

Queens Quay East Revitalization & East Waterfront LRT Schematic Design

March 24th, 2021

East Waterfront LRT Project Components

Queens Quay East – 2A

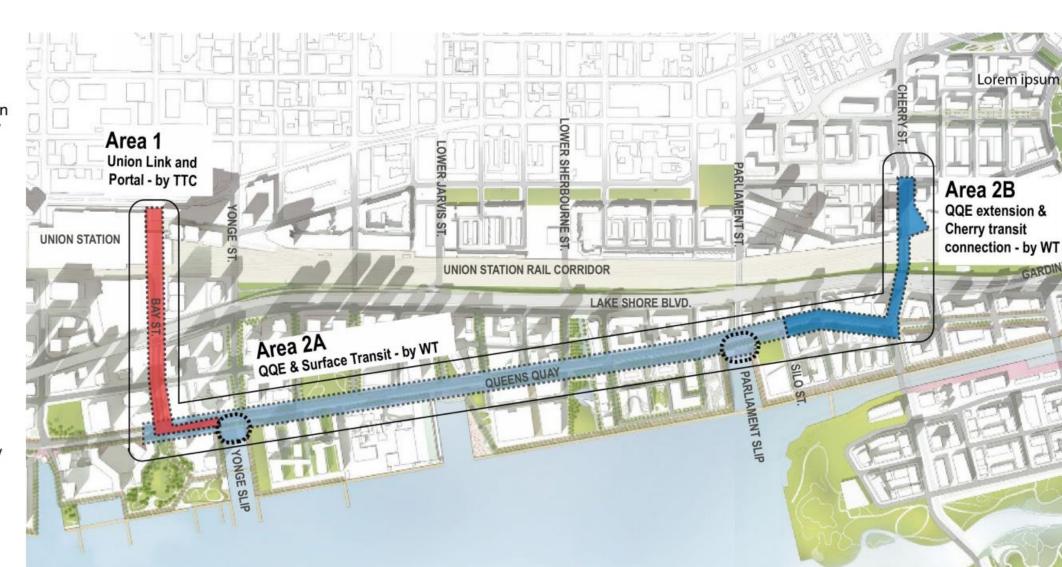
Proponent: Waterfront Toronto Design Team: West8, DTAH Review Stage: Schematic Design

Scope Areas

1) 30% design for the Union Loop, tunnel, Queens Quay Station and Portal. Managed by TTC.

2A) 30% design for the section between the Portal and the Silos (Future Silo Street). Managed by Waterfront Toronto.

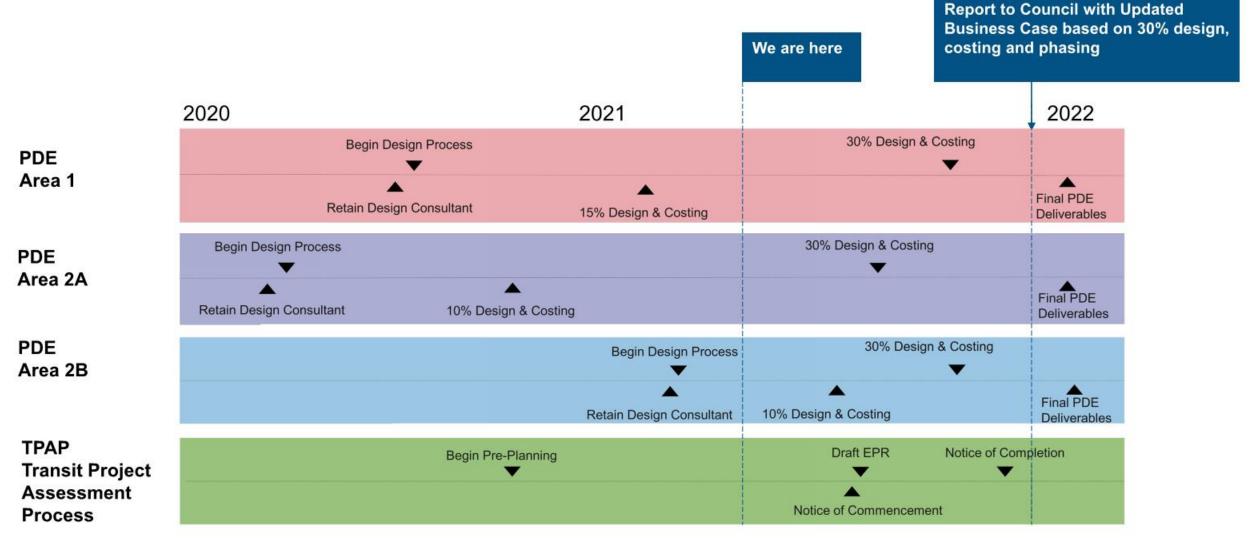
2B) 30% design for the Queens Quay East extension to New Cherry Street and design along New Cherry Street, from Queens Quay to the Distillery Loop. Managed by Waterfront Toronto.



East Waterfront LRT Preliminary Design & Engineering Schedule

Queens Quay East – 2A

Proponent: Waterfront Toronto Design Team: West8, DTAH Review Stage: Schematic Design



Estimated construction timelines, subject to funding, are between 2023-2026 for QQE and 2024-2029 for Union to QQ link

Project Description & Background

Queens Quay East - 2A

Proponent: Waterfront Toronto Design Team: West8, DTAH Review Stage: Schematic Design

Background

• 30% Preliminary Design and Engineering and Costing of Queens Quay East LRT and streetscape to inform a business case for Waterfront Transit implementation funding for consideration in the City's Fall 2021 budget

Description/ Scope of Work

- 30% design for transit, streetscape and public realm for Queens Quay East from Bay to Cherry St. including a
 transit connection to Distillery Loop is the full scope led by Waterfront Toronto.
- This team's scope is Area 2A which extends from Bay St. to future Silo St. inclusive of slip fill at Yonge and Parliament slips to facilitate the road and transit extension.
- This design is an update of the previously completed 2012 design for Queens Quay East to current best practices in ecology and mobility and integrating lessons learned from Queens Quay West
- Embodied carbon assessment will be part of 30% design and future stages

Anticipated Timeline

- 30% design for Area 2A by May 2021
- Full program 30% design and costing, and business case by Fall 2021
- Future phases of design and implementation subject to funding
- Estimated construction timeline 2023-2026 for Queens Quay East subject to funding

Design Brief

Queens Quay East - 2A

Proponent: Waterfront Toronto Design Team: West8, DTAH Review Stage: Schematic Design

Vision

Queens Quay is Toronto's **primary lakefront boulevard** connecting its existing and emerging precincts, parks and public spaces and **establishing a strong cohesive character across the waterfront**. Building on the successful revitalization of the western section, Queens Quay East will further integrate urban ecology, active transportation, and place-making to create a street that is resilient to future change.

Objectives:

- 1. Integrating with Urban Ecology
- 2. Moving People
- 3. Building a Destination





Design Brief

Queens Quay East – 2A

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1/ Integrating with <u>Urban Ecology</u>: Design for ecological performance

- Expanded tree canopy and planting
- Integrated green infrastructure
- More permeable ground surface
- Enhanced user comfort
- Habitat and eco-corridors for biodiversity
- Resilient species selection for waterfront
- Customized details for variable lake levels
- Low-maintenance landscape
- Monitoring and adaptive maintenance

2/ Moving People: Design for safety, convenience and flexibility

- Improve clarity at intersections
- Improve pedestrian crossings
- Safe intermodal interactions
- More convenient cycling environment
- Accommodate new micro-mobility
- Flexibility to accommodate new trends
- Performance review & adaptive management

3/ Building a Destination:

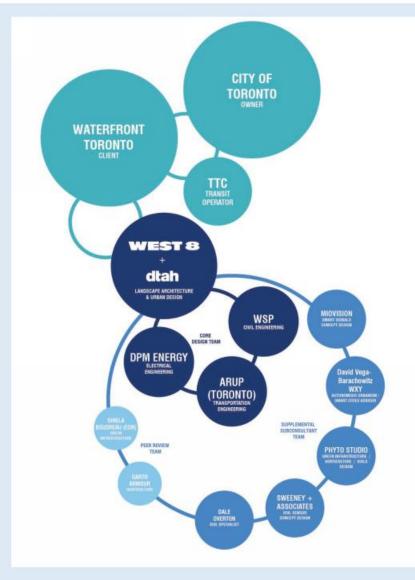
Design for character and experience

- Continuity of design language with QQW
- Greater coherence of paving materials
- Durable materials and craftsmanship
- Slips and intersections as destinations
- Flexibility for closures & programming
- Consistent palette of furniture, lighting, etc.
- Integrated infrastructure for programming
- Encourage social interaction

Project Team

Queens Quay East - 2A

Proponent: Waterfront Toronto Design Team: West8, DTAH Review Stage: Schematic Design



Core Team:

West 8 + DTAH - Landscape Architecture & Urban Design

ARUP (Toronto) – *Transportation Engineering*

WSP - Civil Engineering

DPM Energy – *Electrical Engineering*

Supplementary Consultant team:

