Wilket Creek Geomorphic and Habitat Systems Master Plan

WELCOME TO Public Information Center #3 – June 5, 2014

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Toronto and Region Conservation for The Living City

PARISH geomorphic

Study Purpose and Objectives

Creating a long-term plan for the management of Wilket Creek

Study being undertaken by the **City of Toronto and Toronto and Region Conservation Authority (TRCA).**

Purpose:

- to develop a ***long-term management plan*** (i.e. Master Plan) for Wilket Creek that takes account of ***natural processes, aquatic and wildlife habitat, and public amenities***

Key objectives: (a) ***protect infrastructure at risk*** due to erosion impacts during large storm events

- exposed manholes
- exposed sewers
- pedestrian bridges

(b) ***protect well-wooded valleyland and trail system***

Study Purpose and Objectives

Creating a long-term plan for the management of Wilket Creek

Why are we developing a Master Plan for Wilket Creek?

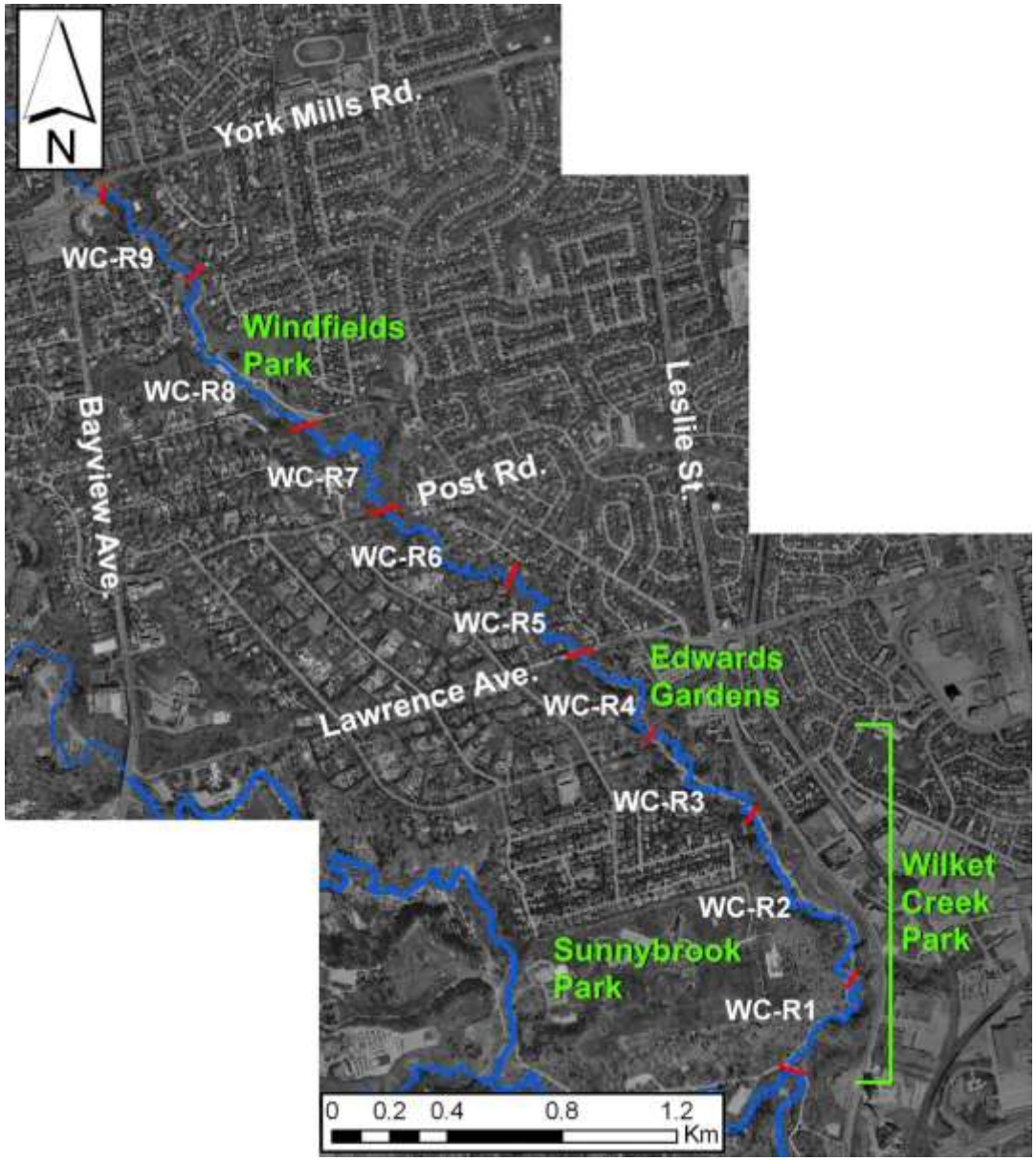
- Significant storm events of 2000, 2005, and 2008 have caused major damage to the channel and local infrastructure including bridges, pathways, manholes, and sanitary sewers
- Interim repair efforts have been successfully implemented at three sites in Wilket Creek Park
- Ongoing erosion impacts and infrastructure damage confirms the need for the development of a longer term management plan that takes into account natural channel processes

What will be the outcome?

