

Executive Summary



E.1 Executive Summary

The City of Toronto and the Toronto Transit Commission have conducted an Individual Environmental Assessment (EA) (in accordance with the requirements of the Ontario Environmental Assessment Act), for a 6.2 kilometre, 4-station underground extension of the Spadina Subway from Downsview Station to Steeles Avenue, with related commuter facilities (bus terminals, passenger pick-up and drop-off and commuter parking).

This report provides a summary of the EA Study, including the following:

- 1) Background and context for the current Study,
- 2) Purpose and objectives of the EA Study and the Project,
- 3) Overview of the EA Study process, including public and stakeholder agency consultation,
- 4) Key study findings and recommendations,
- 5) Commitments to future work, and
- 6) Proposed EA amending procedures.

E.1.1 Background and Context

Approved Yonge-Spadina Loop Environmental Assessment

TTC and the former Metropolitan Toronto completed an Environmental Assessment Report for the Yonge-Spadina Loop Project. The EA established the need and justification for transportation improvements in northwest Toronto. The Study determined that extending and connecting the north ends of the Yonge and Spadina Subway Lines across Steeles Avenue was the preferred alternative. This recommendation was based on several alternatives including “doing nothing”, roadway improvements, alternative technologies and modifications to the existing subway system. The Project became known as the Yonge-Spadina Loop.

In 1994, upon review of the TTC/Metro Toronto Environmental Assessment Report, the Minister of Environment and Energy authorized the extension of the Spadina Subway from Downsview Station to York University only (see Figure ES-1). At that time, it was anticipated that completion of the entire “Loop” from York University to Finch Station (via Steeles) would be many years into the future.

Design and construction of the approved extension of the Spadina Subway did not proceed due to lack of funding.

Need For a New EA Study

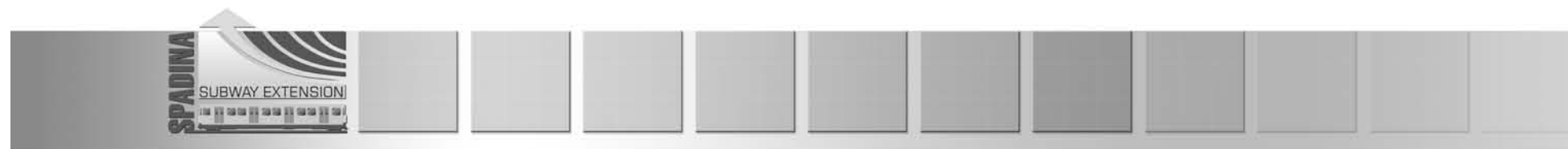
During the time since the original EA study was conducted, several important policy changes, planning initiatives, transit improvement projects, land development decisions and property acquisition activities have occurred. These key changes are listed below and are illustrated in Figure ES-2.

- 1) The 2001 Rapid Transit Expansion Study (RTES) concluded that a future subway “loop” along Steeles Avenue is no longer needed and that alternatively a “radial” extension via York University to a terminal station at Steeles Avenue is preferred.
- 2) The City of Toronto and York Region Official Plans support “Higher Order Transit Corridor” services to York University and the new Vaughan Corporate Centre (Highway 7 and Jane Street). Both Plans call for improved transit reliability and capacity in the short term and subway expansion in the long term. Specifically, the new City of Toronto Official Plan includes a Higher Order Transit Corridor following the route proposed in the Rapid Transit Expansion Study.
- 3) Special planning studies, Secondary Plans and Official Plan Amendments support transit-supportive land development (at Allen/Sheppard, along Keele Street, within the Downsview area and the York University lands) and protect for a future subway.
- 4) The Downsview lands (south of Sheppard Avenue West and east of Keele Street) have changed from a Canadian Forces Base to Parc Downsview Park (to consist of parkland, a future technology park and housing). As a result, there will be more people on the site who need better public transit access.
- 5) As a result of the RTES initiative, York University’s new buildings protect for an alternative subway alignment, which is more central within the campus than the 1994 EA alignment.
- 6) York Region has acquired property for an inter-regional transit terminal at Steeles Avenue, between Jane Street and Keele Street.

Although the 1994 EA Approval remains in effect, its amending formula does not accommodate:

- 1) The consideration of alternative subway alignments and station locations,
- 2) A station at Steeles Avenue; and
- 3) The ultimate radial extension of the subway into York Region instead of a loop along Steeles Avenue to Yonge Street.

Therefore, a new EA has been undertaken to develop, review and analyze potential changes to the 1994 EA. The new EA represents an opportunity to consider a subway extension that will better serve the Keele Street area (City of Toronto), York University, GTA commuters from southwestern York Region (City of Vaughan) and Bradford GO Rail Line passengers.



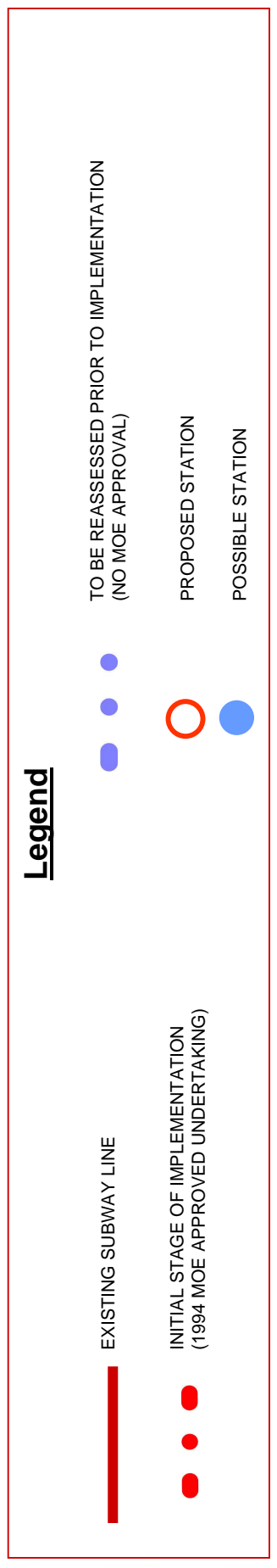
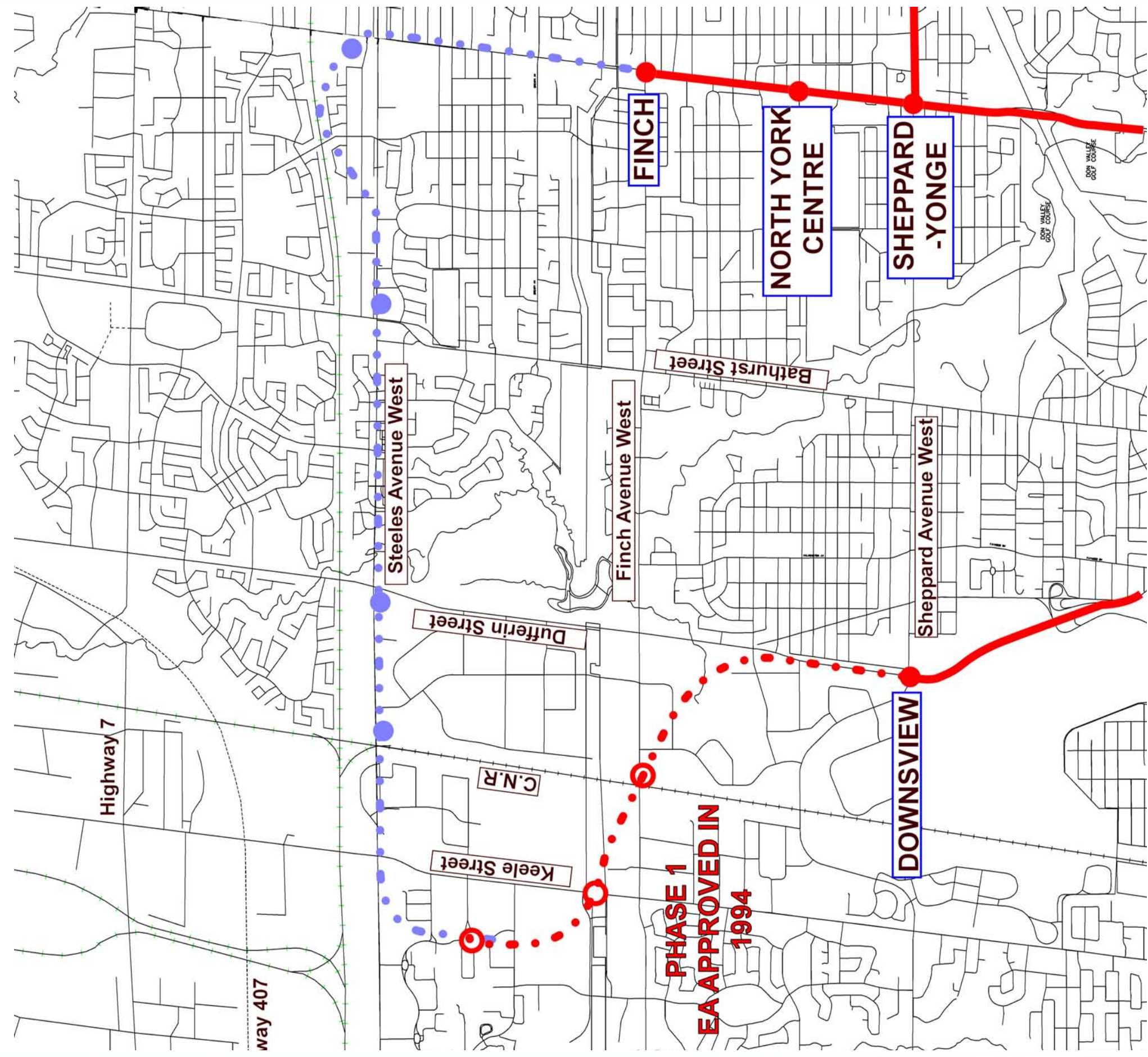
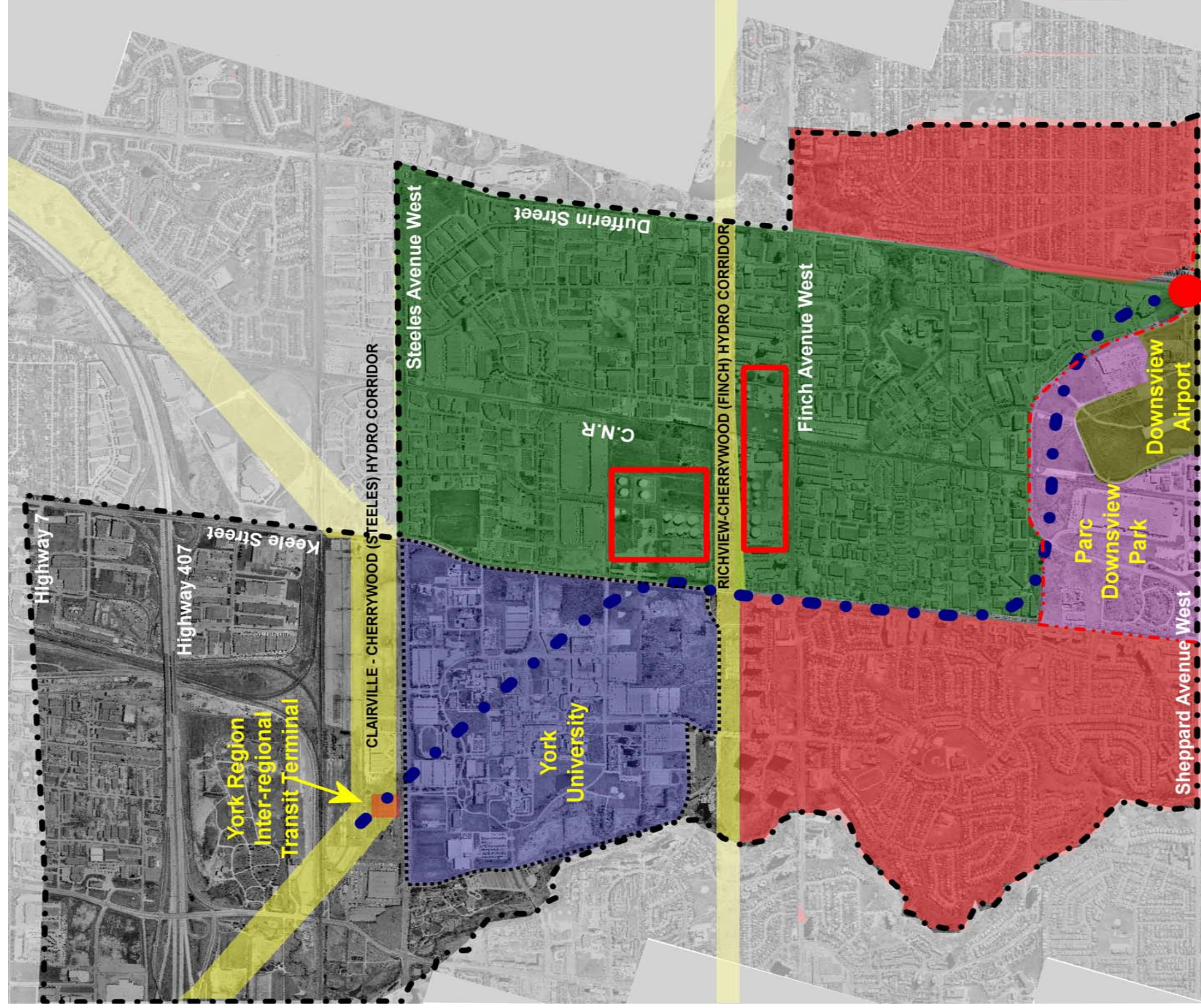


FIGURE ES - 1: YONGE-SPADINA SUBWAY LOOP ENVIRONMENTAL ASSESSMENT RECOMMENDATIONS



Legend

- | | | | |
|--|--|--|---------------------------------------|
| | CITY OF TORONTO
"HIGHER ORDER TRANSIT CORRIDOR" | | DOWNSVIEW AREA SECONDARY PLAN |
| | STUDY AREA | | STABLE RESIDENTIAL AREA |
| | YORK UNIVERSITY SECONDARY PLAN | | GAS/OIL TANK STORAGE AND DISTRIBUTION |
| | HYDRO CORRIDOR | | KEELE INDUSTRIAL AREA |

FIGURE ES - 2: LAND USE AND TRANSPORTATION PLANNING CONTEXT

E.1.2 Study Purpose and Objectives

The purpose of the EA Study is to develop and analyze alternative alignments and station locations for the 1994 EA to extend the Spadina Subway from Downsview Station to York University and to study a further radial extension to a terminal station at Steeles Avenue. The EA Study has also determined environmental impacts and has developed mitigation measures to minimize any negative impacts.

Consistent with the 1994 EA, the objectives of the Spadina Subway Extension are to:

- 1) Provide subway service to the Keele/Finch area, York University and a new inter-regional transit gateway and commuter parking facility at Steeles Avenue;
- 2) Provide improved connections between the TTC subway system and GO Transit, York Region Transit and other inter-regional transit services;
- 3) Support local population and employment growth up to 2031, in accordance with the land use and transportation policies of the new City of Toronto Official Plan and the York Region Official Plan;
- 4) Minimize any negative environmental impacts; and
- 5) Achieve reasonable capital and operating costs.

The Spadina Subway Extension shall include the construction, operation and maintenance of underground subway tunnels from Downsview Station to Steeles Avenue, with subway stations (and related commuter facilities) (see Figure ES-3) located:

- 1) At an interchange with the GO Bradford Rail Line;
- 2) In the vicinity of Keele and Finch;
- 3) On the York University campus; and
- 4) At Steeles Avenue (between Keele and Jane Streets).

The alignment at the Steeles Avenue Station will also protect for the long-term extension of the Spadina Subway to Vaughan Corporate Centre.

E.1.3 EA Study Process

Ontario Environmental Assessment Act

The Ontario Environmental Assessment Act requires the preparation and approval of a Terms of Reference as a prerequisite to the commencement of the Environmental Assessment Study. The Terms of Reference provides a plan for the preparation of the EA and a benchmark for the subsequent review and approval of the Study.

During Spring 2004, TTC and the City prepared the Terms of Reference for the Spadina Subway Extension Environmental Assessment, which:

- 1) Described the background and context,

- 2) Identified the purpose of the Spadina Subway Extension,
- 3) Provided a preliminary description of the key elements of the Project,
- 4) Determined a preliminary Study Area,
- 5) Developed a proposed work plan for the EA Study, and
- 6) Described the plan for public and stakeholder consultation during the EA.

The Terms of Reference was reviewed by the general public at Open Houses held on April 20, 2004 (C.W. Jefferys Collegiate Institute) and April 22, 2004 (York University) and was circulated to key stakeholder agencies. The Commission, at its meeting of June 16, 2004, approved the submittal of the Terms of Reference to the Ministry of the Environment. Subsequently, the Minister of the Environment approved the Terms of Reference on September 13, 2004.

In November 2004, TTC retained URS Canada Inc. to conduct this EA, in accordance with the approved Terms of Reference.

This EA Study was conducted in three phases, as follows:

Phase One: Routes and General Station Locations – This initial phase involved generating, evaluating and selecting alternative routes (i.e. corridors) and general station locations;

Phase Two: Alignments and Station Concepts – The second phase involved generating and evaluating more detailed alignments and station concepts within the technically-preferred route; and

Phase Three: Detailed Assessment of the Effects of the Undertaking – The last phase of the Study involved the detailed environmental assessment of the technically-preferred alignment and station concepts selected in Phase Two.

Canadian Environmental Assessment Act

The Canadian Environmental Assessment Act (CEAA) applies to federal authorities responsible for a decision or planned action, which enables a project to proceed in whole or in part. The requirements of the Act are “triggered” when a federal authority is the proponent of the project, provides funding or land to the project, or issues a permit, license or authorization (as prescribed in the Law List Regulations).

Commencing with the Terms of Reference phase and continuing throughout the EA Study, the Study Team consulted with federal authorities (through the Canadian Environmental Assessment Agency) to identify any CEAA “triggers”. At the time of writing of this EA Report, no CEAA triggers had been determined.

