

# Union Station Rail Corridor (USRC) Underpasses

Schematic Design

March 25<sup>th</sup>, 2020

# Site Context

## Union Station Rail Corridor (USRC) Underpasses

Proponent: Metrolinx

Design Team: IBI

Review Stage: Schematic Design



**Design Review Area**  
**Union Station Rail Corridor (USRC) Underpasses**

### Removing Barriers / Making Connections

A1) Redesigning the Gardiner Corridor

A2) An extended Waterfront LRT line will stretch...from Exhibiton Place to the Port Lands...

A3) Lake Shore Boulevard will be transformed into an urban avenue...

P7) High quality urban design and landscaping on the north/south connector streets

P8) Railway underpasses will be transformed into more pedestrian-friendly corridors

### Promoting a Clean and Green Environment

P21) Pedestrian and cycling routes will be safe, attractive, comfortable and generously landscaped

# RAISED USRC BERM & GARDINER ACT AS SIDE-BY-SIDE BARRIERS ON THE EAST END RAIL UNDERPASSES ARE THE GATEWAYS TO THE WATERFRONT

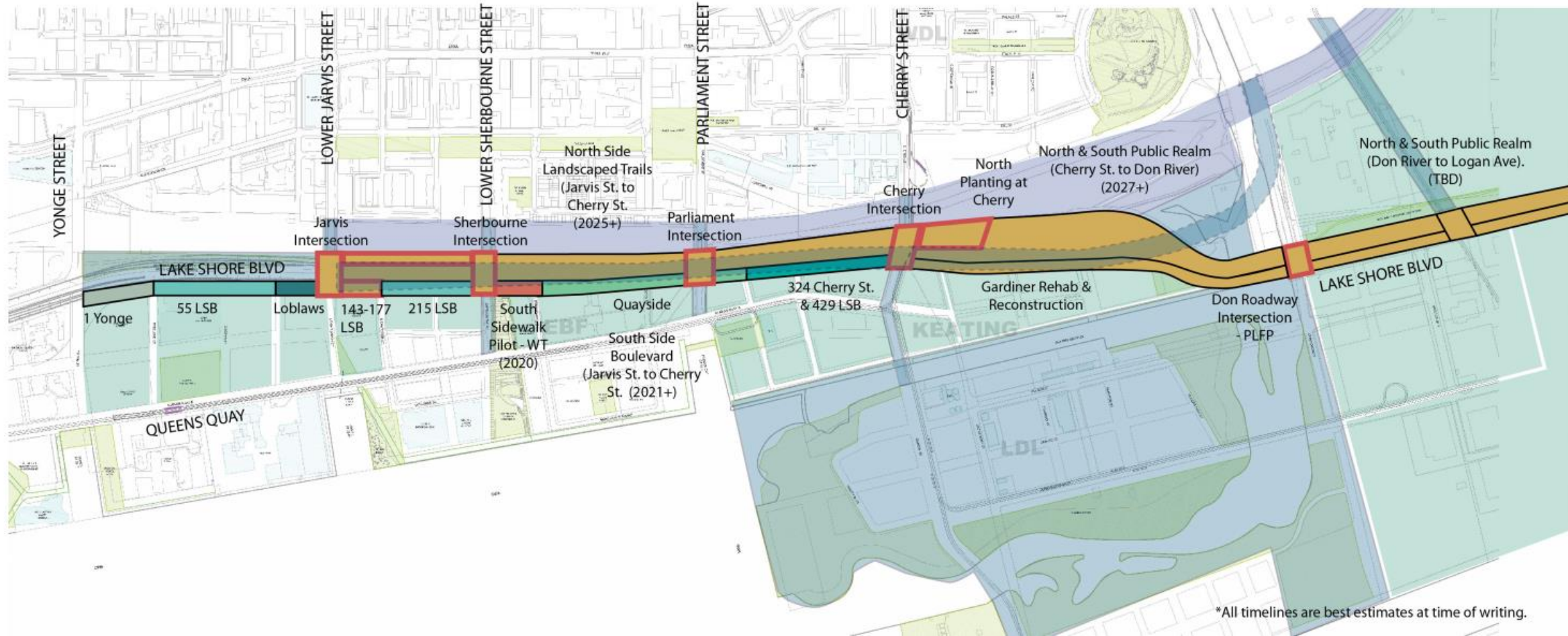


# ADJACENCIES & COORDINATION

## LEGEND

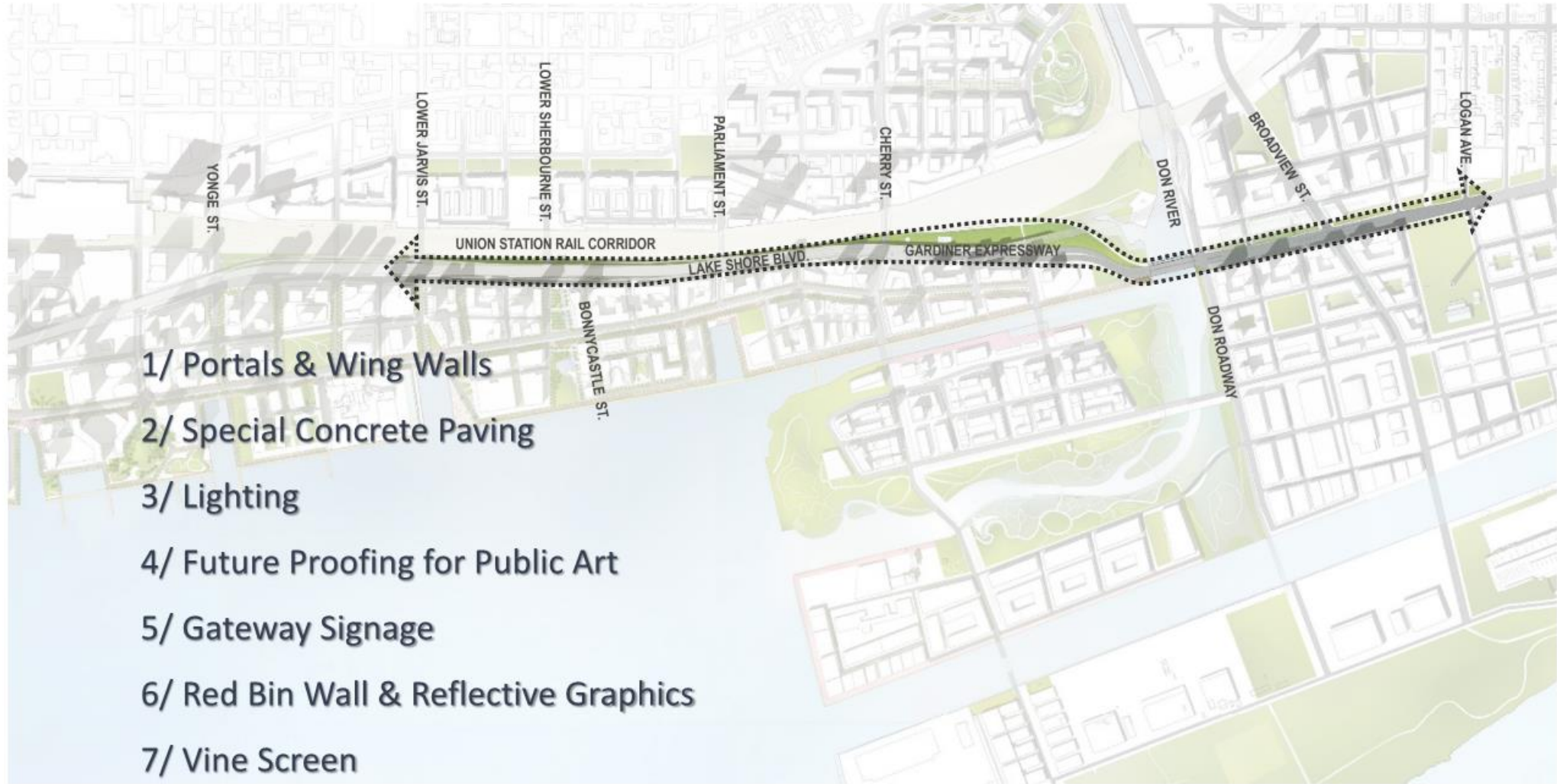
- |                                                                                   |                         |                                                                                   |                                   |
|-----------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------|
|  | Lake Shore Public Realm |  | Metrolinx Projects                |
|  | Quick Start Projects    |  | City / WT Infrastructure Projects |
|  | Pilot Project           |  | Private Development               |
|  | Development Frontages   |                                                                                   |                                   |

