C7
Communication
CW (1) – April 7, 2021
Items # - 12

METROLINX

YONGE NORTH SUBWAY EXTENSION

Initial Business Case - Project Update

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April 7, 2021

BETTER TRANSIT CONNECTIONS FOR YORK REGION & TORONTO

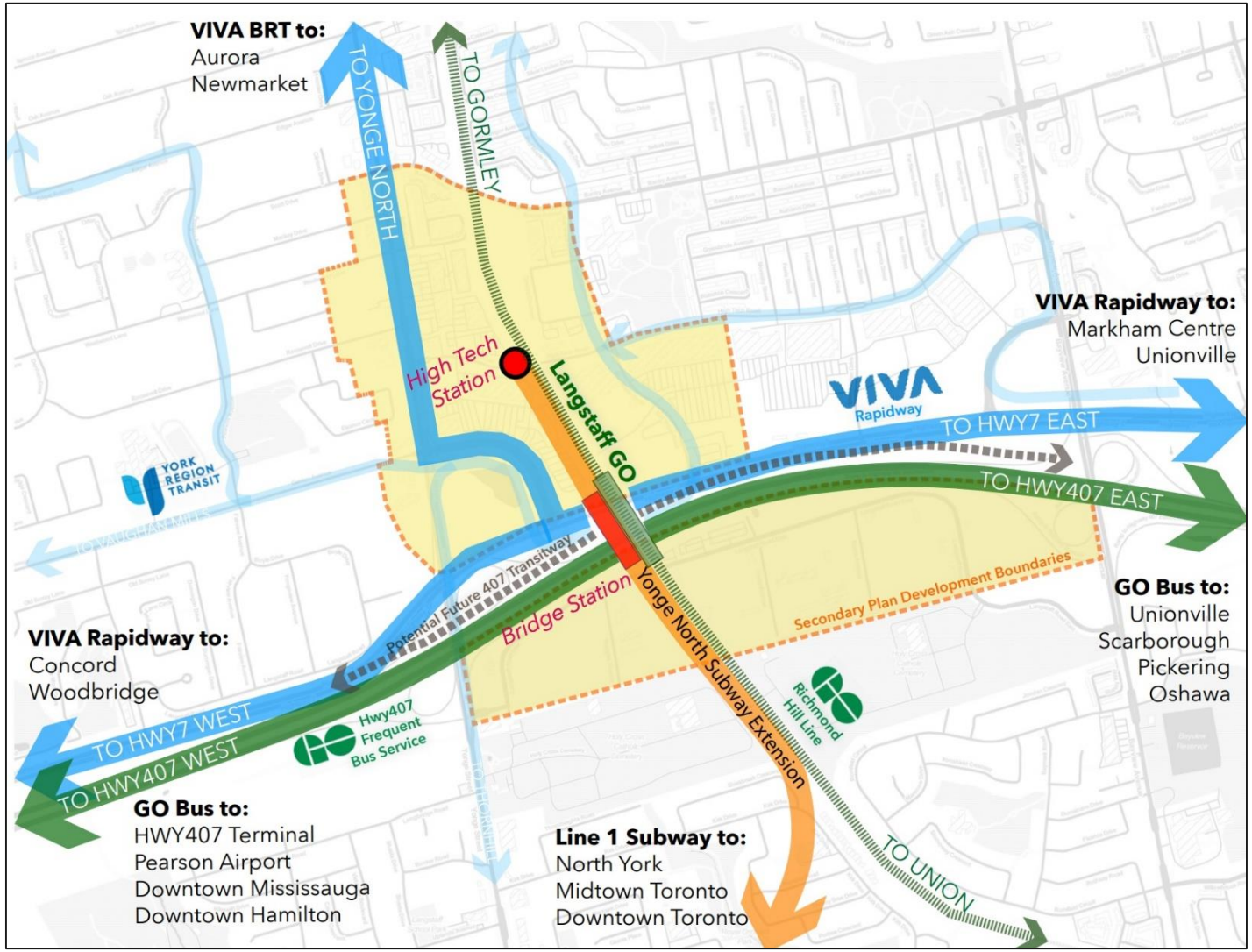
- **Four new stations** along an **approximately eight-kilometre extension** of TTC Line 1, from Finch Station north to Richmond Hill.
- Steeles Station will be a hub for local bus routes as well as a **future rapid transit line** along Steeles Avenue.

- Bridge Station will **conveniently connect** with GO train, GO bus, and local transit service, including VIVA BRT.
- High Tech Station will **serve future communities** envisioned within the Richmond Hill Centre area.
- Metrolinx is working with municipal partners to **evaluate and determine** the best location for the fourth station as planning work continues.

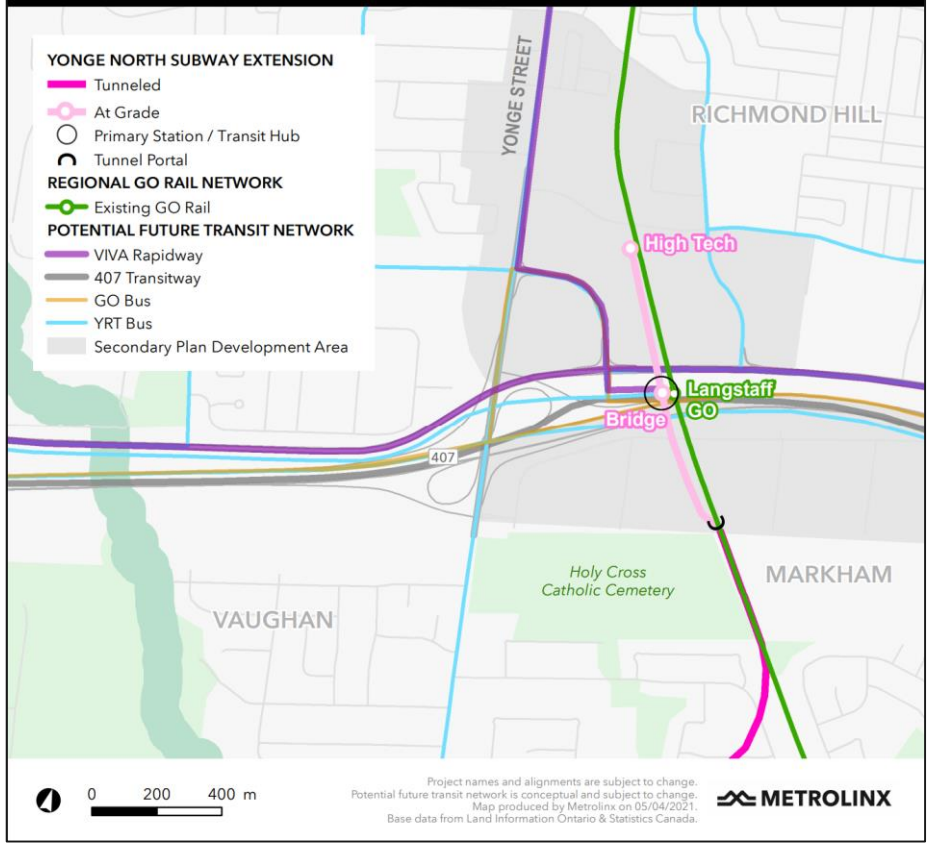
REGIONAL CONNECTIONS

- The transit hub at Highway 7 and Highway 407 – **Bridge Station** – will allow riders across York Region to easily tap into more travel options than ever before.
    - York Region Transit and regional GO buses that travel Highway 7 and Highway 407 will offer **fast, simple connections** to the **regional rapid transit network**
    - Bridge Station will be connected to the existing Langstaff GO station to give riders on the Richmond Hill GO train line easy access to the subway
    - Also will connect with the recently-extended Yonge Street Rapidway, reaching communities further north
- Bridge Station will be a launch pad to employment centres near Highway 407 and Highway 404, or destinations like **Yonge & Eglinton, York University,** and **Pearson Airport**.