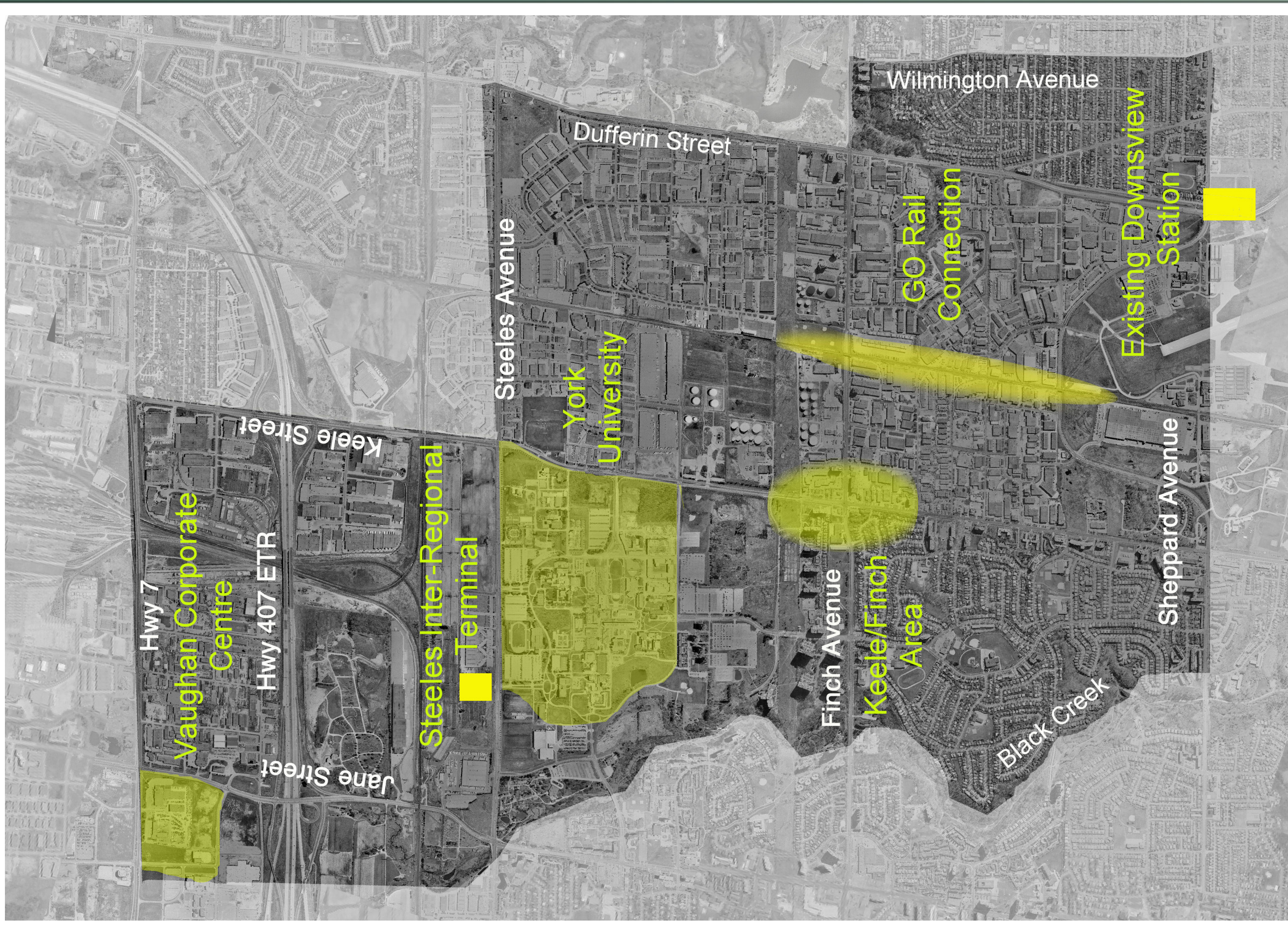


FIGURE ES - 3: Study Area

Consultation

Public and stakeholder agency consultation is a key requirement of the Ontario Environmental Assessment Act. As such, a comprehensive plan was developed during the EA Terms of Reference and implemented during the EA Study.

The plan for public consultation was to offer the public a wide range of methods of communicating with the EA Study Team and to choose their level of involvement in this EA. Accordingly, a dedicated telephone number (including TTY), fax, email address and web site were introduced during the Terms of Reference. Opportunities for public participation in decision-making at the three key milestones of the study included: open houses (with commenting forms), interactive on-line commenting and facilitated workshops (both of which included detailed questionnaires).

A Technical Advisory Committee (TAC), consisting of senior staff of key stakeholder agencies, was established in early 2004 to provide ongoing advice and assistance to TTC and the City of Toronto during the EA Study. Under the leadership of TTC, the TAC consisted of representatives of the Canadian Environmental Assessment Agency, City of Toronto (City Planning and Transportation Services Divisions), City of Vaughan, GO Transit, Ontario Ministry of Transportation, Parc Downsview Park, Toronto and Region Conservation Authority, York Region, York Region Transit and York University. TAC meetings were held on a monthly basis throughout the Terms of Reference and EA Study.

In addition, contacts were established with a broad range of Federal, Provincial and Municipal agencies with a potential interest in the Project during the Terms of Reference stage. Stakeholder agency workshops, including participants from the TAC and a wide range of agencies, were held twice during the EA Study. In addition, ad-hoc meetings were arranged to discuss and resolve specific issues.

Major comments received from the public and stakeholder agencies about key study findings and recommendations are noted in sections E.2 and E.4. Issues that will need to be addressed during the design phase are included in Commitments to Future Work (section E.5).

E.2 Phase One: Routes and General Station Locations

Seven key activities were conducted during the first phase of the EA Study, including:

- 1) A detailed inventory of existing and future conditions in the proposed Study Area;
- 2) Review and confirmation of the Study Area boundaries;
- 3) Review of alternatives to the Undertaking;
- 4) Development of alternative routes (including general station locations);
- 5) Preparation of route evaluation criteria and indicators;
- 6) Public and stakeholder consultation; and
- 7) Evaluation and selection of the technically preferred route.

E.2.1 Existing and Future Conditions

The EA study began with a comprehensive inventory of existing and future conditions within the Study Area (as proposed in the EA Terms of Reference) (see Figure ES-3), and focused on transportation, natural and cultural heritage, as well as socio-economic issues.

Land Use and Transportation Planning Context

Figure ES-2 presents the land use and planning influences within the Study Area. The current land use structure within the Study Area includes:

The Keele Industrial Area, a stable industrial/employment area, which is bounded by Sheppard Avenue to the south and includes an extensive gas/oil tank storage and distribution centre north of Finch;

Two hydro corridors (under the jurisdiction of Hydro One Networks Inc.), including: the Richview-Cherrywood Hydro Corridor (commonly known as the Finch hydro corridor), located north of Finch Avenue, which includes Trans-Northern, Sun-Canadian, Esso, Trans-Canada and Enbridge crude oil and gas pipelines, and the Cherrywood-Claireville Hydro Corridor (commonly known as the Steeles hydro corridor), located north of Steeles Avenue;

York University, which currently has a day-time population of 65,000 students, faculty and staff, whose land holdings include the core campus lands as well as undeveloped or developing lands in the vicinity of Steeles Avenue, Keele Street and the Murray Ross Parkway;

Parc Downsview Park (under Federal jurisdiction), which occupies lands previously occupied by Canadian Forces Base Downsview;

Downsview Airport, which continues to operate with a single north-south runway in support of Bombardier's ongoing aircraft manufacturing operations; and

Stable, residential neighbourhoods, including apartments (on Keele and north-west of the Keele/Finch intersection) and low density residential (south-west of the Keele/Finch intersection and east of Dufferin Street).

The former City of North York Official Plan established and protected this underlying urban structure. The City of North York Official Plan remains as the overriding planning policy document for the lands south of Steeles Avenue, including the 1994 Metro Plan, the York University Secondary Plan and the Downsview Area Secondary Plan. The new City of Toronto Official Plan (currently subject of appeals to OMB, with exception of the transportation policies which were approved by OMB Order on January 25, 2006) promotes measures to reduce car dependency and rush hour congestion by increasing trips made by transit, walking and cycling. Specifically, a corridor between Downsview Station and Steeles Avenue has been identified as a "Higher Order Transit Corridor", to be initially served by the bus-only lanes from Downsview Station to York University (the Municipal Class EA was filed in April 2005) and ultimately by subway (Spadina Subway Extension).

The York University Secondary Plan Update is currently underway and is expected to be completed in 2006. In addition to the York University and Downsview Area Secondary Plans, the City of Toronto has conducted planning studies for the Allen/Sheppard area and Keele Street corridor, which have identified opportunities for intensification and redevelopment.

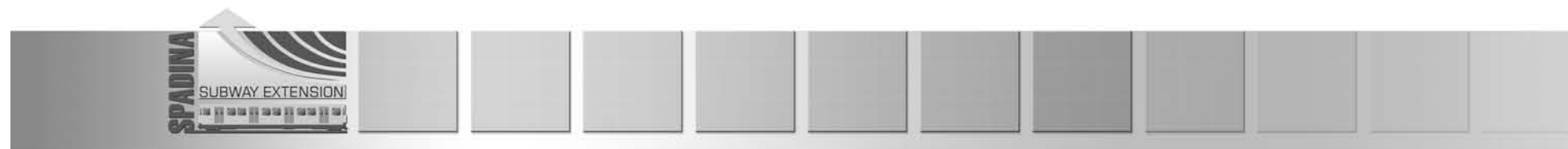
North of Steeles Avenue, the York Region Official Plan and supporting Transportation Master Plan identify a system of Urban Centres and Corridors focused on the Vaughan Corporate Centre (located at the Jane/Highway 7 intersection) and Highway 7. The City of Vaughan incorporates this concept into their statutory planning documents. Both York Region and the City of Vaughan have prepared plans that anticipate the future extension of the Spadina Subway to Vaughan Corporate Centre.

All of these planning documents, with their various levels of statutory approval and influence, support higher density redevelopment in anticipation of the extension of the Spadina Subway to York University, Steeles Avenue and, ultimately, Vaughan Corporate Centre.

Existing Transportation Systems

The focal points of transit services within the Study Area are: Downsview Station, the current terminus of the Spadina Subway, and York University, which is served by over 1,500 buses a day, operated by TTC, GO Transit, York Region Transit and VIVA Transit. All transit service into York University operates into the Harry Arthurs Common (subsequently referred to as the "Common"), which is the large area at the west end of York Boulevard. In addition, GO Transit operates the Bradford commuter rail service, from Bradford to Union Station, via the Canadian National Railway Newmarket Subdivision. Within the Study Area, the GO Bradford service stops at the temporary York University Station, which is located near the campus at Canartic Drive.

Recent ridership trends show a significant increase in demand for bus service within southern York Region and to York University.



The existing road network consists of a grid pattern of arterial roads within the City of Toronto. Highway 407 and Highway 7 bound the north end of the Study Area. The arterial roads and Highway 7 are subject to chronic traffic congestion during rush hours, which also results in delays to bus services.

Existing Natural Environment

The Study Area is situated between the valleys of Black Creek and the West Don River, and generally drains east to the West Don River. Historical records indicate soils consisting of fill, upper till, upper sand/silt deposits and upper clay deposits.

As shown in Figure ES-4, watercourse/water bodies located within the potential zone of influence of the Spadina Subway Extension include Dufferin Creek, Stong Pond and the York University Pond. No aquatic species at risk are located within the Study Area.

The most significant vegetation communities within the Study Area are associated with the Dufferin Creek Valley, the Black Creek Valley, and the West Don River Valley. There are also woodlots (Boynton, Boyer, Danby, Osgoode and Saywell) at York University. Because the Study Area is urbanized, wildlife habitat is typical of an urban setting and hosts species that are very tolerant of human disturbance.

Existing Socio-Economic Environment

As shown in Figure ES-5, the Study Area hosts a broad range of community centres, recreation centres, and schools (mainly located within the residential areas) as well as places of worship. In addition to Parc Downsview Park, other parkland is situated within the residential communities and in the vicinity of the Black Creek and West Don River valleys.

Although there are no registered archaeological sites within the Study Area, eleven properties associated with historic communities have heritage significance (see Figure ES-5).

E.2.2 The Rationale for the Undertaking

As estimated as part of the 1994 EA and reconfirmed as part of this EA, land use changes in the City of Toronto and York Region continue to result in greater demands on the existing transportation system.

The Undertaking is needed to increase the overall person carrying capacity of the north-south transportation system that provides an essential interregional connection between the City of Toronto and York Region. The Undertaking will also provide a solution, which is consistent with provincial and municipal policies that promote more intensive land use patterns, densities and a mix of uses that encourage a balance of travel by all transportation modes.

E.2.3 Review of Alternatives to the Undertaking

Alternatives to the Undertaking are functionally different ways of approaching or dealing with a problem or opportunity. The Environmental Assessment Act requires that an evaluation of alternatives to the Undertaking be conducted as part of the environmental assessment process. Because the current EA study is being undertaken to update the approved 1994 Yonge-Spadina Subway Loop EA, the current EA:

- 1) Identified and reviewed the alternatives to the Undertaking considered in the 1994 Yonge-Spadina Subway Loop EA and the 2001 Rapid Transit Expansion Study;
- 2) Presented the assessment of each alternative based on these previous studies;
- 3) Identified the key changes to the environment which have occurred since the completion of the 1994 EA and assess how they may affect the conclusions of the previous studies;
- 4) Examined the ability of each alternative to meet the purpose of the Spadina Subway Extension (See section E.1.2); and
- 5) Determined the preferred alternative to carry forward for detailed analysis and evaluation.

1994 Yonge-Spadina Subway Loop Environmental Assessment

The 1994 EA examined a comprehensive range of alternatives to the Undertaking, including:

- 1) Doing nothing;
- 2) Roadway improvements (including reserved bus lanes and additional automobile lanes);
- 3) Modifications to the Yonge-University-Spadina Subway Line (including terminal and Bloor Station improvements, Automatic Train Control, and Bus or Light Rail Transit between the Yonge and Spadina Subway corridors);
- 4) Extension of the proposed Sheppard Subway from Yonge Street (now Sheppard-Yonge Station) to Allen Road (now Downsview Station);
- 5) Extensions of the existing Yonge-University-Spadina Subway Line (including northerly extensions of the Yonge and Spadina Subway Lines; northerly extensions, with a bus or Light Rail Transit connection between the Yonge and Spadina Subway corridors; and northerly extensions with a Yonge Street to Allen Road extension of the Sheppard Subway; or
- 6) Connection of the Yonge and Spadina Subway Lines to form a continuous “loop”.

These alternatives were evaluated on the basis of how well they achieved the project objectives, including level of transit service (i.e. sufficient system capacity and reliability), integration of transit services, intensification of land use, social and natural environmental impacts and costs. The evaluation confirmed that extension of the Spadina Subway to the north, ultimately connecting to the Yonge Subway at Finch Station (via Steeles Avenue) to form a “loop”, was the preferred alternative.



Legend

	Study Area		Toronto District School Board Elementary		Arena
	Parks		Toronto Catholic School Board Secondary		Outdoor Pool
	Utility Corridor		Toronto District School Board Others		Indoor Pool
	Four Winds Drive		Toronto Catholic District School Board Elementary		Library
	Allotment Community		Toronto District School Board Secondary		Child Care Centre
	Garden		Private School		Place of Worship
	Cultural Heritage Site				

Data Sources: Toronto Urban Development Services, Toronto District School Board, Toronto Catholic District School Board, and information from Community & Neighbourhood Services at the City of Toronto.

ARCHAEOLOGICAL SERVICES INC.

FIGURE ES – 5: CULTURAL HERITAGE

2001 Rapid Transit Expansion Study

In 2001, TTC conducted the Rapid Transit Expansion Study (RTES) to examine the needs and priorities for expansion of TTC's rapid transit system to the Year 2021 in support of the population and employment growth envisaged in the new City of Toronto Official Plan and in recognition of GTA development trends.

One of the critical issues examined in RTES was whether connecting the Yonge and Spadina Subway Lines was still required, given changes, which have occurred since the Yonge-Spadina Subway Loop EA was conducted. The RTES report observed that, while the need for a loop seemed more pressing in 1992/93 due to congestion on the Yonge Subway, ridership circumstances have changed significantly since the Yonge-Spadina Subway Loop EA was conducted. RTES also noted that while looping has certain operational benefits, there would be more cost-effective ways of eliminating operational constraints at terminal stations (such as terminal and signalling improvements) than connecting the Yonge and Spadina Subways.

Accordingly, the report concluded that looping of the Yonge and Spadina Subways would not be required in the medium term and that looping of the two lines via Steeles Avenue in the long term is unlikely. The conclusions opened the following opportunities for extending the Spadina Subway:

- 1) The loop that would connect the Yonge and Spadina Subways on Steeles Avenue could be pushed further north (e.g. Highway 7) if required in the future;
- 2) Radial extension of the line beyond York University to Steeles Avenue could be considered if Steeles Avenue is no longer a constraint on the location of the top of the loop; and
- 3) Alignments that penetrate further west into the York University campus could be considered (rejected in the 1994 EA due to increased capital costs for an easterly extension of the Spadina Line to join the Yonge Line).

The Rapid Transit Expansion Study (RTES) recommended extension of the Spadina Subway Line to Steeles Avenue (instead of terminating within the York University campus). This would offer the potential for some commuter facilities to be relocated from the York University campus lands (as proposed in the 1994 EA) to the hydro corridor north of Steeles Avenue. By moving some of these facilities into the hydro corridor, the prime lands on the York University campus would be freed for development.

RTES also recommended further analysis to determine the best alignment of the Spadina Subway between Downsview Station and York University, including a review of an alternative alignment with the GO Bradford Rail Line-TTC interchange station at Sheppard Avenue and a Keele/Finch Station closer to the Keele/Finch intersection.

The current Environmental Assessment Study builds on the Project need and justification established in the 1994 EA and the 2001 Rapid Transit Expansion Study. The new EA is being conducted to ensure the best alignment for the Spadina Subway Extension is chosen to capitalize on recent and future changes within the Study Area.

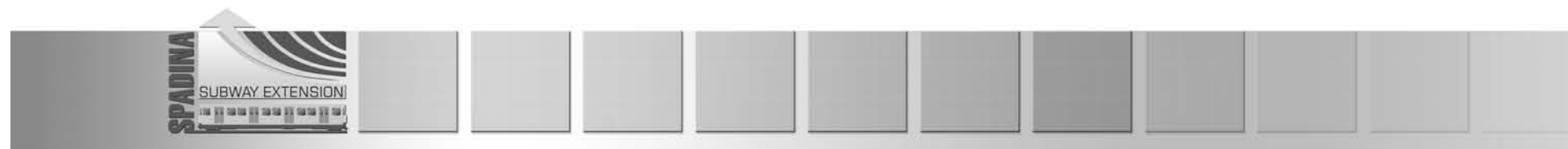
E.2.4 Development of Alternative Routes

Alternative subway routes and general station locations were developed for further analysis and evaluation. Routes were defined by the Study Team as broad geographical corridors, within which, a number of subway alignments may occur. Routes and general station locations were developed using "route generation criteria", which were based on the five key project objectives (see section E.1.2 and Table ES-1 below). As summarized in Table ES-2, a total of eight routes were developed using these criteria.

