

# TORONTO TRANSIT COMMISSION REPORT NO.

**MEETING DATE:** December 17, 2008

**SUBJECT:** YONGE SUBWAY EXTENSION – FINAL REPORT ON TRANSIT  
PROJECT ASSESSMENT PROCESS AND FUTURE ACTIONS

## **ACTION ITEM**

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### **RECOMMENDATION**

It is recommended that the Commission:

- 1) Approve the submission of an Environmental Project Report, jointly with the City of Toronto and York Region, for the Yonge Subway Extension project as required under the Transit Project Assessment Process (TPAP), based on the recommended project configuration outlined in this report including the following key considerations:
  - A 6.8 kilometre extension of the Yonge Subway line from its current terminus at Finch Station north to the Richmond Hill Centre (Highway 7);
  - The construction of six stations at Cummer/Drewry, Steeles, Clark, Royal Orchard, Langstaff/Longbridge and Richmond Hill Centre, resulting in average station spacing of 1.13 kilometres;
  - The provision of major intermodal bus terminals at Steeles and Richmond Hill Centre Station and the provision of a bus loop at Cummer/Drewry Station on the north side of Drewry Avenue west of Yonge Street;
  - The provision of sufficient commuter facilities and parking at Langstaff/Longbridge Station to serve existing Finch Station commuters (who will find it more convenient to park further north) and to attract new riders to the extension;
  - The conversion of the existing Finch Station pocket track/tail track to a double ended configuration, a crossover at Steeles Station and a crossover/tail track arrangement at Richmond Hill Centre Station; and
  - A bridge structure for the subway extension over the East Don River (between Clark and Royal Orchard Stations).

Noting that the Yonge Subway Extension project has the following benefits for the TTC/City:

- Increased TTC ridership;
- The addition of two new stations and the resulting re-development opportunities;

- Improved local access to commuter parking;
  - Reduced community/environmental impacts from existing bus services on Yonge Street;
  - Improved quality, reliability and travel time for Yonge Street commuters;
  - Reduced PPUDO congestion at Finch Station; and
  - Improved transit connectivity to/from York Region.
- 2) Continue to support the implementation of the Yonge Subway Extension project subject to the following principles:
- The TTC's base capital funding needs must continue to be fully funded including replacement streetcars and the timely implementation of Transit City lines;
  - The TTC's future base capital funding needs for rail yard expansion, the expanded subway car fleet to support reduced headways on the YUS line and increased capacity of Yonge-Bloor Station must also be funded;
  - The Spadina Subway Extension and ATO/ATC on the YUS line must be in place prior to the opening of the Yonge Subway Extension;
  - It will not be possible to implement improved headways on the YUS line (with ATO/ATC) without a significant investment in Yonge-Bloor Station capacity prior to the availability of the new signal system in 2016, and the Yonge-Bloor Station improvements must therefore be fully funded;
  - The capacity of the Yonge Subway line to accommodate future ridership from this extension (and other network improvements that connect to the Yonge Subway) is a significant operational issue that requires further study and resolution before the project can proceed;
  - The current budget for the Yonge Subway project includes an allowance for storage/maintenance of Yonge Subway Extension vehicles in an existing yard (Wilson or Davisville). Should a stand alone yard (or a satellite facility at the north end of the Yonge Subway Extension project) be required, the capital cost of the Yonge-Subway project will increase from the current estimate of \$2.4 billion (2008 dollars). The Subway Rail Yard Needs Study to support the Yonge Subway Extension and other planned increases on the YUS Subway line currently being undertaken by the TTC will identify future yard requirements to 2031, including the capital cost implications for yards over and above the existing Yonge Subway extension budget, and these needs must be met prior to implementation;
  - The estimated \$125 million cost to acquire property for the Yonge Subway project has not yet been confirmed as eligible for funding from the Province of Ontario based on draft capital cost eligibility guidelines. The TTC/City position is that property costs for the project should not be born by the TTC/City; and

- The design of Yonge Subway Extension stations and surface facilities be designed to a high standard of excellence in collaboration with proven architects, including integrated artwork, and be environmentally sustainable consistent with City/TTC standards.
- 3) Endorse the following principles with respect to the governance/implementation of the project:
- TTC will be directly responsible for project management and delivery of the Yonge Subway Extension project utilizing TTC procurement policies and procedures;
  - TTC will operate and maintain the subway infrastructure (including commuter parking lots) but excluding passenger pick-up and drop-off facilities and bus terminals in York Region;
  - TTC will own the property, assets and subway facilities within York Region except for bus terminals and passenger pick-up and drop-off facilities and bus terminals located in York Region;
  - Stations and bus interface facilities used by the TTC will be designed and built consistent with TTC design standards and practices;
  - Consistent with the Move Ontario 2020 commitments, the City expects the Province of Ontario will be responsible for all capital costs;
  - Any increases in net operating costs incurred for the Yonge Subway Extension will be at no cost to the City of Toronto; and
  - A Coordinating Committee (including representatives of the TTC, York Region and City of Toronto) will be established to proceed with the project and finalize the funding and service agreements with Metrolinx, the Province of Ontario and the Government of Canada.
- 4) Request staff to report back to the Commission on the results of the Metrolinx Benefits Case Analysis in Spring 2009.
- 5) Request TTC/City staff to submit a report outlining the capacity and ridership issues associated with the Yonge Subway line directly to the January 27/28, 2009 City Council meeting. The report should include consideration of the following:
- Growth in background TTC ridership;
  - Ridership impacts of the Transit City lines, planned GO Transit rail improvements and the Metrolinx Regional Transportation Plan proposal for a downtown core relief rapid transit;
  - The ridership diverted from the Yonge Subway to the Spadina Subway with the opening of the Spadina line to the Vaughan Corporate Centre, and

- The extension of the Yonge Subway to Richmond Hill Centre.
- 6) Request staff, at the appropriate time, to report on efforts to minimize the property impacts of the underground bus terminal at Steeles Station and the feasibility of completing the Service Road to Drewry Avenue prior to the start of construction of Cummer/Drewry Station.
- 7) Request staff, in light of the public concerns about the capacity of the Yonge Subway south of Finch Station, to arrange additional public meetings in January 2009 to outline the planned capacity improvements that will be made to the YUS subway line in parallel with the implementation of the Yonge Subway Extension project and that the results of these meetings be reported directly to the January 27/28, 2009 City Council meeting.
- 8) Authorize the TTC General Secretary to forward this TTC staff report to the January 5, 2009 Executive Committee and January 27/28, 2009 City Council meetings for consideration along with a City staff report on the project.
- 9) Authorize the TTC General Secretary to forward this report to York Region and Metrolinx for their information noting that the TTC's subway rail yard needs, the expanded subway car fleet to support reduced headways on the YUS line and the capacity of Yonge-Bloor Station must be fully funded to ensure that the Yonge Subway can support the projected ridership.

## **FUNDING**

The Yonge Subway Extension project was included in the TTC's 2009-2013 Capital Program budget as outlined on pages 1559-1561; however, this project is presented below the line and can proceed only upon the confirmation of funding approval.

The cost of the functional planning and TPAP work carried out by York Region to date has been front ended by York Region at no cost to the TTC/City of Toronto. On October 23, 2008, the Commission authorized \$0.3 million in funding to allow TTC staff input to the project to continue through April 2009, at which time it is expected that additional Provincial funding will be available to proceed with initial start up of the project. City of Toronto Council also approved the \$0.3 million on December 10, 2008 as part of the 2009-2013 TTC Capital Program.

The Yonge Subway Extension project is being assessed through a Benefits Case Analysis (BCA) by Metrolinx. The purpose of the BCA is to identify those projects outlined as the top 15 projects identified in the draft Regional Transportation Plan (RTP) which should move into the implementation phase on a priority basis. Metrolinx staff, in a November 28, 2008 presentation to the Metrolinx Board, indicated that the Yonge North Subway Extension BCA will be completed early in the new year leading to a prioritization framework to support the 2010 Metrolinx Capital plan recommendations in Fall 2009. The results of the Metrolinx BCA

for the Yonge Subway Extension project will be the subject of a Commission report in Spring 2009.

The following funding issues with respect to capital costs of the Yonge Subway project remain to be resolved as outlined in this report:

- The full cost of storing Yonge Subway vehicles from a yard perspective as determined by the Subway Rail Yard Needs Study; and
- The property cost for the Yonge Subway Extension project (\$125 million) has not yet been confirmed as eligible for Provincial funding.

While the TTC/City continues to support the funding and implementation of the Yonge Subway Extension project, the TTC's base capital program (including replacement streetcars and Transit City) must be fully funded. As well, it should be noted that the subway vehicles required to increase service levels on the YUS line (with ATO/ATC) are not included in the current TTC base capital budget and that prior to the implementation of ATO/ATC in 2016, it will be necessary to invest in solving the capacity problems at Yonge-Bloor Station which are attributable to a variety of factors (including, in part, the Yonge Subway Extension project).

While it is expected that the capital cost of the project will be born by the Province (Metrolinx), there have not been any discussions to date with respect to responsibility for operating costs. Metrolinx has reserved discussions on operating cost implications for a future report to be delivered in 2013, well before the scheduled opening of the Yonge Subway Extension project in 2017.

In parallel with the Yonge Subway Extension TPAP submission, the TTC is undertaking a Subway Rail Yard Needs Study (SRYNS) to identify the preferred strategy for the accommodation of the expansion of the subway car fleet from a storage and maintenance perspective. The cost of the SRYNS is estimated to be \$165,000 excluding TTC staff costs with an agreement in place that this cost is being front ended by York Region.

The estimated cost of the Yonge-Bloor Station capacity study is estimated to be \$200,000; funded \$75,000 by the TTC station modernization project budget and \$125,000 out of the \$0.3 million in funding approved by the Commission on October 23, 2008 for the Yonge Subway Extension project.

## **BACKGROUND**

York Region is leading, at their expense, a functional planning study and a Transit Project Assessment Process (under the new Environmental Assessment Act Regulations for Transit Projects) for the extension of the Yonge Subway from Finch Avenue to Highway 7 (Richmond Hill Centre). The functional planning work to select the preferred alignment, station location and layout of surface station elements (entrances, bus terminals, commuter parking, passenger pick-up and drop-off, substations, emergency exit buildings) has been ongoing for the past 12 months with input from City and TTC staff.

In September 2008, Metrolinx released its draft RTP and included the Yonge Subway Extension project amongst the top 15 priorities for early implementation within the first 15 years of the plan, thus confirming their commitment to the project.

On October 3, 2008, the formal TPAP for the project based on the new 6 month environmental assessment process commenced as a result of the Notice of Study Commencement by York Region. The York Region Notice of Commencement of the TPAP was issued on October 3, 2008, via an advertisement in the Metro newspaper. It was followed by another advertisement in the Toronto Star on October 4, 2008. In addition, the notice was mailed to all registered property owners within 500 meters of the Yonge Subway extension corridor, from Finch Avenue to the Richmond Hill Centre.