NETWORK CONNECTIVITY



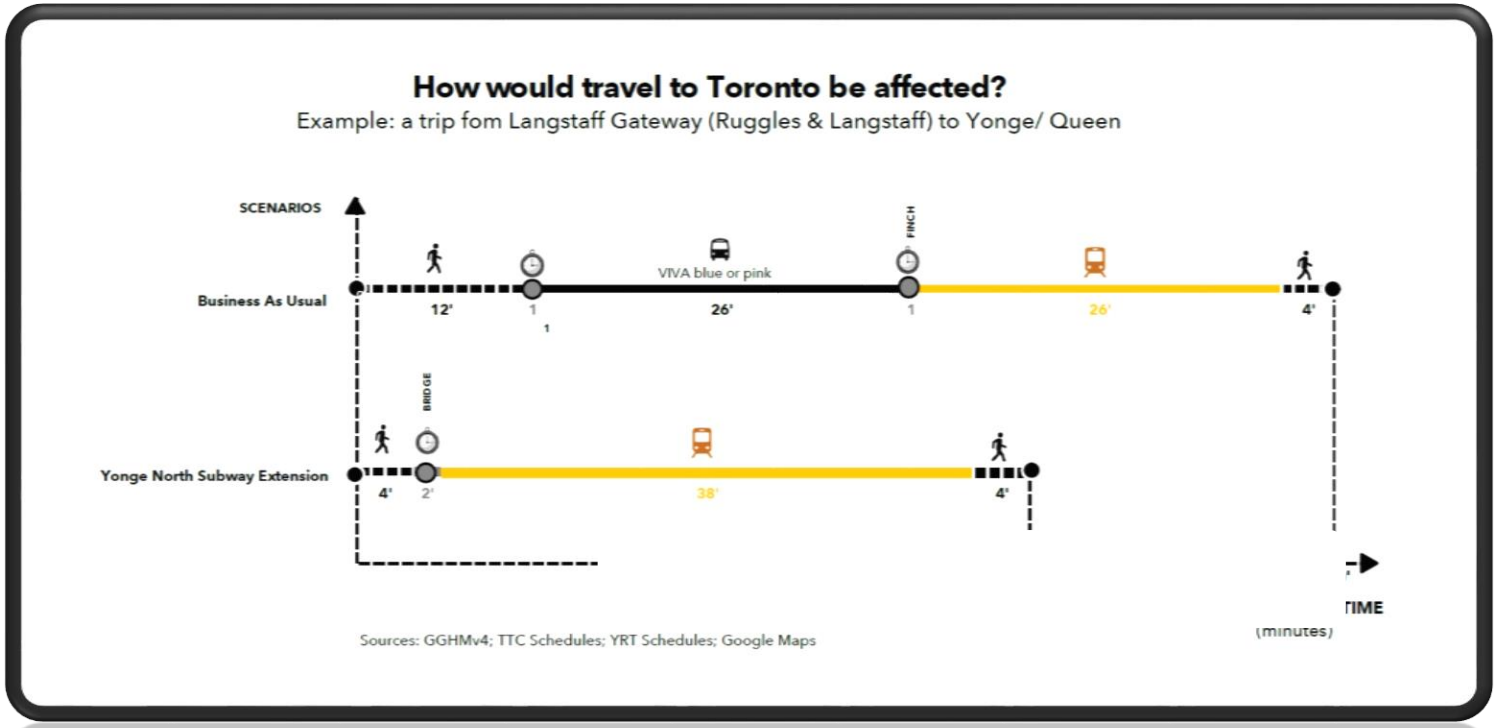
Northern Stations within Transit Network Connectivity



BY THE NUMBERS

Route length	~8 km
Ridership	94,100 daily boardings
Improved access to transit	26,000 more people within a 10-minute walk to transit
Improved access to jobs	22,900 employees within a 10-minute walk to transit
Daily reductions in traffic congestion	7,700 km in vehicle kilometres traveled
Yearly reductions in greenhouse gas emissions	4,800 tonnes

KEY BENEFITS



The extension will save riders as much as 22 minutes on a trip from York Region to downtown Toronto

- Bridge Station **maximizes TOC opportunities** by connecting two communities in Markham & Richmond Hill that are poised for growth.
- Shifting the alignment in the northern section **reduces construction timelines and property needs** by using a dedicated rail corridor that already exists.
- The project will serve **94,100 riders each day** by 2041, cutting the time spent commuting in Toronto and York Region by a combined **835,000 minutes daily**.