Table ES- 1: Route Generation Criteria

Objectives	Criteria
Provide subway service to the Keele/Finch area, York University and a new inter-regional transit terminal and commuter parking facility at Steeles Avenue.	Locate subway station within 500 m of the Keele/Finch Intersection.
	Locate a subway station within York University Campus.
	Terminate subway extension at York Region's inter-regional transit terminal site on the north side of Steeles Avenue between Jane Street and Keele Street.
Provide improved connections between the TTC subway system and GO Transit, York Region Transit and other inter-regional transit services.	Locate subway station where the subway extension crosses the GO Bradford Rail Line.
	Provide bus terminals, where appropriate, to allow bus passengers (TTC, GO and York Region Transit) to transfer to the subway.
Support local population and employment growth.	Protect for a future subway extension to the Vaughan Corporate Centre.
	Subway stations should be 1.0 km apart to maximize the areas serviced by the subway (based on maximum walking distance of 500 m).
Minimize any negative environmental impacts.	Where possible, avoid residential areas, fuel tank farms, and significant natural and cultural heritage features.
Achieve reasonable capital and operating costs.	Make route as straight as possible or use very large curves so that trains can operate at maximum speeds.
	Start the subway extension where the existing track ends at Downsview Station.

Notably, Route 1 (Figure ES-6) follows the alternative alignment (with the TTC-GO Bradford Rail Line interchange at Sheppard Avenue) proposed for further analysis in RTES and Route 5 (Figure ES-7) is consistent with the 1994 EA Alignment from Downsview Station to York University.



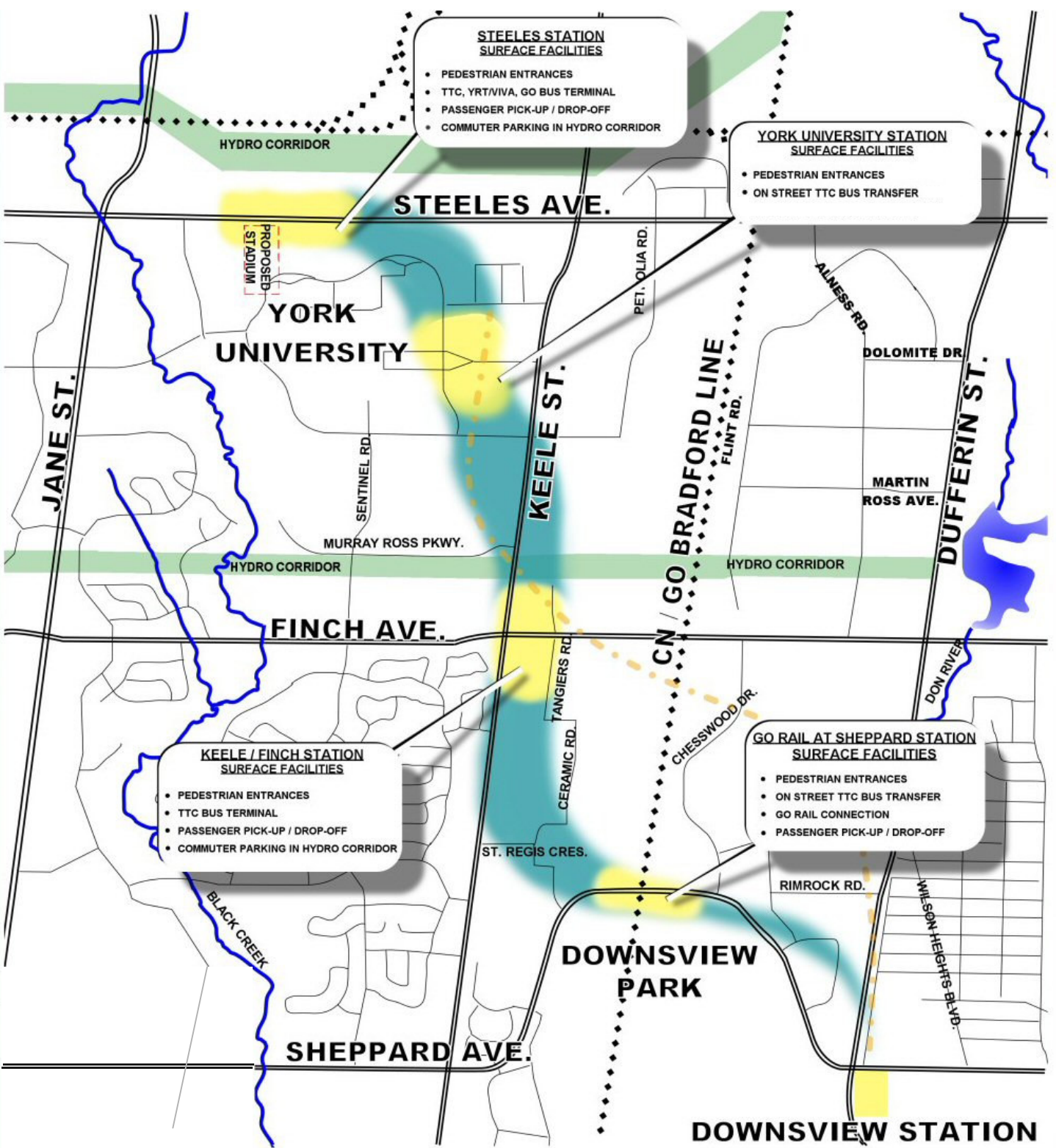


FIGURE ES – 6: ROUTE 1

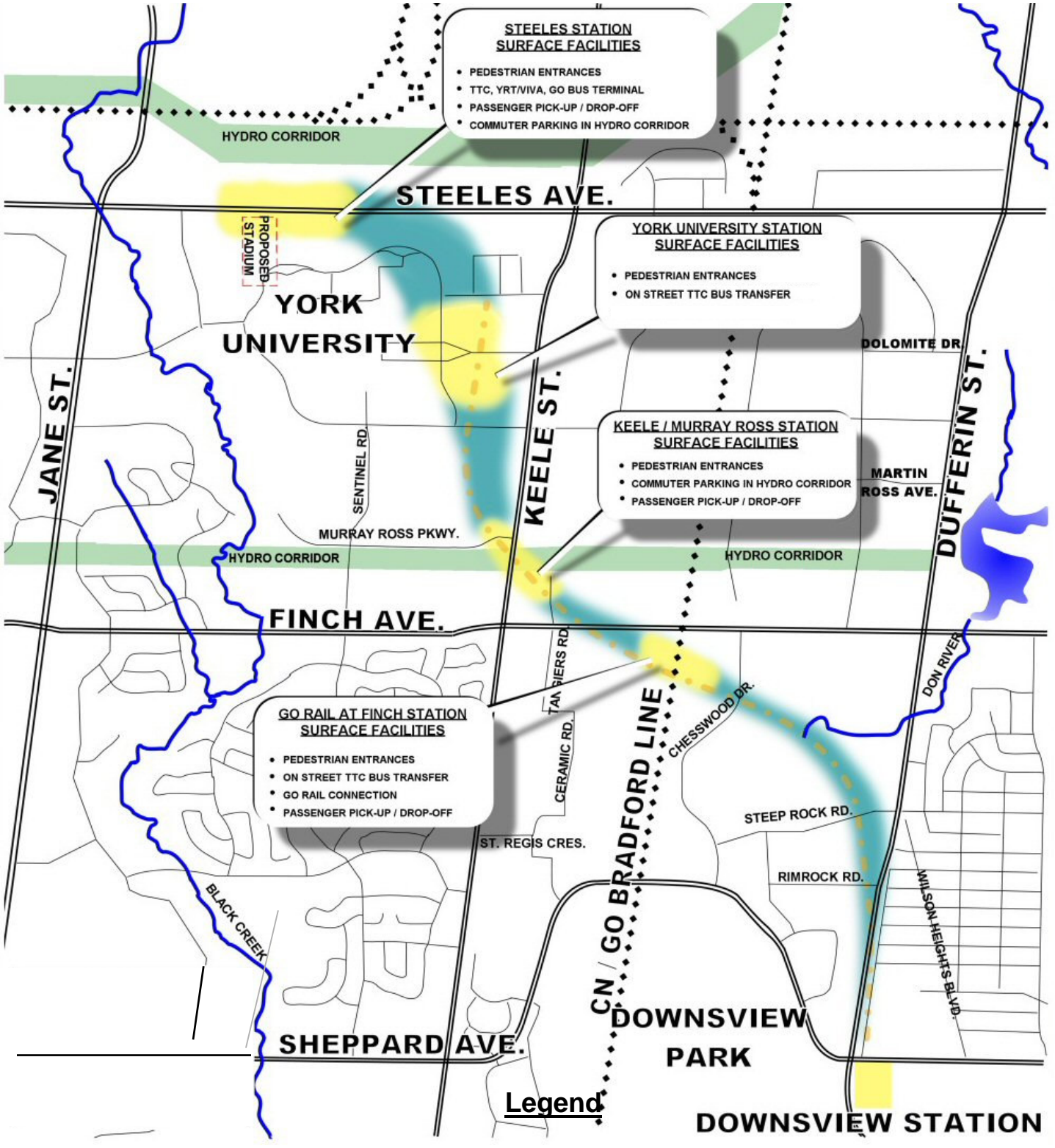


FIGURE ES – 7: ROUTE 5

Legend

- ROUTES
- GENERAL STATION LOCATION
- 1994 EA-APPROVED ALIGNMENT

E.2.5 Public and Stakeholder Consultation

During the first round of consultations, held in February 2005, members of the public and stakeholder agencies were invited to review and comment on the following:

- 1) Inventory of existing and future conditions,
- 2) Review of alternatives to the Undertaking,
- 3) Proposed alternative routes and general station locations, and
- 4) Proposed route evaluation criteria and indicators.

Based on these consultations, further details on local conditions were added to the Study Area inventory and several new or revised indicators were added to the route evaluation criteria.

E.2.6 Evaluation of Routes

A comprehensive list of evaluation criteria and indicators were developed by the Study Team in order to analyze and evaluate the alternative routes. These criteria were derived from the project objectives and included the following considerations:

- 1) Convenience for riders to walk to local stations;
- 2) Convenience for other modes of travel;
- 3) Conform with current, approved planning documents;
- 4) Maximize redevelopment potential in support of the subway extension;
- 5) Maximize the potential to create a high quality urban/pedestrian environment;
- 6) Protect existing stable land uses;
- 7) Minimize the potential effects on important natural and cultural heritage features;
- 8) Minimize capital and operating costs of the subway extension;
- 9) Maximize revenue generated from the subway extension;
- 10) Maximize the subway extension in lands with no property costs to the Project; and
- 11) Quality of subway service.

For the evaluation of the eight alternative routes (and general station locations), the Study Team used both numeric and a qualitative analysis method. These two methods were used concurrently to provide a traceable decision-making process.

The evaluation of the eight possible routes and the selection of the technically-preferred route focussed on determining the best location for TTC-GO Rail interchange, the Finch/Keele and York University stations. All routes would serve a station located at the York-Region inter-regional bus terminal lands at Steeles Avenue West.

Three general station locations were considered for the TTC-GO Rail interchange: at Sheppard Avenue (Routes 1, 2, 3 and 4), in the centre of the Keele Industrial Area at Chesswood Drive (Routes 7 and 8) and at Finch Avenue (Routes 5 and 6). While all proposed locations would serve passengers transferring between the GO Bradford Rail Line and the subway, both the Chesswood Drive and Finch Avenue locations (within the Keele Industrial Area) would offer limited opportunities for future population and employment growth. This is because the Keele Industrial Area is a stable, low density employment area, which is protected under the new City of Toronto Official Plan. At Finch Avenue, development opportunities are further inhibited by extensive fuel storage tank lands and the Finch hydro corridor to the north. In comparison, a station at Sheppard Avenue would be situated at Parc Downsview Park, which is slated for future development as parkland and for a technology park and housing. Therefore, the preferred location for the TTC-GO Rail interchange would be at Sheppard Avenue.

One of the most significant transportation requirements for the Keele/Finch area is to provide a convenient transfer between the subway and the 36 - Finch West bus route, which is one of Toronto's highest demand bus routes. This could occur at the Keele / Finch intersection (as proposed in Routes 1 and 4) or as identified in the 1994 EA, on Finch at the Bradford GO Rail Line (as proposed in Routes 5 and 6). Greater than 200 metres from Finch Avenue, bus passengers who are not transferring to the subway would incur too much delay and, therefore, a connection between the 36 - Finch West bus route and the subway could not be made. This lack of transfer opportunity was one of the key reasons for not considering Routes 2, 3, 7 and 8 for further analysis. In addition, a station at the Keele/Finch intersection would offer enhanced transit-supportive redevelopment opportunities, compared to the hydro corridor, which can host only limited types of uses (such as recreation trails, allotment gardens, roads and commuter parking).

At York University, the two general station locations were either in the Common (Routes 1, 2, 5 and 7) or at Sentinel Road (Routes 3, 4, 6 and 8). The Common, which is the current transit hub for the University, served by over 1,500 buses a day, was preferred over the Sentinel Road location.

E.2.7 Selection of the Preferred Route

Route 1, which comprises the preferred locations for the GO Rail-TTC interchange, Keele/Finch node and York University stations, was selected as the technically-preferred route.

Route 1 would include stations at the following locations:

- 1) Sheppard Avenue West at the Bradford GO Rail Line (Sheppard West Station),
- 2) The intersection of Keele Street and Finch Avenue West (Finch West Station),
- 3) The Common area of the York University campus (York University Station), and
- 4) The proposed inter-regional transit terminal at Steeles Avenue West (Steeles West Station).

Route 1 was selected as the technically-preferred route for the following reasons:

- 1) The proposed Sheppard West Station connects to the GO Bradford Line and will encourage redevelopment of the Downsview lands;
- 2) The proposed Finch West Station will provide a convenient connection to the busy 36 Finch West bus route;
- 3) The proposed York University Station is situated in the Common area, which is the existing transit hub for the University;
- 4) The route maximizes use of the Keele Street road right-of-way, which reduces property impacts and costs;
- 5) The route minimizes impacts to the natural environment and avoids Black Creek and Dufferin Creek; and
- 6) The route protects for future expansion into York Region and Vaughan Corporate Centre.

During the second round of public and stakeholder consultation, the selection of Route 1 was supported by over 90% of respondents.

E.3 Phase Two: Alignments and Station Concepts

The second phase of the EA Study included the development and evaluation of detailed alignments within the Route 1 corridor as well as station concepts.

E.3.1 Development of Alternative Alignments

Alignment Generation Criteria

Alternative alignments were developed using “alignment generation criteria”, which were developed by the Study Team based on the overall objectives for the Spadina Subway Extension, subway operating requirements and TTC’s engineering design criteria. Alignments were defined as 30-metre wide rights-of-way located within the technically-preferred Route 1.

These criteria were as follows:

- 1) Construct subway under road right-of-way to avoid disruption and minimize property acquisition;
- 2) Avoid petroleum storage facilities;
- 3) Avoid structures with deep foundations (buildings and existing bridges);
- 4) Construct below existing grade to minimize impacts to crossing roads and adjacent properties;
- 5) Avoid impacts to cultural and natural heritage features;
- 6) Avoid stable residential areas;
- 7) Meet geometric design standards (absolute minimum radius = 300 metres; desirable minimum radius = 700 metres; all stations must be on at least 200 m of straight track);
- 8) Allow trains to operate at two-minute headways;
- 9) Provide cross over and storage tracks for operational needs; and
- 10) Protect for further extension into York Region (Vaughan Corporate Centre).

In support of the subway operations, “special track work areas” were identified based on the following subway operations requirements:

- 1) Provision for switching trains between northbound and southbound tracks at Finch West Station, to be used to provide reliable service or in emergency situations, which would require double cross-over tracks south of the station);
- 2) Turn back of trains at Steeles West Station terminus, requiring double cross-over tracks immediately south of the platform;
- 3) Tail-track structure north of Steeles West Station platform to allow full operating speed into Steeles West Station as well as to provide for temporary storage of trains; and
- 4) The connecting track from Wilson Yard to Downsview Station, which has already been granted EA, approved status (through the New Subway Storage and Maintenance Facility EA).

Construction Methodology

Historically, three types of construction methods have been used for Toronto subway projects:

Tunnelling Method – A Tunnel Boring Machine (TBM) is placed in the ground via a launch site and is used to remove soil and to fabricate the subway tunnels. Because most of the tunnelling activity occurs below the ground level, disruption to traffic and buildings is minimised. Tunnelling method is used to construct the subway running structures (i.e. tracks running between stations).

Cut-and-Cover Method – Cut-and-Cover method involves excavating from the ground level to the bottom of the subway structure, building the subway structure and then backfilling on top of the structure. This method is used for the more complex sections of the subway alignment, including stations and special track work areas (such as tail tracks, cross-overs and three-track structures). Typically when cut-and-cover method is used within a road right-of-way, decking is installed at the road level to allow traffic to operate while excavation and construction of the subway continues below.

Open Cut Method – Similar to cut-and-cover method, the open cut method involves excavating from the ground level to the base of the subway structure. The difference is that once the subway structure is constructed, no backfilling occurs, creating an open “trench”. An example of open cut is the Rosedale Station to St. Clair Station section of the Yonge Subway. Notably, there are certain locations along this section of the Yonge Subway, which have been covered as local development occurs.

In order to determine the environmental impacts arising during the construction of the Spadina Subway Extension, preliminary investigations of the proposed construction methodology were conducted as part of the alignment development and evaluation process.

As shown in Figure ES-8, cut-and-cover method would be used for:

- 1) Each of the four stations;
- 2) The proposed cross-overs south of Finch West Station and Steeles West Station; and
- 3) The tail tracks at the north-end of Steeles West Station.

The remaining 4 kilometres of running structures would be constructed by tunnelling method. Open cut method was also considered for the section of the alignment within the undeveloped Parc Downsview Park lands as an alternate construction method to tunnelling or cut-and-cover. This option was not carried forward due to potential long-term maintenance issues and concerns (by Parc Downsview Park) that an open cut configuration would be incompatible with short and long-term development plans.