To support the project, the Commission authorized the following at its October 23, 2008 meeting:

- Publishing a Notice of Study Commencement for the Yonge Subway under the TPAP process;
- The TTC being a co-proponent for the project along with the City of Toronto/York Region;
- Participation in the necessary public consultation;
- Funds to allow staff participation in the project until April 2009;
- Initiation of a study to address the capacity constraints of Yonge–Bloor Station; and
- Proceeding with a Subway Rail Yard Needs Study (SRYNS).

At its meeting of October 29/30, 2008, Toronto City Council approved the TTC/City of Toronto as co-proponents of the project. Subsequently, on November 19, 2008, a Notice of Study Commencement was published advising the public and Ministry of the Environment (MOE) and other stakeholders that the City and TTC were now partners in the TPAP for the Yonge Subway Extension project. Work is continuing on the completion of the final TPAP submission to the Ministry of the Environment to ensure that the project is ready to proceed to the design phase in Spring 2009.

On November 28, 2008, the Metrolinx Board approved the RTP and the Yonge Subway Extension project remains amongst the top 15 priorities for early implementation within the first 15 years of the plan.

This report outlines the current status of the project, the recommended configuration of the Yonge North Subway Extension and the process for submitting the Environmental Project Report (EPR) for the extension following the January 27/28, 2009 City Council meeting. This report to the Commission will be forwarded to the Executive Committee/City Council in January 2009, along with a City staff report on the project. TTC and City staff have co-ordinated the content of both reports.

## **DISCUSSION**

### **a) Current Project Status**

York Region has taken the lead to initiate the TPAP studies as the Yonge Subway Extension to Richmond Hill Centre/Highway 7 is an important component of York's long term rapid transit network including VIVA connections to the terminal Station for their Highway 7 and Yonge Street VIVA services. As well, the Yonge Subway Extension impacts York Region plans (now on hold) for bus rapid transit service in the Yonge Street corridor between Steeles Avenue and Highway 7.

The Class Environmental Assessment (EA) Study for surface transit improvements on Yonge Street between Finch Avenue and Steeles Avenue was initiated in 2003. This project has been deferred due to the pending implementation of the Yonge Subway Extension project.

### **b) Relationship to Yonge Street Surface Transit Improvements**

Assuming that the Yonge Subway Extension project receives approval to proceed in Spring 2009, it is anticipated that the construction could commence in 2012 and be completed in 2015/16, with the subway operational in 2016/2017. When the subway and the associated surface facilities are completed, the anticipated bus usage on Yonge Street between Finch Avenue and Steeles Avenue is expected to be less than 10 buses per hour.

Assuming that the Yonge Street Class EA project for surface transit improvements is completed in 2009, and assuming that all impacts, especially property, could be mitigated within one year, the absolute earliest start date for construction of surface transit improvements would be 2011 with operations as early as 2012/2013. Given these timelines, the subway construction will begin prior to the busway being completed and the subway construction would require the removal of any portion of the centre median busway that had been constructed by that time. In addition, there is not a justification for a busway south of Steeles Avenue once a subway is in place. Therefore, at this time, the construction of a busway on Yonge Street is not recommended. However, if the subway extension project is not initiated in the near-term, and is delayed by in the order of 10 years from the above timelines, it would be reasonable to construct the busway to improve transit service in this corridor for an interim period of 8-10 years until subway construction was initiated.

### **c) Final Environmental Project Report**

The final public meetings and public consultation for the project under the TPAP regulations have been held and the EPR outlining the recommended project configuration and identification of mitigative measures to address the construction and operation of the line will be submitted to the MOE following consideration of TTC and City staff reports at the January 27/28, 2009 City Council meeting. In order to submit

the EPR in accordance with the TPAP regulations, the EPR must be submitted no later than February 2, 2009.

d) Public Consultation Process

TTC and City of Toronto staff have participated in the Yonge Subway functional planning and TPAP work which has included two public consultation meetings in Toronto held on:

- October 16, 2008 – North York Civic Centre – Council Chambers; and
- December 3, 2008 – Mitchell Field Community Centre.

Notification of the Public Consultation Centre in Toronto involved over 4000 letters, nearly 3000 emails, advertisements in the Toronto Star and North York Mirror and a listing on [www.vivayork.ca](http://www.vivayork.ca). About 150 people attended each of the public meetings and provided feedback on the overall project. The public concerns about the project within the City of Toronto can be summarized as follows:

- There is public sentiment the project is urgently needed and should be implemented as quickly as possible;
- The property impacts of the Steeles Station bus terminal are a concern; and
- The impacts and mitigation of construction impacts (particularly cut/cover construction) are recognized as an implementation issue.

Within York Region, the major public concerns are centred around the heritage design of the East Don River Bridge, how to mitigate the implementation of the commuter parking spaces at Langstaff/Longbridge Station in the Hydro corridor south of Highway 407 and the intermodal facilities/connections to/from Richmond Hill Centre Station.

Within the City of Toronto, few concerns about the capacity of the existing YUS line have been expressed at the October 16 and/or December 3, 2008 public consultations.

This is in part due to the staff presentation at the above meetings that appeared to satisfy the public that capacity improvements are planned in parallel with the implementation of the Yonge Subway Extension. Nonetheless, due to the sensitivity of this issue, further public meetings on the Yonge Subway Extension project/YUS capacity improvements are now being organized for mid January in the Yonge/Eglinton area and the results of these meetings will be outlined in a TTC staff report directly to the January 27/28 City Council meeting.

d) Recommended Yonge Subway Extension Configuration

Based on the analysis undertaken to date and the public consultation process, the recommended configuration of the project is outlined in Exhibits 1 to 15 and described in more detail below.

Exhibit 1 outlines the study area for the project which involves a 6.8 kilometre extension of the Yonge Subway from Finch Station to the Richmond Hill Centre Station north of Highway 7. The project is below grade under Yonge Street for the majority of its length and emerges above grade at a bridge crossing of the East Don River north of Clark Avenue. The extension consists of six new stations at Cummer/Drewry (in Toronto); Steeles Avenue; Clark Avenue; Royal Orchard Boulevard; Longbridge Avenue/Langstaff Road (an integral part of the operating terminal configuration with Richmond Hill Centre); and Richmond Hill Centre, north of Highway 7 (see Exhibit 2). Intermodal bus terminals will be located at Steeles Avenue and the Richmond Hill Centre.

The recommended six station configuration results in average station spacing of 1.13 kilometres. Given the historical 500 metre catchment area of stations (the convenient walking distance to an entrance), the recommended station spacing results in little or no overlap in the catchment area in between stations. Each of the proposed station locations was assessed with regard to the significant features that would be required at the station. A summary of the features to be provided at each of the six stations is outlined below.

<b>Station</b>	<b>Pedestrian Entrance Required</b>	<b>Bus Terminal Required</b>	<b>PPUDO Required</b>	<b>Commuter Parking Required</b>	<b>Summary</b>
Cummer/Drewry	Yes	Bus turn around loop	No	No	Line Station with minimal surface requirements
Steeles	Yes	Yes	Yes	No	Transit Hub
Clark	Yes	No	No	No	Line Station with minimal surface requirements
Royal Orchard	Yes	No	No	No	Line Station with minimal surface requirements
Langstaff/Longbridge	Yes	No	Yes	Yes	Commuter Hub
Richmond Hill Centre	Yes	Yes	Yes	No	Transit Hub

The subway operational track configuration includes the following key features (see Exhibit 2):

- The conversion of the existing single ended pocket track at Finch Station to a double ended configuration. This would allow trains to access the pocket track from north or south of Finch Station;
- A crossover at Steeles Station; and
- A crossover, tail track, single ended pocket track at Richmond Hill Centre Station.

e) Yonge Subway Service Levels

Initial service plans on opening day call for every train to operate to Finch Station and every other train to operate through to Richmond Hill Centre Station in the AM rush period. In the PM rush hour all trains would operate through to Richmond Hill Centre Station. This results in 2 minute 24 second headways to Finch and 4 minute 42 second headways to Richmond Hill Centre in the AM peak period and 2 minute 24 second headways to Richmond Hill Centre in the PM rush period. As every second train will leave Finch Station with only those local passengers who board at Finch Station (the Yonge extension having captured the current ridership to Finch Station on the trains destined to Richmond Hill Centre), seat availability on the trains departing from Finch Station should improve for existing riders south of Finch.

f) Ridership Forecast/Yonge Subway Capacity

City, York and Metrolinx staff are currently developing ridership forecasts based on assumed transit network in 2031. As the models developed by each agency do not assume the same future transit network, the ridership forecasts are not directly comparable. As well, the model results are very preliminary and are currently being reviewed for consistency and accuracy. As a result, the ridership forecasts presented in this report should be considered very preliminary and subject to change.

Preliminary TTC/City forecasts of Yonge Subway ridership have been developed as follows:

- Both the TTC's MADITUC and City's GTA models were utilized;
- Similar to TYSSE forecasts, the City's GTA model results were adjusted based on MADITUC results particularly as they relate to travel behaviour for transit ridership allocated to GO Rail and the Yonge Subway which serves the same corridor but different travel markets. The extent to which some models over/under estimate ridership to the Yonge Subway/GO Rail network is a significant modelling issue for which adjustments are made;

- The future transit network assumes the Transit City network (with more frequent service), Yonge Subway to Richmond Hill Centre (with feeder bus adjustments), Sheppard East/Finch West LRT continuous services to the Airport and extension of the Don Mills LRT from Steeles to Highway 7. Note that a select link forecast of individual network options (e.g. the Yonge Subway ridership implications) isolated from other network changes has not been undertaken to date and is not part of the current modelling efforts of any agency;
- The land use is assumed to be the same as used in Transit City forecasts but does not include the full impact of intensification around Yonge Subway Extension stations as outlined separately later in this report.

Based on the above network/modelling assumptions, 2031 AM peak forecasts for the Yonge Subway are as follows based on the City/TTC estimates:

<b>Yonge Subway Link</b>	<b>AM Peak period volume</b>	<b>AM peak hour volume</b>
SB to Steeles Station	25,000	14,000
SB to Wellesley Station	65,000 to 70,000	36,000 to 39,000

The projected AM peak hour volume south of Bloor compares to current ridership of 27-28,000 per hour and reflects the cumulative impact of all of the network modelling assumptions outlined above. At this time it is not possible to isolate the peak point ridership of the Yonge Subway extension on its own from other planned network improvements. This will be addressed in the January TTC report to the City.

Based on preliminary information from Metrolinx, the City/TTC forecasts appear to be in the same ballpark from a modelling perspective. Metrolinx has also analyzed the impact of a Downtown Rapid Transit line (Bloor West – Downtown – Danforth) on Yonge line ridership. The forecast shows Yonge line ridership south of Bloor of 25,100 per hour with 17,500 peak hour riders diverted to the Downtown RT line.

