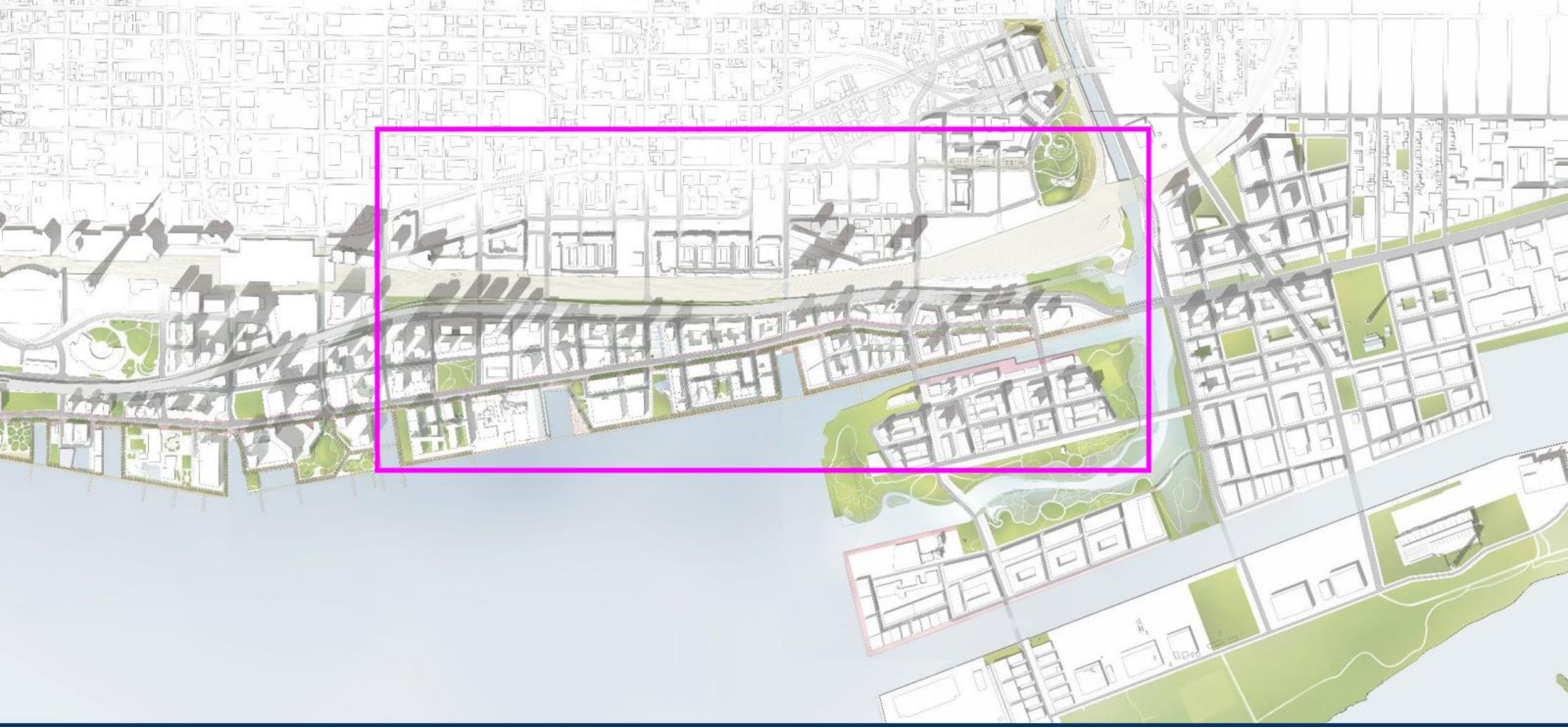


Metrolinx Pedestrian & Cycling Connection Study (PCCS)

For Information

July 22nd, 2020

Project Background & Description

Ped. & Cycling Connection Study

Proponent: Metrolinx
Design Team: Urban Strategies, WSP, MBTW
Review Stage: For Information

Background and History

- Pedestrian & Cycling Connectivity Study led by Metrolinx in consultation with City of Toronto, Waterfront Toronto, and a Community Advisory Committee, as an outcome of the TPAP for the USRC East Enhancements (rail bridge extensions) required for GO expansion.

Description

- This is a planning study to assess options for improving connectivity across the rail corridor in the area between Yonge St. and the Don River, and between King St. and the Lake.
- The presentation does not show design work as these projects are unfunded at this time, but rather shows examples of the type of interventions being considered for cost – benefit evaluation purposes at a planning level. These projects will return to the panel when they are at the design stage.

Timeline

- The PCCS study began in October 2018 and is anticipated to be completed by Fall 2020

PCCS Site Context

Ped. & Cycling Connection Study

Proponent: Metrolinx
Design Team: Urban Strategies, WSP, MBTW
Review Stage: For Information

Legend

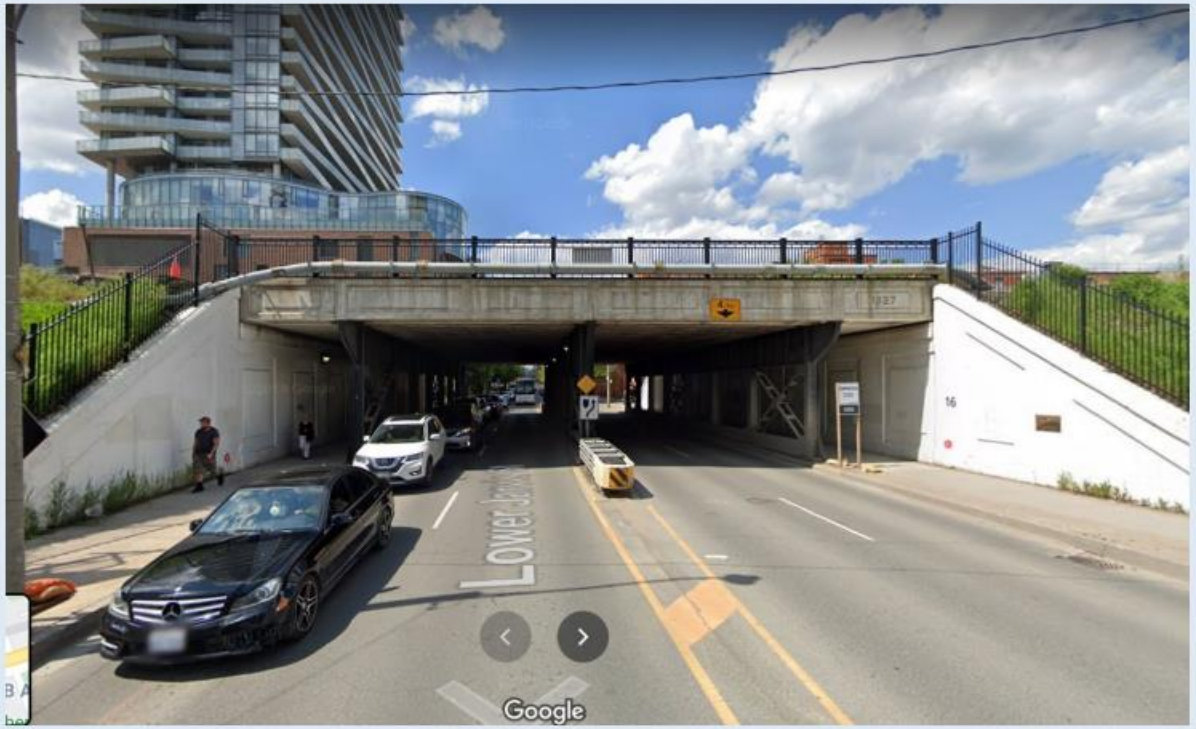
- **Existing Underpass Locations**
  Existing Lengths:
  Jarvis St - 30.7m
  Sherbourne St - 26.5m
  Parliament St - 37.5m
  Cherry St - 54.5m
- **South Side Underpass Extension** (11m) - construction in 2020 to support TSS1
- **North Side Underpass Extension** (7m) - construction deferred; may be required to support TSS2, to be determined with community consultation
- **North Side Underpass Extension** (7m) - potential future extension, beyond TSS2

*TSS - Train Service Specifications for phases of GO Expansion

Existing Ground Conditions

Jarvis St. Hydro Tower + Underpass

Jarvis St. from the north



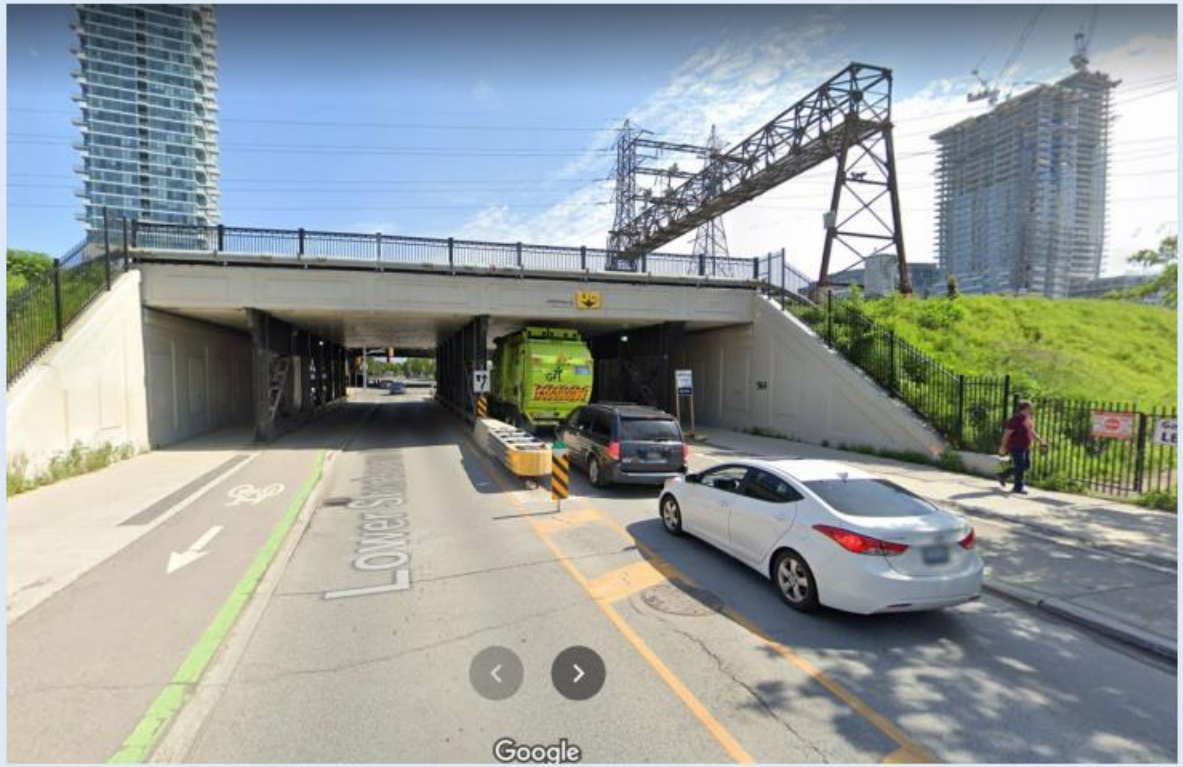
Jarvis St. from the south

Existing Ground Conditions

Sherbourne St. Underpass

Ped. & Cycling Connection Study

Proponent: Metrolinx
Design Team: Urban Strategies, WSP, MBTW
Review Stage: For Information