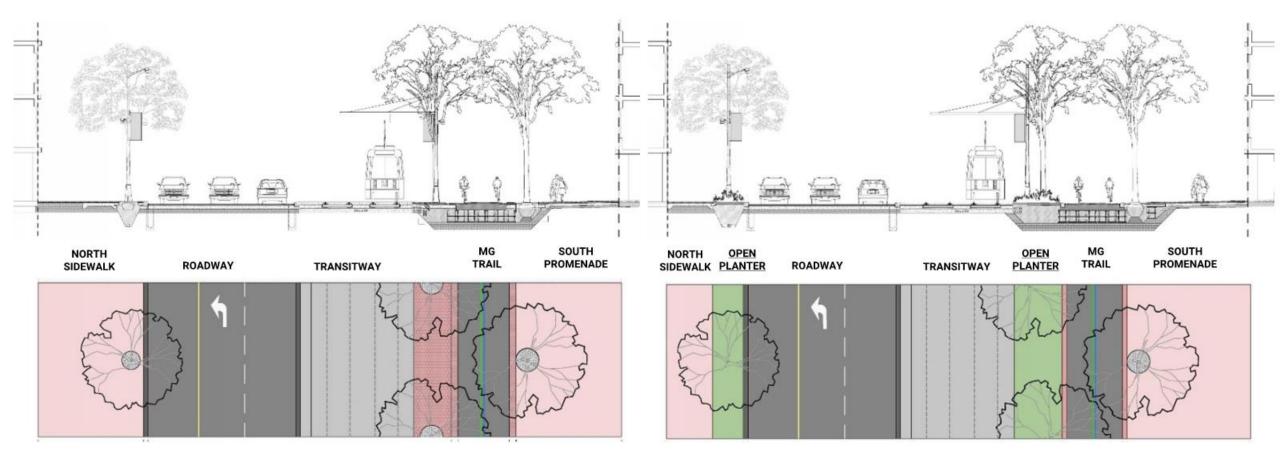
- Dale Overton Soil Specialist
- Swneeney + Associates Soil sensor concept design
- Phyto Studio Green infrastructure, horticulture, soils design
- David Vaga-Barachoviz WXY Autonomous urbanism / smart cities adviser
- Miovision Smart signals concept design

Peer Review Team:

- Sheila Boudreau Green Infrastructure
- Garth Armour Horticulture

Continuous Identity with Enhancements

Queens Quay East – 2A



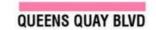
2012 - Typical Cross Section

2020 - Typical Cross Section + Understory Planting

Enhancing the Arrival Experience to the Water

Queens Quay East – 2A

















Improving Clarity at Intersections

Queens Quay East - 2A



2012 Design Mixing Zone



2020 DesignDelineation between cyclists and pedestrians

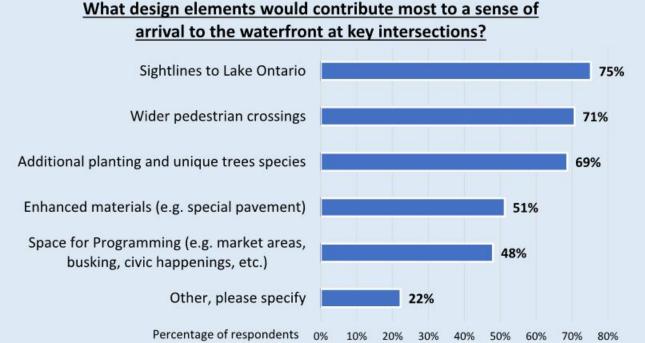
Public Information Center Feedback

Queens Quay East – 2A

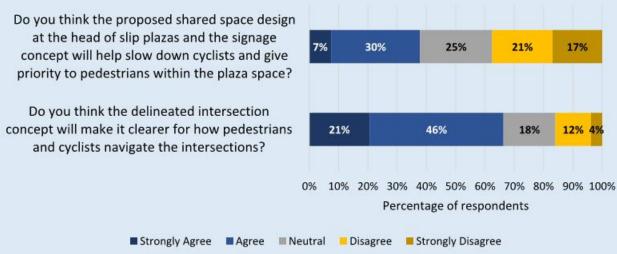
Proponent: Waterfront Toronto Design Team: West8, DTAH Review Stage: Schematic Design

Feb 17, 2021

Participants identified the importance of clearly differentiating the cycling track on the Martin Goodman Trail to mitigate against conflicts between people riding bikes and other visitors to the waterfront. Overall, participants stressed the importance of the waterfront as an iconic part of the city that should feel welcoming and connected to the city's past and present. Participants emphasized the need for a variety of seating areas, lighting, hardy vegetation, and wayfinding improvements.



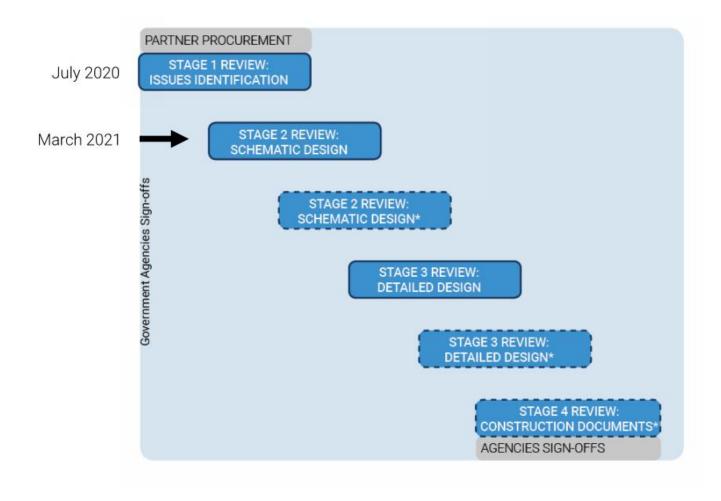
Shared Space and Delineated Intersection Concepts



DRP Stream 2: Public land – Site Plan Approval

Project Approval Stage

Queens Quay East – 2A



Recap from July 2020 Stage One Consensus Comments

Queens Quay East – 2A

Proponent: Waterfront Toronto Design Team: West8, DTAH Review Stage: Schematic Design

General

- Supportive of the **team continuity** from the Queens Quay West project and appreciated the design continuity by carrying the vision forward.
- Support for the overall project.
- Appreciated the "lessons learned", consider showing photos of critical areas at the next review to provide greater understanding moving forward.
- It is important to **share the knowledge base** from the project in the future, such as street tree biodiversity, to help the public understand the role of public realm infrastructure.

Public Realm

- Signage will be an important, consider further studies and provide more information at the next review.
- Supported the overall design strategy of the **north south streets** meeting Queens Quay.
- As an iconic point of interest, provide more information and the rationale on the design of the foot of Yonge Street at the next review.
- It is important to ensure Queens Quay East will be a great urban retail street.
- Focus on the **intersections** as they are major points of movement with various modes of mobility.

Landscape

Supportive of the proposed urban ecology strategies to include diverse tree allee, increased ground cover planting, and continuity in the public realm.

Areas for Panel Consideration

Waterfront Toronto

Queens Quay East - 2A

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Does the updated design of Queens Quay East address our objectives for:

- Continuity of identity and design language for entire Queens Quay Boulevard as one cohesive street
- Enhanced ecological performance, active transportation, and placemaking
- Arrival experience at intersections and heads of slips
- Resilient planting approach & integration of ecological infrastructure
- Martin Goodman Trail refinements and delineated intersections
- Accessibility enhancements



The 15 year legacy of Queens Quay Boulevard as the Spine of the Secondary



Agenda

1. Design Principles (15 minutes)

- Overview of Principles
- Maintain a Continuous Identity
 - Five sacred elements of QQ Blvd
 - Waterfront Signature Light
- Improved Arrival Experience
 - City Scale QQ context
 - Waterfront Scale 5 arrival zones
 - Street scale two types of intersections
 - Flexible laybys
- Enhanced Martin Goodman Trail
- Green and Climate Resilient
 - Green features
 - Groundwater research, recommendations, outcomes
 - Planting character and Species
 - Two understory approaches
- Open and Accessible
 - Bike share and escooter parking
 - Heated Paving
 - CNIB and TO360

2. Walk Through West to East (15 minutes)

Overview of Project and Zone Breakdown
Bay and Yonge Arrival Zone

Yonge Slip to Redpath Factory

Redpath Factory

Jarvis Arrival

Jarvis to Sherbourne

Sherbourne Arrival

Bayside and Quayside

Parliament Arrival

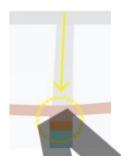
Area 2B Boundary and Alignment to Cherry Street



Five Design Principles for Queens Quay East Refresh



1. Maintain a Continuous Identity



2. Improve the Arrival Experience



3. Enhance the Martin Goodman Trail



4. Green and Climate Resilient

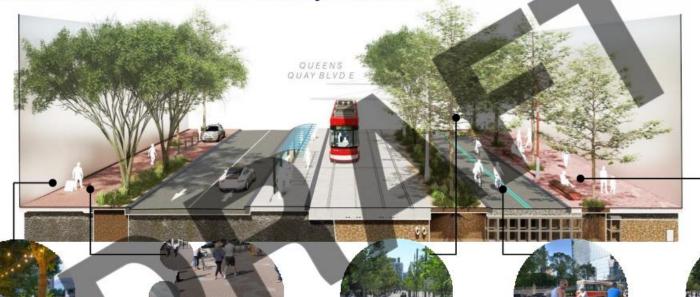


5. Open and Accessible



1. Maintain a Continuous Identity

The Five Sacred Elements of Queens Quay Boulevard



Queens Quay is Queen

- Hierarchy of Queens Quay over adjacent parks and N-S streets
 Paving comes up to building
- Paving com faces
- A continuous and consistent streetscape width and character

