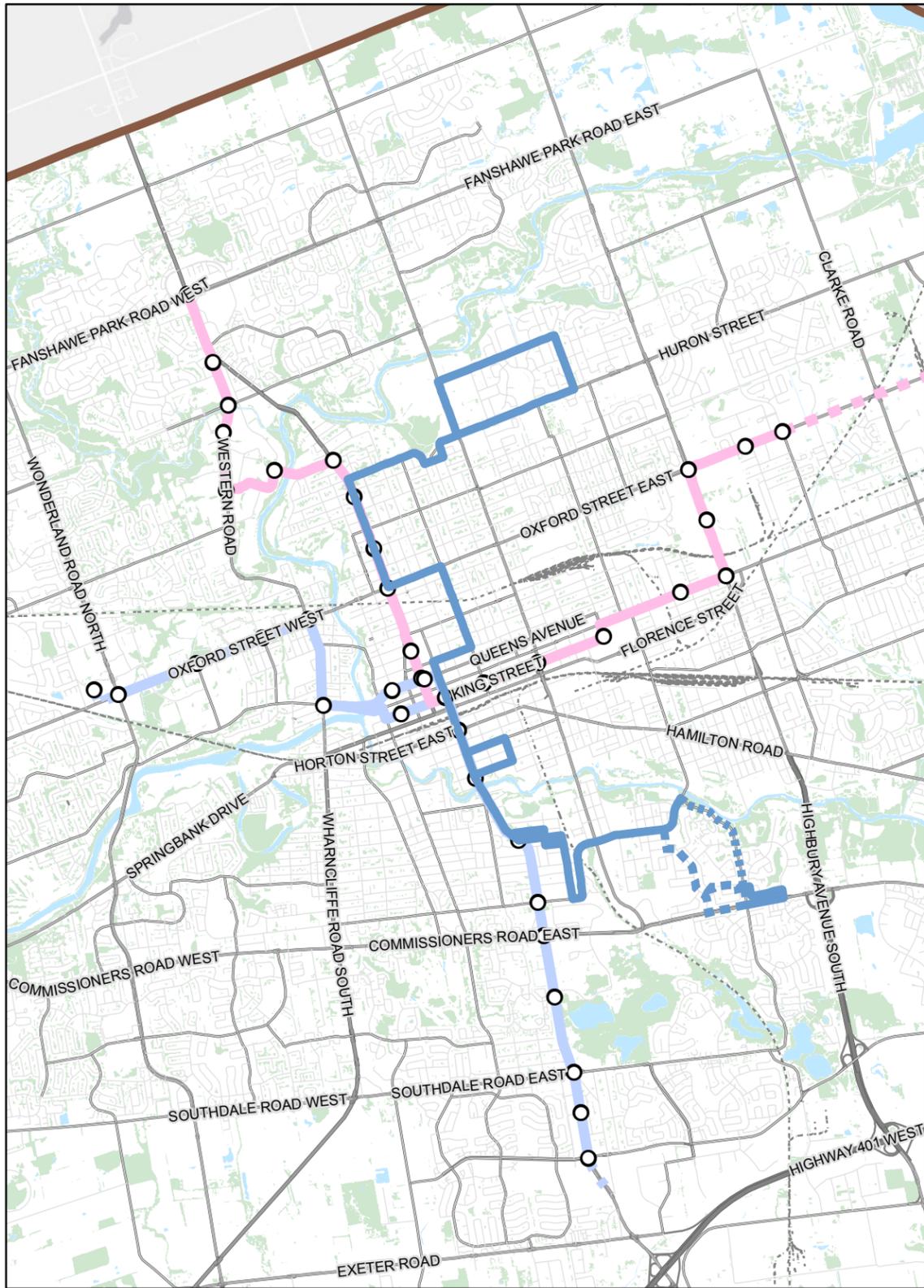
5.0 SUMMARY AND CONCLUSIONS

The Shift Business Case estimates 2035 ridership as 31,600,000, of which 23,700,000 represent rides on local routes and 7,900,000 represent rides on the BRT corridors. Several local routes will be restructured, and several will have improved service as well. The proposed 2035 network includes enhanced local, community and ASD routes providing additional revenue service hours representative of more service. These service improvements will result in increased ridership on local routes as well as connections to the BRT corridors.

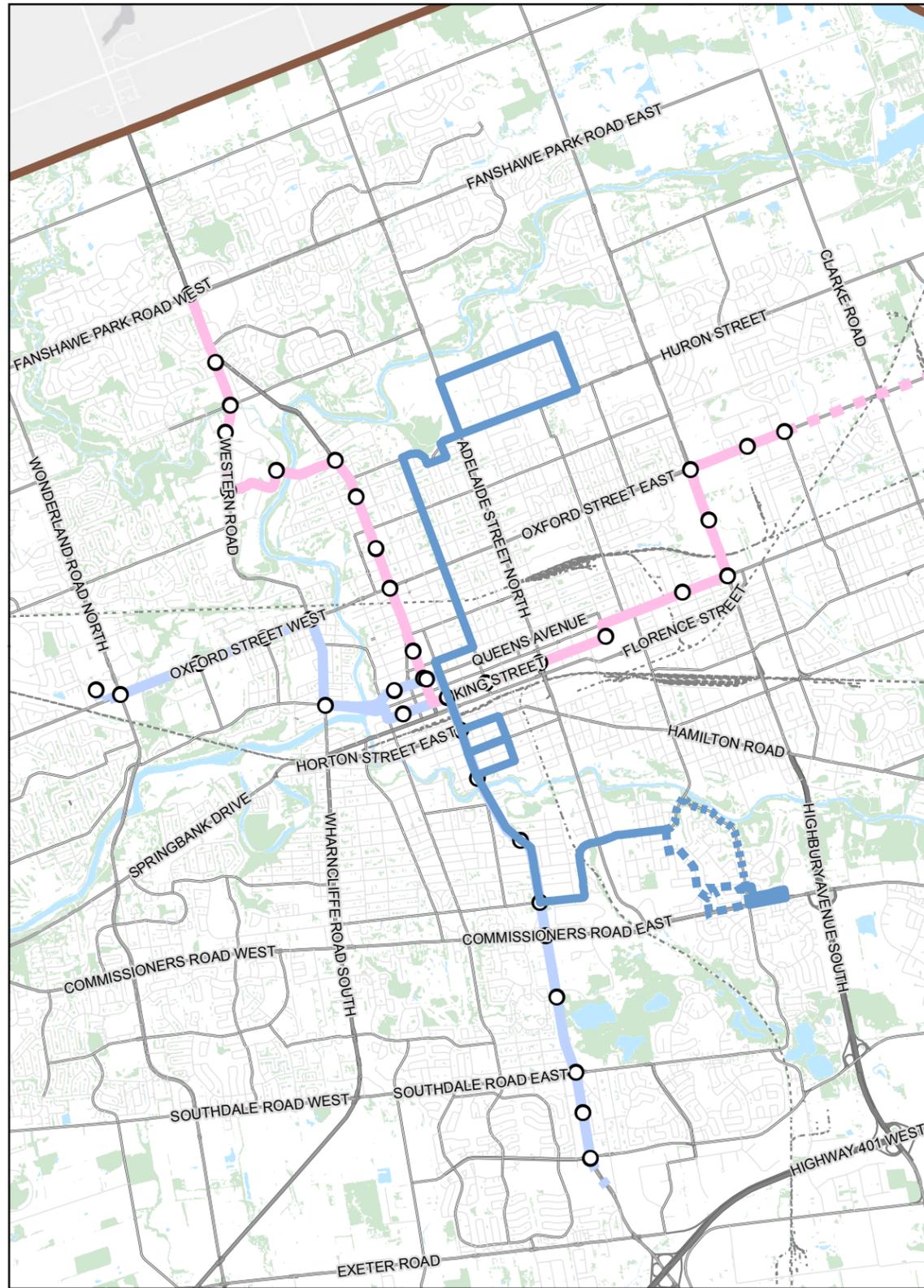
APPENDIX A

Proposed Route Modifications

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: I

2018 Network	2035 Network
I	I
IA	IA
IB	IB

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.75 1.5 3 km



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DATE: 10/24/2018

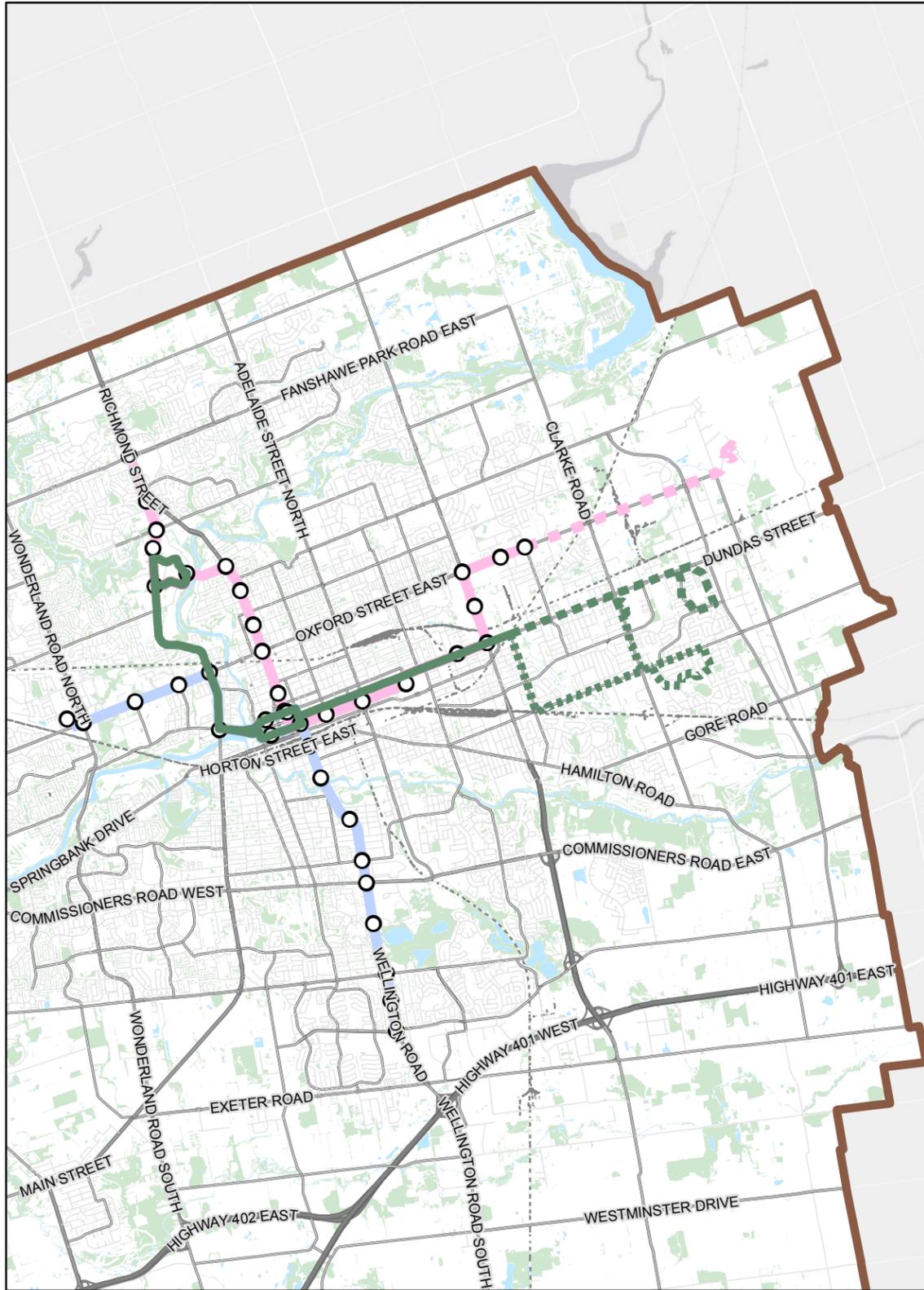
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SATURDAY

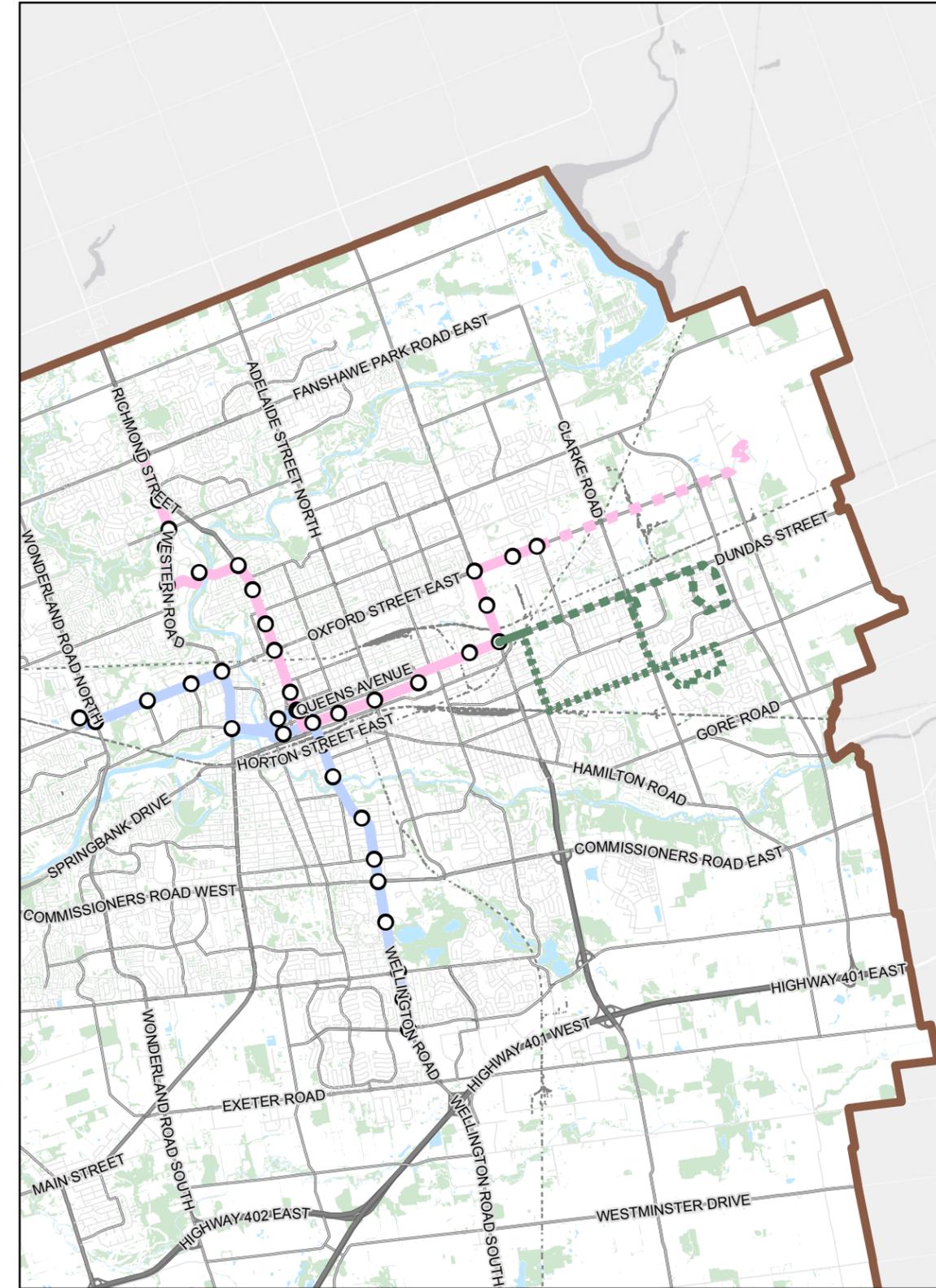
SUNDAY

	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	-	15	20	15	30	30	30	30	20	30	30	-	30	30
PROPOSED 2035	20	10	20	10	30	30	30	20	20	20	30	-	20	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 2, 2A and 2B

2018 Network	2035 Network
2	2A
2A	2B
2B	

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary



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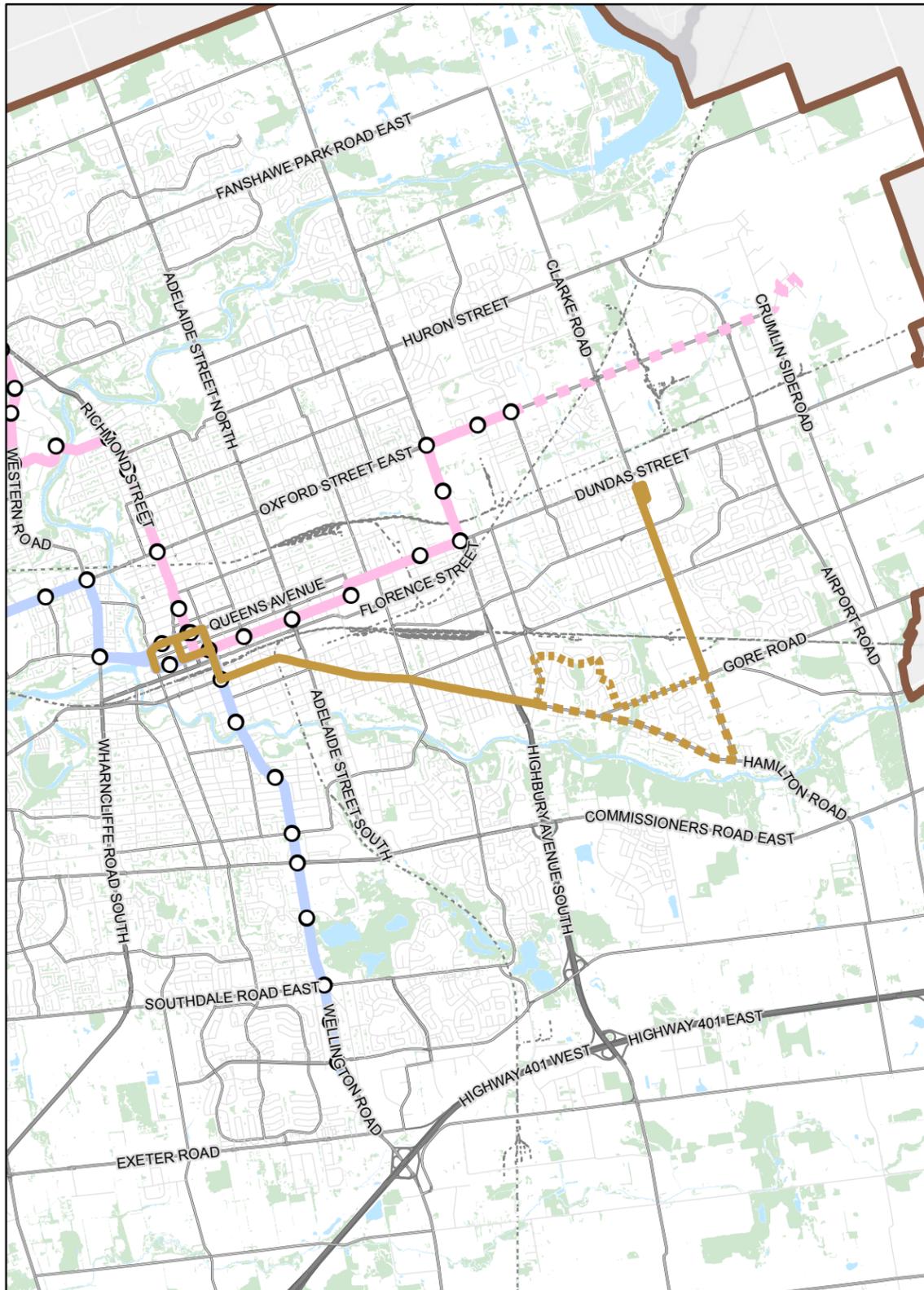


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DATE: 10/24/2018

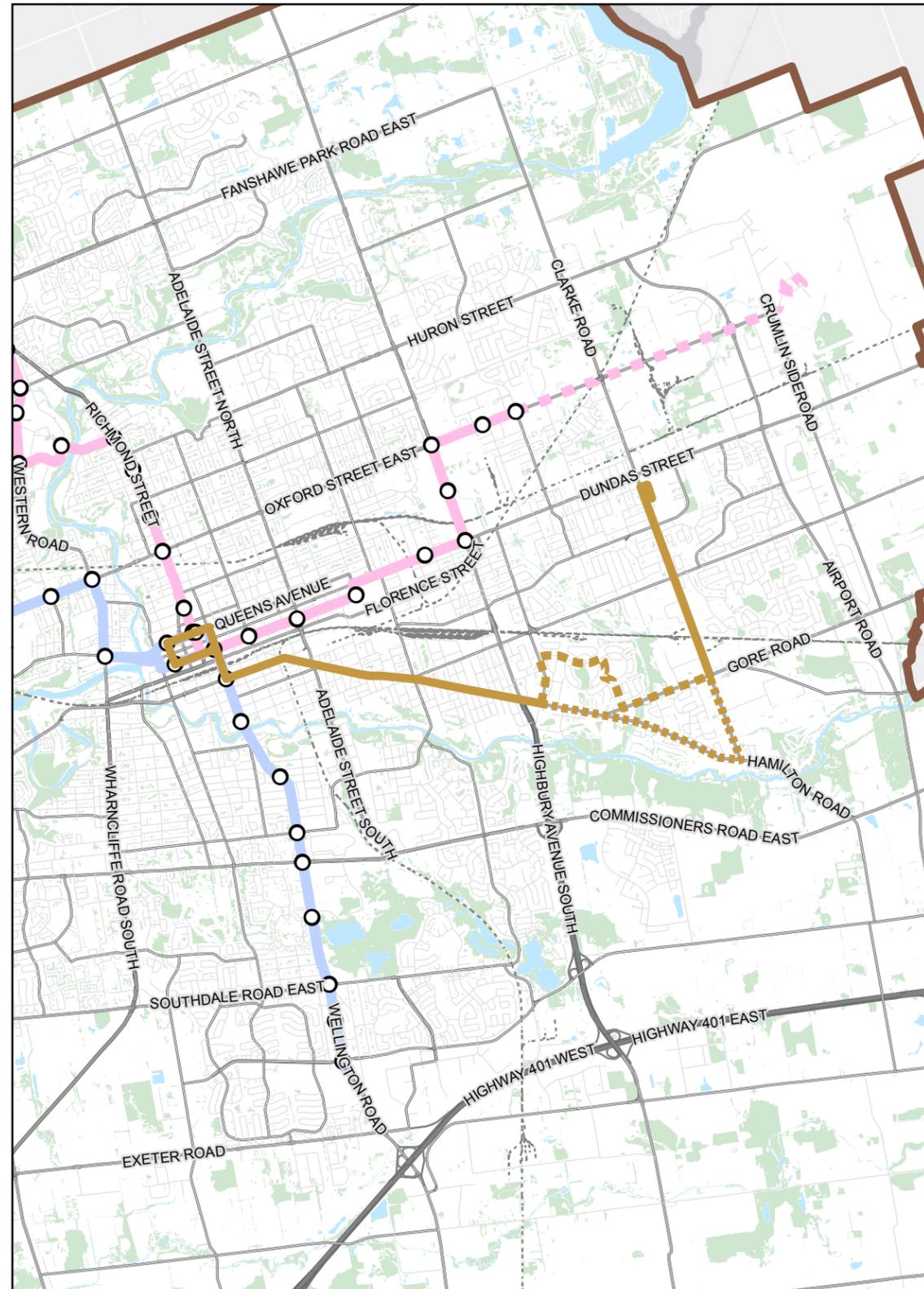
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	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018*	15	15	15	15	15	20	30	15	15	15	30	30	15	30
PROPOSED 2035**	30	17	20	20	30	40	42	28	30	28	45	40	30	40

* Please note, in 2018 Route 2A and Route 2B are patterns operating at half the base frequency
** In 2019, Route 2A and 2B are separate routes operating at the proposed headway

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 3

2018 Network	2035 Network
3	3
3A	3A
3B	3B

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 1 2 4 km



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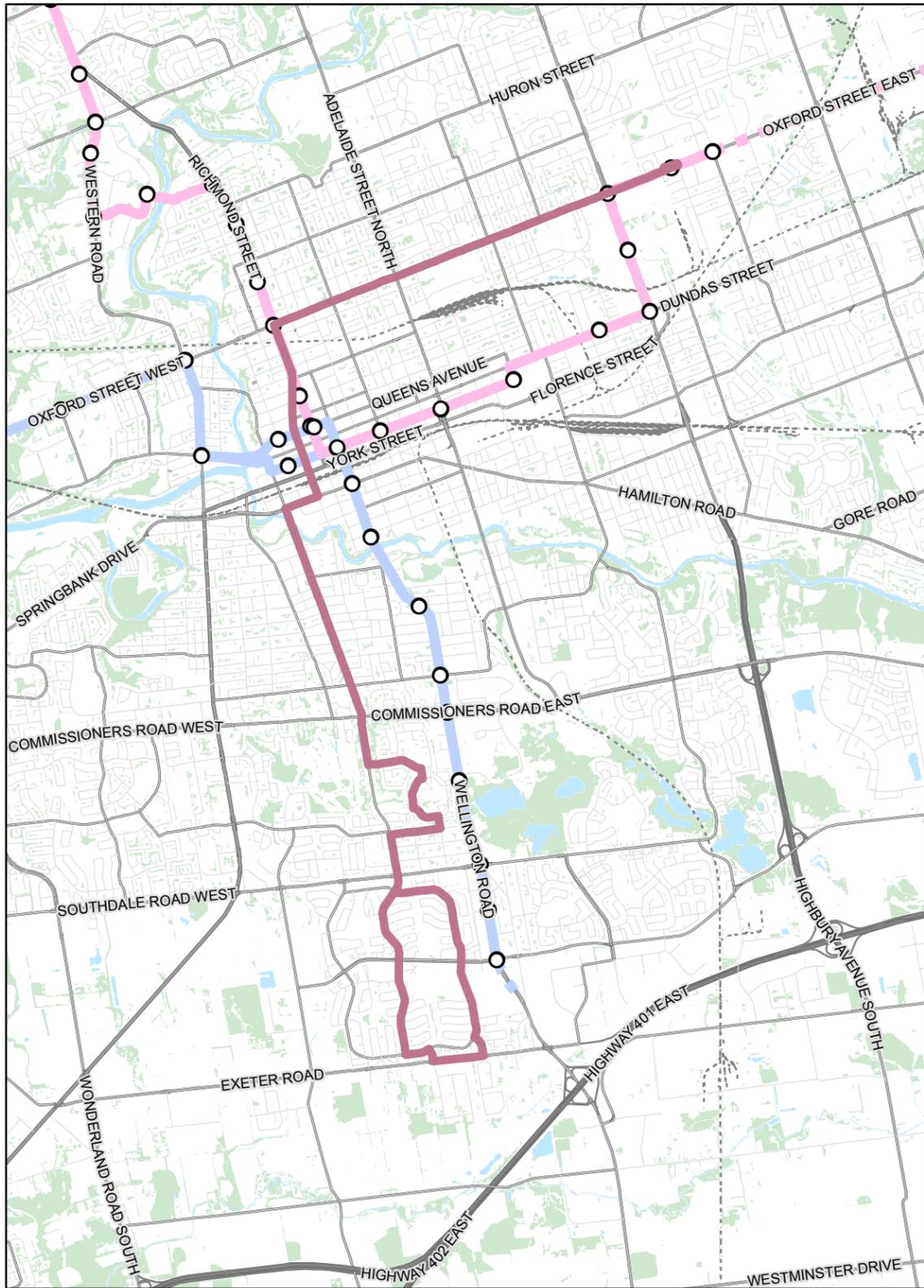
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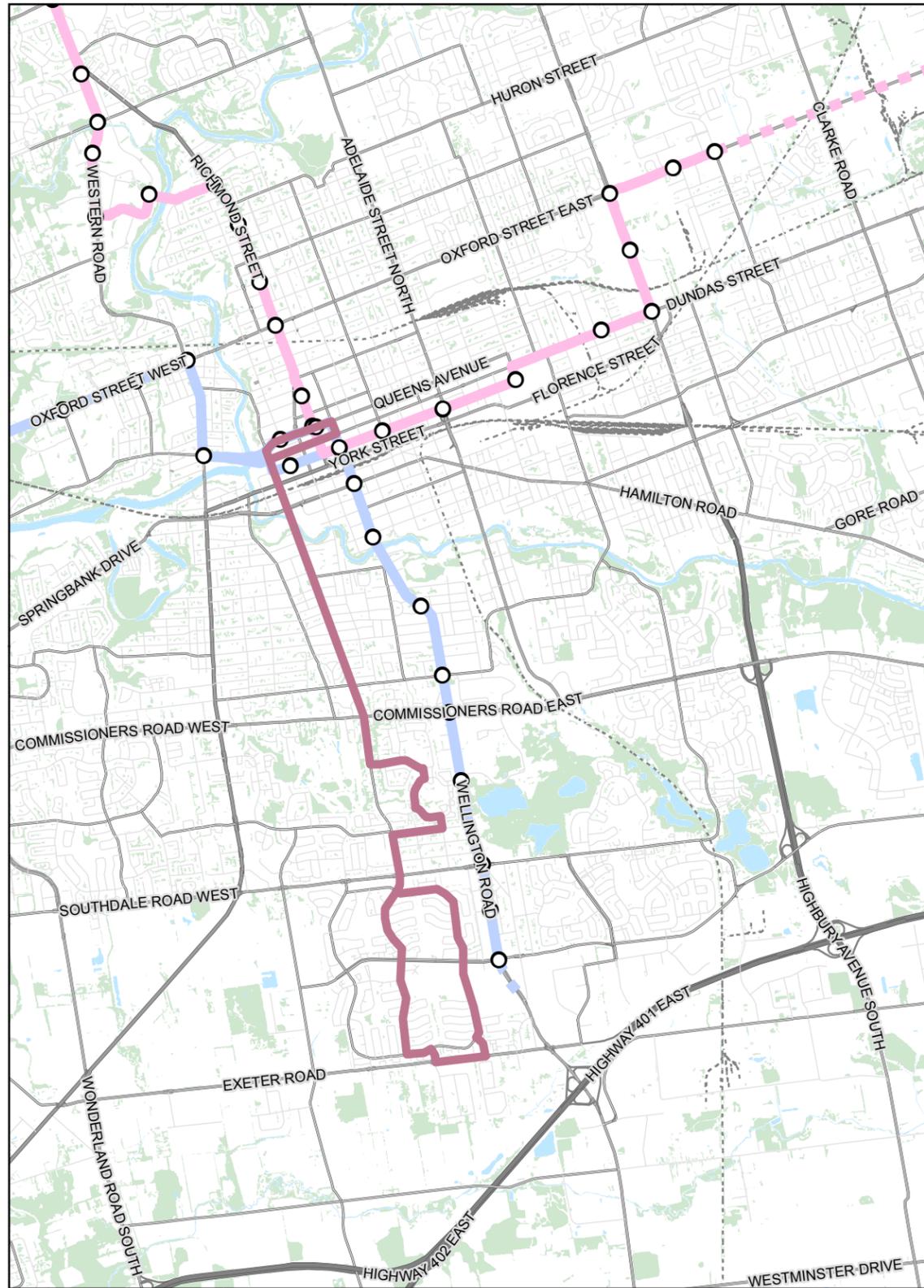
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STATUS: DRAFT
DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	25	15	15	15	30	30	30	30	30	30	30	-	30	30
PROPOSED 2035	15	15	15	15	30	30	30	30	30	30	30	-	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

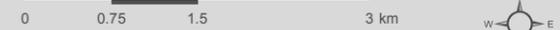
RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 4

2018 Network 2035 Network
— 4 - - - 4

Base Data

- BRT Station
- North-East Route
- South-West Route
- - - Airport Extension
- - - South-West Route (Mixed Traffic)
- - - Railway
- Waterbody
- Forest
- Municipal Boundary