**Projects to be Coordinated:**  
 USRC East Enhancements, Wilson Yard  
 Lake Shore Public Realm  
 Gardiner Rehab & Reconstruction  
 Port Lands Flood Protection  
 Sediment & Debris Management Area



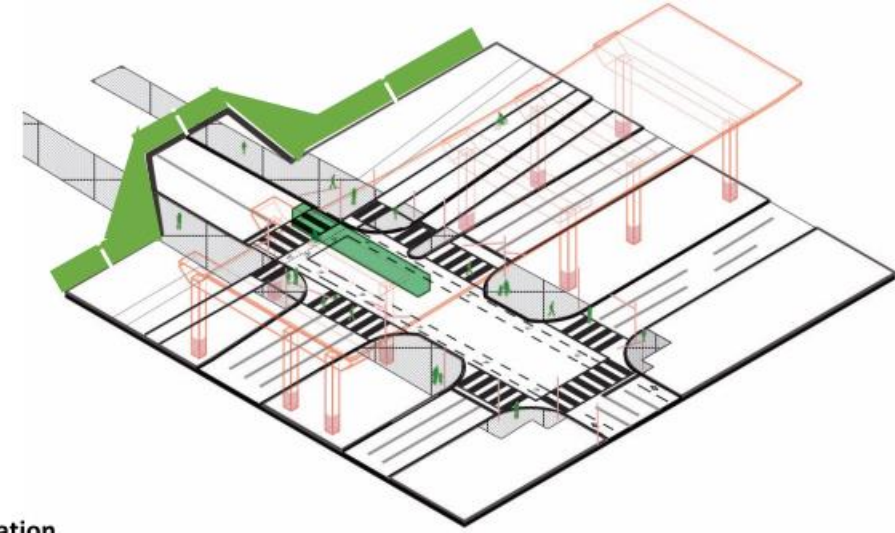
\*All timelines are best estimates at time of writing.

# OPPORTUNITIES FOR COORDINATION WITH ELEMENTS FROM LAKE SHORE PUBLIC REALM:



- 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

# 1/ PORTALS & WING WALLS



REFERENCE IMAGES: TEXTURED CONCRETE



Birch Bark inspiration



Montreal Bonaventure Expressway at Lachine Canal  
Retaining wall and underpass patterned concrete

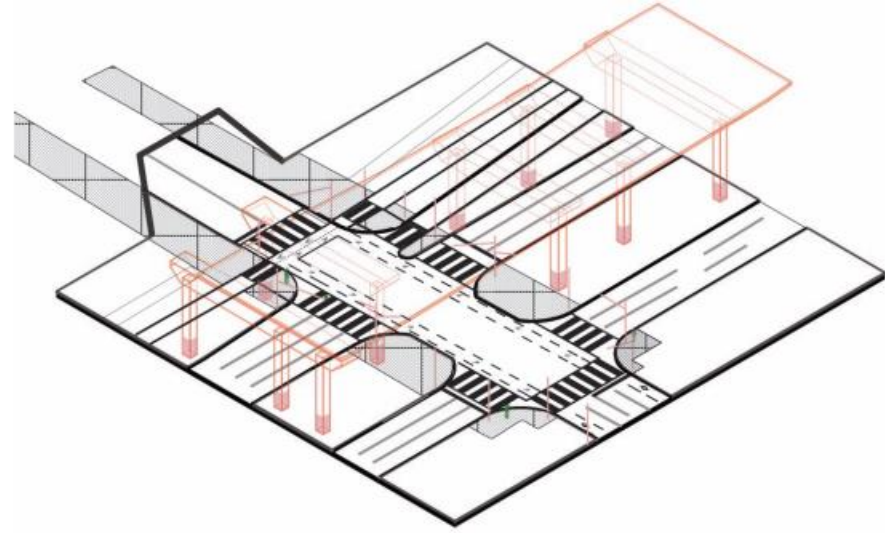


Route du Soleil  
Textural concrete part of a linear narrative



Amsterdam Centraal station  
Architectural concrete mouth, delight of the mural on the inside

## 2/ SPECIAL CONCRETE PAVING



### DESIGN STRATEGY: SPECIAL PAVING FINISH AT CORNERS AND MEDIANS



LIGHT  
SANDBLAST  
FINISH



BROOM FINISH  
ONE  
DIRECTION  
(CITY OF  
TORONTO  
STANDARD)



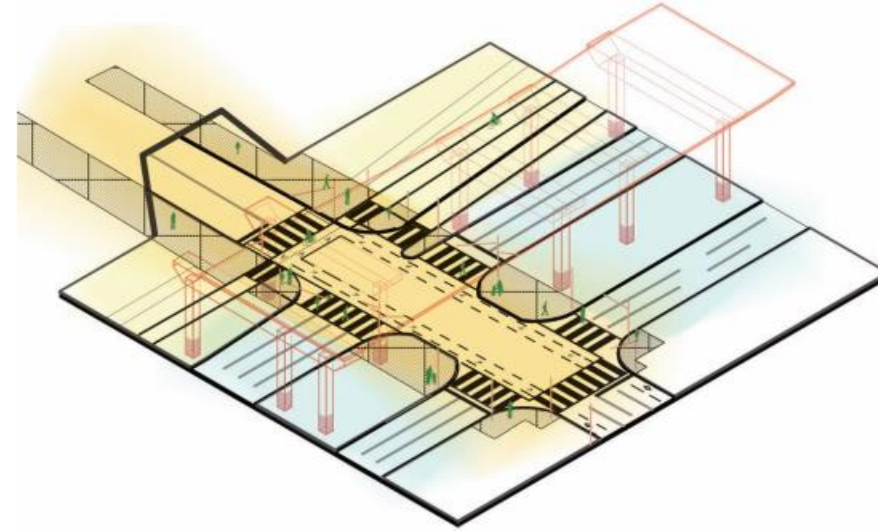
BROOM  
FINISH  
OPPOSITE  
DIRECTION





Reference Image:  
Yonge Street,  
Stabilized pebble  
edge adjacent to  
pedestrian waiting  
areas at medians



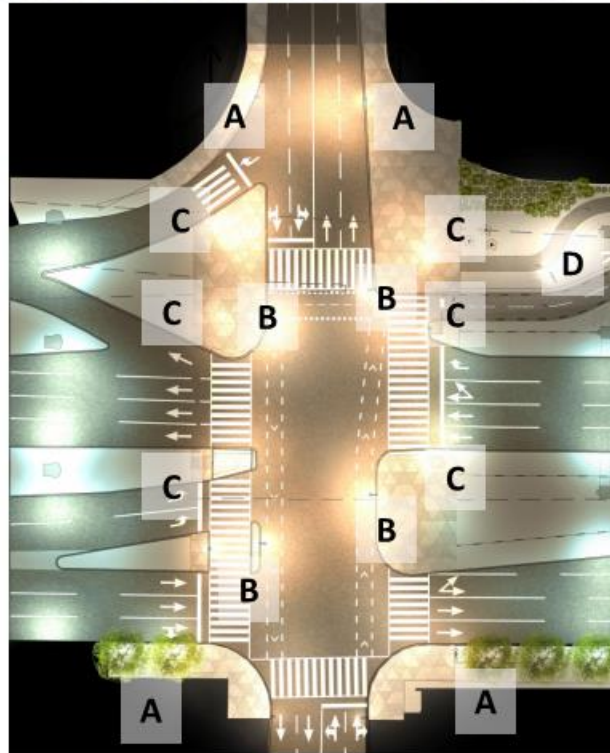
# 3/ LIGHTING



## DESIGN STRATEGY: WARM COLOUR TEMPERATURE AT INTERSECTIONS

-  Colour temperature 3500K throughout E-W corridor (cooler)
-  Colour temperature 2800K at intersections (warmer)

\*\* lighting levels need to be verified in future phases by electrical engineer



## LIGHTING FIXTURES NXT SERIES



A+B – Road Lighting



D – North Side Trail

## LEOTEK Esata™ LED Wall Sconce ES1

Technical specifications for the Esata™ LED Wall Sconce ES1, including dimensions and weight.