Initial Business Case
&
Supplementary Analysis

INITIAL BUSINESS CASE ANALYSIS – ALIGNMENT OPTIONS

Option 1

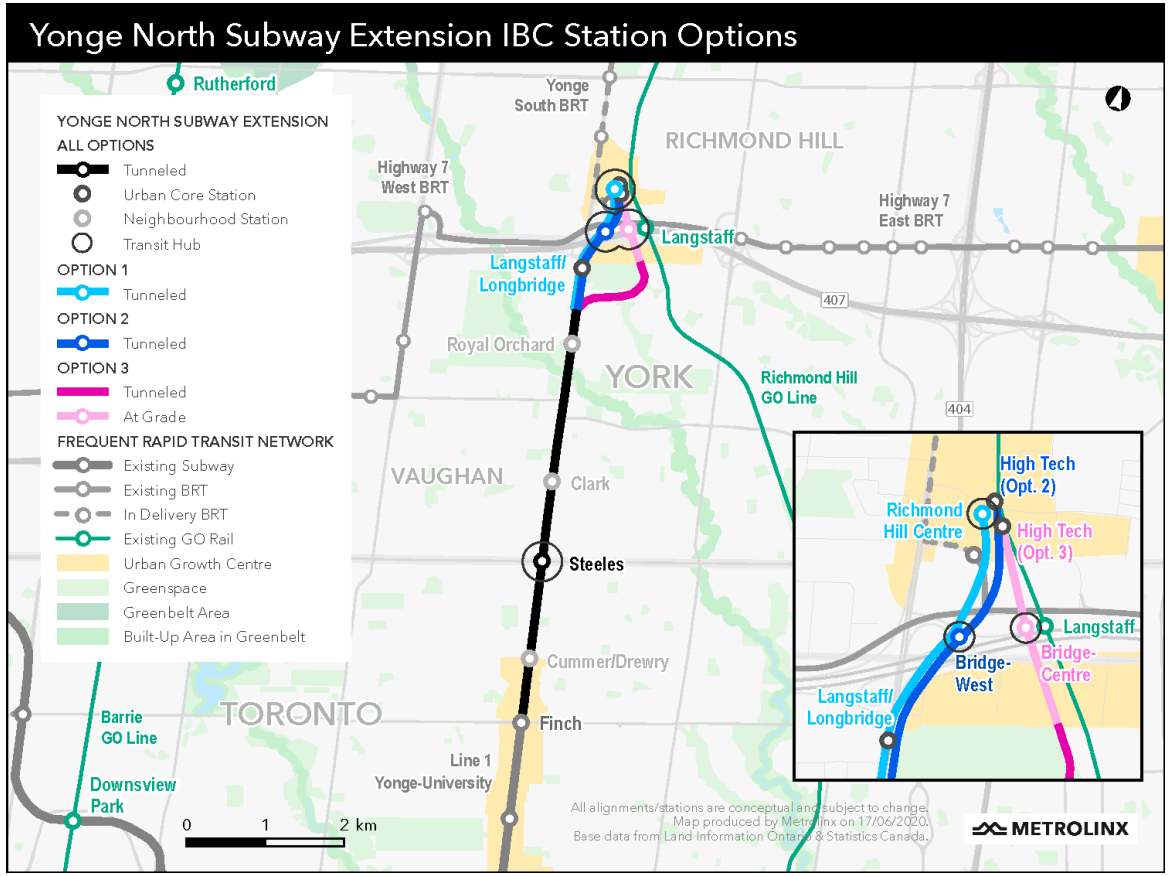
- Same alignment as approved EA, fully underground
- Funding envelope accommodates up to **3 stations**

Option 2

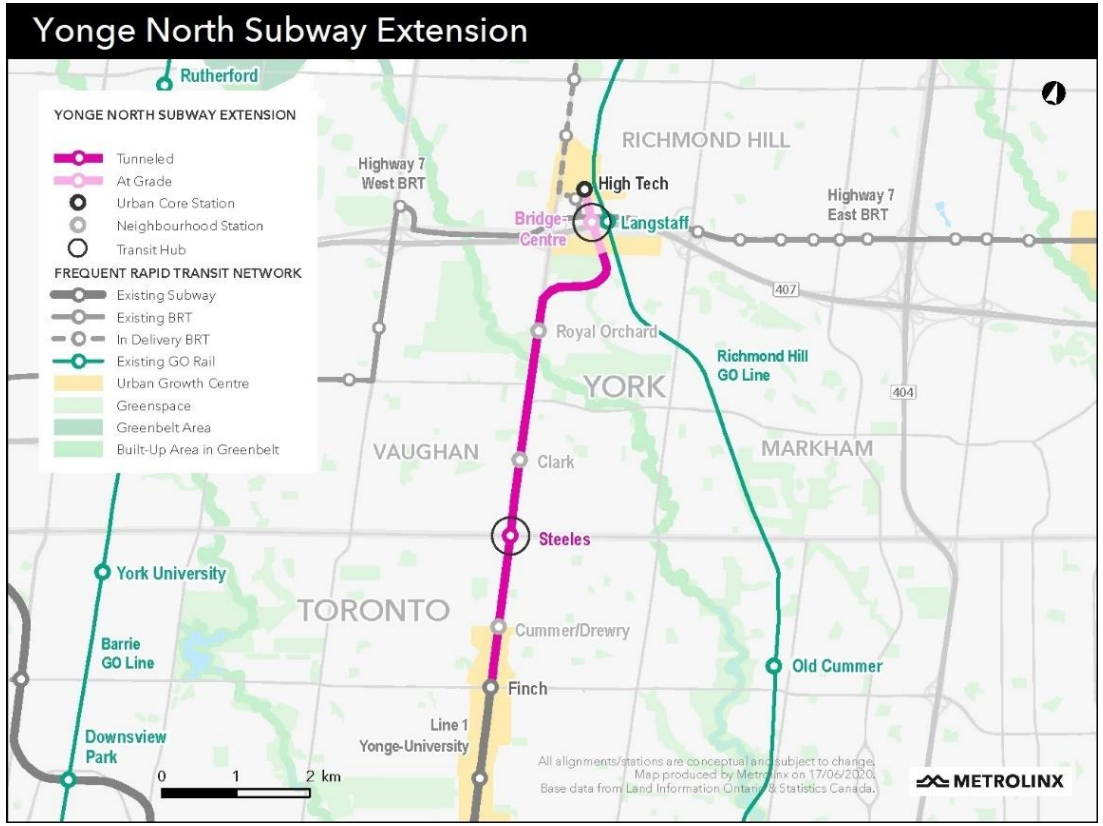
- Alignment curves east slightly to enable a different station placement, fully underground
- Funding envelope accommodates up to **3 stations**