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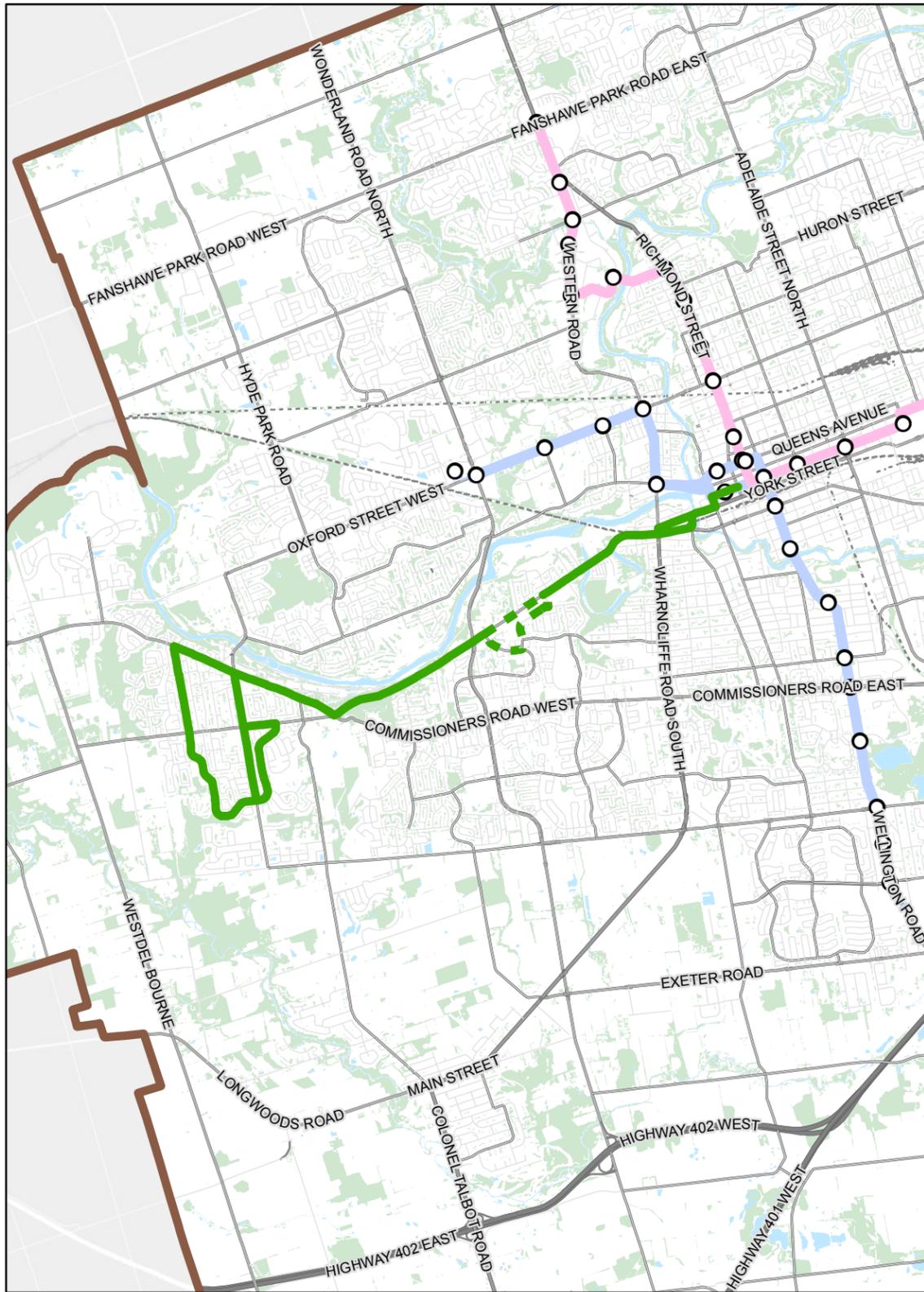
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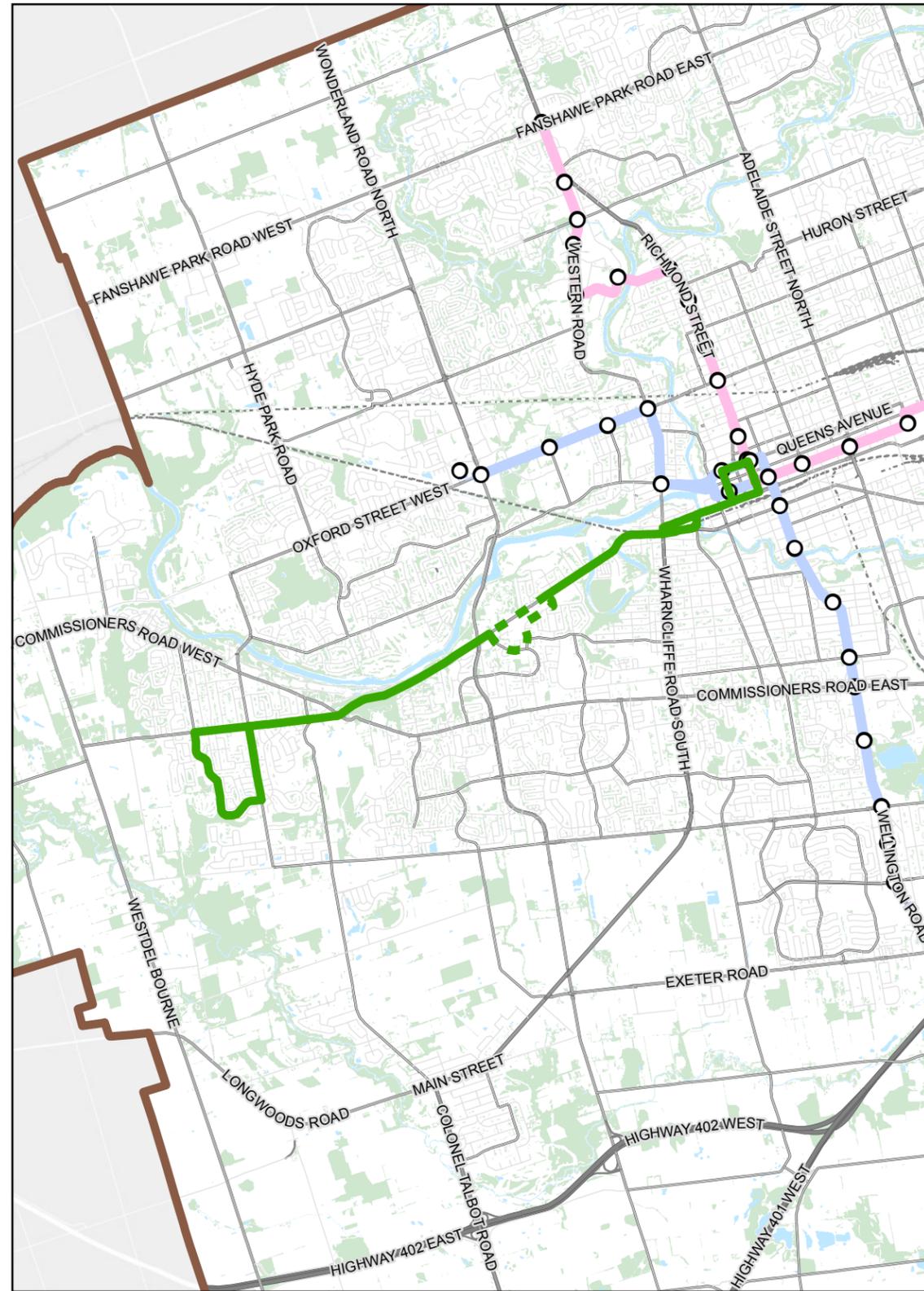
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DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	15	20	15	20	30	30	30	25	30	30	45	30	30
PROPOSED 2035	30	15	20	15	20	30	30	30	25	30	30	45	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 5

2018 Network	2035 Network
5B	5B
5A	5A
5	5

- Base Data**
- BRT Station
 - North-East Route
 - South-West Route
 - Airport Extension
 - South-West Route (Mixed Traffic)
 - Railway
 - Waterbody
 - Forest
 - Municipal Boundary



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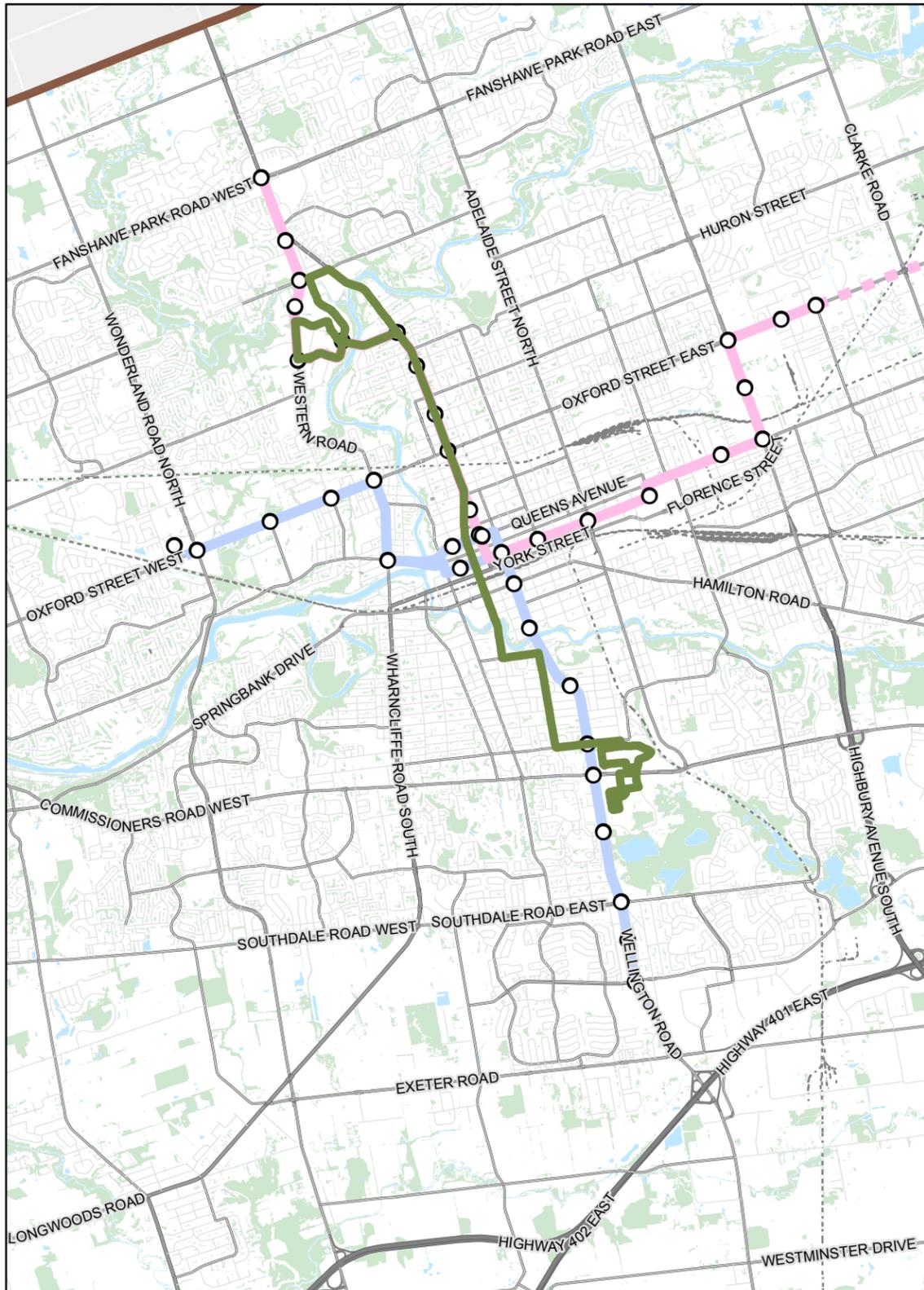
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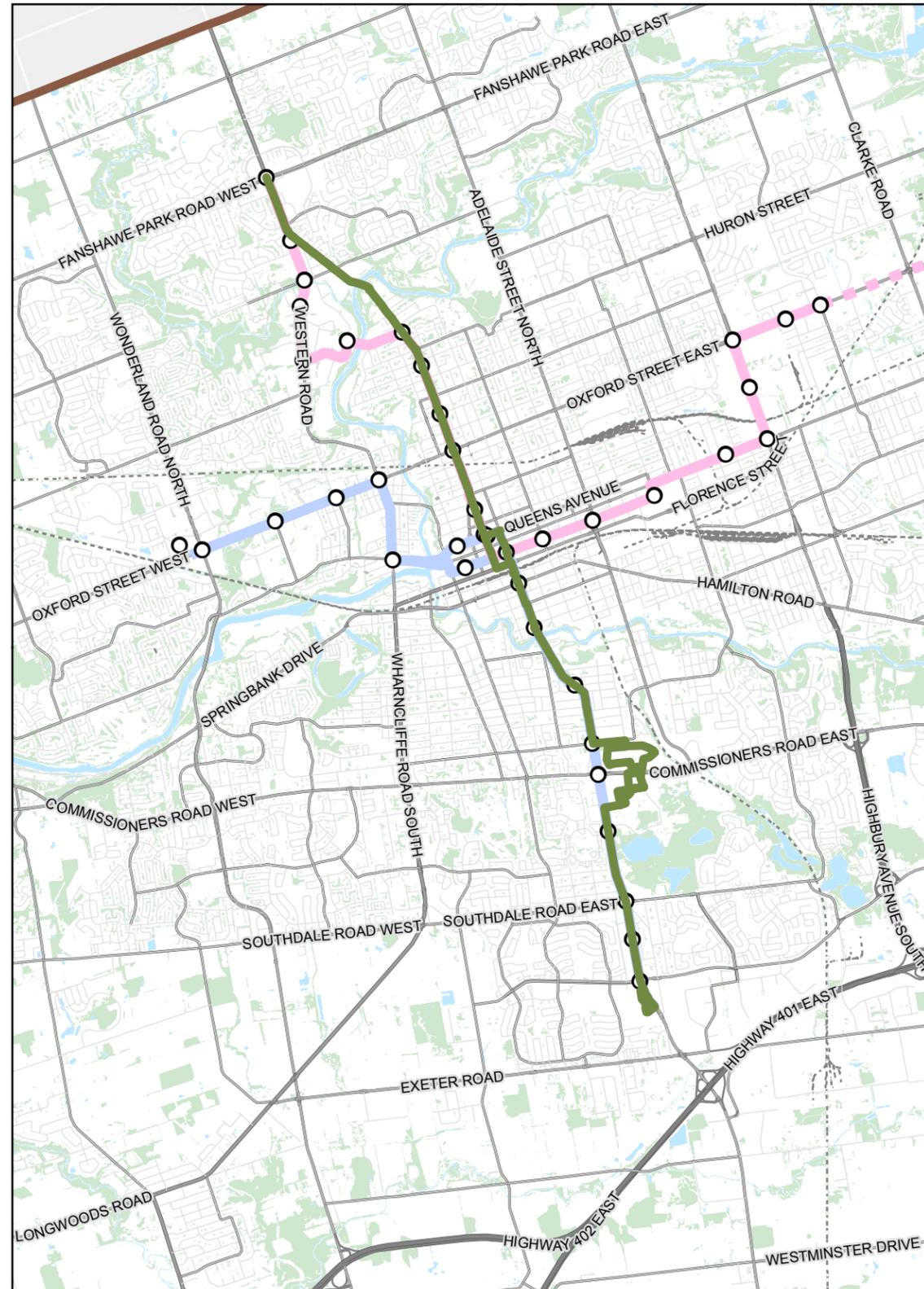
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EXISTING 2018	30	30	30	30	60	60	60	60	30	60	60	-	60	60
PROPOSED 2035	30	30	30	30	60	60	60	30	30	60	60	-	30	60

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 6

2018 Network **2035 Network**
— 6 — 6

Base Data

- BRT Station
- North-East Route
- South-West Route
- - - Airport Extension
- - - South-West Route (Mixed Traffic)
- - - Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.75 1.5 3 km



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PROJECT: 18-8035

STATUS: DRAFT

DATE: 10/24/2018

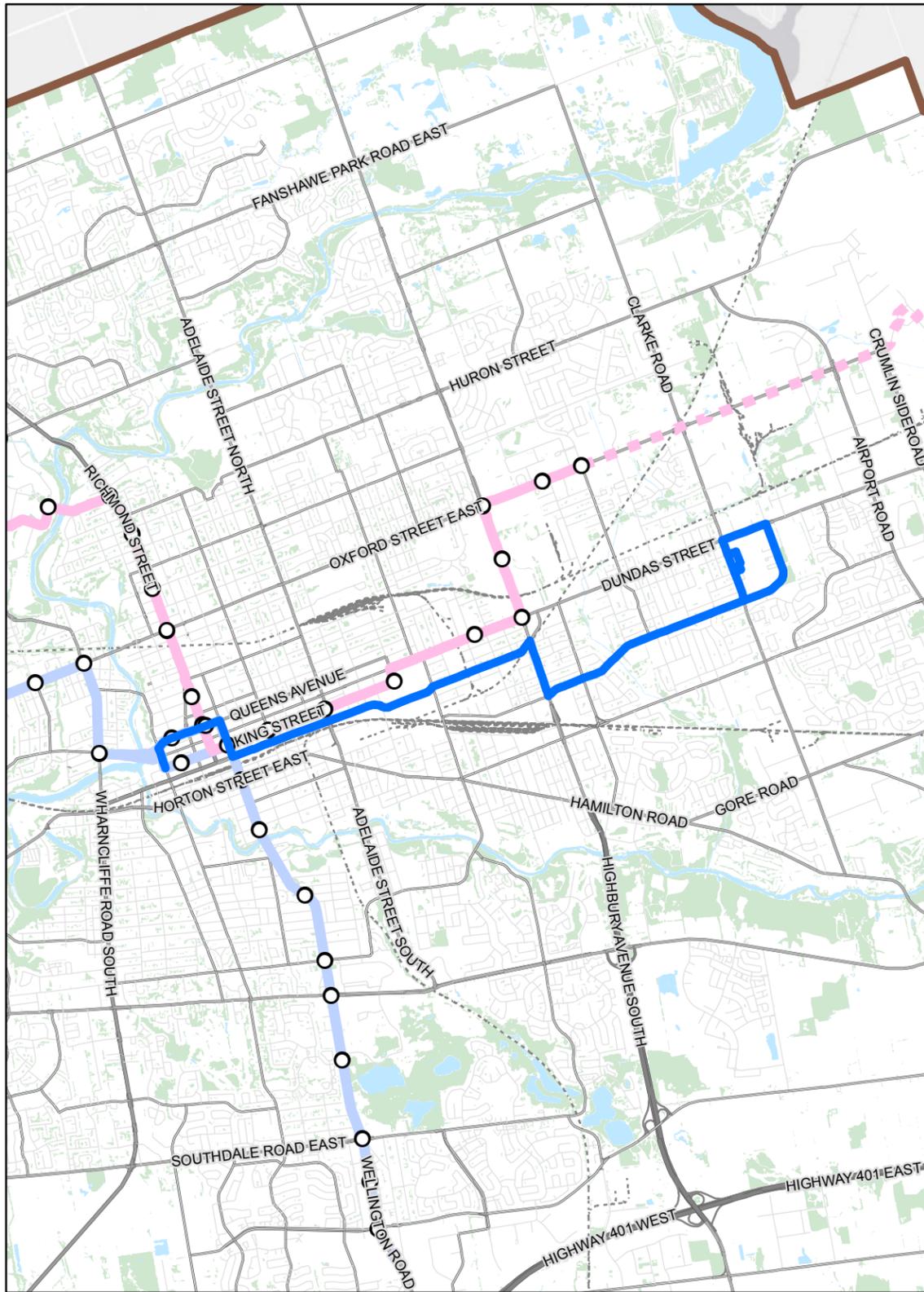
WEEKDAY

SATURDAY

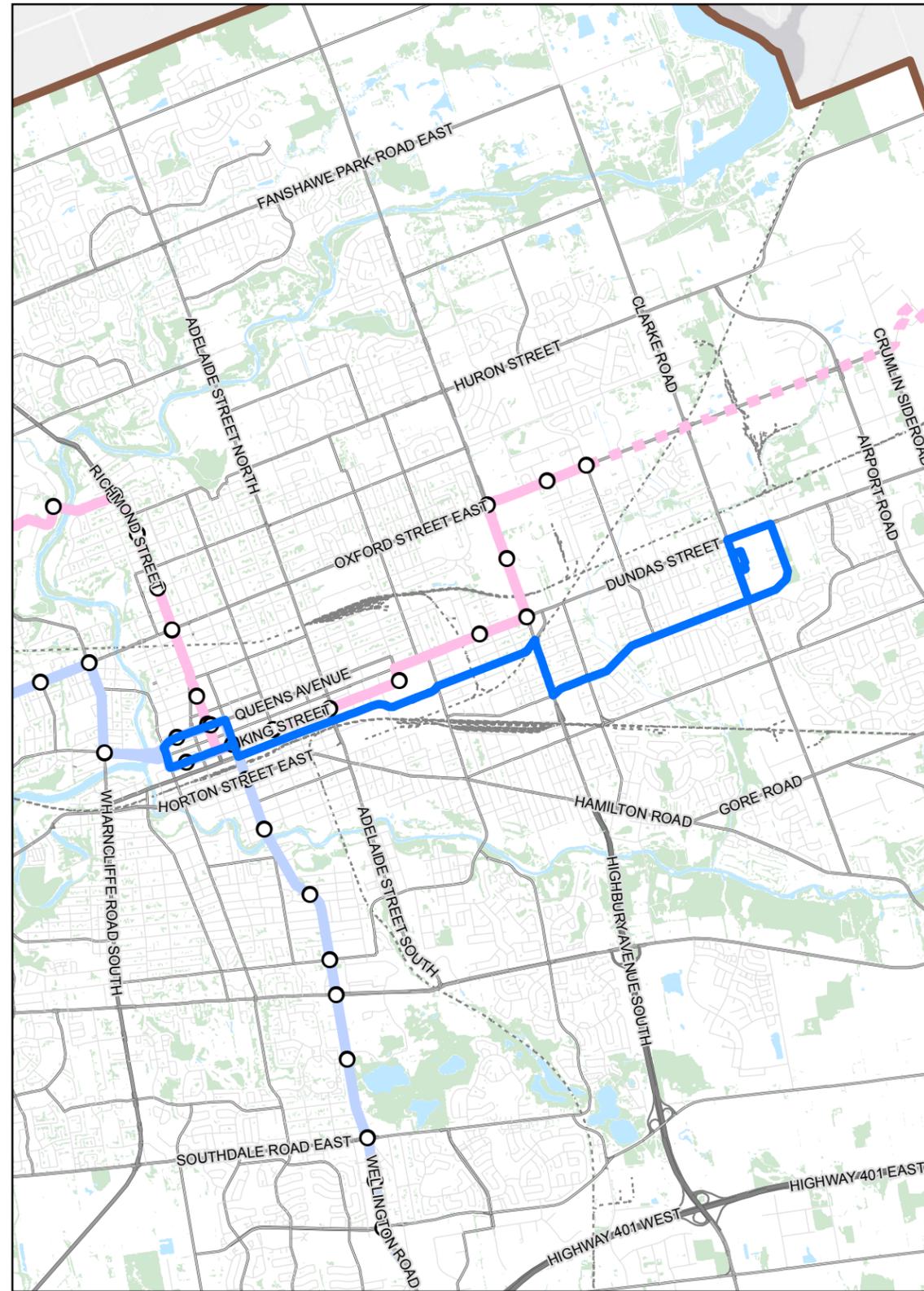
SUNDAY

	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	30	30	25	30	30	35	30	20	30	30	30	30	30
PROPOSED 2035	20	15	20	15	20	30	35	20	20	30	30	30	20	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 7

2018 Network

7

2035 Network

7

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.75 1.5 3 km



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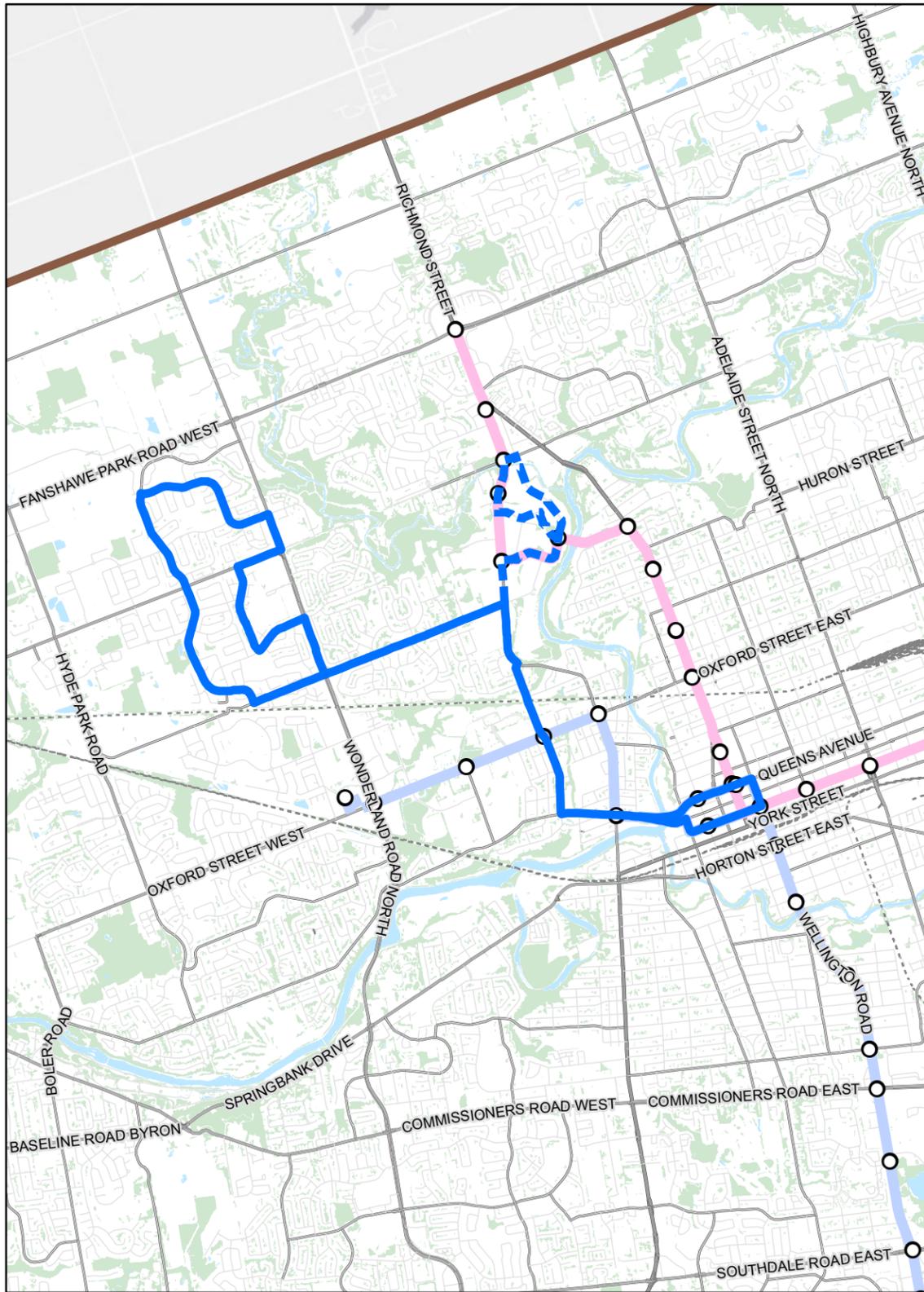
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SATURDAY

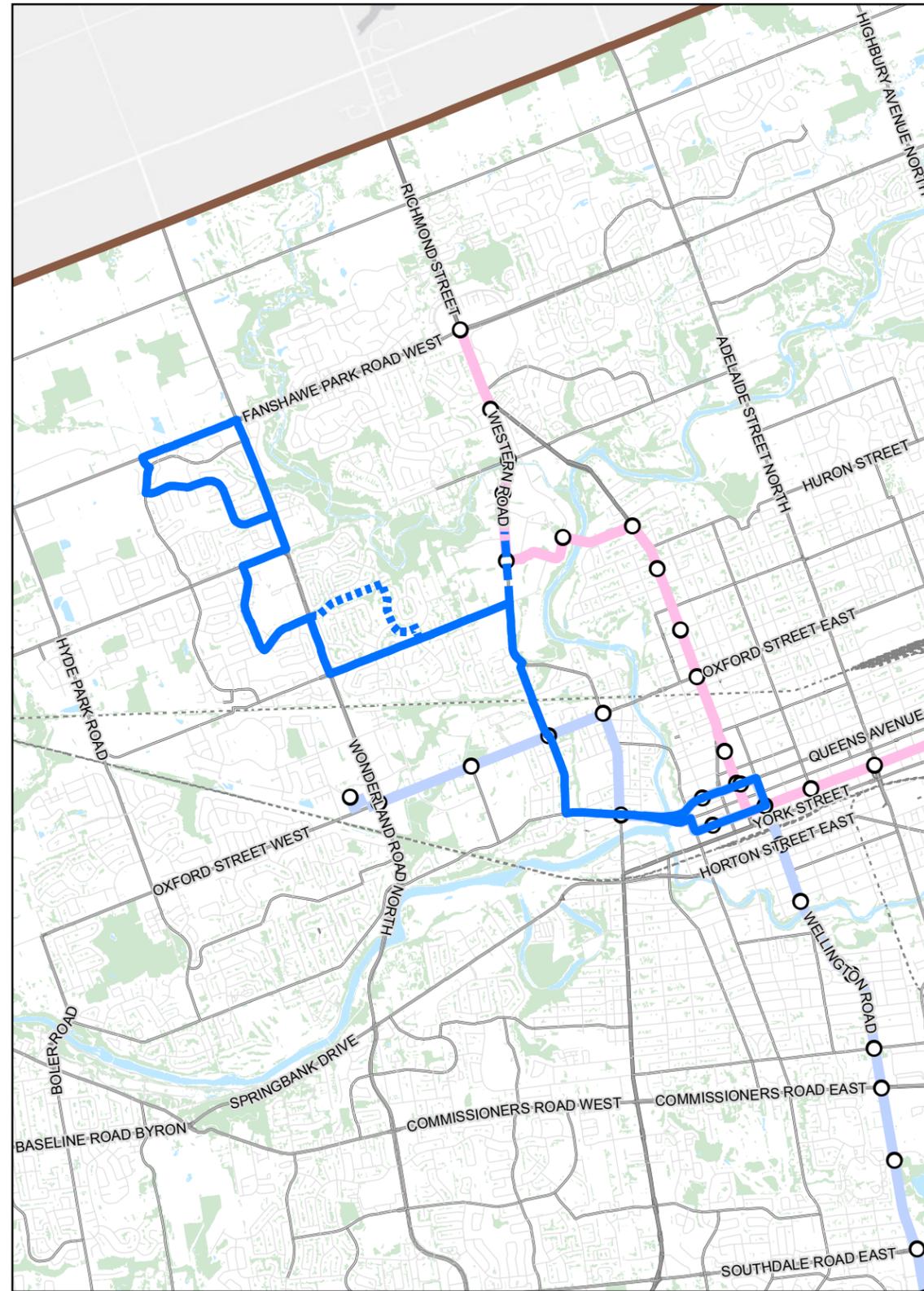
SUNDAY

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EXISTING 2018	30	20	30	20	30	30	60	30	30	30	30	-	30	30
PROPOSED 2035	30	20	30	20	30	30	60	30	30	30	30	-	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 9

2018 Network	2035 Network
9	9
9C	9A
	9C

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary



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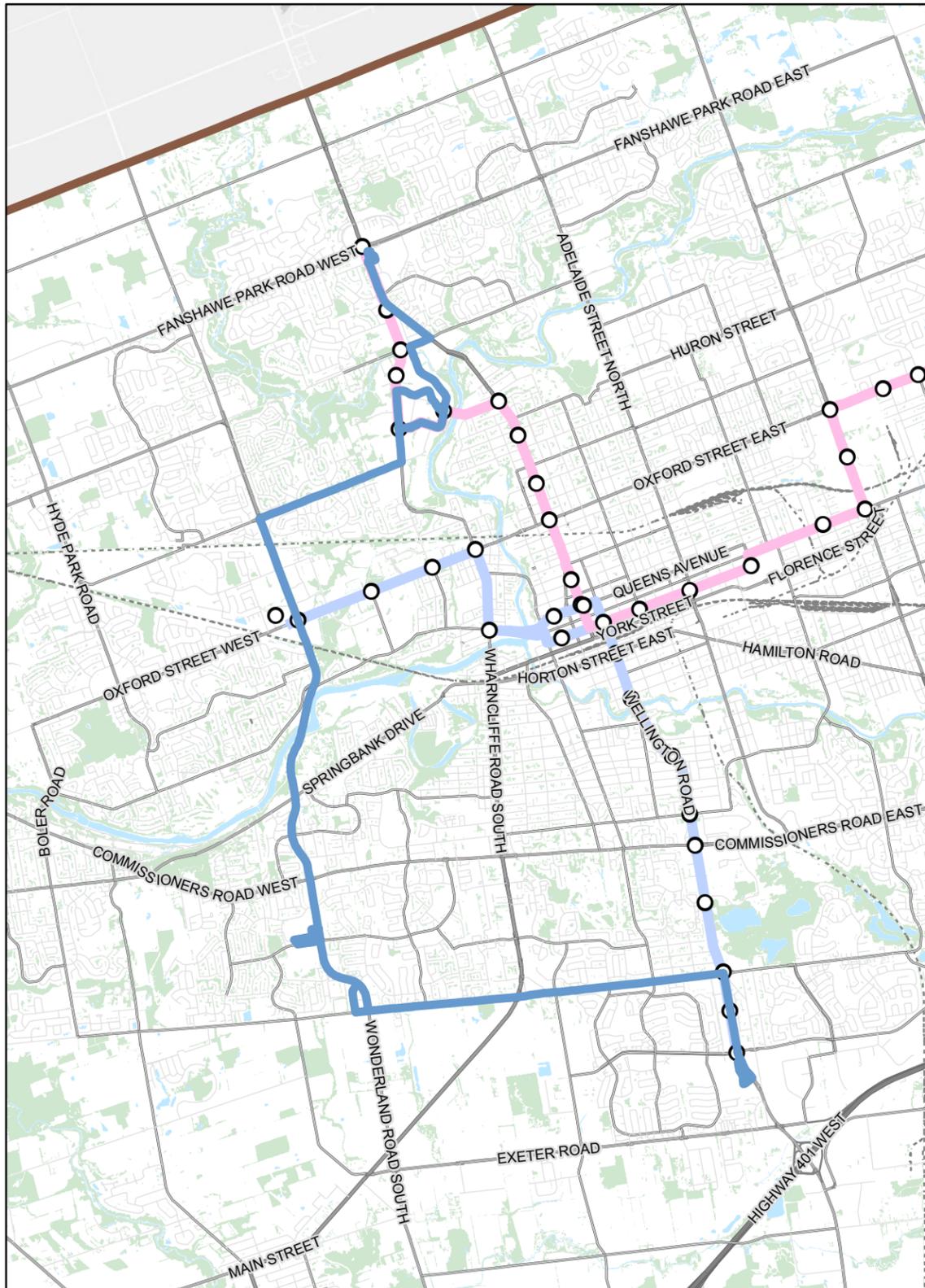
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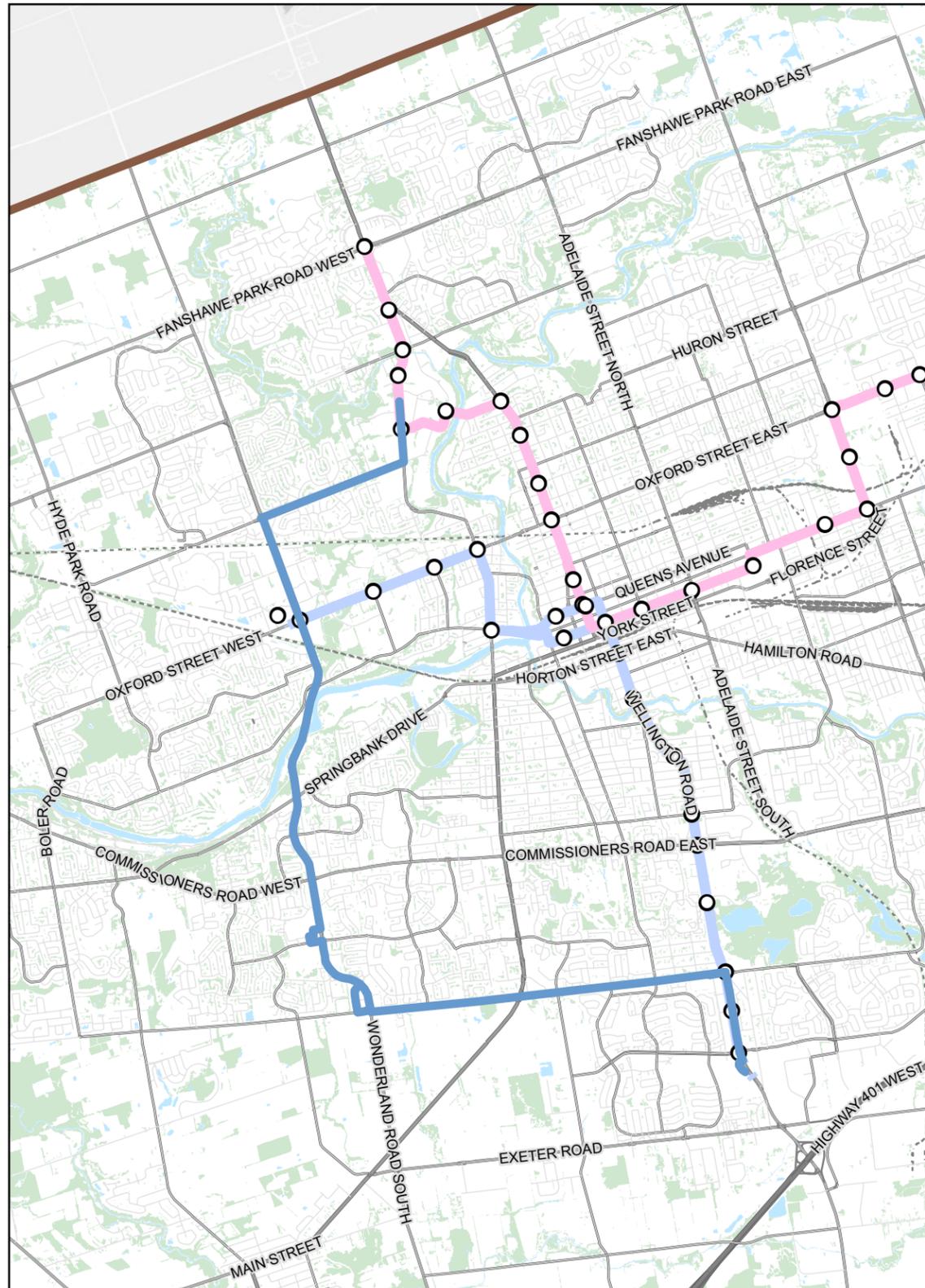
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DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
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EXISTING 2018	15	15	15	15	30	30	60	30	30	30	30	30	30	30
PROPOSED 2035	15	15	15	15	30	30	30	20	20	30	30	30	20	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 10