C – Bent mounted pedestrian lighting

## 4/ FUTURE PROOFING FOR PUBLIC ART



- Electrical infrastructure
- Data infrastructure
- Enough safety lighting to meet requirements and minimize conflict with future art
- Clean, neutral surfaces with minimum cosmetic treatment
- Paint & repair underpass interiors

## 5/ GATEWAY SIGNAGE



Construction  
engineering  
principle

Collage style  
graphic  
ornamentation,  
Fonts, word art



# 6/ RED BIN WALL & REFLECTIVE GRAPHICS

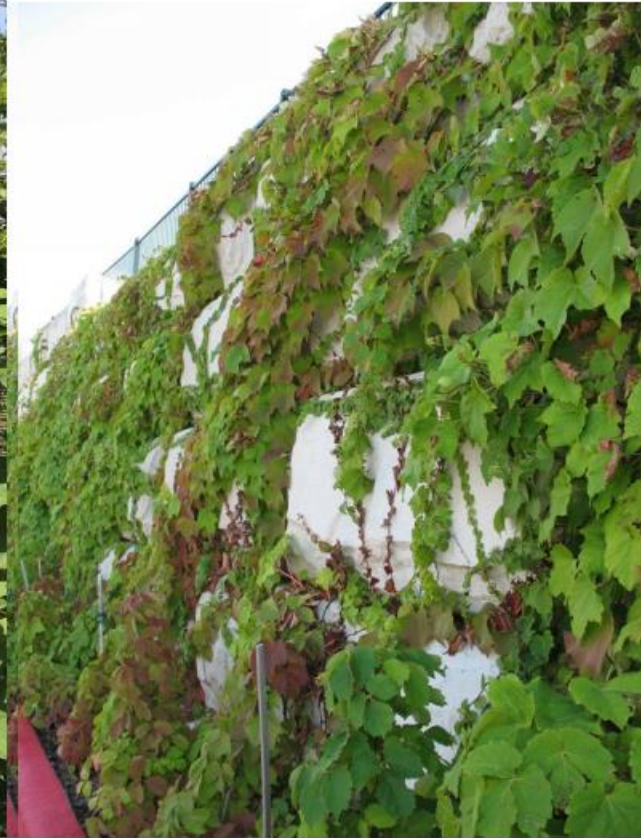


**DESIGN STRATEGY: BENT SOCKS AND NUMBERS**

## 7/ VINE SCREEN



West Toronto Rail Path along rail line



Transform the existing bin walls with their opportunistic greenery into an intentionally green interface with vines that can be cut back when necessary for maintenance access.

# 8/ PLANTING STRATEGY – MANAGED SUCCESSION

## BIRCHES AND WILDFLOWER MEADOW



*Betula papyrifera*

White Birch

- ✓ Salt spray tolerant
- ✓ Moderate to high salt soil tolerance
- ✓ Height: 20m
- ✓ Width: 15m
- ✓ Full sun
- ✓ Moist to dry sandy or loamy soil



*Betula populifolia*

Grey Birch

- ✓ Salt spray tolerant
- ✓ Moderate salt soil tolerance
- ✓ Height: 6-12m
- ✓ Width: 3-6m
- ✓ Full sun
- Moist, well drained soil



Groundcover planting

Native Ontario Wildflower

Seed/Plug Mix

Examples:

*Brown eyed susan*

*Butterfly weed*

*Common milkweed*

*Upland White Aster*

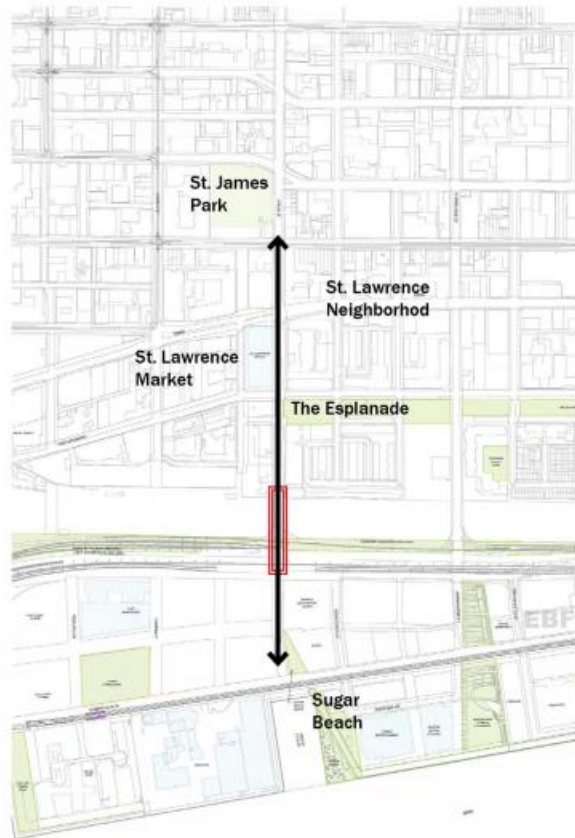
*Goldenrod*

*Virginia Mountain Mint*

*Verbena*

# JARVIS UNDERPASS

CONSIDERATIONS: Heavy traffic street, Gardiner onramp on West Side, TO Core Great Street, Potential future Teamway and cycle track on East Side



Connections

## JARVIS ST. UNDERPASS CONTEXT

### 5. EXISTING CONDITIONS



# SHERBOURNE UNDERPASS

CONSIDERATIONS: Cycling Route, Parks Connector, Quieter street 1 lane each direction, Potential future HONI bridge



Connections

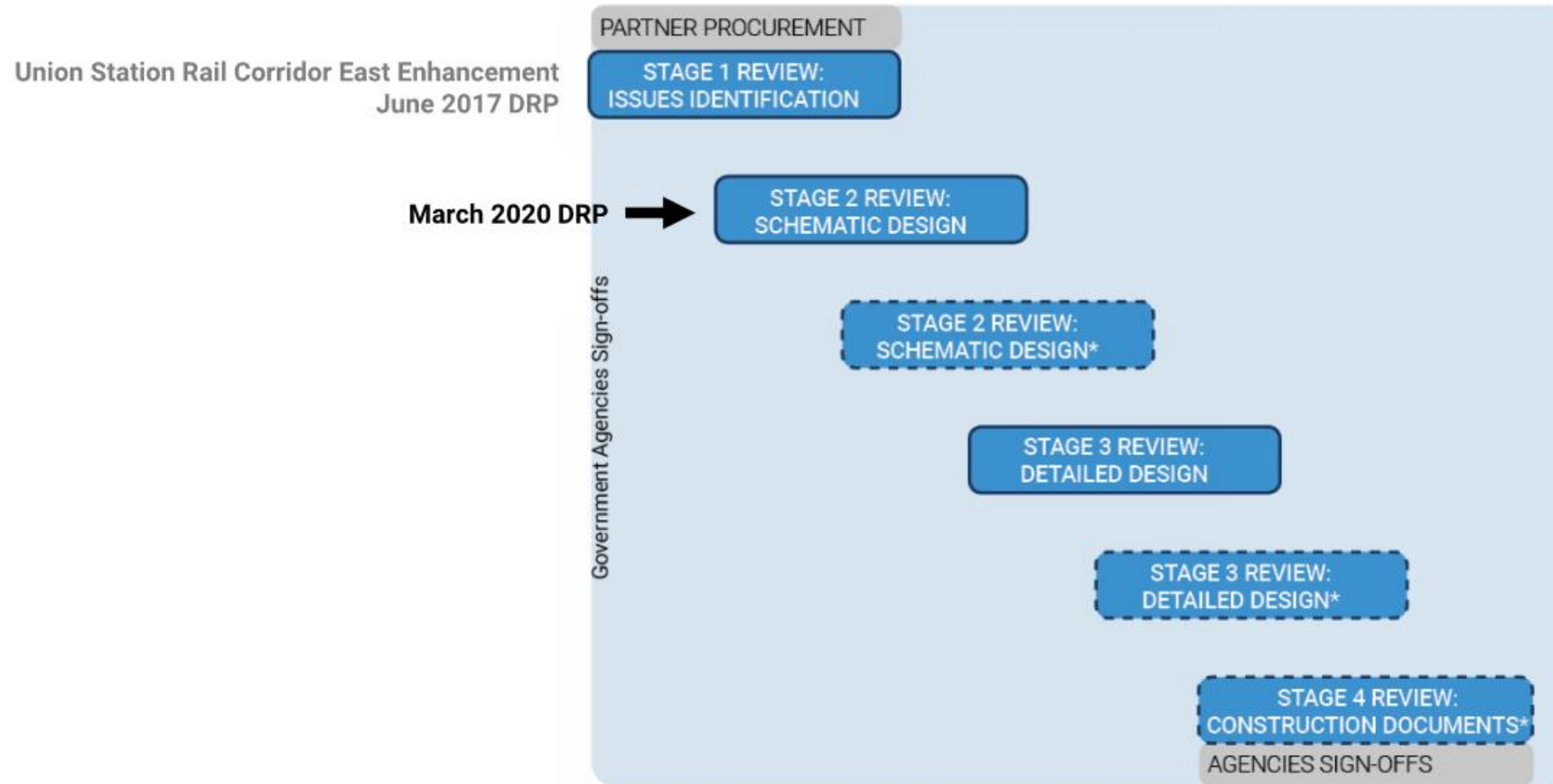


## SHERBOURNE ST. UNDERPASS CONTEXT



# Project Approval Stage

## DRP Stream 2: Public land – Agencies Sign-Offs



\*This review will only be required if the project has changed significantly since the previous review, or the Panel, Waterfront Toronto, or City staff have significant outstanding concerns.