As outlined in Exhibit 3a, a number of initiatives to increase the capacity of the Yonge Subway line are planned in parallel with construction of the Yonge Subway extension by 2017. The diversionary impact of the TYSSE project and the new subway trains (which have approximately 10% more capacity) will be in place by 2017. As a result, existing peak point ridership on the Yonge line south of Bloor will be impacted as follows:

<u>Factor</u>	<u>Peak Hour Volumes</u>
- Existing Yonge Ridership	27 – 28,000
- Diversion impact of Spadina Subway Extension	<u>- 2,300</u>
- Net peak hour Yonge Ridership	24,700 – 25,700

Coupled with the above, the introduction of the Toronto Rocket cars is expected to increase peak point capacities by about 10% or 3,200 per hour by 2010. This provides additional Yonge Subway carrying capacity prior to the opening of the Yonge line extension in 2017. Future ridership increases on the Yonge line will be accommodated with reduced headways (with ATO/ATC) and the addition of a seventh car to a subway train in the long term. A more in depth analysis of Yonge Subway ridership and capacity issues will be the subject of a direct report to the January 27/28, 2009 City Council meeting.

York Region staff recently provided TTC/City staff with the following preliminary 2031 forecasts of AM peak period station usage:

Station	Boardings by Mode of Access (1)				Alightings by Mode of Egress (1)				Total Boardings/Alightings per day (1)
	Walk	Park & Ride	Transfer	TOTAL	Walk	Park & Ride	Transfer	TOTAL	
Richmond Hill Centre	1,600		23,600	25,200	-		-	-	25,200
Langstaff/Longbridge	700	1,900	100	2,700	400		-	400	3,100
Royal Orchard	1,200		200	1,400	100		-	100	1,500
Clark	1,000		600	1,600	100		100	200	1,800
Steeles	800		3,600	4,400	200		800	1,000	5,400
Cummer/Drewry	400		1,300	1,700	200		200	400	2,100
Finch	4,800	2,700	1,200	8,700	700		500	1,200	9,900

(1) These forecasts have not been reviewed for consistency with TTC/City forecasts (including the underlying land use assumptions).

York Region has also indicated that they are forecasting peak point volumes as follows:

<u>Yonge Subway</u>	<u>AM Peak Hour Volume</u>
- Southbound at Richmond Hill	10,600
- Southbound to Steeles	14,200

- Southbound to Finch 17,900

The AM peak volumes projected by York at Steeles (14,200) are similar to the City/TTC volumes at Steeles of 14,000 per hour. When the peak period boardings at the new various stations are converted to daily boardings using standard TTC factors for typical stations, the daily boardings for the stations are estimated to be:

<u>Station</u>	<u>Daily Boardings</u>
- Richmond Hill Centre	113,500
- Langstaff/Longbridge	13,700
- Royal Orchard	6,800
- Clark	8,100
- Steeles	23,900
- Cummer/Drewry	9,200

Typical stations in the existing TTC system that compare to this level of ridership are outlined below:

<u>New Stations</u>	<u>Existing Comparable Stations</u>
- Richmond Hill Centre	- Finch (existing)
- Steeles	- Don Mills, Greenwood, Davisville, Main, Sherbourne
- Langstaff/Longbridge	- High Park, Woodbine, Dupont, Christie
- Royal Orchard, Clark, Cummer/Drewry	- Castle Frank, Chester

Estimates of the net operating costs of the Yonge Subway Extension will be developed following finalization of the ridership forecasts in Spring 2009.

**g) Project Benefits to the TTC/City**

The project provides the following benefits to the TTC/City of Toronto:

- A significant reduction in bus traffic on Yonge Street between Finch Avenue and Steeles Avenue will be achieved resulting in substantial reductions in noise, bus traffic, emissions and environmental impacts from transit operations;
- The substantial volume of bus traffic to Finch will transfer at Steeles Station, resulting in improved travel time and quality and reliability of transit service;
- Up to 1,900 commuters, who currently park at Finch Station, are expected to park at Langstaff/Longbridge Station at the end of the extension with the resulting traffic and environmental benefits. This will also provide an increased

opportunity for local City residents to access the Finch lot which is currently at capacity;

- The current size of the TTC bus terminal at Finch Station will be reduced in size from 15 bus bay to 10 bays with the Yonge Subway extension and to 8 bus bays with the implementation of the Yonge extension and the Finch LRT. This provides a significant opportunity to redevelop the TTC bus terminal lands (including the adjacent Yonge Street properties) to high density, transit orientated development;
- The current congestion in the Finch passenger pick-up and drop-off facility will be alleviated with the inclusion of PPUDO facilities at Steeles Station, Langstaff/Longbridge Station and Richmond Hill Centre Station. Currently, PPUDO and commuter parking volumes on Hendon Avenue (west of Yonge Street) are heavily congested;
- The Yonge Subway Extension includes a \$10 million allowance to renovate Finch Station so that when the Yonge Subway extension opens in 2017, Finch Station will have been modernized at no cost to the TTC/City;
- Improved transit accessibility/convenience will be available to existing residents/businesses in the vicinity of Cummer/Drewry and Steeles Stations;
- The construction of two new stations provide opportunities for intensification and increased property tax assessment within the City of Toronto;
- The extension significantly improves transit connectivity to/from York Region and with the implementation of other York Region initiatives (Yonge north BRT, Highway 7 BRT), begin to establish a comprehensive network of high quality transit service north of Steeles Avenue. This will contribute to higher transit modal splits north of Steeles Avenue, which is expected to lessen the impact of congestion in north Toronto/south York; and
- The travel time from Richmond Hill Centre to Finch Station will be reduced from the current 24 minutes (by local bus) or 16 minutes by VIVA, to 12 minutes via the Yonge Subway (assuming 6 stations). This substantial reduction in travel time, combined with improved quality and reliability of service, will increase transit ridership within both the City of Toronto and York Region.

#### **h) Station Concepts**

Each of the recommended station concepts is described below.

##### **Cummer/Drewry Station**

Cummer/Drewry Station provides good transit connections to local routes and a good opportunity for redevelopment. The south end of the Cummer/Drewry Station box is at the intersection of Cummer Avenue/Drewry Avenue and Yonge Street, facilitating

redevelopment on the south east quadrant (Newtonbrooke Plaza) as outlined in Exhibit 4.

Initially, entrances are planned for the north east and south west quadrants as well as an entrance at the north end of the station on the west side of Yonge Street. A future entrance will be protected for on the south east quadrant in connection with a direct entrance connection to be funded by the developer of the Newtonbrooke Plaza site.

Currently the Cummer and Drewry buses operate down Yonge Street to Finch Station. With Cummer/Drewry Station, buses will operate as follows:

- A through route across Yonge Street on Cummer/Drewry; and
- An additional branch of service on the east side of Yonge Street along Cummer Avenue. This branch of the route will drop off passengers at the entrance on the north east quadrant, proceed through the Yonge Street intersection, turn around in a bus loop on the north side of Drewry Avenue west of Yonge Street, pick up passengers at the south west entrance and then proceed through the Yonge Street intersection east on Cummer Avenue. This branch of service is required due to higher passenger demand for bus service east of Yonge Street.

TTC and City staff are co-ordinating with respect to whether the proposed extension of the Service Road from Finch Avenue to Drewry Avenue could be completed prior to the start of cut/cover construction of Cummer/Drewry Station (see Exhibit 5).

### **Steeles Station**

Steeles Station provides a high potential for intensification and provides an opportunity for high quality bus to subway connections. The proposed station location for the Steeles Station box is at the intersection of Steeles Avenue and Yonge Street.

In developing Steeles Station alternatives, the following key planning considerations were taken into account:

- 25-26 bus bay terminal, PPUDO and entrance buildings required;
- Large volume of TTC and YRT buses approaching from the north, east and west (approximately 45 buses/hour from each direction);
- Provide approximately 50m buffer to Yonge Street and Steeles Avenue from bus terminal or PPUDO facilities to preserve development frontages;
- Minimize the walking distances/transfers between bus and subway;
- Bus movements/entrances (signalized):
  - o 200m spacing shared signal transit/cars, and
  - o 100m spacing transit only;
- Minimize property impacts;

- Maximize the opportunity for redevelopment; and
- Consideration of new access/ring roads.

Exhibits 6 and 7 illustrate the recommended concept for Steeles Station including the underground bus terminal in the Steeles Avenue right of way. During the development of this preferred configuration, two technical and municipal stakeholder workshops were held to analyze the bus terminal options and identify a preferred bus terminal configuration. The technical analysis confirmed that a viable above grade terminal, integrated with the Centre Point Mall, could be developed. However the underground bus terminal is recommended due to the following:

- It maximizes passenger convenience by minimizing passenger walking distance between the subway and the bus terminal, as well as bus to bus transfers;
- It minimizes bus operating distances and thereby operating costs;
- It reduces bus travel time by eliminating bus movements through the Steeles and Yonge intersection, freeing up capacity for other movements;
- Creates the best possible opportunity to facilitate transit-orientated development on the four corners of Steeles Avenue and Yonge Street;
- The majority of the land is already owned by public entities in the public right-of-way;
- Operating costs for long term maintenance of the weather protected underground terminal compare favourably with exposed elevated structural slab in an above ground terminal;
- It may result in less business impact to existing businesses; and
- An underground bus terminal can accommodate the identified Steeles Avenue BRT/LRT identified in the Regional Transportation Plan more easily than off-street arrangements.

It should be recognized however that the underground bus terminal will require a number of partial property acquisitions and the full acquisition of approximately 27 residential properties on the south side of Steeles Avenue on the east side of Yonge Street. During design of Steeles Station, every effort will be made to minimize the property acquisitions required to implement the recommended underground bus terminal concept. A PPUDO will be located on either the north east or north west quadrant and the electrical substation will be located on the south east quadrant on one of the properties to be acquired to implement the underground bus terminal.

### **Clark Station**

Clark Station provides opportunity for intensification with existing medium and high density development. The south end of the proposed Station location for the Clark Station box is at the intersection of Clark Avenue and Yonge Street. The Clark Station concept, illustrated in Exhibit 8, includes a minimum of two entrances and an electrical

substation.

### **East Don River Crossing**

The East Don River is one of the two main branches that form the Don River watershed. The river is situated in a valley with wide open embankments on both sides. The Ladies' Golf Club of Toronto is located on the east side of Yonge Street, while the Thornhill Country Club is situated on the west side. The East Don River flows through a large concrete culvert which supports the existing Yonge Street roadway in the Thornhill Heritage District.