2018 Network 2035 Network
10 10

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.75 1.5 3 km



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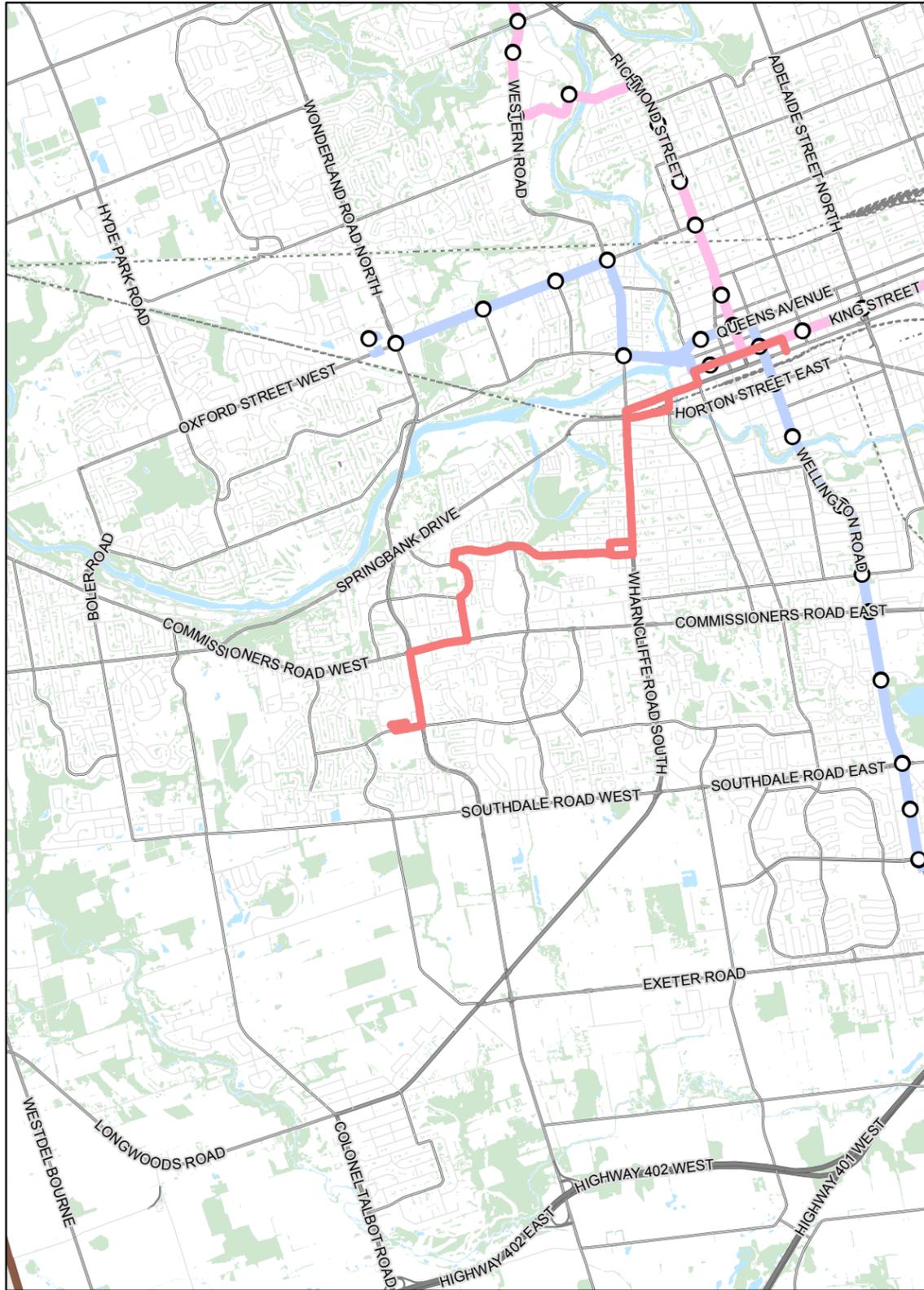
WEEKDAY

SATURDAY

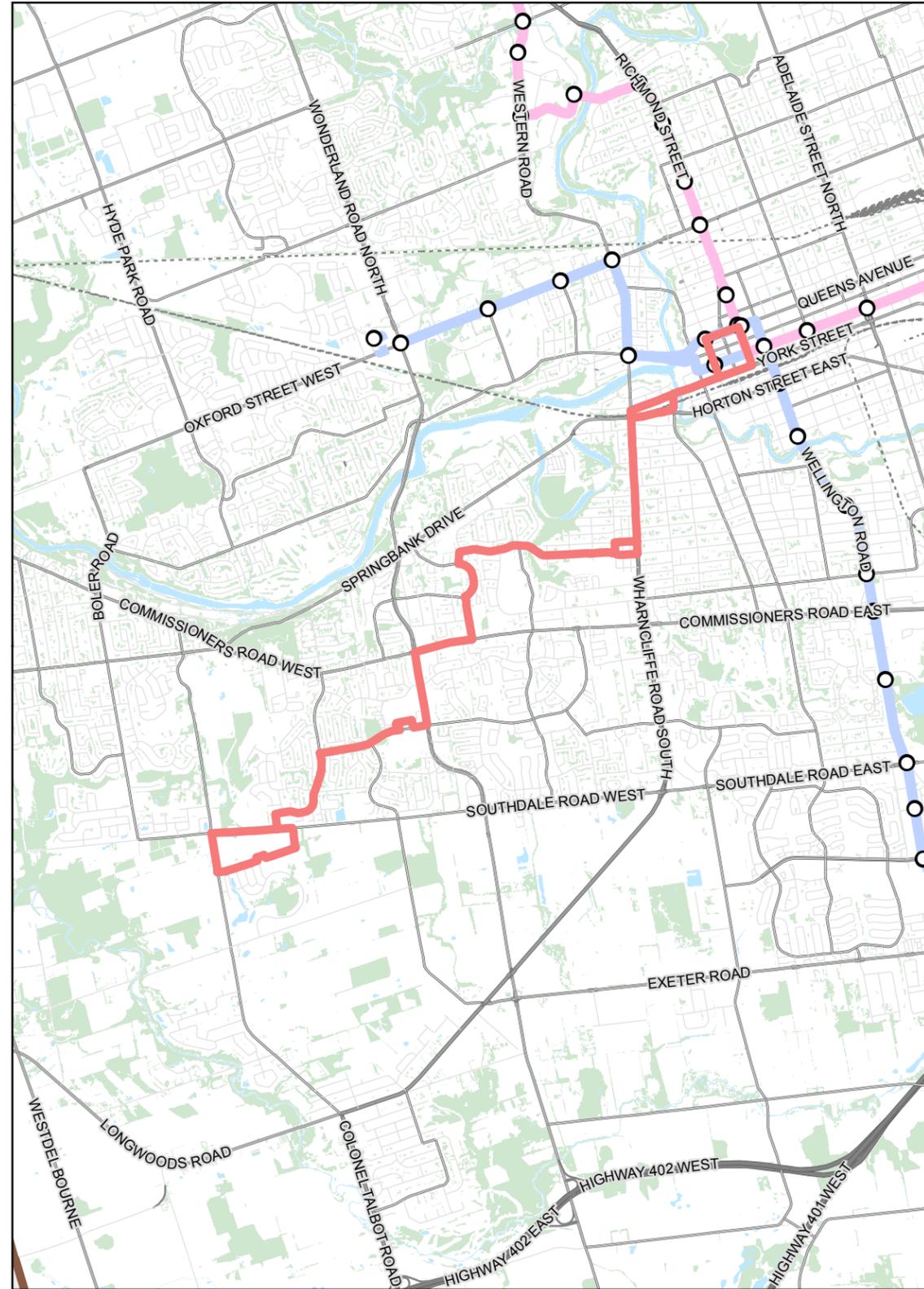
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EXISTING 2018	30	20	30	20	30	30	60	30	30	30	60	45	30	60
PROPOSED 2035	30	20	20	20	20	30	30	20	20	30	30	30	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

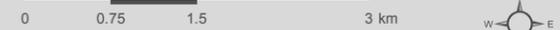
RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 11

2018 Network 2035 Network
— 11 — 11

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- - - Railway
- Waterbody
- Forest
- Municipal Boundary



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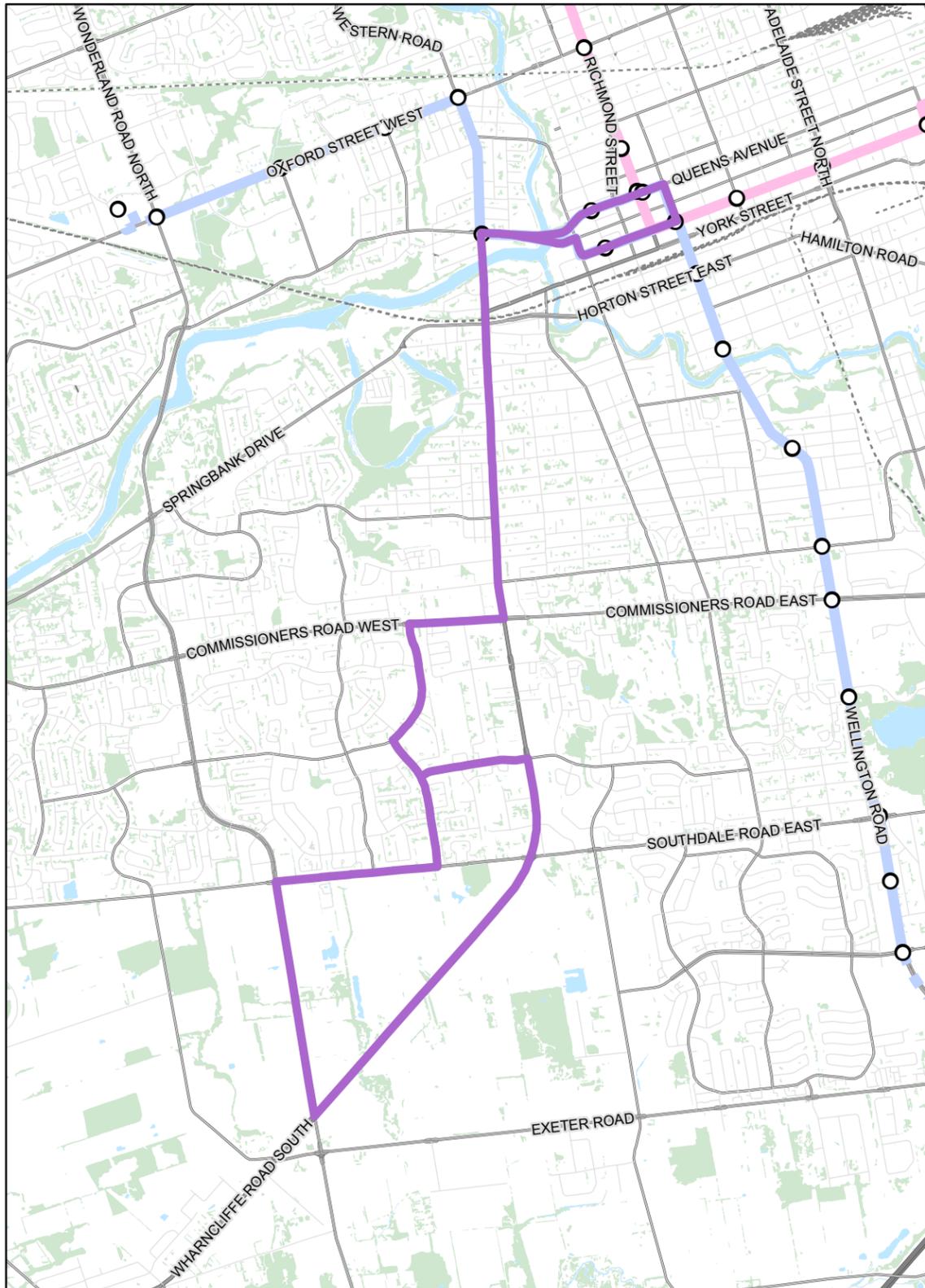
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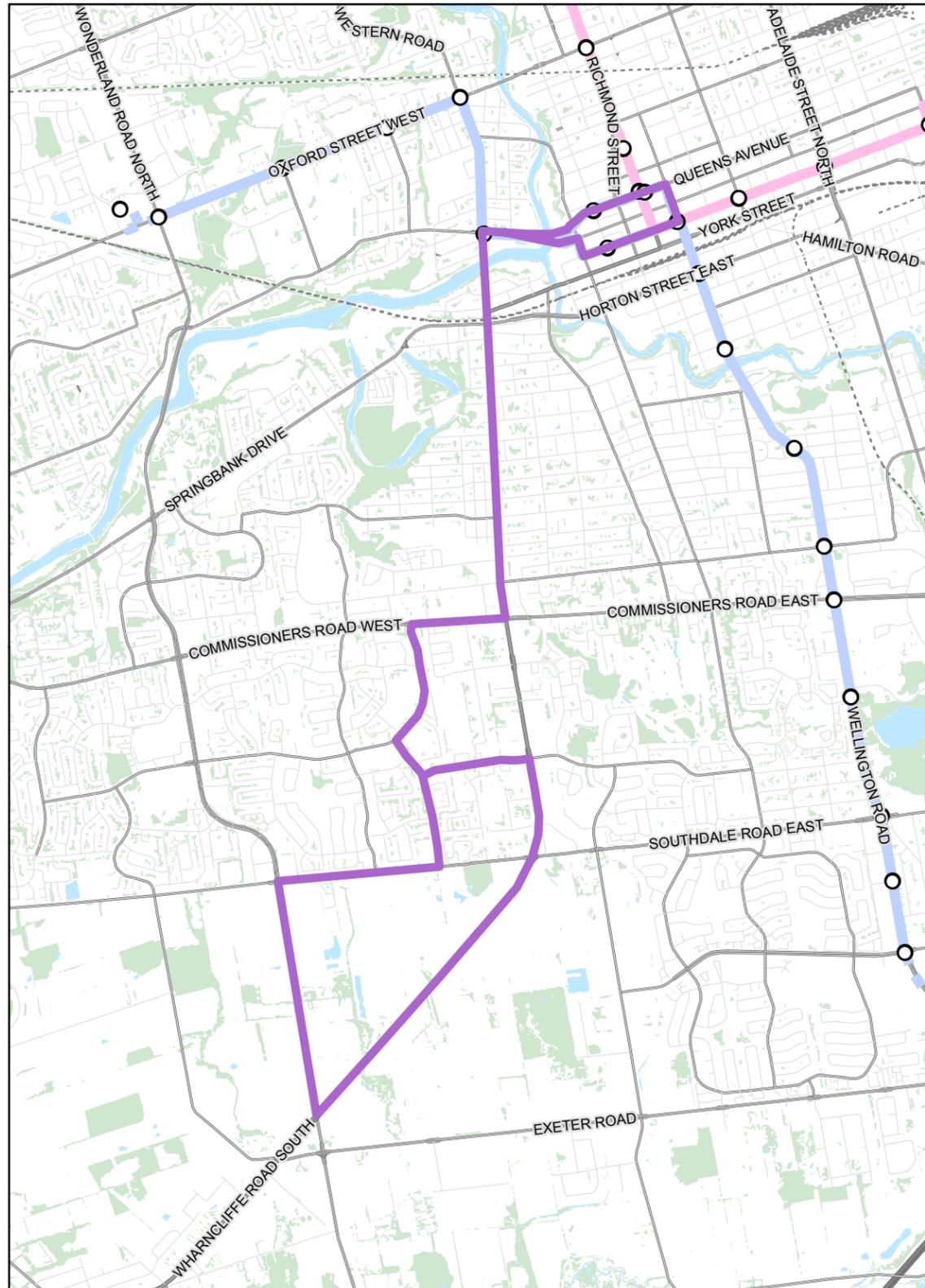
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	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	20	30	20	30	60	60	30	30	30	60	-	30	60
PROPOSED 2035	30	20	30	20	30	30	60	30	30	30	60	-	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



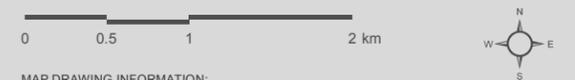
LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 12

2018 Network 2035 Network
12 12

- Base Data**
- BRT Station
 - North-East Route
 - South-West Route
 - Airport Extension
 - South-West Route (Mixed Traffic)
 - Railway
 - Waterbody
 - Forest
 - Municipal Boundary



MAP DRAWING INFORMATION:
DATA PROVIDED BY LTC, MNRF, Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

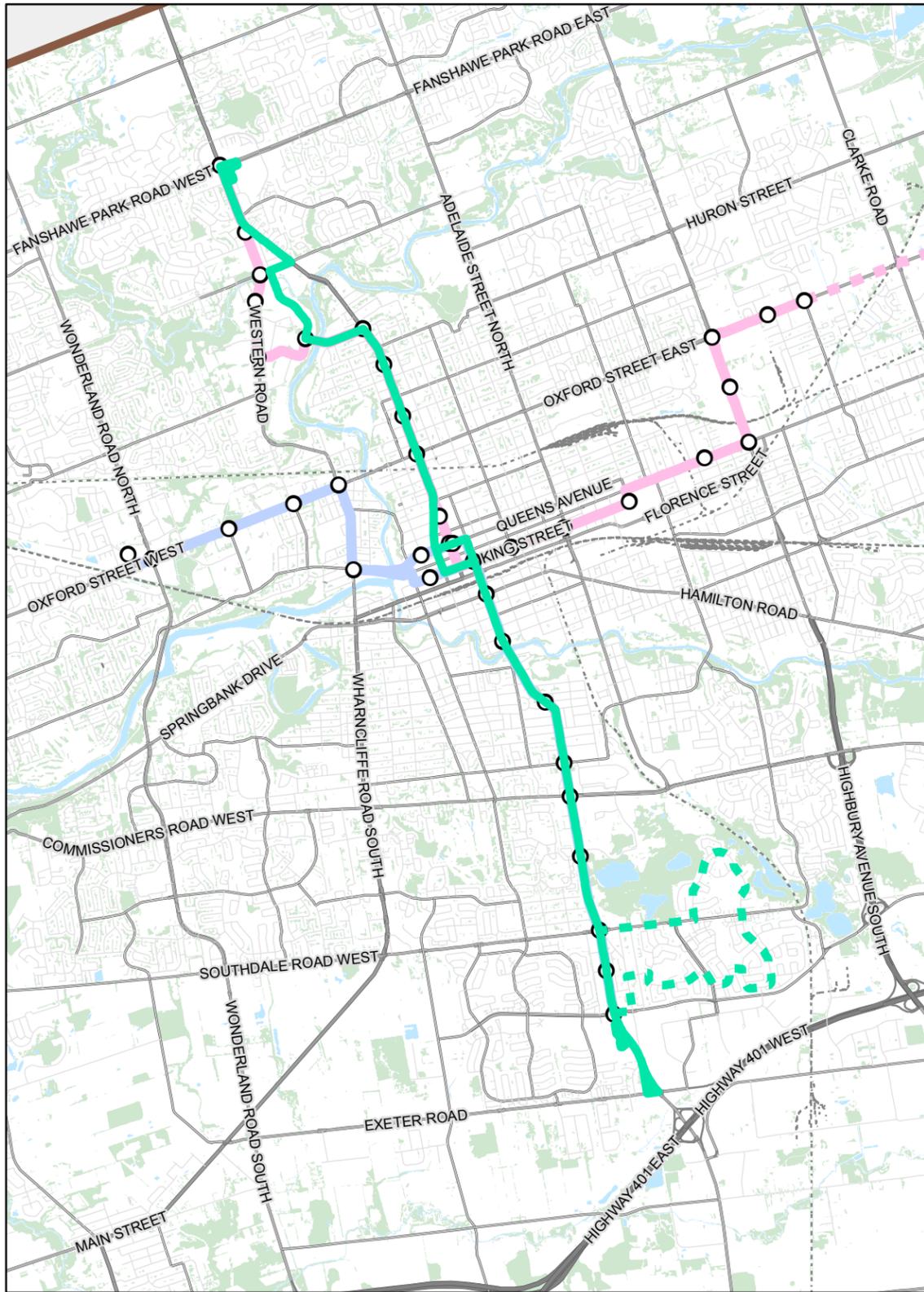
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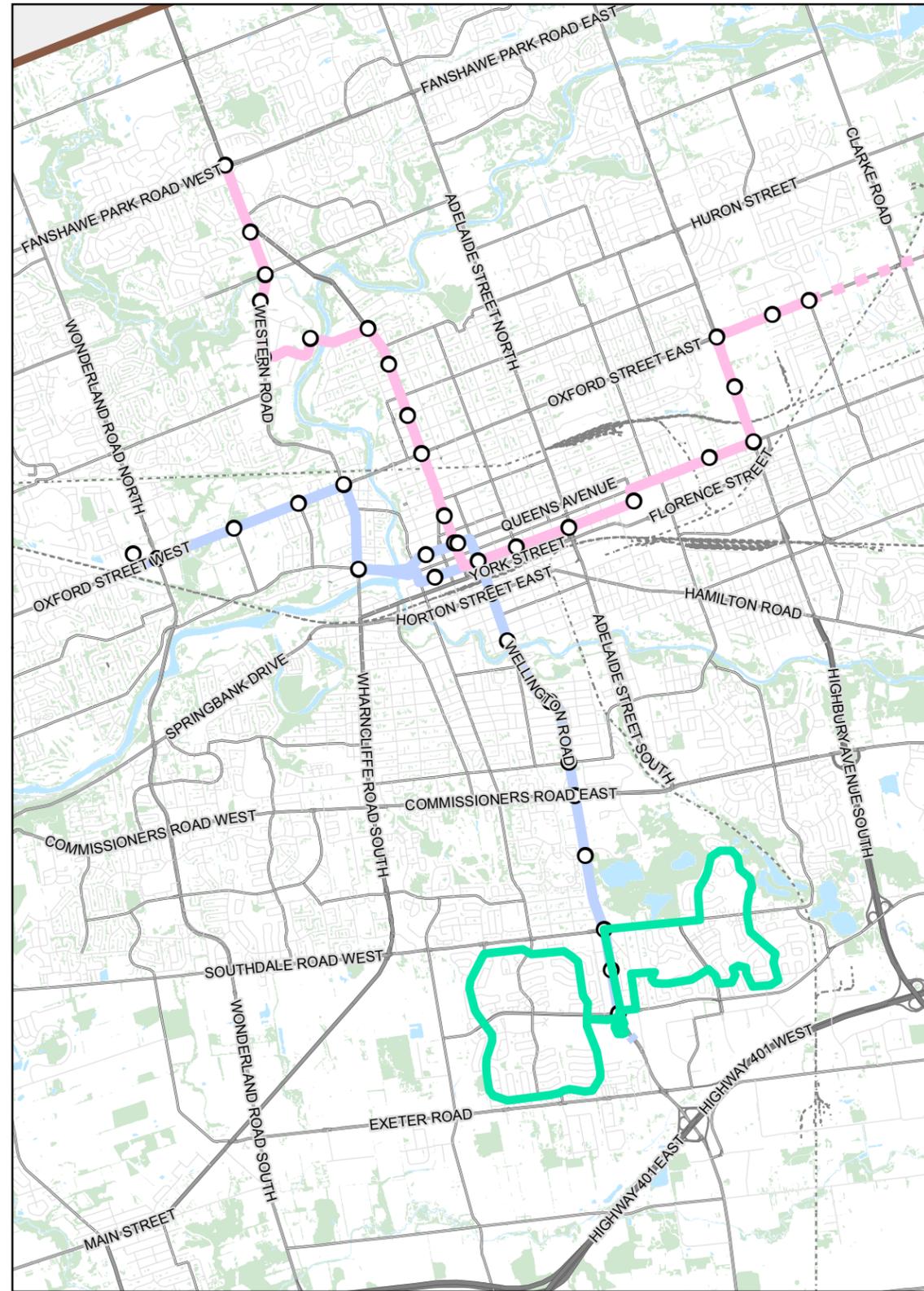
PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	30	30	30	30	60	60	30	30	30	60	-	60	60
PROPOSED 2035	30	20	30	20	30	60	60	30	30	30	60	-	60	60

2018 NETWORK



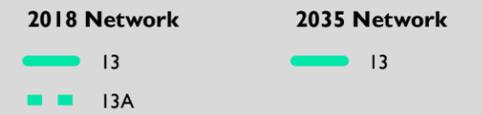
PROPOSED 2035 NETWORK



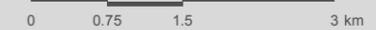
LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 13



- Base Data**
- BRT Station
 - North-East Route
 - South-West Route
 - Airport Extension
 - South-West Route (Mixed Traffic)
 - Railway
 - Waterbody
 - Forest
 - Municipal Boundary



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

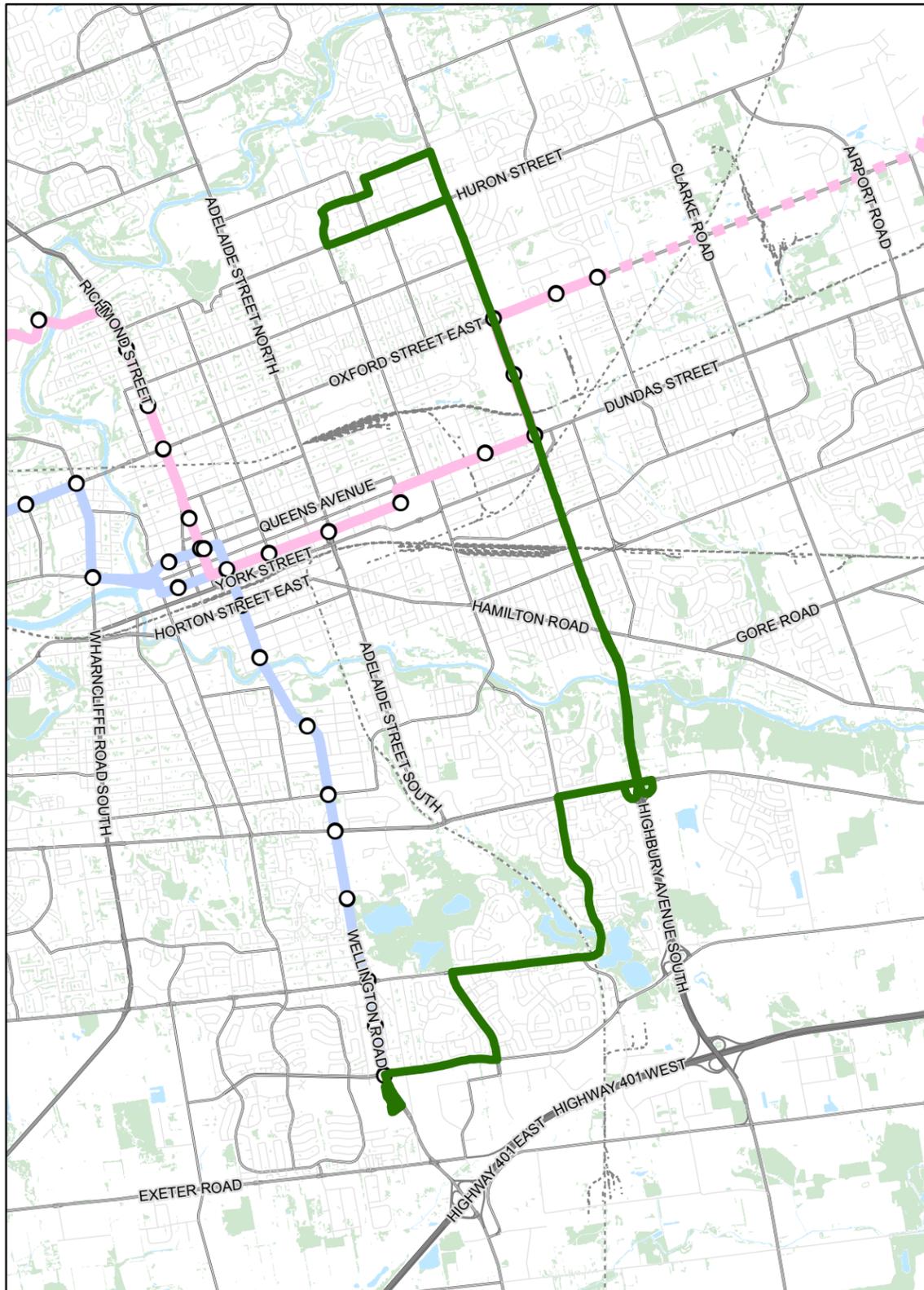
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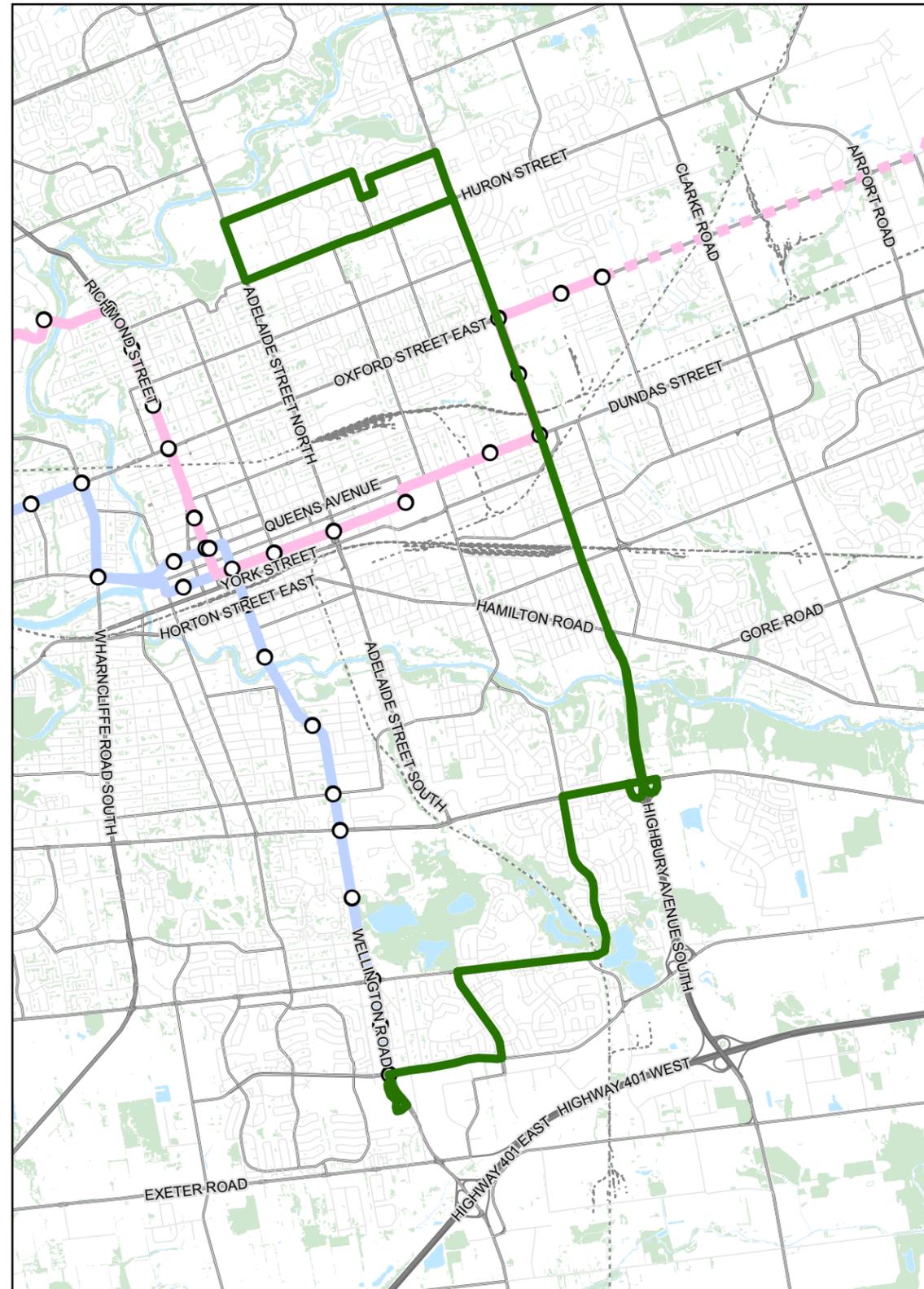
PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	15	15	15	15	20	30	30	15	15	20	30	35	30	30
PROPOSED 2035	15	15	15	15	20	30	30	15	15	20	30	35	20	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

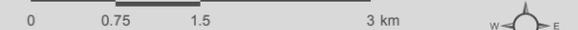
RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 14

2018 Network **2035 Network**
█ 14 █ 14

Base Data

- BRT Station
- North-East Route
- South-West Route
- - - Airport Extension
- - - South-West Route (Mixed Traffic)
- - - Railway
- Waterbody
- Forest
- Municipal Boundary



