Don Mouth Naturalization and Port Lands Flood Protection Project EA

May 9th, 2009
TRCA

Presentation Overview

1. **Where We Were**
2. **Conceptual Design**
   - **How Water Moves**
   - **How Sediment is Managed**
   - **How Habitat is Created**
   - **How Existing Contaminants are Managed**
3. **Next Steps**

Project Goal

To establish and sustain the **form, features, and functions of a natural river mouth** within the context of a **revitalized City environment** while providing **flood protection** up to the Regulatory Flood.

Naturalization

Revitalized City Environment

Flood protection

Project Objectives

1. Naturalize and rehabilitate mouth of the Don River
2. Provide flood protection for Spill Zones 1 and 2
3. Manage sediment, debris and ice
4. Integrate infrastructure
5. Encourage recreation, cultural heritage opportunities and accessibility
6. Contribute to revitalization and sustainability of waterfront
7. Design and implement this project in a sustainable manner

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Study Area

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Conclusion of Step 4

- 4WS preferred alternative subject to studies on:
  - Hydrology/ Sediment Management
  - Management of Contaminated Soils and Groundwater
  - Risk Analysis of Shipping Lane

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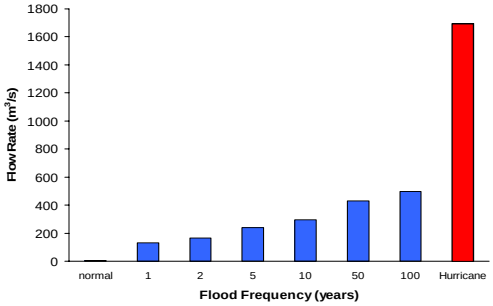
River Characteristics - (Flow Rate



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Regulatory Flood Spill Zones

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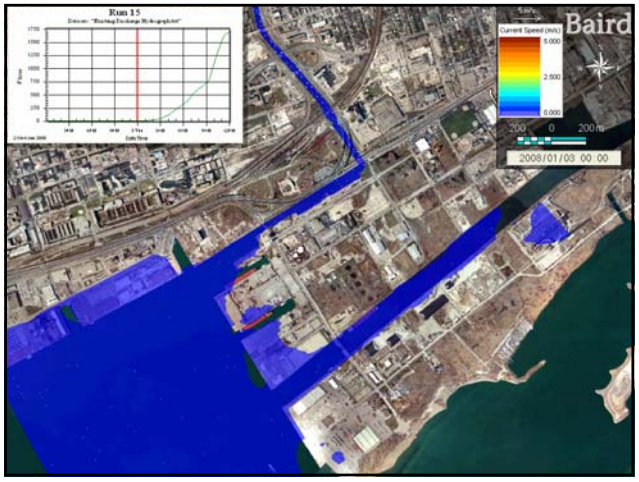
Model of Existing Conditions



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Regulatory Flood

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Creating the Valley Feature

- Shape of valley and river channel serves three purposes:
  1. Convey Regulatory Flood
  2. Provide aquatic, wetland, & upland habitat
  3. Public use and recreation

- Armouring of valley and river channel required to stabilize slopes and ensure long-term sustainability of wetlands

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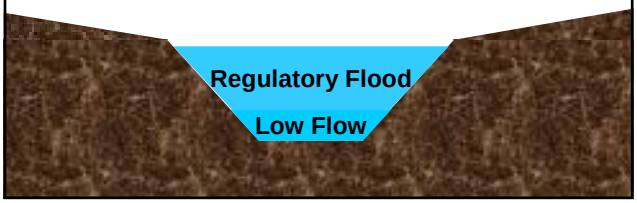
Creating the Valley Feature

1. Excavate to depth of valley
2. Fill adjacent lands



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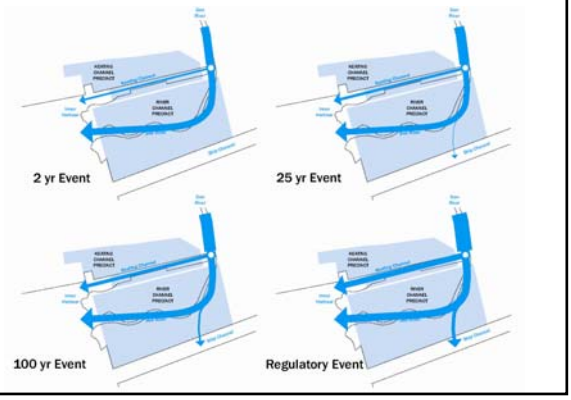
Where Does the Flow Go?