# Recap from June 2017

## Schematic Design Consensus Comments

Union Station Rail Corridor (USRC) Underpasses

Proponent: Metrolinx

Design Team: IBI

Review Stage: Schematic Design

- Determining the ownership of the underpasses and maintenance responsibilities is critical
- Consider the possibility of natural light penetration through bridges to the underpass and adding artificial lighting
- There is an opportunity to rethink the bridges in order to open up the space and create something new
- Improvements to the underpasses are necessary as the current situation is far from good
- The retaining walls should be understood as part of the landscape treatment and not just a wall
- An integrated public realm plan is fundamental

# Areas for Panel Consideration- Waterfront Toronto

Union Station Rail Corridor (USRC) Underpasses

Proponent: Metrolinx

Design Team: IBI

Review Stage: Schematic Design

- Potential of Underpasses as Gateways to the Waterfront
- Integration with Lake Shore Public Realm & PLFP Sediment Management Area
- Integration / future-proofing for potential teamway at Jarvis
- Integration / future-proofing for HONI bridge at Sherbourne
- Future-proofing for Public Art
- Underpass Interior: Finishes of new extension vs. existing underpass
- Underpass Exterior: South façade treatment & tie-in into context



# UNION STATION RAIL CORRIDOR EAST PUBLIC REALM COORDINATION

Waterfront Toronto Design Review Panel Presentation

# AGENDA

1. *Waterfront Toronto Adjacencies and Coordination*

2. *Union Station Rail Corridor Overview*

3. *USRC East Benefits Review*

4. *Metrolinx Projects*

- *USRC East Track Enhancements Project Overview*

- *Retaining Wall - East of Cherry Street*

- *HONI Utility Bridge - Design Concept*

- *Wilson / Don Yard*

- *Pedestrian & Cycling Connectivity Study*

- *Union Station Backup Generator Enclosure*

- *Ontario Line*

- *Noise & Vibration Mitigation*

5. *Questions*

*Note: This presentation is for information purposes only and to obtain input from Waterfront Toronto Design Review Panel (DRP) on finishes. Metrolinx is looking for DRP support on the architectural finishes of the structural facade.*

# WATERFRONT TORONTO ADJACENCIES AND COORDINATION

# UNION STATION RAIL CORRIDOR (USRC) OVERVIEW

# UNION STATION RAIL CORRIDOR (USRC) OVERVIEW

- Area - Bathurst Bridge – Union Station - Wilson Yard / Don River
- Main corridor for all GO Train services – East end – Lakeshore East, Stouffville, Richmond Hill and Rail Layover Facilities
- Part of GO Expansion and On Corridor upgrades
- Multiple Projects: Many of them interlinked



USEP: Union Station Enhancement Project



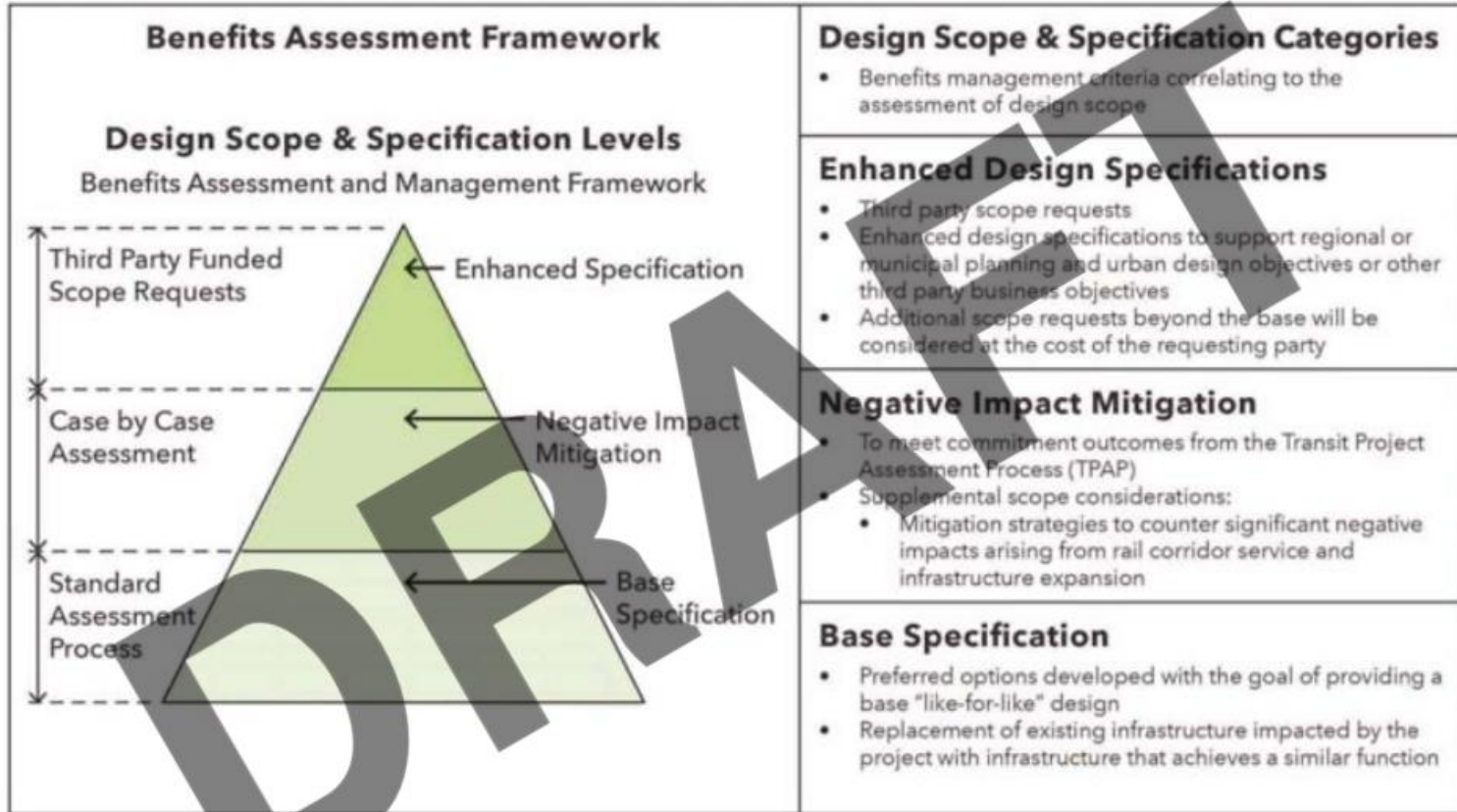
# USRC EAST BENEFITS REVIEW

# BENEFITS

- *Increased Track Capacity into / out of Union Station*
- *Increased reliability of GO Train services – improved resilience*
- *Faster service (average of 10 minutes saved per trip)*
- *Expanded choices – 29% of places to live and 32.5% of places to work in the Greater Toronto & Hamilton Area are accessible with a fast, frequent, two-way all-day GO Rail service*
- *More of the region can be reached by GO Rail including 4,000 cultural, educational, social service, and recreational sites within transit access distance of a station with two-way all-day service*
- *Increased connectivity to the rapid transit network*

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# METROLINX BENEFITS ASSESSMENT AND PROJECT SPECIFICATION CATEGORIES



# METROLINX PROJECTS

# USRC EAST TRACK ENHANCEMENTS PROJECT OVERVIEW

# UNION STATION RAIL CORRIDOR - EAST TRACK ENHANCEMENTS

## Project Scope:

- Environmental Assessment (TPAP)
- 1.8 KM of New Mainline Tracks (E7 & E8)
- 2 Bridge Expansions at Jarvis St and Sherbourne St.
- 300 metres of Retaining Walls east of Cherry St.
- Utilities Relocation & Site Grading

## Schedule:

- Construction Start: Fall 2020
- Project Completion: Fall 2023

## Status:

- Ongoing Detailed Design



Project Map

# DESIGN PRINCIPLES

*One of the objectives of the design USRC East public facing infrastructure is to support the ambitions of Waterfront Toronto's Lakeshore Boulevard East Public Realm projects by:*

- Providing a consistent landscape strategy extending from the multi-use trail to the rail embankment;*
- Providing canvases for future public art projects on the wing walls to south underpass entrances; and,*
- Providing the infrastructure to support future lighting installations that may extend into the underpasses.*