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

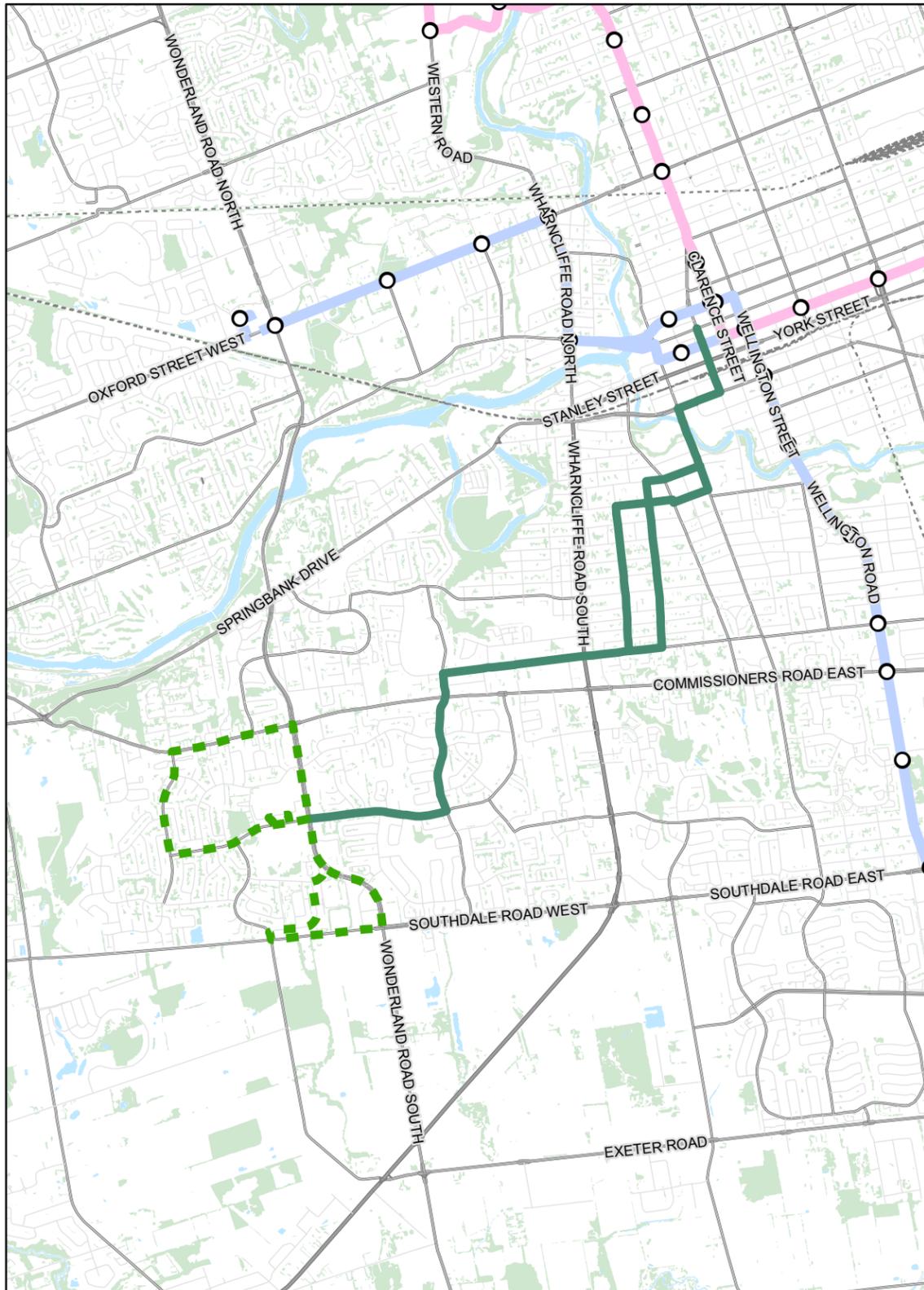
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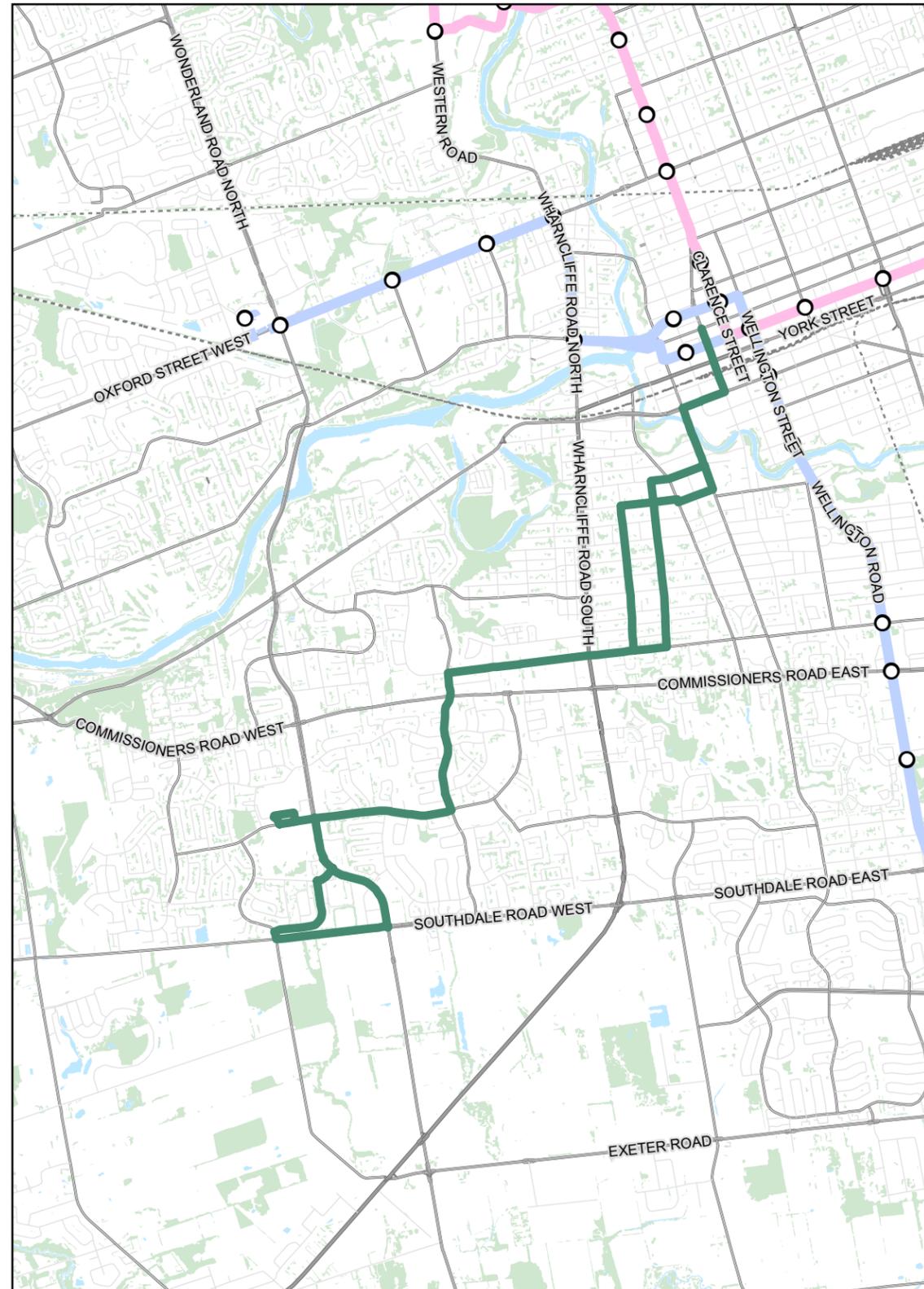
PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

	<u>WEEKDAY</u>						<u>SATURDAY</u>					<u>SUNDAY</u>		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	20	30	20	30	30	60	30	30	30	30	45	30	60
PROPOSED 2035	30	20	20	20	20	30	30	20	20	30	30	45	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

**LONDON TRANSIT NETWORK
ROUTE NUMBER: 15**

2018 Network	2035 Network
15B	15
15A	
15	

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.5 1 2 km



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:\GIS\163037 - LTC\2018 Project\2035_R redesign_HWTABLES_LK.mxd



PROJECT: 18-8035

STATUS: DRAFT

DATE: 10/24/2018

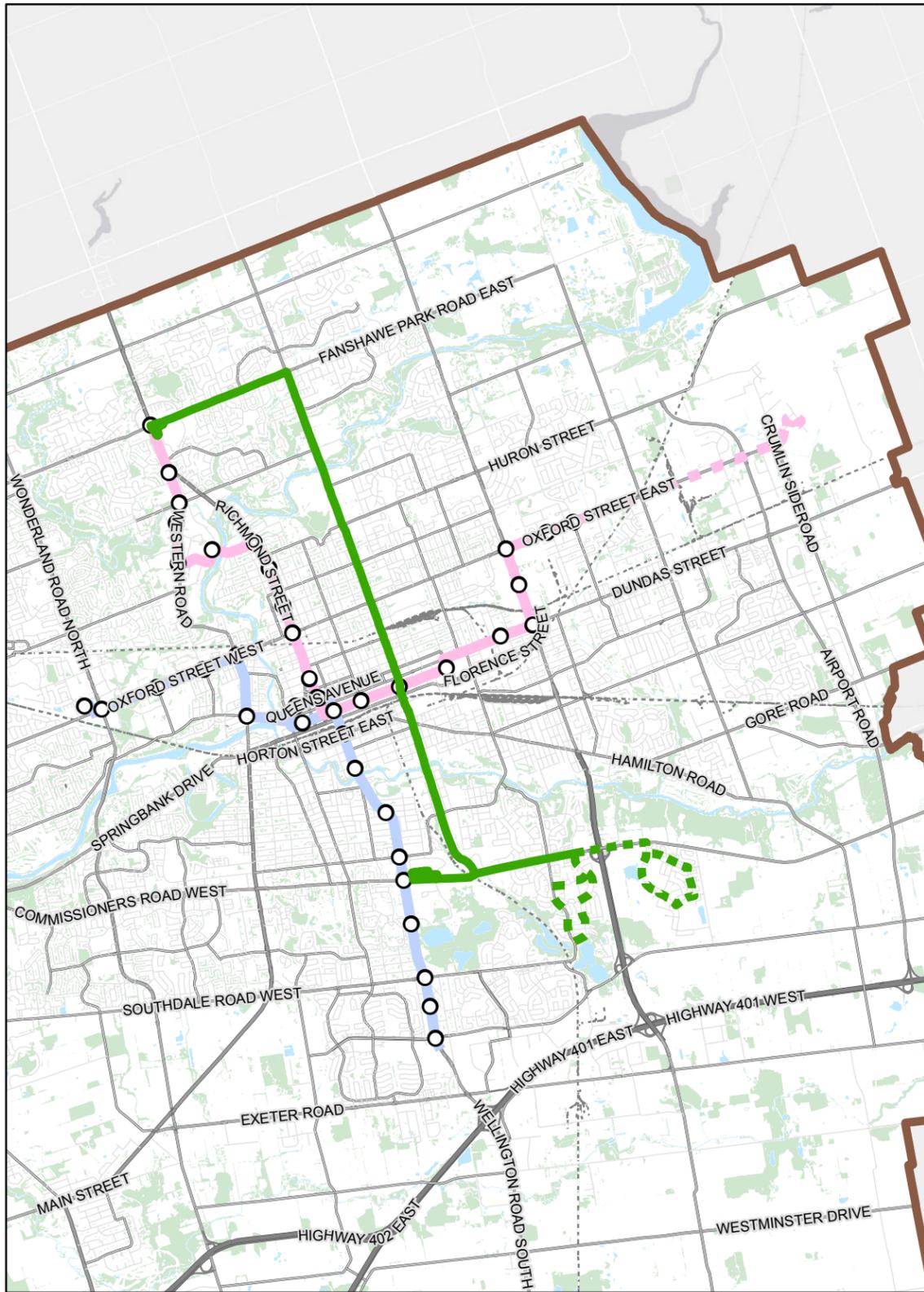
WEEKDAY

SATURDAY

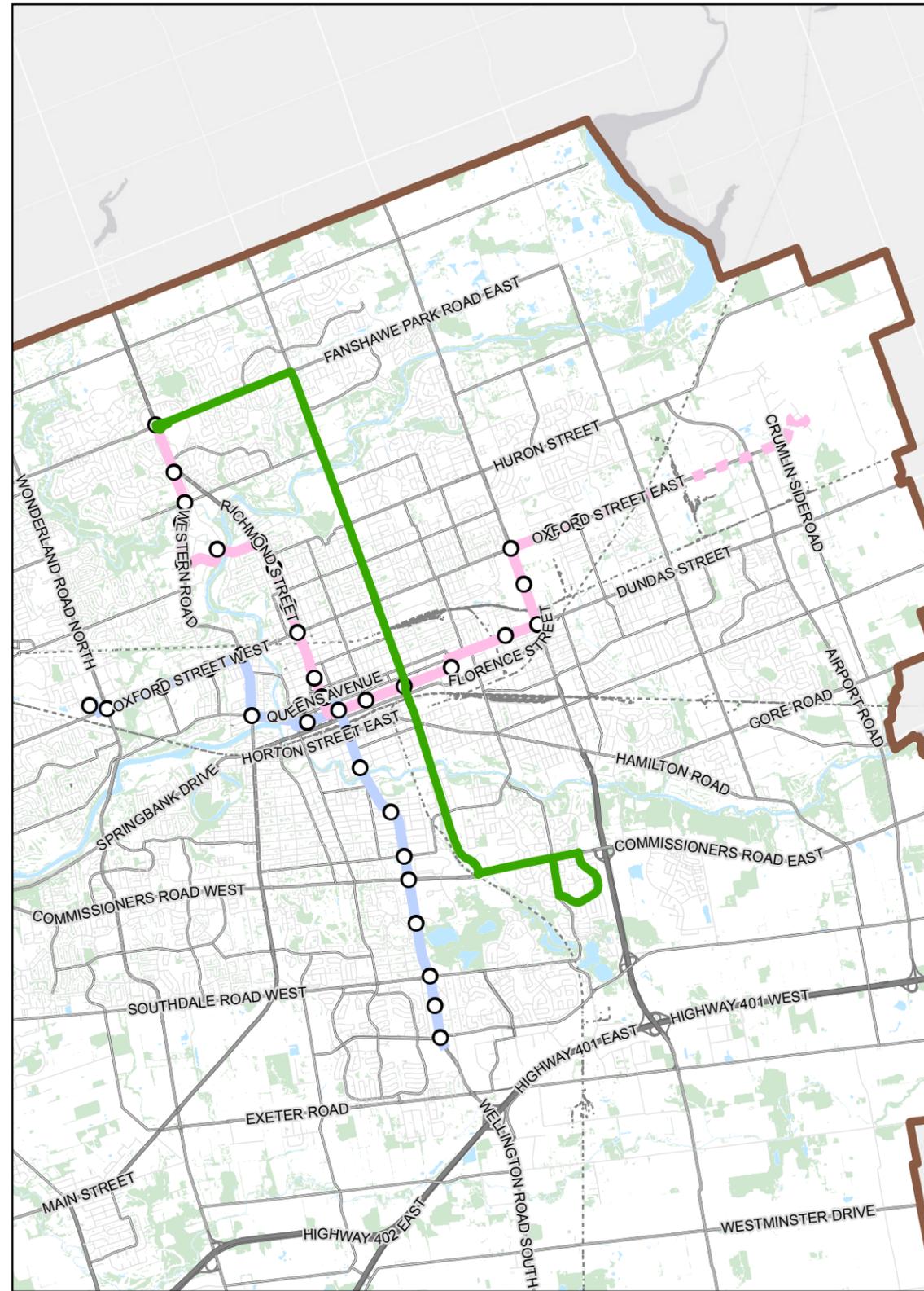
SUNDAY

	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	15	15	15	15	30	30	30	30	20	30	30	60	30	30
PROPOSED 2035	15	15	15	15	20	30	30	30	20	30	30	60	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 16

2018 Network	2035 Network
16	16
16A	
16B	

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

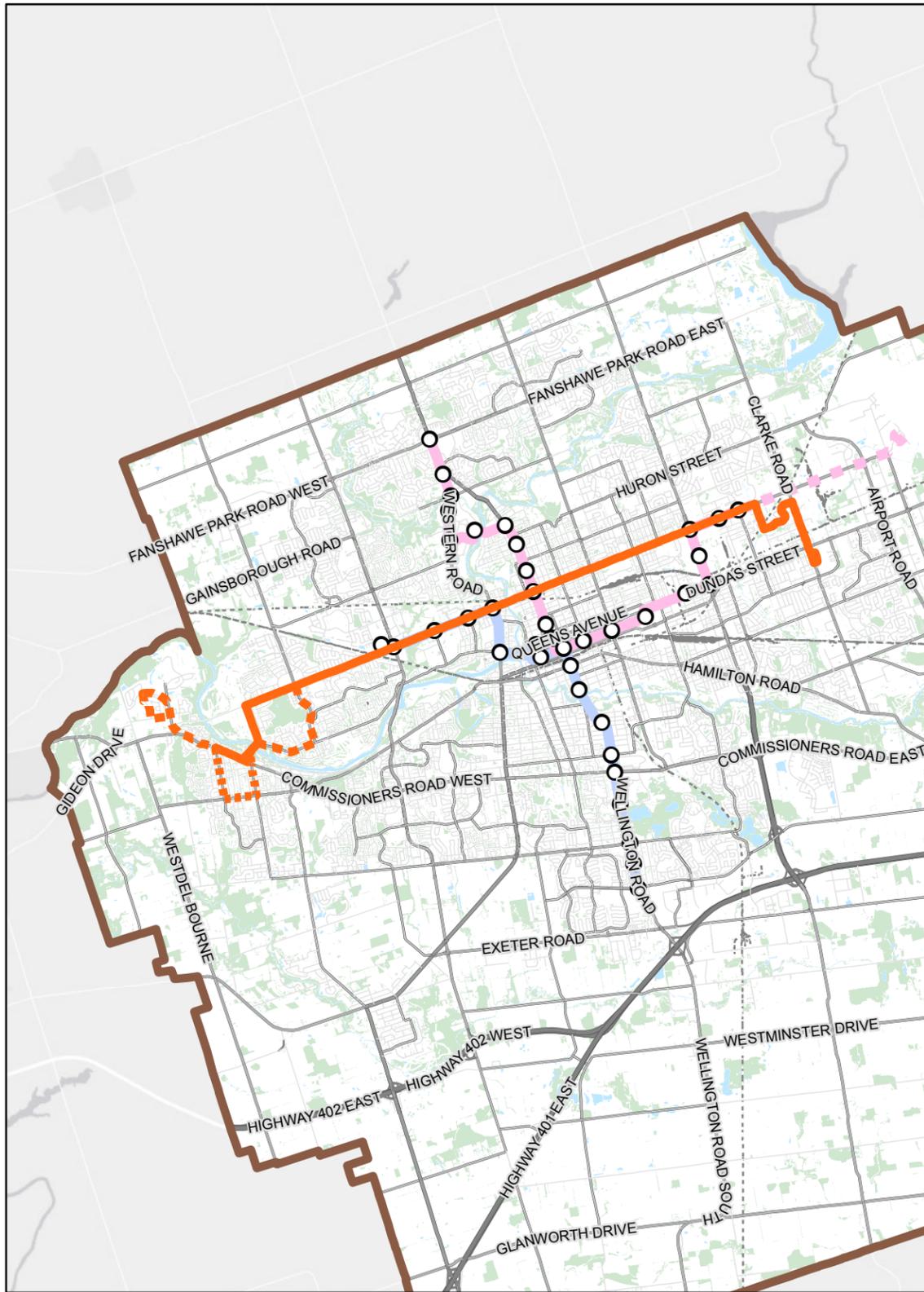
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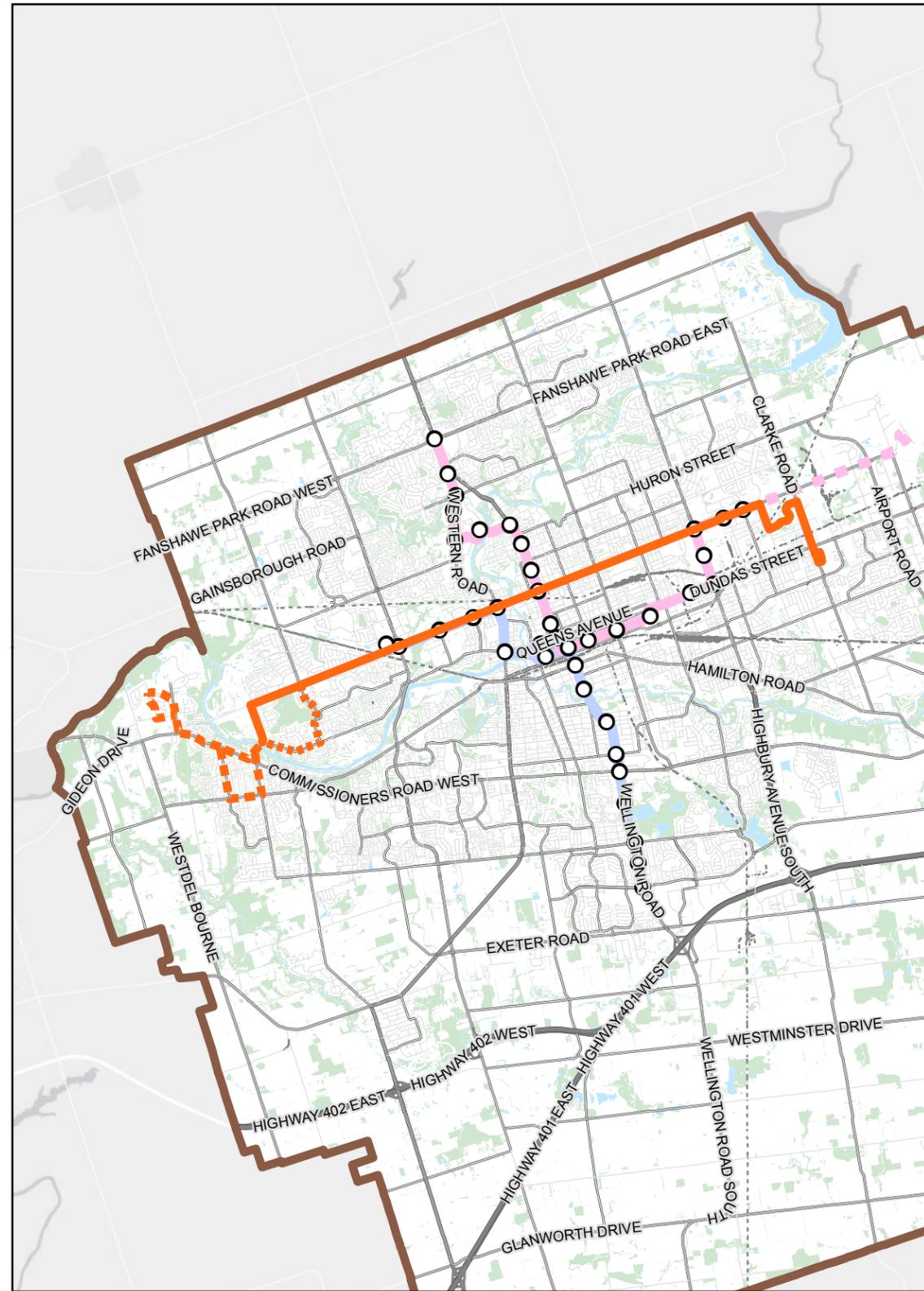
PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	20	15	17	15	30	30	30	25	15	20	30	40	30	30
PROPOSED 2035	20	15	15	15	30	20	20	25	15	20	30	40	20	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

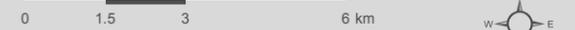
RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 17

2018 Network	2035 Network
17	17
17A	17A
17B	17B

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

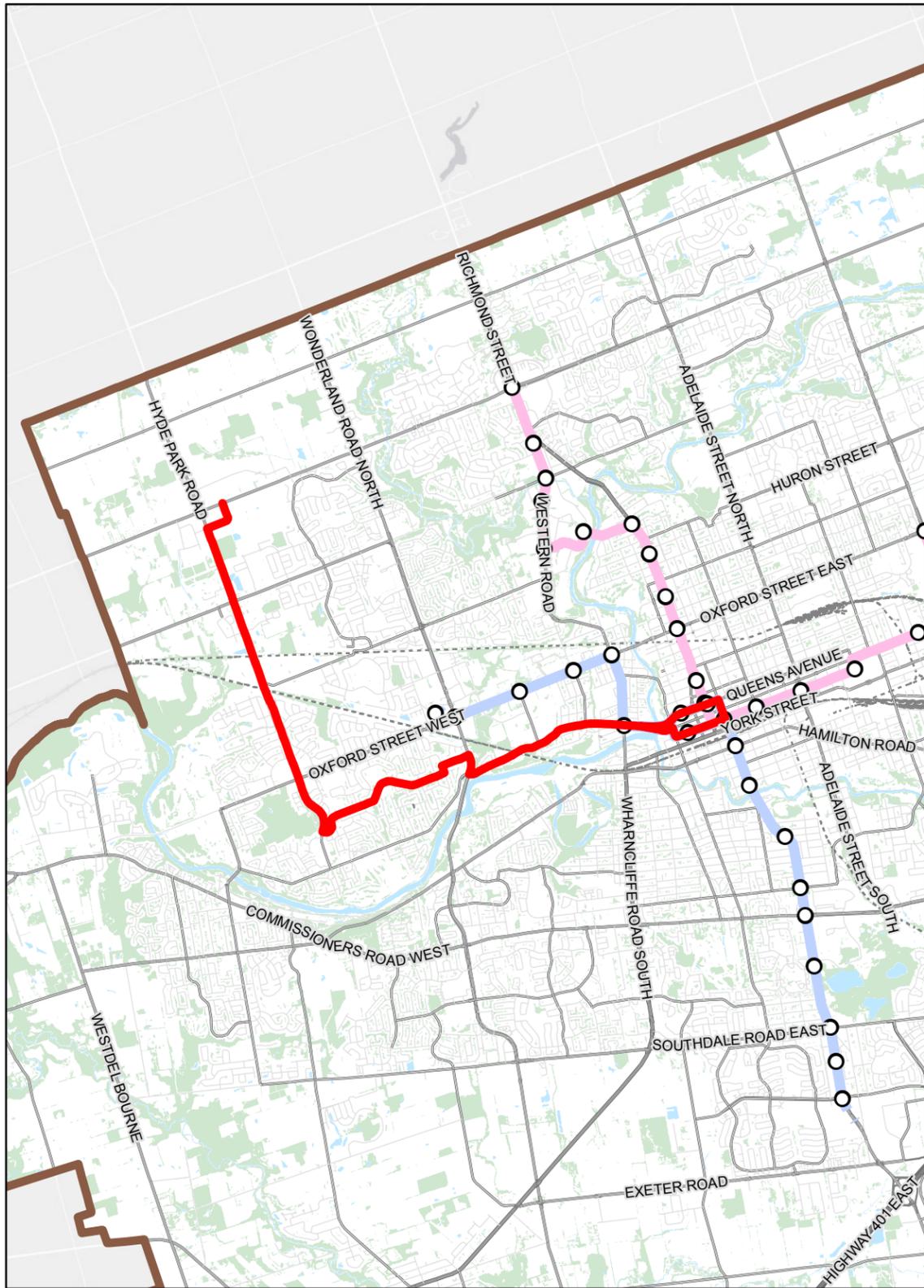
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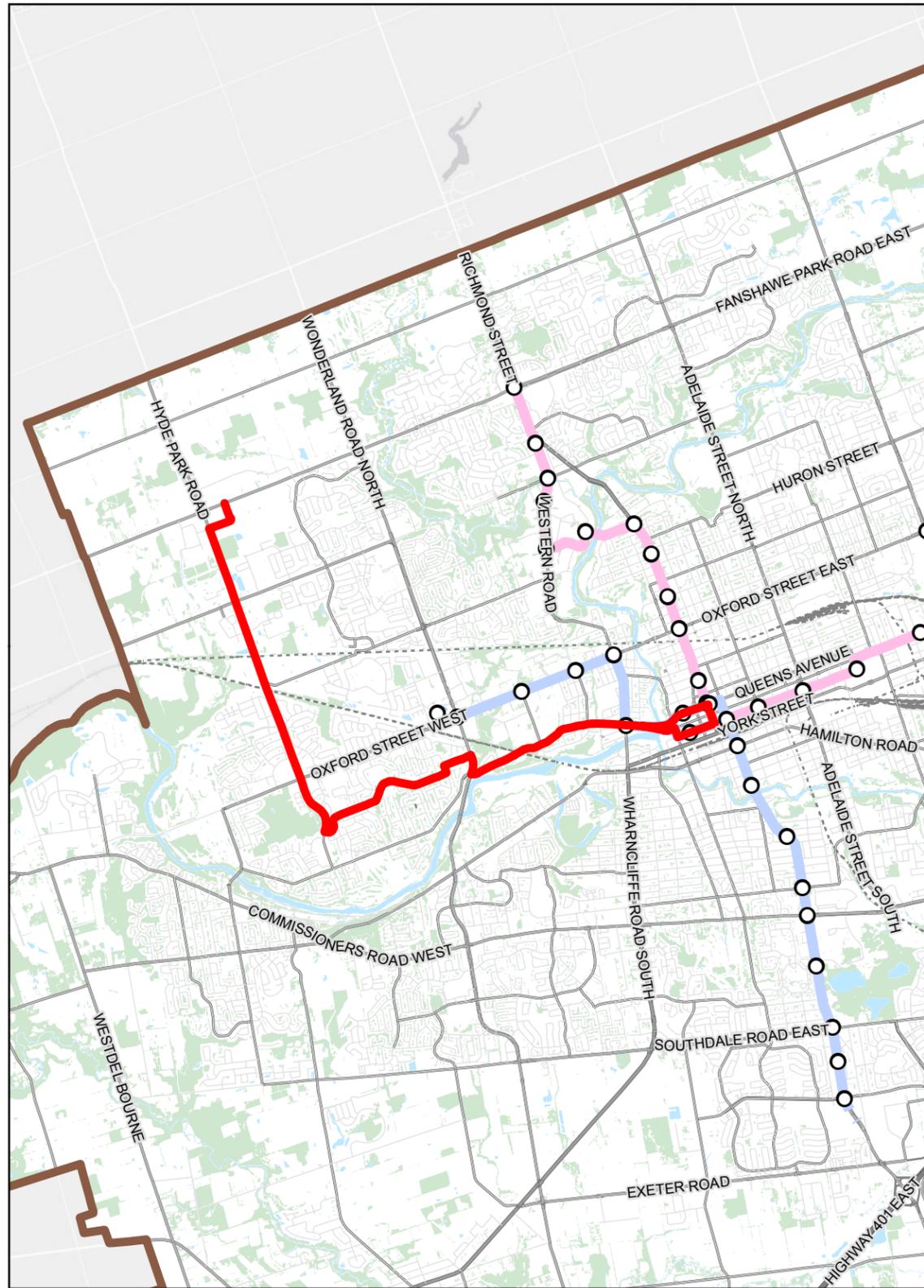
PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	20	20	20	20	20	30	40	40	30	30	30	30	40	30
PROPOSED 2035	20	15	15	15	15	30	30	20	20	20	20	15	15	15

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 19

2018 Network 2035 Network
19 19

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary



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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

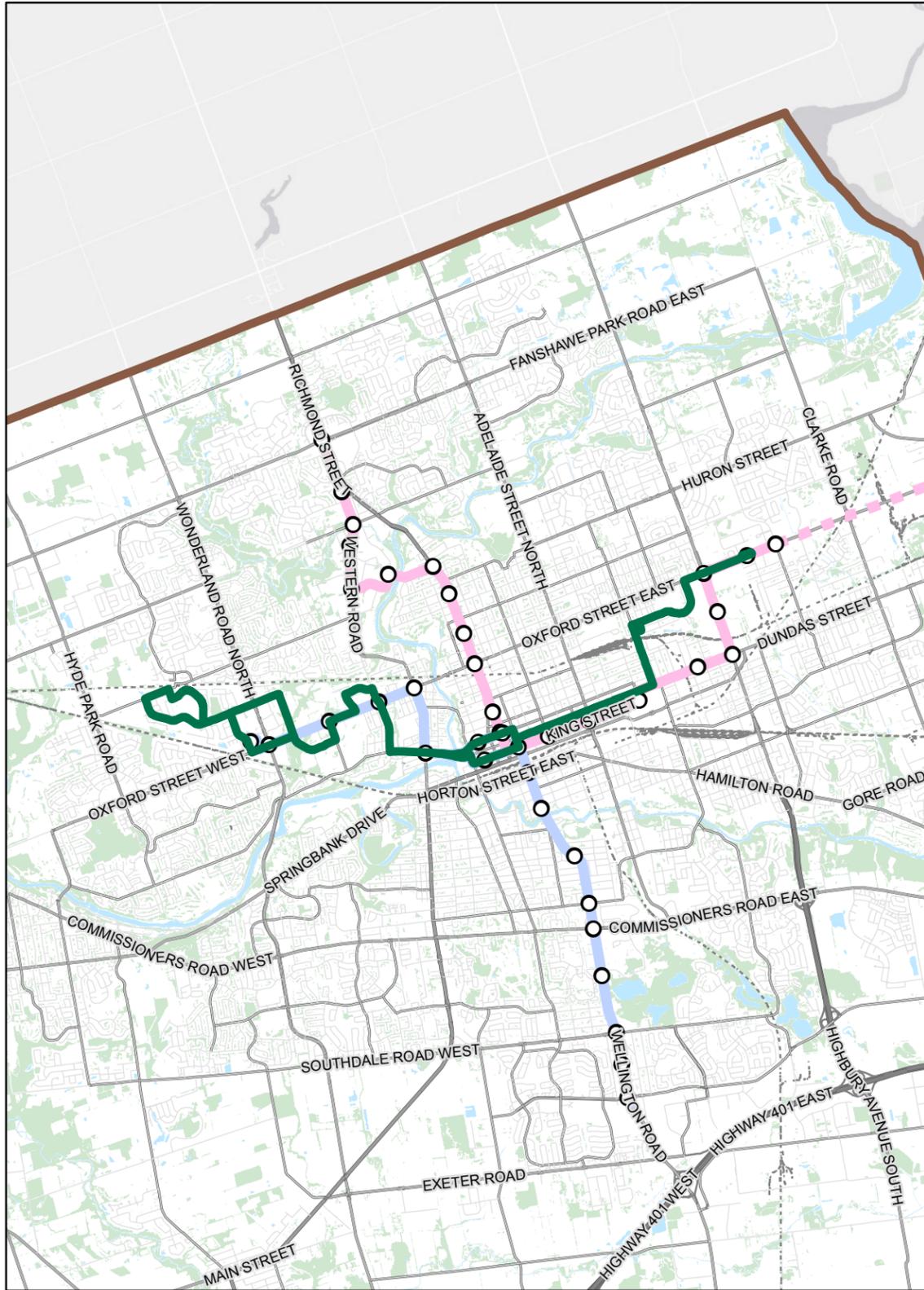
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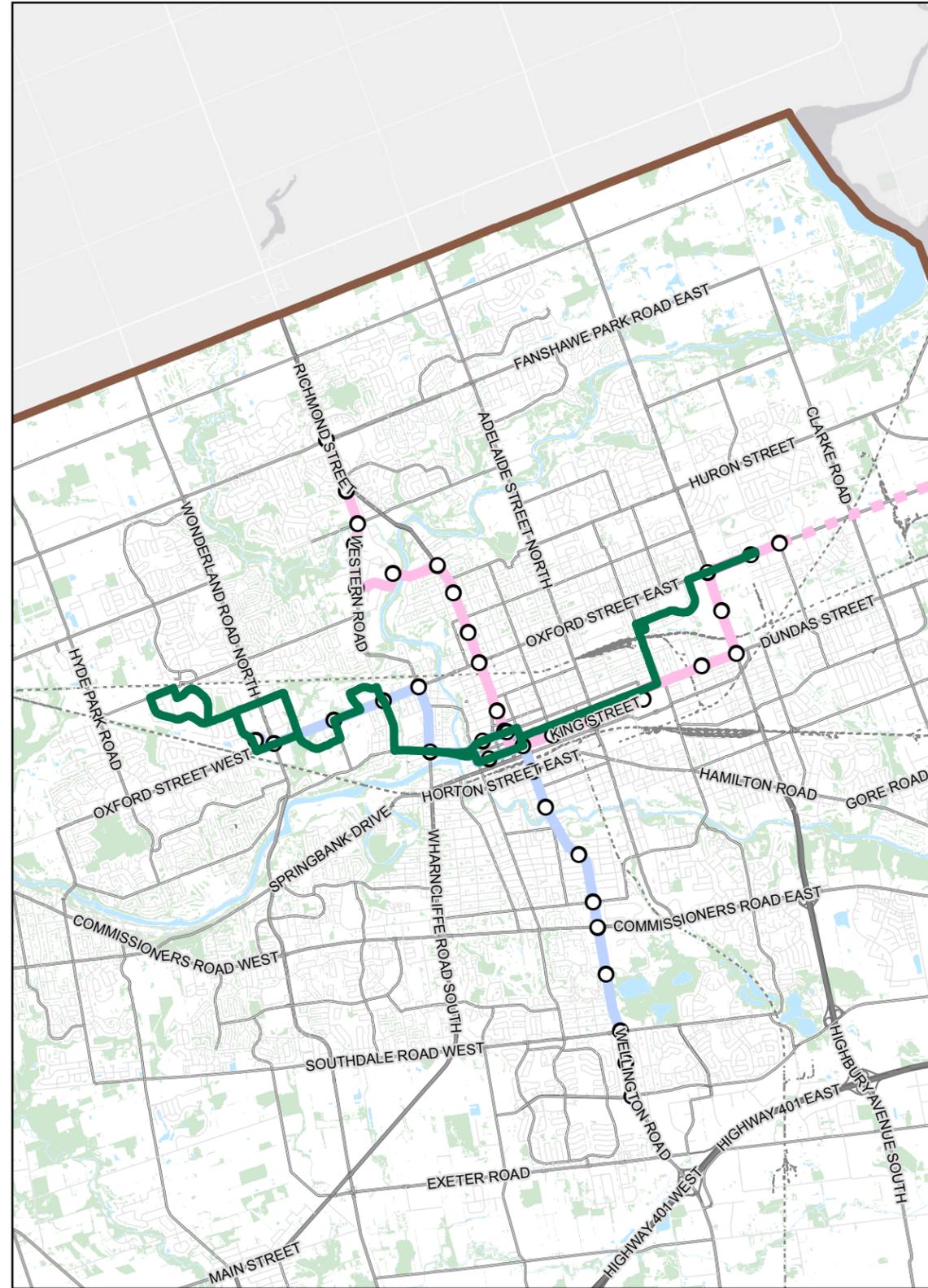
PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	30	30	30	40	55	-	30	30	60	60	-	60	-
PROPOSED 2035	30	15	20	15	30	30	45	30	30	30	60	-	30	60