The Paving Palette

- Iconic pink granite cobblestone with world class detailing
 Maple leaf pattern on south side
- Grey granite curbs, ramps, and let downs
- Paleotec unit pavers at driveways
- Asphalt MGT and Roadway

Mature Shade Trees

- Double row "allee" beside MGT with shared soil volume
- Single row on north side with continuous trench

The MGT Markings

- Blue green centre stripe
 Maple leaves coming to a stop
- Blue box with STOP

The Furnishing Zone

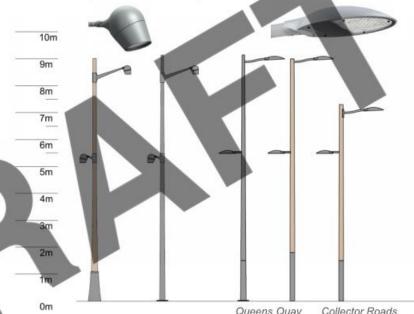
A place for benches, trash cans, poles, signs, bike parking, newspaper stands, mailboxes, water fountains, you name it!

and hard

1. Maintain a Continuous Identity

Signature Light Pole optimized with WT Request for off the shelf products for acceptance by Toronto Hydro





Original Signature Waterfront Toronto Light

- Olivio Grande Fixture
- Custom brackets
- Custom glulam pole
- Custom shroud

Queens Quay Collector Roads (minor arterial) Optimized Signature Waterfront Toronto Light

- Philips MileWide2 Fixture
- Philips Brackets
- Structura glulam pole or
- · Valmont metal round tapered pole

2. Improve the Arrival Experience

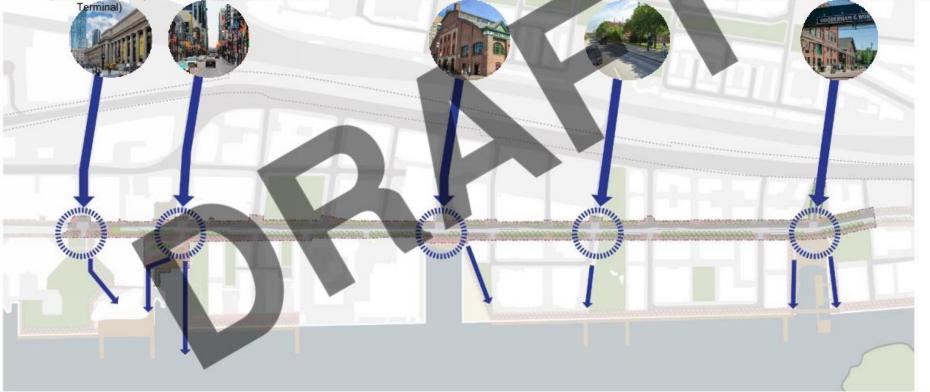
25 Intersections with 11 "arrivals" on Queens Quay, 12 Intersections with 5 "arrivals" in project

site







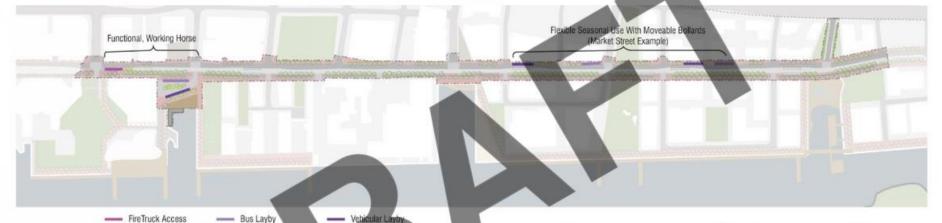




2. Improve the Arrival Experience

Flexible Layby Areas and Integrated Layby at Yonge







Laybys throughout are at same grade as sidewalk. Pedestrians are automobilists are separated with bollards and contrast curb.



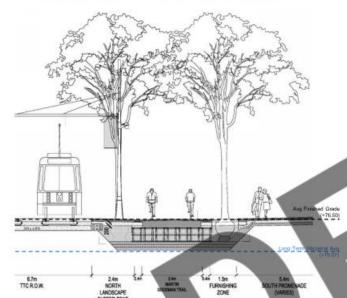
Client Aspiration: Digital Signage Pilot Reference: Solar powered e-ink signs in Australia, software by Visionect



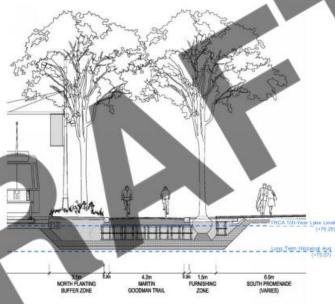
Reference: Market Street in the winter and the summer. A simple and effective transformation with moveable bollards.

3. Enhanced Martin Goodman Trail

Wider and grade separated



2012, Queens Quay West 3.4m asphalt, no grade separation

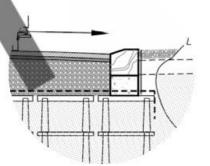


2020

4.2 m asphalt, **5cm** grade separation

- · Clearer delineation of cycling path
- Anticipates increased use of MGT
- Increases accessibility
- Gives cyclists small foot rest when stopped

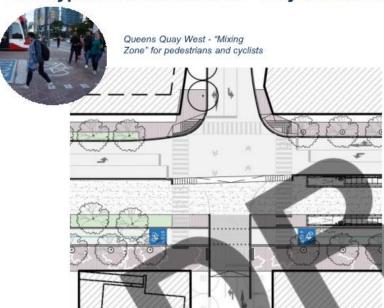






3. Enhanced Martin Goodman Trail

Two types of Intersections - fully delineated Martin Goodman Trail



Intersections with Automobilists

- Reduces conflict between cyclists with green light and pedestrians standing in MGT
- Extend pedestrian crossing times
- Raised pedestrian crosswalks across MGT



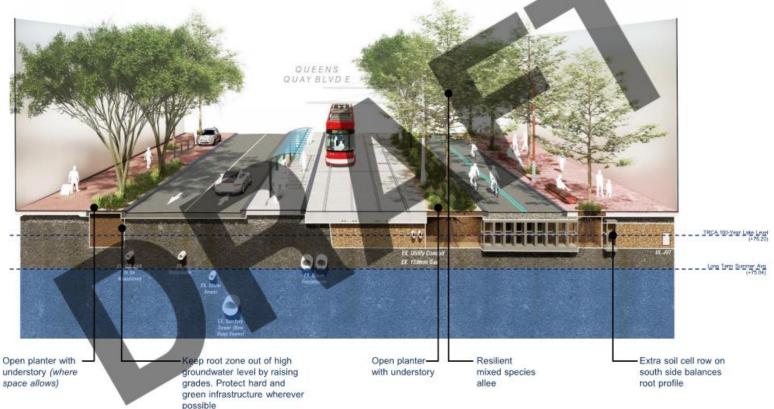
"T" Intersections

- Introduction of Cycling Signals for clarity of movement
- Waiting space for N-S cyclists
- Paleotec "welcome mat" in the roadway on Queens Quay
- Facilitate fluid movement of large groups
- Reserve space for small scale temporary programming



4. Green and Climate Resilient





4. Green and Climate Resilient - Situation

Tall

How to build lake-resilient and look for opportunities?

Lake Ontario: Two record high water events in last four years

2020 Regulatory 100-year High Water Level, TRCA,

76.20 2019 Regulatory High Water Level, TRCA, 76.08

2019 Record High Water 75.93 2017 Record High Water 75.88

1952 Record High Water 75.82

Long Term Summer Average, measured since 1918, 75.07

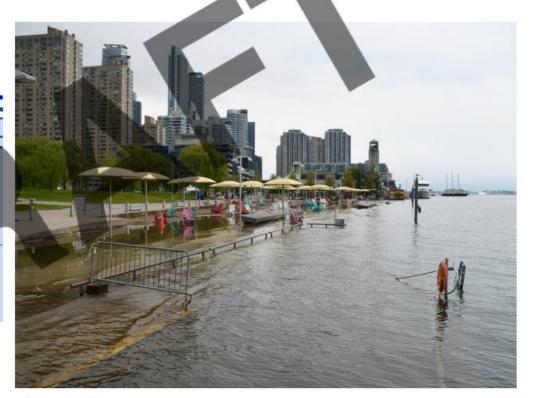
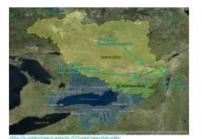


Image: mcfcrandall.blog

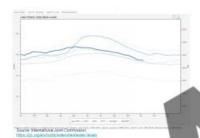
4. Green and Climate Resilient - Research

Outcome of evidence based approach will double check the following scientific parameters for site resiliency



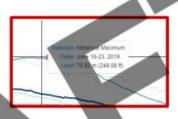
Can high water be regulated?