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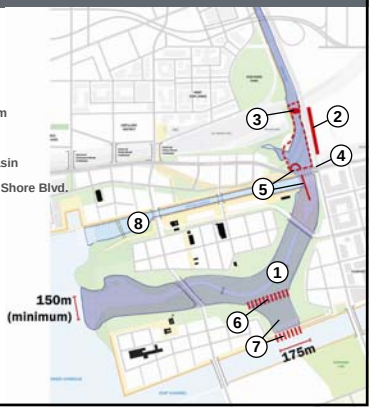
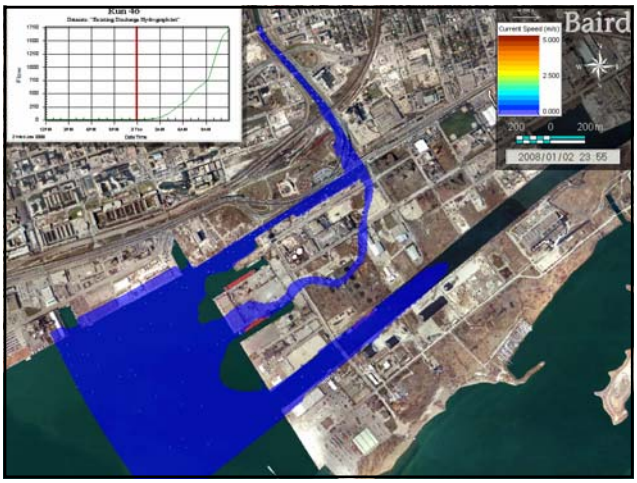
Flood Protection Measures

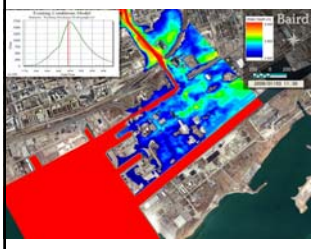
1. River Valley Formation
2. East Bank Flood Protection Landform
3. Removal of Utility Bridge
4. Channel Modification & Sediment Basin
5. Bridge Lengthening & Weirs at Lake Shore Blvd.
6. Overflow Levee
7. Greenway Wetland and Floodway
8. Keating Channel Floodway

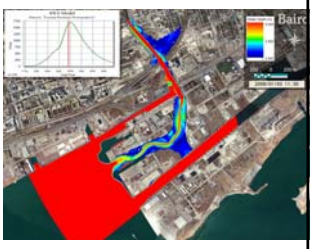


17 **Conveying the Regulatory Flood**



19 **Existing Conditions and Conceptual Design**





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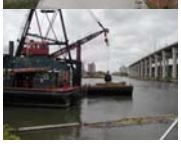
21 Existing Approach to Sediment Management

- Sediment currently managed within Keating Channel
- Clamshell dredge removes up to 40,000 m^3 per year
- Barge with dredgeate is towed to Tommy Thompson Park for disposal





22 Sediment Management Assumptions

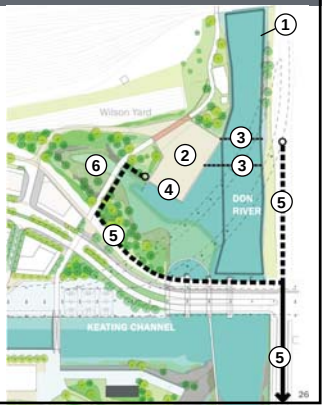
- Dredging required to maintain hydraulic conveyance channel and ecological stability navigation
- Sediment trap north of Lake Shore Blvd. will collect majority of bedload (sand)
- Suspended sediment (silt and clay) will continue downstream as presently occurs

23 Hydraulic Dredge Examples




24 Sediment Management Area

1. Sediment Trap
2. Sediment/Debris Management Area
3. Debris Booms
4. Barge Dock
5. Sediment Hydraulic Conveyance Pipe
6. Accommodation for Access Shaft



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Naturalization

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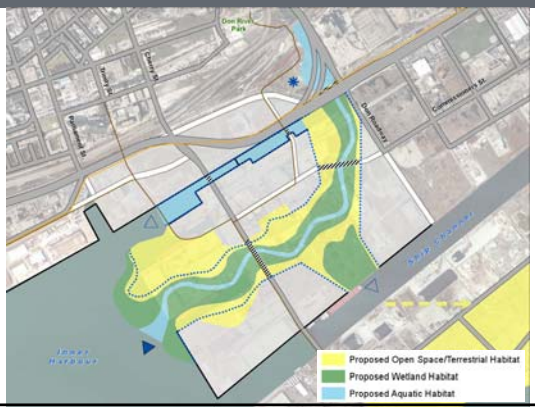
Naturalization Design from 4WS



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Naturalizations Assumptions

- Design to provide mix of aquatic, wetland, and upland communities
- Wetlands fed primarily by lake, not river
- A range of wetland access controls will be considered to reduce the presence of invasive species
- Vegetation communities expected to be highly disturbed following very large flood events

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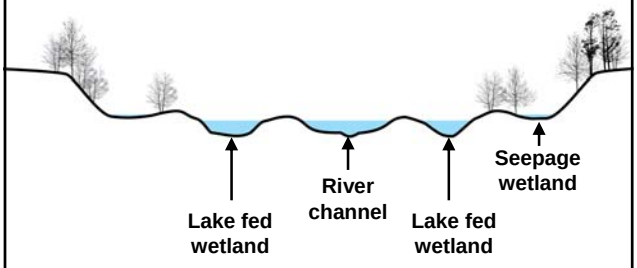
Valley Channel Creation



