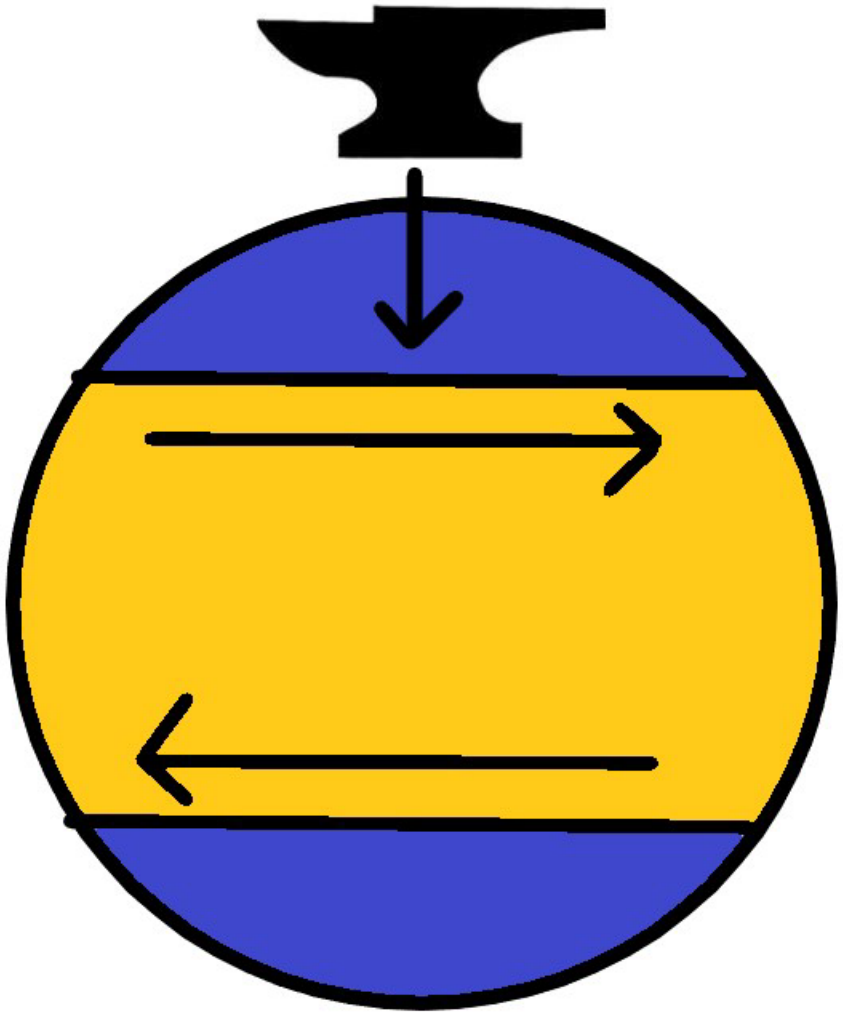
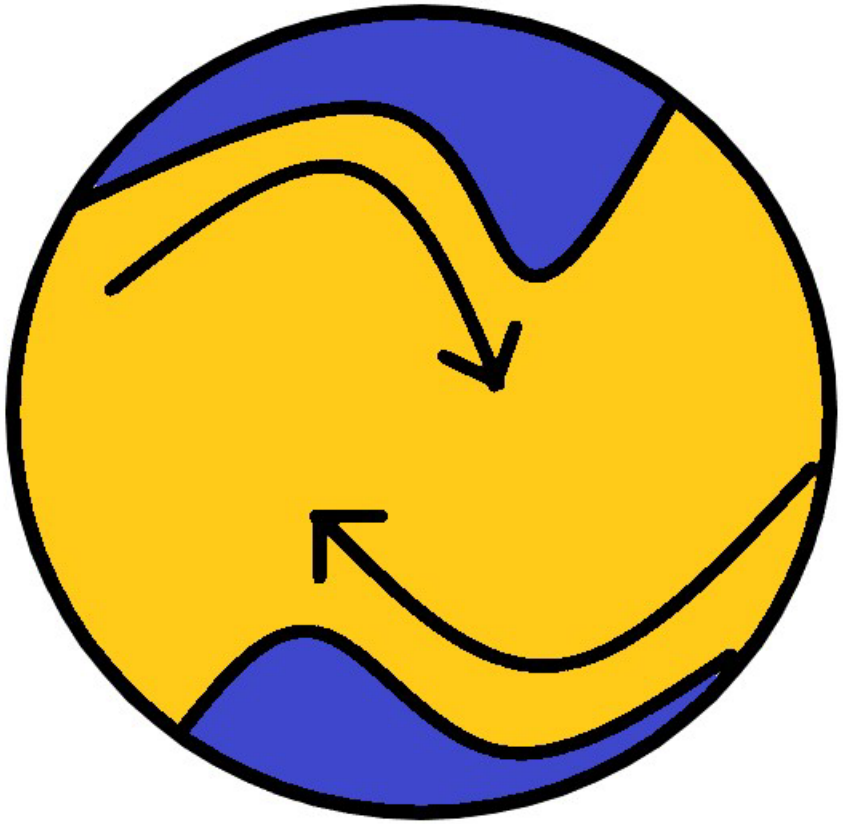
City of Toronto
Climate Positive Design