The Master Plan will:

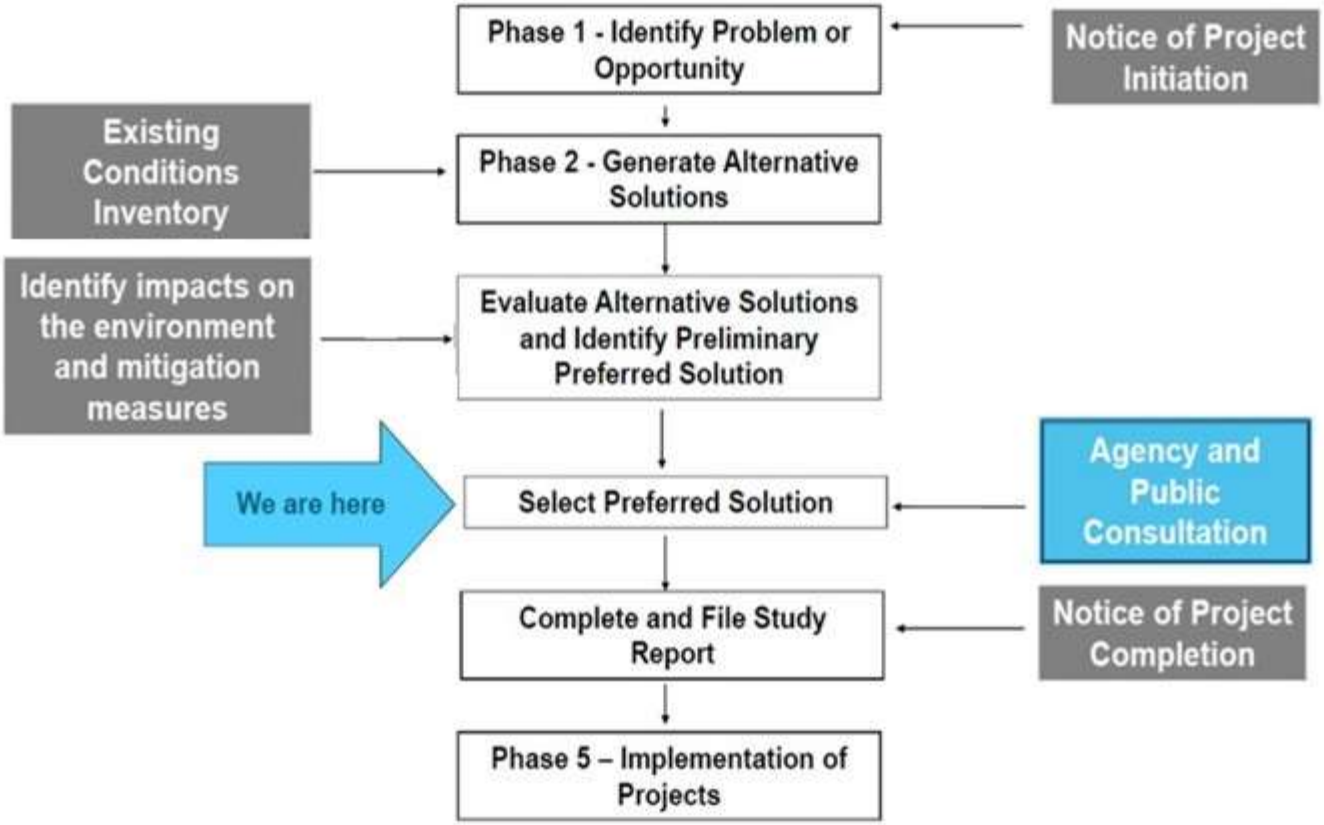
- Recommend projects to stabilize sections of Wilket Creek and protect infrastructure from future erosion impacts
- Incorporate habitat considerations to improve riparian and wildlife habitat within the channel
- Prioritize projects (e.g. short-term, medium term, long-term)
- Identify mitigation measures to reduce impacts of recommended projects to the greatest extent possible

Wilket Creek Key Map



Municipal Class Environmental Assessment

This study is following the *Master Planning* provisions of a Municipal Class Environmental Assessment



Following Adaptive Management Principles within the Class EA Process

This study is following a process founded in the principles of **Adaptive Environmental Management (AEM)**, as outlined in the document ***"The Adaptive Management of Stream Corridors in Ontario (2001)"***

This process has **Four Phases**:

Assess
Identify the Problem

Explore
Explore the Problem

Confirm
Alternatives and Implications

Choose
Making the Choice

When making the choice of what to do, we can:

1. **Do Nothing** – monitor the situation
2. **Use Land-use Planning Tools** – land-use designations / zoning, protect the feature
3. **Design** – detailed analysis for planning and design
4. **Manage the existing situation** – best management practices, habitat restoration

Alternative Solutions

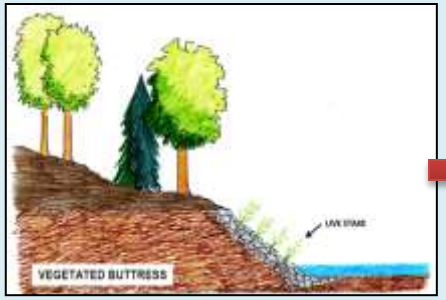
1. **Do Nothing**
   - No human intervention
   - Creek conditions monitored and allowed to function in current erosive state

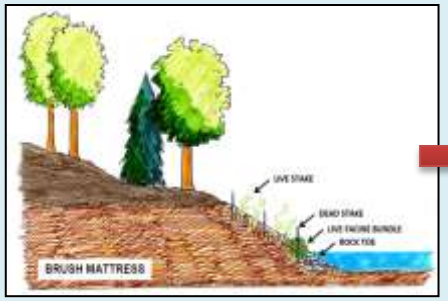
2. **Local Improvements**
   - Infrastructure repairs
   - Stream bank and slope stabilization
   - Stream bed stabilization and grade control
   - Minor planform adjustments/ realignments