*The design will be cohesive with an integrated design language for all elements:*

- Consistent form liner pattern on wing walls, fascia and retaining walls*
- Design of new elements will be complimentary to the existing heritage elements*
- Heritage railing will be reinstated*
- Wing wall railings will have a complimentary design language to the heritage railing*
- Security fencing*
- Embankment planting to tie into planting strategy of Lakeshore Boulevard East Public Realm*
- All finishes allow for bridge inspection*
- Constructable*
- Low maintenance*

## ITEMS **NOT** INCLUDED IN SCOPE

- *Public Art Installations*
- *Architectural feature lighting*
- *Sidewalk improvements above City Standard*
- *Cycle track improvements*
- *Lane reconfigurations*
- *Painting of the underpass ceilings*

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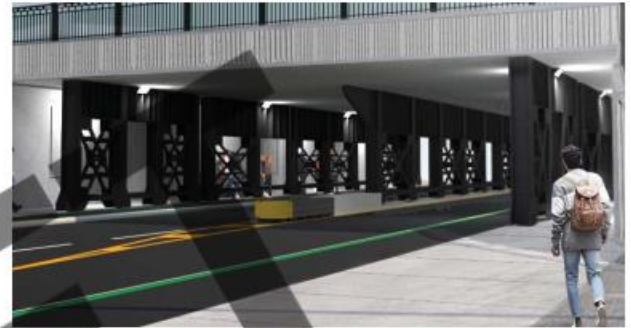
# SUSTAINABILITY

- Reduce the urban heat island effect through the use of high albedo materials in paint finishes, concrete finishes and light coloured paving materials
- Use LED luminaires to reduce energy consumption
- Permeable surfaces are maximized on the slope embankments to provide for storm water infiltration
- Plant material will be native, non-invasive, low maintenance, salt and drought tolerant to help offset carbon emissions from the structural and architectural work.
- Native meadow species will contribute to habitat for insects and birds
- Plant material will provide slope stabilization, reduce stormwater runoff and erosion



# DESIGN FEATURES

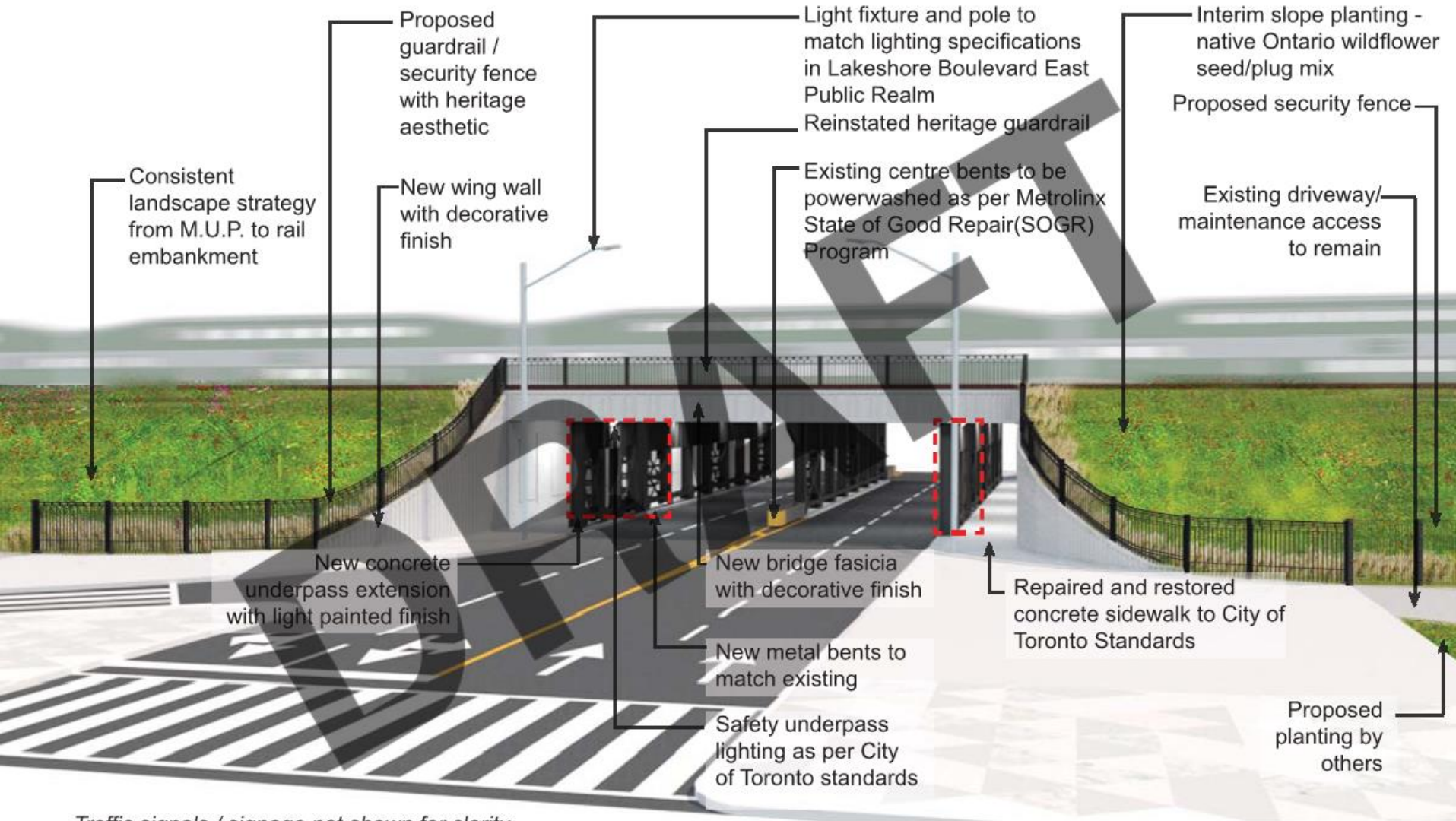
- South fascia and wing walls to be finished in a timeless urban form liner finish suitable to accept future Third Party Art as required.
- The form liner pattern will be vertical in order to mitigate the visual impact of expansion and control joints
- Underpass abutment walls will be painted white/light gray to match the wing walls
- New underpass extensions will include alcove patterning to match existing alcove patterning
- Design of new bents will match the existing bents including black paint finish
- Functional safety lighting will be included in the underpass
- Electrical conduits in underpass to future proof for public art installation
- 1.8m high-security fencing
- Heritage guardrail transitions into custom guardrail on top of wing walls
- Slope stabilization planting (i.e. low maintenance salt tolerant, native ground covers) will comply with the Integrated Vegetation Protocol





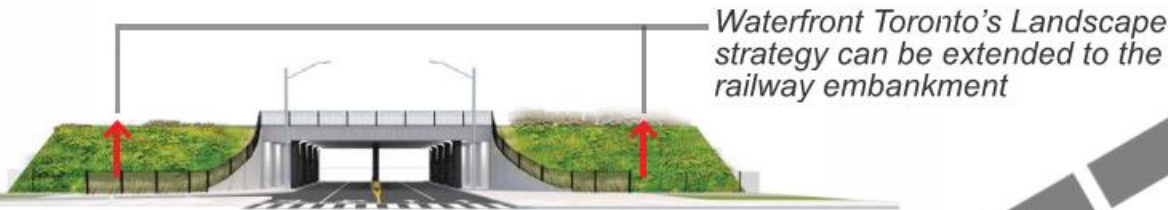
*Traffic signals / signage not shown for clarity*

# SUMMARY OF PROPOSED ELEMENTS FOR THE BRIDGE EXTENSION



Traffic signals / signage not shown for clarity

# LANDSCAPE DESIGN STRATEGY: INTEGRATION WITH THE PUBLIC REALM PROJECT



## Landscape Strategy:

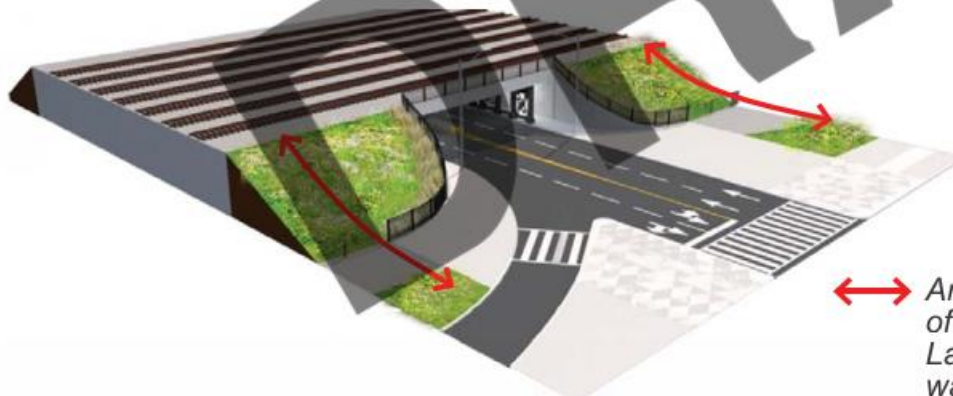
- Use landscape design to blur the line between the Lakeshore Boulevard East Public Realm project and Metrolinx lands on the south side of the Union Station Rail Corridor. Waterfront Toronto's landscape and planting strategy can be replicated\* on the slopes of the railway berm so that Metrolinx lands can be visually appropriated by the public realm. The extension of the landscape design would also reduce the visual impact of the security fencing along the property line.