Transportation Services

APWA – May 25, 2023



Global Warming



TORONTO


Source: Toronto and Region Conservation Authority
Google Earth
Toronto
Orillia
Bobcaygeon
Collingwood
Argyle
Angus
Georgina
Peterborough
Hanover
Bolton
TORONTO
Brampton
Lake Ontario
Kitchener
Ancastler
Hamilton
Rochester
Niagara Falls
London
St. Catherines
Buffalo
St. Thomas
Lake Erie
Dunkirk
Springville
Fredonia
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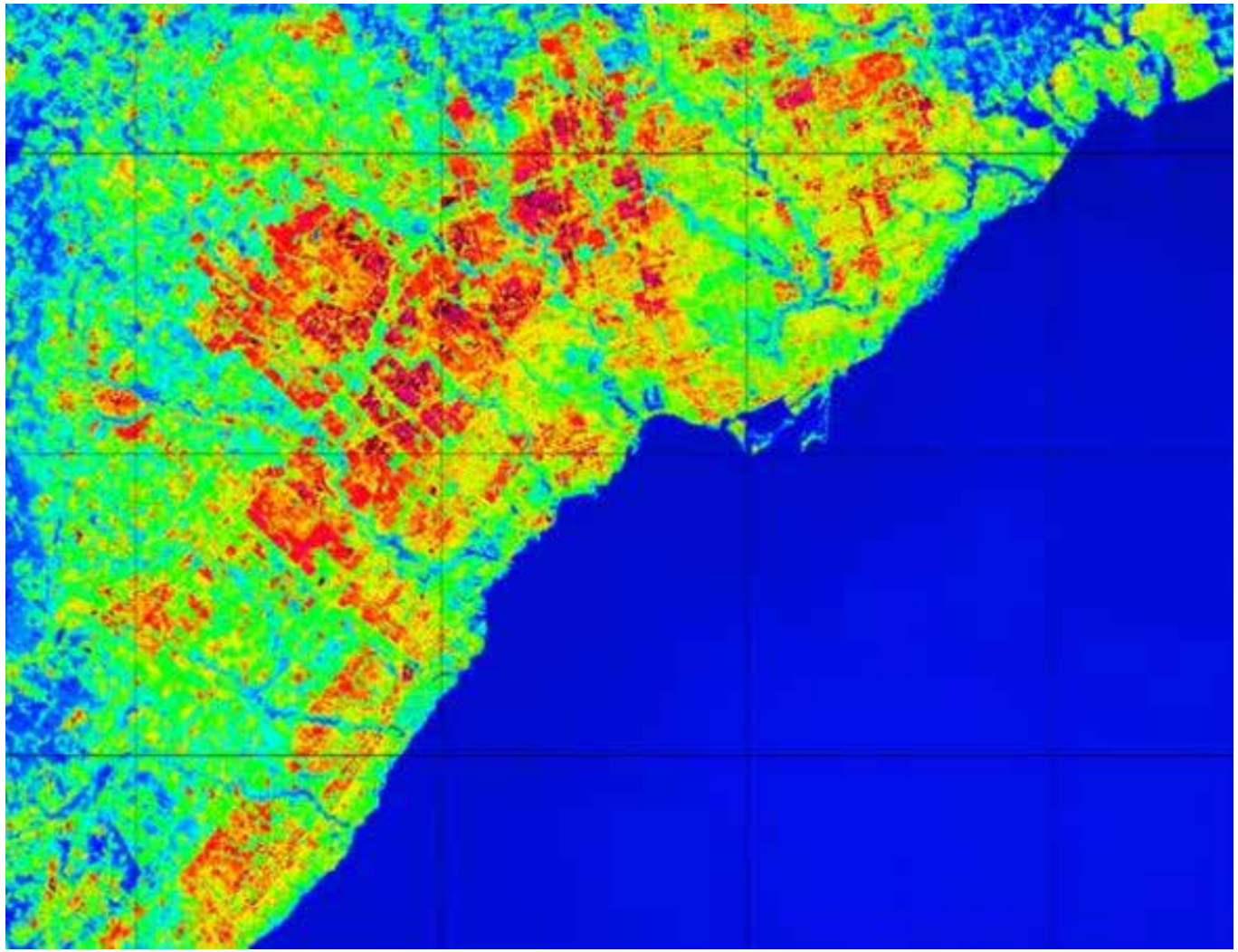
City of Toronto Concerns:

- Significant Storm Events and Flooding.
- More Freeze Thaw Cycles with Impact on Infrastructure.
- Urban Heat Island and Prolonged Heat Waves – Public Safety Concern.
- Pollution and Air Quality. Public Health Concern.
- Lake Water Level Changes impacting infrastructure.



www.cleanairpartnership.org

https://toronto.ctvnews.ca/nine-new-streetcars-damaged-by-extensive-flooding-in-toronto

Transportation Services Response:

Climate Change Adaptation

- Increase Storm Water Infiltration with Green Street Initiative.
- Plant Trees within Transportation Right of Way.
- Capital Infrastructure Changes for Flood Control

www.cleanairpartnership.org

Transportation Services Response:

Climate Positive Design

- Encourage Active Transportation.
- Support Communities and Promote Local Pedestrian Improvements.
- Green Street Initiatives
- **Review and Revise City Construction Standards to Reduce Embodied Carbon**
- **Review Project Design and Construction Practice to Reduce Embodied Carbon**

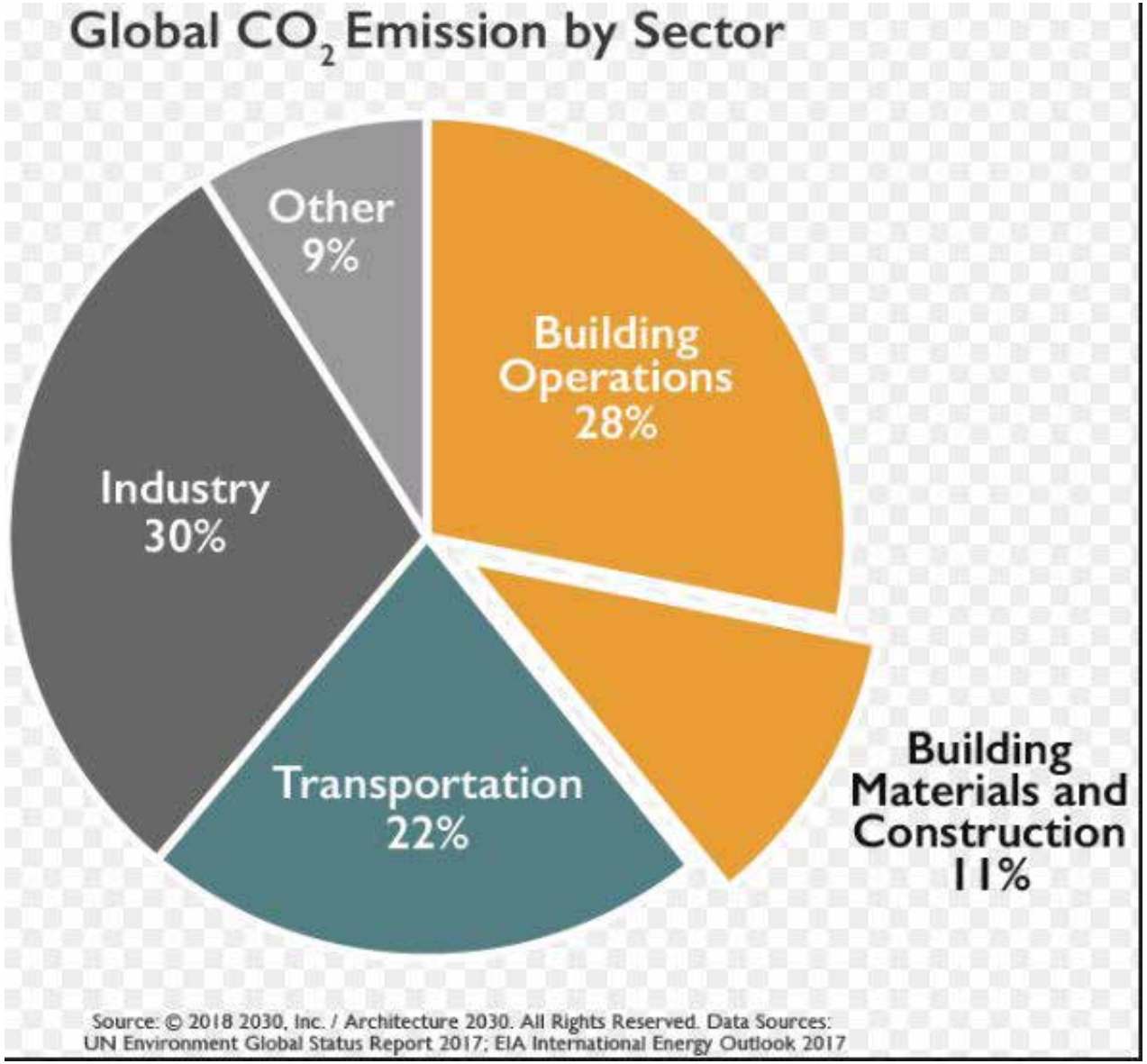
Impacts of Construction Activity:

- Increased Mining Activity
- Resource Depletion
- Greenhouse Gas Emissions
- Air Quality / Water Quality
- Transportation of Materials
- Traffic Congestion
- Noise Pollution
- Social Factors: Comfort and Well Being.
- Economic Impacts: Road Closures, Business/ Retail Access.
- Resulting Maintenance / Operational Impacts

Carbon Impact of Construction Activity

Embodied carbon refers to the greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials. Embodied carbon is a significant percentage of global emissions and requires urgent action to address it.