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 20

2018 Network **2035 Network**
█ 20 █ 20

Base Data

- BRT Station
- █ North-East Route
- █ South-West Route
- █ Airport Extension
- █ South-West Route (Mixed Traffic)
- Railway
- █ Waterbody
- █ Forest
- █ Municipal Boundary



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
 MAP CHECKED BY: IB
 MAP PROJECTION: NAD 1983 UTM Zone 17N

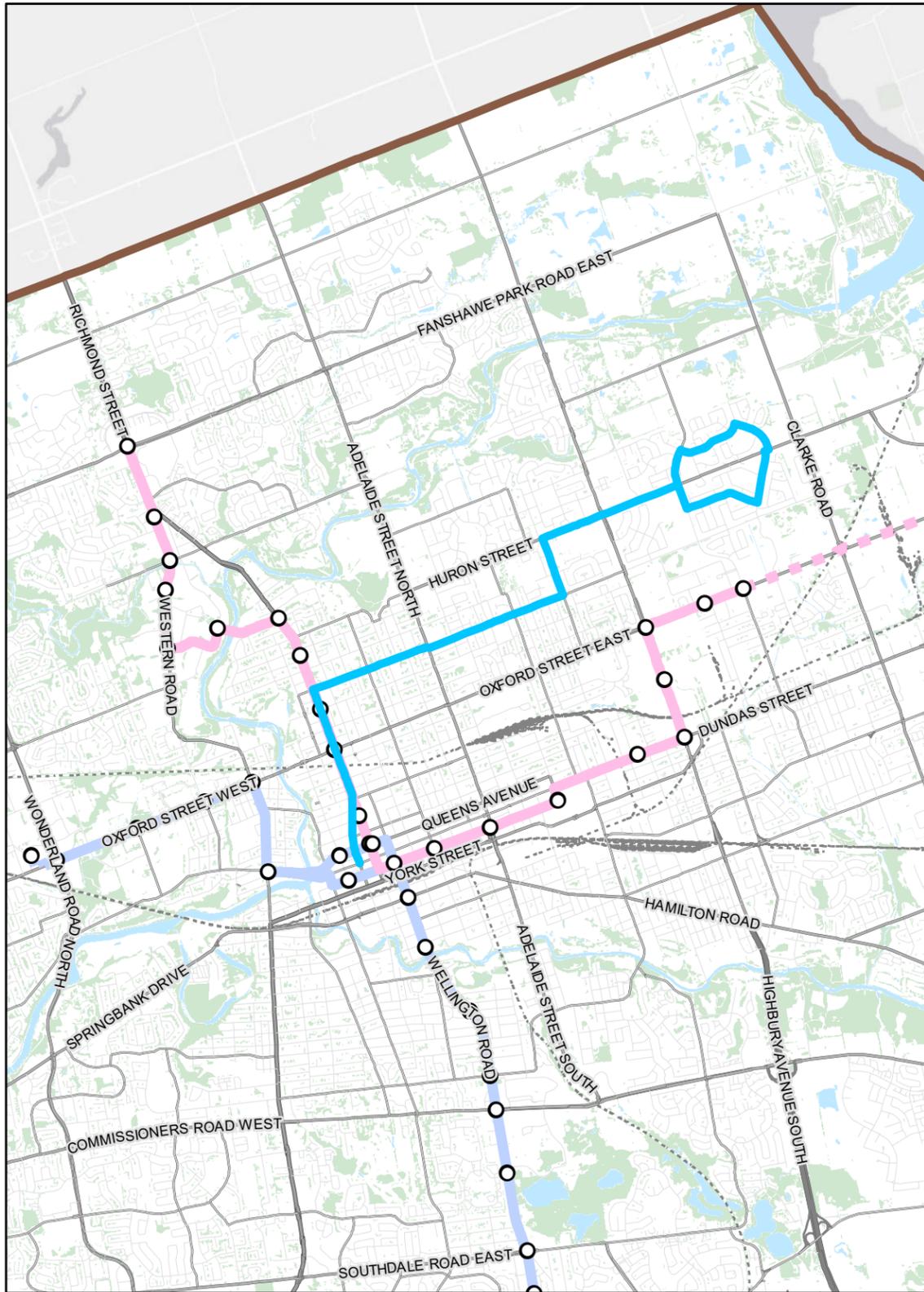
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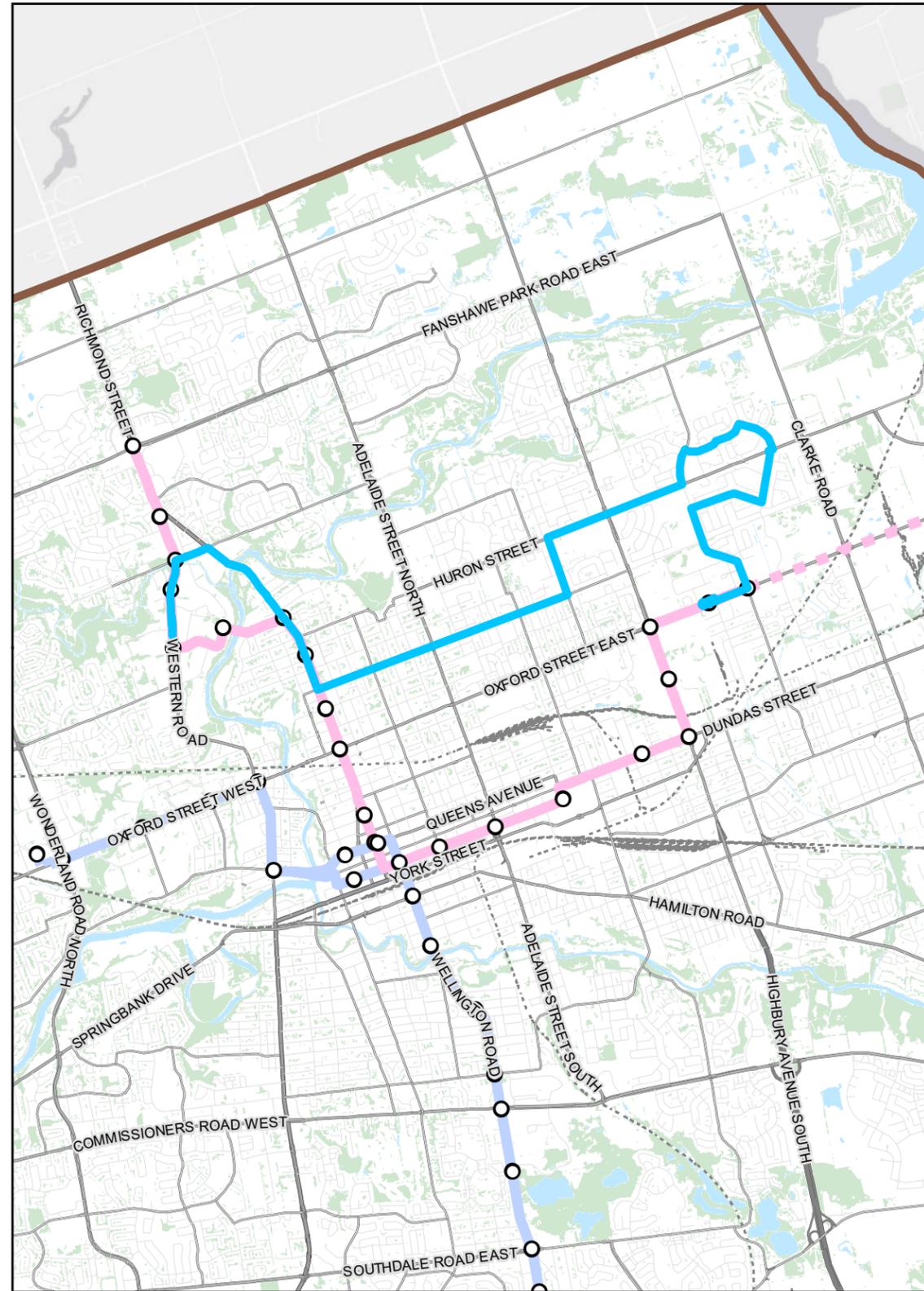
PROJECT: 18-8035
 STATUS: DRAFT
 DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	15	20	15	20	30	45	30	20	30	30	30	30	30
PROPOSED 2035	30	15	20	15	20	30	40	20	20	30	30	30	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 21

2018 Network 21 2035 Network 21

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.75 1.5 3 km



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

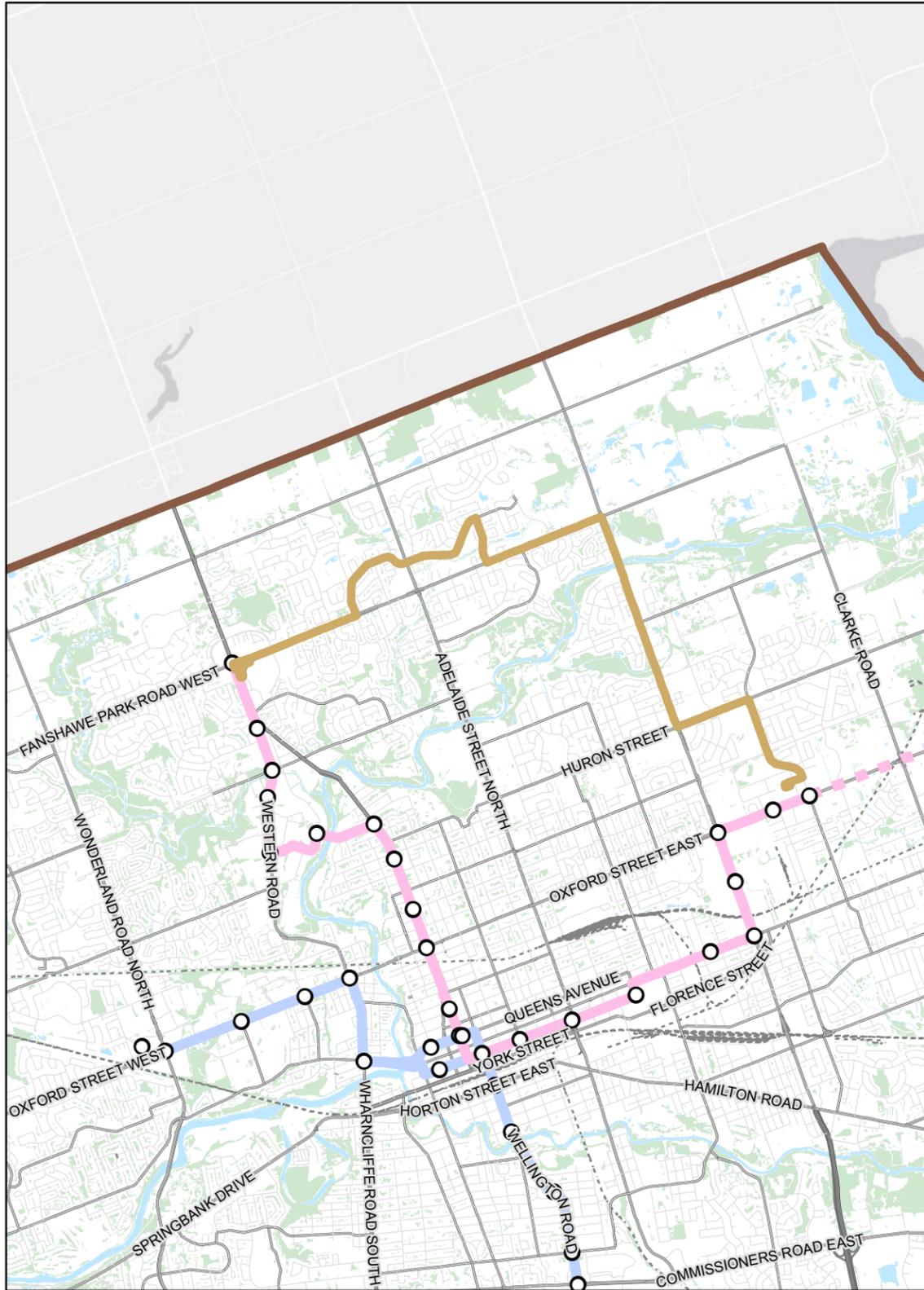
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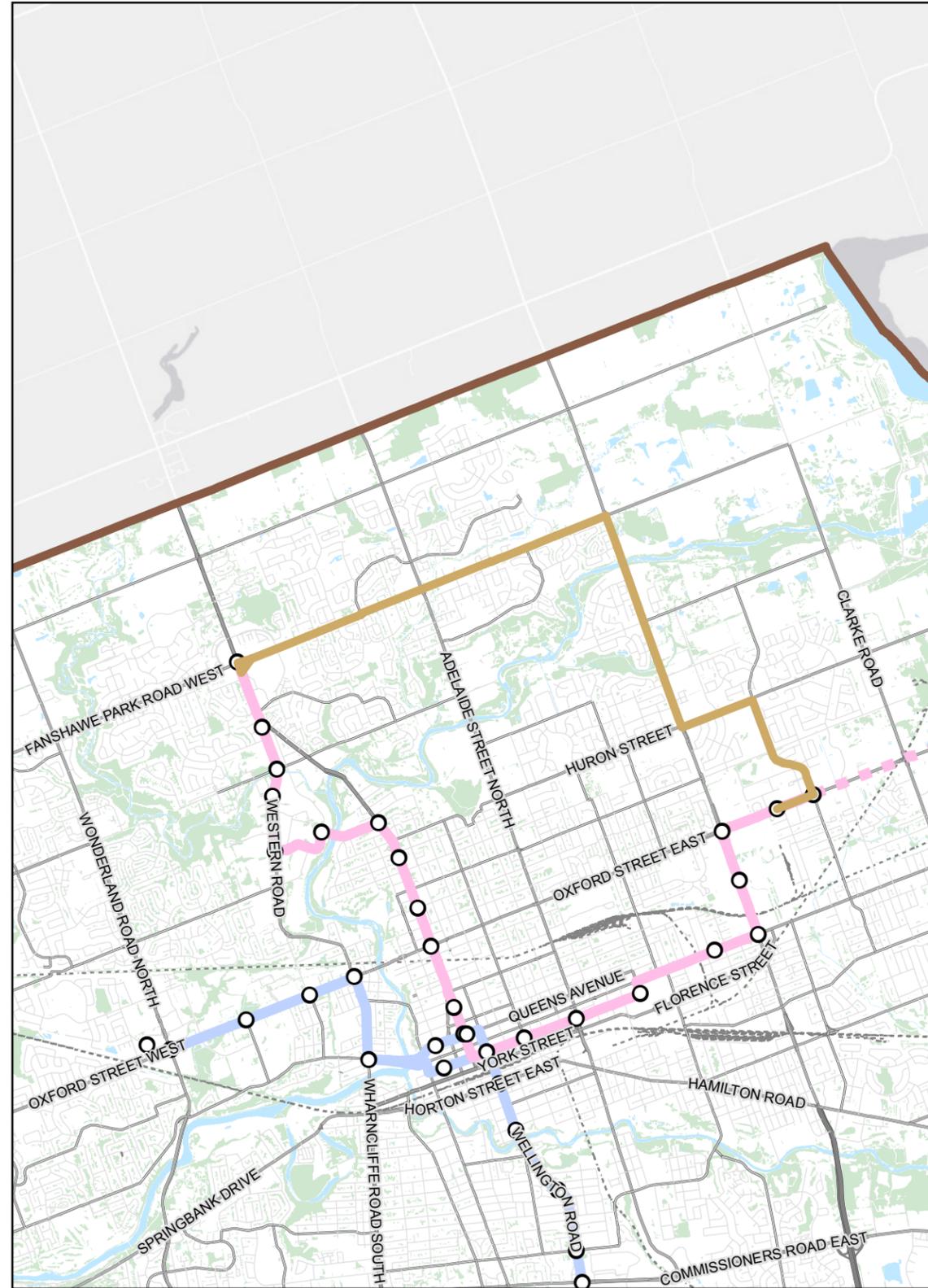
PROJECT: 18-8035
STATUS: DRAFT
DATE: 2018-10-22

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	15	15	15	15	30	30	30	30	20	30	30	30	30	60
PROPOSED 2035	15	15	15	15	30	30	30	15	15	30	30	30	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 25

2018 Network 25 2035 Network 25

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.75 1.5 3 km



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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:\GIS\163037 - LTC\2018 Project\2035_Redesign_HWTABLES_LK.mxd



PROJECT: 18-8035

STATUS: DRAFT

DATE: 10/24/2018

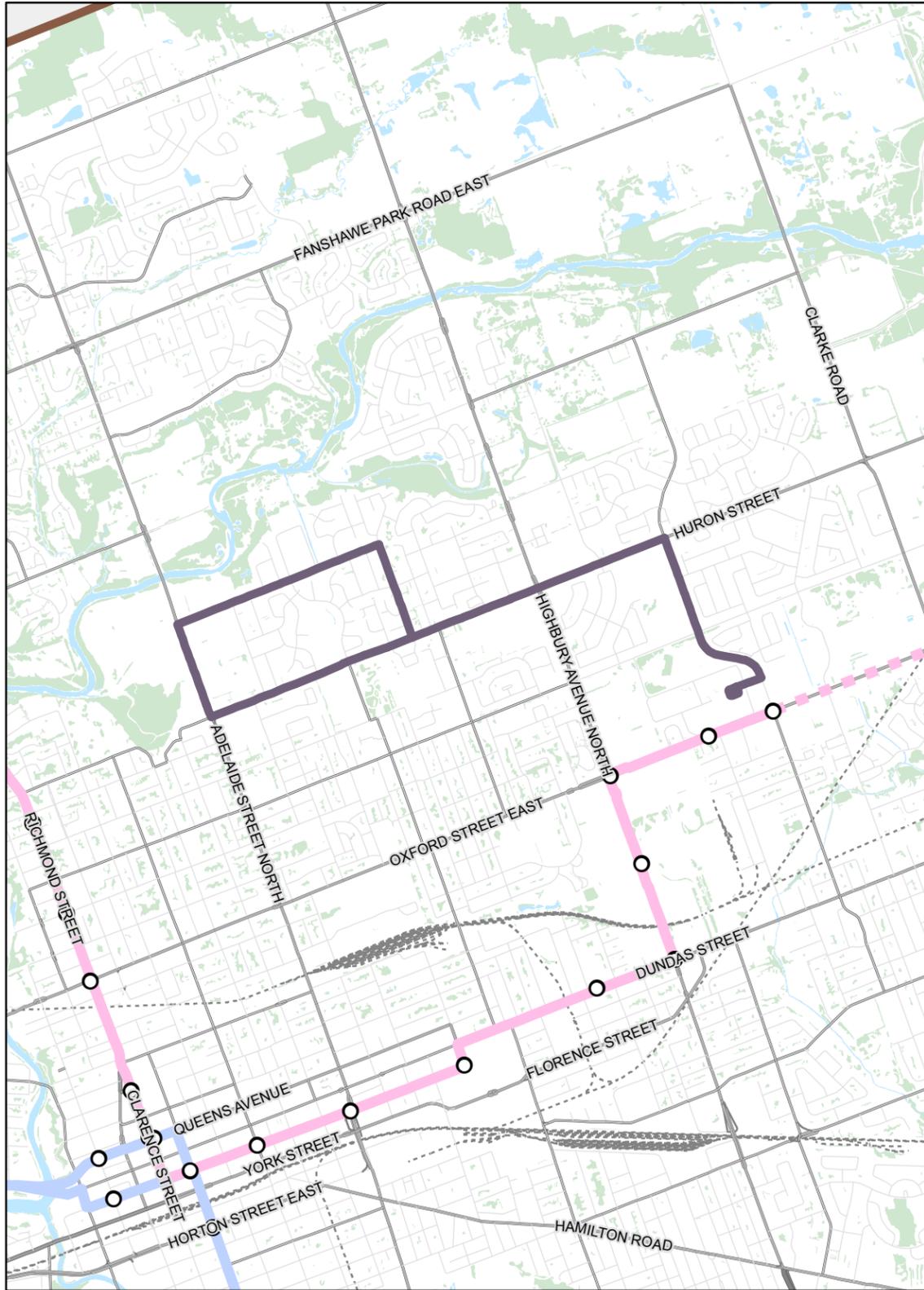
WEEKDAY

SATURDAY

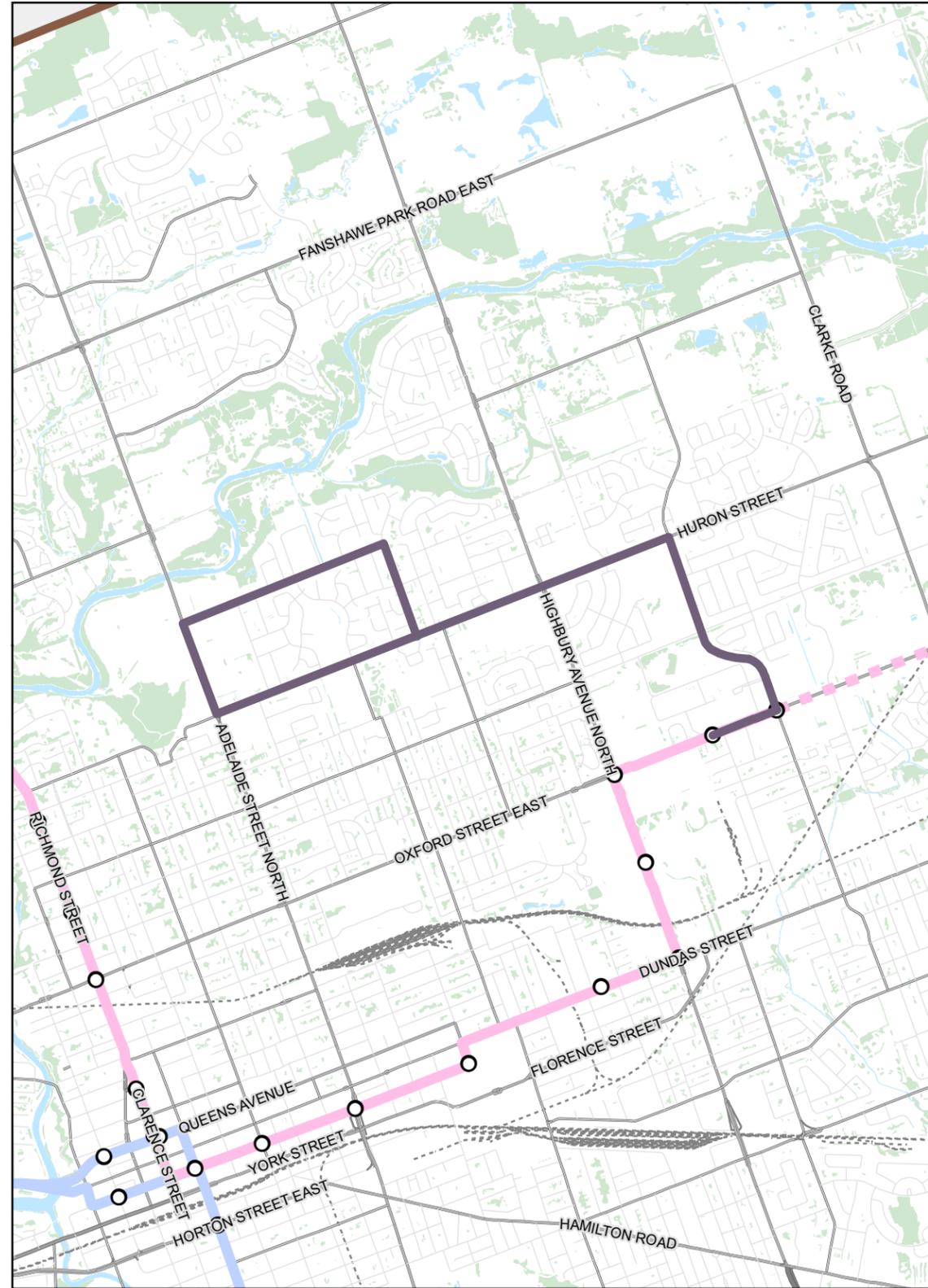
SUNDAY

	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	30	30	30	60	60	60	60	30	60	60	-	60	60
PROPOSED 2035	30	15	20	15	30	30	60	30	30	30	30	60	30	30

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

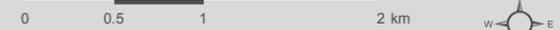
RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 27

2018 Network **2035 Network**
— 27 — 27

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary



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 MAP CREATED BY: LK / SW
 MAP CHECKED BY: IB
 MAP PROJECTION: NAD 1983 UTM Zone 17N

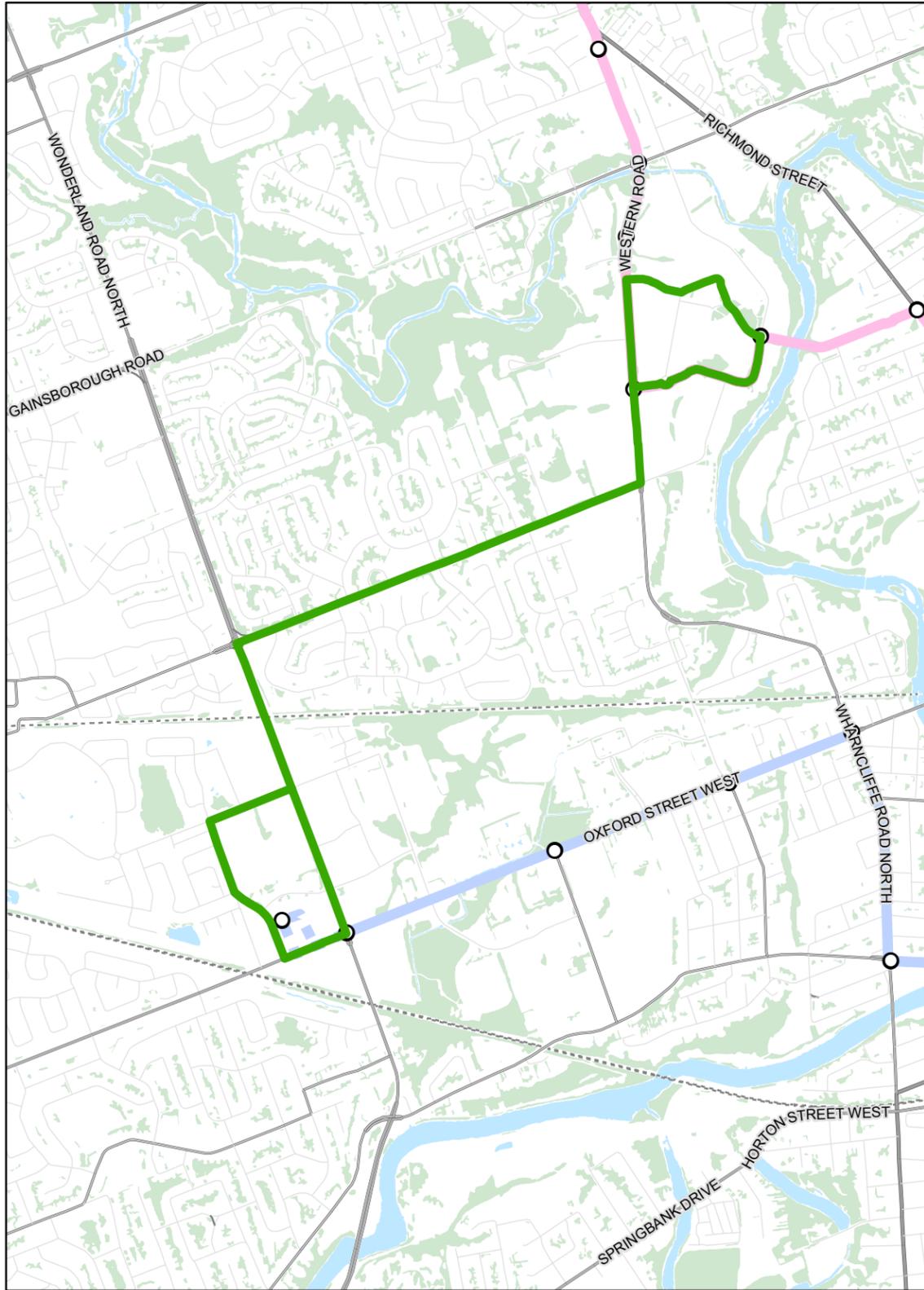
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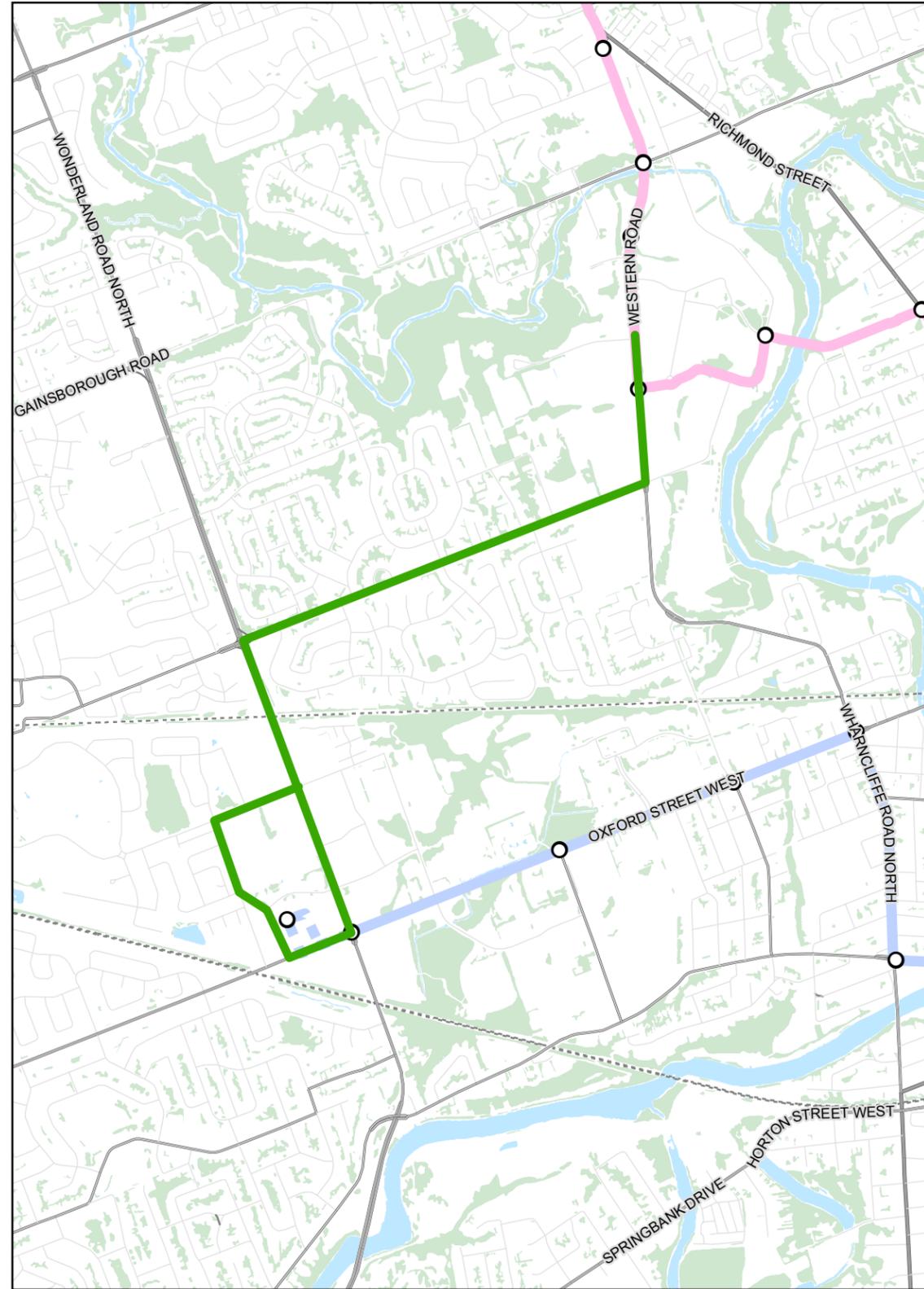
PROJECT: 18-8035
 STATUS: DRAFT
 DATE: 10/24/2018

	<u>WEEKDAY</u>						<u>SATURDAY</u>					<u>SUNDAY</u>		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	-	15	15	15	20	-	-	-	40	40	-	-	-	-
PROPOSED 2035	-	10	15	10	15	-	-	-	40	40	-	-	-	-

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 29

2018 Network **2035 Network**
— 29 — 29

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- - - Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.325 0.65 1.3 km



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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:\GIS\163037 - LTC\2018 Project\2035_R redesign_HWTABLES_LK.mxd



PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

	<u>WEEKDAY</u>						<u>SATURDAY</u>					<u>SUNDAY</u>		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	-	12	15	10	13	13	-	35	35	-	-	-	35	-
PROPOSED 2035	-	12	12	10	13	13	-	35	35	-	-	-	35	-

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 30

2018 Network

30

2035 Network

30

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.5 1 2 km



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW

MAP CHECKED BY: IB

MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:\GIS\163037 - LTC\2018 Project\2035_R redesign_HWTABLES_LK.mxd



PROJECT: 18-8035

STATUS: DRAFT

DATE: 10/24/2018

WEEKDAY

	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE
EXISTING 2018	40	40	-	40	-	-
PROPOSED 2035	40	20	-	20	-	-