There is no maximum regulated level for Lake Ontario, and recent records are caused by multiple international watershed and river basin inputs. IJC recommends resilient design solutions.

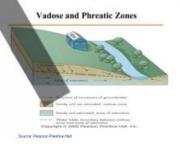


When is high water happening? High water is happening in Apr/May to

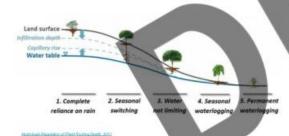
July/Aug. Lake Ontano is currently in a Period of High Water Levels.



How long does high water last? 65-75 days within 60cm of finished grade on QQE, in 2017 and 2019

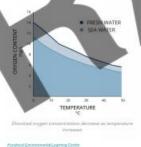


How does groundwater relate to surface water bodies? Groundwater level is equal to or greater than lake water level



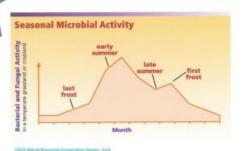
Can we pick flood resistant species?

No trees are naturally adapted to seasonal high groundwater in the summer months. Floodplain species are adapted to spring freshet.



Why is summer more dangerous?

The warmer the water is, the less oxygen it can hold



Why is summer more dangerous? Microbial activity is highest in the summer

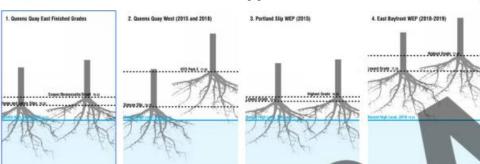


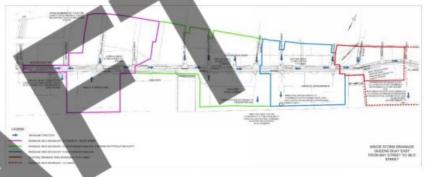
Waterlogged soils cause anaerobic soils and ecosystem decline

4. Green and Climate Resilient - Site Conditions



Outcome of evidence based approach will double check the groundwater conditions for site resiliency



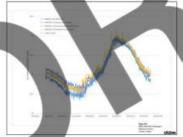


How does QQE compare to other built areas of the central waterfront?

Existing Grades on Queens Quay East are lower than Queens Quay West and the Waters Edge Promenade



Can we raise the entire district, like was done for the Portlands? Existing building grades and overland flow routes have to be respected, future developments to east can be raised

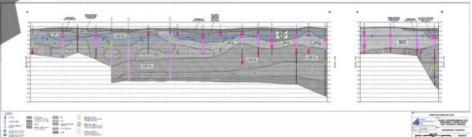


Groundwater level is equal to or greater than lake water level, based on existing groundwater data *Sources:

- LVM borehole readings
- Franz borehole readings, 2012
 - Waterfront Toronto groundwater monitoring wells,
- Recent development application borehole data
 Portlands shallow monitoring well borehole data

Why is Queens Quay Lower and what is it's role in the local watershed?

Queens Quay serves as overland flow route, with 1/4 of watershed stormwater flowing to new recently built stormwater treatment facilities



Existing data on subsurface composition, presence of shallow sand, indicate high permeability, support parameter of hydraulic connection between Lake level and groundwater

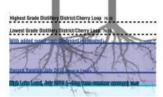
4. Green and Climate Resilient- Research



How have other waterfront trees responded to recent extreme climate events and what are their grades?

- July 8, 2013 Distillery District and Cherry Loop
- + Record Rainfall in Summer
- + Average Lake Level
- * 100% trees drowned, no gas exchange for more than 48-72 hours (Ormston-Holloway)







Holloway 2015-2017

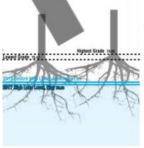
May 25-29, 2017 Queens Quay West

- + Rainfall Event in Spring
- + Record High Lake Level + Spring Snowmelt
- * Platanus diagnosed with Sycamore anthracnose fungal disease in 2018, replaced in 2018

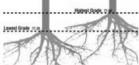








East Bayfront WEP (planted 2018-2019) * No recorded signs of disease or death



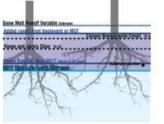
2019 Record High Level, June July 1931

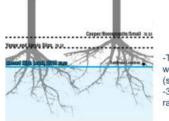
How would QQE trees have fared in recent extreme climate events at existing grades?

July 8, 2013

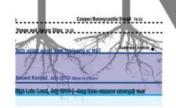
- + Record Rainfall in Summer
- + Average Lake Level







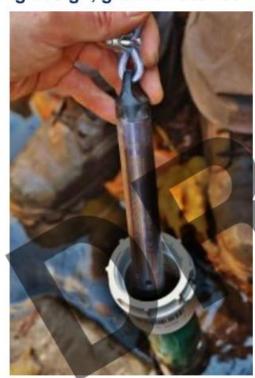
-Trees illustrated with 1.2m root depth (silva cell volume) -30% soil porosity for rainfall events



4. Green and Climate Resilient - Active Monitoring Program

Client team will install six shallow groundwater monitoring wells to collect groundwater data to inform grading design, groundwater benchmarks

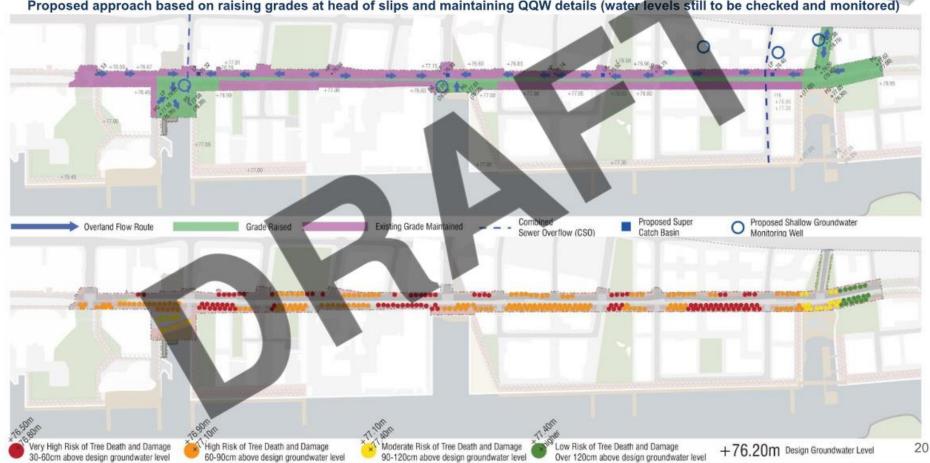




- 2 wells in Queens Quay West at Simcoe Intersection Planting Pilot
- 4 wells in Queens Quay East

4. Green and Climate Resilient - Active Monitoring Program

Proposed approach based on raising grades at head of slips and maintaining QQW details (water levels still to be checked and monitored)

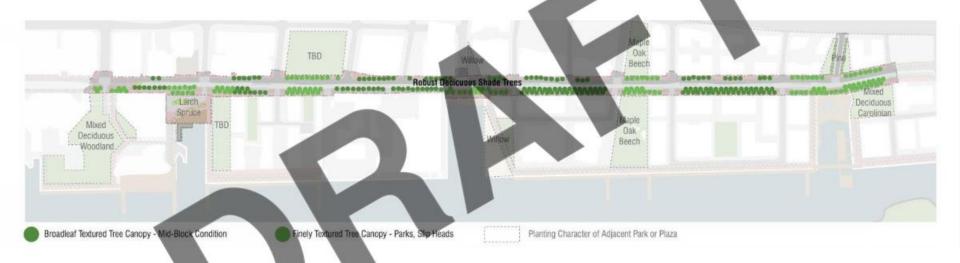


4. Green and Climate Resilient



Planting Character of Queens Quay and Neighbouring Parks

- Fine-textured tree species at Arrival Zone Intersections and Parks, Broadleaf species at mid-block conditions
- Parks and plazas north and south of Queens Quay have own distinct identities



4. Green and Climate Resilient

Bio- and Genetic diversity, Multiple Cultivars, Sourcing of Trees

- Trees clustered by similar leaf forms and fall colours for maximum emotional impact
- *indicates City of Toronto approved Street Tree ** indicates used on Queens Quay West

BROADLEAF TYPOLOGY









FINELY TEXTURED TYPOLOGY





YONGE SLIP



Acer nigrum*
Acer rubrum (cultivars)*
Acer truncatum 'Keithsform'
Acer truncatum 'Main Street'
Acer x freemanii**
Liquidambar styraciflua 'Cherokee'*
Maclura pomifera 'White Shield'
Quercus macrocarpa 'Urban Pinnacle'*
Ouercus rubra*



Gleditsia triacanthos "Moraine"
Gleditsia triacanthos "Shademaster"
Gleditsia triacanthos "Skyline"
Gymnocladus dioicus "Stately
Manor"
Gymnocladus dioicus 'True North'*
Ulmus parviflora ALLÈE

Ulmus 'Morton'
Ulmus 'Morton Glossy'