- Carbon Leadership Forum.org



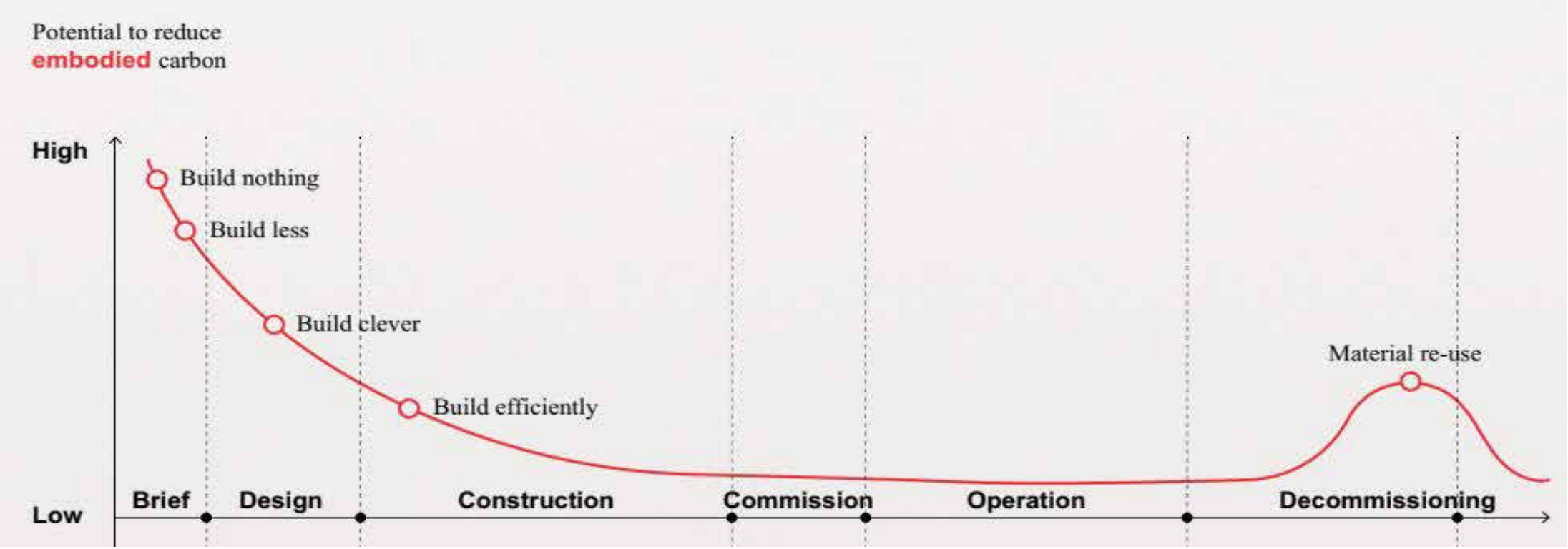
Materials

- Revise specifications to select material with lower embodied carbon.
- Promote the re use of materials on site. (Beyond recycling).
- Discontinue specifying rare materials.
- Source local materials in support of the circular economy.