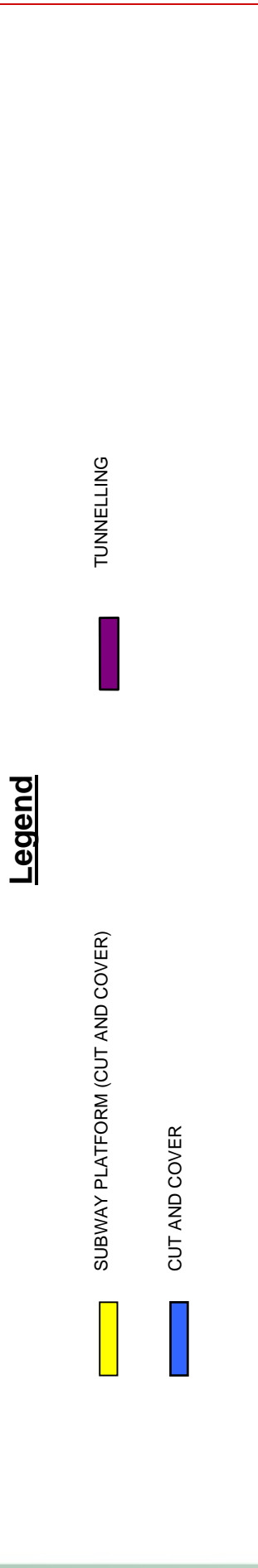
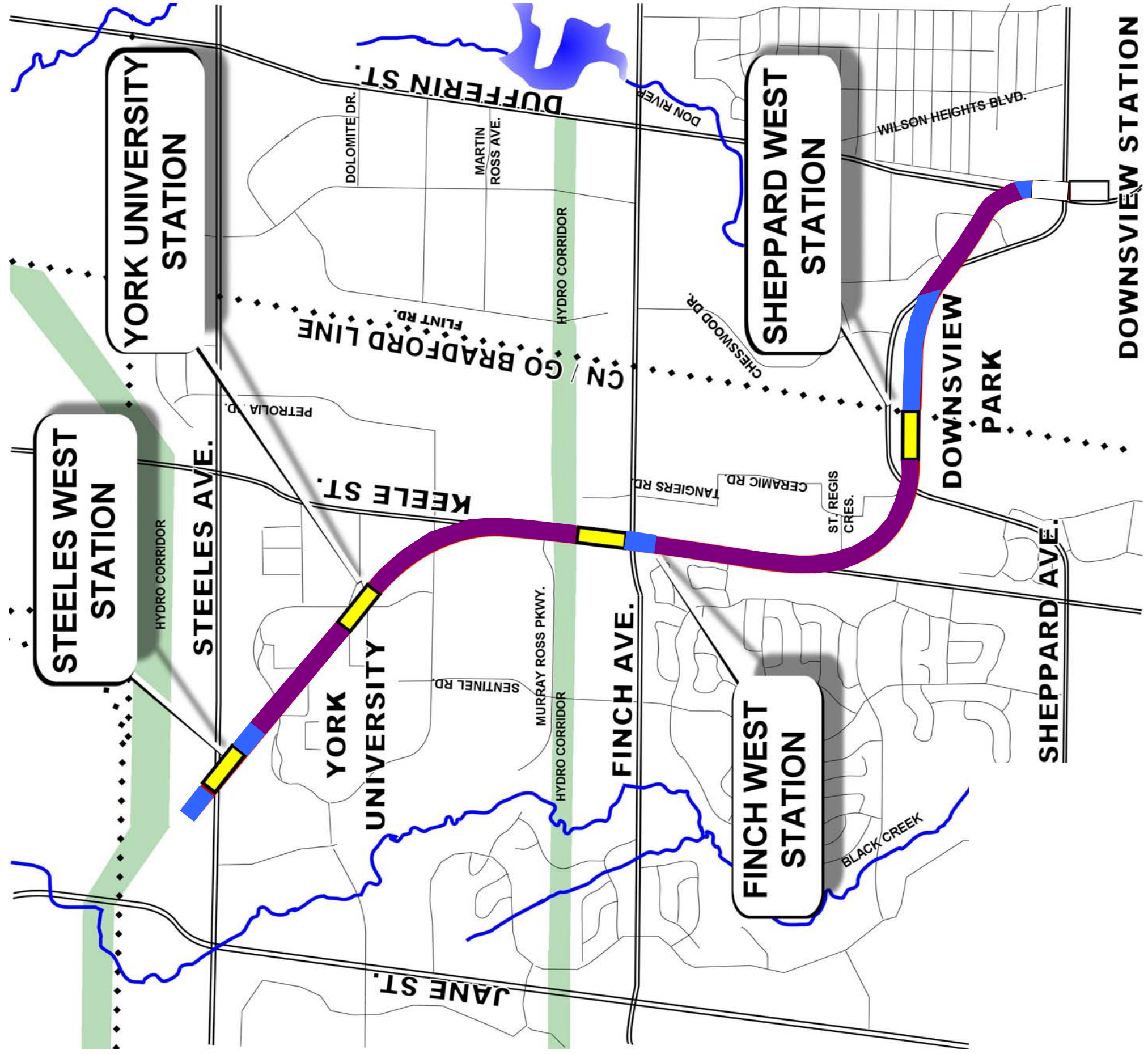


FIGURE ES – 8: CONSTRUCTION METHODS

Keele Street Alignment

At the outset of the development of alternative alignments, the Study Team determined the following benefits of maximizing the length of the subway alignment within the Keele Street road right-of-way:

- 1) The number of properties with subway tunnels running below would be minimized. As such, potential property impacts would be avoided;
- 2) Construction of Finch West Station (which must be constructed by cut-and-cover method) within the Keele Street right-of-way would minimize the number of private properties to be acquired for the station and related commuter facilities in the vicinity of the Keele and Finch intersection. This would result in fewer properties to be acquired for the subway project, resulting in decreased business disruption and socio-economic impacts); and
- 3) Using the municipal-owned road right-of-way, instead of private properties for the subway tunnels and Finch West Station, would minimize property costs.

For these reasons, it was determined that the best location for Finch West Station would be under the Keele Street right-of-way, in the vicinity of Finch Avenue West. Because the alignment would be within the road right-of-way, the Finch West Station box could be shifted north or south, without impacting private property.

Because all potential alignments would converge at the Keele/Finch intersection, Route 1 was divided into a southern section, from Downsview Station to Finch Avenue West and a northern section from Finch Avenue West to Steeles Avenue West. Alternative alignments were developed and evaluated for both sections. Any of the northern and southern alternatives could be combined to achieve the best overall Spadina Subway Extension alignment.

Southern Alignments

As shown in Figure ES-9, four alignments were developed for the southern section of Route 1, including:

- 1) **Alternative S1**, which runs along the south perimeter of Route 1, with the minimum allowable curve immediately north of Downsview Station, maximizing the use of the government-owned Department of National Defence and Parc Downsview Park lands located south of Sheppard Avenue;
- 2) **Alternative S2**, which runs immediately south of Sheppard Avenue, mainly within the Parc Downsview Park lands;
- 3) **Alternative S3**, which runs immediately north of Sheppard Avenue, under privately-owned properties within the Keele Industrial Area; and
- 4) **Alternative S4**, which runs along the north perimeter of Route 1, within the Keele Industrial Area.

The potential for running the alignment under the Sheppard Avenue West road right-of-way was investigated early in the EA Study. It was determined that the subway tunnels would conflict with the footings of the Canadian National Railway bridge and that costly and disruptive reconstruction of the bridge

would be required. As well, the subway alignment would be extremely deep at this point, which would result in passenger inconvenience due to the vertical distance between the ground level station entrances and the Sheppard West Station platform level. Accordingly, the use of the Sheppard Avenue road right-of-way was not considered further.

In addition, sub-options for each of the four southern alignments were developed with Sheppard West Station located either on the east side or the west side of the CN/GO Bradford Rail Line.

Table ES- 2: Southern Alignments: Sub-Options

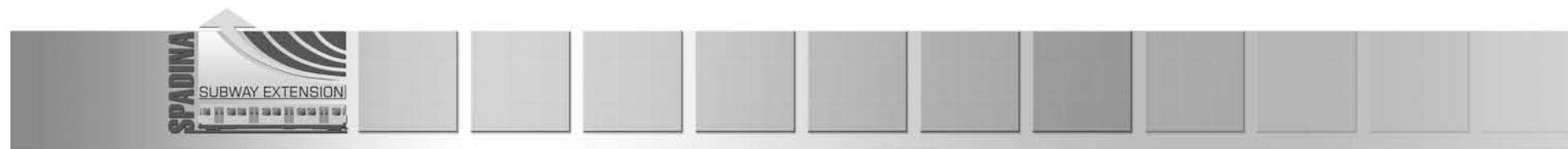
	Sheppard West Station located west of CN/GO Bradford Rail Line	Sheppard West Station located east of CN/GO Bradford Rail Line
Alignment S1	S1(West)	S1 (East)
Alignment S2	S2 (West)	S2 (East)
Alignment S3	S3 (West)	S3 (East)
Alignment S4	S4 (West)	S4 (East)

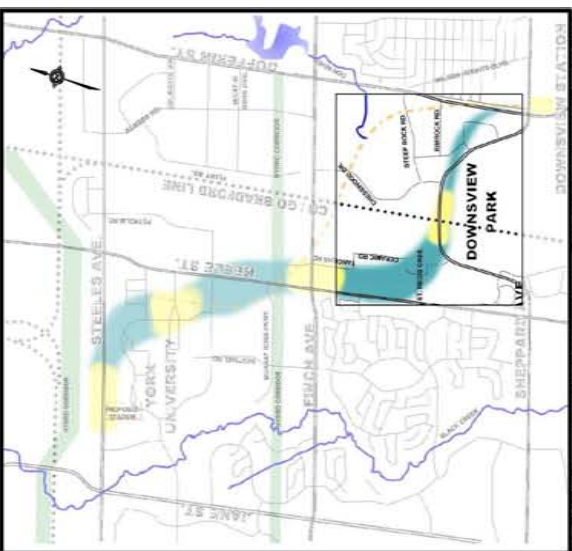
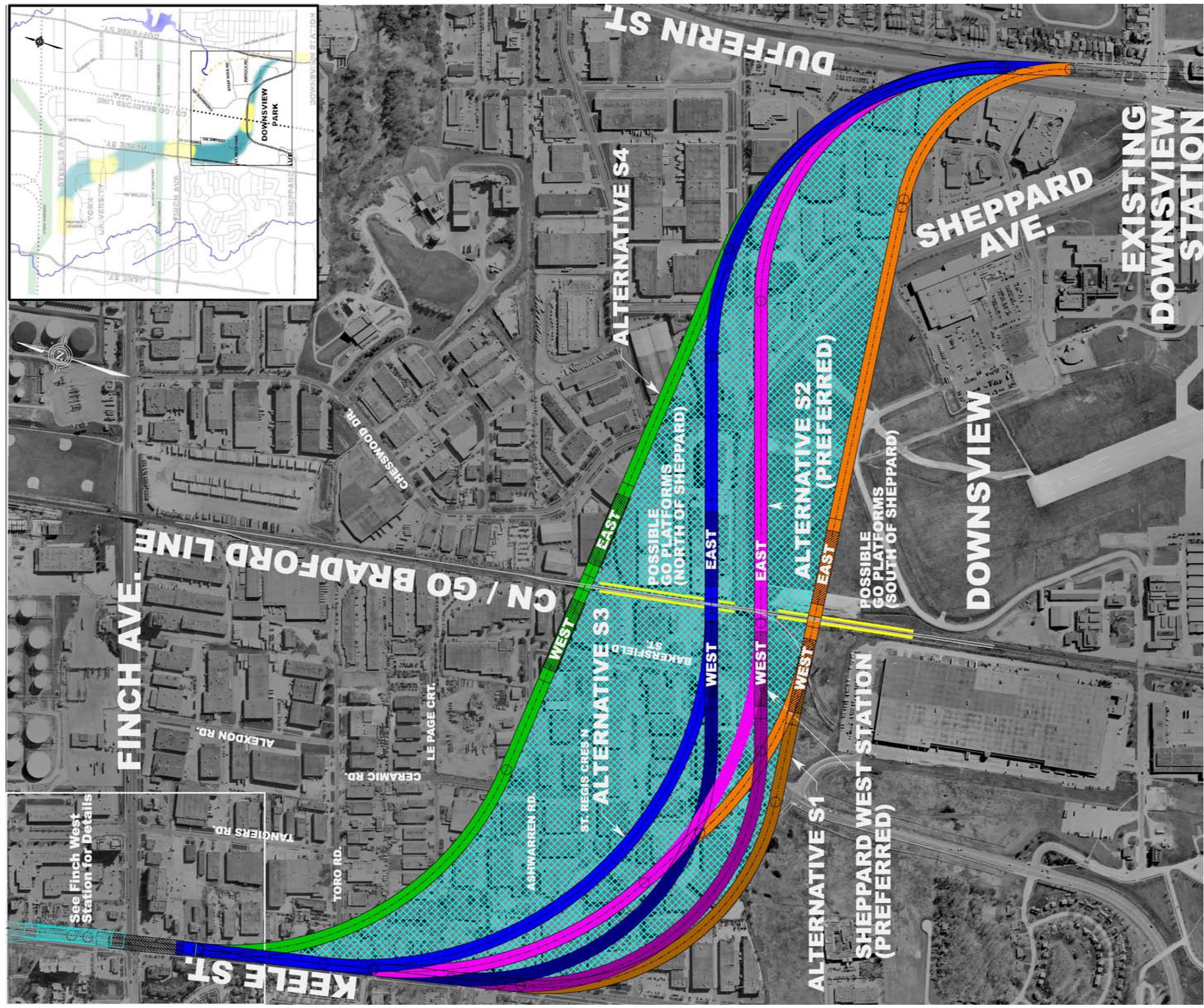
Within each of the sub-options, there are minor differences in the alignments between the CN/GO Bradford Rail Line and Keele Street, due to the location of Sheppard West Station.

Northern Alignments

For the northern section of Route 1, three alignments were developed (see Figure ES-10), including:



- 1) **Alternative N1**, which generally runs under Ian MacDonald Boulevard within the York University campus and Steeles Avenue West. This alignment was originally proposed in the 2001 Rapid Transit Expansion Study. Under this alternative, the proposed York University Station would be located on Ian MacDonald Boulevard, at the east end of the Common. The proposed Steeles West Station would be located under the Steeles Avenue West road right-of-way;
- 2) **Alternative N2**, which would run under the Keele Street right-of-way up to The Pond Road and would run in relatively direct alignment between existing campus buildings. The proposed York University Station would be located northeast of York Lanes and the Common. The proposed Steeles West Station would be centred on Steeles Avenue, with a north-west to south-east orientation; and
- 3) **Alternative N3**, which would run under the Keele Street right-of-way up to The Pond Road and in a direct alignment between Keele Street and Steeles Avenue West, passes under the existing Schulich School of Business and York Lanes buildings. The proposed York University Station platform would be located at the east end of the Common, between the Schulich and York Lanes buildings. Steeles West Station would have a similar location and orientation as for Alignment N2.





See Finch West Station for Details

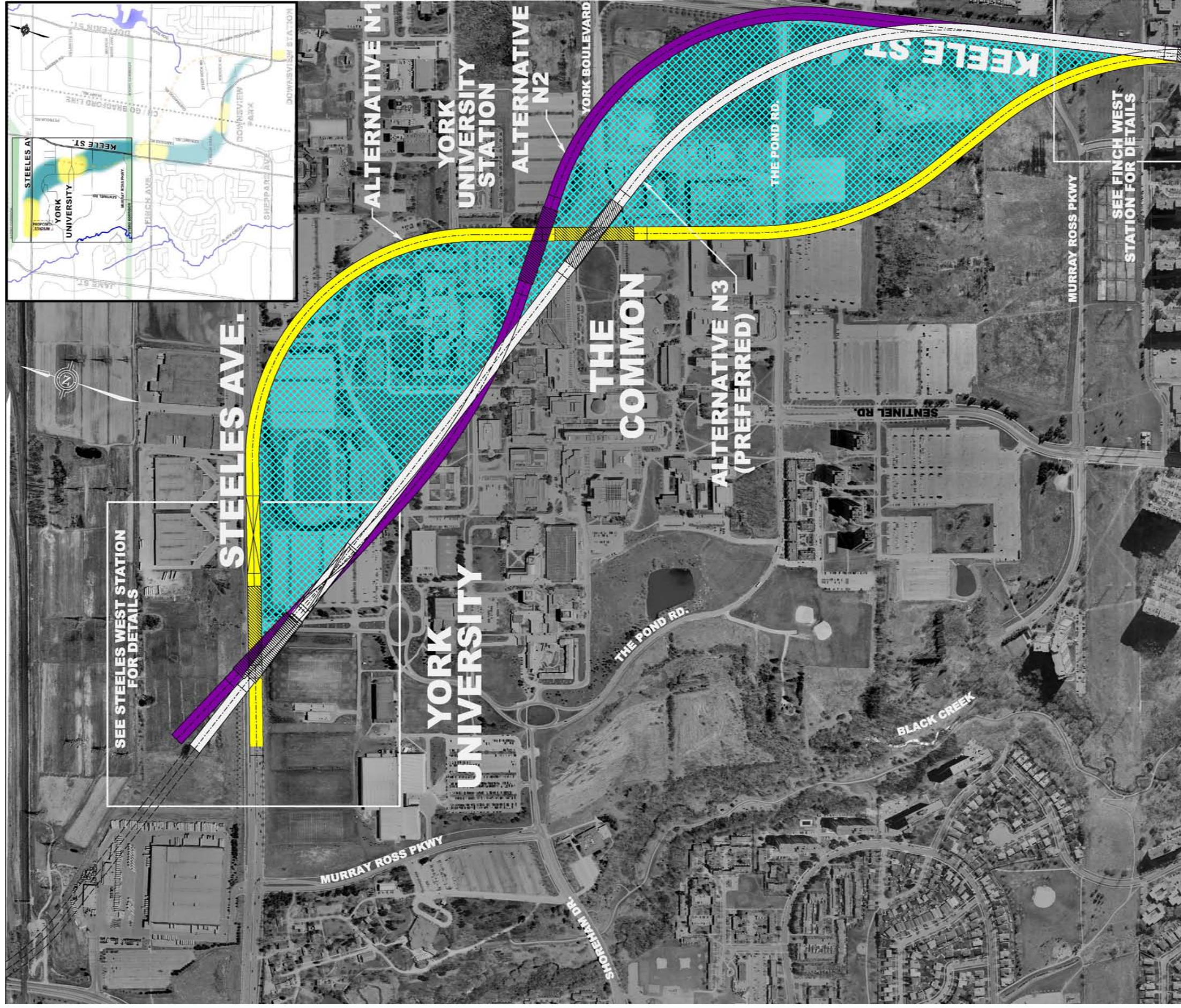
Legend

-  ALL ALIGNMENTS ARE SUBJECT TO REFINEMENT WITHIN THE SHADED AREA
-  POTENTIAL STATION PLATFORM LOCATIONS




NOTES:

1. SHEPPARD WEST STATION PLATFORM MAY BE LOCATED EITHER EAST OR WEST OF THE GO BRADFORD LINE
2. ALL ALIGNMENTS IN SOUTH SECTION CAN BE COMBINED WITH ALTERNATIVE ALIGNMENTS IN NORTH SECTION

FIGURE ES – 9: SOUTHERN ALIGNMENT ALTERNATIVES



Legend

-  ALL ALIGNMENTS ARE SUBJECT TO REFINEMENT WITHIN THE SHADED AREA
-  POTENTIAL STATION PLATFORM LOCATIONS
-  CROSS-OVER TRACKS

NOTE:
ALL ALIGNMENTS IN NORTH SECTION CAN BE COMBINED WITH ALTERNATIVE ALIGNMENTS IN SOUTH SECTION

FIGURE ES – 10: NORTHERN ALIGNMENT ALTERNATIVES

E.3.2 Development of Alternative Station Concepts

Station concepts were developed based on travel demand forecasts, the proposed feeder bus network, future transit supportive development opportunities and TTC’s engineering design criteria. These concepts included preliminary layouts of the subway platforms, station entrances, bus terminals, commuter parking, passenger pick-up and drop-off facilities and traction power substations. The type and size of commuter facilities (in addition to station entrances) to be provided at each station is summarized in Table ES-3.