Sherbourne St. from the north

Sherbourne St. from the south

Existing Ground Conditions

Parliament St. Hydro Tower + Underpass

Ped. & Cycling Connection Study

Proponent: Metrolinx
Design Team: Urban Strategies, WSP, MBTW
Review Stage: For Information

Parliament St. from the north

Parliament St. from the south

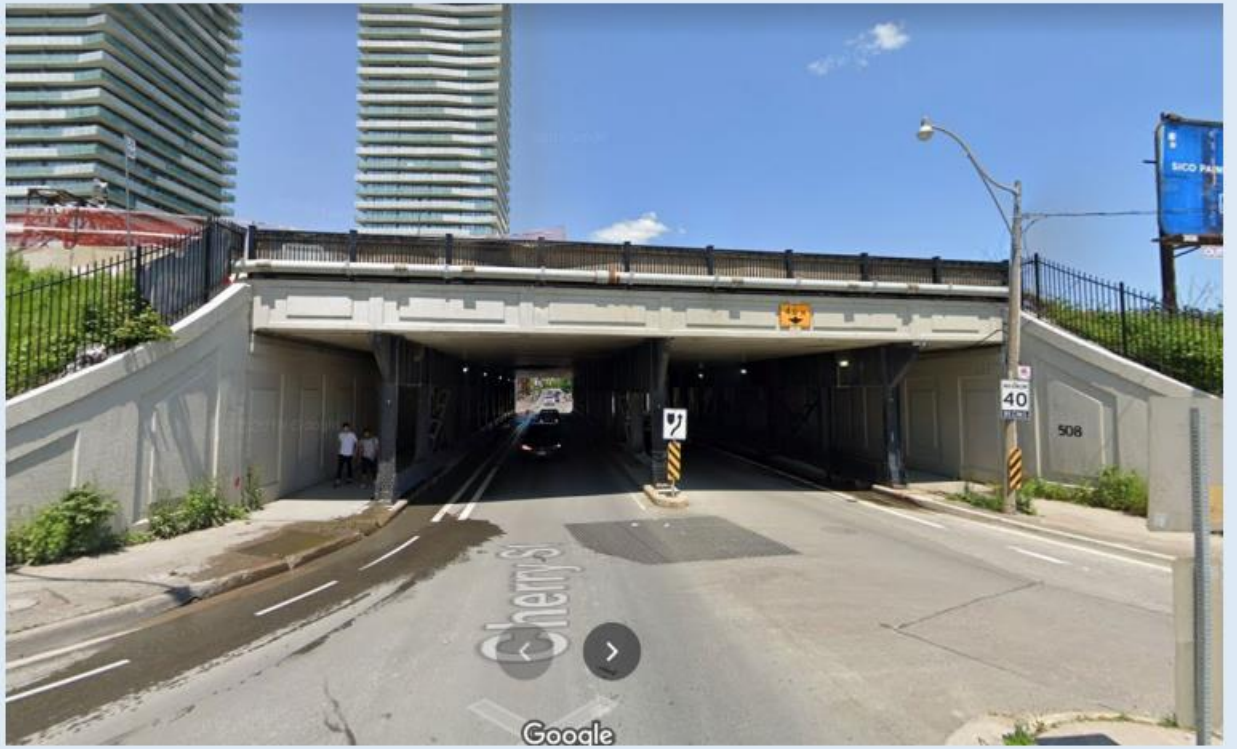
Existing Ground Conditions

Cherry St. Underpass

Ped. & Cycling Connection Study

Proponent: Metrolinx
Design Team: Urban Strategies, WSP, MBTW
Review Stage: For Information

Cherry St. from the north



Cherry St. from the south

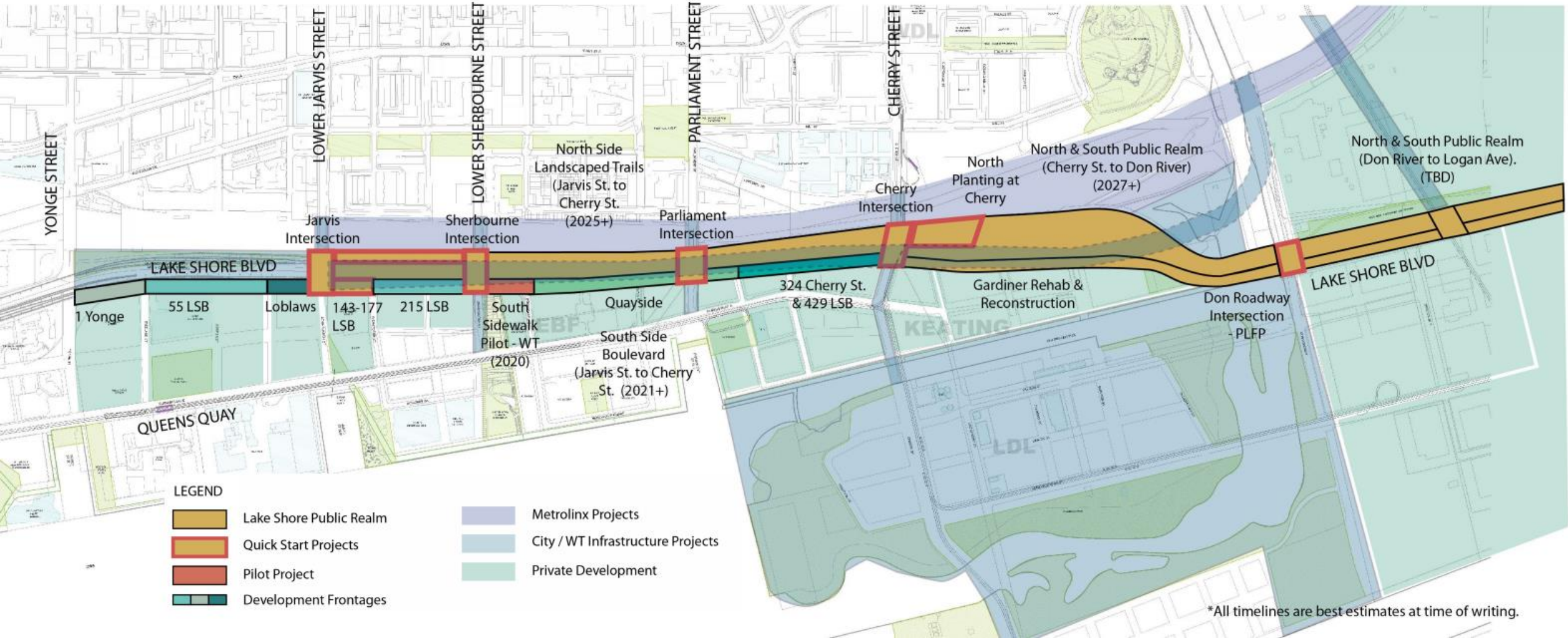
Future Proofing & Coordination

Major adjacent project context

Ped. & Cycling Connection Study
Proponent: Metrolinx
Design Team: Urban Strategies, WSP, MBTW
Review Stage: For Information

Lake Shore Public Realm
Gardiner Rehab & Reconstruction
USRC East Enhancements (Early Works)

Port Lands Flood Protection
Sediment & Debris Management Area
Wilson Yard & RER Electrification (HONI relocation)



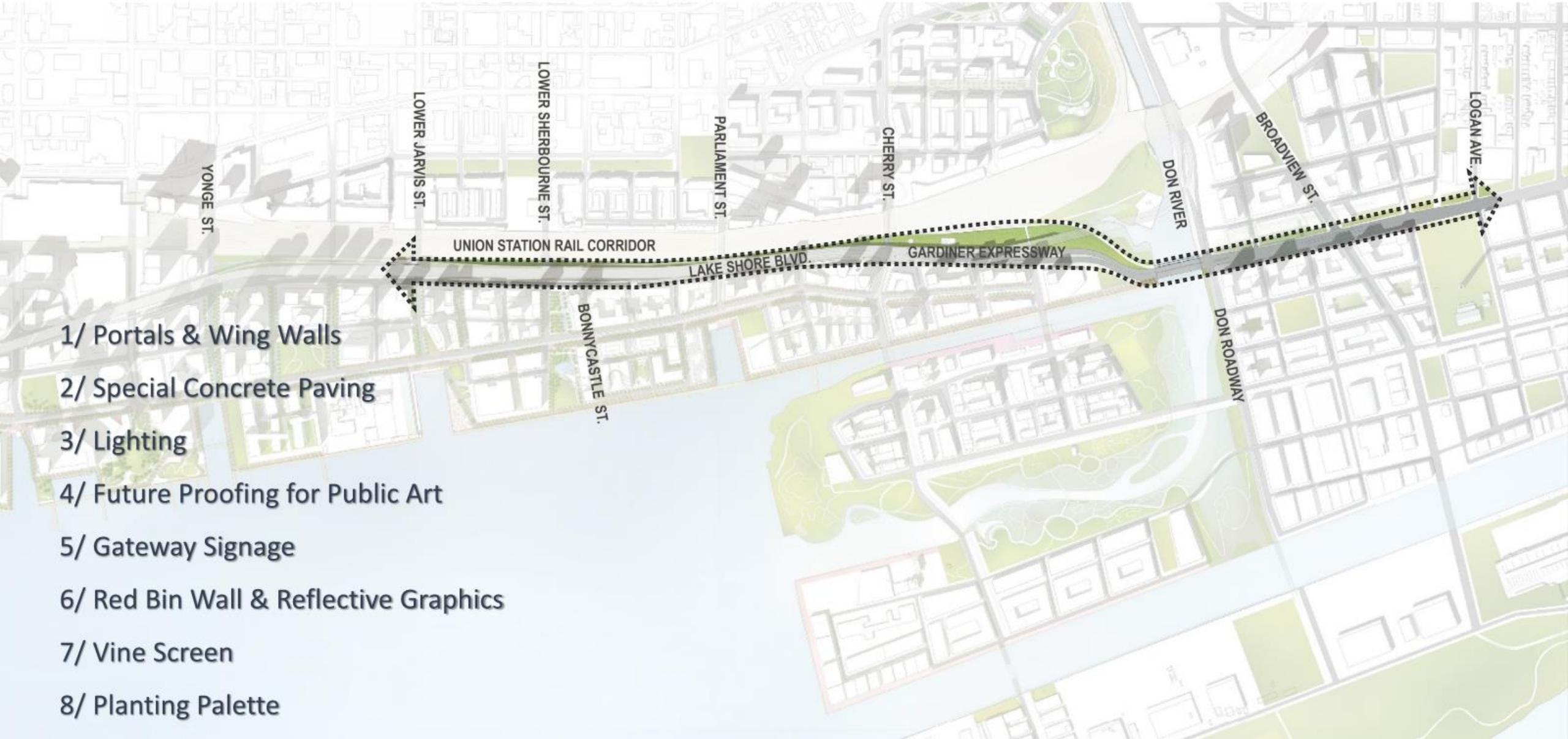
*All timelines are best estimates at time of writing.