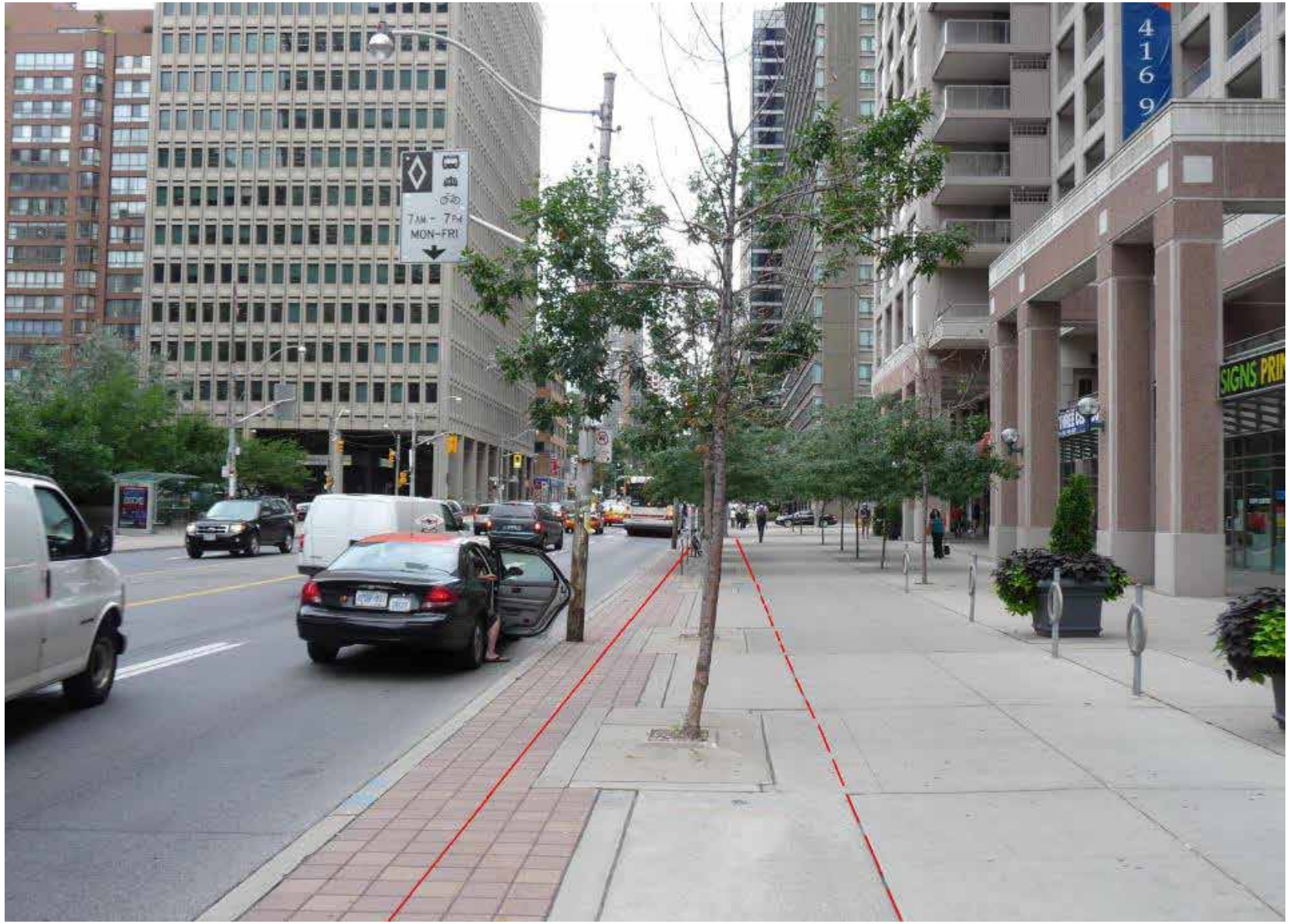
https://rmi.org/embodied-carbon-101/

Design and Construction Practice:

- Promote production of an existing site material inventory prior to developing a demolition plan.
- Meet project objectives but with reduced construction and reduced waste.
- Use of a project carbon impact calculation tool such as: https://climatepositivedesign.com/
- Dry construction and decommissioning.