Bed Stabilization Options

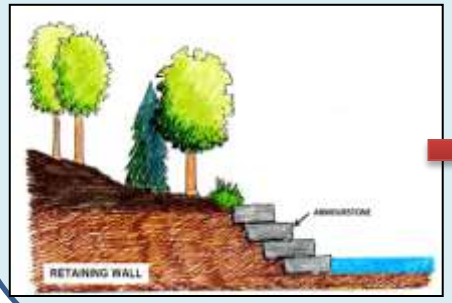
Bank Stabilization Options

Bioengineering Methods





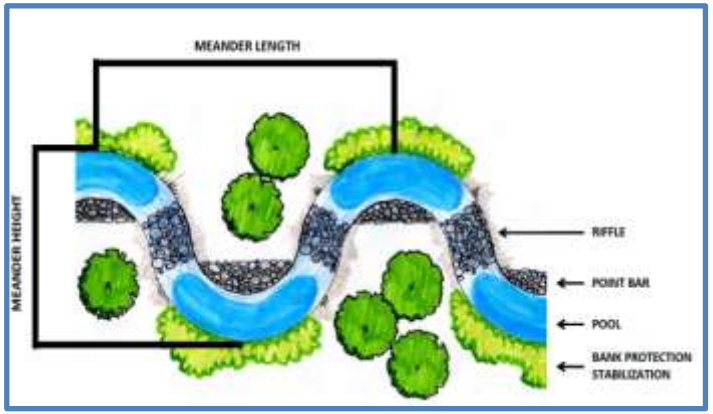
Engineered Methods

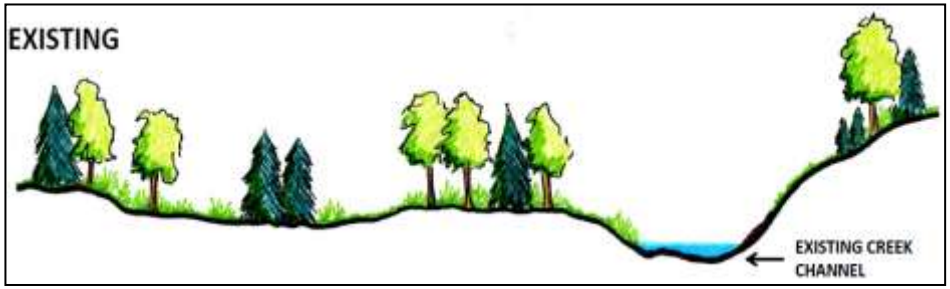


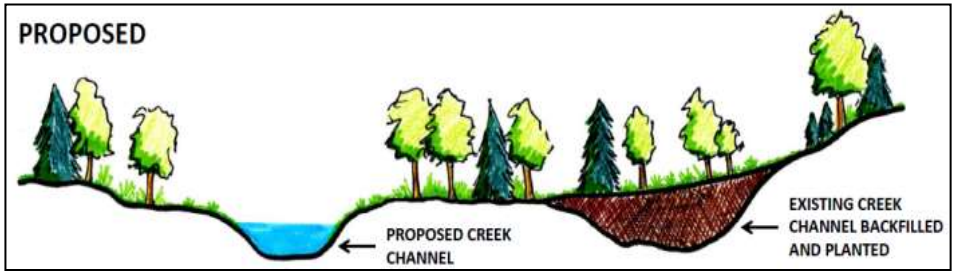
Alternative Solutions

3. Complete Channel Realignment

- Re-establish natural meandering pattern with pools and riffles
- Construct new channel within constraints of available property
- Planform, profile, and cross-sectional shape developed in balance with existing sediment and flow regime to reduce erosive forces and promote a self-maintaining system
- Restore bank stability, grade controls, and natural vegetation within new creek corridor







Evaluation Criteria

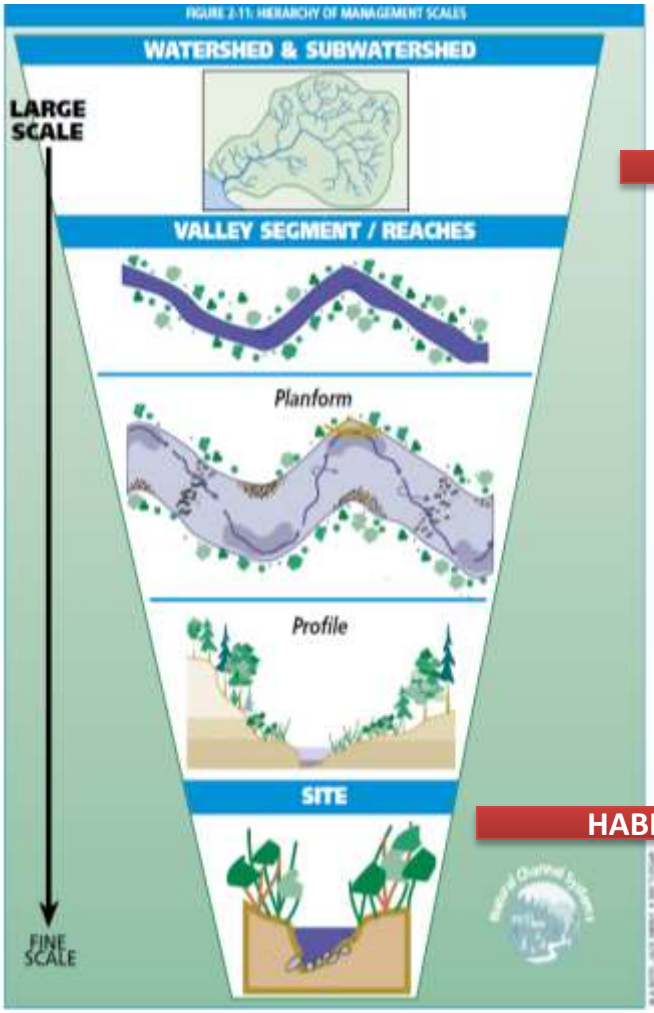
1. Natural Environment
   a) **Channel Form and Function** – will this alternative provide erosion protection while allowing natural channel function?
   b) **Slope Stability** – does this alternative address current and potential future valley slope stability issues?
   c) **Natural Environment** – what will be the impacts on aquatic and terrestrial habitats?