Three alternatives for the subway crossing on the East Don River were considered, including a bridge, a raised embankment and a tunnel alternative (see Exhibit 9). A bridge option, as visualized in Exhibit 10, is recommended for the following reasons:

- Shallower subway stations and emergency exit buildings on either side of the East Don River to effect easier and quicker tunnel evacuations in the event of an emergency, and to provide easier station access during normal use;
- Improvement of the Yonge Street road vertical alignment, reducing the gradients which cause pedestrian and traffic hazards in winter and affect bus operations;
- Removal of existing culvert structures within the East Don River valley creating opportunities to naturalize the river valley, re-establish wildlife corridors and improve east/west access through the valley for recreational purposes;
- Improved vertical alignment of the subway with associated benefits to subway operations;
- Reduced effect on groundwater during and following construction as well as a reduction in groundwater pumping requirements from subway tunnels that are at shallower depth.

It appears based on preliminary noise studies that the full enclosure of the subway box under the East Don River bridge is not required to mitigate the noise impacts of the subway. A decision as to partially or fully enclosing the subway box under the East Don River bridge will be made during the design phase including consideration of noise, capital costs, operating costs, maintenance, visual impacts, ventilation and heritage considerations.

### **Royal Orchard Station**

Royal Orchard Station provides a good opportunity for intensification of existing medium density development. The south end of the Royal Orchard Station box is at the intersection of Royal Orchard Boulevard and Yonge Street. Exhibit 11 outlines the recommended concept for Royal Orchard Station, which includes entrances at the north and south end of the station in combination with an electrical sub station.

The Metrolinx BCA is expected to focus on whether five or six stations are required (with Royal Orchard as the optional station). In the event Royal Orchard Station is not recommended, there would be a 2.5 kilometre gap between the north end of Clark Station and the south end of Langstaff/Longbridge Station.

This would be equivalent to the current spacing between St. Clair West and Eglinton West Stations on the Spadina Subway line.

### **Langstaff/Longbridge Station**

In developing Langstaff/Longbridge Station alternatives, the following key planning considerations were taken into account:

- Protection of Holy Cross Cemetery on the east side of Yonge Street;
- Significant future development site on east side of Yonge Street, south of Highway 407;
- Provision of commuter parking facility (2000 spaces);
- Passenger pick-up and drop-off facility; and
- Minimize impact to Hydro One's transmission facilities.

Langstaff/Longbridge Station provides high potential for intensification and a key location for commuter parking that works in tandem with Richmond Hill Centre (see Exhibit 12). The location of major bus terminal facilities in Richmond Hill Centre, in combination with the decision to locate commuter parking facilities outside of the centre (at Langstaff/Longbridge Station), was a conscious policy decision to minimize the operational implications of both facilities in a single location, maintain high quality bus service to Richmond Hill Centre and maximize TOD opportunities. The location of commuter parking facilities in the Hydro corridor backing on to the residential properties on Longbridge Avenue is consistent with TTC practice for such facilities and allows extensive commuter parking to be provided without impacting the development potential of the remaining station lands on the east side of Yonge Street, south of Highway 407 and in the Richmond Hill Centre (see Exhibit 13). The location of the PPUDO is preliminarily located on the west side of Yonge Street in the Hydro corridor in conjunction with commuter parking and an entrance. A second entrance would be located on the east side of Yonge Street on the Langstaff development lands.

The Longbridge community has expressed opposition to the commuter parking in the Hydro corridor. York Region and TTC staff will work jointly to mitigate the impacts of the commuter parking on the community. Given that approximately 1900 existing Finch users will find it more convenient to park at Langstaff/Longbridge Station, the implementation of the commuter parking lot at this station is important to the TTC.

### **Richmond Hill Centre Station**

Richmond Hill Centre presents a unique and important opportunity to create an intermodal passenger hub (mobility hub) to act as the transit gateway to York Region (see Exhibit 14). Ideally, the transit hub will be fully integrated with a major transit-oriented development plan for the northeast quadrant of Highway 7 and Yonge Street. The Yonge Subway, GO Transit, CN, GO Transit 407 services (ultimately the 407 Transitway), VIVA bus rapid transit and YRT conventional services will all connect at Richmond Hill Centre. Physical constraints in the area collectively present challenges for generating the best terminal arrangements for all of these services. Key considerations for the development of the Richmond Hill Centre include:

- Recognition of the principals of the Richmond Hill Centre Land Use and Built Form Master Plan Study;
- The requirement for multiple inter-modal interfaces between the subway, YRT and GO Bus, 407 Transitway and the GO Train; and
- The location/configuration of surface facilities associated with the subway Station, in particular a 28 bay bus terminal; a passenger-pick-up-and-drop-off (PPUDO), pedestrian entrances, a substation and vent shafts.

As outlined in Exhibit 12, the recommended alignment through to Richmond Hill Centre Station is to the east of Yonge Street to make a convenient connection to the existing Richmond Hill GO Line and the planned Highway 407 Transitway. The exact location/configuration of the bus terminal/PPUDO will be determined during design in consultation with affected property owners and municipal agencies.

**i) Preliminary Construction Methodology**

Exhibit 15 outlines preliminary construction methods for each section of the project, including areas that are expected to be tunnelled and those to be constructed using the cut/cover method. Within the City of Toronto, the section from Finch Station to the north end of Cummer Station will be cut/cover as will the crossover and station at Steeles Avenue. Significant research, analysis and design are required to confirm the final construction approach for the project. This work will be conducted during the design phase.

**j) Transit Oriented Development/Existing and Planned Densities**

York Region, in conjunction with the Cities of Vaughan, Markham and Richmond Hill are currently undertaking subway intensification studies in parallel with the functional planning/TPAP process for the Yonge Subway Extension project. The aim of these studies is to define the planning and densities around the recommended station concepts and to have zoning/OPA amendments in place to guide development prior to the start of construction of the extension.

The TTC/City standard for a successful station (25-30% transit modal split) is based on 100 people and jobs per hectare within the catchment area (500 metre radius) of a subway station. The Provincial Places to Grow Act for Urban Growth Centres is 200

residents and jobs per hectare. It should be emphasised that the Richmond Hill Growth Centre in the Places to Grow Act includes the lands north of Highway 407 and the lands south of Richmond Hill and the lands south of Highway 407 in Markham (i.e. the Langstaff lands east of Yonge Street). It is important that the Yonge Subway project support intensification north and south of Highway 407 and, as noted previously, this requires a two station approach to serve both north and south of Highway 407 (Richmond Hill Centre Station to the north and Langstaff/Longbridge Station to the south). Both stations are needed and must be considered as essential to the success of the project and the achievement of the policy objective of the Place to Grow Act targets for growth centres.

The planning studies have identified potential intensification areas, stable residential areas/heritage properties, protection of open space, mix of uses and transit supportive densities within the 500 metre catchment area of stations. For each York station, the populated/employment ratio was selected as follows:

<u>Station</u>	<u>Population</u>	<u>Employment</u>
Steeles (York portion)	60%	40%
Clark	80%	20%
Royal Orchard	90%	10%
Langstaff/Longbridge	80%	20%
Richmond Hill Centre	60%	40%

The existing interim (2031) and full build out (approaching 2051) densities planned for each station are outlined in Exhibits 16 to 21. Note that Steeles, Clark and Langstaff/Longbridge all are expected to have densities in excess of the TTC/City minimum threshold by 2031 and that Richmond Hill Centre is expected to exceed the Places to Grow Act target by 2031. Royal Orchard Station will barely meet the TTC population/employment threshold by 2031 and for this reason the Metrolinx benefits case analysis is focusing on 5 and 6 station options (with Royal Orchard Station as the optional station).

Approximately 15 existing TTC subway stations have densities lower than those projected for the Yonge Subway Extension line stations and the types of densities planned for the line Yonge Subway Extension stations compare to existing TTC line stations as follows:

– Keele (107)	High Park (120)
– St. Clair West (123)	Kennedy (109)
– Davisville (143)	Runnymede (83)
– Islington (126)	Jane (70)

Note that the planned densities around Steeles and Cummer/Drewry Stations within the City of Toronto will be the subject of upcoming planning studies.

**k) Capital Costs**

Based on the project concept defined in this report, an estimate of capital costs has been

developed as summarized below:

<b>Major Project Elements</b>		<b>Cost M\$</b>
Stations and Area Facilities		\$650
Finch Improvements	\$10	
Cummer/Drewry	\$70	
Steeles	\$195	
Clark	\$70	
Royal Orchard	\$65	
Langstaff/Longbridge	\$85	
Richmond Hill Centre	\$160	
Tunnels, Special Structures and Operating Systems		\$600
Subway Cars (72 vehicles)		\$240
Storage and Maintenance Facilities for Subway Trains		\$110
Engineering and Other Costs		\$670
Property		\$125
<b>Project Cost Estimate, 2008 dollars</b>		<b>\$2.4 billion</b>

The above capital cost estimate includes an allowance for yard modifications assuming that Yonge Subway Extension vehicles will be stored in an existing yard (e.g., Wilson Yard). In the event a new and/or satellite yard is required as a result of the Yonge Subway Extension (or other yard facilities that cannot be accommodated in an existing TTC yard), the cost to accommodate the Yonge Subway Extension vehicle fleet will need to be adjusted accordingly. The above estimate includes the implementation of Automatic Train Operation and Platform Edge Doors on the Yonge Subway Extension project.

**h) Project Implementation Issues**

To date, there has been little or no discussion with either York Region or Metrolinx with respect to the governance/ implementation of the project. It is expected that funding of \$5 million to start up the Yonge Subway Extension project will be included in the Spring 2009 Provincial budget. It will be necessary to establish a project governance/implementation strategy to move forward with the project based on the following key principles:

- TTC be directly responsible for project management and delivery of the Yonge Subway Extension project;
- TTC will operate and maintain the subway infrastructure (including commuter parking lots) but excluding passenger pick-up and drop-off and bus terminals in York Region;
- TTC will own the property, assets and subway facilities within York Region, except for bus terminals and passenger pick-up and drop-off facilities/bus

terminals located in York Region;

- Stations and bus interface facilities used by the TTC will be designed and built consistent with TTC design standards and practices; and
- The Subway Rail Yard Needs Study to support the Yonge Subway Extension and service increases on the YUS subway, being conducted by the TTC, may include location options in York Region. The conclusions of the study may impact the cost of the Yonge Subway Extension project and may identify further funding needs (see below);
- Consistent with the Move Ontario 2020 commitments, the City expects the Province of Ontario will be responsible for all capital costs;
- Any increases in net operating costs incurred for the Yonge Subway Extension will be at no cost to the City of Toronto;
- A Coordinating Committee (including representatives of the TTC, York Region and City of Toronto) will be established to proceed with the project and finalize the funding and service agreements with Metrolinx, the Province of Ontario and the Government of Canada;
- To support the Yonge Subway Extension and to address increased ridership/service on the Yonge line, funding to expand Yonge-Bloor Station is an important requirement (see below); and
- Currently, the property has not yet been confirmed as an eligible project cost by the Province. With a property budget of \$125 million for the project, this is a significant issue. The TTC/City position is that the property cost for this project should be at no cost to TTC/City.

i) Subway Rail Yard Needs Study (SRYNS)

The SRYNS is currently underway and is expected to be completed in the first quarter of 2009. The study will determine the best strategy for accommodating the expansion of the subway car fleet increases attributable to the Spadina and Yonge Subway Extensions, the extension of existing short turn locations to the north, the phased implementation of ATO/ATC and growth in the Sheppard Subway car fleet to 2031.