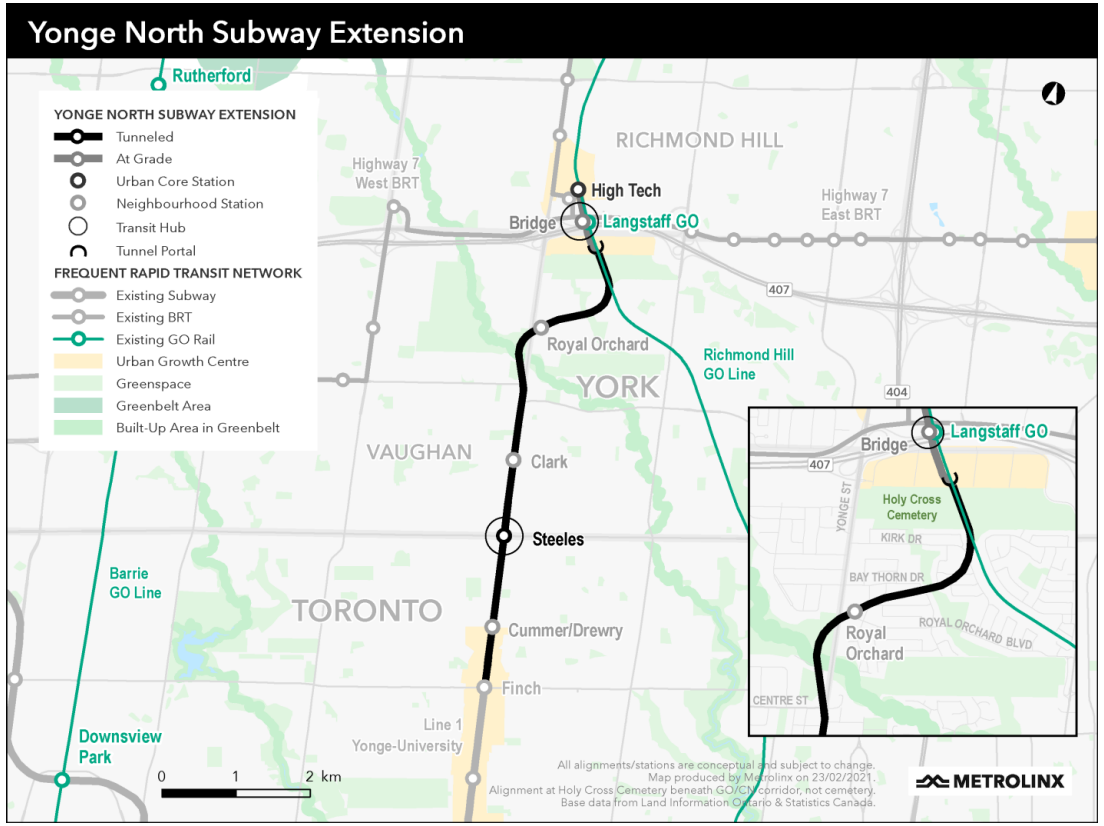
Option 3

- Alignment curves east before turning again to run at-grade and within the CN/GO rail corridor
- Funding envelope accommodates up to **4 stations**
- *Challenges*: tunneling and excavation in additional residential areas, near Holy Cross Cemetery



OPTION 3 – REFINEMENTS



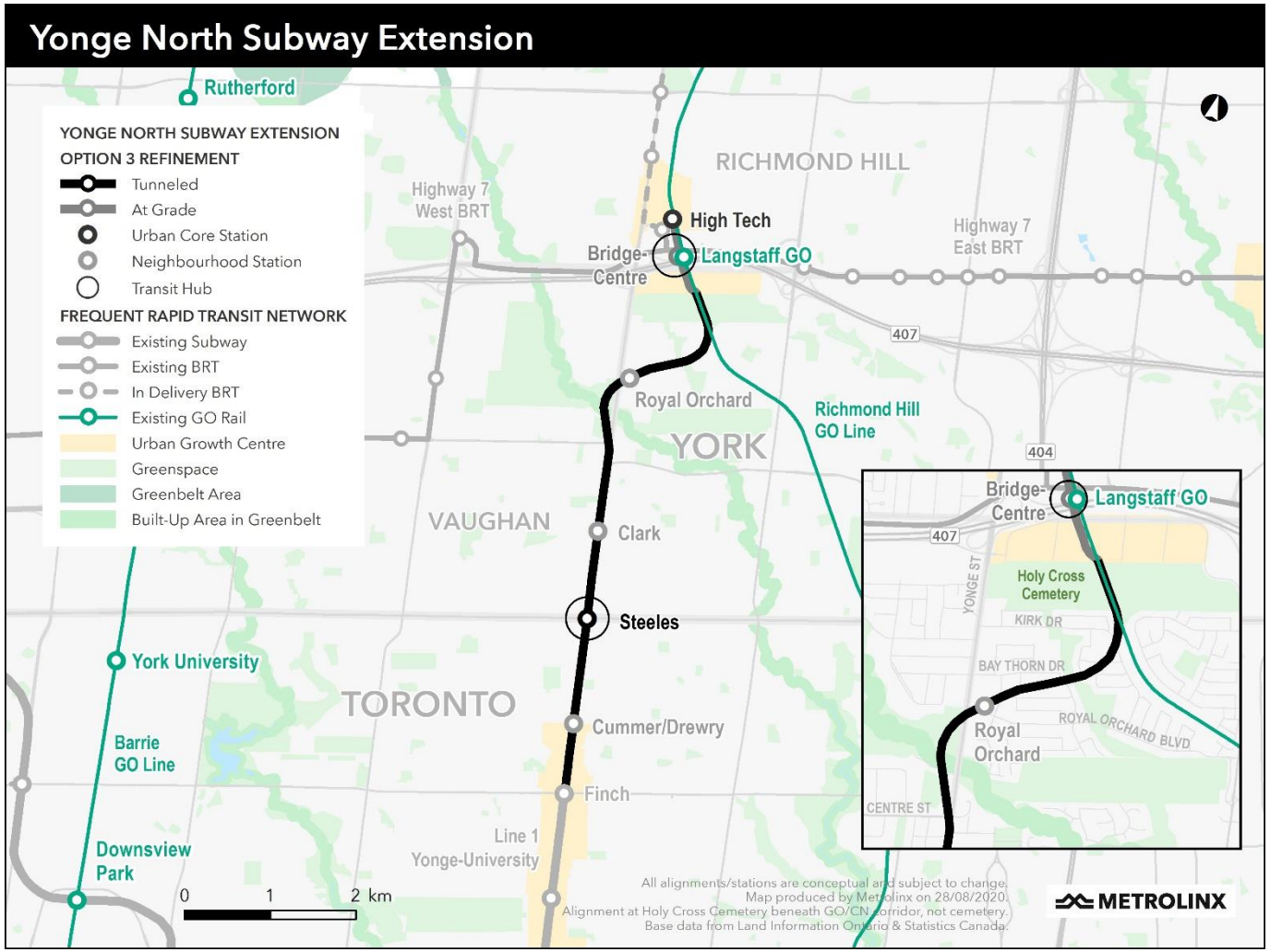


PRESENTED IN IBC

REFINED ALIGNMENT

- ✓ Key transit benefits
- ✓ Number of stations
- ✓ Design innovations
- ✓ Removes challenges of tunneling under Holy Cross Cemetery