Table ES- 3: Summary of Commuter Facilities by Station

	Sheppard West Station	Finch West Station	York University Station	Steeles West Station
Bus Facilities	On-street bus stops	8-10 bay bus terminal	On-street bus stops	35-40 bay bus terminal(s)
Passenger Pick-up and Drop-Off	No	Yes	No	Yes
Commuter Parking	No	400 spaces in hydro corridor, north of Finch	No	2,400 to 3,000 spaces in the hydro corridor, north of Steeles

Alternative station concepts were developed and evaluated for Finch West and Steeles West Station. Because both York University and Sheppard West Stations would have modest commuter facilities (i.e. station entrances and on-street bus stops only), alternative station concepts were not developed for comparison and evaluation purposes. Instead, layouts showing the station box location and entrances were developed once the station locations were confirmed (through the evaluation of the alternative alignments).

Finch West Station

For Finch West Station, five alternative concepts were developed. Each concept sited the passenger pick-up and drop-off and commuter parking at the same location within the hydro corridor lands, but had different bus terminal locations, as shown in Figures ES-11 to ES-15, and described below:

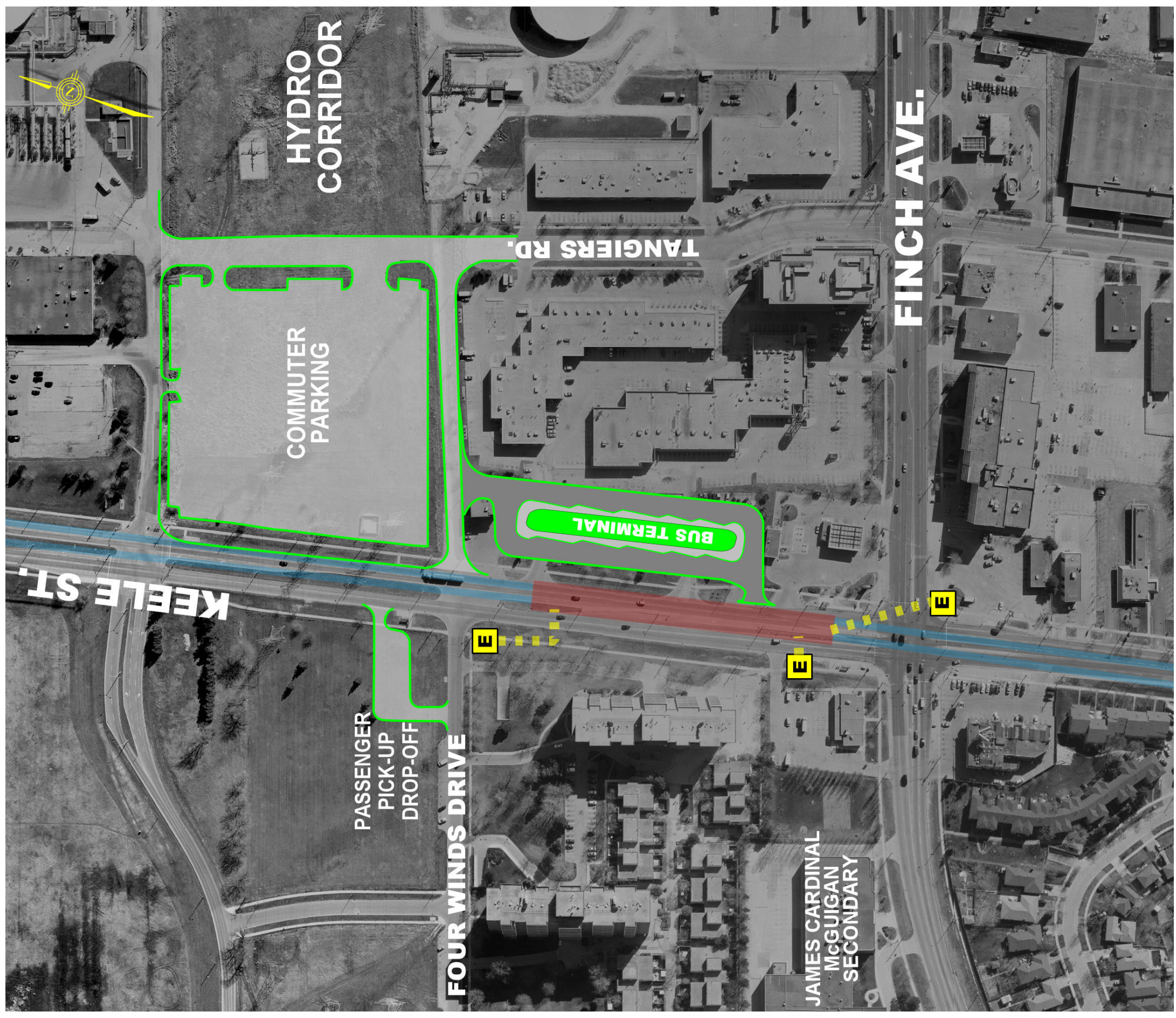
- 1) **Option 1** – The bus terminal would be located on the east side of Keele Street, immediately south of the hydro corridor;
- 2) **Option 2** – The bus terminal would be located north and east of the Keele/Finch intersection, on lands currently occupied by a commercial/industrial condominium complex;
- 3) **Option 3** – The bus terminal would be located at the south-east corner of the Keele/Finch intersection;
- 4) **Option 4** – The bus terminal would be situated at the north-east corner of the intersection; and
- 5) **Option 5** – The bus terminal would be located south and east of the Keele/Finch intersection.

In order to protect existing stable residential areas, no alternatives were developed for the west side of Keele Street. Another important consideration was a potential to link with a future Higher Order Transit Corridor running along the hydro corridor, as proposed in the new City of Toronto Official Plan.

Steeles West Station

For Steeles West Station, four alternative bus terminal concepts were developed (see Figures ES-16 to ES-19). All of the following concepts would use the lands owned by York Region, which are designated for a future inter-regional bus terminal:

- 1) **Option 1A** - This option would include three surface level bus terminals: two located north of Steeles on the lands between the proposed future Street B and Street C and one terminal on the York University lands, south of Steeles Avenue;
- 2) **Option 1B** – This option would be similar to Option 1A, but with the terminals north of Steeles located on lands on each side of the future Street C;
- 3) **Option 2** – Two surface bus terminals would be located on property purchased by York Region-owned lands and within the hydro corridor, north of Steeles Avenue; and
- 4) **Option 3** – Under this option, a two-level bus terminal would be constructed on the York Region lands, north of Steeles Avenue (similar to Wilson Station bus terminal).



Legend

- STATION PLATFORM
- SUBWAY LINE
- UNDERGROUND WALKWAY

- ENTRANCE

FIGURE ES - 11: FINCH WEST STATION OPTION 1



Legend







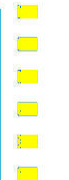
-  STATION PLATFORM
-  SUBWAY LINE
-  UNDERGROUND WALKWAY
-  ENTRANCE

FIGURE ES - 12: FINCH WEST STATION OPTION 2



Legend

-  STATION PLATFORM
-  SUBWAY LINE
-  UNDERGROUND WALKWAY

-  ENTRANCE

FIGURE ES – 13: FINCH WEST STATION OPTION 3



Legend

- STATION PLATFORM
- SUBWAY LINE
- UNDERGROUND WALKWAY
- ENTRANCE

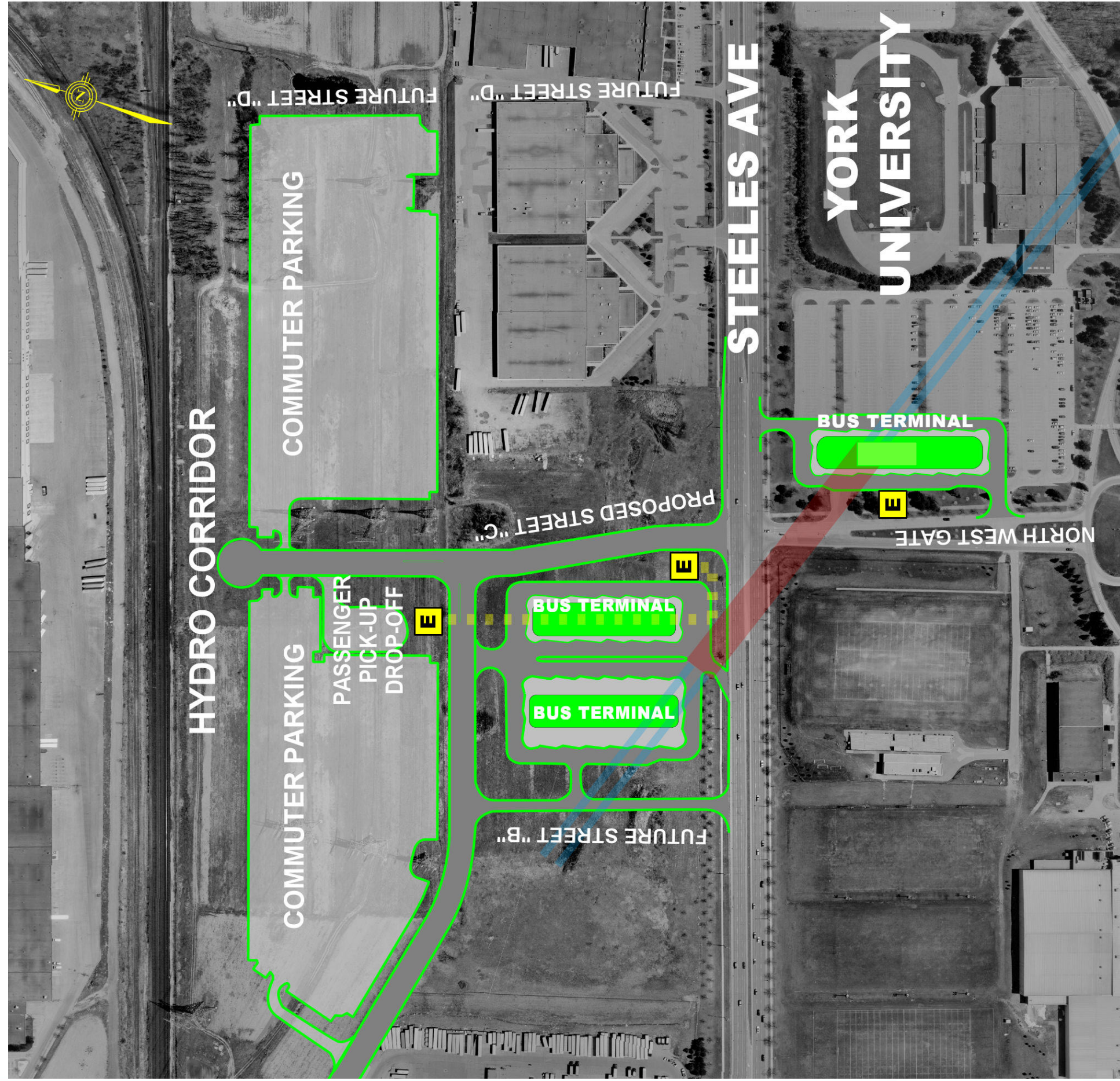
FIGURE ES - 14: FINCH WEST STATION OPTION 4



Legend

-  STATION PLATFORM
-  SUBWAY LINE
-  UNDERGROUND WALKWAY
-  ENTRANCE

FIGURE ES – 15: FINCH WEST STATION OPTION 5



Legend

- STATION PLATFORM
- SUBWAY LINE
- UNDERGROUND WALKWAY
- ENTRANCE

FIGURE ES - 16: STEELES
WEST OPTION 1A

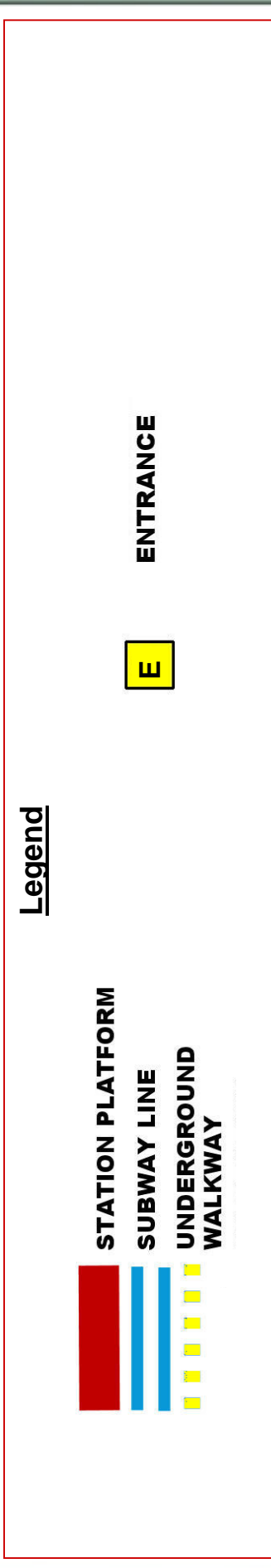
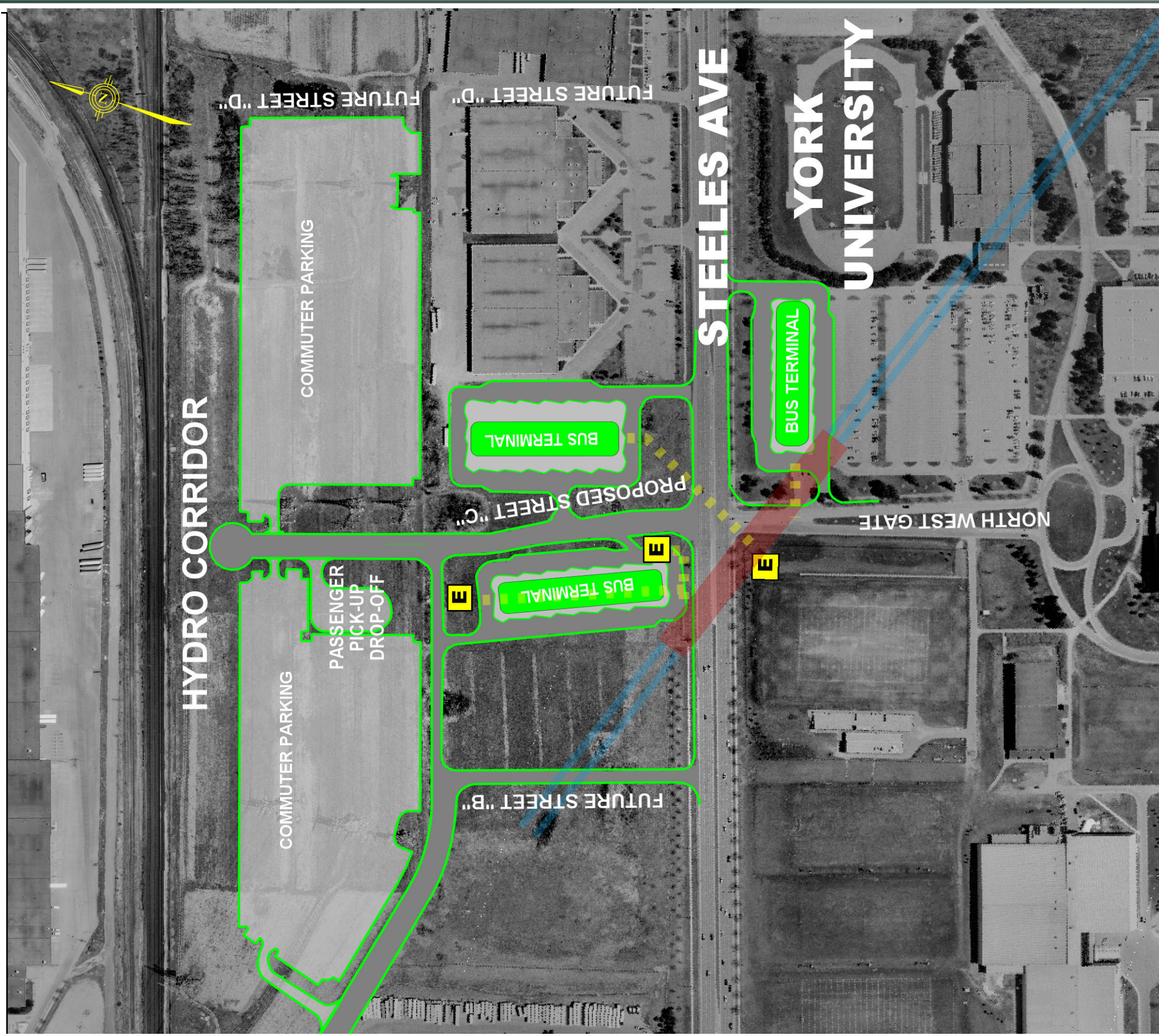
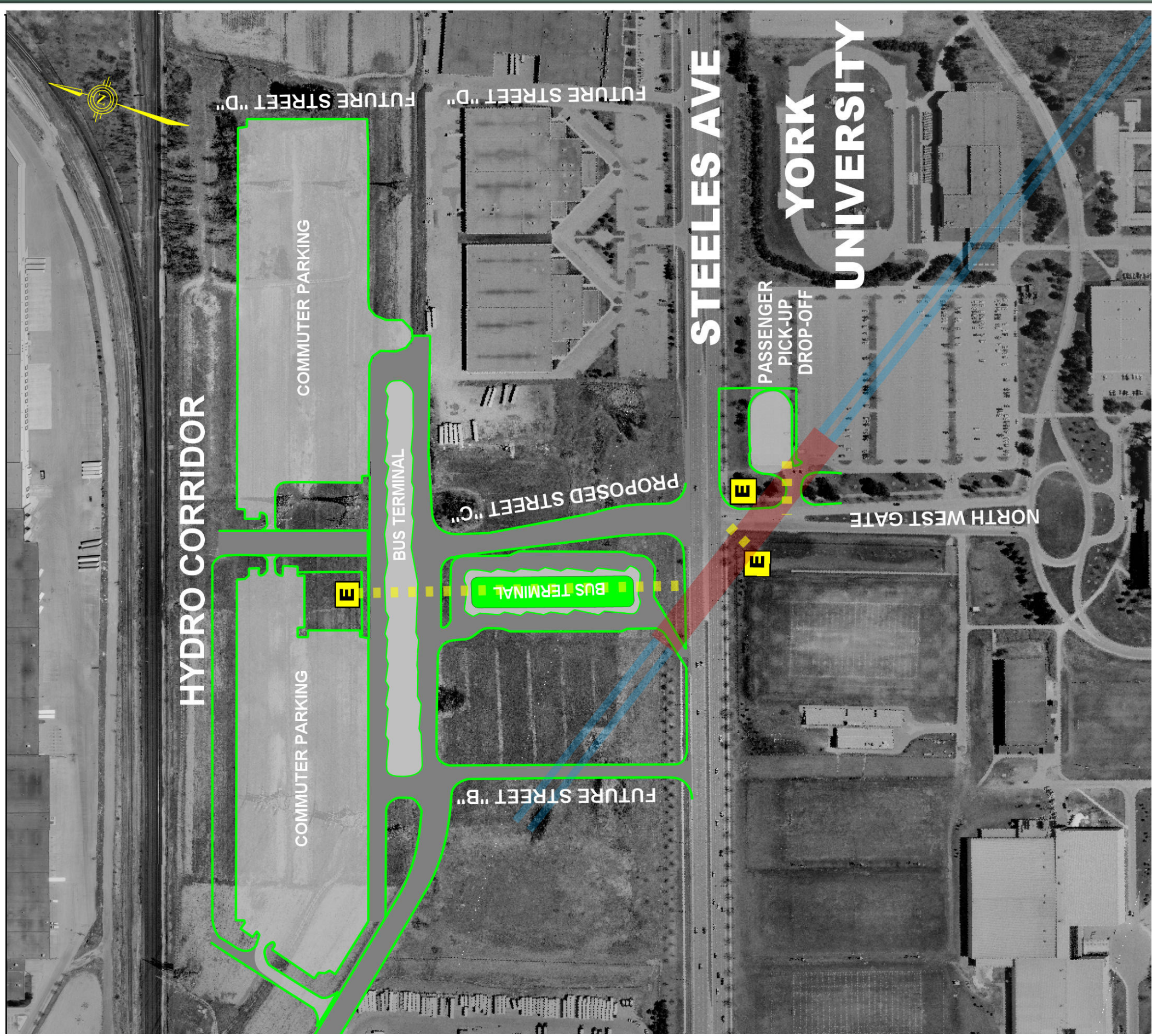