2. Social / Cultural Environment
   a) **Private Property** – how will this alternative impact lands under private ownership?
   b) **Public Perception** – will this alternative have perceived impacts on public interests (e.g. safety, recreation, privacy)?
   c) **Cultural Heritage** – will this alternative have impacts on known or unknown cultural resources?

3. Technical / Economic Factors
   a) **Risk Assessment** – what is the degree of risk that failure / damage will occur, and when could it be anticipated?
   b) **Access / Constructability** – are there limits or constraints to construction of this alternative (e.g. slopes, property ownership, significant environmental features)? Is the site accessible for the required construction machinery / techniques to build the alternative and maintain it in the future?
   c) **Immediate (Capital) Costs** – what will be the capital costs to carry out this alternative?
   d) **Long-term Maintenance** – how long will the alternative last? Will additional work need to be completed again, and when? How much will it cost?

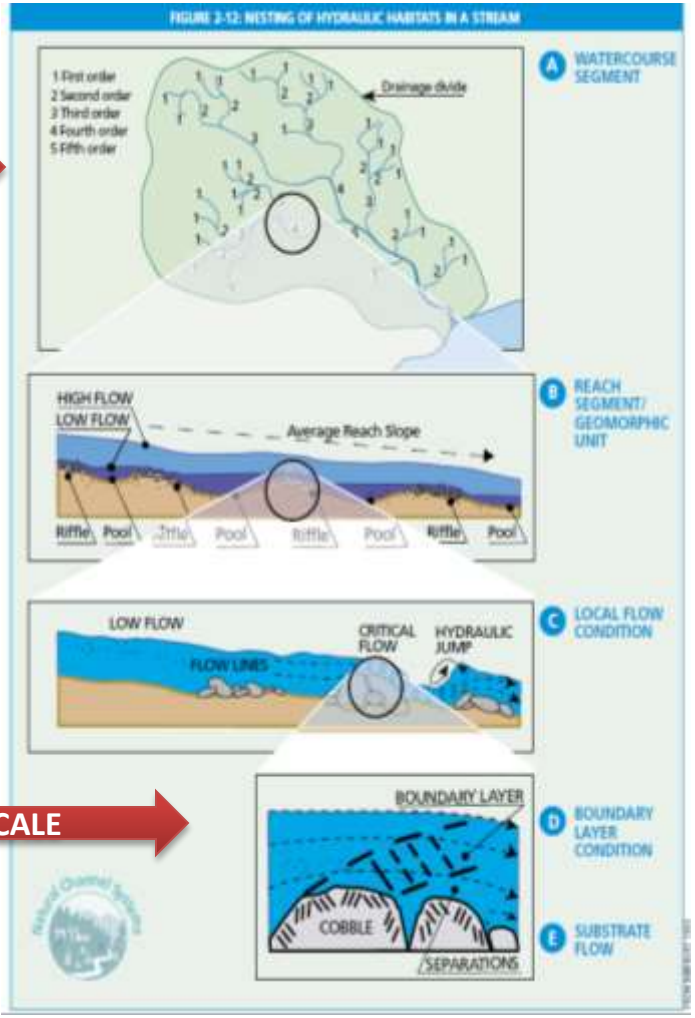
Natural Channel Processes – Fluvial Geomorphology Analysis

Stream analyses must consider the ***reach scale*** (large) to the ***habitat / aquatic organism scale*** (fine)