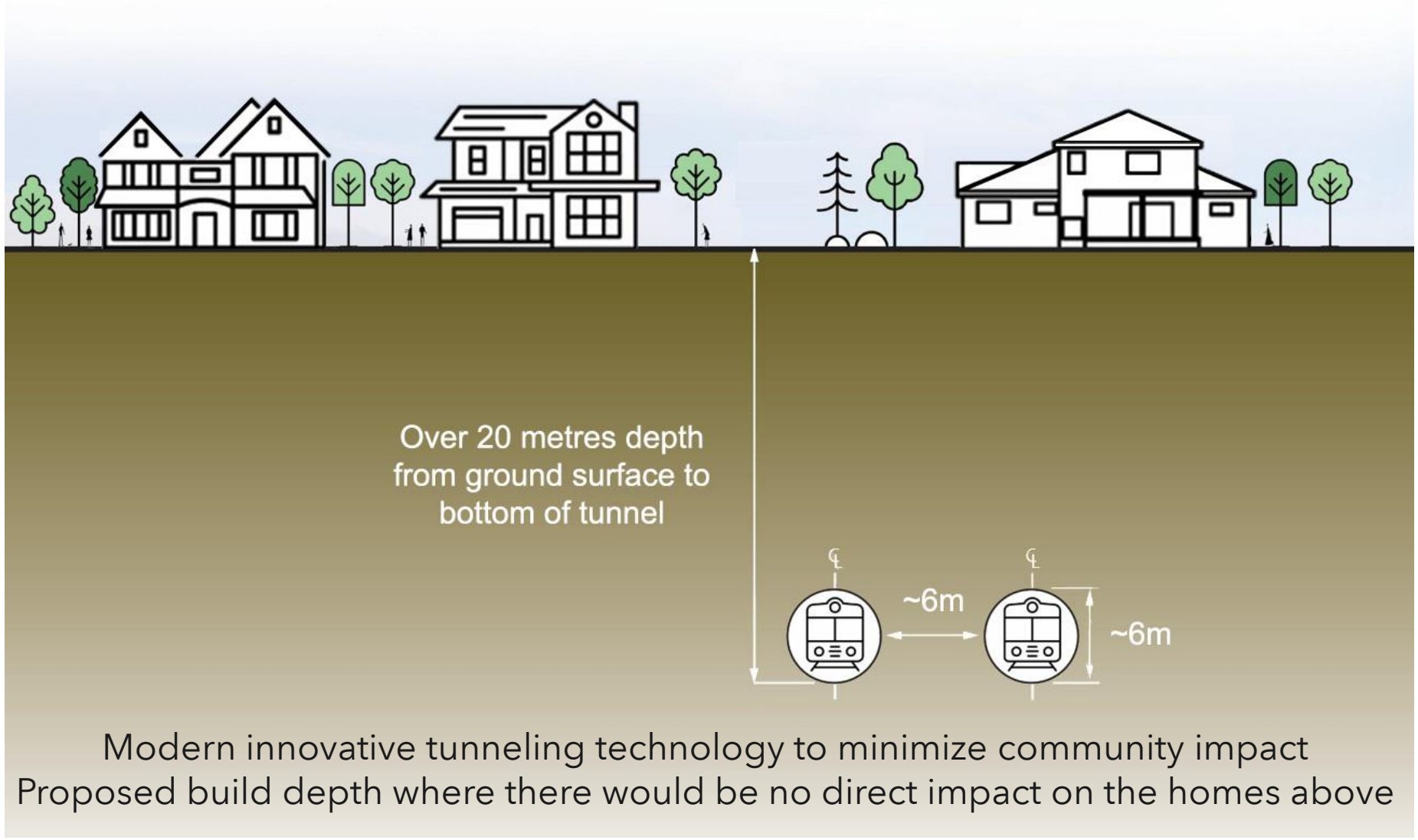
APPROVED REFERENCE ALIGNMENT



- **Expected Benefit-to-Cost Ratio:** 0.79 (*from 0.74 to 0.86*)
- Potential for **highest number of stations** within $5.6 billion project funding envelope
- **Primary Stations/Transit Hubs:** Steeles, Bridge
- **Complementary Urban Core Station:** High Tech
- **One Neighbourhood Station:** Cummer / Clark / Royal Orchard

** Further analysis on Neighbourhood Station selection to be conducted through next stage of business case process*

TYPICAL SECTION UNDER ROYAL ORCHARD COMMUNITY



Modern innovative tunneling technology to minimize community impact
Proposed build depth where there would be no direct impact on the homes above

BRIDGE AND HIGH TECH STATION

Bridge Station and High Tech Station will serve the highest density areas to make it faster for riders to use the subway, and better for supporting growth and curbing local traffic congestion.

- **Fast and hassle-free** transfers to GO train/GO bus/local transit
- **Convenient access** to the subway at the heart of Richmond Hill Centre and Langstaff Gateway development areas
- More than half of Richmond Hill Centre residents will live within **walking distance** of High Tech Station by 2041
- Bridge Station site preserves nearby development space to allow the area to evolve into a **thriving urban centre**

Source: City of Richmond Hill 2010 Regional Centre and Land Use Study

Source: City of Markham 2009 Langstaff Gateway Master Plan

ABOVE GROUND ALIGNMENT

Running the extension above ground along the CN railway corridor means we can finish the project sooner.

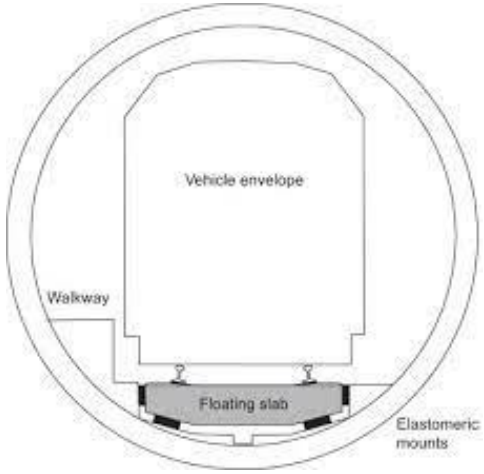
- At-grade subway lines have **been proven around the world** as a way to improve transit connections and strengthen communities
- Reduces the need for **complex, time-consuming, and costly** construction of tunnels and underground stations
- **Cuts down on disruptions** of hydro, natural gas, and water service
- Positions northern stations to provide **better transit connections** and more opportunities for nearby communities to grow