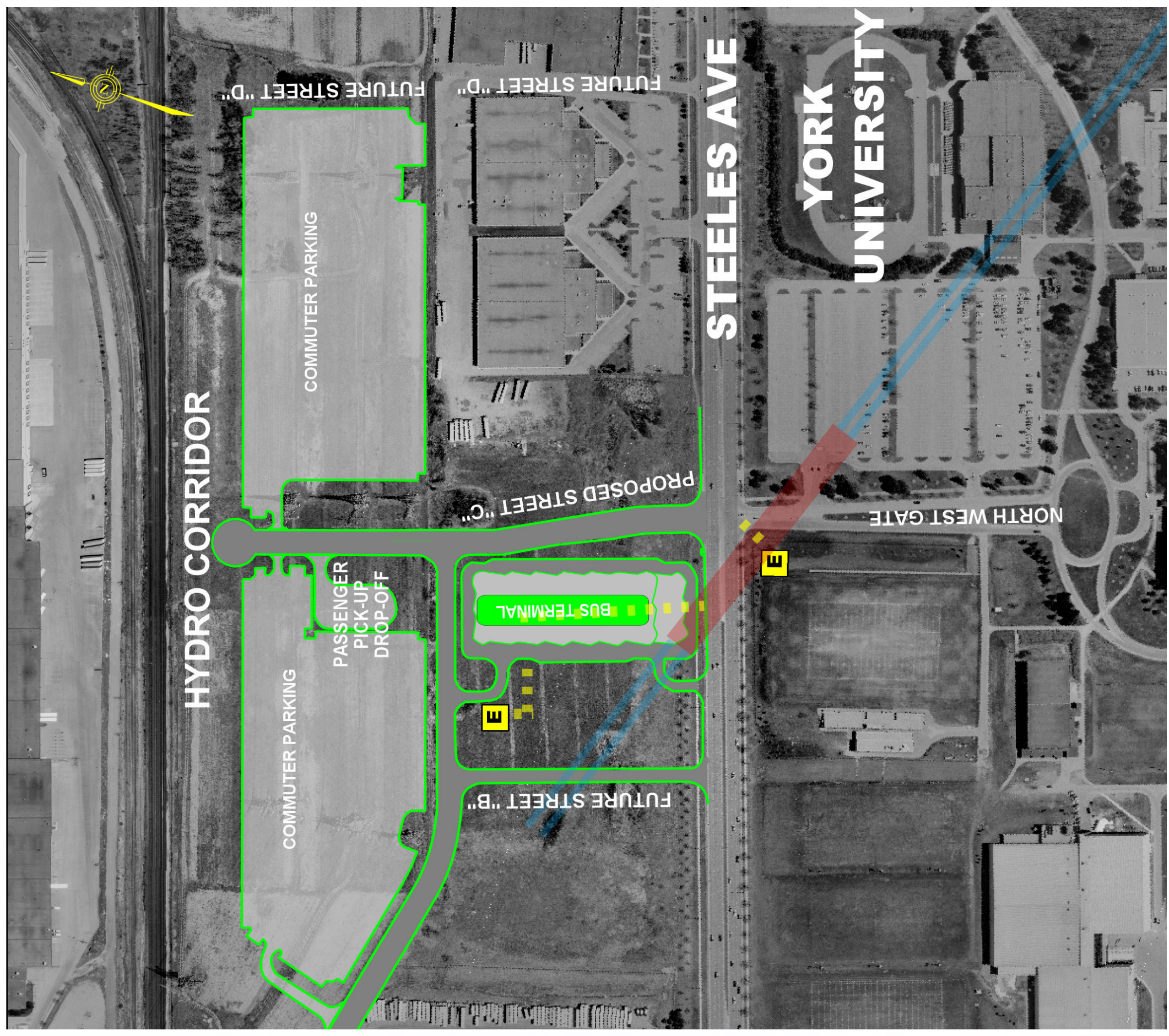
FIGURE ES - 17: STEELES
WEST OPTION 1B



Legend

- STATION PLATFORM
- SUBWAY LINE
- UNDERGROUND WALKWAY
- ENTRANCE

FIGURE ES – 18: STEELES WEST OPTION 2



Legend

- STATION PLATFORM
- SUBWAY LINE
- UNDERGROUND WALKWAY

- ENTRANCE

FIGURE ES-19: STEELES WEST OPTION 3

E.3.3 Evaluation and Selection of the Preferred Alignment

Evaluation Criteria and Indicators

The Study Team developed a comprehensive list of indicators, which were refined based on public and stakeholder agency comments received during the second round of consultations. These indicators are based on the criteria listed below:

- 1) Potential for riders to walk to local stations;
- 2) Speed and comfort for subway passengers;
- 3) Convenience for transfers from buses (including Wheel-Trans and Mobility Plus) or GO Rail to subway;
- 4) Convenience for access from other travel modes (taxi, bicycle, pedestrians (including ambulatory/non-ambulatory disabled persons), passenger pick up and drop off and commuter parking;
- 5) Flexibility for potential future subway extension into York Region;
- 6) Maximize redevelopment potential in support of the subway extension;
- 7) Maximize the potential to create a high quality urban/pedestrian environment;
- 8) Potential effects on natural heritage features;
- 9) Potential effects on geology and hydrogeology;
- 10) Potential effects on hydrology;
- 11) Potential effects on socio-economic features;
- 12) Potential effects on pedestrian and traffic access/ flow;
- 13) Potential effects on freight and rail passenger service and its signal systems at Sheppard West Station;
- 14) Potential effects on cultural heritage resources;
- 15) Potential effects on pipelines located in the Finch hydro corridor;
- 16) Minimize capital costs;
- 17) Minimize costs of property acquisition; and
- 18) Minimize net operating cost.

Similar to the selection of the technically preferred route, the Study Team used both qualitative and numerical analysis methodologies to evaluate the alternative alignments and station concepts.

Southern Alignments

For the southern section of the alignment, Alternatives S1 and S2 (see Figure ES-9), which were located south of Sheppard Avenue West, maximizing use of the under-developed, federally-owned Parc Downsview Park lands were preferred over Alternatives S3 and S4 (see Figure ES-9), which would run under existing businesses located in the Keele Industrial Area, north of Sheppard Avenue. Parc Downsview Park offers significant opportunities for long-term transit-supportive development, which would be served by the proposed Sheppard West Station. Alternative S2 was preferred over S1, because it is closer to Sheppard Avenue, offering convenient access for passengers transferring from bus routes on Sheppard Avenue West to the subway.

Further analysis of Alternative S2 (West) (Sheppard West Station west of the CN Rail right-of-way) compared to Alternative S2 (East) (Sheppard West Station located east of the CN Rail right-of-way), indicated that by locating Sheppard West Station west of the CN Rail right-of-way, higher development densities could be achieved within the catchment area (i.e. 500-metre walk distance) of the station, due to less severe height restrictions (related to continued operation of Downsview Airport runways) and better access to future development lands within Parc Downsview Park. In summary, Alternative S2 (West), was selected as the technically-preferred alternative, because it would:

- 1) Minimize impacts on existing businesses and properties in the Keele Industrial Area;
- 2) Maximize development opportunities on the Parc Downsview Park lands; and
- 3) Facilitate convenient transfers between the Sheppard West bus route and the subway.

Northern Alignments

For the northern section of Route 1, three alternative alignments were analyzed. Alternative N1 (see Figure ES-10), which was the alignment recommended for further analysis in the 2001 Rapid Transit Expansion Study, would maximize use of the Ian MacDonald Boulevard and Steeles Avenue road rights-of-way. By doing so, this alternative would include two additional curves, compared to Alternatives N2 and N3 (see Figure ES-10). In addition, Alternative N1 would require that the future extension of the Spadina Subway, from Steeles Avenue West to Vaughan Corporate Centre (at Jane Street and Highway 7), pass under Black Creek.

Alternatives N2 and N3 are more direct, resulting in lower subway operating and maintenance costs. Although a future extension of N2 or N3 to the Vaughan Corporate Centre would potentially affect Black Creek, the potential environmental impacts are less than Alternative N1. From a transit service perspective, N3 is more centrally located in the Common and will provide for possible direct connections to York Lanes, the Schulich School of Business and the new Accolade East. In summary, Alternative N3 was selected as the technically preferred alternative, because it would:

- 1) Provide the most direct alignment, resulting in lower subway and operating costs;
- 2) Provide a centrally located station that serves the existing transit hub – the Common; and
- 3) Minimize environmental impacts for future extensions north of Steeles, to the Vaughan Corporate Centre.

Alignment Refinement

Following the detailed analysis of the northern and southern alignment sections, the technically preferred alignment (combination of S2 (West) and N3) was shifted approximately 100 metres south of Sheppard Avenue within the Parc Downsview Park lands (see Figure ES-20) to:

- 1) Provide better access to the Station within the prime Parc Downsview Park development lands;
- 2) Permit flexibility for development of buildings or a linear park on the Sheppard frontage, even if the subway extension (or Sheppard West Station only) is not implemented for many years into the future; and
- 3) Reduce property impacts for the alignment section between Downsview Station and Sheppard West Station.

During the third round of consultations, the technically preferred alignment (including the refinement described above) was strongly endorsed by the public and the majority of key stakeholder agencies.

However, in order to reduce both the capital cost and property impacts, further refinements to the alignment were conducted following the third round of consultations, as shown in Figure ES-21. Although originally planned for special track work, the alignment north from Downsview Station will be tunnelled to avoid surface impacts to businesses directly above the subway.

Emergency Exit Buildings

Emergency Exit Buildings are used for the evacuation of subway train passengers in the event of an emergency and may be equipped with emergency backup power and ventilation equipment. In accordance with TTC's design criteria, six Emergency Exit Building sites were identified for the recommended alignment, as shown in Figure ES-22. These locations will be subject to further review during detailed design.