\* Due to clearance requirements around electrification infrastructure trees cannot be planted inside Metrolinx rail corridor.

Suggested plant species for slope embankment planting:

- Native Ontario wildflower seed/plug mix
- Little Bluestem
- Red Osier Dogwood
- Red Switchgrass
- Coreopsis
- Aster
- Goldenrod

(from Gardiner East Public Realm Study - Planting Plan by others)



↔ Arrows indicating the extension of Waterfront Toronto's Landscape strategy to the railway embankment

# LAKESHORE BOULEVARD EAST PUBLIC REALM LANDSCAPE STRATEGY

## REFERENCE IMAGES

Stabilized stone as median edge



Precast drivable concrete slabs



Rough Natural Stone Aggregate 2-4cm Dia. and 10-20cm Dia.



Armourstone "scramble"



Asphalt with Concrete Soft Curb



Groundcover with Concrete Soft Curb



CIP Concrete w/special saw cuts and finish



Birches and groundcover

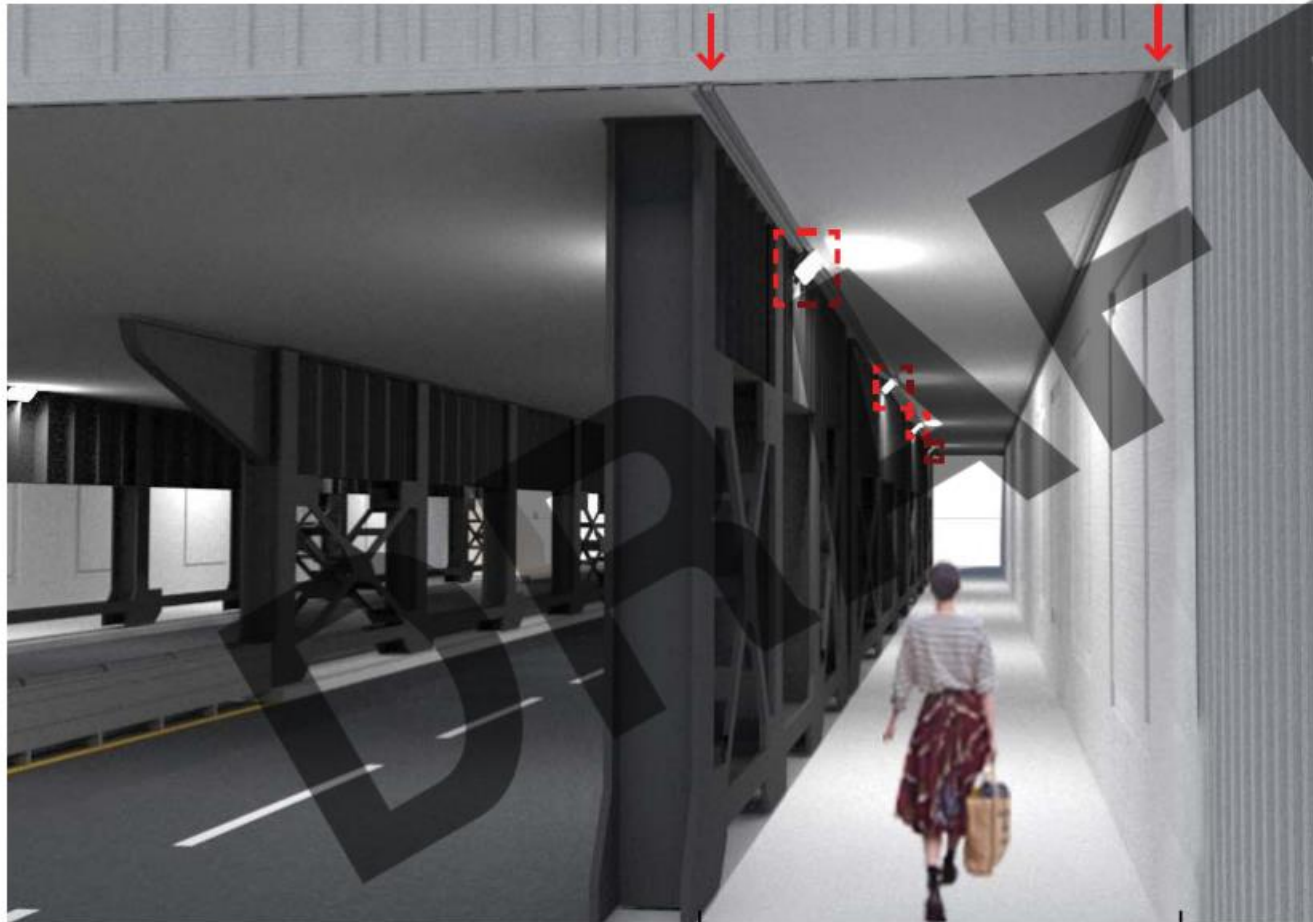


# PROPOSED UTILITY LIGHTING IN THE UNDERPASS



*Height of extension is 4.1 metres (to match existing clearance). Restricted height sign to be reinstated.*

# PROPOSED UTILITY LIGHTING IN THE UNDERPASS ALONG SIDEWALK



*Provisions have been made to include electrical infrastructure to support future lighting installations (by Waterfront Toronto)*

*- A total of 16 empty conduits will be installed (i.e 8 per bridge, 4 at each sidewalk)*

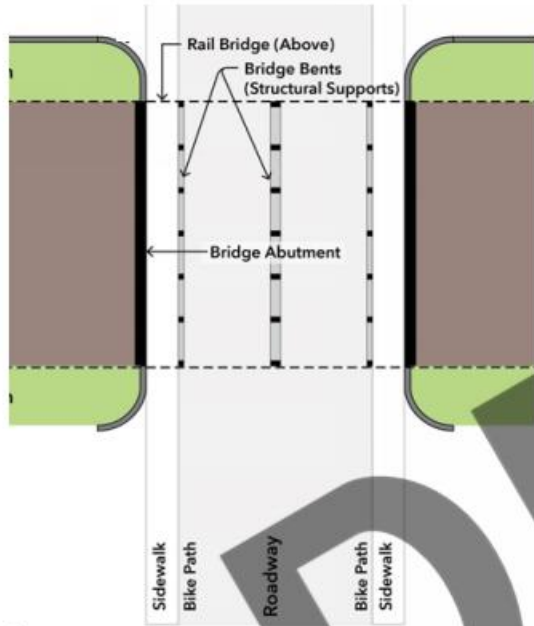
*- Metrolinx will work with Waterfront Toronto on final configuration and location*

± 2.5 meters

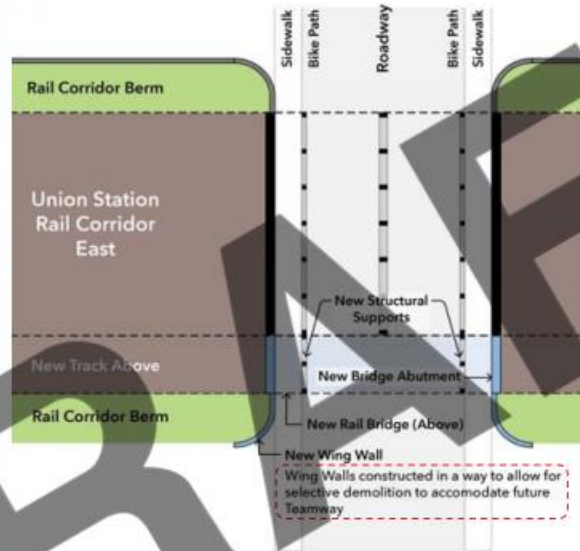


# BRIDGE EXTENSIONS: PHASES

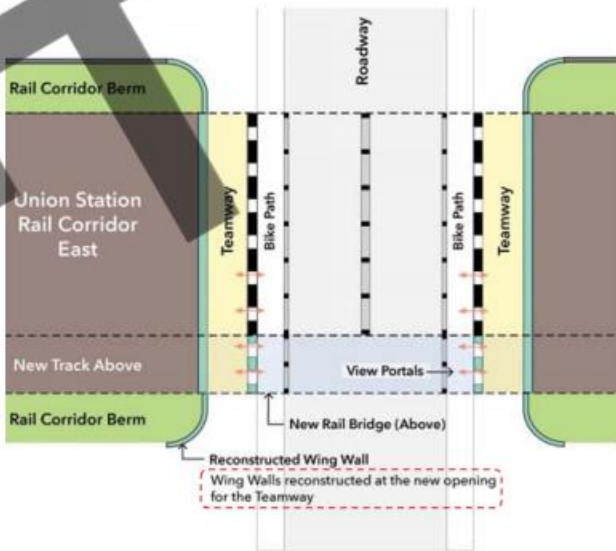
EXISTING UNDERPASS CONDITION



BRIDGE EXTENSIONS: PROTECTION FOR FUTURE TEAMWAYS



BRIDGE EXTENSIONS: PROTECTION FOR FUTURE TEAMWAYS



Teamways at Jarvis and Parliament to be protected.