REACH SCALE

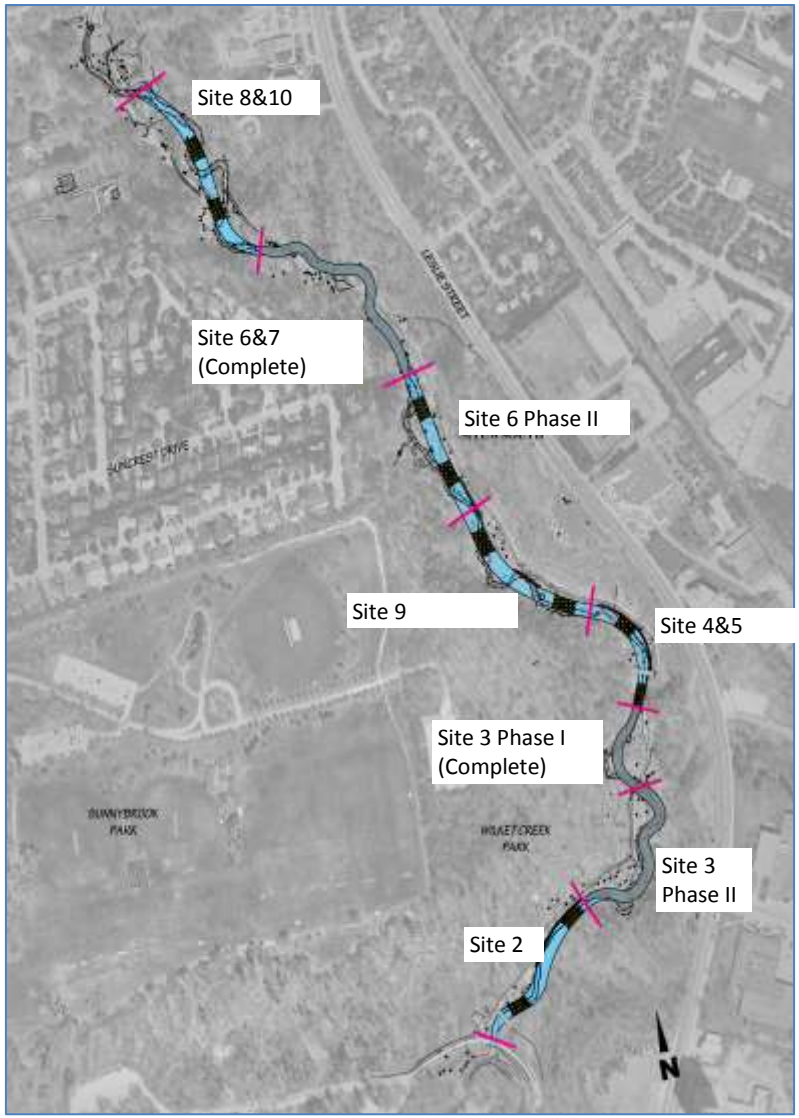
HABITAT / ORGANISM SCALE



Wilket Creek Park - Evaluation Findings

	Advantages	Disadvantages
Alternative 1: Do Nothing	• No immediate cost impacts • No site disturbance • No interruption of park use due to construction	• Continued bank erosion and bed incision • Continued impacts on sewer infrastructure; risk of damage is high • No improvement in aquatic habitat • Continued safety concerns for trail and bridge users
Alternative 2: Local Improvements	• Addresses immediate risks to sewer infrastructure • Some improvement to aquatic habitat • Some improvement to geomorphic form • Some decrease in erosion impacts	• Moderate construction costs • Moderate site disturbance • Requires some vegetation removal and replanting (wider channel)
Alternative 3: Complete Realignment	• Removal of impacts/ risk on sewer infrastructure and park amenities • Establishment of stable planform, profile and cross section • Improves sediment transport • Reduces erosive forces promoting a self-maintaining system • Lowest long-term maintenance costs	• Large construction costs • Large site disturbance • Disruption to park use during construction • Requires most vegetation removal and replanting (new planform and wider channel)

Wilket Creek Park – Recommended Solution



Wilket Creek Reach 5 - Problems and Opportunities (December 2013 PIC)

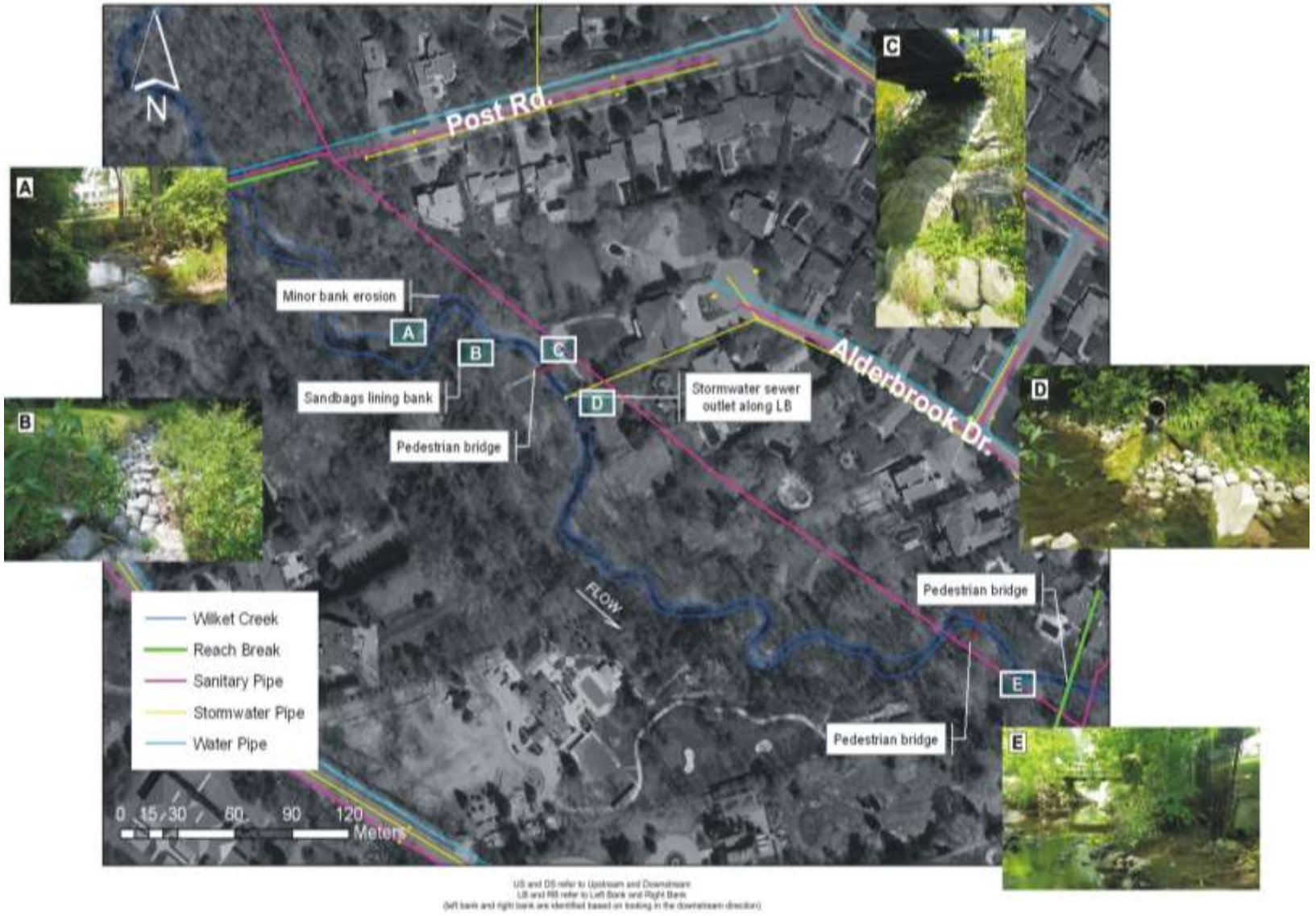
US and DS refer to Upstream and Downstream
LB and RB refer to Left Bank and Right Bank
(left bank and right bank are identified based on looking in the downstream direction)