Lake Shore Public Realm

Public Realm coordination with USRC

Ped. & Cycling Connection Study

Proponent: Metrolinx
Design Team: Urban Strategies, WSP, MBTW
Review Stage: For Information



1/ Portals & Wing Walls

2/ Special Concrete Paving

3/ Lighting

4/ Future Proofing for Public Art

5/ Gateway Signage

6/ Red Bin Wall & Reflective Graphics

7/ Vine Screen

8/ Planting Palette

Areas for Panel Consideration

Waterfront Toronto + City of Toronto

Ped. & Cycling Connection Study

Proponent: Metrolinx
Design Team: Urban Strategies, WSP, MBTW
Review Stage: For Information

1. Waterfront Connectivity has been a long-standing issue. Recognizing that these areas have specific context and budgetary constraints, are the structural and non-structural improvements appropriate and effective in improving connectivity between established neighbourhoods to the north and the eastern waterfront?

2. Is the approach of extending the Lake Shore public realm identity north to include the underpasses an appropriate connectivity strategy? Should this treatment be extended down to Queens Quay?

3. Do you agree with the recommended connections? Understanding the City's desire to bring additional design options forward as secondary options given the area's dynamic urban environment.

4. What is the best way for Metrolinx, the City and Waterfront to advance this work?

USRCE PEDESTRIAN & CYCLING CONNECTIVITY STUDY (PCCS)

Waterfront Design Review Panel Presentation

URBAN STRATEGIES | MBTW | WSP

July 22nd, 2020

This presentation is for information purposes only.

USRCE PEDESTRIAN & CYCLING CONNECTIVITY STUDY (PCCS)

PRESENTATION OUTLINE

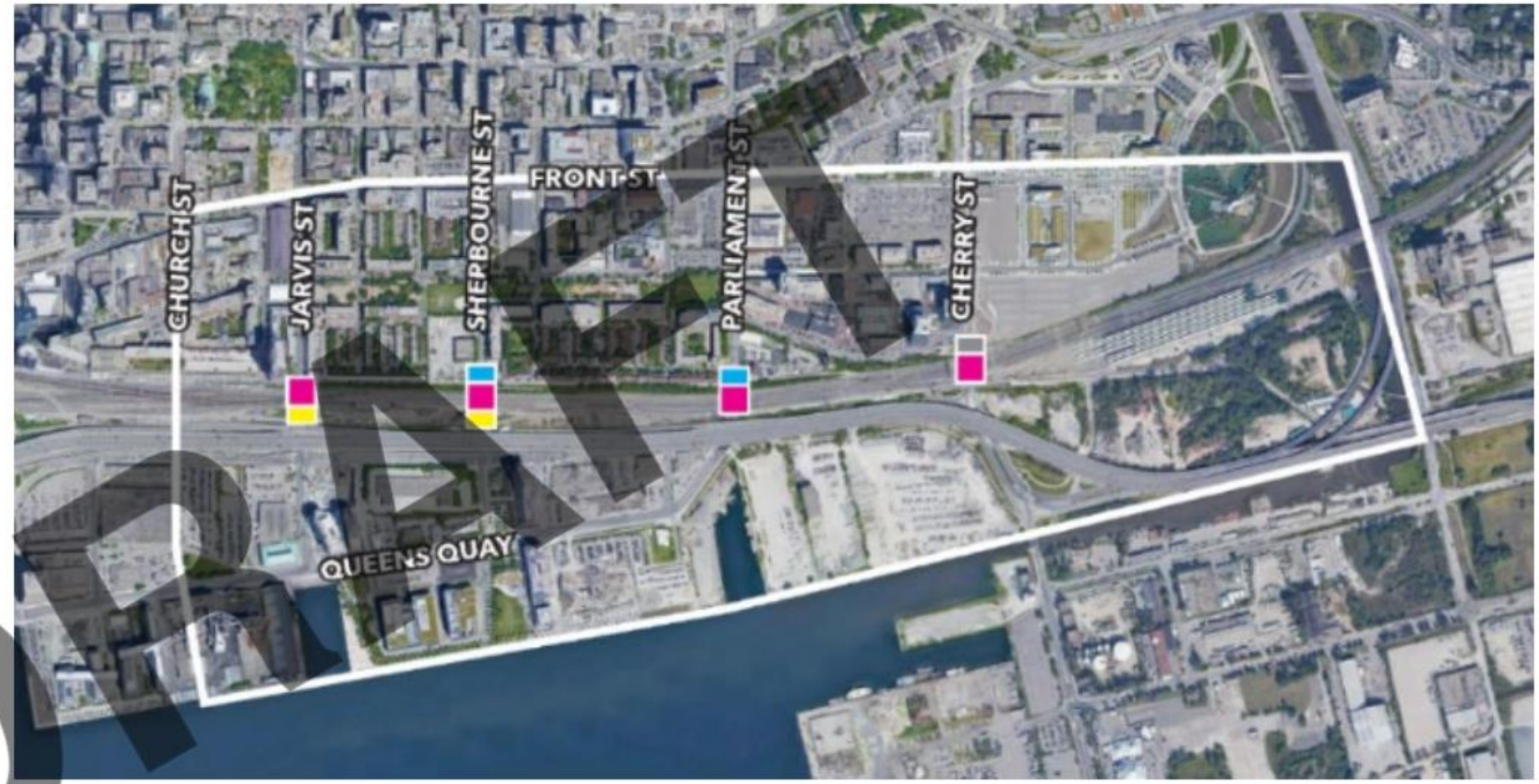
1. Background
2. Process for Identifying Improvements
3. Testing Structural Improvements
4. Non Structural Improvements
5. Next Steps
6. Additional Reference Slides

Background

THE USRCE PEDESTRIAN & CYCLING CONNECTIVITY STUDY (PCCS)

The PCCS Context

- The GO Expansion Program is being implemented to deliver 15-minute all-day, two-way rail service to core segments of the rail network
- The Union Station Rail Corridor East is being **widened to support expansion of service**
- Within this context, there is a desire to explore opportunities to **improve connectivity across the corridor**



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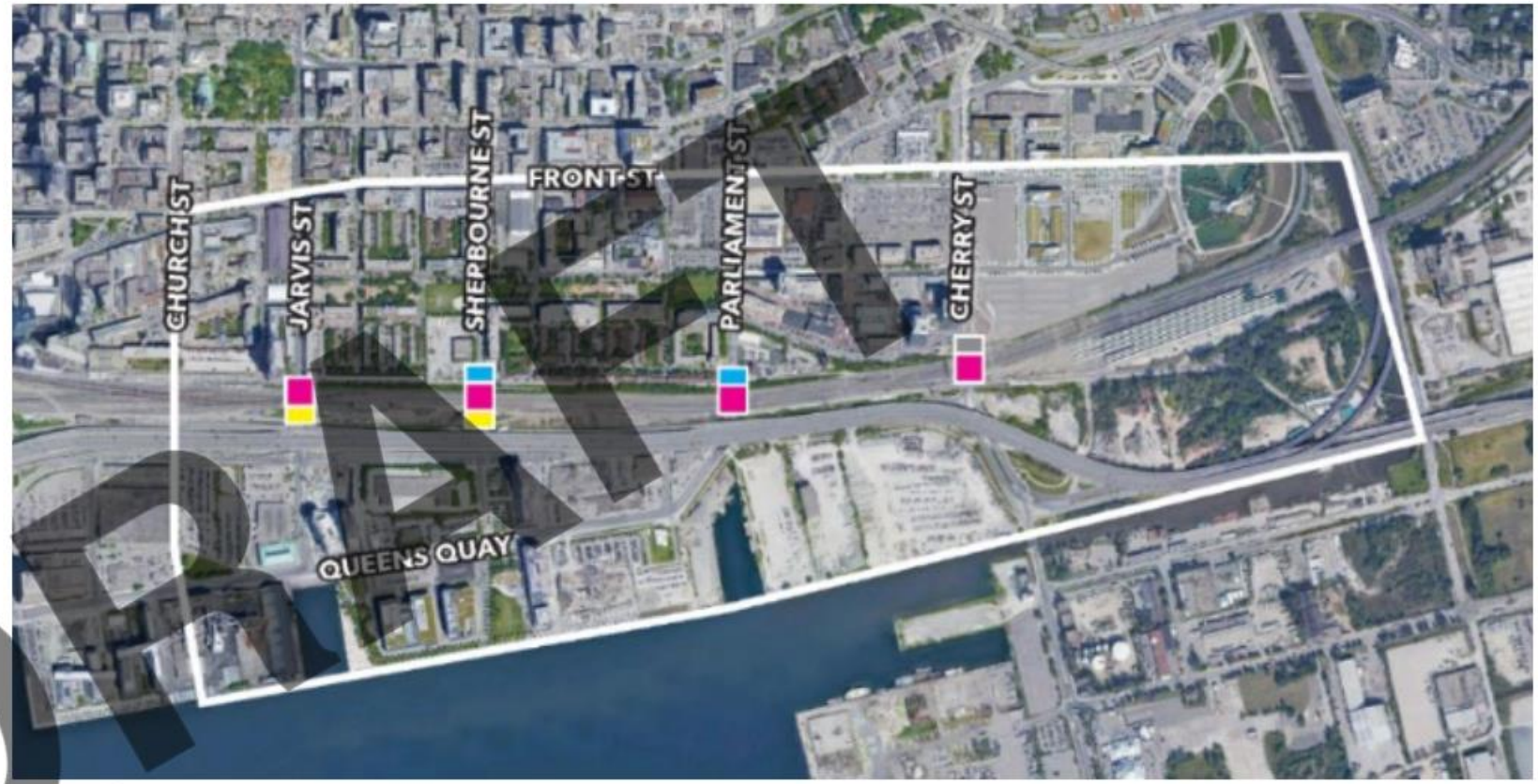
*TSS - Train Service Specifications for phases of GO Expansion