Larix laricina Picea mariana

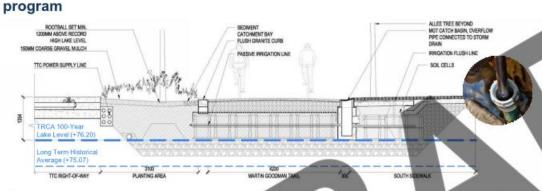


Sample Planting Plan - Bay to Yonge

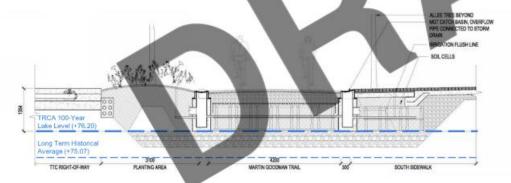


4. Green and Climate Resilient

Stormwater management and planting concepts to be revisited at Detailed Design with outcome of groundwater monitoring



Option 1: Bioswale, Perennial and Stormwater Focused



Option 2: Raised Beds, Tree focused



Green to Grey, Sheffield



Buffalo Niagara Campus

4. Green and Climate Resilient

Planting Pilot in Queens Quay West to be Constructed this year

LANT LIST				(2) PLANTING STIESMAN CLAM OF MINERAL CORMS
RUBS	CODE	BOTANICAL NAME	COMMON NAME	(9) (9) (9) (9) (9) (9) (9) (9) (9) (9)
	Ср	Ceanothus x pallidus 'Marie Simon'	Marie Simon New Jersey Tea	Som So com
	Ra	Rhus aromatica 'Gro-Lo'	Fragrant Sumac	
	Rb	Rosa blanda	Smooth Rose	
	Rc	Rosa carolina	Carolina Rose	1 AREA 1 PLANTING PLOT-POLLINATOR PALETTE
\odot	Rp	Rosa palustris	Swamp Rose	
\odot	St	Spiraea tomentosa	Steeplebush	
•	Tm	Taxus x media 'Wardii'	Ward Yew	
RENNIALS	CODE	BOTANICAL NAME	COMMON NAME	
	af	Agastache foerkulum 'Blue Fortune'	Anise Hyssop	2 AREA 2 PLANTING PLOT - BIRD BIGTOPE PALETTE
	aa	Aruncus aethusifolius	Dwarf Goat's Boan	The state of the s
	mf	Monarda fistulosa	Bergamot	
	m	Rudbeckia hirta 'Cherry Brandy'	Cherry Brandy Gloriosa Dassy	

5. Open and Accessible

A

Space for bike share and e-scooter parking, future forms of mobility





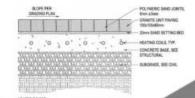
Toronto Bike Share, usually 27 docks



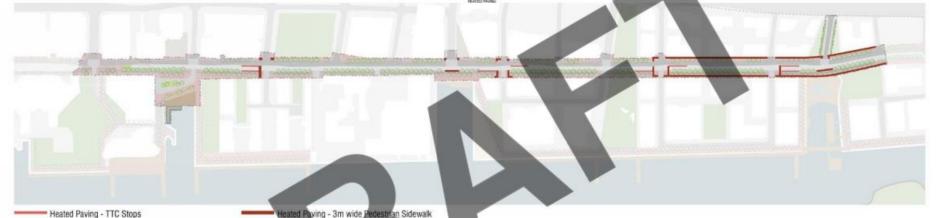
Future space proofing for escooters and other new forms of mobility

5. Open and Accessible

Heated Paving



Conceptual Paving Detail with heating coils embedded in CIP concrete paving base



BACKGROUND

 Hydronic heated (pipes) embedded in the base layer beneath the surface paving is more cost effective because waste heat can be utilized to heat the water/antifreeze mix

CASE STUDIES

- Canadian examples:
 - Montreal piloted and designed; abandoned due to cost and maintenance
 - St John's due diligence study; not pursued due to cost of installation and maintenance
- Case study cities around the world with successfully installed systems installed include: Holland MI, Reykjavik, Helsinki, Oslo, Sapporo

BENEFITS

- Improved safety and access to ground floor businesses, transit stops
- Economic benefits from increased pedestrian activity during winter months
- Reduced slip and fall injuries and hospital burden
- Reduced use of salt and longer-lasting pavement

CONSIDERATIONS

- On average, systems can melt 1" / 2.5cm of snow per hour
- Large snowfall events will still require manual snow removal
- Implementation at larger scale and in a contiguous area (as opposed to small patches) enables economies of scale
- Potential waste heat supplier will significantly increase long-term benefits by way of increased financial viability by reducing cost of

5. Open and Accessible

Wayfinding Beacons for Blind Users



Proposed T0360 Wayfinding Location with Integrated CNIB Beacon

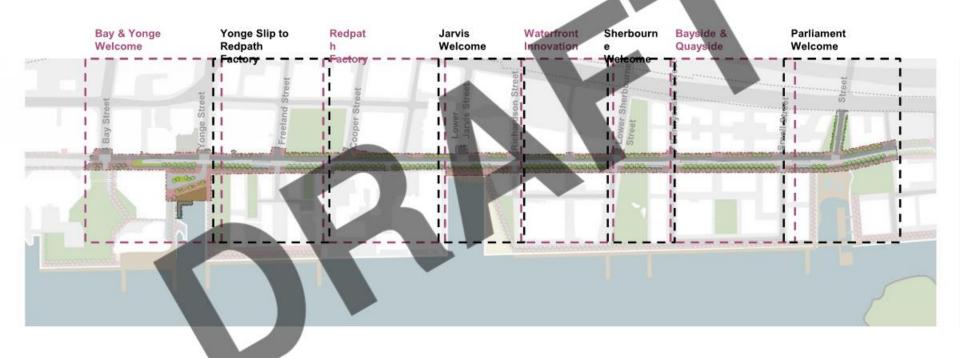
CNIB Beacon for Improved Waterfront Accessibility

- Canadian National Institute for the Blind (CNIB) outdoor wayfinding beacon
 - Battery powered
 - Bluetooth connection to smartphone app for blind users
- Successfully implemented in exterior, public realm settings in other parts of Ontario
- Largest obstacle is securing funding to implement
- CNIB would partner in planning and implementation, including script-writing of audio cues
- Can be embedded in a wayfinding signage post (ie. TO360, pedestrian push button pole)