WC-R5 - Evaluation Findings

	Advantages	Disadvantages
Alternative 1: Do Nothing	• No immediate cost impacts • No site disturbance • No disturbance to private property owners	• Impacts and high risk to sewer infrastructure remains • Continued bank erosion and bed incision • Valley wall contact/ slope stability issues remain • No improvement in aquatic habitat
Alternative 2: Local Improvements	• Addresses impacts and immediate risks to sewer infrastructure • Some improvement in geomorphic form • Some improvement to aquatic habitat • Some decrease in erosion impacts	• Moderate construction activity and costs • Moderate site disturbance • Requires some vegetation removal and replanting • Disturbance to private property owners
Alternative 3: Complete Realignment	• Addresses impacts and removes risks to sewer infrastructure • Establishment of stable planform , profile, and cross section • Decreases erosion impacts • Improves aquatic habitat • Lowest long-term maintenance costs	• Extensive construction activity and costs • Difficult site access • High site disturbance • Disturbance to private property owners • Requires substantial vegetation removal and replanting

Wilket Creek Reach 5
Recommended Solution

Wilket Creek Reach 6 - Problems and Opportunities (December 2013 PIC)



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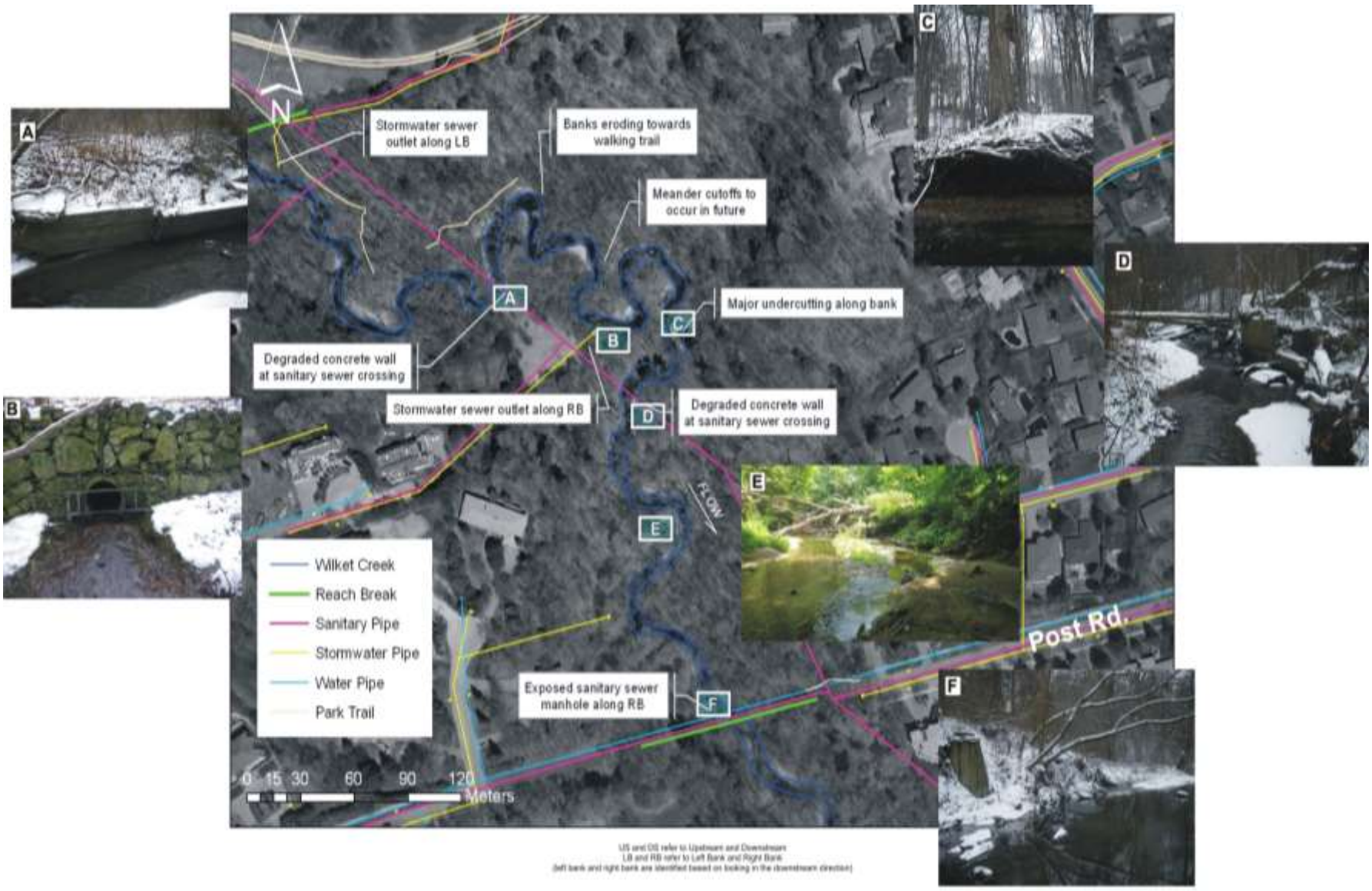
WC-R6 - Evaluation Findings