THE USRCE PEDESTRIAN & CYCLING CONNECTIVITY STUDY (PCCS)

The PCCS Scope

- The PCCS will recommend options for north-south pedestrian and cycling connectivity improvements across USRC East for **after the Early Works are completed** (beyond 2023)
- The study will inform future work to be consulted on and developed in greater detail at a later date
- Materials developed will also assist in future partnership and funding discussions
- Elements identified within the study are being protected for in the Early Works



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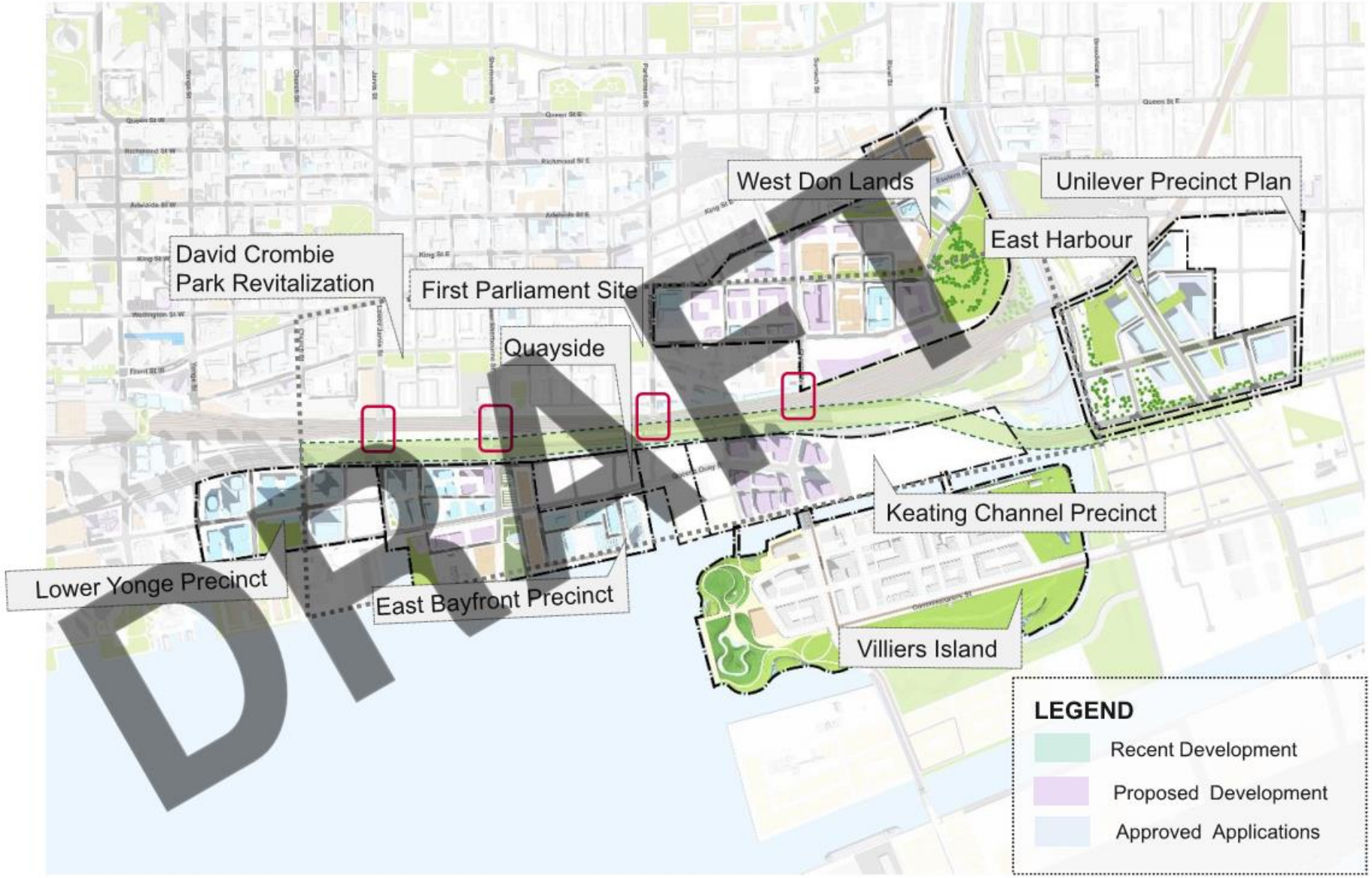
*TSS - Train Service Specifications for phases of GO Expansion

BIG PLANS ARE DELIVERING SIGNIFICANT GROWTH AND DEVELOPMENT

Together, these planned initiatives anticipate tremendous growth, including:

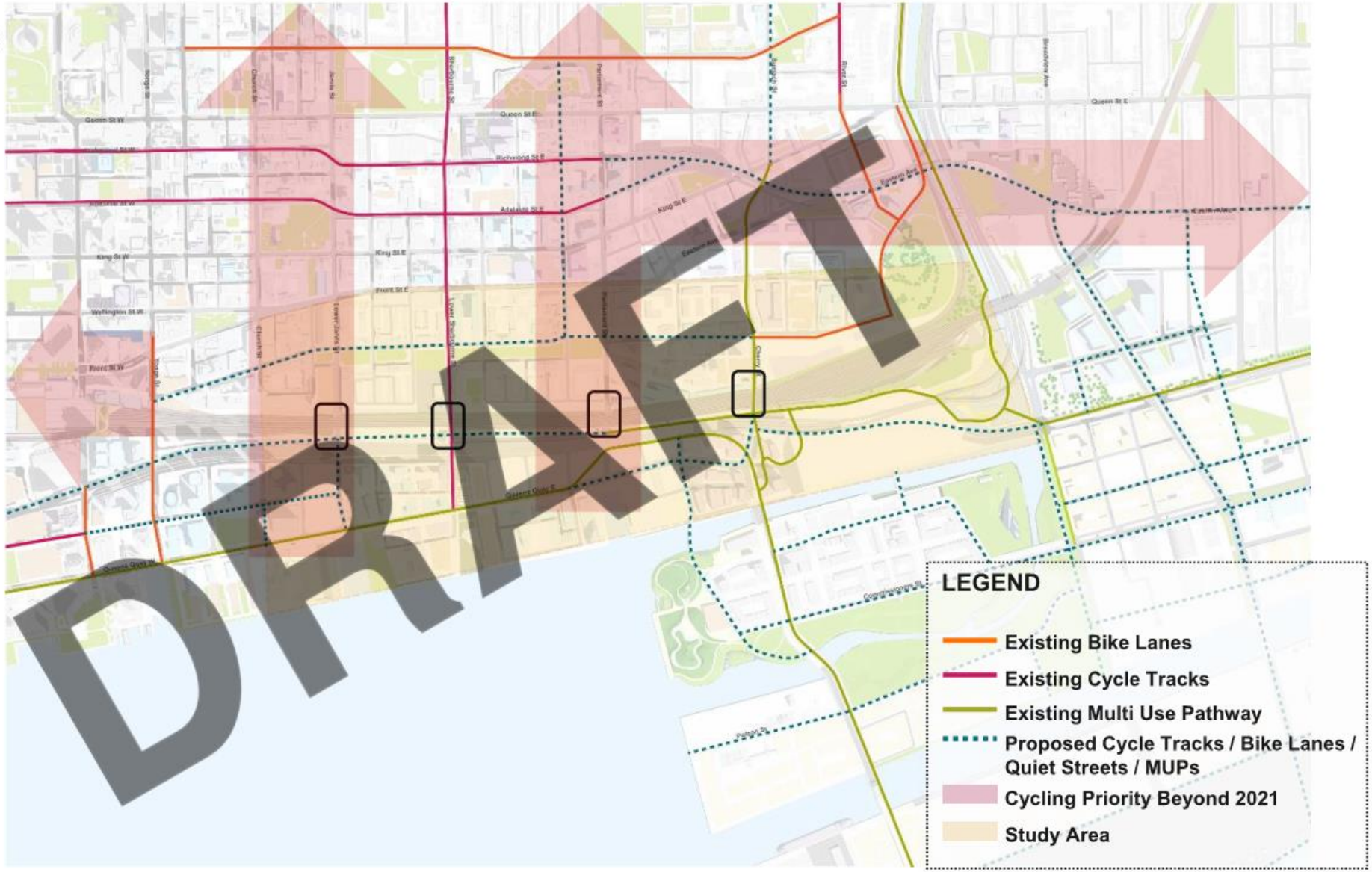
- 30,000 residential units
- 50,000 residents
- Nearly 2 million sm non-residential space
- Over 80,000 jobs