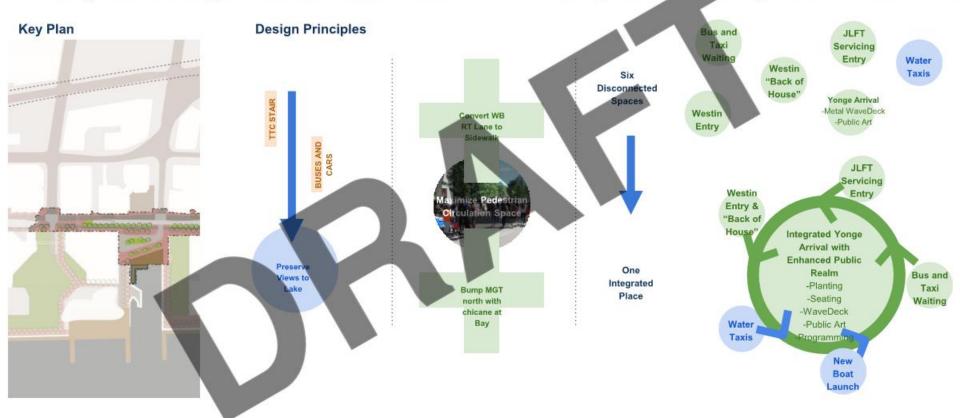




Queens Quay Overview



Bay & Yonge Welcome: Union Station, Ferry Terminal, Longest Street in World



Bay & Yonge Welcome - Existing Site Photos

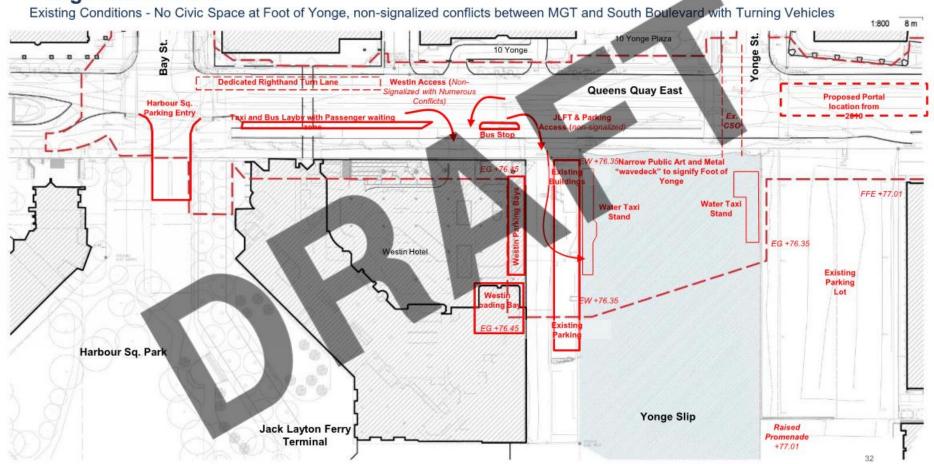


Yonge Street: Longest Street in World, Basis of Concession Roads

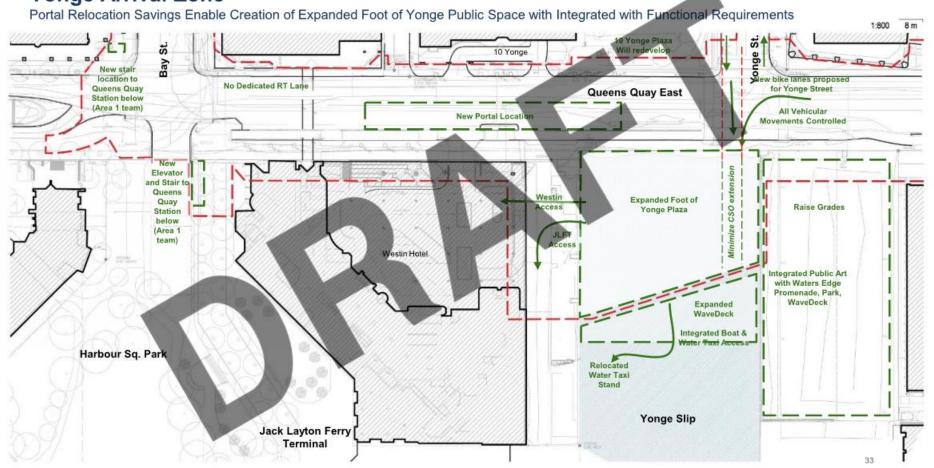


Yonge Street Starts at Lake Ontario

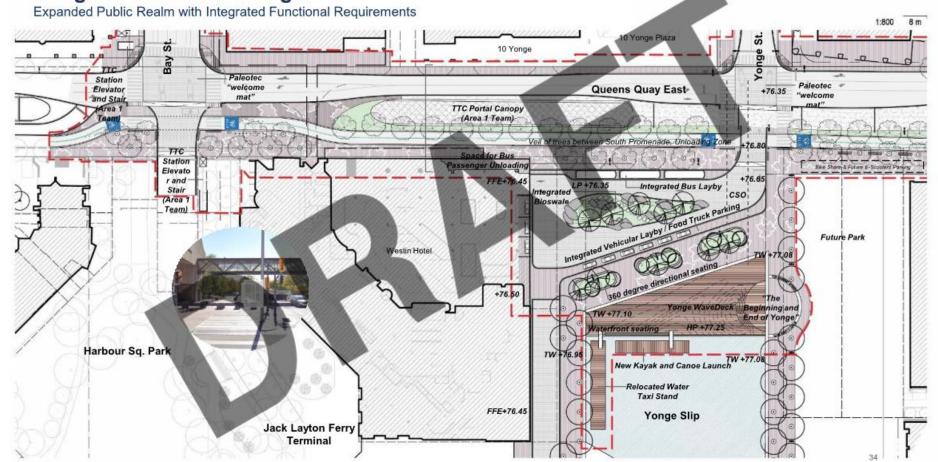
Yonge Arrival Zone



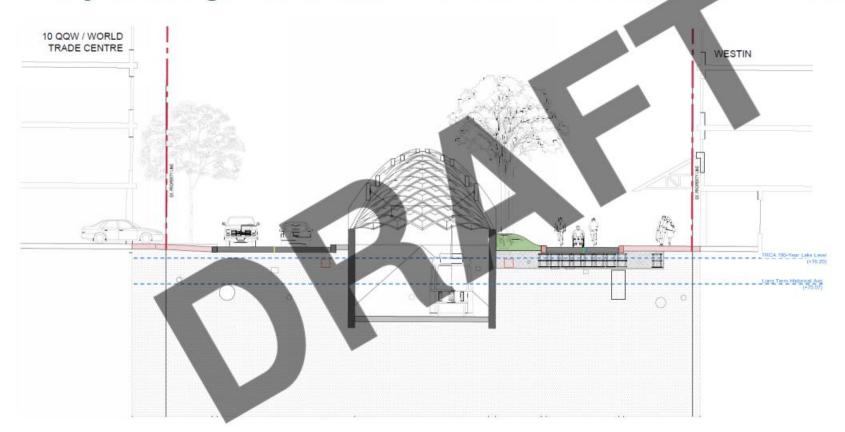
Yonge Arrival Zone



Yonge Arrival Zone Design

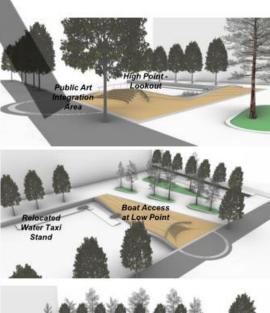


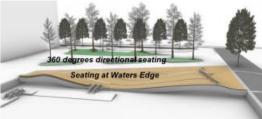
Bay & Yonge Welcome: Portal Relocation Savings Contribute to Public Realm



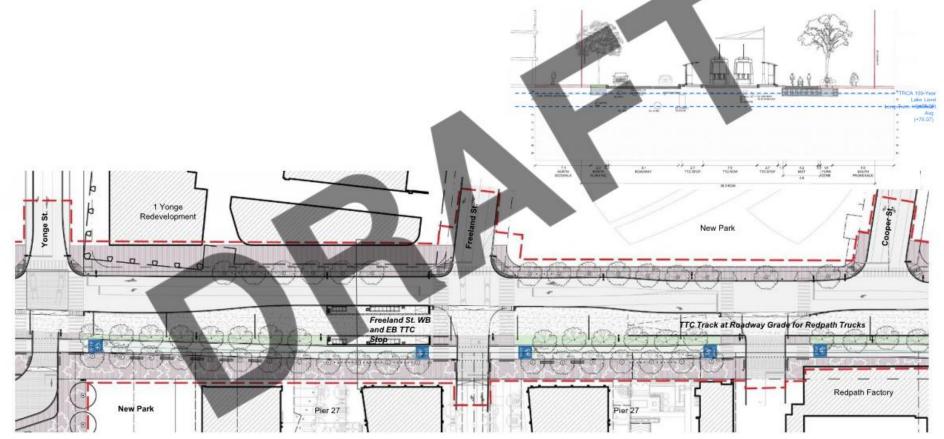
Integrated Head of Slip Vision







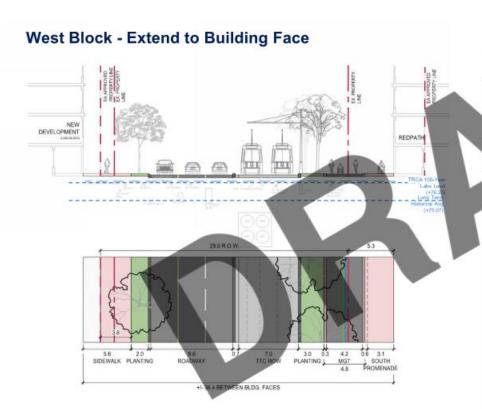
Yonge Slip to Redpath Factory



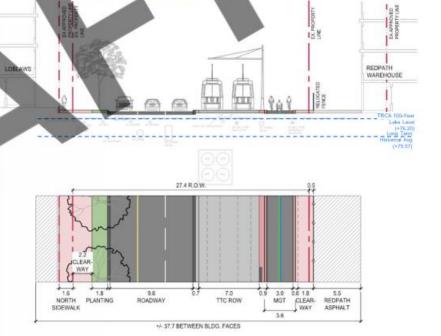


Redpath Factory - proposed solution

Maintains full Redpath operations in balance with public realm continuity

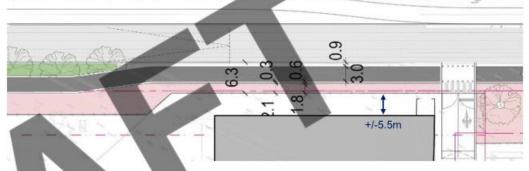


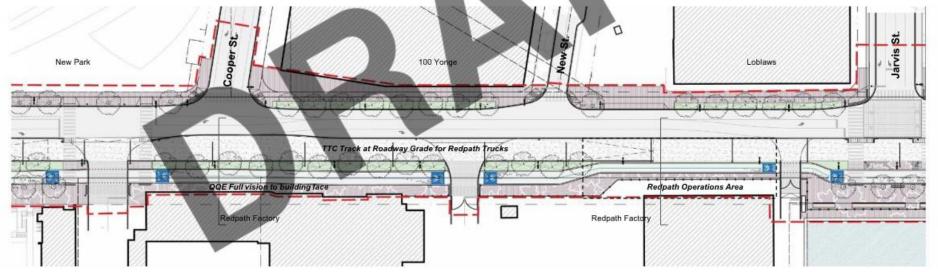
East Block - Full Redpath Operations Maintained, Minimal Dimensions for Public Realm