	Advantages	Disadvantages
Alternative 1: Do Nothing	• No immediate cost impacts • No site disturbance • No disruption to private property owners	• Continued bank erosion and bed incision risk to private property • Risk to private pedestrian bridges remains • Aesthetics low at highly eroded locations • No improvement in aquatic habitat
Alternative 2: Local Improvements	• Stabilizes banks and protects private property • Some improvement to geomorphic form • Some decrease in erosion impacts • Some improvement to aquatic habitat	• Moderate construction costs • Moderate site disturbance • Requires some vegetation removal and replanting • Disruption to private property owners • Risk to private pedestrian bridges remains
Alternative 3: Complete Realignment	• Ensures minimal risks to sewer infrastructure remains • Establishment of stable planform and cross section • Decreases erosion impacts • Risk to private pedestrian bridges addressed • Improvement to aquatic habitat • Lowest long-term maintenance costs	• High construction costs • High site disturbance (including private pedestrian bridges) • High disruption to private property owners • Requires most vegetation removal and replanting

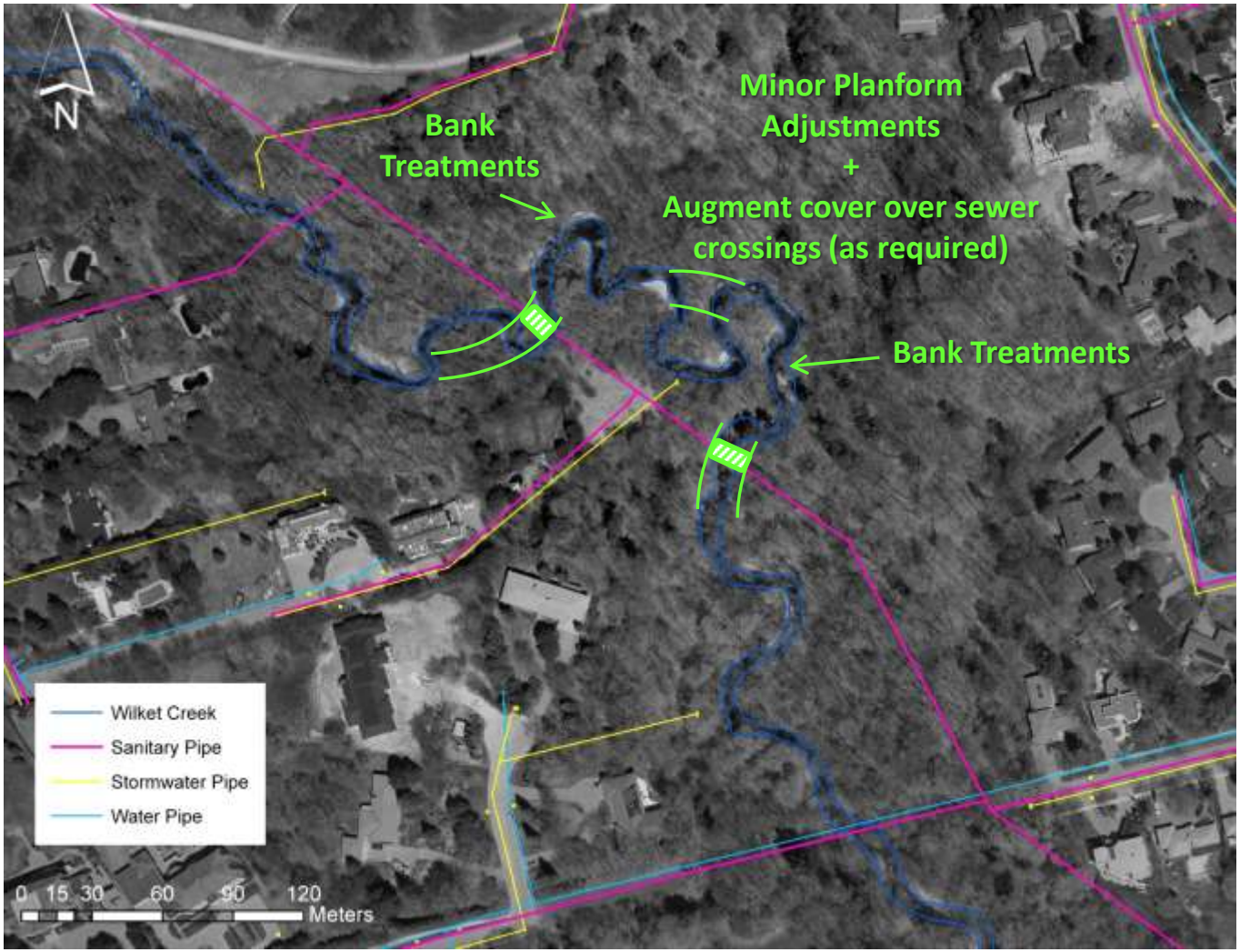
Wilket Creek Reach 7 - Problems and Opportunities (December 2013 PIC)