MAJOR INFRASTRUCTURE IMPROVEMENTS ARE COMING TO THE AREA

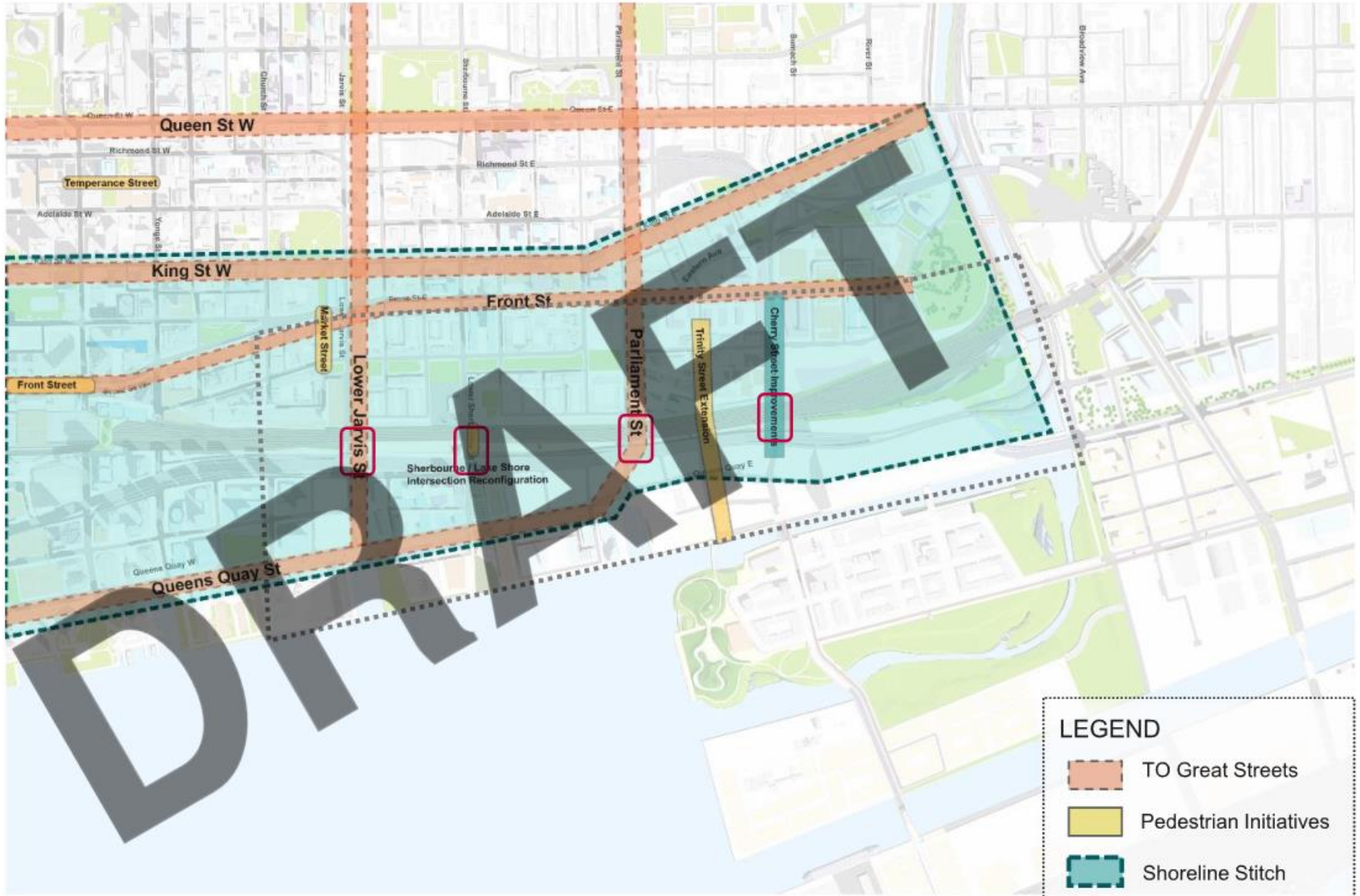
Consideration for how the pedestrian and cycling improvements can align with area infrastructure improvements is required.

THE STUDY AREA NEEDS CONNECTIONS TO THE BROADER CYCLING NETWORK



IMPROVED CONNECTIONS ARE AN IMPORTANT PART OF THE CITY'S PLAN FOR THE DOWNTOWN.

Jarvis and Parliament are Great Streets. Great Streets have city-wide and civic importance with a diverse character that conveys Toronto's public image to the world and sets the stage for festivals, parades, and civic life. They are to be prioritized for public realm improvements.



Identifying Improvements

TOOLKIT OF IMPROVEMENTS

NON-STRUCTURAL OPTIONS

1 UNDERPASS IMPROVEMENTS

2 PUBLIC REALM IMPROVEMENTS

3 STREET DESIGN

4 LATERAL CONNECTIONS

STRUCTURAL OPTIONS

5 TEAMWAY WITHIN EXISTING UNDERPASS

6 NEW TUNNEL ADJACENT TO UNDERPASS

7 NEW MID-BLOCK TUNNEL

8 RAIL BRIDGE RECONSTRUCTION

Evaluation Framework

THEME 1: CONNECTIVITY

Cycling and walking should be **convenient means of crossing** the Union Station Rail Corridor East and **connecting to destinations** on either side.

Compared to the base condition, does the option:

- Provide more direct access across the rail corridor and to key destinations?
- Reduce grade changes for those crossing the rail corridor?
- Increase capacity for existing and future pedestrians and cyclists?
- Provide benefit for existing and planned transit?
- Contribute to optimally serving the needs of all transportation modes across the study area?

THEME 2: PLACE-MAKING

The design of spaces for pedestrians and cyclists should be **comfortable and enjoyable** while providing benefit to the surrounding environment.

Compared to the base condition, does the option:

- Improve the quality of experience for those crossing the corridor?
- Support comfortable noise levels in the impacted spaces?
- Mitigate the visual barrier effect of the rail corridor?
- Provide landscape elements that support ecological functions?
- Have a positive impact on heritage properties?

THEME 3: SAFETY

Streets and public spaces should be designed to be safe and **should feel safe** for all users regardless of age or ability.

Compared to the base condition, does the option:

- Minimize conflicts to improve safety for all road users, including between vehicles, cyclists, and pedestrians?
- Reduce the likelihood of crime using natural surveillance and the principles of CPTED (Crime Prevention Through Environmental Design)?
- Increase or mitigate the risk of flooding?

THEME 4: CITY-BUILDING

Recommendations should **be strategically situated**, responding to existing and planned conditions and fulfilling planning objectives.

Compared to the base condition, does the option:

- Align with existing plans or policy?
- Implement infrastructure plans?
- Respond to the challenges and opportunities identified in the background review?
- Impact socio-economic equity considerations for different groups of people?
- Require a construction process that will significantly disrupt other modes or adjacent users and residents?

THEME 5: FINANCIAL

Resources should be used as **efficiently** as possible to **achieve the stated objective.**

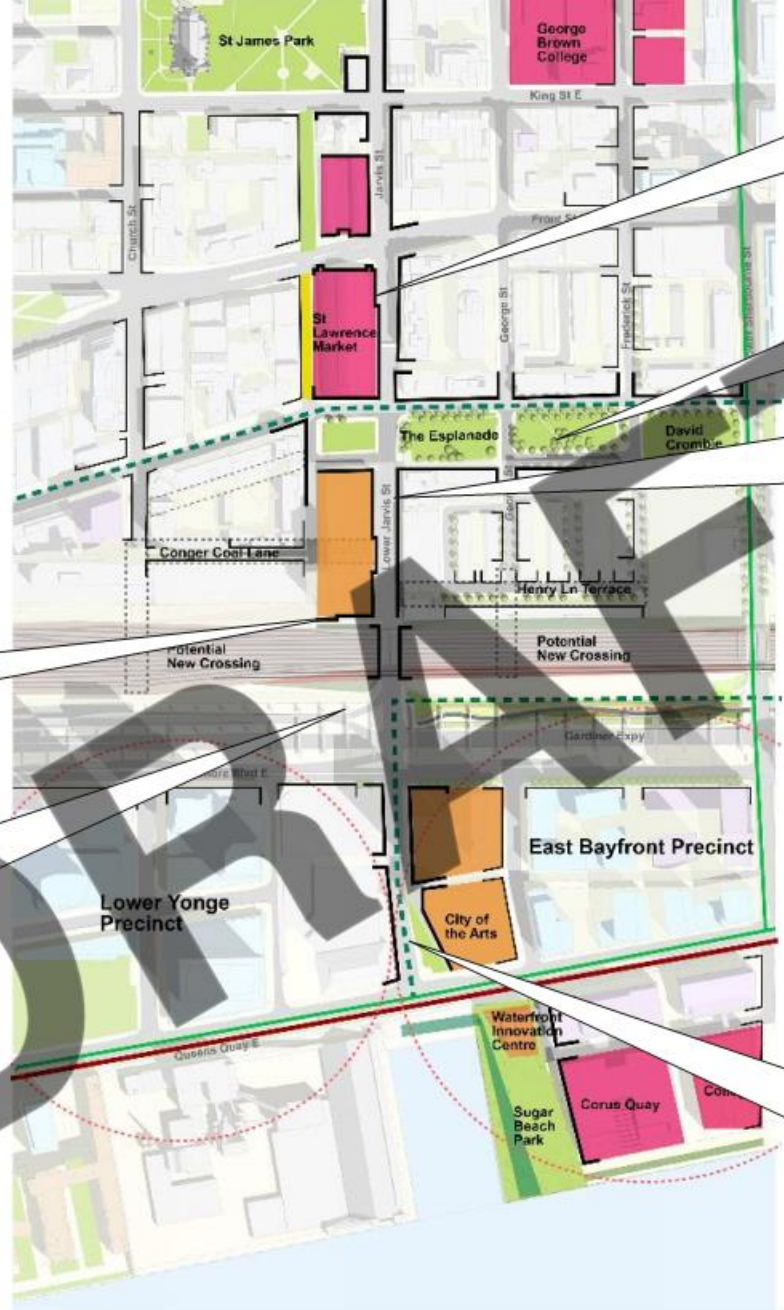
Compared to the other options, does the option:

- Optimize the useful life of existing infrastructure in terms of its structural integrity?
- Require property acquisition?
- Have low, moderate, or high estimated life-cycle costs?
- Have greater or fewer risks or impacts that could add additional costs?
- Have expected throwaway costs associated with bridge reconstruction, or maintenance costs to keep the existing bridge operational?
- Have potential to be delivered or funded as part of adjacent or parallel initiatives?

Evaluation Approach

Step 1:

Understanding the structural opportunities within the broader context of potential corridor improvements which together will build out the network.