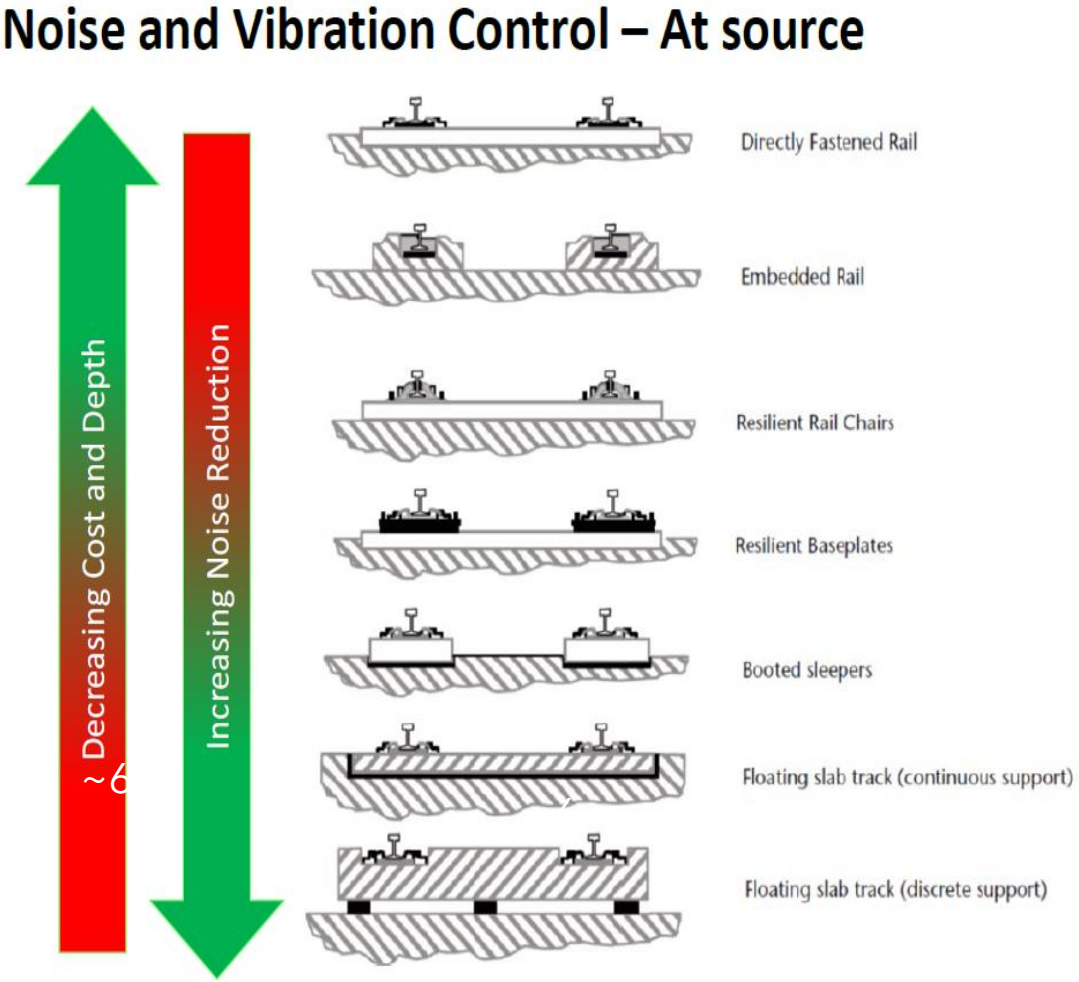
NOISE AND VIBRATION MITIGATION – LATEST TECHNOLOGY

Rail dampers – spring mechanism to dissipate vibration energy, which would otherwise radiate from the rail as noise

Floating slabs of concrete – Supported by isolation pads or steel spring mounts, effectively reducing vibration by absorbing energy

Highly resilient fasteners – Specially designed compressible fasteners to absorb vibration energy



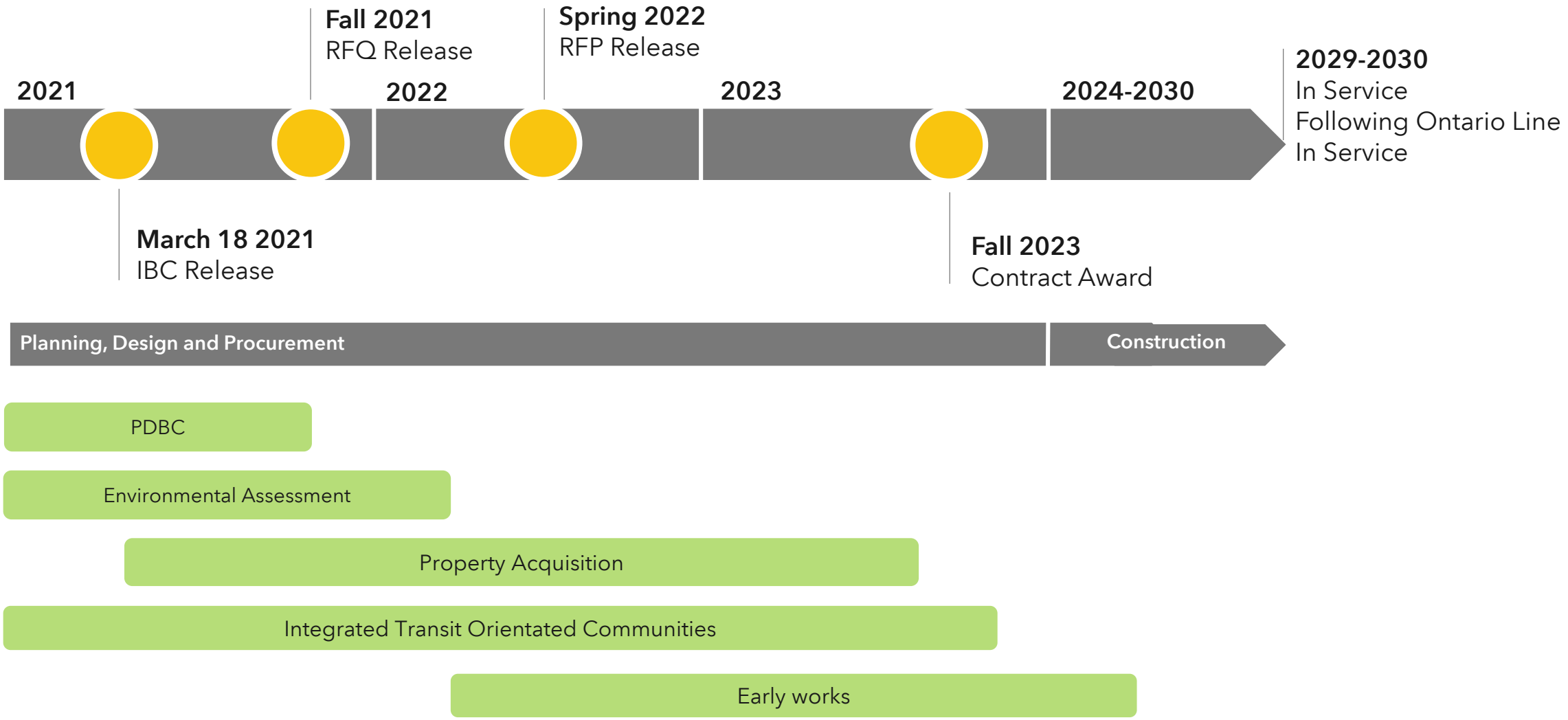


SUBWAYS UNDER HOMES AND ADJACENT TO PUBLIC USES

There are many projects in the world with subways beneath homes and sensitive surface structures

- Northgate Link Extension - Seattle Washington (opening 2022)
  - Tunnels directly below single family homes and Washington University Campus
- Westside Subway Extension Metro Purple Line, Los Angles, California (opening 2025)
  - Tunnels directly below single family homes
- Toronto/York Spadina Subway Extension – Toronto/York Region, (2017)
  - Tunnels directly below York University Campus
- Jubilee Line (1999) and Elizabeth Line (2022) extensions, London, England
  - Tunnels under hundreds of existing homes, business and historic buildings
- Canada Line, Vancouver, British Columbia (2009)
  - passes under private residential properties adjacent to False Creek
- High Speed 1 (vicinity of Stratford Station), London, England (2004)
  - Tunnels pass under private residential buildings

PROJECT MILESTONES



DATES/TIMELINES SUBJECT TO CHANGE

Communications, Community and Stakeholder Engagement

THE RIGHT PROJECT AT THE RIGHT TIME

Flagship Project in Metrolinx's Innovative Subway Program

New Yonge North Subway Extension transit connections - open up new travel possibilities in every direction across the region's growing transit network.

Project will serve the heart of major growth centres and significantly cut travel times – creating a critical and long awaited extension of our transit network.