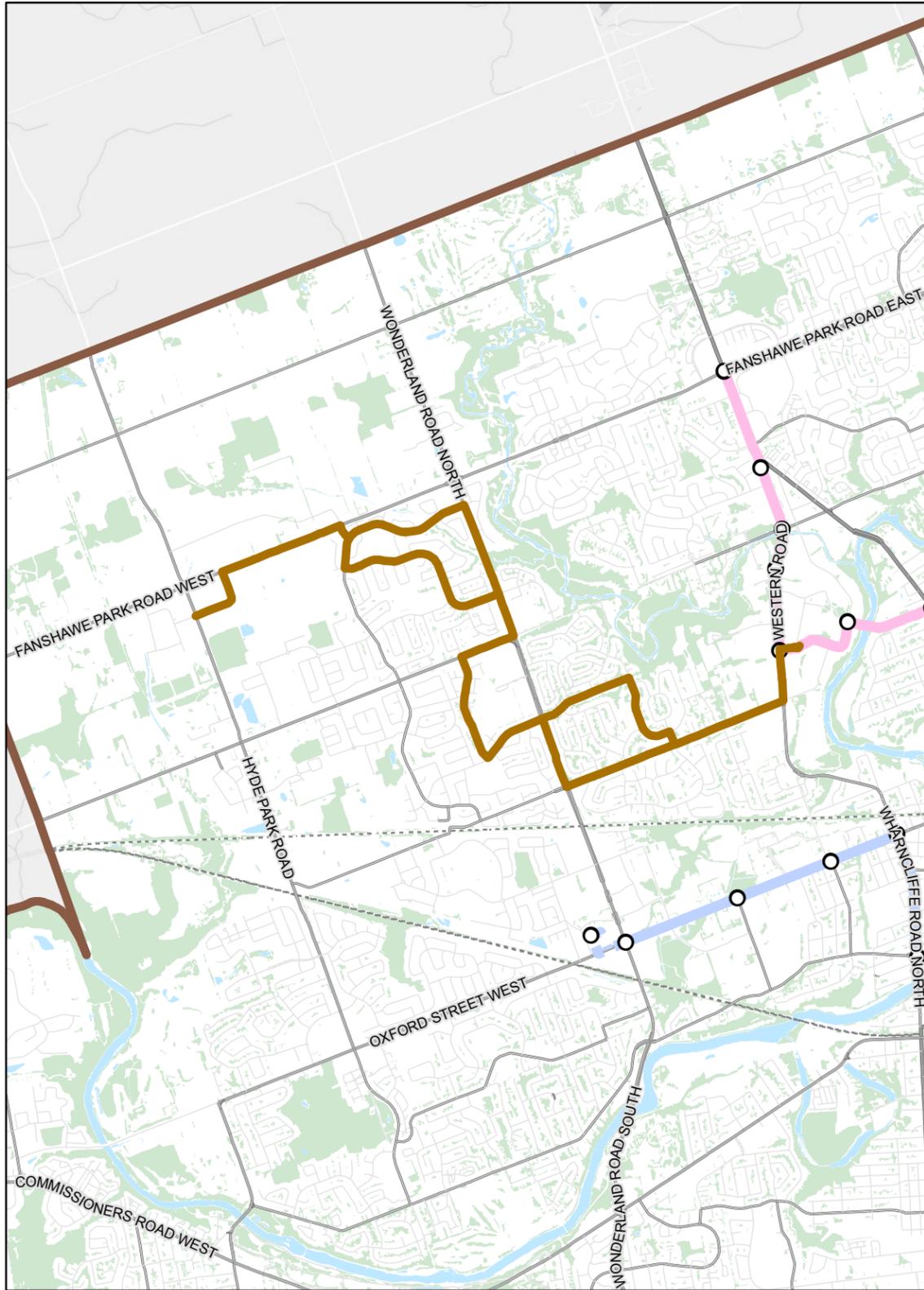
SATURDAY

	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE
EXISTING 2018	-	-	-	-	-
PROPOSED 2035	-	-	-	-	-

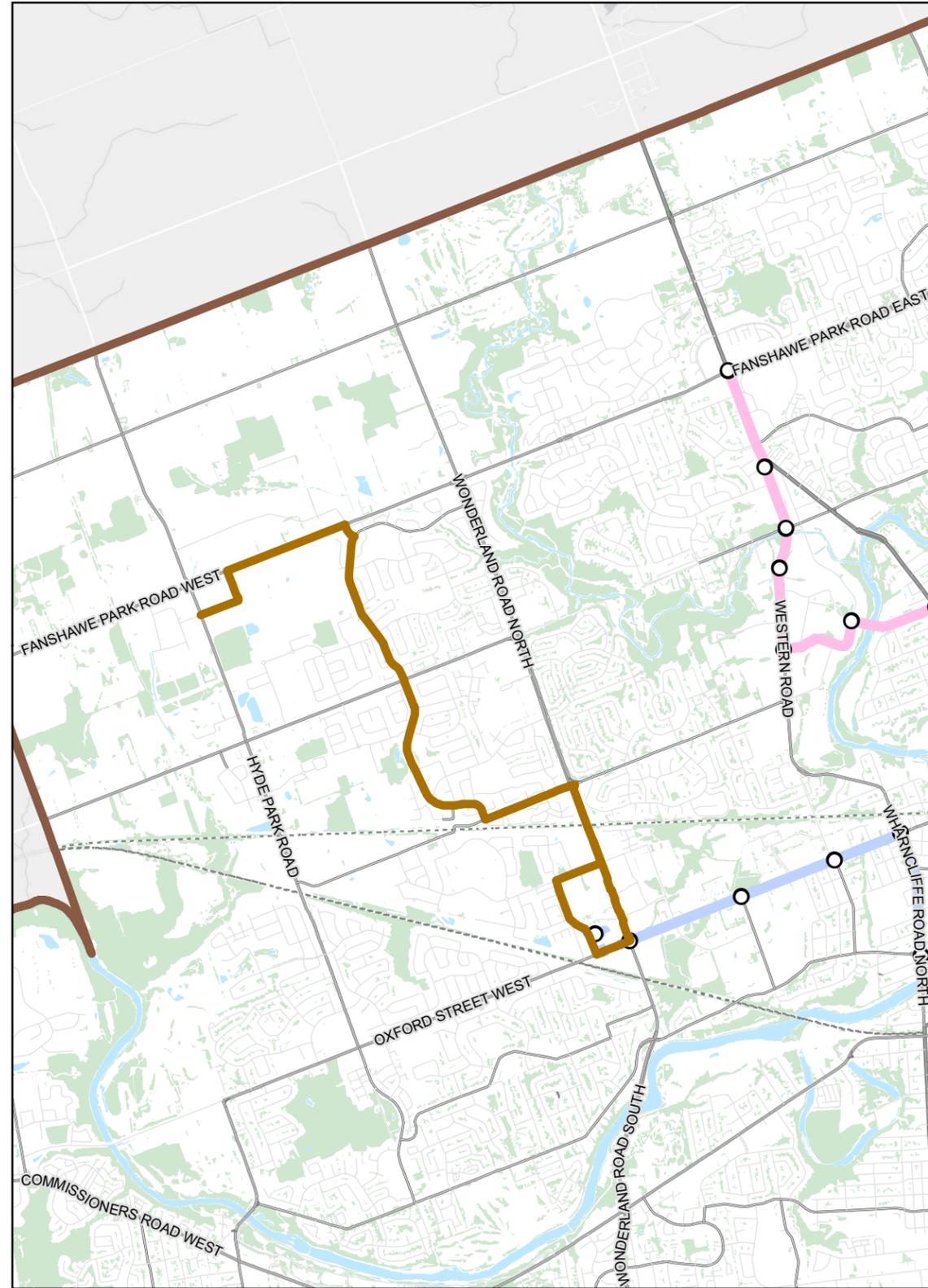
SUNDAY

	EARLY AM	DAY	EVENING
EXISTING 2018	-	-	-
PROPOSED 2035	-	-	-

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 31

2018 Network **2035 Network**
— 31 — 31

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- - - Railway
- Waterbody
- Forest
- Municipal Boundary



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
 MAP CHECKED BY: IB
 MAP PROJECTION: NAD 1983 UTM Zone 17N

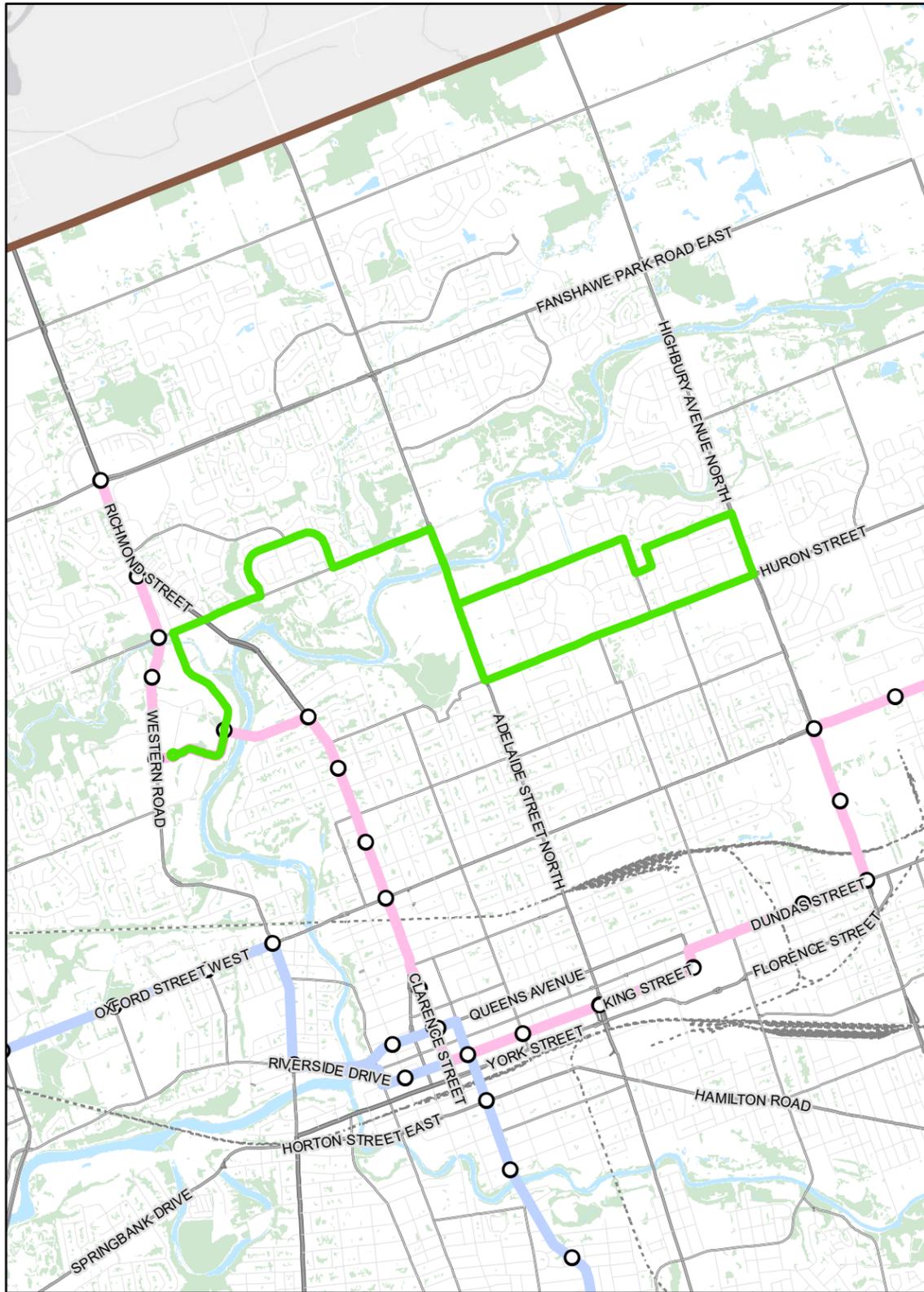
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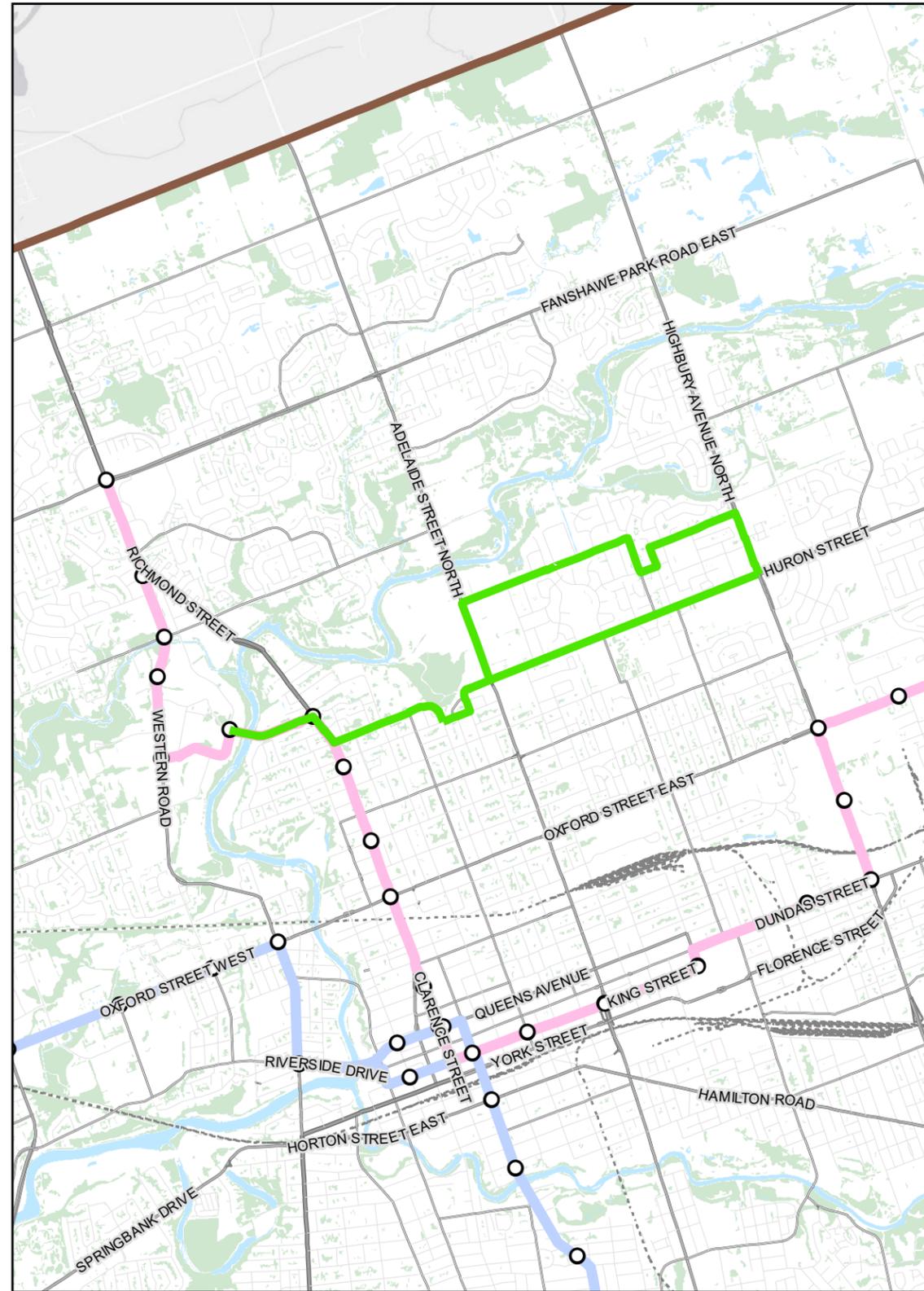
PROJECT: 18-8035
 STATUS: DRAFT
 DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	30	30	30	60	-	45	30	30	60	60	-	60	-
PROPOSED 2035	30	15	20	15	30	30	45	30	30	30	60	-	30	60

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 32

2018 Network 32 2035 Network 32

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.5 1 2 km



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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

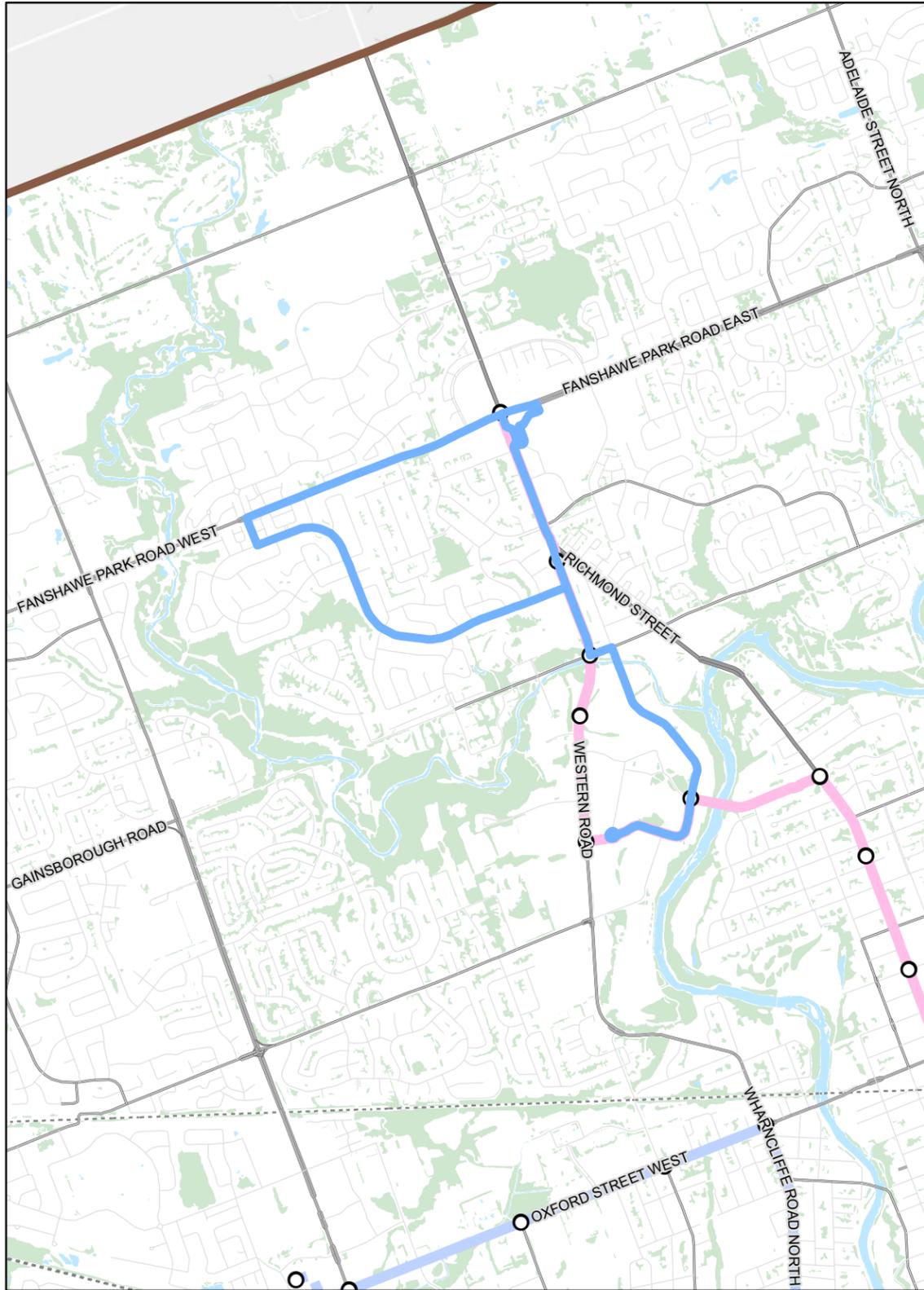
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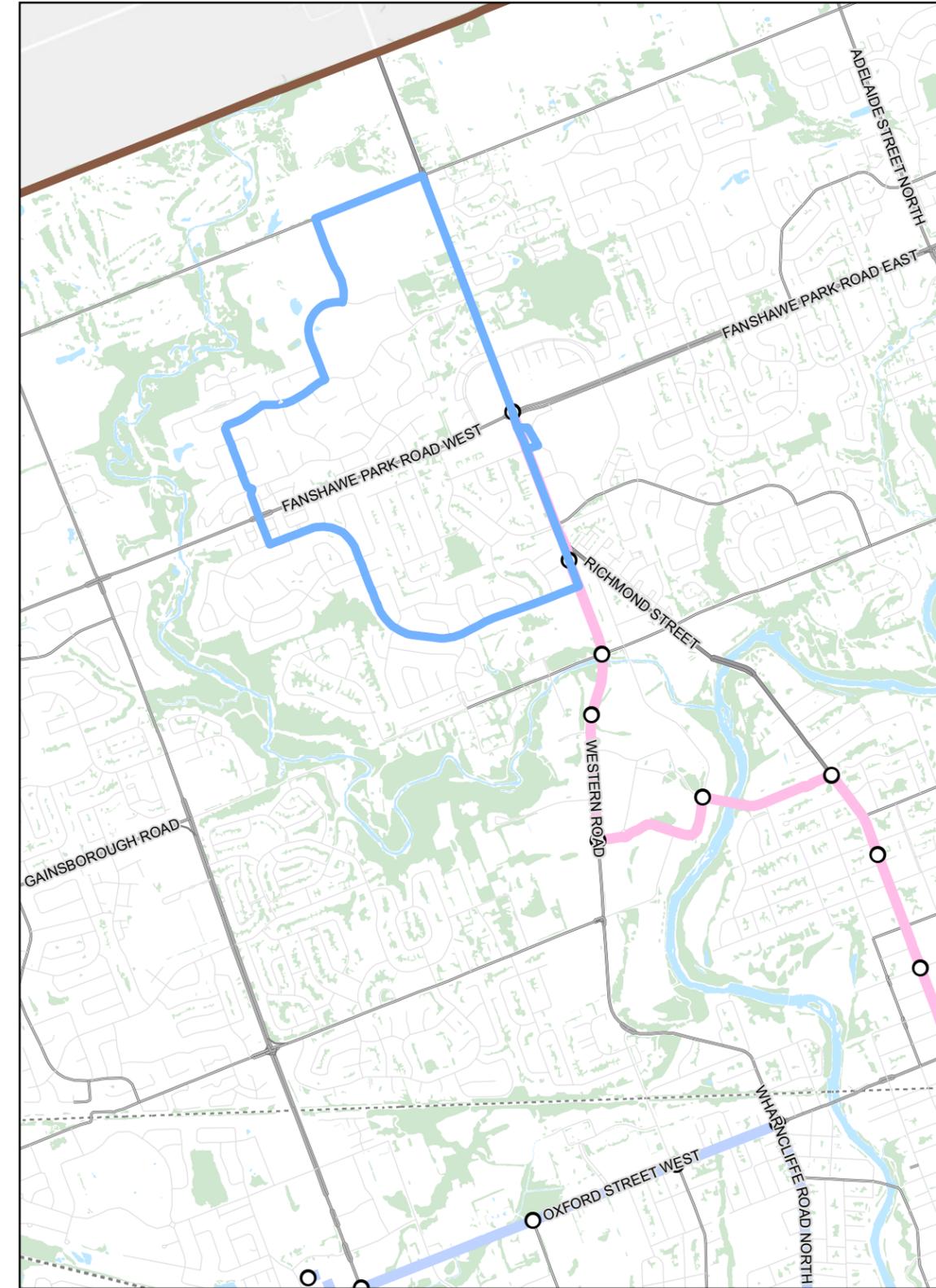
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DATE: 2018-10-22

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EXISTING 2018	30	30	30	30	60	-	-	30	30	60	60	-	60	-
PROPOSED 2035	30	15	20	15	30	30	45	30	30	30	60	-	30	60

2018 NETWORK



PROPOSED 2035 NETWORK



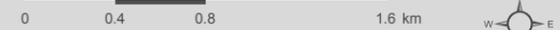
LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 34

2018 Network 34 2035 Network 34

- Base Data**
- BRT Station
 - North-East Route
 - South-West Route
 - Airport Extension
 - South-West Route (Mixed Traffic)
 - Railway
 - Waterbody
 - Forest
 - Municipal Boundary



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

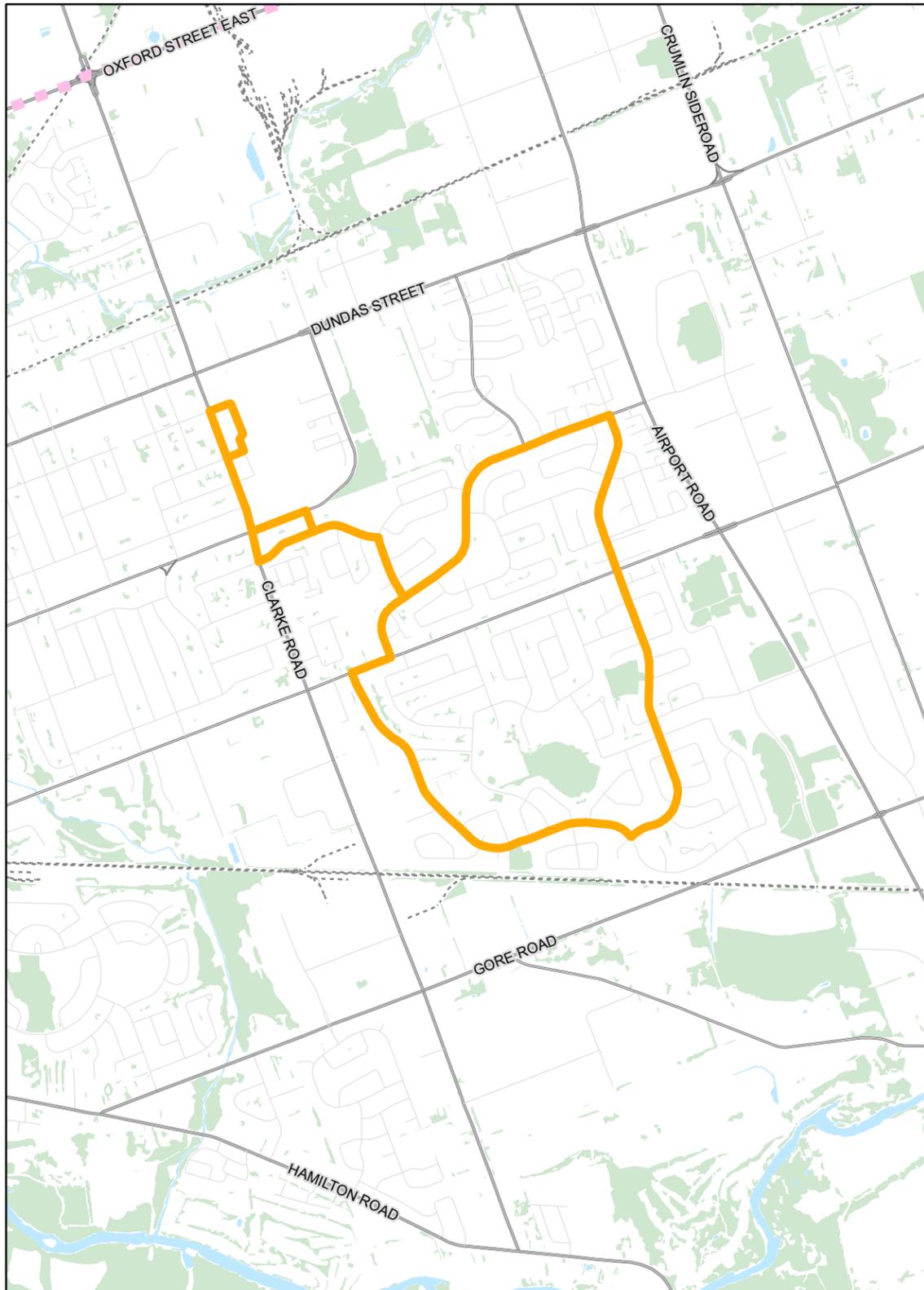
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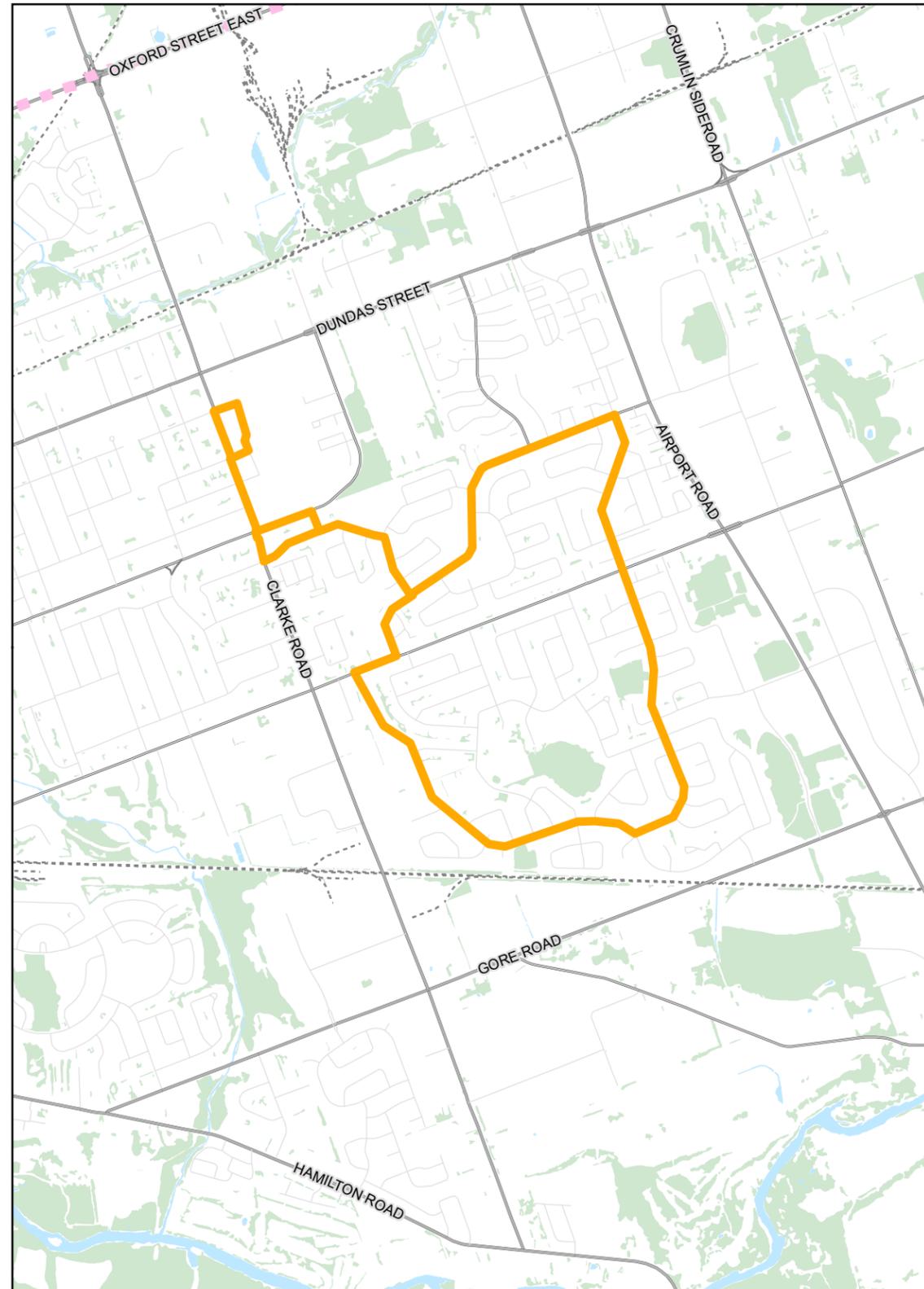
PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	-	40	60	40	60	60	-	30	40	60	60	-	40	60
PROPOSED 2035	-	30	30	30	30	60	-	30	30	60	60	-	40	60

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 35

2018 Network

35

2035 Network

35

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary

0 0.3 0.6 1.2 km



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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PROJECT: 18-8035