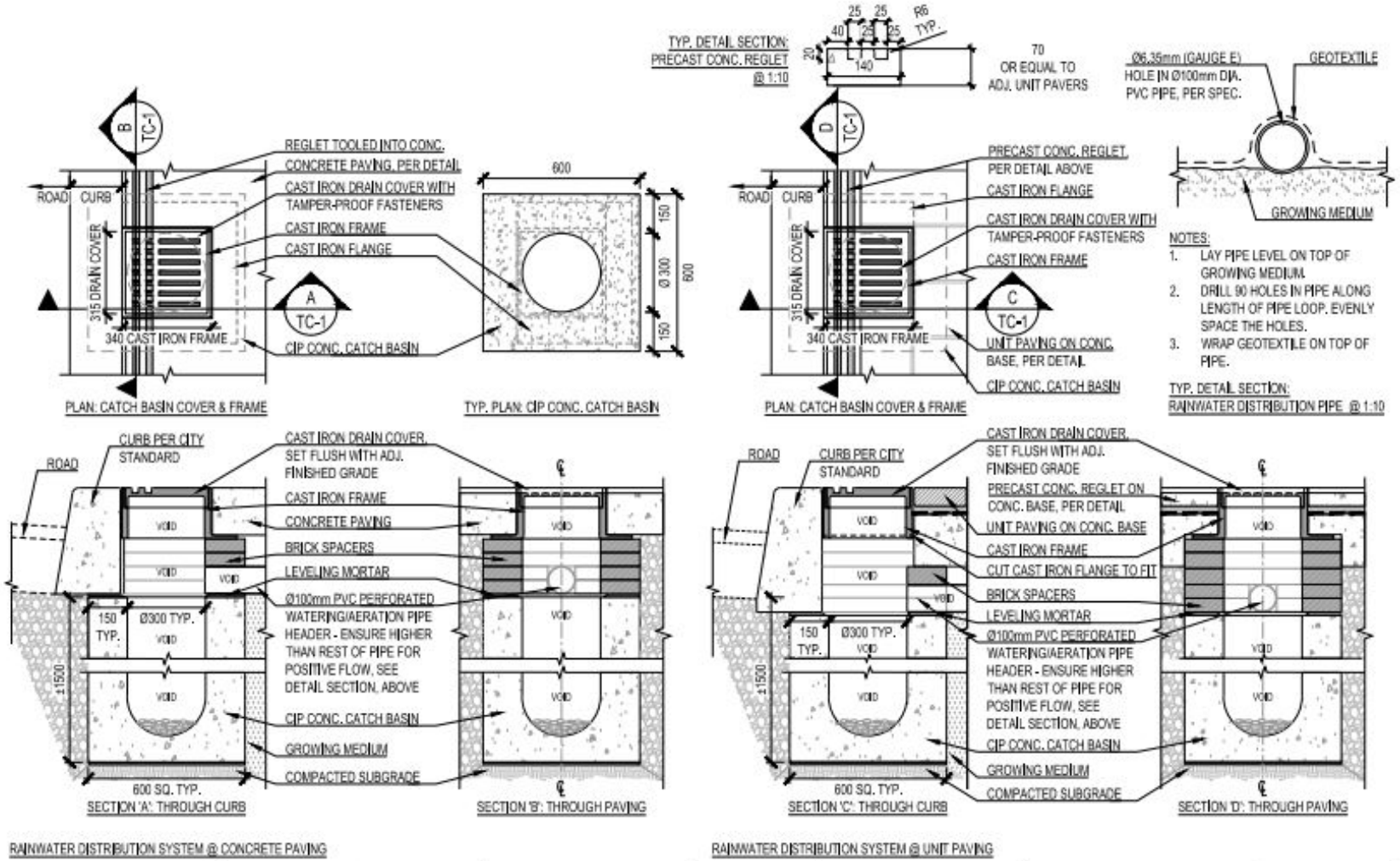
Bay Street Tree Trench



TORONTO

Bay Street Tree Trench

Simplify:


TYP. DETAIL SECTION: PRECAST CONC. REGLET @ 1:10
70 OR EQUAL TO ADJ. UNIT PAVERS
Ø6.35mm (GAUGE E) HOLE IN Ø100mm DIA. PVC PIPE, PER SPEC.
GEOTEXTILE
GROWING MEDIUM
NOTES:
1. LAY PIPE LEVEL ON TOP OF GROWING MEDIUM.
2. DRILL 90 HOLES IN PIPE ALONG LENGTH OF PIPE LOOP. EVENLY SPACE THE HOLES.
3. WRAP GEOTEXTILE ON TOP OF PIPE.
TYP. DETAIL SECTION: RAINWATER DISTRIBUTION PIPE @ 1:10
REGLET TOOLED INTO CONC. CONCRETE PAVING, PER DETAIL
CAST IRON DRAIN COVER WITH TAMPER-PROOF FASTENERS
CAST IRON FRAME
CAST IRON FLANGE
CIP CONC. CATCH BASIN
ROAD
CURB
315 DRAIN COVER
340 CAST IRON FRAME
PLAN: CATCH BASIN COVER & FRAME
TYP. PLAN: CIP CONC. CATCH BASIN
PRECAST CONC. REGLET PER DETAIL ABOVE
UNIT PAVING ON CONC. BASE, PER DETAIL
CURB PER CITY STANDARD
CAST IRON DRAIN COVER, SET FLUSH WITH ADJ. FINISHED GRADE
CONCRETE PAVING