Large volumes of traffic create an unfriendly pedestrian/cycling environment

Plans for improving David Crombie Park and reconsidering the role of The Esplanade

Leverage street parking and wider sidewalk areas to enhance the pedestrian environment, while supporting the image and liveliness of the street

Development adjacent to the corridor may restrict potential for new connections

High levels of traffic at the Jarvis on ramp and corridor access may create conflicts for pedestrians / cyclists

Shift proposed bike lanes to the east side to create a protected multi-use path

Evaluation Approach

Step 2: Assess the benefits

- 4 Themes (Connectivity, Place-Making, Safety, City-Building)
- Given a score based on the degree of benefit over the base case (the do-nothing condition)

Step 3: Assess the costs

- Financial theme, with five criteria
- Given a score based on degree of costs against the range of options
- Criteria weighted to reflect likely impact on overall project costs over the long term

Weighted Criteria:

50%	Have low, moderate, or high estimated life-cycle costs?
20%	Optimize the useful life of existing infrastructure?
10%	Require property acquisition?
10%	Have greater or fewer risks or impacts that could add additional costs?
10%	Have expected throwaway costs associated with bridge reconstruction, or maintenance costs to keep the existing bridge operational?

Step 4: Select preferred structural options

Compare the benefits and costs to determine the preferred structural options across the corridor.

STRUCTURAL IMPROVEMENTS: Jarvis Corridor

Church-Cooper Tunnel
- Benefits all users
- Reduces Jarvis Street traffic load

Jarvis East Teamway*
- Remove east side parking to add cycling and pedestrian facility from The Esplanade to Queens Quay*
- Avoids west side merge lane to Gardiner

Jarvis Dependent on:			Connectivity	Place-Making	Safety	City-Building	Total Benefit	Financial Cost
#8 Rail Bridge Reconstruction	Reconstruction	Cycle tracks from QQ to The Esp.	1.5	2	2	1.5	7	-3
#7 Mid-Block Tunnel	Church-Cooper Tunnel 1 (full)	New crossing at Lakeshore, cycle tracks QQ to The Esp.	2	2	2	2	8	-3
	George-Richardson Tunnel		1	0.5	0.5	0.5	2.5	-2
#6 Tunnel Adjacent to Underpass	West Tunnel - no space							
	East Tunnel - no space							
#5 Teamway	West Teamway	West side cycle tracks from QQ to The Esp.	0.5	0.5	1	1	3	-2
	East Teamway	East side cycle tracks from QQ to The Esp.	1.5	2	2	2	7.5	-2
	Dual Teamways	Cycle tracks from QQ to The Esp.	1.5	2	2	1.5	7	-3

METROLINX *Desired cycling connection, under review.

EVALUATION OF EARLY BRIDGE RECONSTRUCTION

- Reconstruction is recognized as a long-term option along each of the corridors however the input from Metrolinx and experience on other corridors suggests that the current structures could be maintained indefinitely (at least 40 years)
- The benefits of reconstructed structures were assessed alongside the rest of the toolbox of structural improvements for each of the corridors
- In almost all cases **a reconstructed underpass delivered the greatest amount of benefit** against the evaluation criteria
- However, along every corridor **structural improvements (tunnels or teamways not requiring the full reconstruction of the bridge) were able to deliver comparable levels of benefit at significantly reduced cost** of constructability. This is a result of factors that would diminish the benefit of full reconstruction such as existing street configuration, ability to connect with existing/planned cycling networks and the adjacency of existing and planned development.

LADDER OF NORTH- SOUTH CONNECTIVITY

Implementing the highest scoring structural improvements from the evaluation would result in a ladder of north-south pedestrian and cycling connectivity comprised of improved underpasses, new teamways and tunnels.

*Desired cycling connection, under review.

A SERIES OF EAST-WEST CORRIDORS

The ladder would compliment a series of existing and emerging east-west connections along the corridor.

*Desired cycling connection, under review.

NEIGHBOURHOOD LOOP LINKING KEY DESTINATIONS

The grid of connectivity improvements together with the existing and emerging open space network would help to link key destinations throughout the study area.

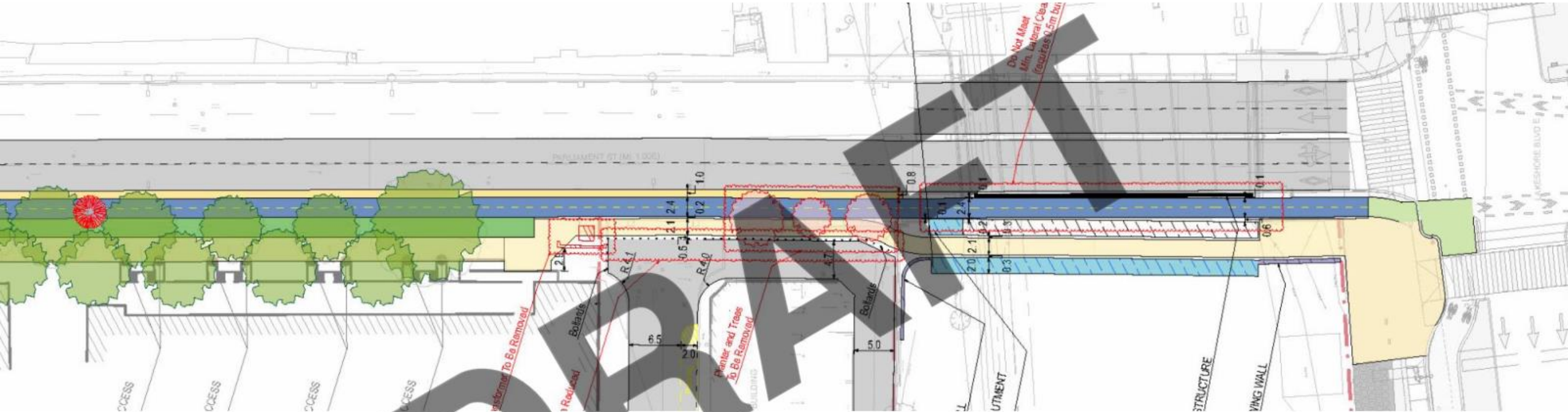
*Desired cycling connection, under review.

A FRAMEWORK FOR IMPROVED PEDESTRIAN AND CYCLING CONNECTIVITY

METROLINX *Desired cycling connection, under review.

Testing Structural Improvements

IDENTIFIED STRUCTURAL IMPROVEMENTS UNDERWENT A SPACE PROOFING EXERCISE TO IDENTIFY TECHNICAL CONSIDERATIONS AND CHALLENGES



Cost estimate: $30-35 million

East laneway: Reduced to 4.7m

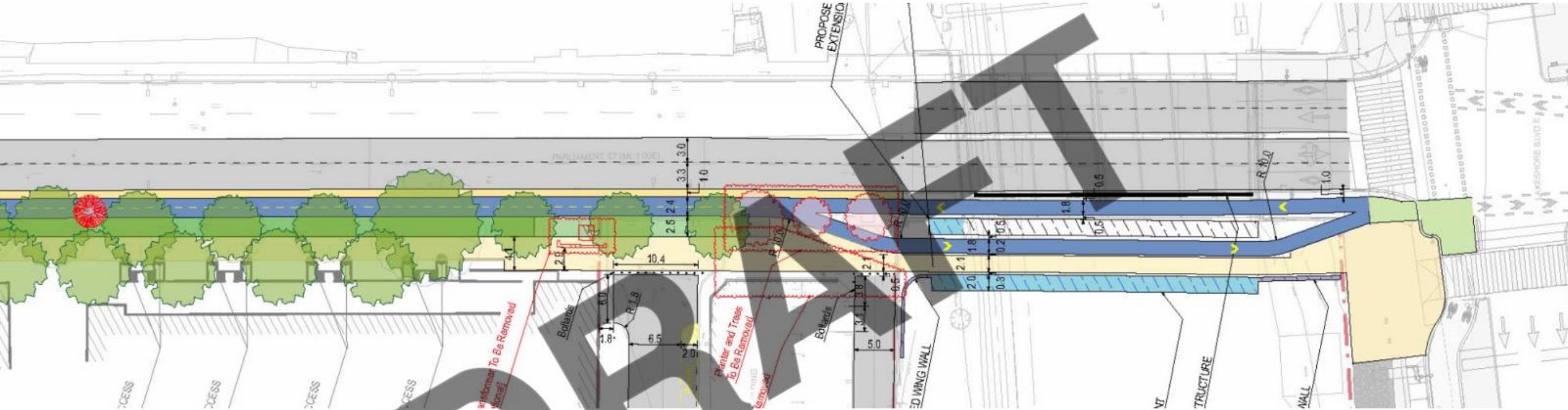
Strengths:

- Least impact on laneway of the Parliament Street Options
- Most intuitive cycle track configuration

Weaknesses:

- Cycle track buffers from walls in underpass (sub-standard)
  - Total 0.1m width instead of 0.5m

PROPOSED STRUCTURAL IMPROVEMENTS UNDERWENT A SPACE PROOFING EXERCISE TO IDENTIFY TECHNICAL CONSIDERATIONS AND CHALLENGES



Cost estimate: $30-35 million

East laneway: Closed

Strengths:

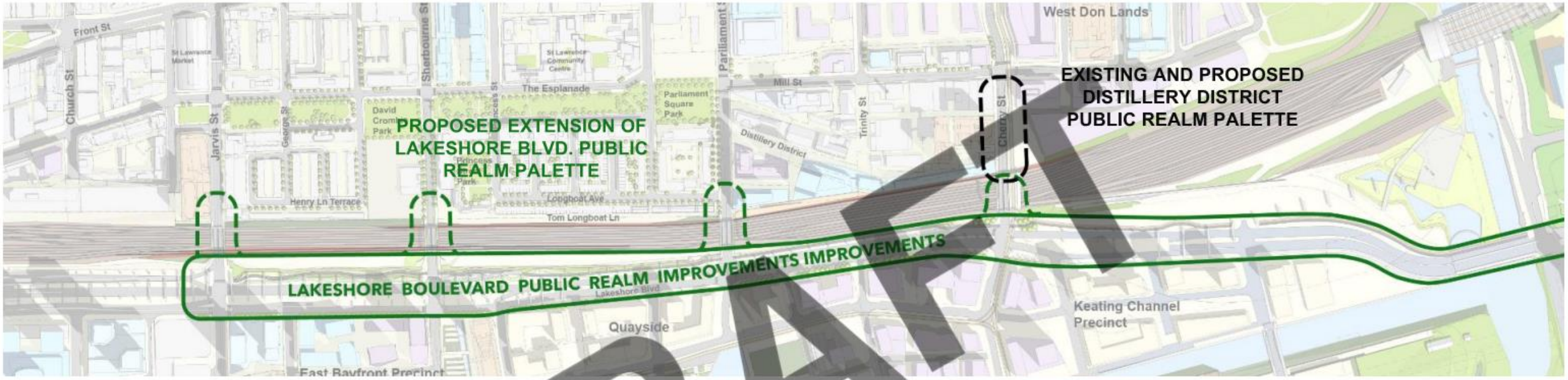
- Adequate cycle track width
- Intuitive pedestrian connection with opportunity for improved streetscape

Weaknesses:

- Results in the loss of the eastern access point to Tom Longboat Lane
- Substandard pedestrian clearway along the north side of Longboat Avenue

Non-Structural Improvements

PROPOSED PCCS DESIGN APPROACH



The proposed public realm strategy for the PCCS draws from planned improvements along Lake Shore Boulevard and extends them to the north side of the USRCE to stitch the two sides of the rail corridor together.