One of the options for accommodating the YUS fleet to 2031 involves the creation of a satellite facility for the storage/light maintenance of subway cars at the north end of the Yonge Subway Extension to Richmond Hill Centre and/or new yard on the north end of the Yonge Subway. The implementation of either of these options would require an increase in the cost of storage and maintenance facilities currently included in the Yonge Subway Extension capital cost estimate.

j) Yonge-Bloor Station Capacity

An RFP for a comprehensive study of the potential solutions to the existing capacity constraints of Yonge-Bloor Station will be out to tender in January 2009. The study

will address both the existing capacity issues affecting passenger movements between the upper level (Yonge Subway, Bloor Station) and lower level (Bloor-Danforth Subway, Yonge Station), as well as the dwell time problem which constrains the ability to add more trains following the implementation of ATO/ATC. It should be emphasized that the Yonge-Bloor Station capacity study (and other impacts on Yonge Subway Stations) is in response to a variety of future YUS subway service initiatives to respond to the full implementation of the Metrolinx RTP. The proposed Yonge Subway Extension is only one of many initiatives that will require the capacity of the Yonge Subway stations to be addressed in the future. Nonetheless it will not be possible to take advantage of ATO/ATC unless the capacity of Yonge Bloor Station is addressed by the time ATO/ATC is available (2016).

The capital funding of the TTC's rail yards need and increasing Yonge-Bloor Station capacity are important projects to ensure that the TTC's most important asset (the Yonge Subway) continues to be efficient and effective.

k) Vehicles to Expand Service with ATO/ATC

The current TTC capital budget does not include the fleet size to implement improved headways on the YUS line following implementation of ATO/ATC.

**JUSTIFICATION**

The Yonge Subway Extension project is an important project for the TTC, City of Toronto, York Region and Metrolinx. The timely completion of the TPAP process following City Council consideration of the recommended project configuration in January 2009, will ensure that the project is ready to proceed to conceptual design should funding be available in the 2009 Provincial budget.

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December 17, 2008

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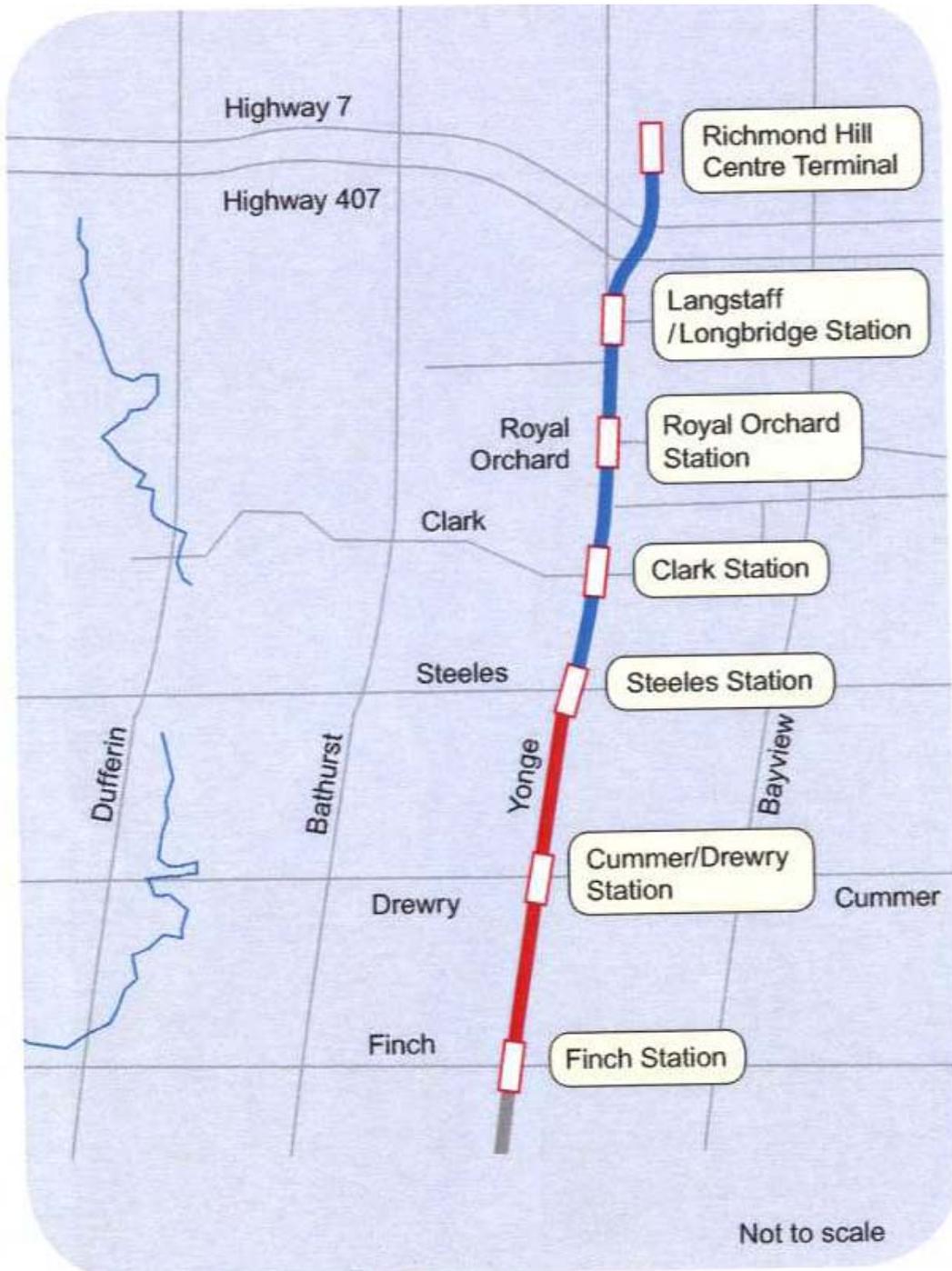
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Attachments – Exhibits 1-21

Exhibit 1– Yonge Subway Extension Study Area



Exhibit 2 – Yonge Subway Extension Station Locations



### Exhibit 3 – Yonge Subway Preliminary Alignment Station & Special Track Schematic

Note: 0+000 (Reference) - End of existing Tail Track

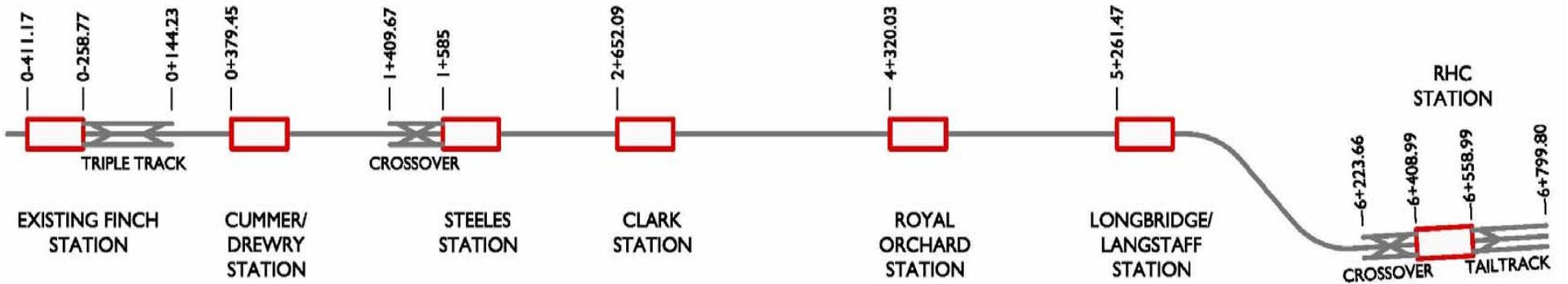
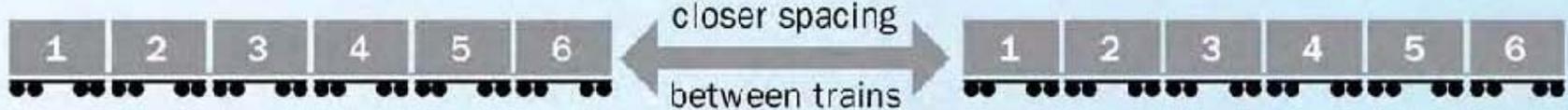