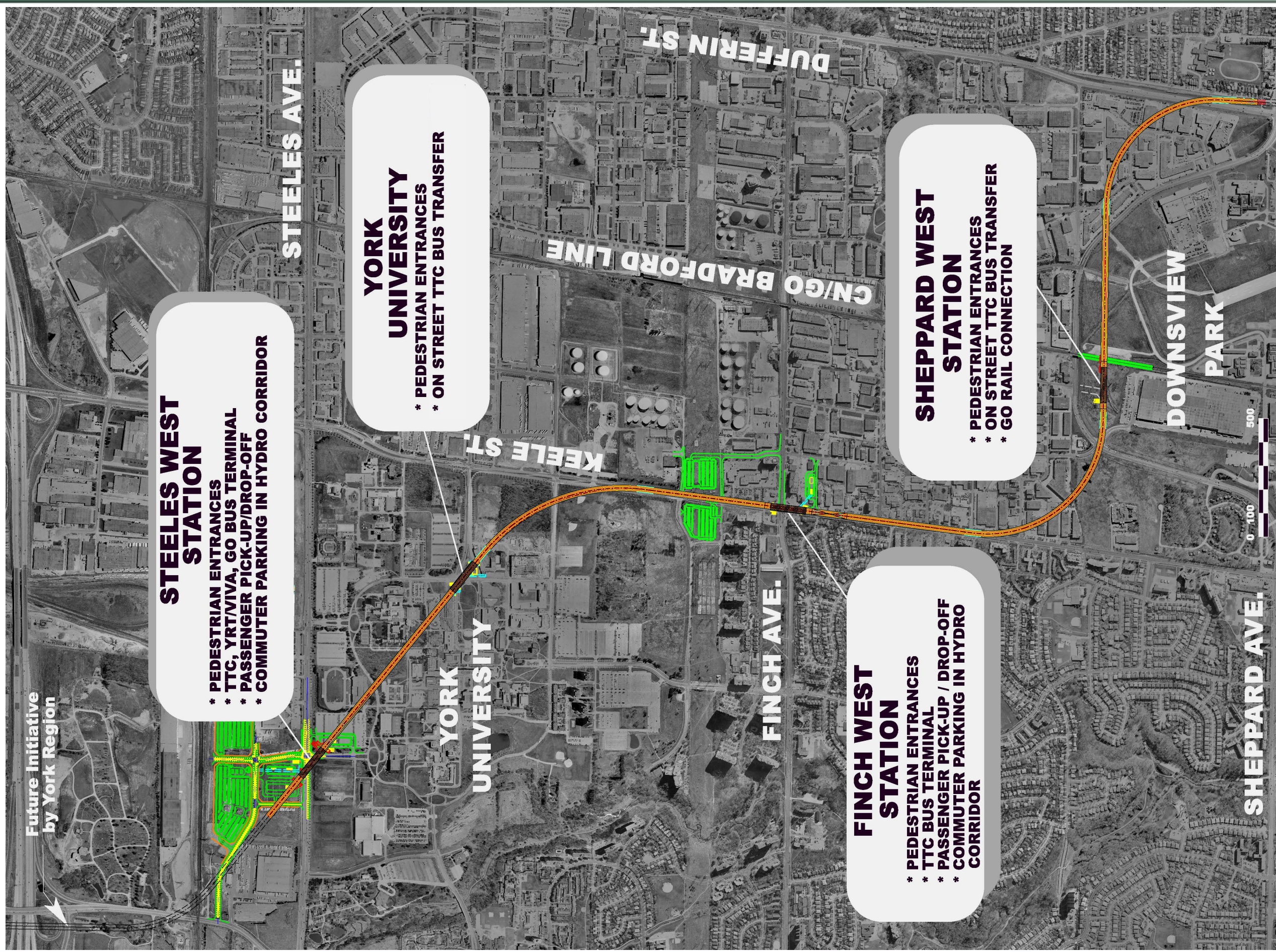


FIGURE ES – 20: PREFERRED SPADINA SUBWAY EXTENSION ALIGNMENT PRESENTED DURING THIRD ROUND OF CONSULTATIONS

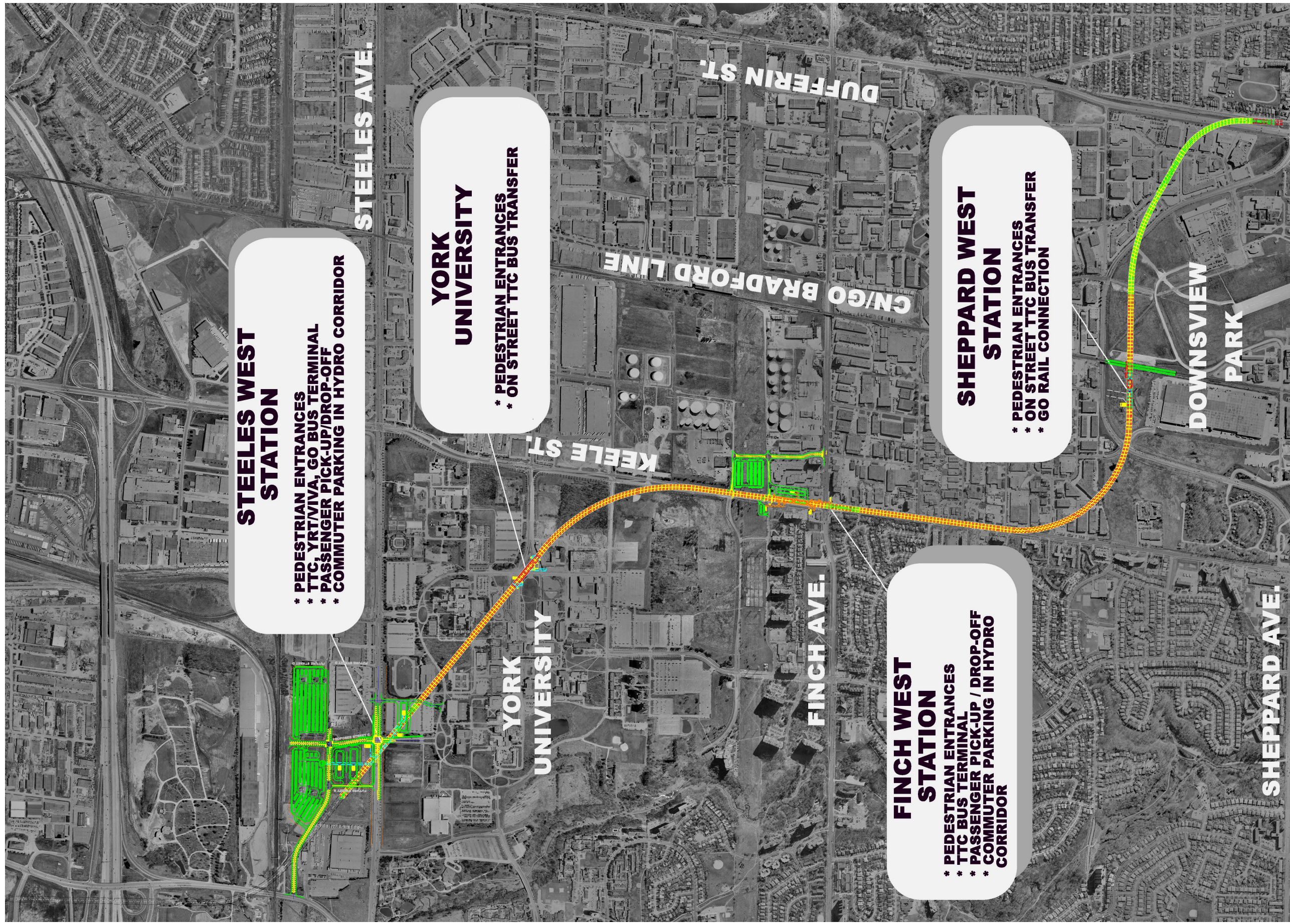


FIGURE ES – 21: RECOMMENDED SPADINA SUBWAY EXTENSION ALIGNMENT

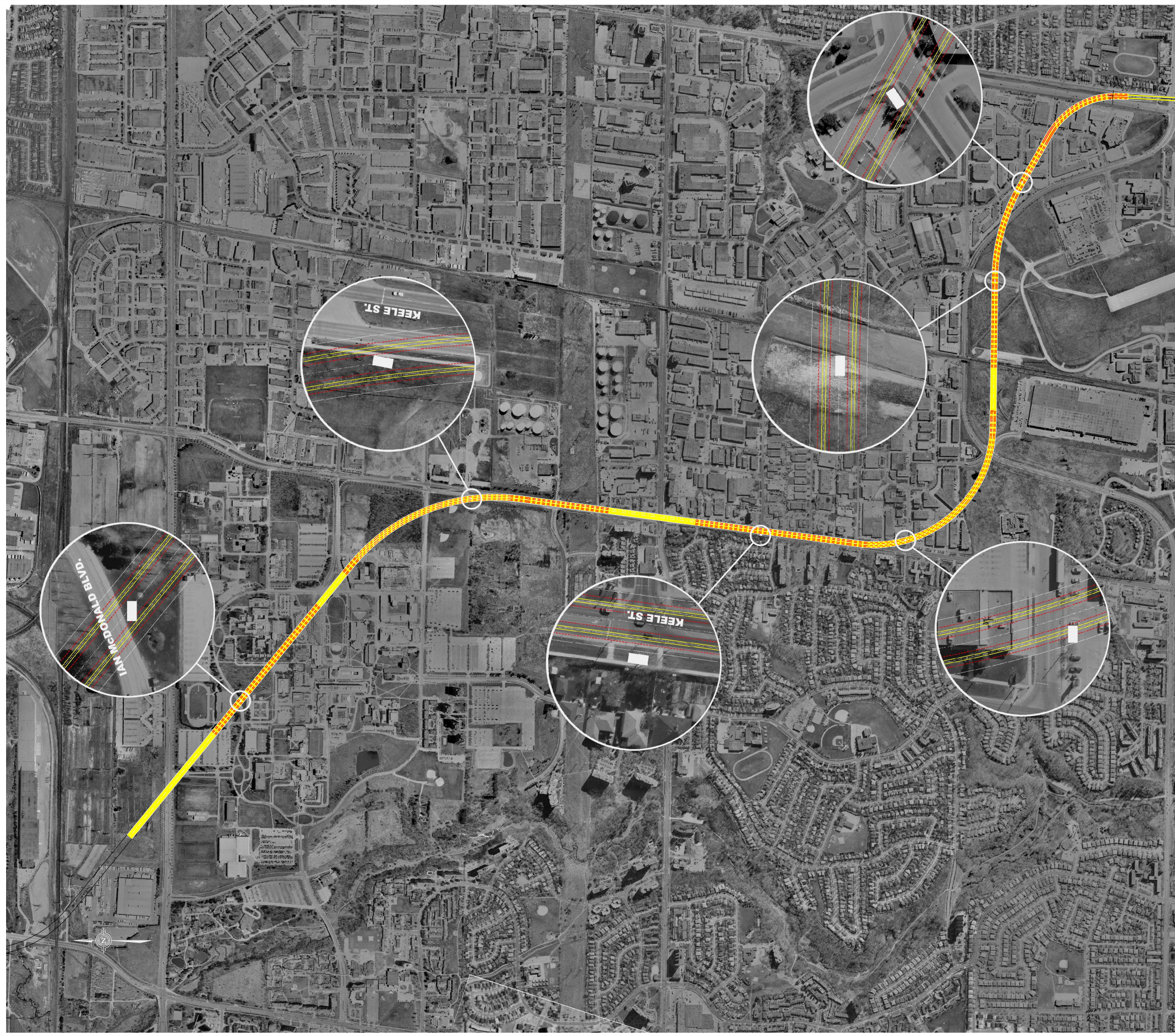


FIGURE ES - 22: RECOMMENDED
EMERGENCY EXIT BUILDING LOCATIONS

E.3.4 Evaluation and Selection of Preferred Station Layouts

Sheppard West Station

As shown in Figure ES-23, Sheppard West Station will be situated west of the GO Rail Bradford Line within the Parc Downsview Park lands and will include entrances at each end of the station platform and a possible underpass connecting to east of the GO Rail Bradford Line. Further work will be conducted during the design of the Spadina Subway Extension to optimize long-term pedestrian and bus passenger access to the station and integration of the station with Parc Downsview Park. The final location and configuration for the GO Rail station will be subject to a separate study by GO Transit.

Finch West Station

Consistent with the overall project objectives, the key requirements for the bus terminal at Finch West Station are as follows:

- 1) Provide fast, convenient and reliable access for buses operating on Keele Street and Finch Avenue West;
- 2) Minimize walk times between the bus terminal and the subway platform for transferring passengers;
- 3) Preserve the Keele and Finch street frontages for transit-supportive redevelopment;
- 4) Minimize impacts on existing businesses and residents, and
- 5) Achieve reasonable costs.

Options 3 and 4 (Figures ES-13 and ES-14), would situate the bus terminal on the southeast and northeast corners of the Keele/Finch intersection, respectively. Consequently, bus access/egress for these station locations would be from driveways in close proximity to the congested Keele Street / Finch Avenue intersection. Daily bus operations for these two station concepts would be slow and unreliable because buses would have difficulties negotiating left turns to and from the bus terminal. These options would also use prime development lands at the Keele/Finch intersection.

Options 1, 2 and 5 (Figures ES-11, ES-12 and ES-15) would offer comparable bus access times, operational reliability (through the introduction of new transit-priority traffic signals, where warranted) and bus to subway platform transfer times. Option 1 would situate the bus terminal on prime transit-supportive redevelopment lands, on the Keele Street frontage, north of Finch Avenue West. Option 2, which is situated on lands currently occupied by an industrial/commercial condominium complex, would result in displacement of a significant number of existing businesses and would incur substantial property acquisition and business loss costs. Option 5, which is located off of the Keele Street frontage, south of Finch Avenue and which affects a limited number of properties (compared to Option 2), was carried forward as the technically-preferred option for public and stakeholder agency review and comment during the third round of consultations.

During the third round of consultation, the public generally supported the selection of Option 5 but expressed concern over the distance between the main entrance and the commuter facilities in the Finch

hydro corridor. Significant concern to Option 5 was expressed by the key stakeholder agencies, who favoured a more compact station concept that would reduce the transfer time between the bus terminal and subway platform and provide a more convenient entrance location to the passenger pick-up and drop-off and commuter parking facilities.

To address these concerns, representatives of TTC, City of Toronto Planning and City of Toronto Works (Traffic section) worked collaboratively to develop a modified Option 1. The recommended Finch West Station concept, as shown in Figure ES-24, will have the following advantages:

- 1) Reduced business loss impacts (impacts to the industrial/commercial condominium complex are limited to a minor loss of parking and the elimination of all direct vehicular access on to Keele Street);
- 2) Acceptable transit and traffic operations; and
- 3) The desired compact station form, while still providing connections to the north and south sides of Finch Avenue West.

Opportunities for integration of station entrances and the bus terminal with potential redevelopment of the Keele/Finch intersection will be explored further during the design of the station.

Recognizing that this recommendation will directly affect different property owners (versus the technically-preferred Option 5), which was presented at the third round of public consultation, TTC notified all directly affected parties in order to provide an opportunity for these property owners to respond prior to filing the EA with the Ministry of the Environment. One of the new properties affected by the recommended Finch West Station concept is the Toronto Fire Services Station #141 (3965 Keele Street). Discussions have been initiated with Toronto Fire Services for the proposed relocation of this facility.

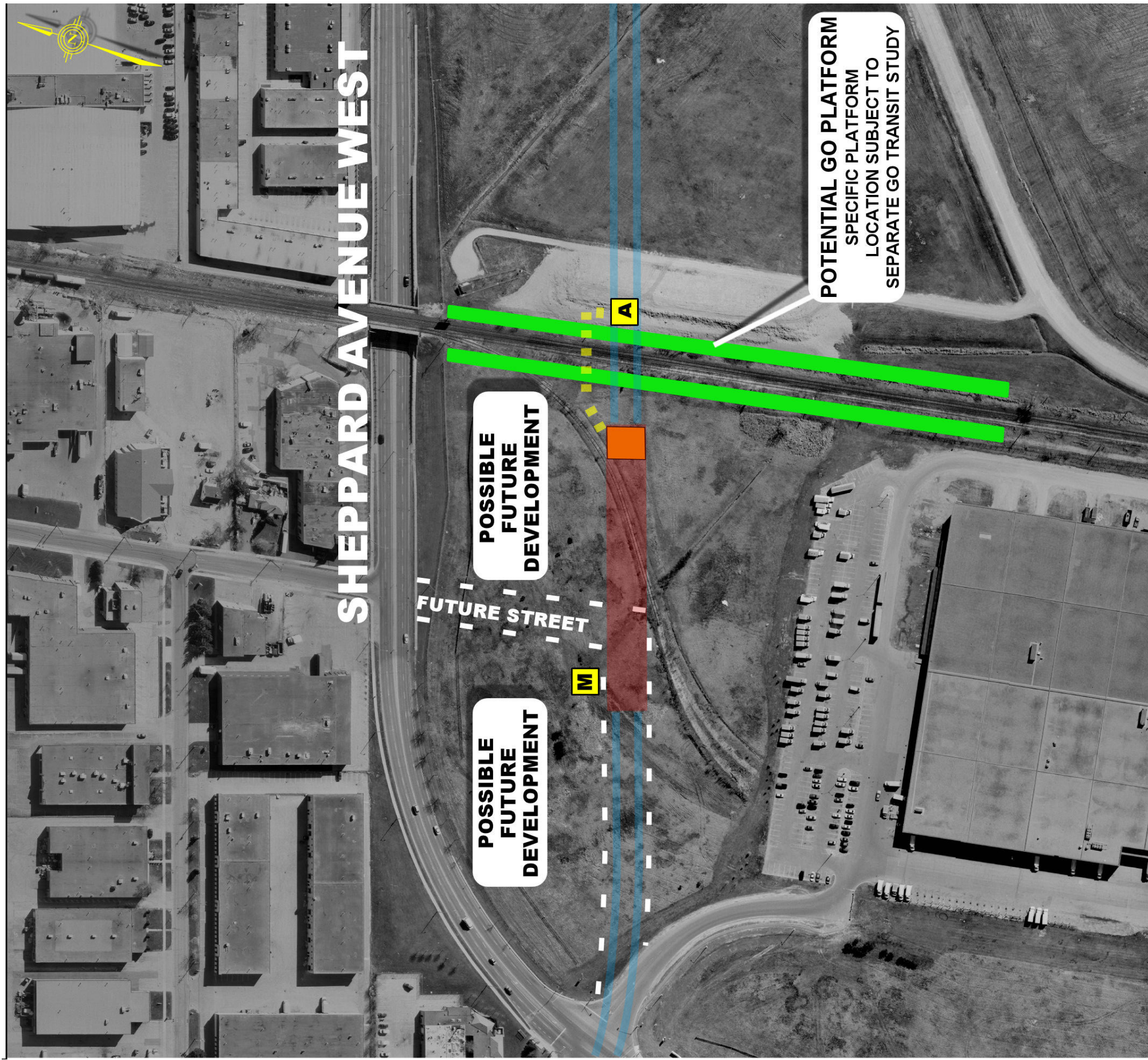






FIGURE ES – 23:
RECOMMENDED SHEPPARD
WEST STATION CONCEPT



Legend

-  STATION PLATFORM
-  SUBWAY LINE
-  UNDERGROUND WALKWAY
-  SUBSTATION

-  MAIN ENTRANCE
-  SECONDARY ENTRANCE
-  AUTOMATIC ENTRANCE

FIGURE ES - 24: RECOMMENDED FINCH WEST STATION CONCEPT

York University Station

As shown in Figure ES-25, the proposed York University Station platform will be situated at the east end of the Common area, between the York Lanes and Schulich School of Business. Entrances are proposed at each end of the station. Opportunities to integrate entrances into adjacent York University buildings will be considered during future design phases.

The concept received broad, general support from the public and stakeholder agencies during the third round of consultations.

Steeles West Station

For Steeles West Station, the challenge is to provide adequate facilities to meet rapidly increasing demand for bus services from York Region and beyond to York University and the proposed subway extension, while minimizing the impact on developable land.

In 2001, York Region acquired property on the north side of Steeles Avenue for an 18-bay bus terminal. Since that time, due to the growth in GO Transit, York Region Transit and Viva services, the required number of bus bays for the Steeles West bus terminal has more than doubled and can no longer be entirely accommodated on the intended site.

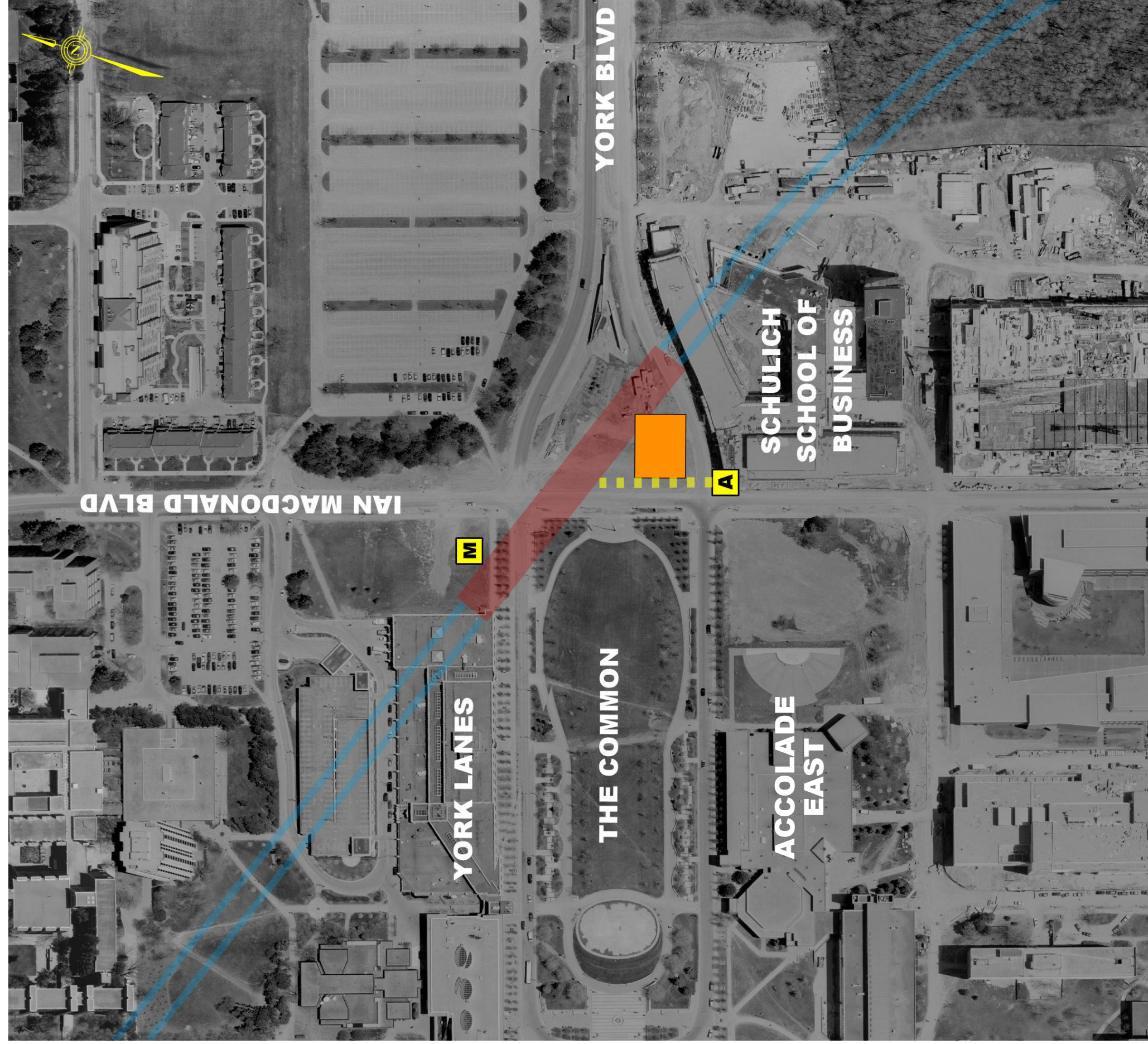
Option 2 (Figure ES-18), which would accommodate the additional bus bays in the hydro corridor, would result in long walk times (up to 5 minutes) from the bus terminal to the subway platform. Furthermore, restrictions due to the high voltage hydro lines, would limit the opportunities to provide a high-quality, weather-protected waiting area for bus passengers in the hydro corridor.