LAKE SHORE PALETTE

1. Saw cut concrete with coloured granite aggregate mix
2. Granite curb
3. Intermediate roll curb

PROPOSED PCCS DESIGN APPROACH

- In addition a recommendation is being made to focus underpass enhancements on three key elements:

1. Signature gateway signage

- Mark the connections
- Support wayfinding

1.

2. Integrated lighting and public art

- Emphasize pedestrian and cycling areas
- Reinforce the sense of movement/connection between the two sides of the corridor
- Create interest both day and night

2.

3. Textured concrete wing and retaining walls*

- Designed to provide interest at different scales
- Create connection between the underpass openings on either side of the corridor
- Should pick up on existing/planned waterfront themes

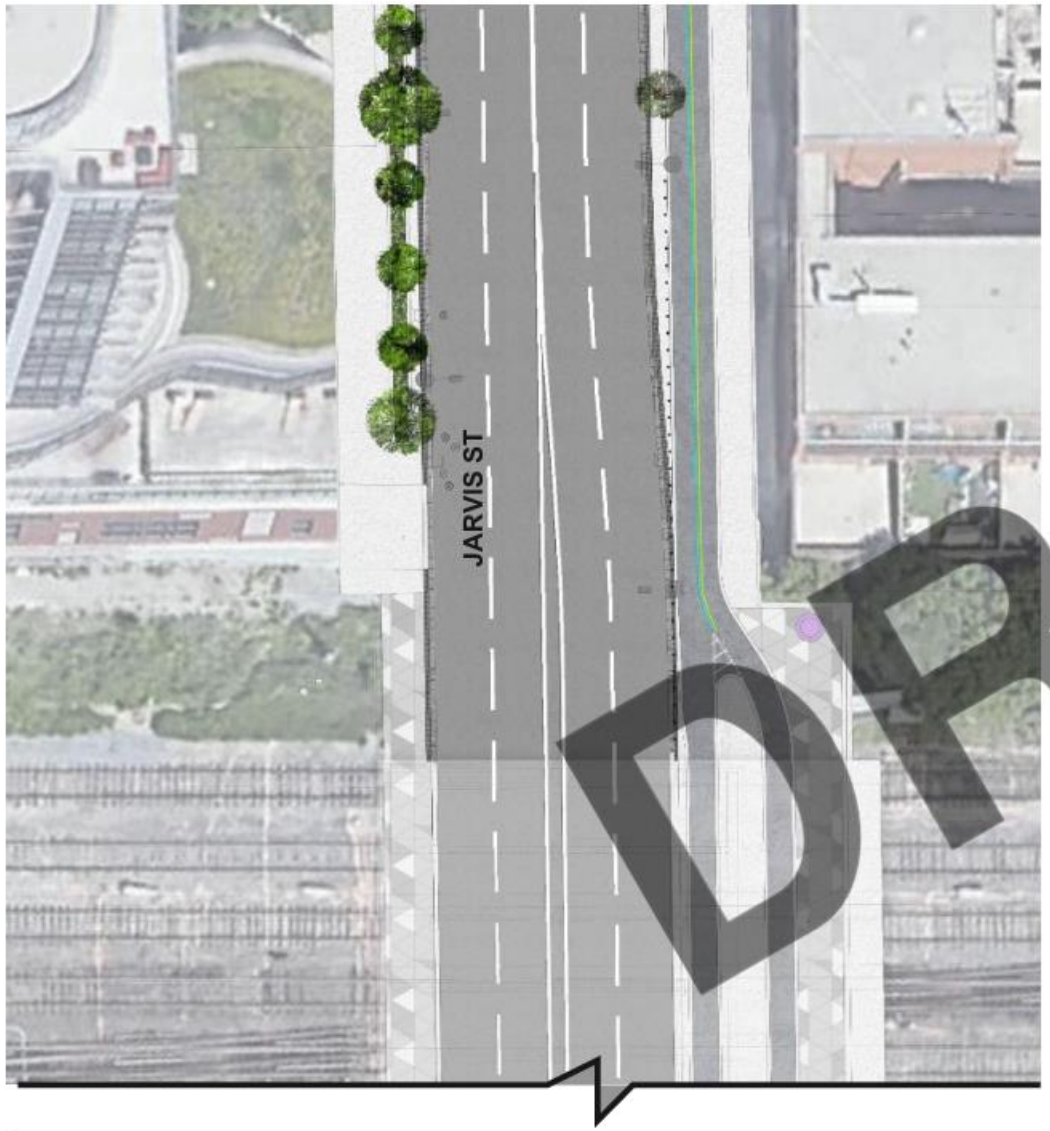
* Will need to be balanced against heritage considerations

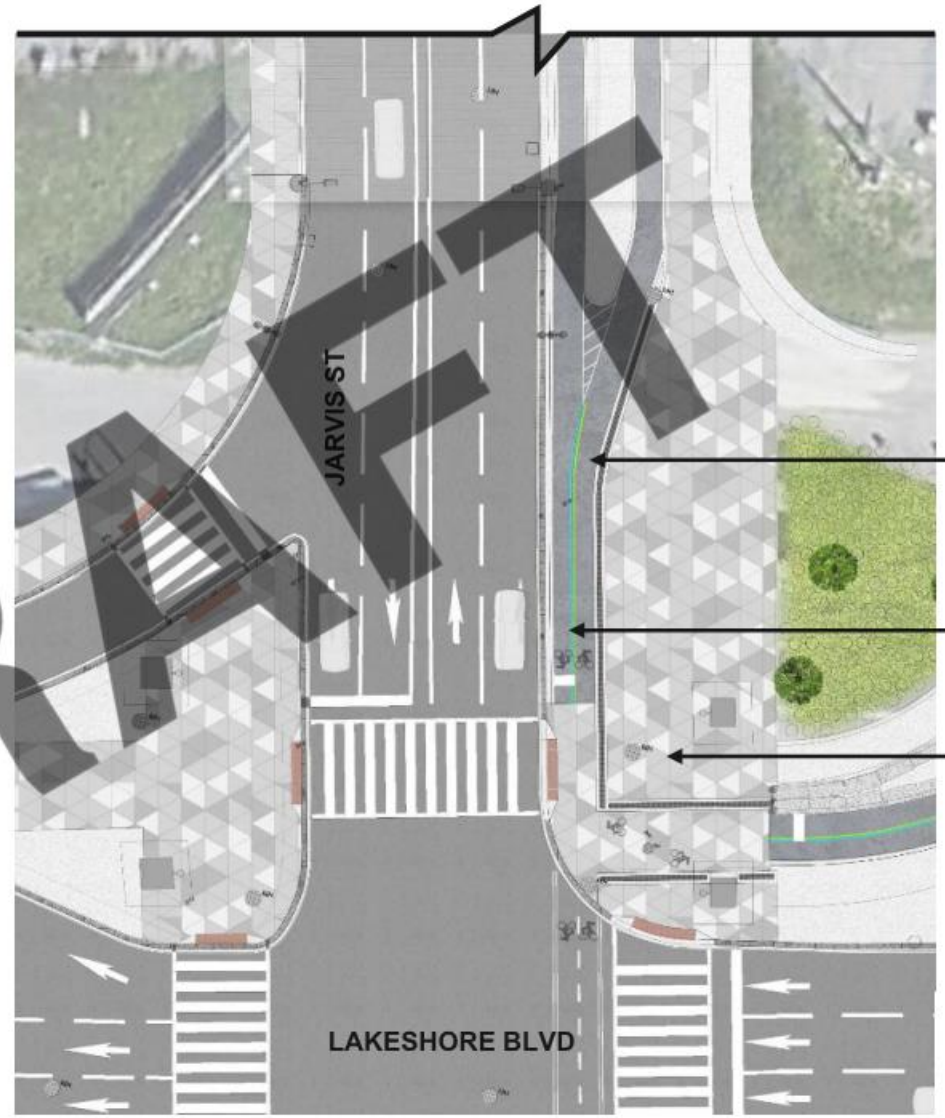
3.