# JARVIS STREET BRIDGE

## ELEVATION

Consistent landscape strategy to extend from the multi-use trail to the rail embankment

## FORM LINER FINISH OPTIONS



Linear Pattern (Preferred)

## ISOMETRIC VIEW

Proposed guardrail to match heritage aesthetic

Existing access driveway to remain



Board Form Pattern (Alternative 1)



Bamboo Pattern (Alternative 2)

# DIAGRAM SHOWING LIMIT OF NEW CONSTRUCTION



# JARVIS STREET BRIDGE

PREFERRED OPTION - LINEAR PATTERN



# JARVIS STREET BRIDGE

## PREFERRED OPTION - LINEAR PATTERN

*The rationale for using the vertical patterning is as follows:*

- Clean and contemporary*
- Timeless*
- Visually mitigates the control and expansion joints in the structural wing walls*
- Ties into the design aesthetic of the heritage railing*
- Responds to the prominent vertical design language of the bents*
- The “border” on top and bottom of the wall wing finish is a concrete cap that acts as a drip to keep water from running down the surface of the concrete and staining it.*

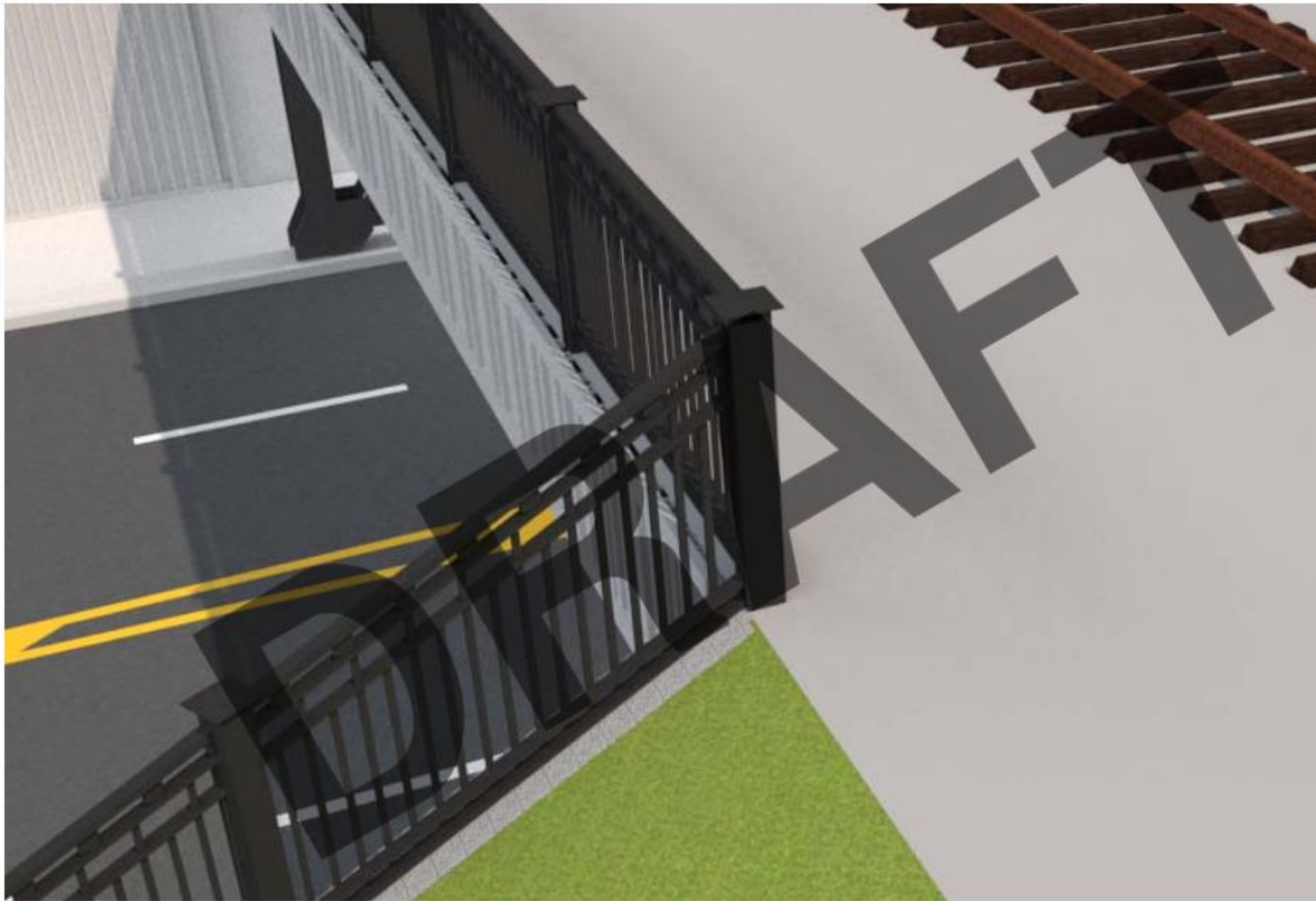
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# JARVIS STREET BRIDGE

ALTERNATIVE 1 - BOARD FORM PATTERN



# CLOSE UP OF HERITAGE GUARDRAIL DETAIL INTERFACE



# RETAINING WALL

## - EAST OF CHERRY STREET

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# RETAINING WALL EAST OF CHERRY STREET

## KEY MAP



Extent of the Retaining Wall

# RETAINING WALL EAST OF CHERRY STREET

## ELEVATION AND CROSS SECTION



*For the security fencing mounted on top of the retaining wall Metrolinx will select a finish/colour that minimizes the visual impact when seen against the sky*

# HONI UTILITY BRIDGE

## DESIGN CONCEPT

# LANDSCAPE DESIGN STRATEGY: INTEGRATION WITH THE PUBLIC REALM PROJECT

## HONI Utility Bridge

*Metrolinx has started to work with Hydro One Networks Inc. (HONI) on three proposed utility bridges on the southside of the Union Station Rail Corridor at Sherbourne, Parliament and Cherry Streets. The design of these utility bridges will reflect the significance of their location; however, any design enhancements will have to comply with technical specifications provided by HONI.*

## HONI Utility Bridge Locations:

1. Sherbourne Street
2. Parliament Street
3. Cherry Street

## Technical Requirements:

- Utility bridge cladding proposals shall comply with HONI technical specification and maintenance regimes.
- Cladding proposals shall comply with Metrolinx inspection and maintenance requirements.