Option 3 (Figure ES-19), which would involve constructing a multi-level bus terminal (similar to the existing facilities at Wilson Station) on the York Region-owned lands, would require significant capital and ongoing maintenance costs. As well, there would be limited ability to expand or reduce the size of the bus terminal structure in the event of changes in future bus bay requirements. Furthermore, the ramping requirements for the multi-level facility would require additional lands beyond the property purchased by York Region.



Options 1A and 1B (Figures ES-16 and ES-17) provide surface level facilities, north and south of Steeles Avenue, and are more easily adaptable to changes in bus demands. Option 1A is preferred because the location of the bus terminals north of Steeles Avenue will result in shorter bus terminal to subway platform transfer times than under Option 1B. As well, the terminals are adjacent to each other and will allow for combining into one single platform if deemed desirable during the detailed design phase of the Project.

As a result of discussions held with York Region, the City of Vaughan, York University and the affected bus operators during the third round of consultations, the orientation of the bus terminals was adjusted to preserve the affected north and south frontages of Steeles Avenue West for future transit-supportive development (see Figure ES-26). Opportunities for integration of station entrances and the bus terminals with new development will be explored further during the design of Steeles West Station. A key objective will be to facilitate co-ordinated or joint development of the lands in the vicinity of the Station. The final

assignment of terminal locations will be subject to future fare integration initiatives and service planning needs of the service providers at this station.

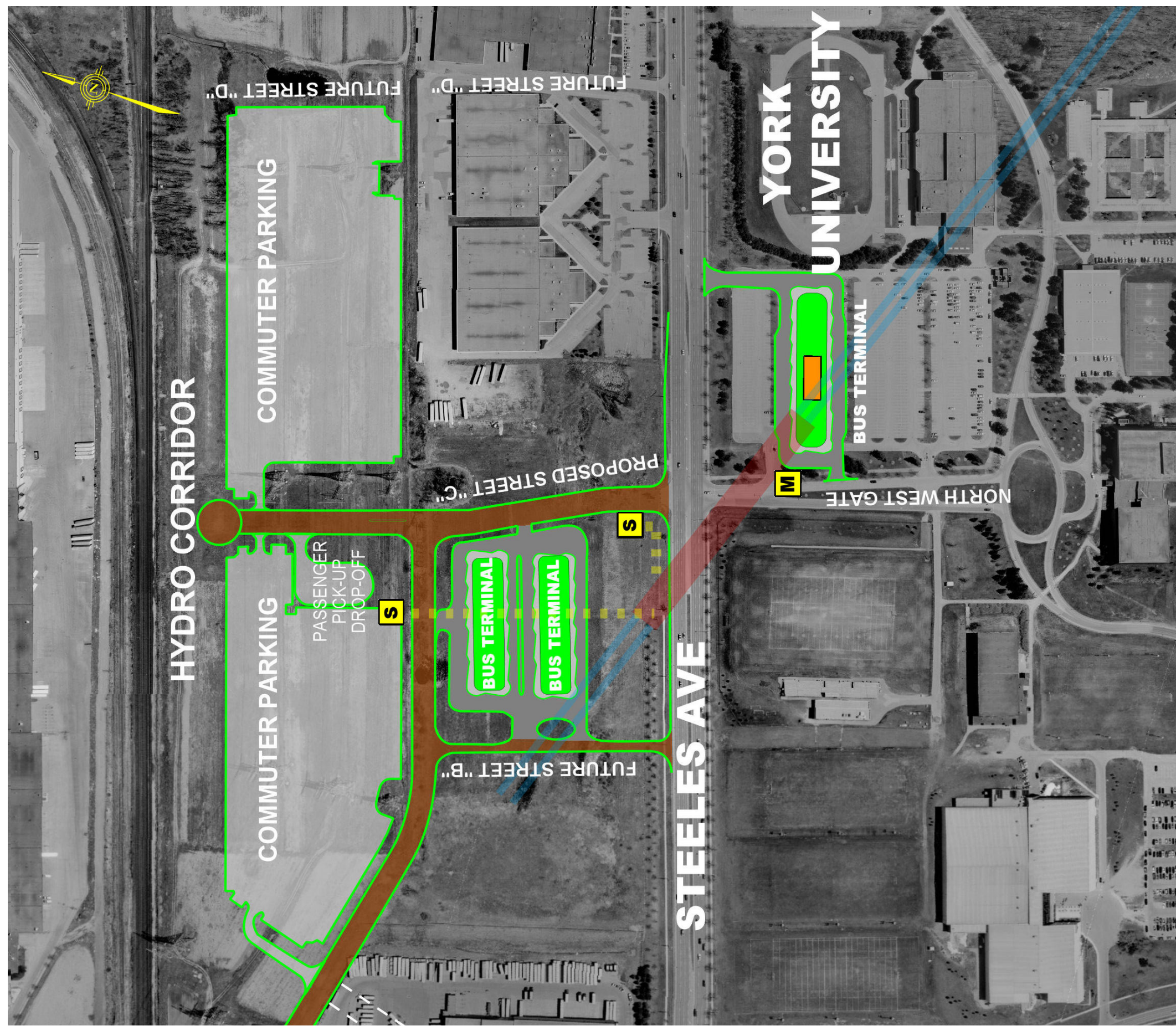


Legend

-  STATION PLATFORM
-  SUBWAY LINE
-  UNDERGROUND WALKWAY
-  SUBSTATION

-  MAIN ENTRANCE
-  AUTOMATIC ENTRANCE

FIGURE ES - 25: RECOMMENDED YORK UNIVERSITY STATION CONCEPT



Legend

- STATION PLATFORM
- SUBWAY LINE
- UNDERGROUND WALKWAY
- SUBSTATION
- YORK REGION PROPOSED ROADS

- M MAIN ENTRANCE
- S SECONDARY ENTRANCE

FIGURE ES - 26: RECOMMENDED STEELES WEST STATION CONCEPT

E.4 Phase Three: Detailed Assessment of the Effects of the Undertaking

The final phase of the study included:

- 1) Public and stakeholder consultation,
- 2) Confirmation of the recommended subway alignment and station layouts (see sections E.3.3 and E.3.4);
- 3) Determination of environmental effects;
- 4) Development of mitigation measures for any negative effects; and
- 5) Commitments to future work to address any issues that are beyond the EA scope.

E.4.1 Alternative Construction Methods

The Study Team identified an opportunity to reduce project costs by constructing a portion of the alignment on the undeveloped Parc Downsview Park lands using open cut method (to be covered as development occurs at a later date). However, initial comments from Parc Downsview Park, TTC Operations and the general public have not supported this approach and, therefore, it is not recommended.

For the purposes of the Environmental Assessment Study, standard construction methods were assumed, as described in section 7.0. Detailed investigations of construction methods will be conducted during detailed design in order to minimize temporary and permanent impacts on buildings, properties, pedestrians, transit passengers and automobile and truck traffic, while achieving reasonable costs and project implementation schedule impacts.

E.4.2 Project Duration

The anticipated duration of a project of this scope would be approximately 6.5 years, including the following overlapping activities:

- 1) Design (2 to 3 years);
- 2) Construction (3 to 4 years); and
- 3) Testing and commissioning (1 year).

The actual duration of the project would depend on project financing, property acquisition, and the construction methodology, contracting methods and procedures as well as other factors.

E.4.3 Project Costs

The order-of-magnitude cost estimate for the 6.2 kilometre subway extension, including design and construction costs, property, yard improvements and vehicles, is \$1.4 billion in 2005 \$.

E.4.4 Environmental Effects and Mitigation Measures

The environmental effects for the Spadina Subway Extension are classified as follows:

- 1) **Displacement of Existing Features by the Subway Facilities** – These include existing features within the Study Area, which would be directly affected by the introduction of the subway tunnels, stations, commuter facilities and ancillary facilities.
- 2) **Construction Impacts** - These are short-term potential impacts due to construction activities for the Spadina Subway Extension.
- 3) **Operations and Maintenance Impacts** – These are ongoing, long-term impacts related to the operation and maintenance of the Spadina Subway Extension.

These impacts and proposed measures to mitigate any negative effects are summarized.

Displacement of Existing Features by the Subway Facilities

The most critical impact of the Project is the displacement of existing businesses and buildings which conflict with the proposed Finch West bus terminal. The City of Toronto (on behalf of TTC) would acquire these properties and provide compensation through either a negotiated settlement or, in the event that expropriation is required, in accordance with the Ontario Expropriation Act.

The following three properties would be directly impacted by the proposed Finch West Station bus terminal:

- 1) 3941 Keele Street,
- 2) 3955 Keele Street, and
- 3) 3965 Keele Street (Toronto Fire Services Station #141).

TTC and the City of Toronto are committed to the following process/principles for these impacted properties:

- 1) Early notification to property owners;
- 2) Ongoing meetings and discussions with property owners concerning property impacts to minimize property takings and identify mitigative measures;
- 3) Further investigations of alternative construction methods for the three-track structure, with the objective of minimizing direct impacts on these properties, while achieving reasonable Project costs; and
- 4) Uniform and equitable treatment, in accordance with the Ontario Expropriation Act.

During the EA process, partial takings have been identified for a further 28 properties. These include underground easements for the subway tunnels and partial surface takings for station entrances, commuter facilities (such as bus terminals and passenger pick-up and drop-off facilities) and ancillary facilities (such as Emergency Exit Buildings). TTC and the City of Toronto will conduct a Property Protection Study during

the design of the Spadina Subway Extension, which will determine detailed property requirements, including temporary construction easements. The acquisition of these properties will follow the same principles described above in this section.

Significant property requirements are needed on both the York University and Parc Downsview Park lands. York University previously offered most of the land required for the Yonge-Spadina Subway Loop alignment at no cost to the Project. However, the subway alignment through the York University lands at that time was significantly different than the North #3 route now recommended. Accordingly, TTC staff have met with York University on a co-operative basis to further refine and develop a set of property acquisition principles for this Project. Parc Downsview Park (under Federal jurisdiction) has indicated their support for the recommended subway alignment and Sheppard West Station on their lands. As well, Toronto City Council requested, at its meeting of September 30, 2005, that... "An approach be made to the Federal Government to seek their participation in the capital funding of the two subway stations that directly benefit the PDP and other federal properties in the vicinity". TTC staff will be meeting with Parc Downsview Park on a co-operative basis to further refine and develop a set of property acquisition principles for the Spadina Subway Extension.

Construction Impacts

For sections of the subway alignment that are tunnelled, the impacts will be very limited. Construction, mitigation measures will be implemented to prevent or minimise or eliminate building settlement/structural stress due to tunnelling.

For stations, commuter facilities and sections of the alignment to be constructed by cut-and-cover construction, mitigation measures will be implemented to prevent or minimise or eliminate the following:

- 1) Erosion and sedimentation due to excavation activities;
- 2) Effects of dewatering on aquifers and recharge/ discharge areas; and
- 3) Building settlement/structural stress due to piling and dewatering;

Mitigation measures will also be implemented to minimize the following:

- 1) Disruption of existing vehicle circulation patterns due to road and lane closures and temporary traffic detours and diversions;
- 2) Impact on pedestrian circulation and safety due to road diversions and detours;
- 3) Noise and vibration generated by construction equipment;
- 4) Increase in air emissions, including dust due to excavation activities and operation of construction equipment;
- 5) Impacts to local business operations due to:
 - a. Modified vehicle and pedestrian circulation patterns;
 - b. Reduced visibility of store fronts and signs; reduction in on-street parking;
 - c. Less convenient access to off-street parking;
 - d. Customer inconvenience due to temporary construction debris, noise and dust; and

- 6) Migration of mud and litter off site.

Mitigation methods will include engineering studies and ongoing management and monitoring of construction activities.

Operations and Maintenance Impacts

Negative environmental impacts due to the operation of the Spadina Subway Extension and related commuter facilities would include:

- 1) Potential traction power stray current impacts on buried utilities using metal piping;
- 2) Noise generated by subway, bus and private vehicle operations;
- 3) Vibration generated by subway and bus operations;
- 4) Potential electromagnetic interference created from the negative rail of the subway DC traction power system; and
- 5) Although the operation of the subway will result in overall reductions in air emissions, localized increases will occur due to increased bus traffic at Finch West and Steeles West Stations.

Subway noise and vibration will be mitigated through the use of the double-tie track system, which has proven to be effective where implemented in the existing subway system. Stray current impacts will be mitigated through use of isolated and insulated power rails.

E.5 Commitments to Future Work

During this EA, TTC and the City of Toronto have worked closely with key stakeholder agencies to address and resolve any issues or concerns. In addition, the TTC's and City of Toronto's commitments to future work include the following:

E.5.1 Permits and Approvals

TTC will secure necessary permits and approvals for the implementation of the Spadina Subway Extension Project, including, but not limited to:

- 1) Planning approvals (including Site Plan Approval) for above-grade structures and facilities (through City of Vaughan and City of Toronto). This will include updates to the supporting traffic impact studies for Finch West Station and Steeles West Station;
- 2) Building permits for the stations, Emergency Exit Buildings or other ancillary features (through City of Vaughan and City of Toronto);
- 3) Permit to Take Water from the Ministry of the Environment if dewatering exceeds 50,000 litres per day;
- 4) Stormwater management, in accordance with City of Toronto (south of Steeles Avenue), City of Vaughan (north of Steeles Avenue), TRCA and MOE requirements;
- 5) Sewer discharge approvals, in accordance with City of Toronto, City of Vaughan and York Region requirements;
- 6) Railway Crossing Agreement (CN Newmarket Sub-Division);
- 7) Pipeline Crossing Agreements (Pipelines within Finch hydro corridor); and
- 8) Hydro One Agreements to allow for the use of the Steeles and Finch Hydro Corridors for transit-related purposes.

E.5.2 Property Acquisition

The City of Toronto and TTC will:

- 1) Proceed with a Property Protection Study during the early stages of the design of the Spadina Subway Extension;
- 2) Continue property negotiations with York University for property required for the Project;
- 3) Initiate discussions with Parc Downsview Park, in accordance with direction received by Toronto City Council at its September 30, 2005 meeting;
- 4) Continue discussions with Toronto Fire Services for proposed relocation of Station #141;
- 5) For all other properties required within the City of Toronto (including temporary easements to facilitate construction), the City of Toronto will acquire property by negotiation or expropriation as required;

- 6) For properties required for the Undertaking within the City of Vaughan (i.e. north of Steeles Avenue), the City of Toronto will co-ordinate property acquisition activities with the City of Vaughan and York Region.

E.5.3 Steeles West Station Development

The bus terminal facilities shown represent the anticipated spatial requirements for intermodal transfers at Steeles West Station. This inter-regional node presents an excellent opportunity to maximize the benefits of government policies promoting compatible transit infrastructure and land use. It is understood that the extent of land, north of Steeles Avenue designated for an integrated and/or adjacent transit-supportive development with Steeles West Station, will be identified by the City of Vaughan and York Region.

The City of Toronto, City of Vaughan, York Region, TTC, GO Transit and York University will work closely during the York University Secondary Plan Update, the City of Vaughan Official Plan Amendment 620, and the Steeles West Station Site plan approval process to optimize the interface and integration of the Steeles West Station bus terminals with transit supportive development.

For Steeles West Station, TTC and the City of Toronto will conduct further discussions with GO Transit, Brampton Transit, York Region and the City of Vaughan to determine the roles and responsibilities of each agency for the design, construction, operation and maintenance of the terminal facilities (including bus terminals, commuter parking, station entrances and passenger pick-up and drop-off).

E.5.4 Construction Issues

TTC will conduct further research and analysis for the construction of the Spadina Subway Extension, including, but not limited to the following activities:

- 1) Include noise, vibration and air quality monitoring and mitigation measures and construction site maintenance/upkeep requirements in construction contract documents;
- 2) Develop traffic, transit and pedestrian management strategies to be included in construction contract documents;
- 3) Prepare and implement tree and streetscape protection and restoration plans;
- 4) Undertake Designated Substances Surveys for any buildings or structures which require demolition and to reflect the findings in construction contract documents;
- 5) Develop procedures for disposal of excavated materials, including contaminated soils, in accordance with Ministry of the Environment requirements;
- 6) Prepare and implement a groundwater management strategy;
- 7) Prepare an erosion and sediment control plan, which complies with prevailing TRCA and City of Toronto water guidelines and requirements;
- 8) Prepare an Environmental Management Plan including monitoring, triggers and contingencies in the event that further groundwater investigations indicate a potential adverse effect on the York University woodlots or other sensitive environmental features;

- 9) Arrange for a Stage 2 archaeological assessment to be conducted at areas where ground disturbance will occur during construction, and which have archaeological potential;
- 10) Undertake buildings, structures, and railway protection and monitoring, and condition surveys; and
- 11) Undertake stray current protection and monitoring for pipelines and other utilities.

E.5.5 Canadian Environmental Assessment Act “Triggers” Monitoring

TTC will continue to monitor the Project for potential CEAA “triggers”, and, in the event that the CEA Act applies to the Project, TTC will prepare an Environmental Screening Report.

E.6 Amending Procedure

The Study Team has prepared an EA amending procedure, which identifies scenarios that would trigger the preparation of an EA Amendment Report and identifies procedures for:

- 1) Notification to affected members of the public and stakeholder agencies (including the Ministry of the Environment),
- 2) Consultation with the public and stakeholder agencies,
- 3) Documentation of the amendment, the rationale, anticipated environmental effects and mitigation measures, and
- 4) Submittal to and review and approval by the Ministry of the Environment.