STATUS: DRAFT

DATE: 10/24/2018

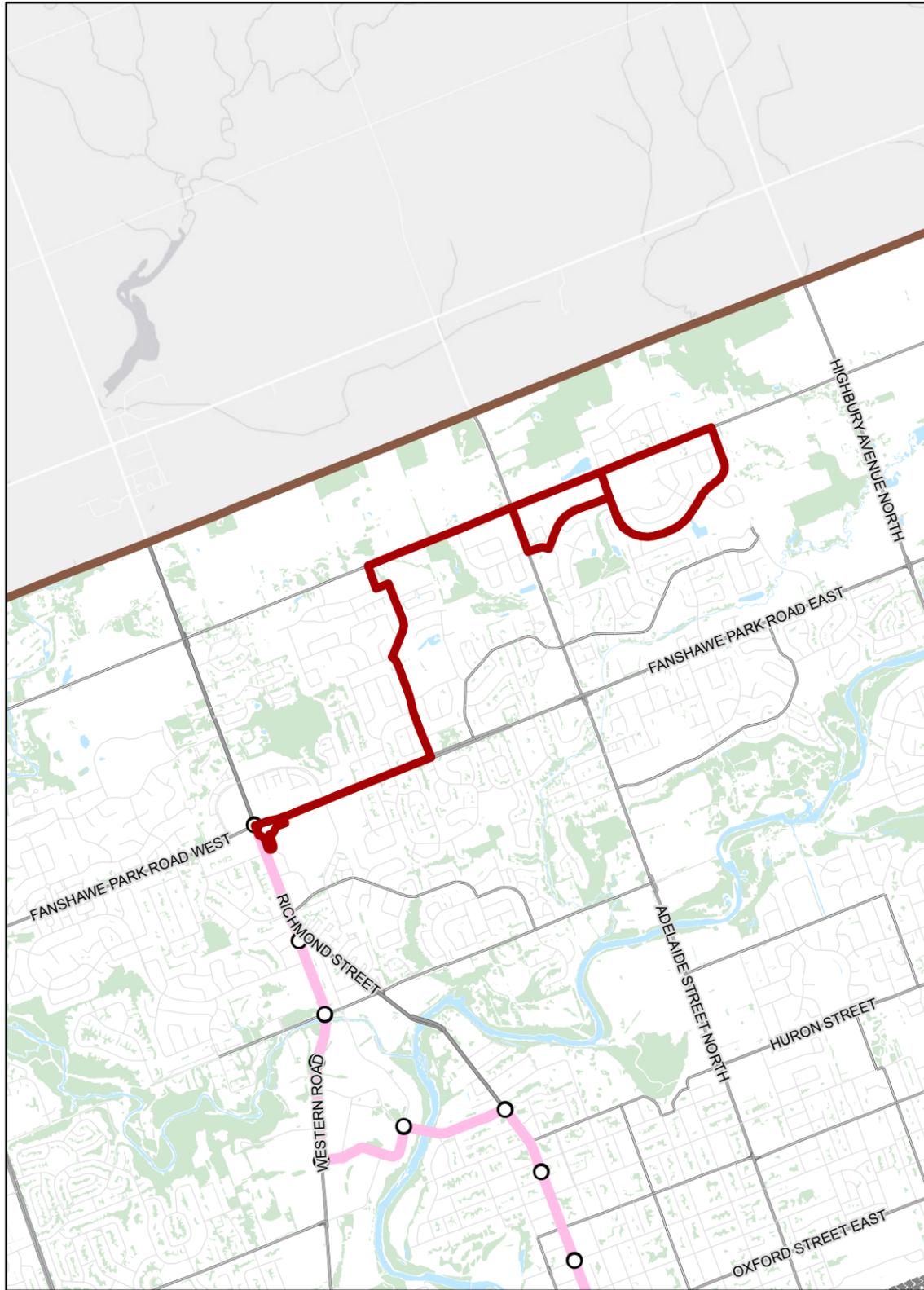
WEEKDAY

SATURDAY

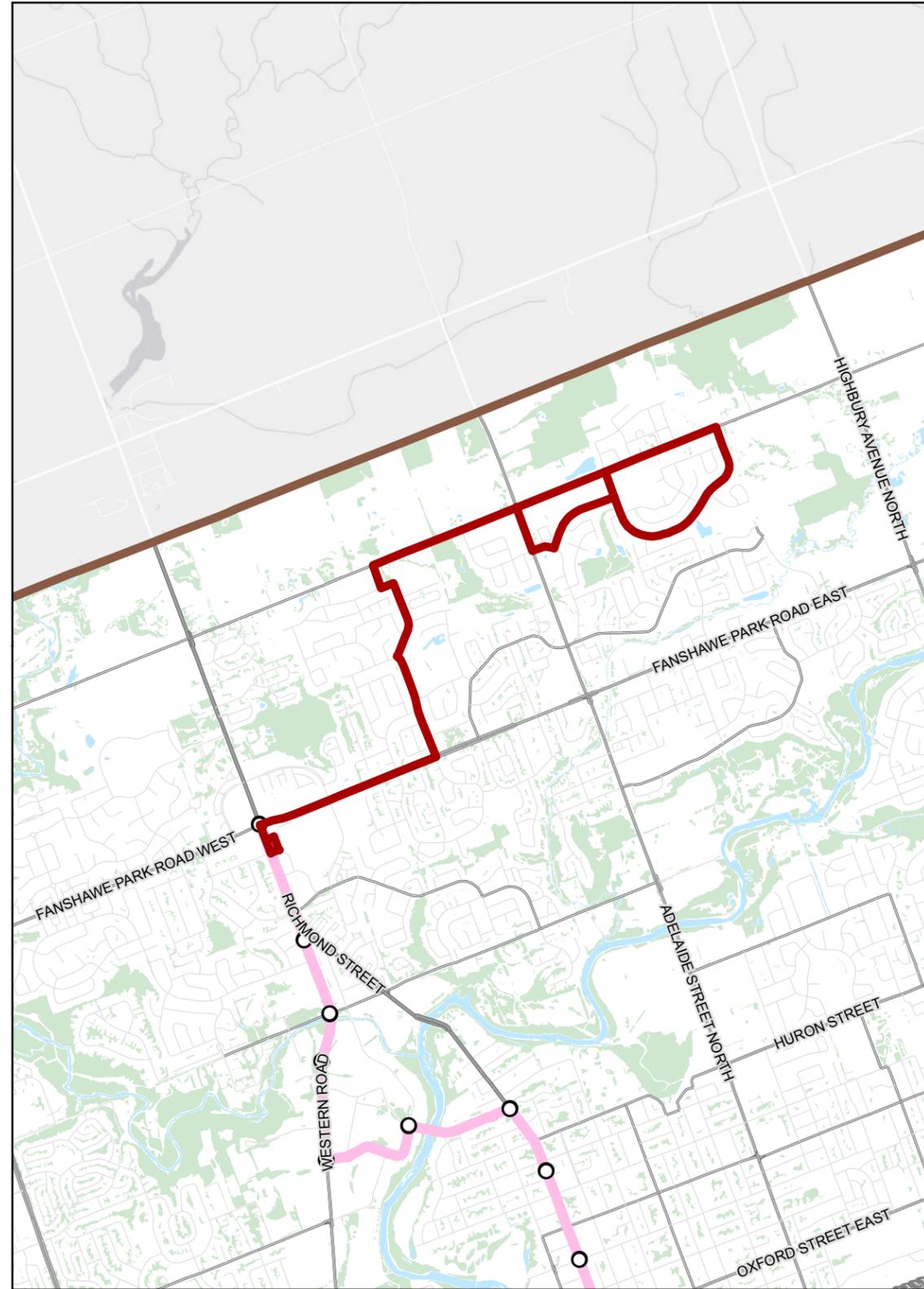
SUNDAY

	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	30	30	30	30	-	30	30	30	30	-	30	30	-
PROPOSED 2035	30	30	30	30	30	-	30	30	30	30	-	30	30	-

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

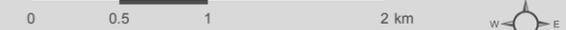
RAPID TRANSIT INTEGRATION REVIEW

**LONDON TRANSIT NETWORK
ROUTE NUMBER: 38**

2018 Network **2035 Network**
— 38 — 38

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- - - Railway
- Waterbody
- Forest
- Municipal Boundary



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MAP CREATED BY: LK / SW
 MAP CHECKED BY: IB
 MAP PROJECTION: NAD 1983 UTM Zone 17N

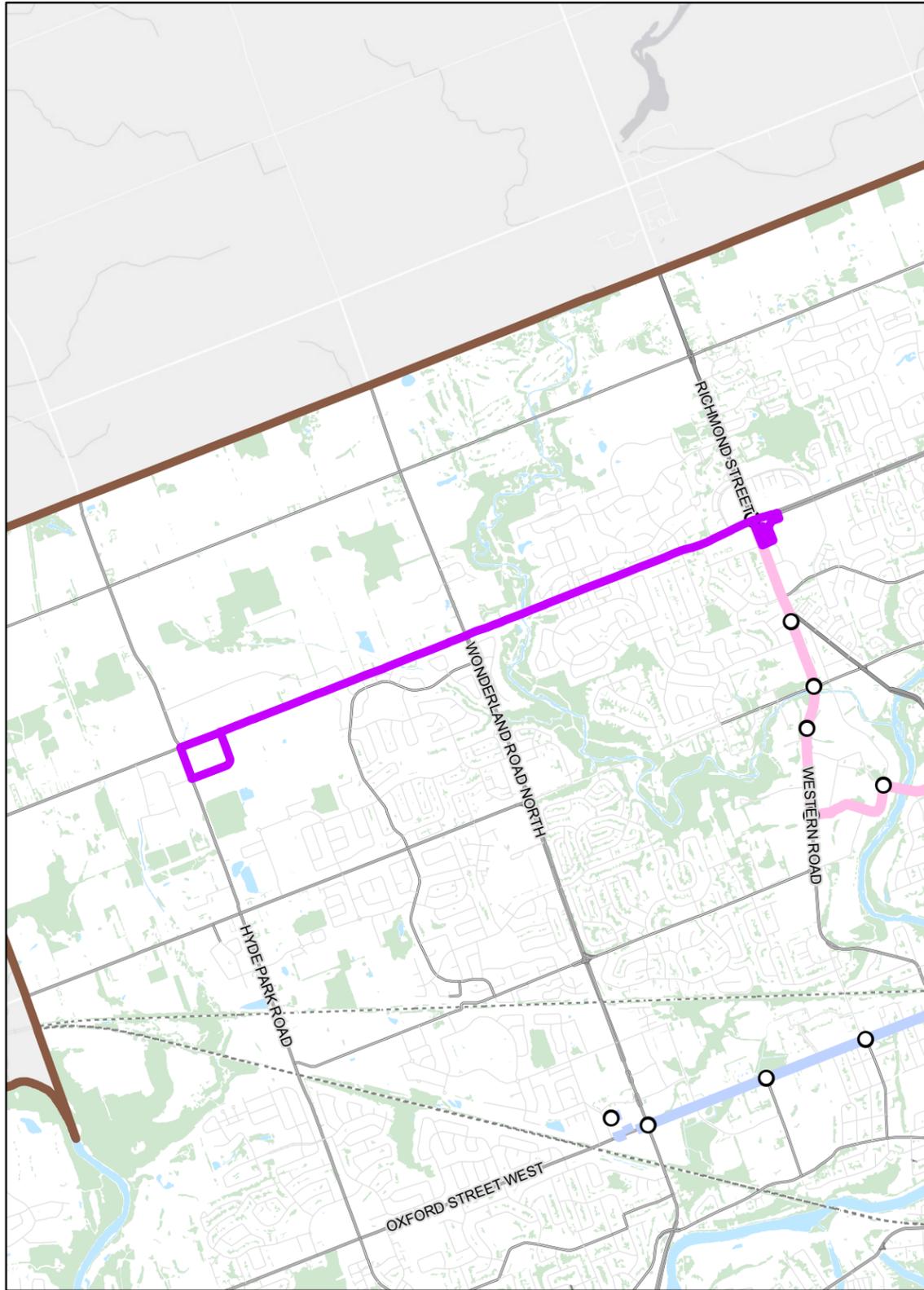
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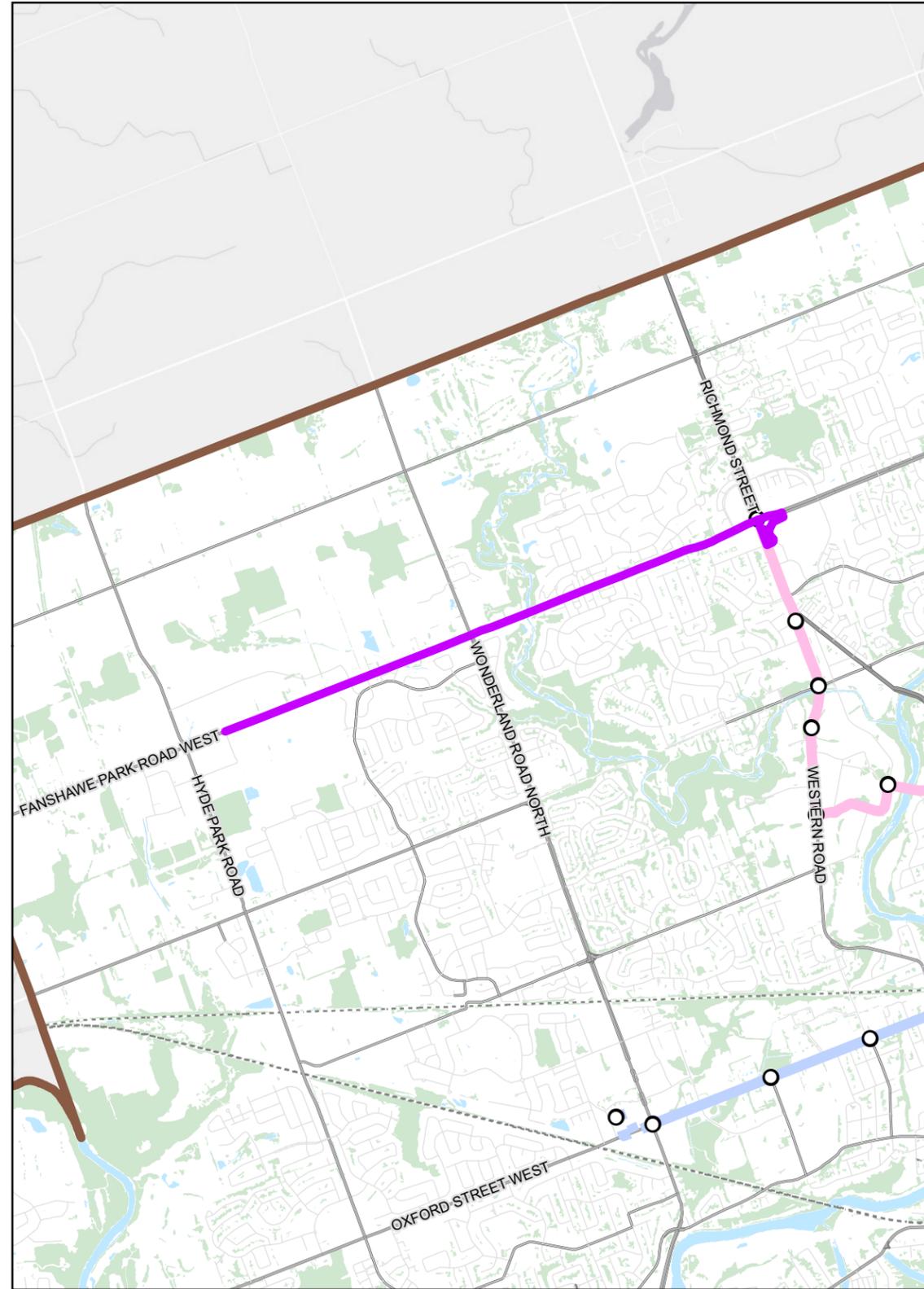
PROJECT: 18-8035
 STATUS: DRAFT
 DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	30	30	30	30	60	-	30	30	60	-	60	60	60
PROPOSED 2035	30	15	20	15	30	30	-	30	30	60	-	30	30	60

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 39

2018 Network **2035 Network**
█ 39 █ 39

Base Data

- BRT Station
- █ North-East Route
- █ South-West Route
- █ Airport Extension
- █ South-West Route (Mixed Traffic)
- - - Railway
- █ Waterbody
- █ Forest
- Municipal Boundary

0 0.5 1 2 km



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MAP CREATED BY: LK / SW
 MAP CHECKED BY: IB
 MAP PROJECTION: NAD 1983 UTM Zone 17N

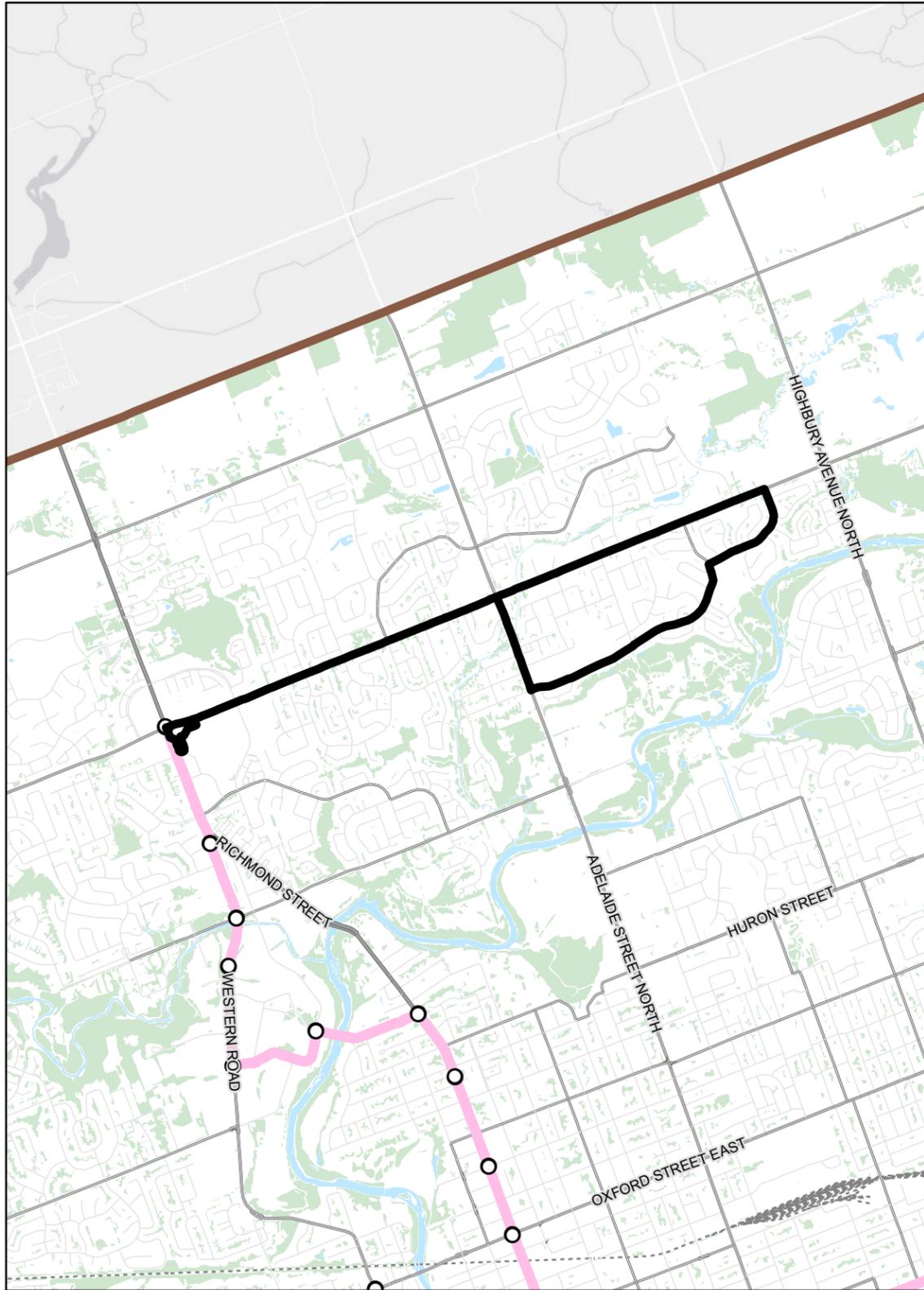
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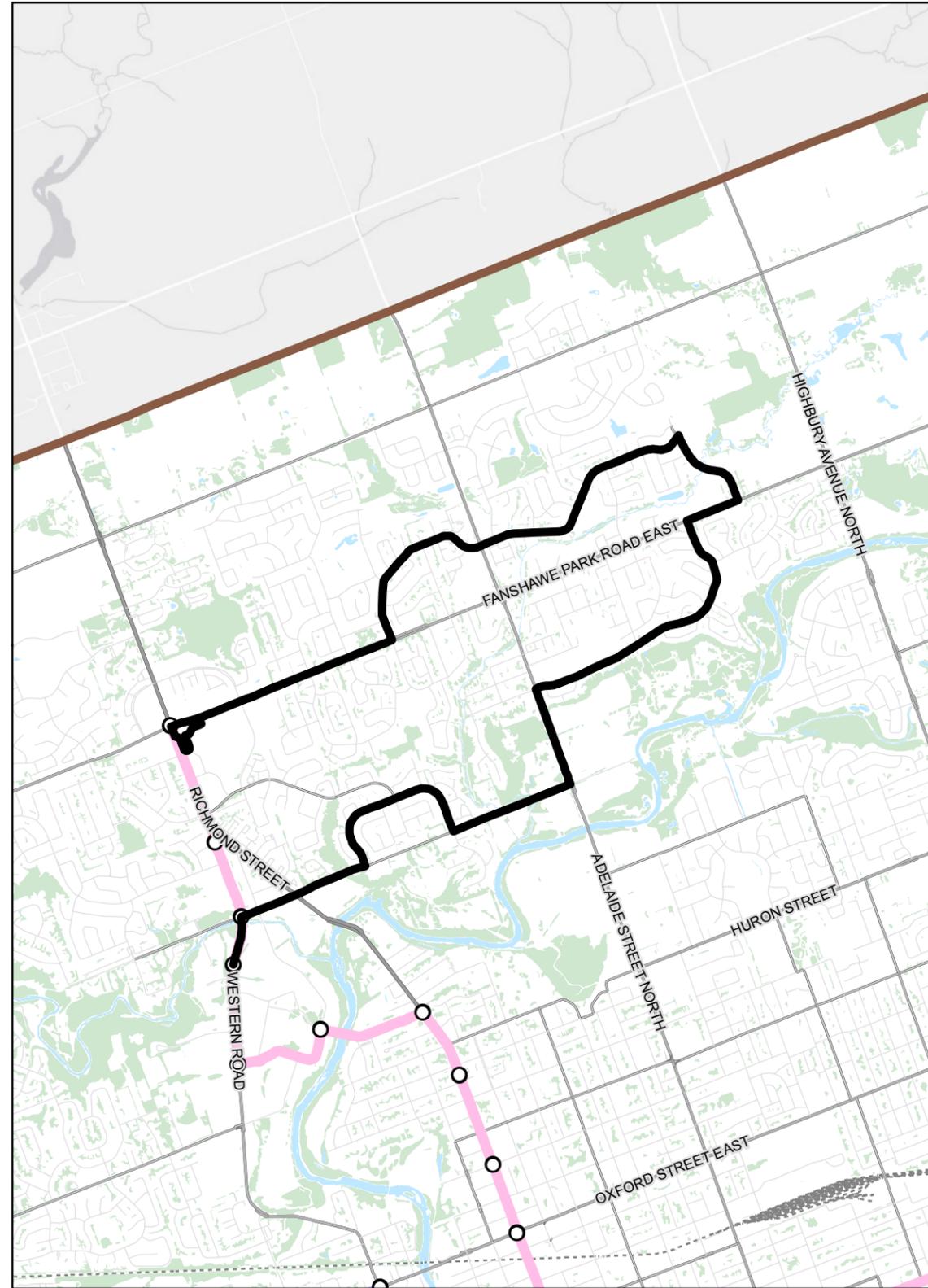
PROJECT: 18-8035
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 DATE: 10/24/2018

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	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	-	30	30	30	40	60	-	30	30	30	-	-	60	-
PROPOSED 2035	-	15	20	15	30	30	-	30	30	30	-	-	30	-

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

**LONDON TRANSIT NETWORK
ROUTE NUMBER: 40**

2018 Network **2035 Network**
 40 40

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary



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MAP CREATED BY: LK / SW
 MAP CHECKED BY: IB
 MAP PROJECTION: NAD 1983 UTM Zone 17N

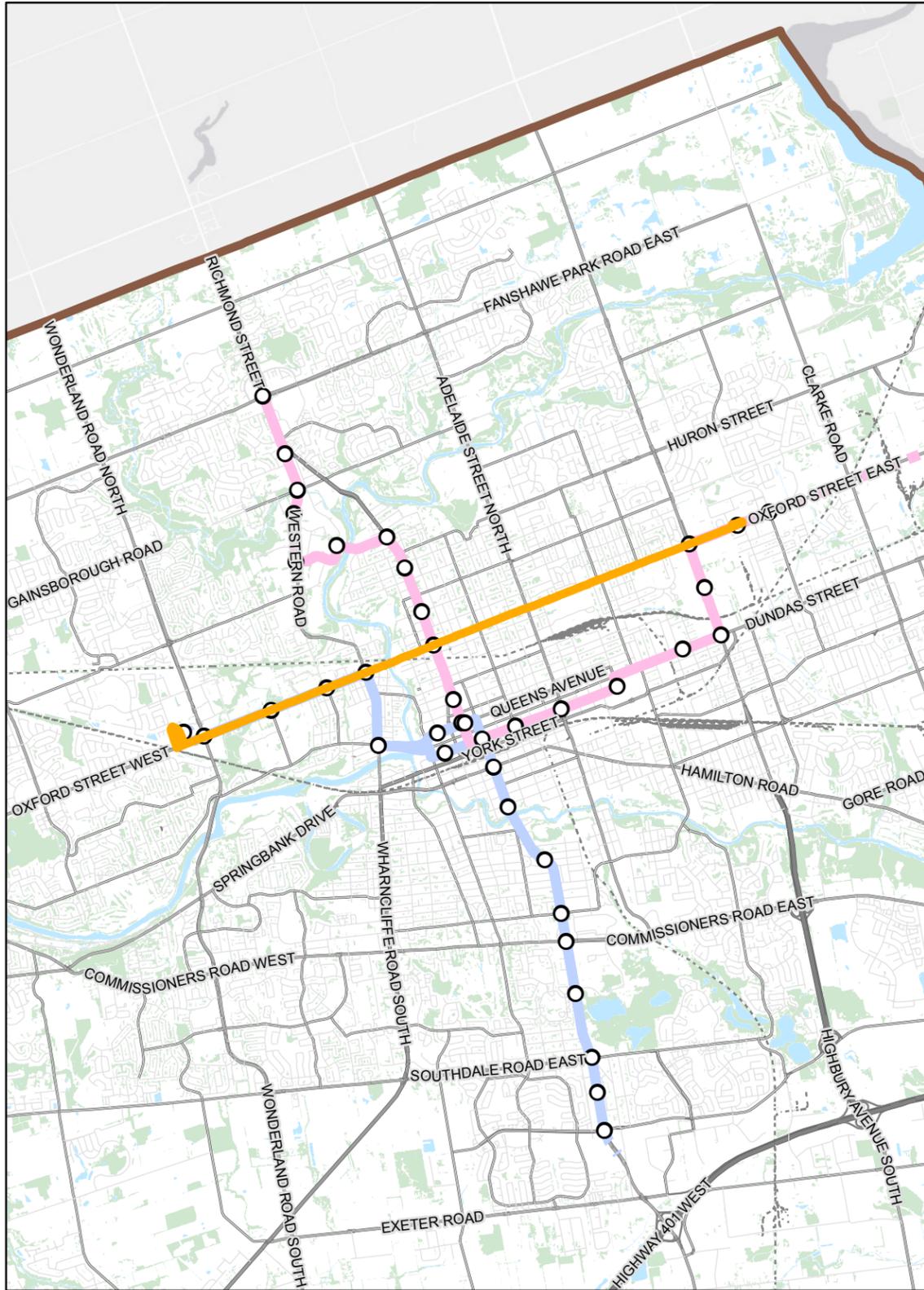
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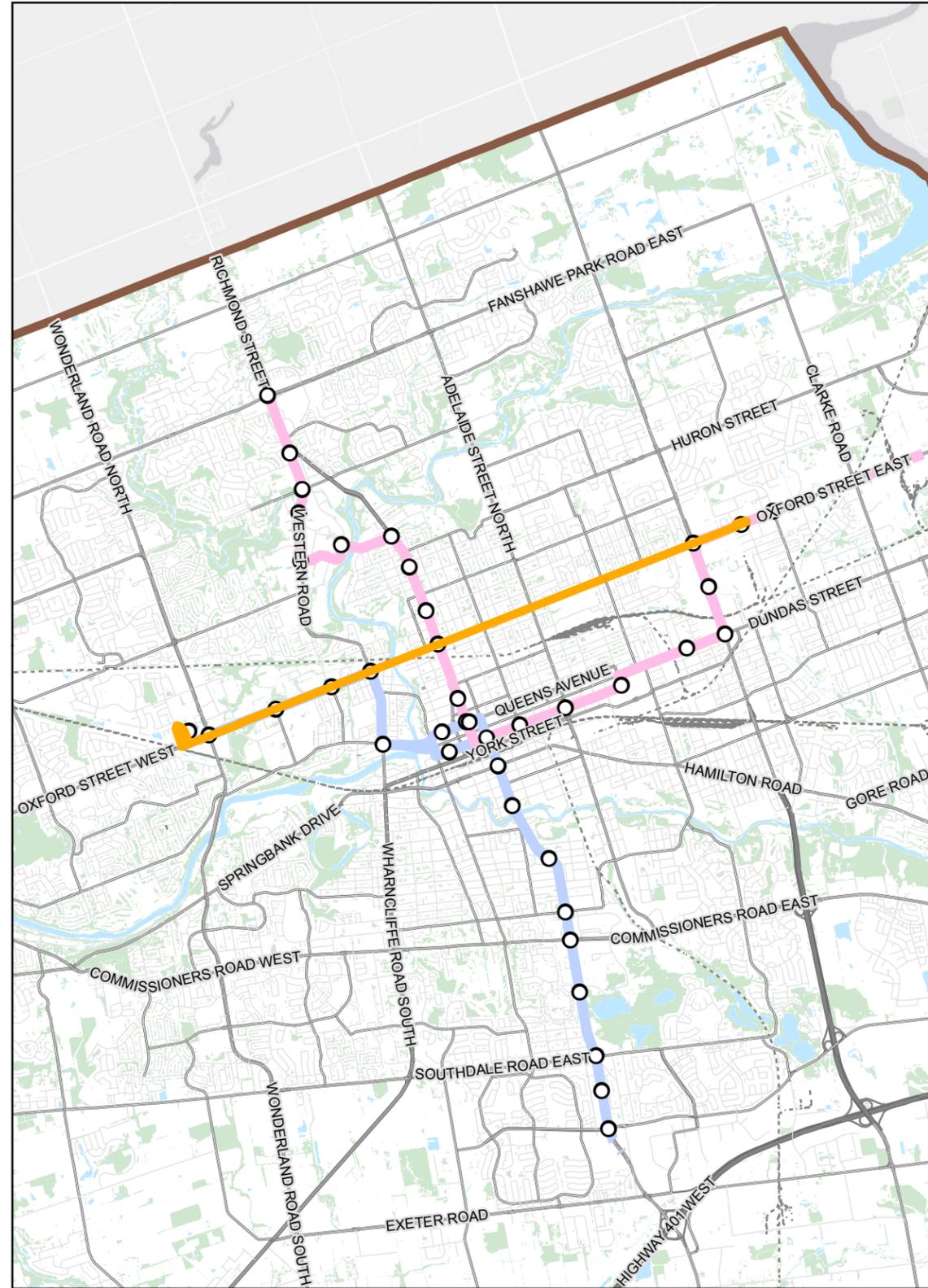
PROJECT: 18-8035
 STATUS: DRAFT
 DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	30	45	60	45	60	60	30	30	40	60	60	60	60	60
PROPOSED 2035	30	25	30	25	60	60	30	30	30	60	60	60	40	60

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

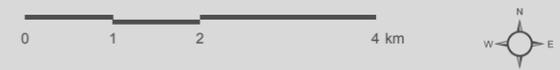
RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK ROUTE NUMBER: 91

2018 Network **2035 Network**
— 91 — 91

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- - - Railway
- Waterbody
- Forest
- Municipal Boundary



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
 MAP CHECKED BY: IB
 MAP PROJECTION: NAD 1983 UTM Zone 17N

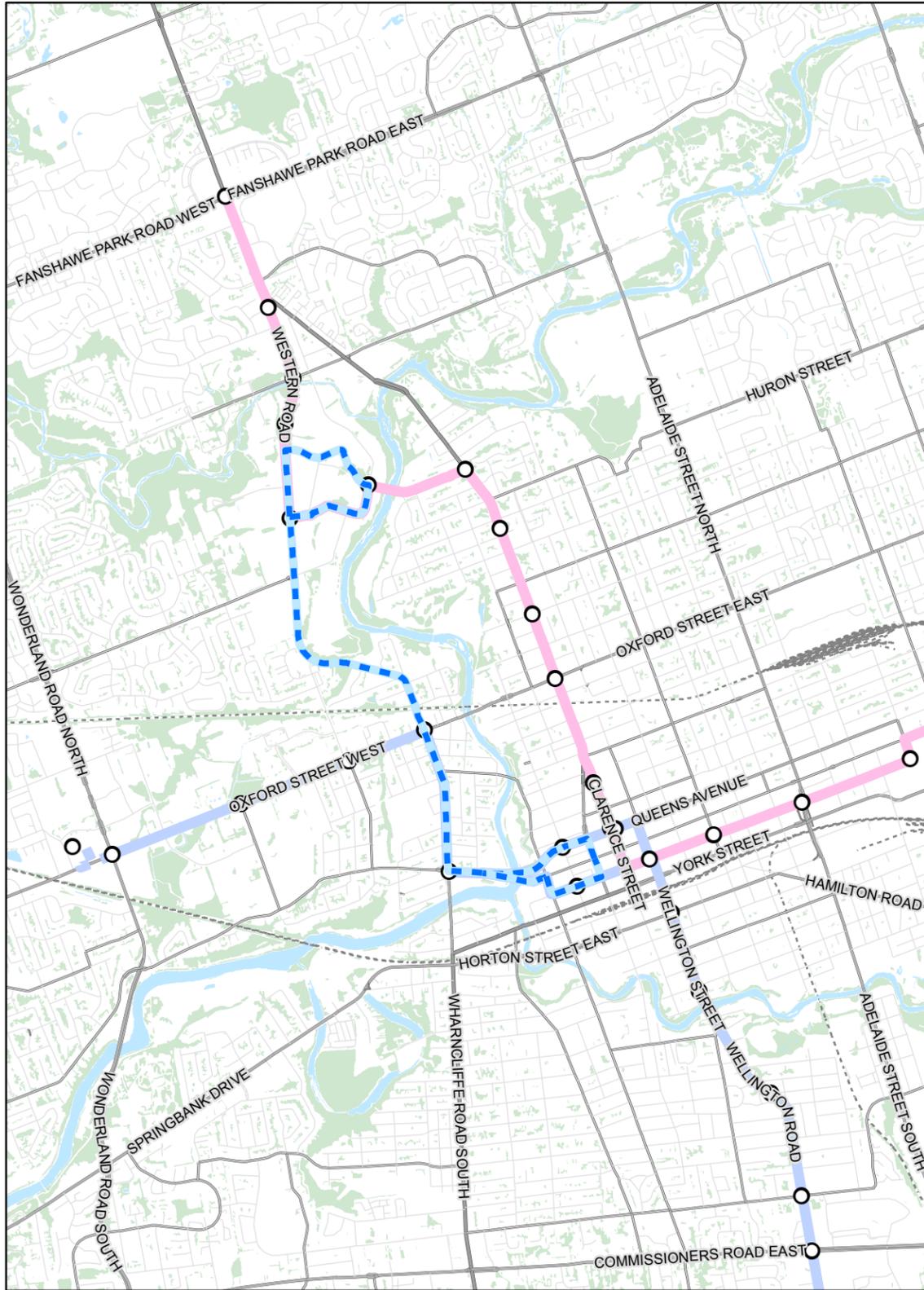
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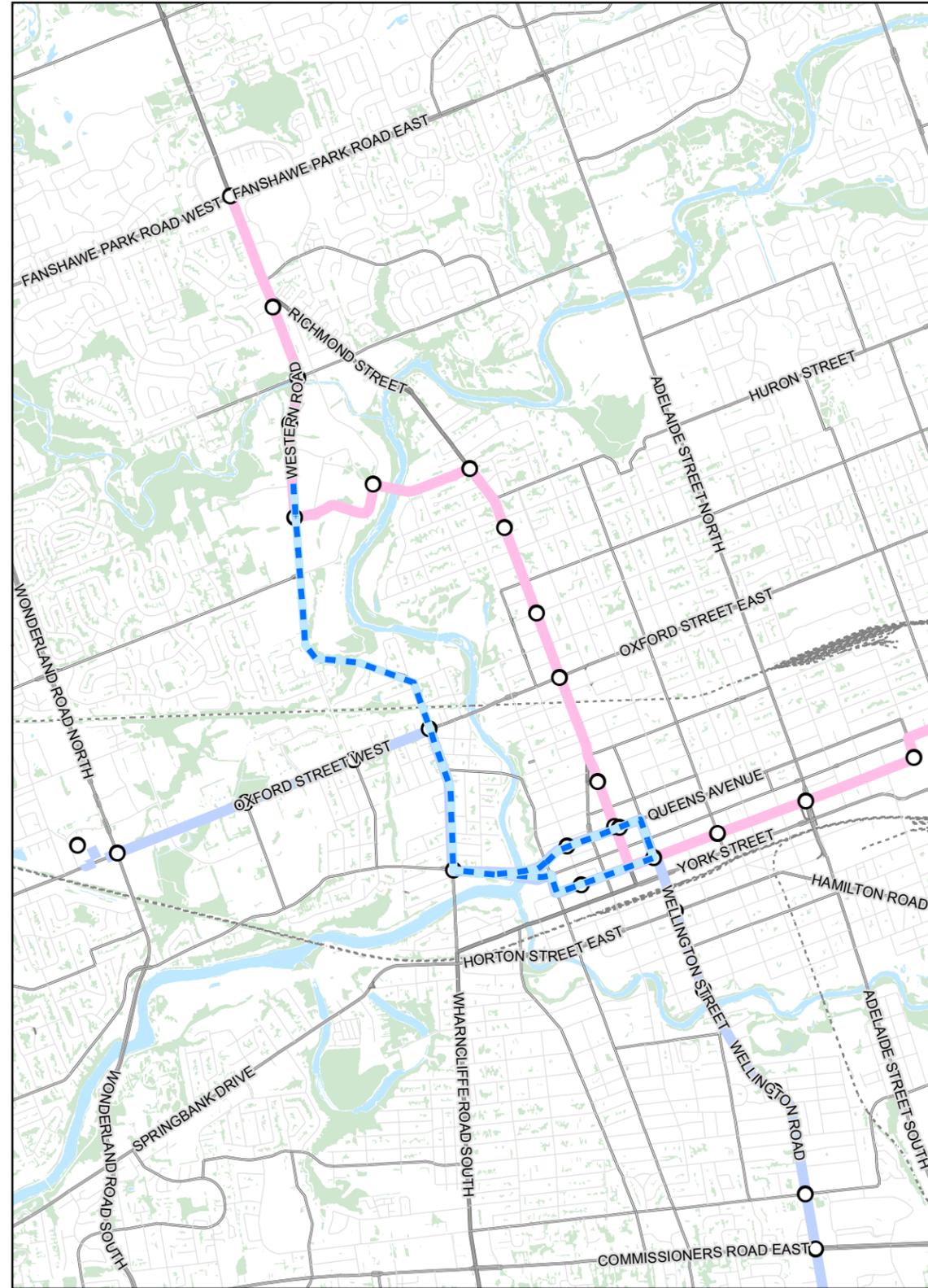
PROJECT: 18-8035
 STATUS: DRAFT
 DATE: 10/24/2018