*Note: This illustration is a proof of concept and does not represent a design proposal. Design work on these structures is about to commence with a different consulting team.*



ELEVATION

*The hydro towers inside the Union Station Rail Corridor East will be removed in conjunction with the construction of the utility bridge.*

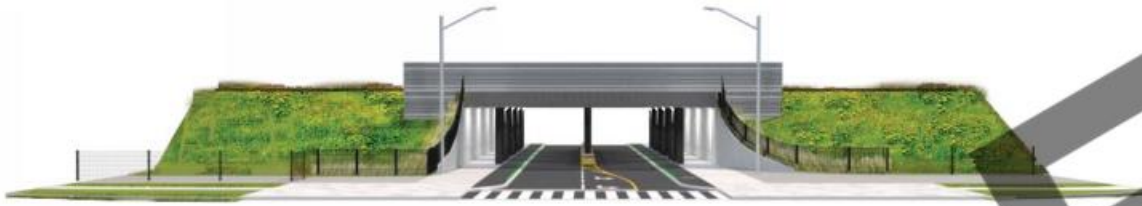


ISOMETRIC VIEW

# SHERBOURNE STREET EXTENSION WITH HONI UTILITY BRIDGE

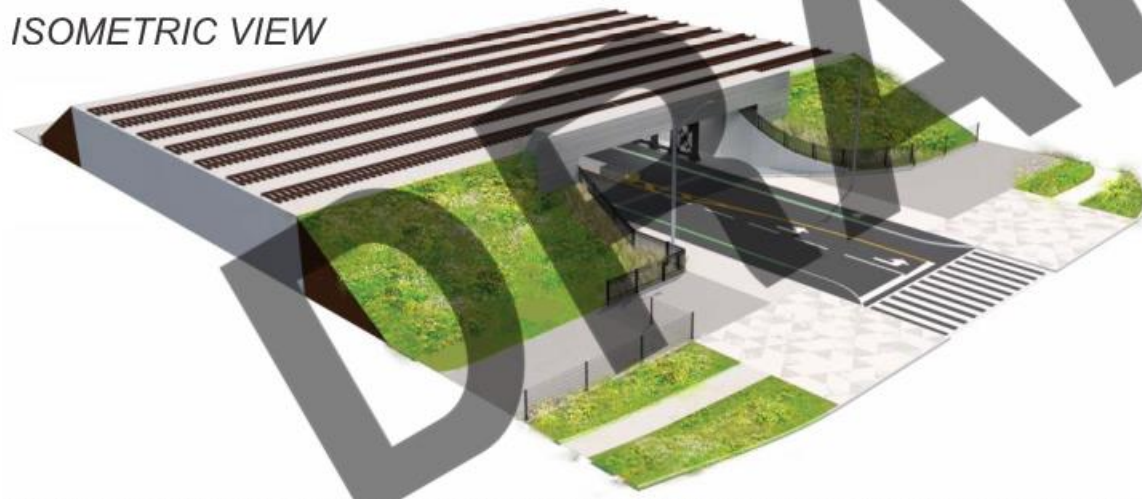
CLOSE UP

ELEVATION



The hydro towers inside the Union Station Rail Corridor East will be removed in conjunction with the construction of the utility bridge.

ISOMETRIC VIEW



*HONI Bridge Technical Specifications  
Pertaining to Cladding:*

- Allow for free air flow over cables
- Provide protection against solar radiation on cables
- Protect against snow and rain
- Use corrosion resistant materials
- Clearance heights in compliance with OTM and City requirements
- Allow for regular maintenance inspections (every 2 years)

*Note: This illustration is a proof of concept and does not represent a design proposal. Design work on these structures is about to commence with a different consulting team.*

# WILSON / DON YARD

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## UNION STATION RAIL CORRIDOR - WILSON YARD

### Project Scope:

- Site grading and retaining walls
- Drainage infrastructure
- Utility relocation
- Realignment of Harbour Lead track

### Schedule:

- Construction Start: Fall 2020
- Project Completion: Fall 2023

### Status:

- Ongoing Detailed Design



Project Map

## WILSON YARD - HYDRO ONE RELOCATIONS

### Project Scope:

- Build new underground infrastructure for three transmission circuits
- Build new terminals at HONI stations
- Commission new circuits
- Remove old infrastructure

### Schedule:

- Construction Start: Fall 2020
- Project Completion: Fall 2023

### Status:

- Ongoing Detailed Design



Project Rendering

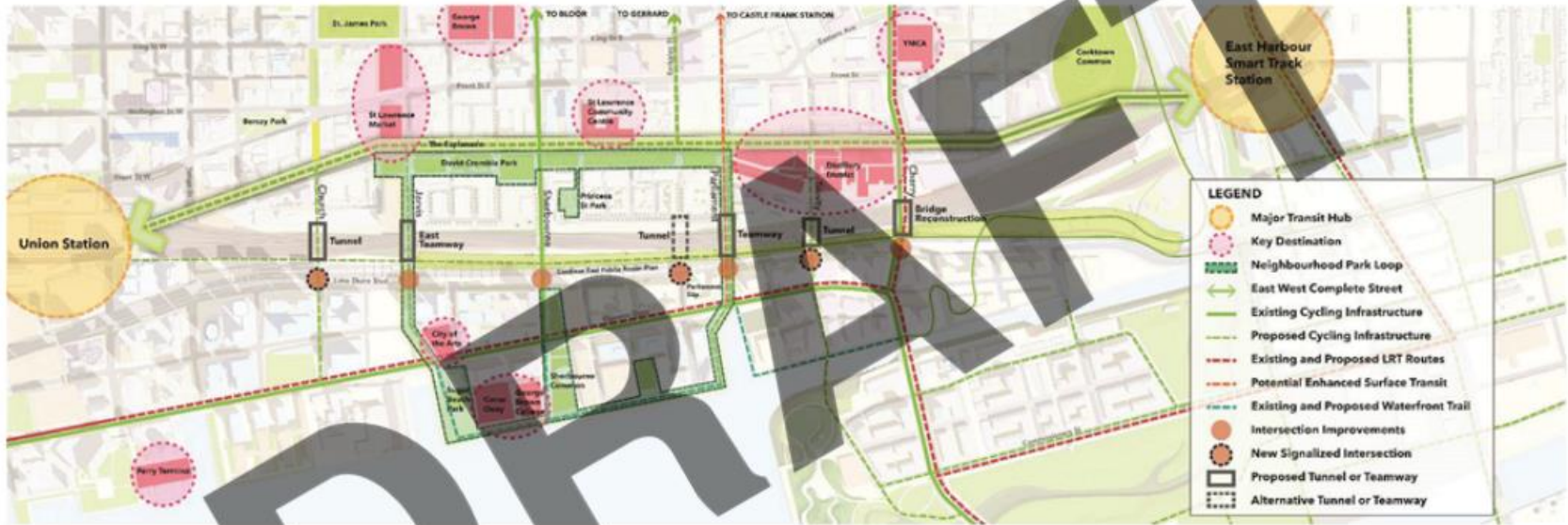
# PEDESTRIAN AND CYCLIST CONNECTIVITY STUDY (PCCS)



# PEDESTRIAN & CYCLIST CONNECTIVITY STUDY

## THE CONNECTIVITY FRAMEWORK

Together the recommended improvements would help to contribute to a more comprehensive pedestrian and cycling network.



1 UNDERPASS IMPROVEMENTS



2 PUBLIC REALM IMPROVEMENTS



3 STREET DESIGN



4 LATERAL CONNECTIONS



5 TEAMWAY WITHIN EXISTING UNDERPASS



6 NEW TUNNEL ADJACENT TO UNDERPASS



7 NEW MID-BLOCK TUNNEL



8 RAIL BRIDGE RECONSTRUCTION



**UNION STATION  
BACKUP GENERATOR ENCLOSURE  
EXAMPLE OF AN ENHANCED DESIGN SPECIFICATION**

# UNION STATION BACKUP GENERATOR ENCLOSURE



## Project Brief

- The Backup Generator is located adjacent to the heritage Scott Street Tower situated on the south side of the Union Station Rail Corridor just east of Yonge Street.
- This is a sensitive location due to the visibility from Waterfront Toronto's lands.
- Metrolinx commissioned an enhanced design for an enclosure for the backup generator to mitigate the negative visual impacts of this structure
- The design proposals were developed with input from the City of Toronto Urban Design team and Waterfront Toronto.

# ONTARIO LINE

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# ONTARIO LINE - PORTALS POTENTIAL LOCATION AT DON YARD

The Ontario Line is a new rapid transit corridor within the City of Toronto. It is proposed to be 16 km with 15 stops running between the Ontario Science Centre and Exhibition Place. An Initial Business Case for this project was completed in July 2019.

The corridor alignment is expected to pass through the eastern section of the USRC approximately between the Don River and Parliament Street.

Further planning and design work is required to determine the impact to existing projects in the area.



 New pedestrian bridge over the lower Don

# NOISE & VIBRATION MITIGATION

## EXAMPLE OF NEGATIVE IMPACT MITIGATION

Window and door replacement at Cathedral Court Co-op, 15 Scadding Avenue, Longboat Area Residents Association, and the Caroline Co-op.

# NOISE & VIBRATION MITIGATION



## Project Brief

- The objective in the window and door replacement and upgrade project is to mitigate the negative impacts of noise and vibration arising from rail service and construction in the Union Station Rail Corridor

- Metrolinx is undertaking this work at Cathedral Court Co-op and Caroline Co-op.

## Locations

1. Cathedral Court Co-op
2. 15 Scadding Avenue  
(Toronto Community Housing)
3. Longboat Area Residents Association  
(LARA)
4. Caroline Co-op

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QUESTIONS