Exhibit 3a - Capacity Improvements to the Yonge Line



new subway cars have increased capacity



7th car added to train



transfer to Spadina Subway



new parking spaces on Spadina Subway extension

# Exhibit 4 – Cummer/Drewry Station

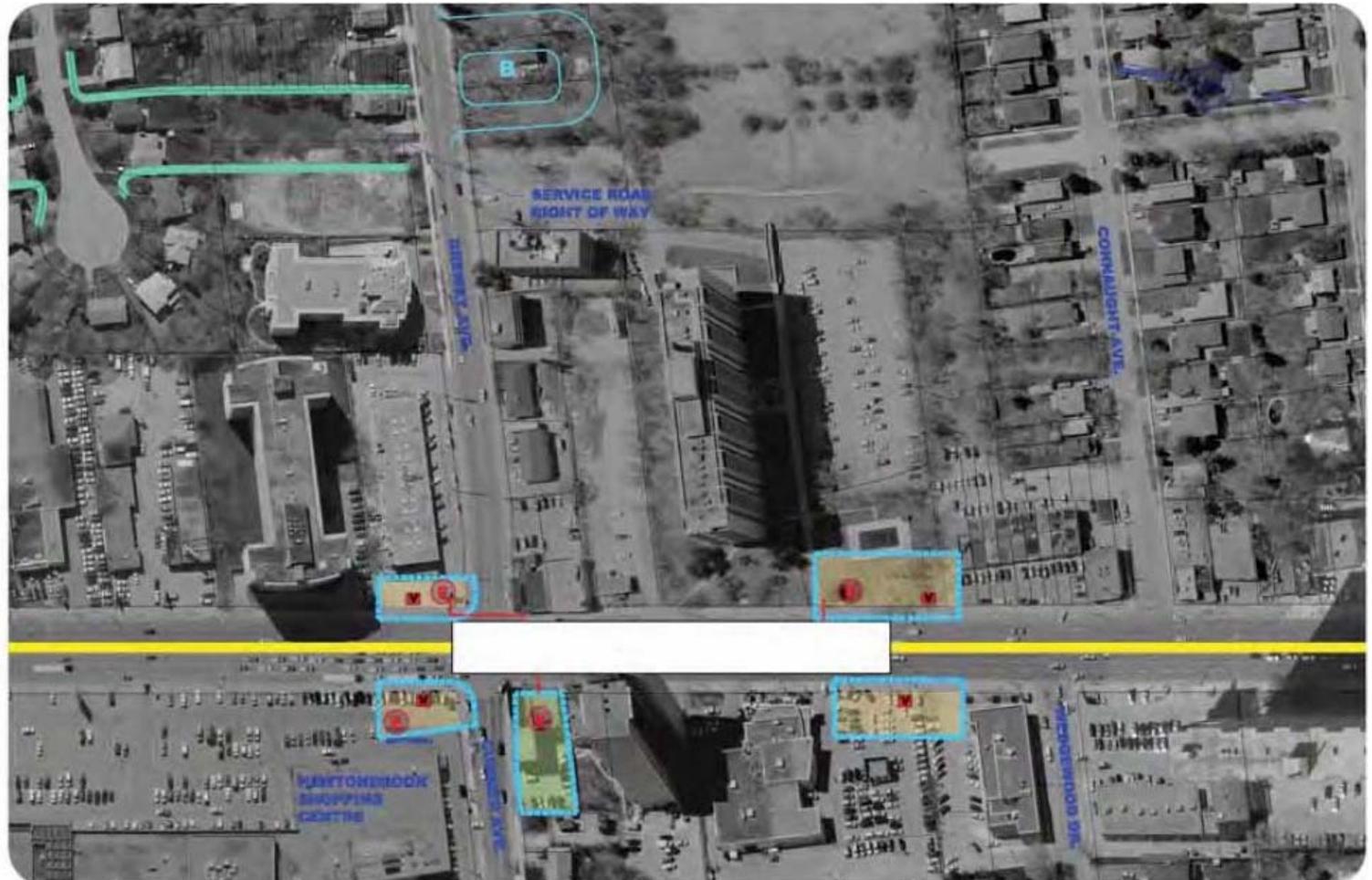
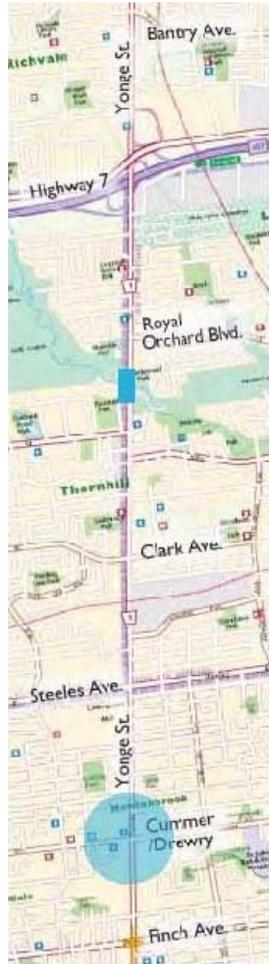