- It is proposed that the bridge supports are maintained as simple black structural elements

JARVIS STREET: PLAN A1 – SPLIT CYCLE TRACK

Jarvis Options
- East Teamway A1
- East Teamway B
- Dual Teamways
- Church-Cooper Tunnel





Granite paver

Asphalt

Saw cut concrete

Perspectives were rendered to show aspects of select options

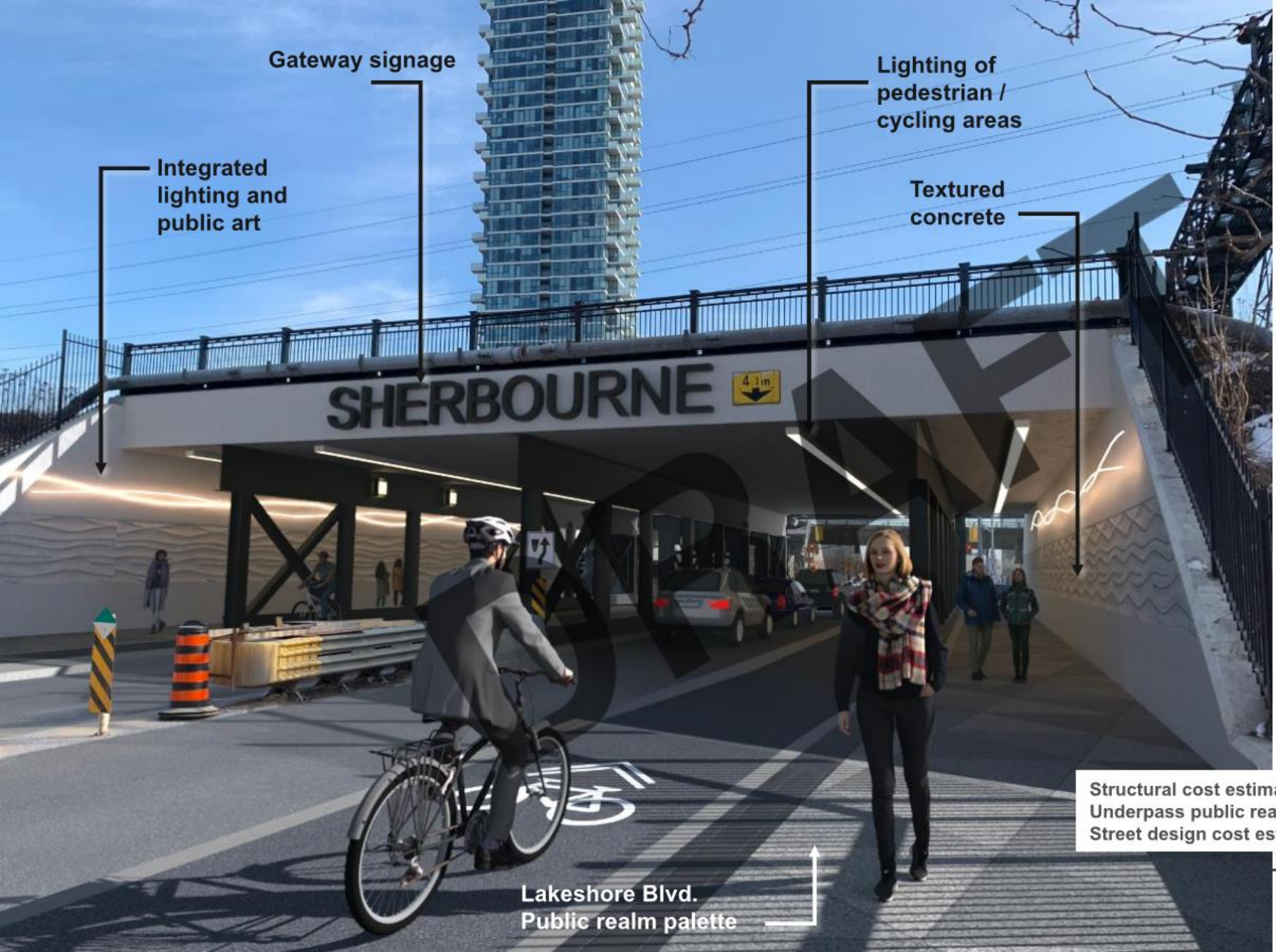
Example: Jarvis Street East Teamway Option A1

Structural cost estimate:	$44 million
Underpass public realm cost estimate:	$1.3 million
Street design cost estimate:	$3.1 million

Perspectives were rendered to show aspects of select options

Example: Jarvis Street East Teamway Option B

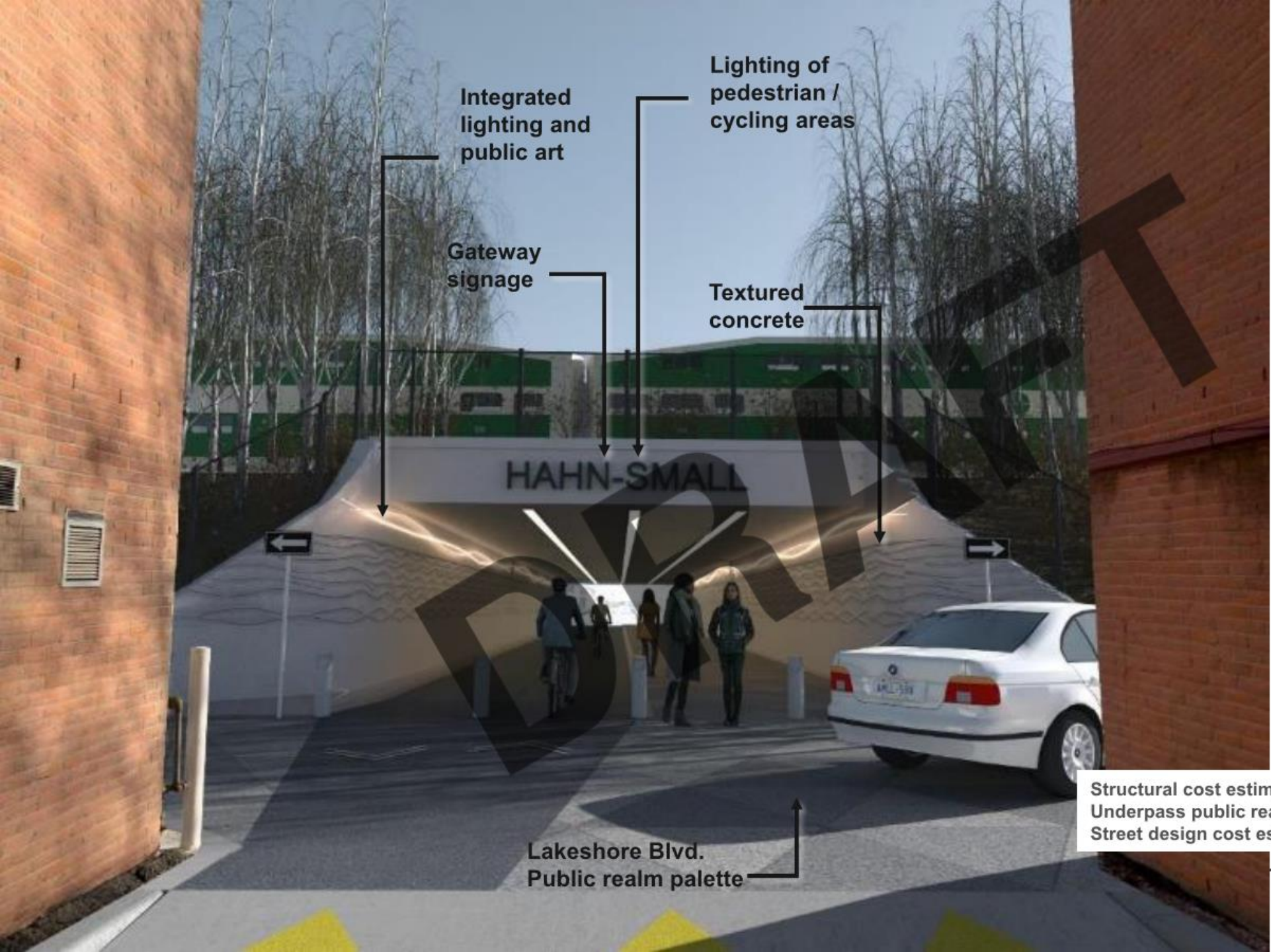
Structural cost estimate:	$44 million
Underpass public realm cost estimate:	$1.3 million
Street design cost estimate:	$3.1 million



Perspectives were rendered to show aspects of select options

Example:
Sherbourne Street non-structural improvements

Structural cost estimate:	$0
Underpass public realm cost estimate:	$1.1 million
Street design cost estimate:	$600,000



Perspectives were rendered to show aspects of select options

Example:
Hahn-Small Pedestrian and Cycling Tunnel

Structural cost estimate (8.7m clearway):	$22 million
Underpass public realm cost estimate:	$1.1 million
Street design cost estimate:	$500,000

Perspectives were rendered to show aspects of select options

Example:
Parliament Option B.2

Structural cost estimate:	$30-35 million
Underpass public realm cost estimate:	$1.4 million
Street design cost estimate:	$2.7 million

STRUCTURAL IMPROVEMENT RECOMENDATIONS

Corridor	Structural Improvement	Considered Location	Assessment
Jarvis	Early Bridge Reconstruction	Jarvis Reconstruction	Feasible
	Mid-Block Tunnel	Church-Cooper	Carried Forward
	Tunnel Adjacent to Underpass	George-Richardson	Feasible
		West	Not Feasible
		East	Not Feasible
	Teamway	West	Feasible
		East	**RECOMMENDED**
		Both	Carried Forward
Sherbourne	Early Bridge Reconstruction	Sherbourne Reconstruction	Feasible
	Mid-Block Tunnel	Princess	Feasible
	Tunnel Adjacent to Underpass	West	Not Feasible
		East	Feasible
	Teamway	West	Feasible
		East	Feasible
		Both	Feasible
Parliament	Early Bridge Reconstruction	Parliament Reconstruction	Feasible
	Mid-Block Tunnel	Hahn-Small	Carried Forward
	Tunnel Adjacent to Underpass	West	Feasible
		East	Not Feasible
	Teamway	West	**RECOMMENDED**
		East	Feasible
		Both	Feasible
Cherry	Early Bridge Reconstruction	Cherry Reconstruction/LRT*	**RECOMMENDED**
	Mid-Block Tunnel	Trinity	**RECOMMENDED**
	Tunnel Adjacent to Underpass	West	Not Feasible
		East	Not Feasible
	Teamway	West	Not Feasible
		East	Not Feasible
		Both	Not Feasible

FINAL RECOMENDATION

Recommended Structural and Non Structural Improvements
1. Construct an east pedestrian teamway and convert the existing east pedway to a bi-directional cycle track extending from The Esplanade to Queens Quay on the east side of Jarvis. 2. Protect for Church-Cooper tunnel
1. Upgrade the public realm within the underpass with improved lighting, materials, paving and flexi-posts if possible.
1. Convert the outer lanes of Parliament into cycle tracks pending traffic impact study • As an alternative to above, construct a west pedestrian teamway and convert the existing west pedway to a bi-directional cycle track extending from Parliament Sq. Park to Queens Quay on the west side of Parliament.
1. Construct a Trinity Walk/Bike Tunnel 2. Construct the planned Cherry LRT tunnel and upgrade the public realm within the existing Cherry underpass with improved lighting, materials, paving and flexi-posts if possible.

*During the PCCS, plans to reconstruct Cherry with an extended LRT were changed to include a new LRT tunnel adjacent to Cherry but without reconstructing the existing underpass.

Next Steps

NEXT STEPS

Summer 2020

- Compile DRP feedback and community comments
- Draft Final Report
- Present to TAC and Finalize Final Report


METROLINX
DRAFT