	WEEKDAY						SATURDAY					SUNDAY		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	-	15	20	15	15	-	-	-	25	25	-	-	25	-
PROPOSED 2035	15	10	12	10	15	30	24	15	12	12	12	-	10	10

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 102

2018 Network **2035 Network**
--- 102 --- 102

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Forest
- Municipal Boundary



MAP DRAWING INFORMATION:
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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

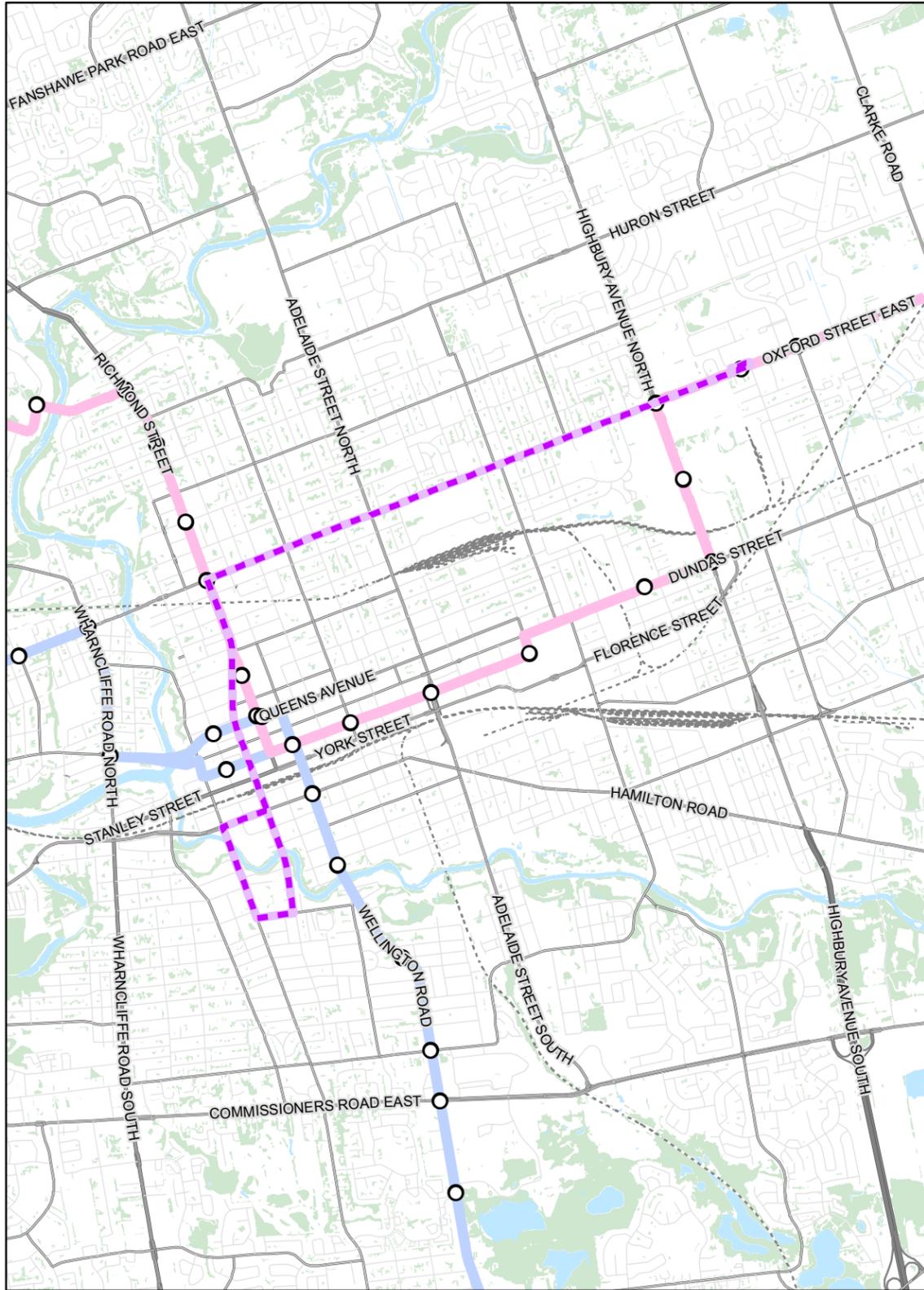
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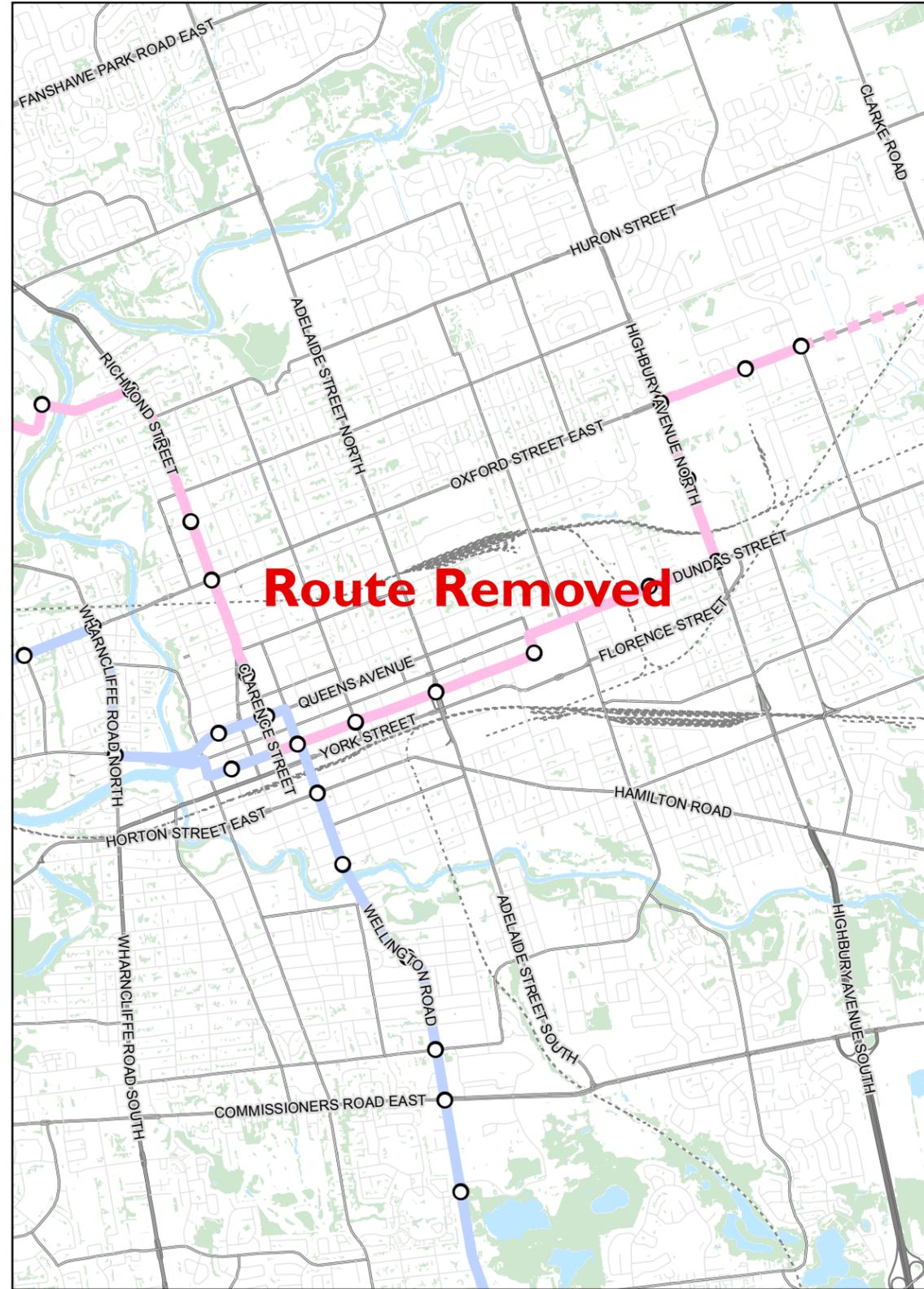
PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

	<u>WEEKDAY</u>						<u>SATURDAY</u>					<u>SUNDAY</u>		
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE	EARLY AM	DAY	EVENING
EXISTING 2018	-	10	12	12	20	35	-	40	40	40	40	40	40	40
PROPOSED 2035	-	3	4	3	10	15	-	10	10	10	20	20	10	20

2018 NETWORK



PROPOSED 2035 NETWORK



LONDON TRANSIT COMMISSION

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
ROUTE NUMBER: 104

2018 Network 2035 Network
--- 104

Base Data

- BRT Station
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- █ Waterbody
- █ Forest
- Municipal Boundary

0 0.5 1 2 km



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MAP CREATED BY: LK / SW
MAP CHECKED BY: IB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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PROJECT: 18-8035
STATUS: DRAFT
DATE: 10/24/2018

WEEKDAY

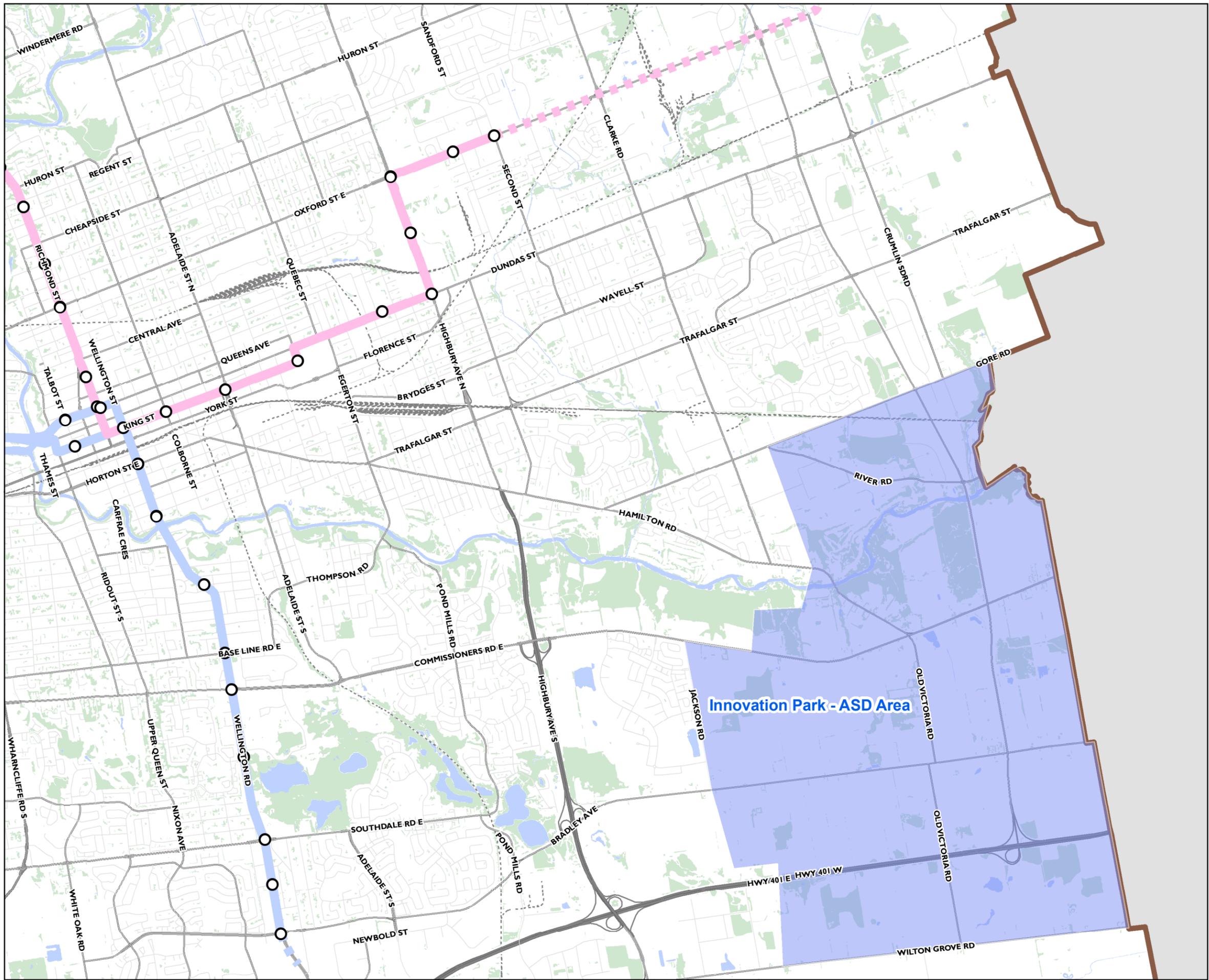
	EARLY AM	AM PEAK	BASE	PM PEAK	EARLY EVE	LATE EVE
EXISTING 2018	30	30	30	30	-	-
PROPOSED 2035	-	-	-	-	-	-

SATURDAY

	EARLY AM	BASE	PEAK	EARLY EVE	LATE EVE
EXISTING 2018	-	30	30	-	-
PROPOSED 2035	-	-	-	-	-

SUNDAY

	EARLY AM	DAY	EVENING
EXISTING 2018	-	-	-
PROPOSED 2035	-	-	-



RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
Alternative Service Delivery Area
Innovation Park

- LTC Bus Route
- BRT Station
- Alternative Service Delivery Areas
- Municipal Boundary
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Vegetation

Innovation Park - ASD Area



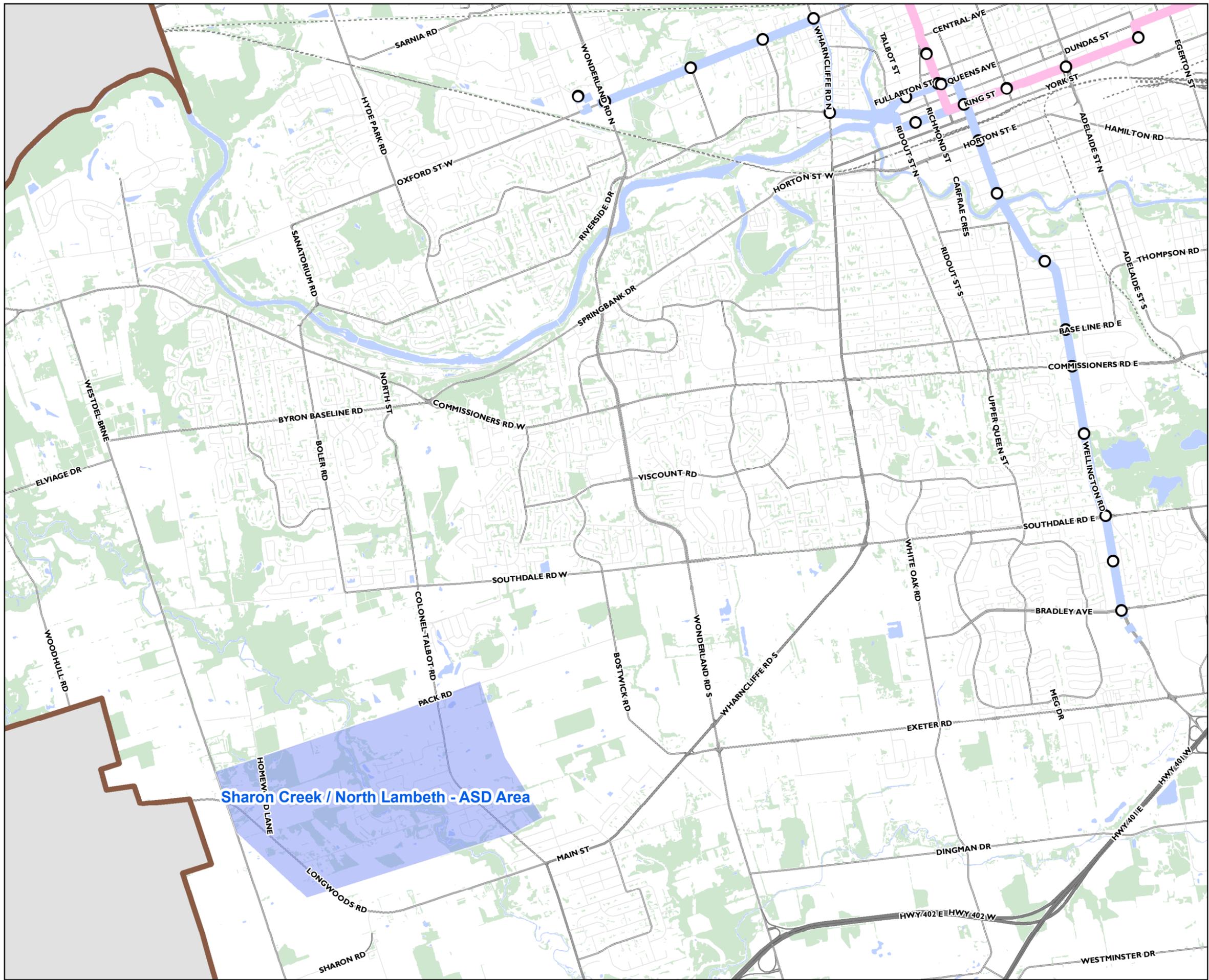
MAP DRAWING INFORMATION:
DATA PROVIDED BY LTC

MAP CREATED BY: KS
MAP CHECKED BY: DAK
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:GIS\163037



PROJECT: 188035
STATUS: FINAL
DATE: 2018-09-24



Sharon Creek / North Lambeth - ASD Area

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
Alternative Service Delivery Area
Sharon Creek / North Lambeth

- LTC Bus Route
- BRT Station
- ▭ Alternative Service Delivery Areas
- ▭ Municipal Boundary
- ▭ North-East Route
- ▭ South-West Route
- ▭ Airport Extension
- ▭ South-West Route (Mixed Traffic)
- Railway
- ▭ Waterbody
- ▭ Vegetation



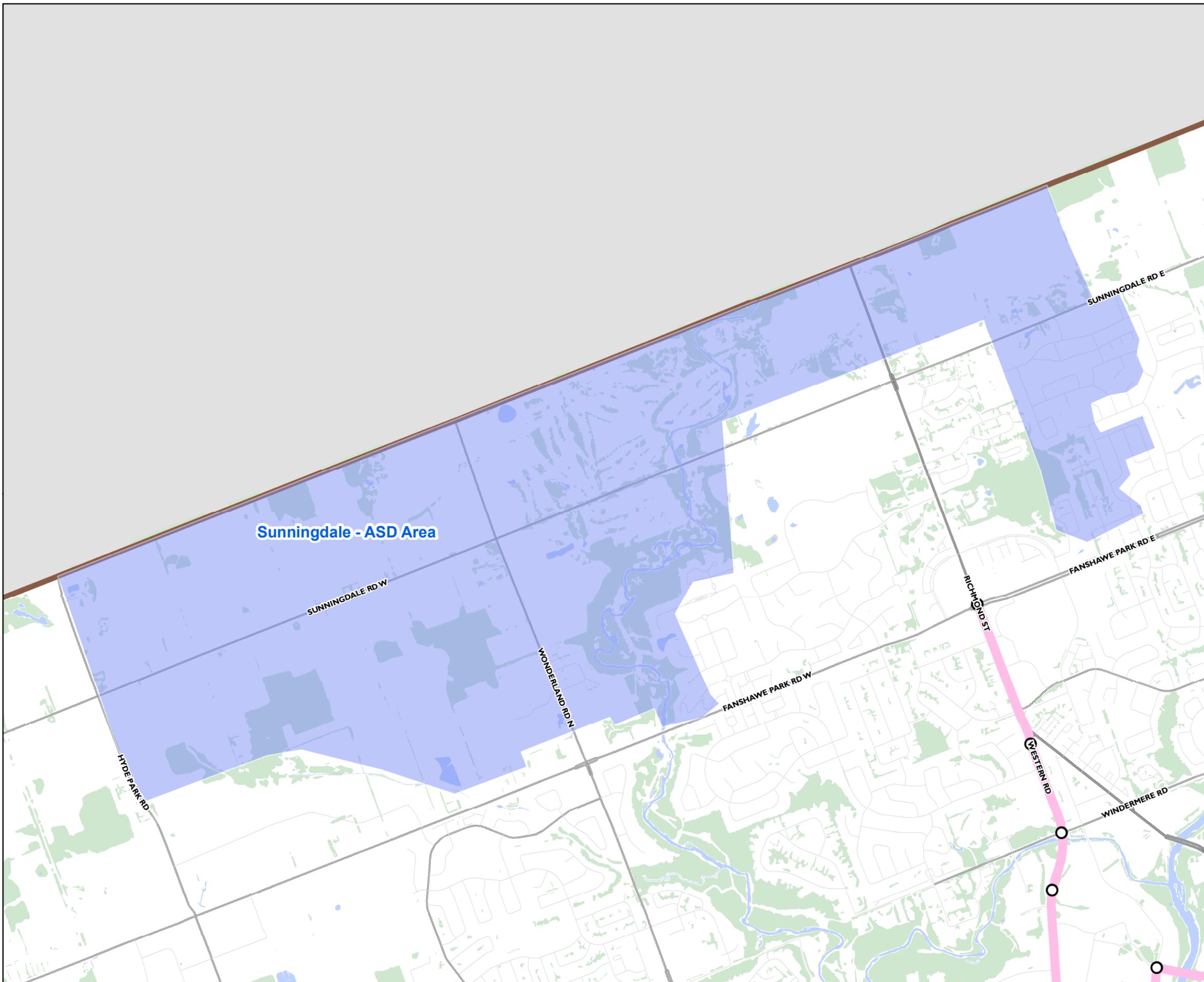
MAP DRAWING INFORMATION:
DATA PROVIDED BY LTC

MAP CREATED BY: KS
MAP CHECKED BY: DAK
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:\GIS\163037



PROJECT: 188035
STATUS: FINAL
DATE: 2018-09-24



Sunningdale - ASD Area

RAPID TRANSIT INTEGRATION REVIEW

LONDON TRANSIT NETWORK
Alternative Service Delivery Area
Sunningdale

- LTC Bus Route
- BRT Station
- ▭ Alternative Service Delivery Areas
- ▭ Municipal Boundary
- North-East Route
- South-West Route
- Airport Extension
- South-West Route (Mixed Traffic)
- Railway
- Waterbody
- Vegetation



MAP DRAWING INFORMATION:
DATA PROVIDED BY LTC

MAP CREATED BY: KS
MAP CHECKED BY: DAK
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: I:GIS\163037



PROJECT: 188035
STATUS: FINAL
DATE: 2018-09-25

APPENDIX B

**Summary of Public Open House and Operator
Feedback on Design Principals**

1.0 ENGAGEMENT SUMMARY

A number of public engagement activities were completed as part of this study. These included a:

- Public Open House;
- LTC Operator Survey; and
- Public Online Survey.

Within each of these activities, comments and suggestions about the existing service as well as the proposed Service Design Principles that were used to integrate existing local routes with approved BRT routes were received.

It should be noted that the amount of participation from the first round of engagement was typical of other studies where the focus is on long-term strategic direction rather than short-term detailed route design. Experience has shown that the public are generally more drawn to engagement activities that show proposed new routes or service changes rather than long-term or high level concepts. The following presents a summary of feedback received from public engagement activities. The focus of the summary below is on the Service Design Principles. Input received regarding existing services and short-term improvements will be summarized as part of the 2020-2024 Transit Master Plan.

1.1 Public Open House

A public open house was conducted on September 11th, 2018 between 2:00pm and 4:00pm and between 6:00pm and 8:00pm at the downtown public library. Approximately 40 people were in attendance. A number of informative and interactive display boards were made available to get attendee feedback on the existing system as well as the Design Principles (**Section 3.0**) that were used to integrate local routes with the introduction of BRT services. **Figure BI** shows the six design principles that participants were asked to provide feedback on.

The majority of comments and feedback received from attendees was on the existing service, including what works and what should be improved. This feedback will be summarized as part of the 2020-2024 Transit Master Plan.

Approximately six responses were received regarding the Design Principles. The majority of these respondents indicated that they would like to ensure any changes to the local routes with the introduction of BRT Maintain Connections (Design Principle #1) and Ensure Directness (Design Principle #3).

Figure B1 – Design Principles Feedback

DESIGN PRINCIPLES FEEDBACK

Please place a **one (1) sticker** in the right column to signify which rapid transit integration principle that is most important to you.

	#1: MAINTAIN CONNECTIONS	Ensure routes connect directly to key origins and destinations - between places where people live and where people can work, shop, learn, socialize and do business.	
	#2: PROVIDE FREQUENT SERVICE	Local routes that connect to Bus Rapid Transit should be designed to minimize waiting times when customers transfer between services. This will involve reducing the frequency of connecting local bus services where applicable	
	#3: ENSURE DIRECTNESS	Local bus routes and connections to Bus Rapid Transit should be designed to maintain direct travel and reduce travel time to major destinations (e.g. downtown London).	
	#4: MINIMIZE DUPLICATION	Bus Rapid Transit will provide high frequency and faster service along key corridors in London. To make the best use of this investment, duplication with local services should be minimized and reinvested to other areas of the City.	
	#5: CONSERVE EFFECTIVE OPERATIONS	Any changes to local bus routes to connect to the Bus Rapid Transit Network must be considered at a 'system-wide' level, ensuring all routes work together from an operations and customer perspective.	
	#6: EXPLORE ALTERNATIVE SERVICE MODELS IN LOW DEMAND AREAS	Provide effective connections between Bus Rapid Transit and low-demand areas through the use of Alternative Service Delivery (ASD) models. ASD models are demand-responsive services which use smaller vehicles that do not rely on a fixed route or schedule. Customers can book a shared-ride by calling London Transit or using a mobile app.	



Rapid Transit Integration Strategy
Five-Year Service Plan



1.2 Online Transit Survey

An online survey was made available to members of the public between September 2nd and September 30th, 2018. Hard-copies of the survey were also made available during the September 11th public open house. The survey captured a range of demographic perspectives with participants from the following age groups:

- 3% High School Student (13 to 18)
- 18% Post-Secondary Student (19 to 24)
- 71% Adult (25 to 64)
- 8% Senior (64+)

The survey asked participants about the existing service, including what is working well and the priority improvements that could be made. This input will be used as part of the 2020-2024 Transit Master Plan.

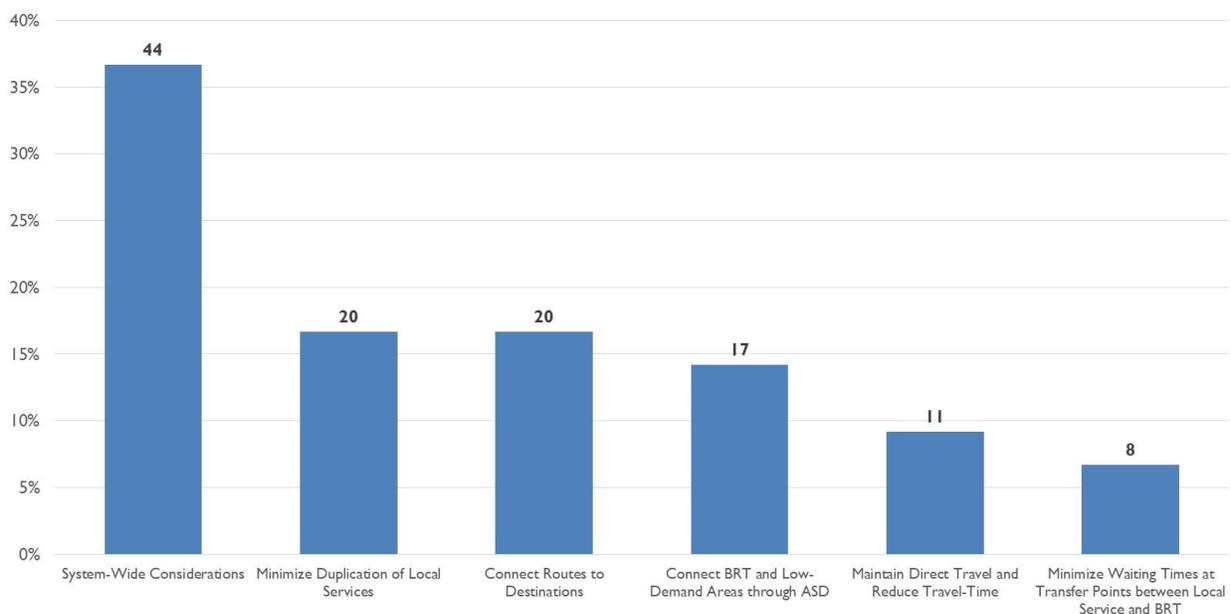
The survey also asked participants to prioritize the most important Service Design Principles to be used when integrating local routes with the proposed BRT routes. Overall, 148 responses were provided to the Service Design Principle question.

QUESTION: “Which of the following design principles are the most important when planning changes to LTC bus routes to better integrate with the future BRT network?”

Of the 148 survey participants, 37 percent of respondents selected the same choice for top ranking design principle:

- *Any changes to local bus routes to connect to the Bus Rapid Transit Network must be considered at a 'system-wide' level, ensuring all routes work together from an operations and customer perspective. This includes maintaining on-time performance (the ability to perform according to a scheduled time), connectivity to other routes and maintaining legible frequencies).*

Figure B2 - Public Perception on Service Design Principles



The second and third highest ranking guiding principles were both chosen by 17 percent of survey respondents.

- *Bus Rapid Transit will provide high frequency and faster service along key corridors in London. To make the best use of this investment, duplication with local services should be minimized and reinvested to other areas of the City. Some duplication will be permitted where Bus Rapid Transit routes do not service local stops along the corridor, which would otherwise result in longer walking distance for customers; and*
- *Ensure routes connect directly to key origins and destinations - between places where people live and where people can work, shop, learn, socialize and do business*

The three lowest ranking design principles relate to alternate service delivery models (14 percent), maintaining direct travel time (9 percent), and minimizing waiting times when customers transfer between services (7 percent).

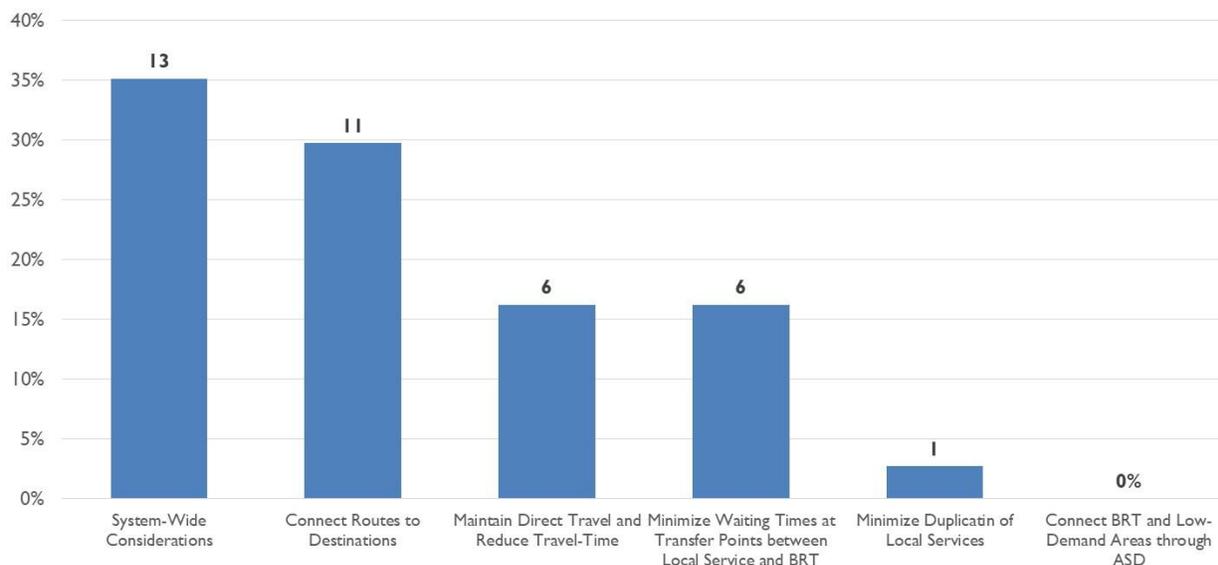
1.3 LTC Operator Questionnaire

LTC operators and front-line staff were also asked to provide their thoughts on the existing route structure and the Service Design Principles that were used to integrate local routes with planned BRT routes.

Of the 37 survey respondents, 35 percent selected the same choice for the top ranking design principle:

- *Any changes to local bus routes to connect to the Bus Rapid Transit Network must be considered at a 'system-wide' level, ensuring all routes work together from an operations and customer perspective. This includes maintaining on-time performance (the ability to perform according to a scheduled time), connectivity to other routes and maintaining legible frequencies).*

Figure B3 - Operator Perception of Service Design Principles



The second highest ranking design principle was chosen by 30 percent of survey respondents.

- *Ensure routes connect directly to key origins and destinations - between places where people live and where people can work, shop, learn, socialize and do business.*

The remaining four design principles relate to maintain direct travel time (16 percent), minimize waiting times at transfer points between local service and BRT (16 percent), minimize duplication of local services (3 percent), and connect low-demand areas to destinations through Alternate Service Delivery models (0 percent).

1.4 Summary

The majority of respondents from both the public and the LTC operator group felt that system-wide considerations is the most important design principle to be adhered to when modifying local routes to better connect to the planned BRT routes. This suggests that the introduction of BRT should pay considerable attention to how it is integrated with the rest of the system, and that the entire LTC continues to be easy to use and operate effectively.

The need to continue to maintain connections on existing routes (suggestion routes should not be modified if it reduces direct connections to key destinations on the route).