COMMUNITY & STAKEHOLDER ENGAGEMENT

IBC briefings for elected officials **(March)** → Stakeholder and community briefings **(March)** → Door-to-Door Canvass and Postcards **(March/April)** → Pre-TPAP elected official briefings **(April)** → TPAP addendum notification **(May)** → TPAP virtual open house **(May)** → Form Construction Liaison Committees **(Fall)**

OFFICIALS BRIEFINGS

- IBC Briefings for Elected Officials — **Ongoing**
- Recent Council Presentations
  - Markham — **March 22**
  - Richmond Hill — **March 24**
  - York Region — **March 25**
  - Vaughan — **April 7**
- Pre-TPAP Briefings Elected Officials — **April 2021**
- Indigenous Nations — **April 2021**
- TPAP Presentations — **May 2021**
  - Municipal Partners, Councils, TEO, TTC
- TPAP Update Briefings — **June 2021-Jan 2022**

COMMUNITY ENGAGEMENT

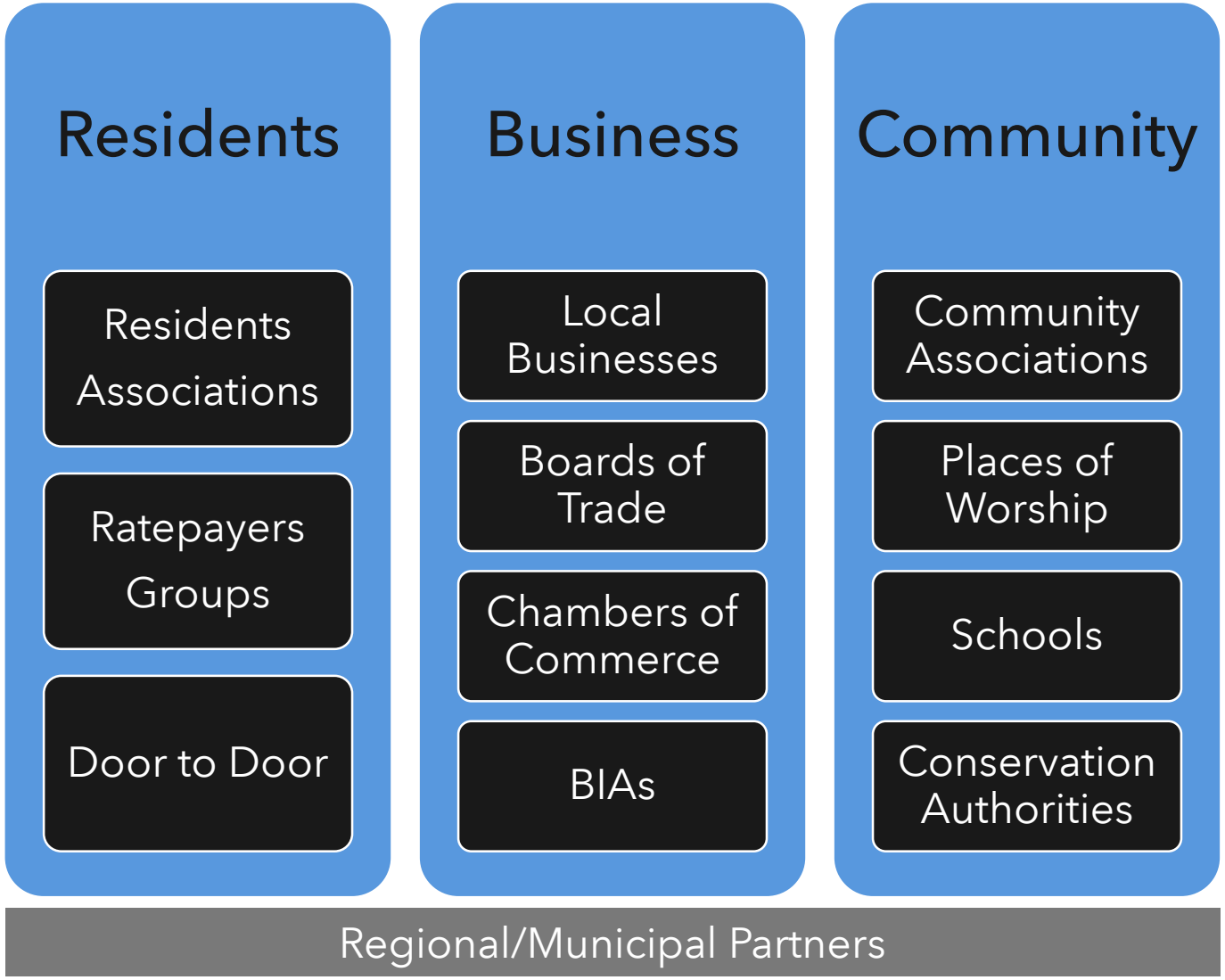
- Project Briefings to Community Groups — **Ongoing**
  - Resident Groups, BIAs, Chambers of Commerce
- Door-to-Door Canvasses — **Late March/April 2021**
  - Royal Orchard & Bayview Glen communities
  - Willowdale-Newtonbrook community
- Community Virtual Open Houses — **April 2021**
  - Royal Orchard & Bayview Glen communities
  - Southern and Northern York Region
- Project Introduction Post Card — **April 2021**
- Project Virtual Open House — **May 2021**
- Project E-Newsletters — **Bi-weekly**
- Form Construction Liaison Committees — **Fall 2021**
- Community Walking Tours — **Fall 2021**

TPAP PUBLIC CONSULTATION

- TPAP Addendum Notification Letters — **April 2021**
  - Announces upcoming TPAP
  - Virtual engagement portal
- Stakeholder pre-briefings — **Late April 2021**
- Newspaper Ad — **May 2021**
- Virtual Open Houses — **May-Aug 2021**

Collaboration with Communications Partners (Municipal/Regional Communicators, TTC, YRRTC)

COMMUNITY & STAKEHOLDER ENGAGEMENT



Week of April 5:

- Royal Orchard Community Virtual Open House (April 7)
- Bayview Glen Community door-to-door canvass
- Briefing with Thornhill Golf Club (April 7)

Week of April 12:

- Ongoing briefings for resident and ratepayer groups
- Mx News Articles on YNSE project

Week of April 19:

- Bayview Glen Community Virtual Open House
- Project postcard mail distribution

UPCOMING ACTIVITIES

Field work begins this spring:

- Noise & vibration monitoring
- Exploratory work for tunnels & launch shaft
- Utility investigations

Metrolinx's commitment to keeping communities informed

Residents near planned field work will receive **notification flyers** at least two weeks in advance

Updates on major field work will be distributed regularly via **email newsletter**

Major notices of work will be posted on the **Metrolinx Engage** website

Construction Liaison Committees will open the lines of communication about all aspects of the project

STAY CONNECTED – WE'RE HERE FOR YOU!