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Terrestrial Habitat – Open Space

Park Land,
Upland Forest,

Approx. 17.5 ha

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Terrestrial Habitat – Valley Slope Transitions

Upland Forest,
Treed Swamp

Approx. 2.5 ha

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Wetland Habitat – Levee System

Thicket Swamp,
Meadow Marsh

Approx. 4.3 ha

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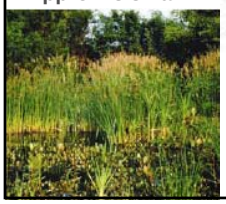
Wetland Habitat – Lake Connected Wetlands

Emergent Marsh
Submergent Marsh
Meadow Marsh

Approx. 8.3 ha



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Wetland Habitat – Seepage Wetlands

Treed Swamp, Thicket Swamp, Meadow Marsh

Approx. 1.3 ha

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Aquatic Habitat

Approx. 18.2 ha + Don Narrows

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Landscape Communities

- Open Space
- Valley Slope Transitions
- Levee System
- Lake Connected Wetlands
- Seepage Wetlands
- Aquatic

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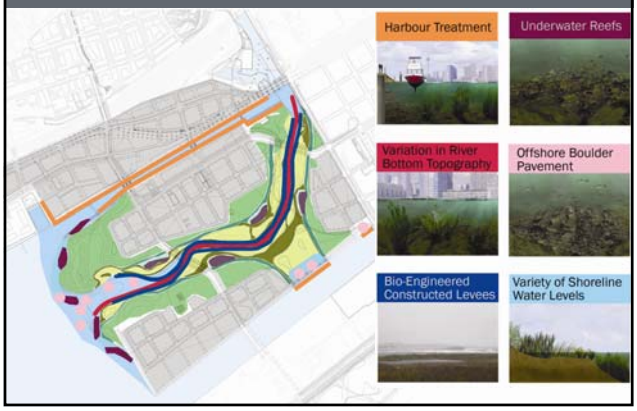
Fish Habitat Restoration



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Don Narrows Naturalization

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Greenway Connection

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Management of Contaminated Soils

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Data Collection on Soils

- **Geotechnical and geo-environmental data collected in 2009 to fill gaps**
- **Data will be used as part of risk assessment / risk management for entire Lower Don Lands**

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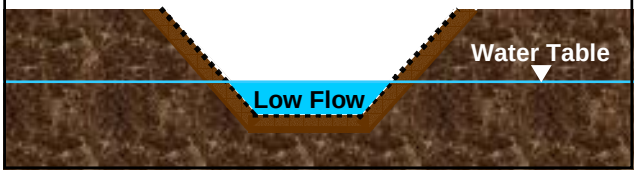
Contaminant Management in Valley Feature

1. Excavate to depth of valley
2. Over-excavate to remove contaminated soils
3. Backfill with clean material
4. Install armouring



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Shipping Lane Consideration

- Promontories do not significantly impact maneuverability within Inner Harbour
- Aids to navigation are likely to be required
- Sediment / debris should be managed upstream to minimize navigation impacts
- Modified currents do not pose an increased risk to navigation interests

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Integration with Lower Don Lands

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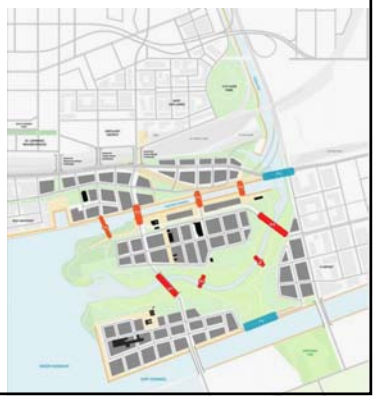
Bridges

- **EA will set clearance requirements for proposed bridges based on hydraulics and sediment management**



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Underground Infrastructure Crossings

- **Minimize disturbance to natural system by:**
  - **Minimizing number of infrastructure crossings**
  - **Eliminating risk associated with open cut activities**

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Next Steps on the Don Mouth EA

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Impact Assessment

- Fall 2009 Public Meeting to present:
  - Assessment of construction and operation-related impacts
  - Development of mitigation measures to address impacts
  - Refinement of conceptual design

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Adaptive Management

- Consider how to deal with:
  - Climate change
  - Operational issues
  - "Natural" changes in vegetation communities

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Timeline

Remaining Tasks	2009	2010	2011	2012
Detailed Impact Assessment	▬			
Public Meeting #4	★			
Prepare Provincial / Federal EAs	▬	▬		
EA Approval Process		▬		
Detailed Design and Other Approvals			▬	
Start Construction				▪▪▪▪▶