BRICK SPACERS
LEVELING MORTAR
Ø100mm PVC PERFORATED WATERING/AERATION PIPE HEADER - ENSURE HIGHER THAN REST OF PIPE FOR POSITIVE FLOW, SEE DETAIL SECTION, ABOVE
GROWING MEDIUM
COMPACTED SUBGRADE
150 TYP.
Ø300 TYP.
1500
600 SQ. TYP.
SECTION 'A': THROUGH CURB
SECTION 'B': THROUGH PAVING
CUT CAST IRON FLANGE TO FIT
SECTION 'C': THROUGH CURB
SECTION 'D': THROUGH PAVING
RAINWATER DISTRIBUTION SYSTEM @ CONCRETE PAVING
RAINWATER DISTRIBUTION SYSTEM @ UNIT PAVING
TREE PLANTING SOLUTIONS IN HARD BOULEVARD SURFACES
ARUP
URBAN TREE
UFI
K. J. BONTIUS
NOV. 9/12
LICENSED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO
3 2013-02-08 Best Practices Manual-100% Submission-R1
2 2012-07-31 Best Practices Manual - 100% Submission
1 2012-02-29 Issued for City Review - 90% Submission
No. DATE REVISIONS
TYPICAL COMPONENTS
RAINWATER DISTRIBUTION SYSTEM DETAILS
SCALE: 1:20
All dimensions are in millimetres unless otherwise noted.
TC-1