Exhibit 5 – Service Road Extension to Drewry Avenue



Exhibit 6 – Steeles Station

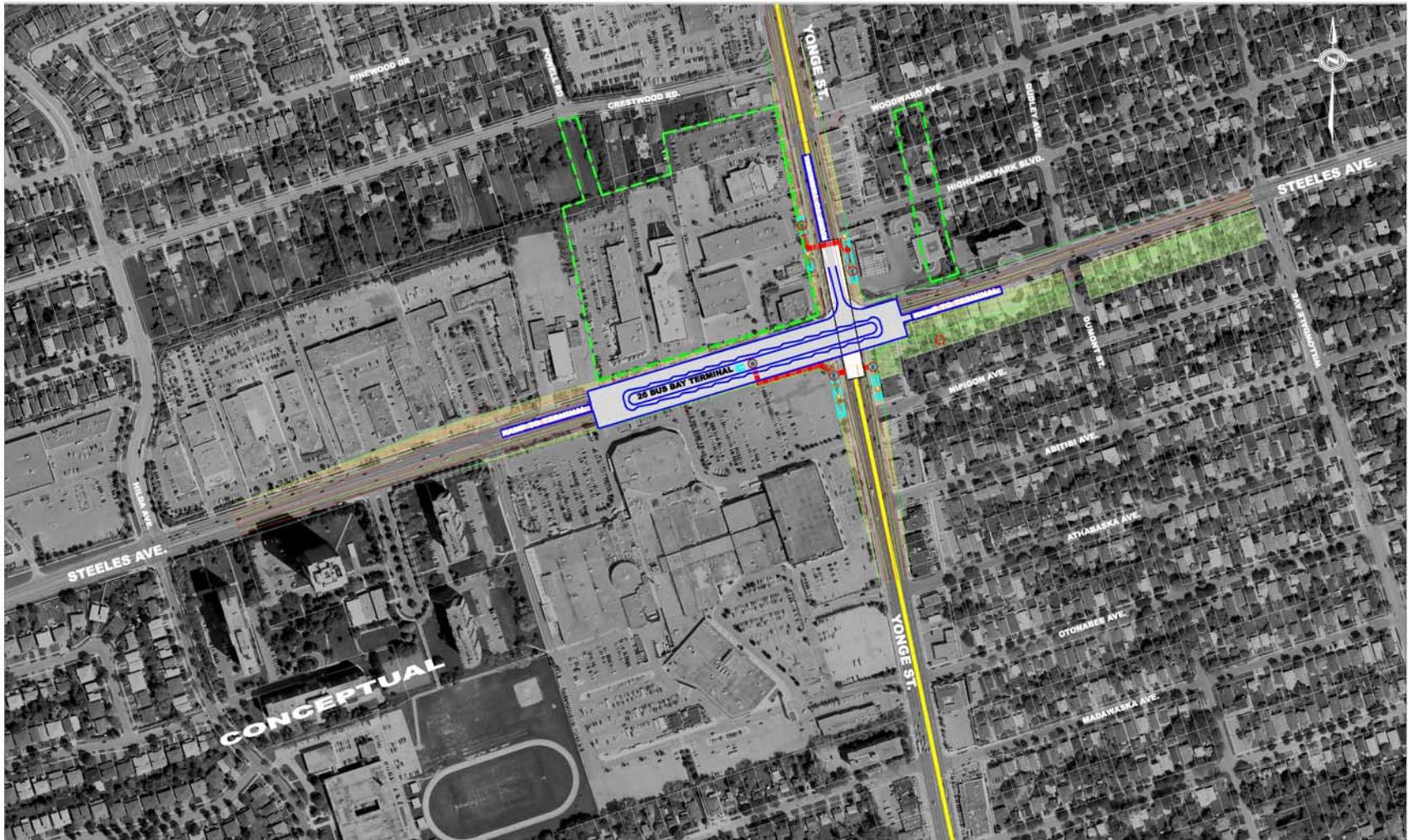


Exhibit 7 – Steeles Station Entrances

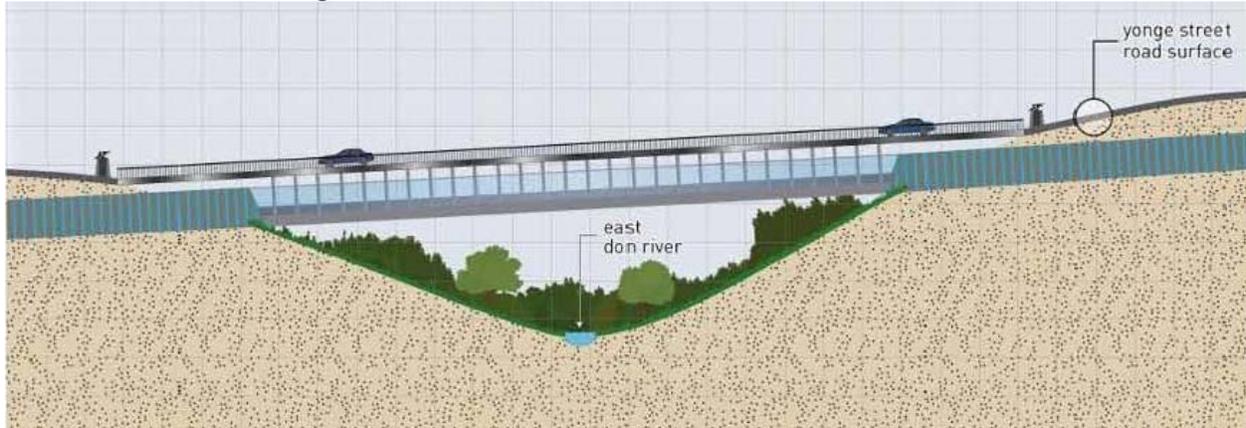


## Exhibit 8 – Clark Station

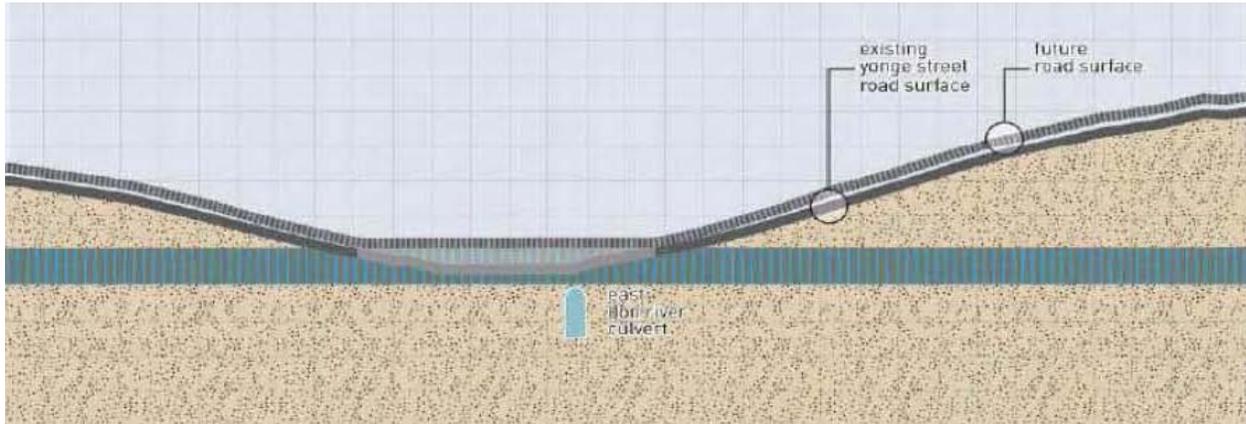


## Exhibit 9 – East Don River Crossing Options

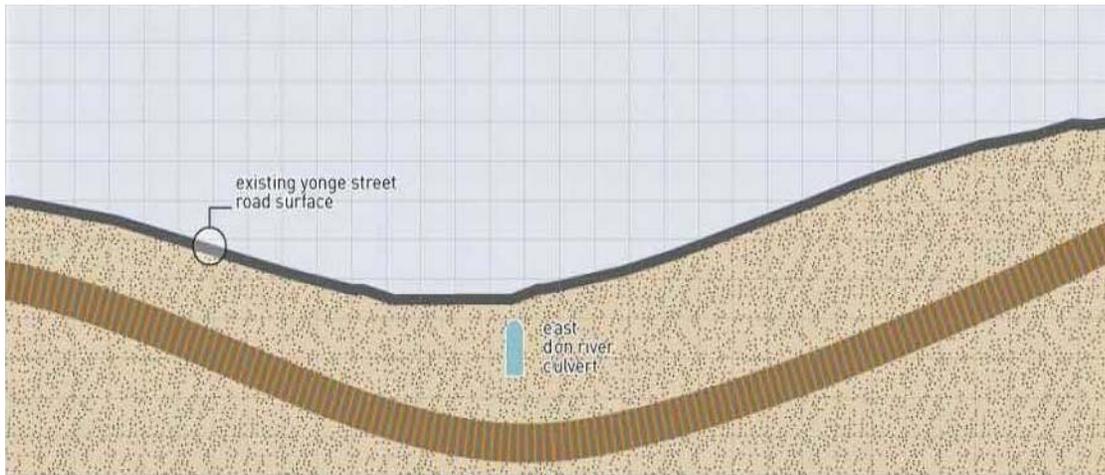
### East Don River – Bridge Alternative



### East Don River – Embankment Alternative



### East Don River – Tunnel Alternative

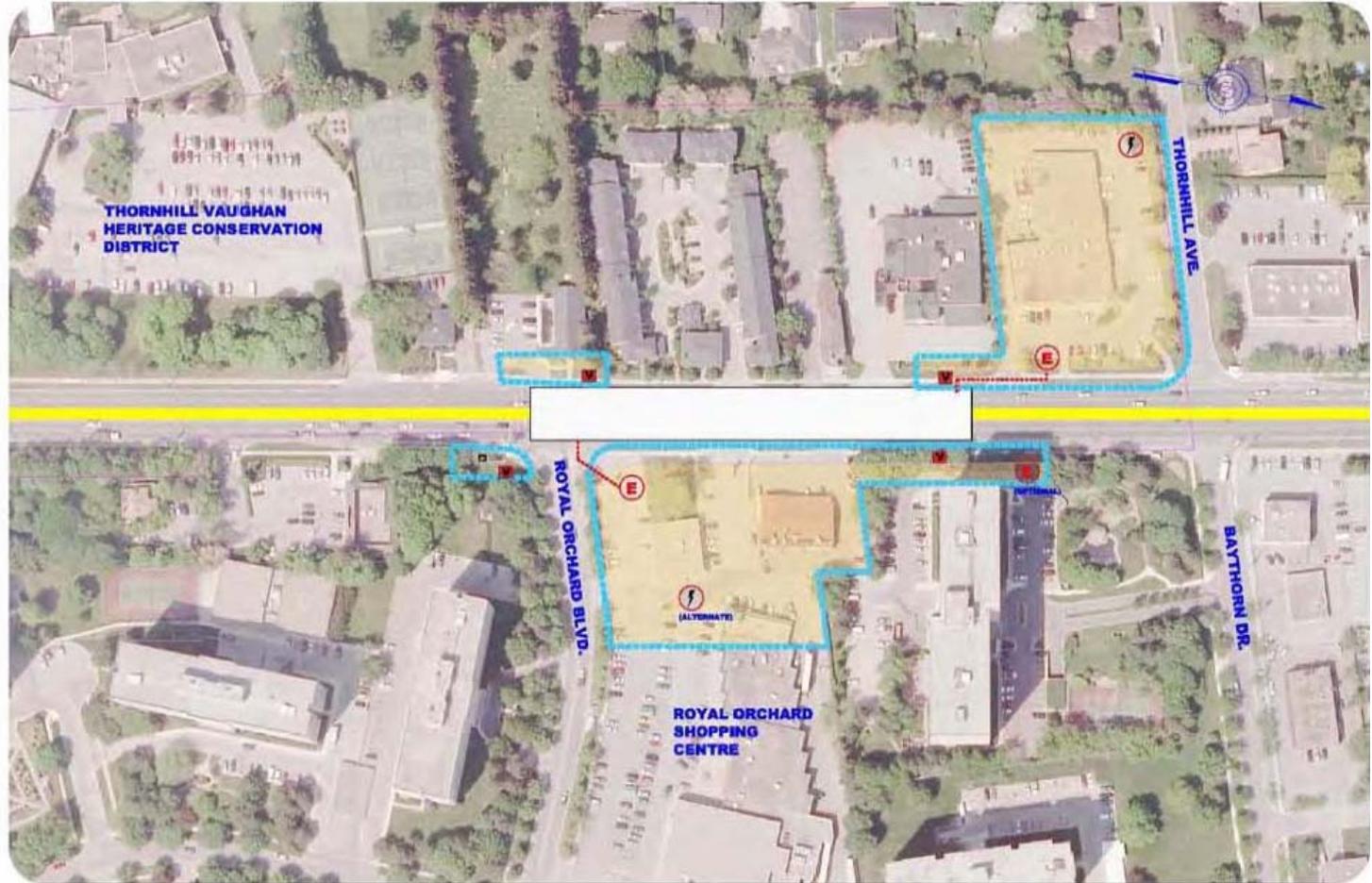
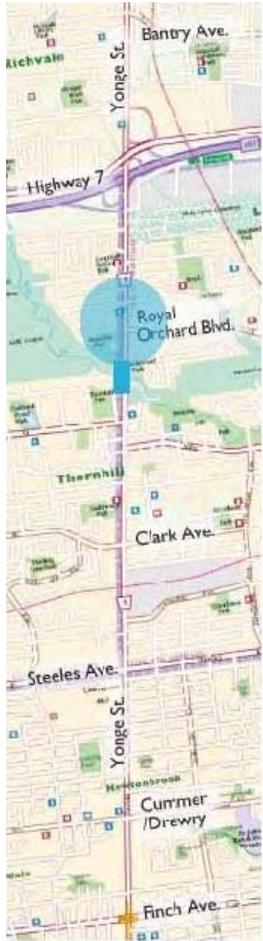