Subscribe:

- YongeSubwayExt@metrolinx.com
- 416-202-7000

Project Information:

- Metrolinx.com/YongeSubwayExt

Follow:

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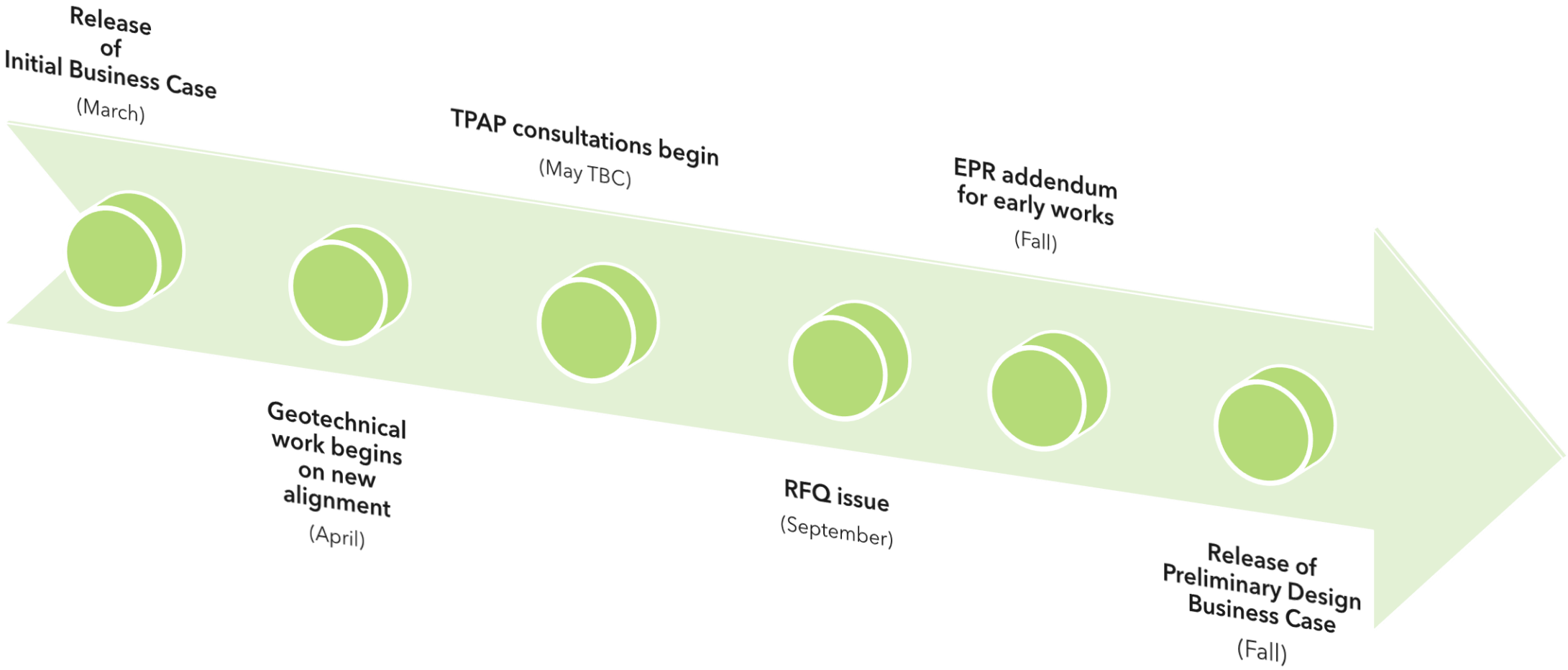
Appendix

APPROVED REFERENCE ALIGNMENT

Refined Option 3 Alignment	
Strategic Case	
Strong Connections	• 94,100 daily riders[1]
Complete Travel Experiences	• 835,000 person-minutes daily travel time savings compared to BAU • 22 minutes saving on a trip from Langstaff Gateway area (Langstaff/Ruggles) to Downtown Toronto (Yonge/Queen) compared to BAU
Economic Case	
Total Economic Impacts (Benefits) ($2020, Present Value)	$3666.5 M
Total Costs ($2020, PV)	$4386.3 M to $5135.5 M
Net Present Value ($2020, NPV)	$-1358.6 M to $-607.9 M
Benefit-Cost Ratio	0.74 to 0.86
Financial Case ($2020, PV)	
Total Revenue Adjustment	114.4 M
Capital Costs[2]	$4,625.0 M
Operating and Maintenance Costs	$ -39.0 M
Total Costs	$4,447.1 M
Deliverability and Operations	
Constructability Matters	• Coordination with the York Durham Sewage System (YDSS) at Steeles • East Don River Crossing • Construction within the busy Yonge Street corridor • Maintaining services on Line 1 during construction • Interface with the Highway 7 and 407 Corridor
Property Impacts	• No tunneling under Holy Cross Cemetery
Operations	• Integrated into current Line 1 Operations • Fully automated operation allows for higher service frequencies

PROJECT MILESTONES



*Dates/timelines are subject to change

PROPOSED MAJOR CHANGES TO PROJECT ELEMENTS CONSIDERED IN IBC

Steeles Station

Moving Steeles Bus Terminal from Below Steeles Avenue to at-grade integrated with development

- Original proposal planned the bus terminal below Steeles Avenue perpendicular to and above the subway station
- Value engineering recommended relocating to at-grade to reduce costs and minimize impacts to YDSS and construction disruption

East Don River

Tunneling below instead of bridging over the East Don River

- Original proposal planned a two level (upper for road – lower for subway) bridge spanning the river valley
- Value engineering recommended tunneling below the watercourse to reduce costs and disruptions during construction

Train Storage Facility

Moving the YNSE Train Storage Facility north of High Tech Road from below ground to at-grade

- Original proposal planned a 3-track, 12 train below ground storage facility
- Value engineering recommended bringing the facility to at-grade in order to reduce costs while maintaining similar functionality

YNSE Alignment

Changing the point where the subway alignment shifts off of Yonge Street

- Original proposal for the alignment to shift east of Yonge Street north of Holy Cross Cemetery
- Value engineering and peer review identified potential benefit increases and cost reductions from bringing the subway to at-grade adjacent to the CN corridor, which will also better serve the central portions of the Richmond Hill Centre and Langstaff Gateway Urban Growth Centre

CREATING CONNECTIONS IN YORK REGION

In Construction:

- Bloomington GO Station (new)
- Rutherford Road Grade Separation
- Rutherford GO Station Upgrades and Parking Garage
- Barrie Corridor double tracking preparatory construction in King City
- York vivaNEXT BRT
- Steeles Grade Separation

In Procurement:

- Barrie Contract 2 (Maple GO Upgrades)
  - New platform, expanded bus loop, noise walls, proposed pedestrian bridge over Major Mackenzie
- Barrie Contract 3 (King City GO Upgrades)
  - New platform, more parking, noise walls, pedestrian bridges

Construction Progress on Rutherford GO parking garage and pedestrian bridge

In Early Design:

- McNaughton Grade Separation (Vaughan)
- Wellington Grade Separation (Aurora)
- Network Electrification and infrastructure

Ongoing Construction on Rutherford Road Grade Separation

GO EXPANSION IN VAUGHAN

- On the Barrie line, **two-way, all-day fifteen minute service or better between Aurora GO Station and Union Station**
- Parking expansions, station enhancements, grade separations, electrification.