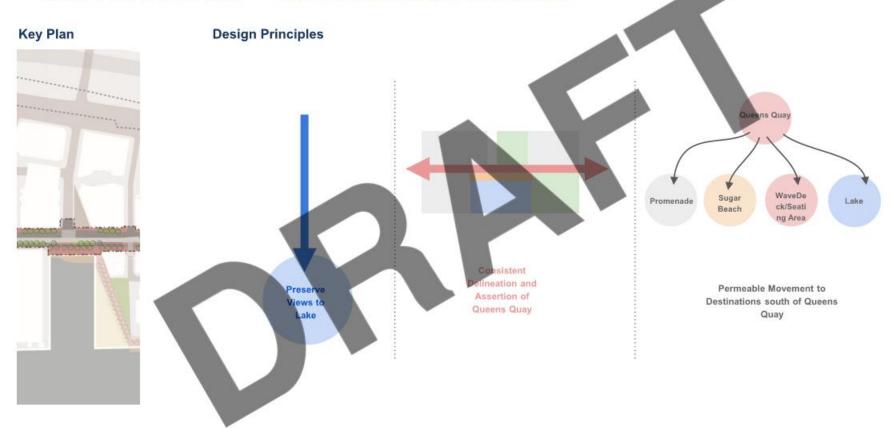
Redpath Factory - proposed solution







Jarvis Arrival - St. Lawrence Market



Jarvis Arrival

Existing Conditions









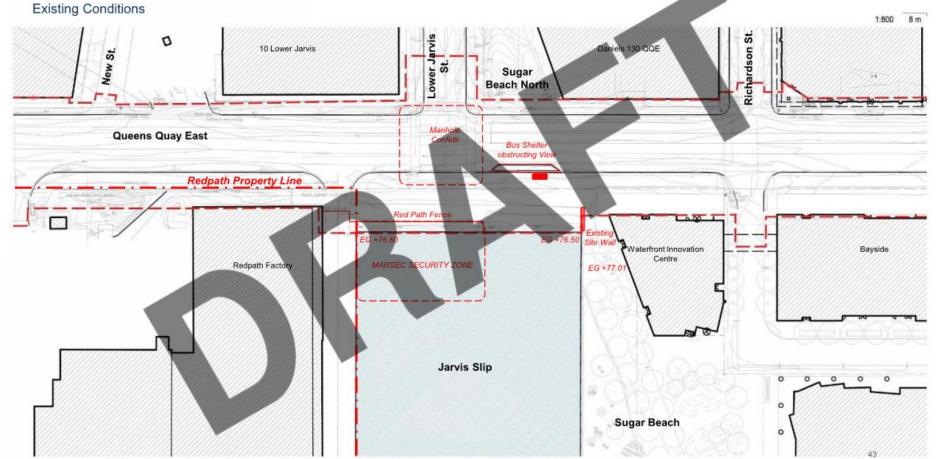




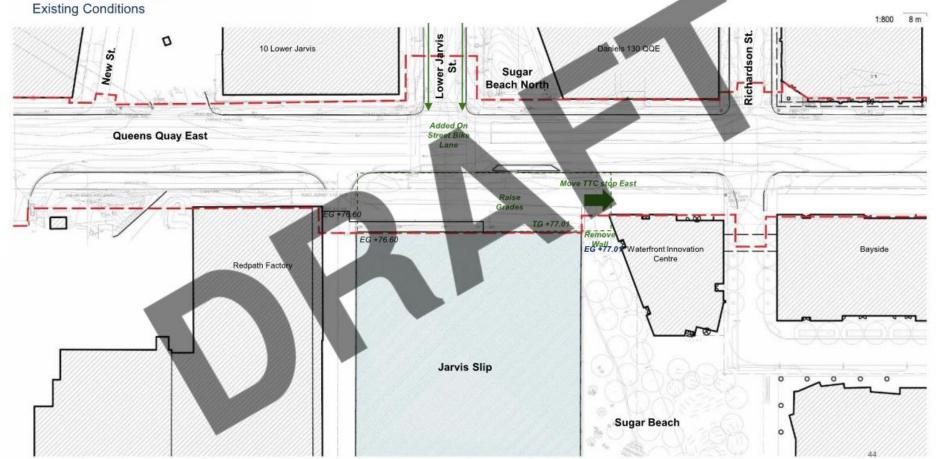


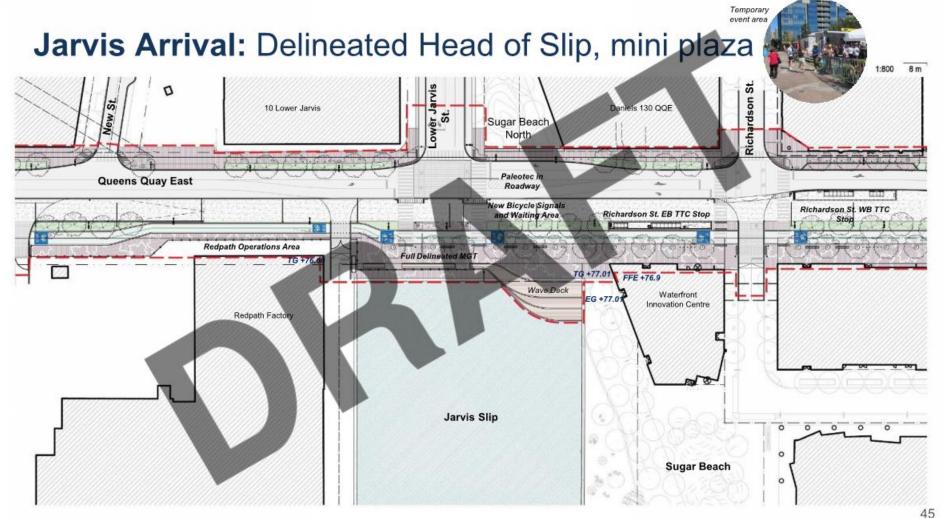


Jarvis Arrival

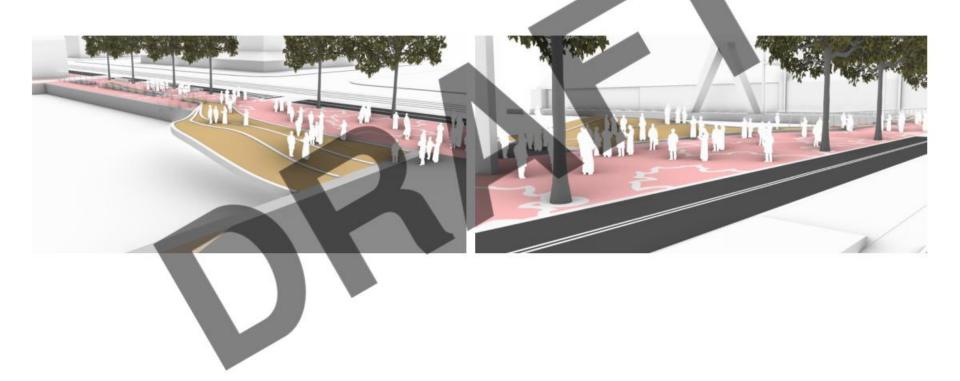


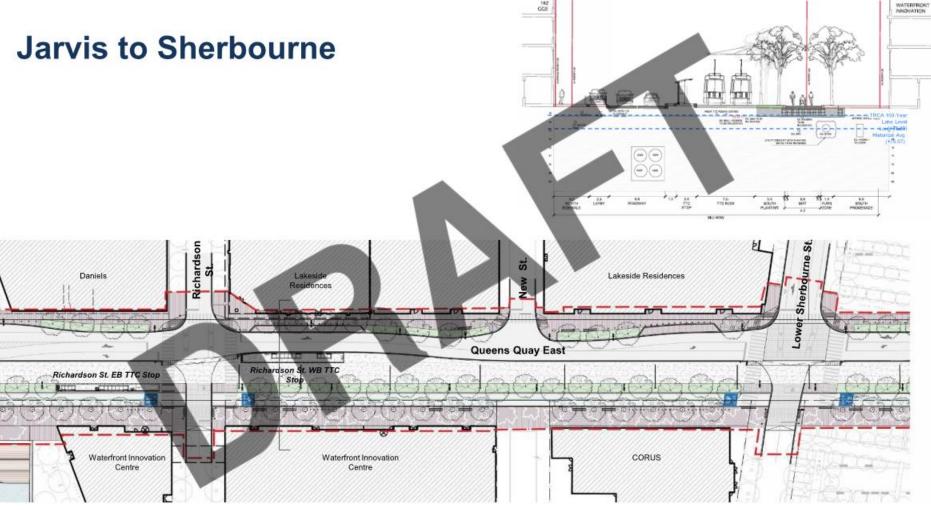
Jarvis Arrival





Jarvis Welcome: WaveDeck blends water, land, promenade

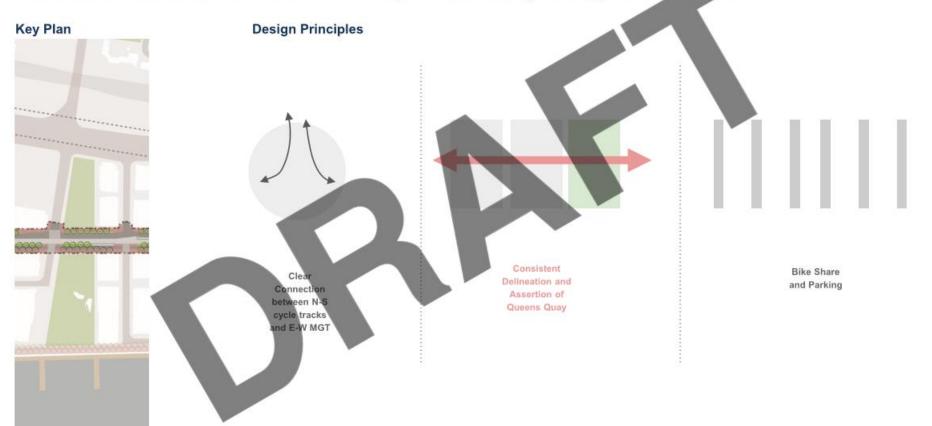




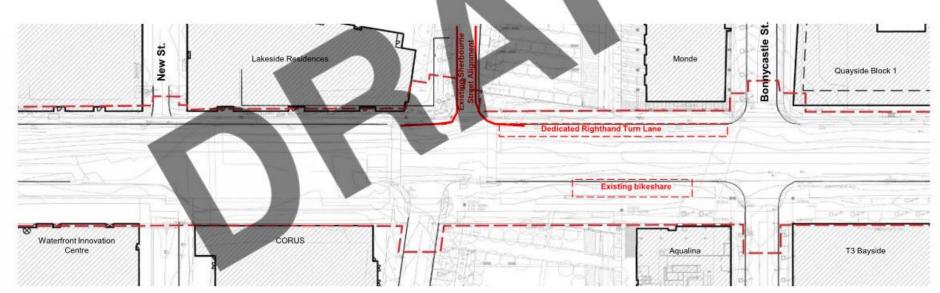
QQE



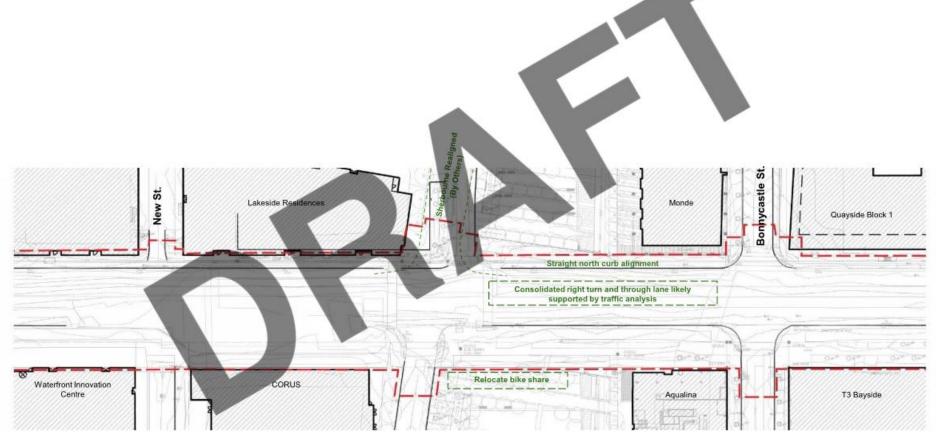
Sherbourne Arrival - Important Cycling Connection



Sherbourne Arrival

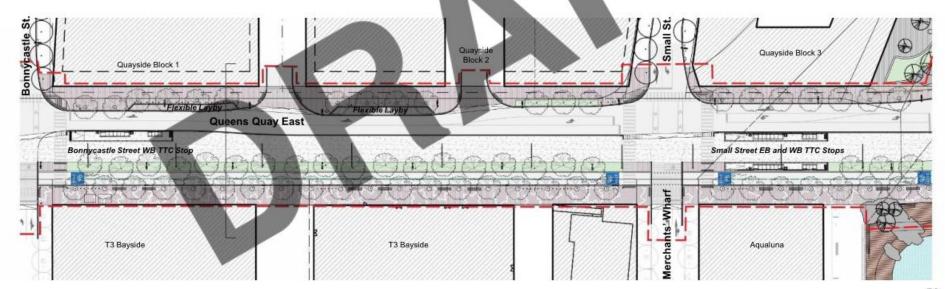


Sherbourne Arrival