**Exhibit 10 – East Don River Bridge**



***Concept drawing only***

**Exhibit 11 – Royal Orchard Station**



## Exhibit 12 – Langstaff / Longbridge / Richmond Hill Centre Station Linkage



Exhibit 13 – Langstaff / Longbridge Station

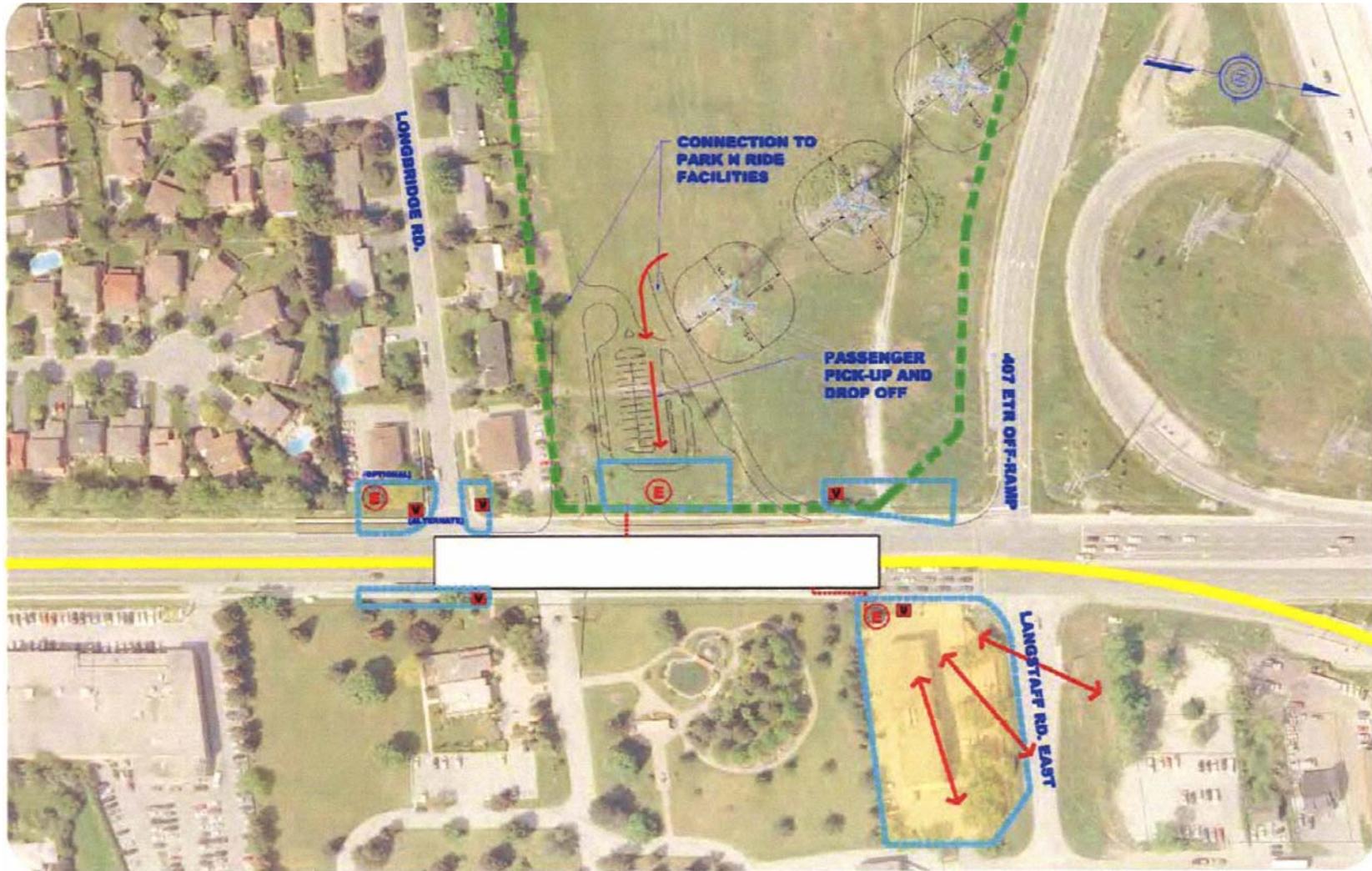


Exhibit 14 – Transit Hub at Richmond Hill Centre Station



## Exhibit 15 –Preliminary Construction Methods

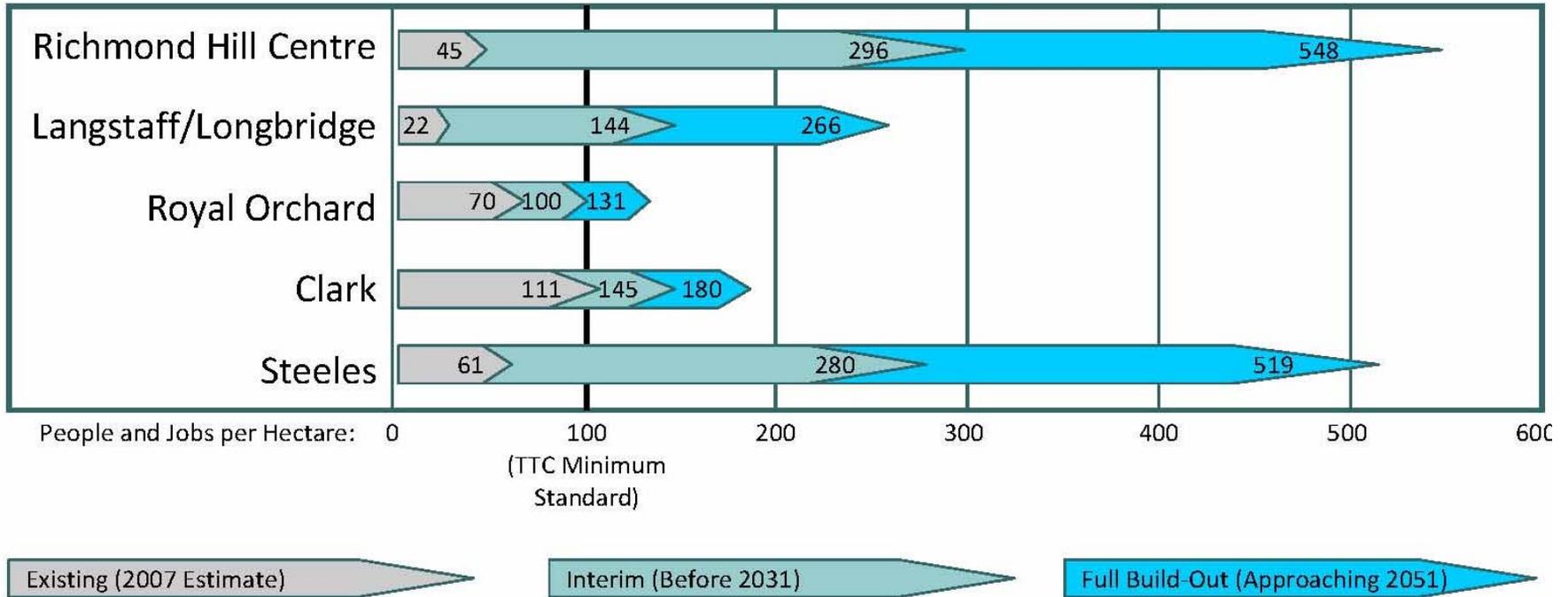


### Legend

-  Subway station
-  Cut and cover
-  Tunnelling
-  Bridge construction
-  Tail tracks
-  Launch shaft
-  Exit shaft



**Exhibit 16 – Yonge Subway Stations in York Region – Existing and Future Densities**



# Exhibit 17 – Steeles Station

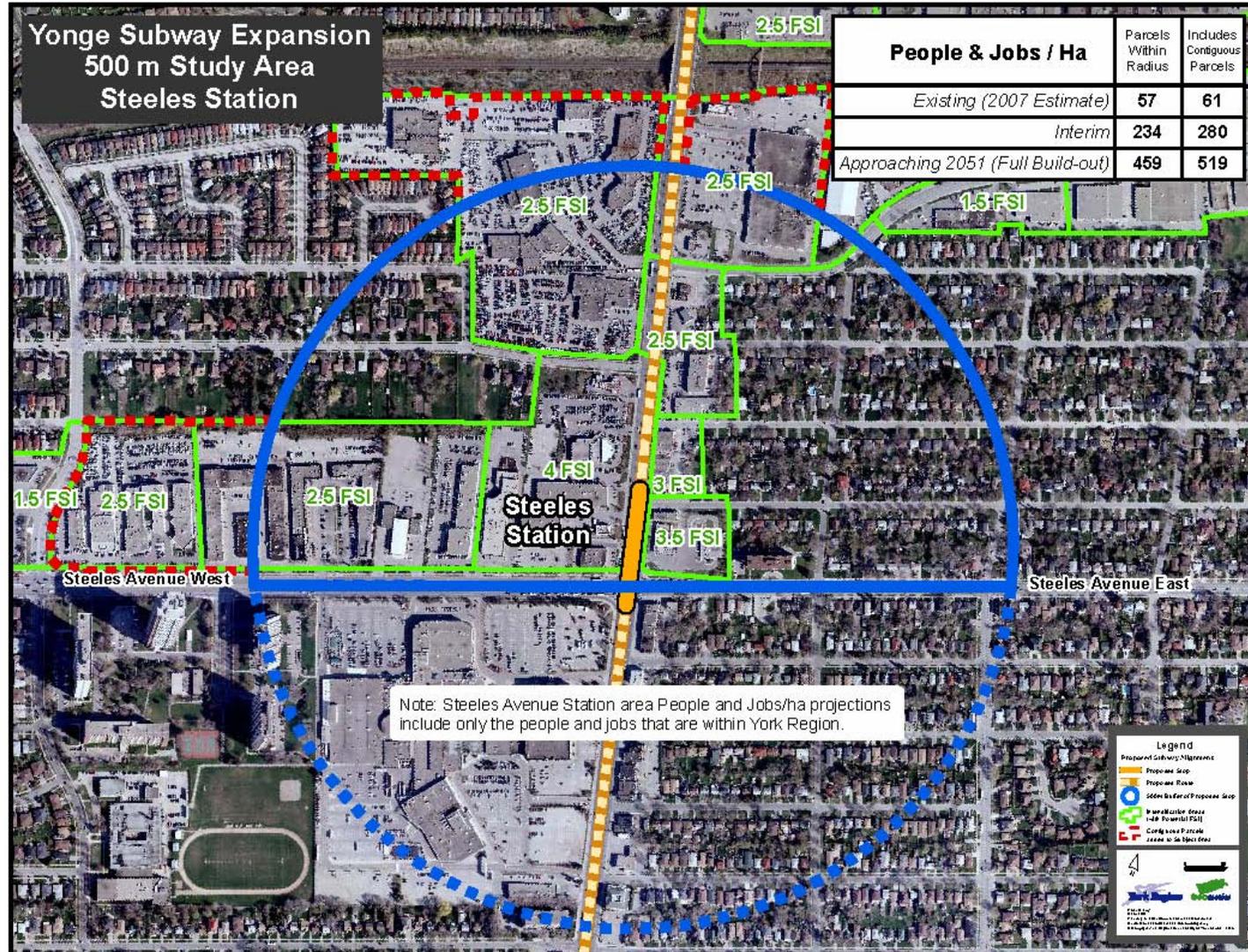


Exhibit 18 – Clark Station

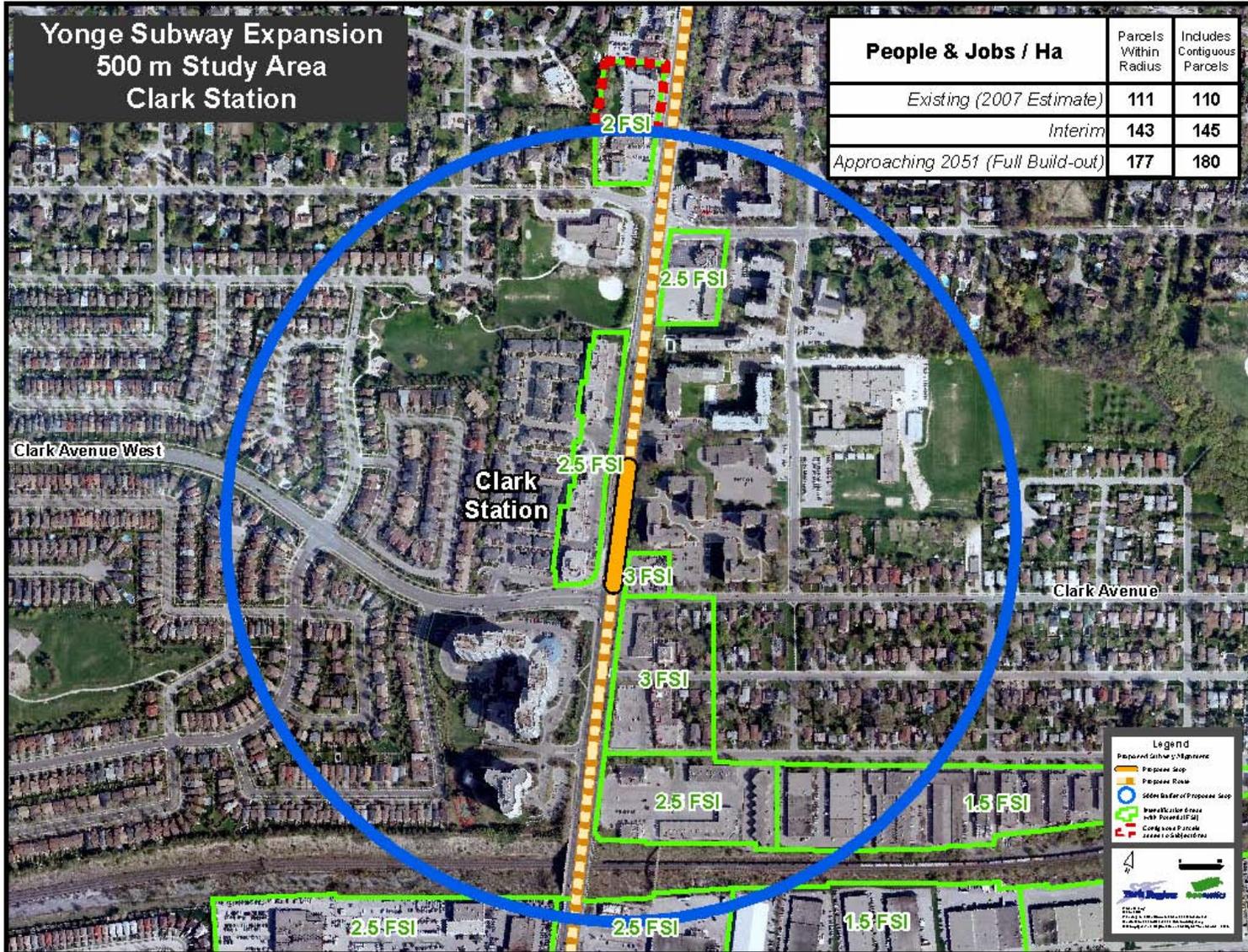


Exhibit 19 – Royal Orchard Station



Exhibit 20 – Langstaff/Longbridge Station



Exhibit 21 – Richmond Hill Station