WC-R7 - Evaluation Findings

	Advantages	Disadvantages
Alternative 1: Do Nothing	• No immediate cost impacts • No site disturbance • No interruption of trail use due to construction	• Continued bank erosion and highly active planform adjustments • Continued risk to sewer infrastructure due to migration • No improvement in aquatic habitat • Continued safety concerns for trail users • High long-term maintenance costs
Alternative 2: Local Improvements	• Addresses existing risk to sanitary sewer infrastructure • Some improvement to aquatic habitat • Some decrease in erosion impacts • Reduction in debris jams • Vegetation removal minimized • Best alternative for preservation of mature forest	• Moderate immediate cost impact • Moderate long-term maintenance costs • Moderate site disturbance • Disturbance to park use during construction • Requires some vegetation (old growth) removal and replanting
Alternative 3: Complete Realignment	• Addresses existing risk to sanitary sewer infrastructure • Lowers long-term risk to sewer infrastructure • Establishment of stable planform, profile, and cross section decreases erosion impacts • Some improvement to aquatic habitat and riparian vegetation • Minimize debris jams • Lowest long-term maintenance costs	• High immediate cost impact • High site disturbance • Disturbance to park use during construction • Requires some vegetation (old growth) removal and replanting

Wilket Creek WC-R7
Recommended Solution



Wilket Creek Reach 8 & 9 - Problems and Opportunities (December 2013 PIC)

US and DS refer to Upstream and Downstream
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(left bank and right bank are identified based on looking in the downstream direction)

WC-R8 and WC-R9 - Evaluation Findings

	Advantages	Disadvantages
Alternative 1: Do Nothing	• No immediate cost impacts • No site disturbance • No interruption of park use due to construction	• Continued bank erosion • Degraded infrastructure (e.g. gabions and stormwater outlets) provides low aesthetic value • No improvement in aquatic habitat – barrier to aquatic organisms remains (weir) • Continued safety concerns for trail users
Alternative 2: Local Improvements	• Addresses localized bank erosion issues • Some improvement to geomorphic form • Some improvement to aquatic habitat and terrestrial systems • Improves aesthetics	• Moderate construction costs • Low to Moderate site disturbance • Minor disruption of park use
Alternative 3: Complete Realignment	• Establishment of stable planform, profile, and cross section ensures long-term stability of infrastructure (sewer, pathway, bridges) • Decreases erosion impacts • Improves aquatic habitat and terrestrial systems • Lowest long-term maintenance costs • Improve aesthetics	• Large construction costs • Large site disturbance • Potential disturbance to private property owners • Major disruption to park use • Requires some vegetation removal and replanting

Wilket Creek – Summary of Recommended Solutions

Wilket Creek Park	**Complete Realignment** • Establish stable, meandering planform with pool-riffle sequence within property constraints to promote a self-maintaining system • Placement of riffle features at high-risk locations such as sanitary sewer crossings • Establish optimal configuration of path network and bridge placement to ensure stability and safety of recreational amenities
WC-R5	**Local Improvements** (including minor planform realignments) • Address immediate high-risk locations and provide some improvement in geomorphic form • Bank/slope stabilization at downstream extent of reach • Riffle-type feature over downstream exposed sewer crossing • Minor channel realignment and riffle feature at exposed sewer crossing mid-reach • Bank/slope stabilization of eroding backyard at upstream end and minor planform realignment away from sanitary sewer
WC-R7	**Local Improvements** (including minor planform realignments) • Minor planform adjustments/ realignments (e.g. complete developing cut-offs) to promote creek migration in the 'safest' direction and minimize disturbance to forest • Bank stabilization and/or re-grading to improve geomorphic form • Monitor and adaptive management
WC-R6 **WC-R8** **WC-R9**	**Local Improvements** • No existing locations at high-risk → localized restoration and improvements as required (e.g. bank stabilization, degraded infrastructure repair/removal, barrier removal, plantings, etc.)

Next Steps

After tonight's workshop,

- Compile and review input received from public consultation into the study report
- Establish a risk-based implementation plan
  - identify when alternatives should be implemented, e.g. immediately, 0-5 years, 5-10 years…
- Issue Notice of Completion for the Master Plan; 30-day public and agency comment period

Upon Completion of Environmental Assessment Process (pending regulatory and budgetary approvals)

- Implementation / Construction of preferred alternatives
- Monitor resulting conditions – successes, failures, adaptation

Contact Information

Thank you for participating in this study.

Your input is important. Please submit your completed **Comment Sheet** to staff at the Registration Table. Alternatively, your comments can be submitted by Fax, Email, or Mail, using the contact information below, by **June 30, 2014**. Pre-addressed envelopes are available upon request.

Contact: Patricia Newland, Environmental Engineering Projects - Restoration Services Division

Address: Toronto and Region Conservation Authority, 1 Eastville Avenue, Toronto, ON, M1M 2N5

Phone: 416-392-9690 Fax: 416-392-9726 Email: pnewland@trca.on.ca

For more information about this project and to access the workshop materials, please visit the study website at http://www.trca.on.ca/wilketcreek/