MONDE AGUALINA. **Sherbourne Arrival** 14.2 POW Lakeside Residences Monde **Sherbourne Commons** Quayside Block 1 Paleotec Queens Quay East "Welcome Bonnycastle Street WB TTC Stop Bonnycastle Street EB TTC Stop Full Delineated MGT Bikeshare and Escooter Parking CORUS Waterfront Innovation Centre T3 Bayside Aqualina **Sherbourne Commons**

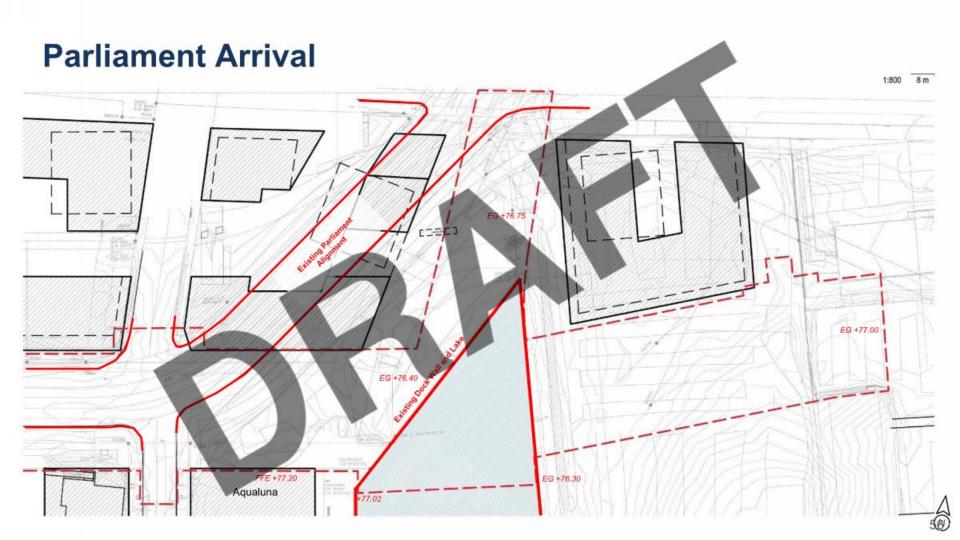
Bayside and Quayside



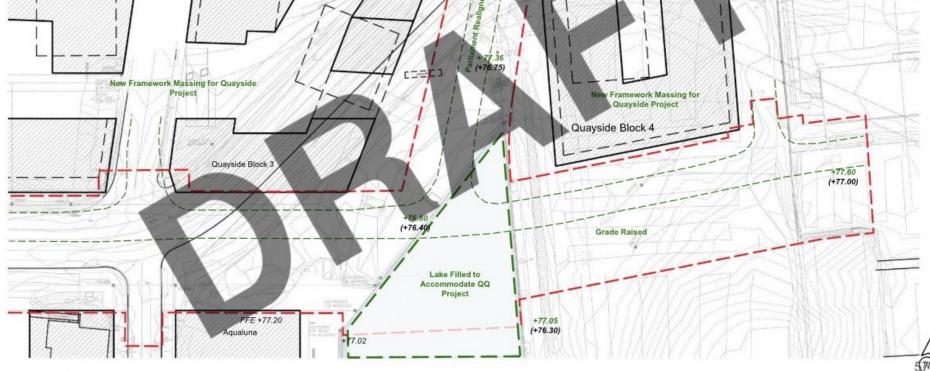


Parliament Arrival - Distillery District

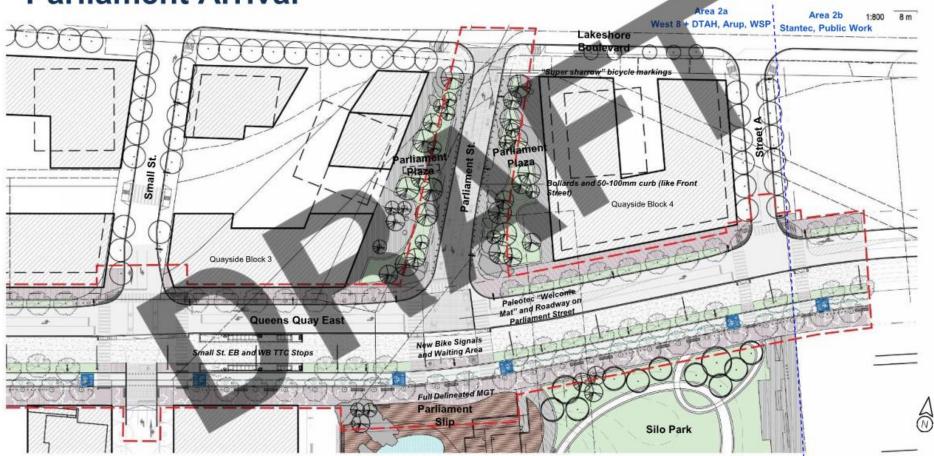




Parliament Arrival 1:800 New Framework Massing for Quayside Project New Framework Massing for Quayside Project Quayside Block 4 Quayside Block 3 (+77.00)



Parliament Arrival





Area 2B Boundary, Alignment to Cherry Street