Revising Boulevards

Danforth Avenue Resurfacing

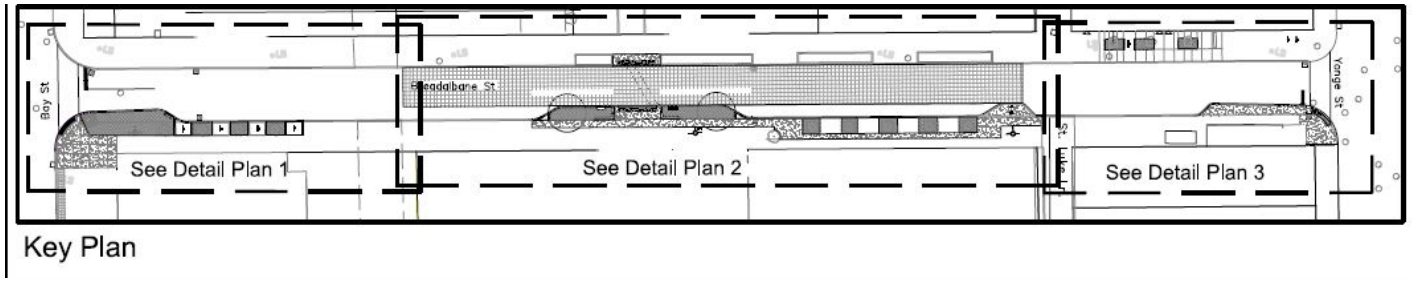
Laneway Puncture

Thelanewayproject.ca

Holbrooke Avenue Resurfacing

TORONTO

Breadalbane St. Proposal (The 100km Street)



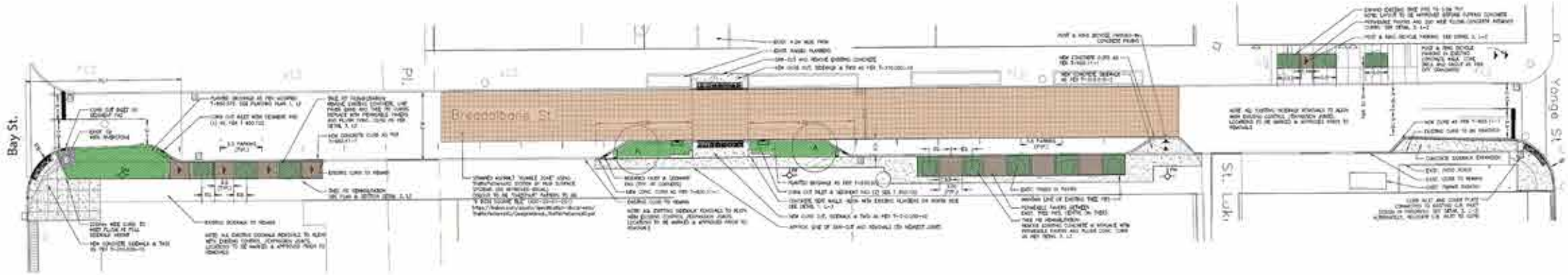
Key Plan

NOTES:

*Breadalbane - The 100 km Street
The City of Toronto promotes a "Circular Economy Approach" to help reduce carbon emissions. Where possible, all materials used in this project will be sources from within a 100km radius. The City will work with the contractor to source and approve locally produced materials. Materials suppliers to be approved by the City.

LEGEND

- TREE PIT
- PERMEABLE UNIT PAVERS
- STAMPED ASPHALT "RUMBLE ZONE"
- NEW CONCRETE SIDEWALK (AREA TO BE VERIFIED)
- EXISTING TREE
- A PROPOSED TREE



Circular Economy Principles to Support Climate Positive Design

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