



# Climate Change Adaptation Strategy Phase 2: Medway Creek Subwatershed Study Update Water Resources & Slope Stability Components

Public Meeting 1  
March 7, 2013



# Welcome!

Tonight you will have the opportunity to learn and comment on:

- The purpose of the study
- An overview of the existing conditions within the study area
- Our understanding of issues and concerns in the study area
- The next steps and how to stay involved



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March 7, 2013



# Introduction

- In December 2007, City Council approved a 2 Phase Climate Change Adaption Strategy to develop water resources and stormwater management strategies and design criteria to evaluate and potentially mitigate risk to essential and critical municipal infrastructure under the extreme storm conditions of climate change
- The Phase 1 Study of this strategy was completed in July 2011 and the City has proceed to Phase 2 of the Climate Change Adaptation Strategy.
- The Medway Creek Subwatershed Study Update is part of Phase 2.
  - Relevant studies and reports completed since 1995 are being incorporated into the Update.



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March 7, 2013



# Background

- In accordance with the requirements of the Middlesex Act, the City of London completed a number of background studies under Vision '96.
  - This included 13 Subwatershed studies with London boundaries
- In 1995 the City Council approved these studies, including the Medway Creek Subwatershed Study
  - The main objectives of the 1995 study were to minimize the impacts of existing land uses and to ensure future development protects key functions of the physical and biological systems which support watershed integrity



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March 7, 2013



# Objectives of the Study Update

The main objectives of the Medway Creek Subwatershed Study Update under the climate change conditions include:

- Develop the water resources (hydraulic, hydrologic and erosion) and preliminary slope stability analyses for the Medway Creek Subwatershed Study Update
- Determine the risk/impact of flooding from extreme storm events under climate change conditions for critical City infrastructure and recommend potential strategies to reduce the risk
- Develop a slope stability strategy to maintain slope stability under extreme storm events to reduce risk

*We are seeking your input*

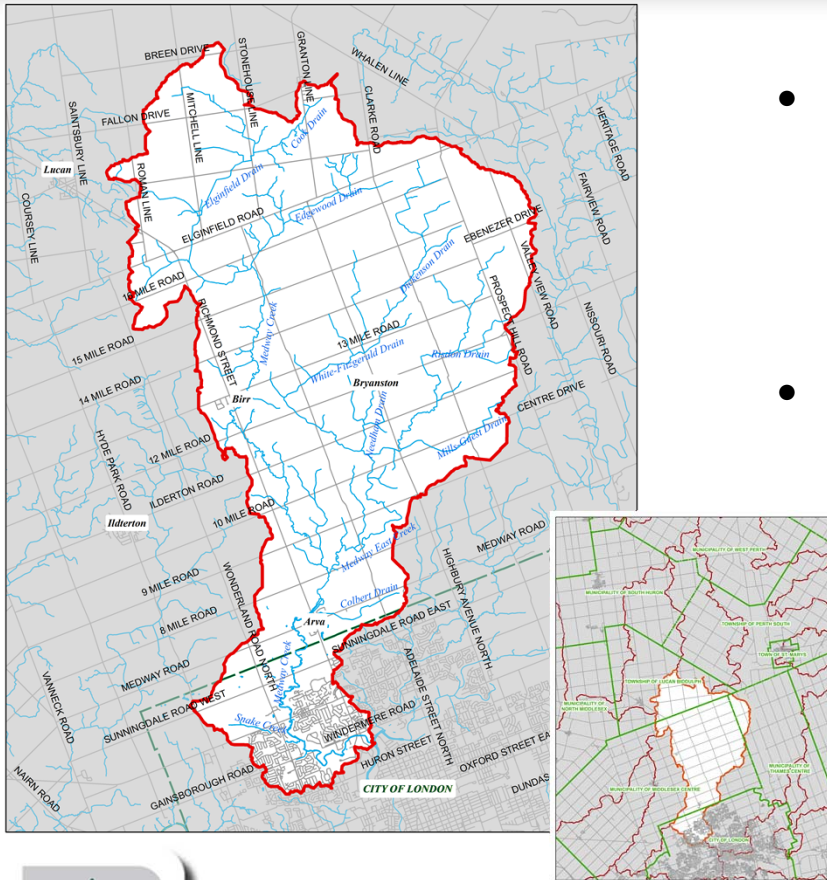
*Please let us know if you would like to be on the distribution list.*



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March 7, 2013



# Medway Creek Subwatershed



- The Medway Creek Subwatershed has a total area of 20,500 ha
  - 10% of the subwatershed is within the City of London
- Land use of the whole subwatershed is divided into the following categories:
  - 83% agriculture
  - 11% natural
  - 6% urban
  - < 1% water
  - <1% aggregate



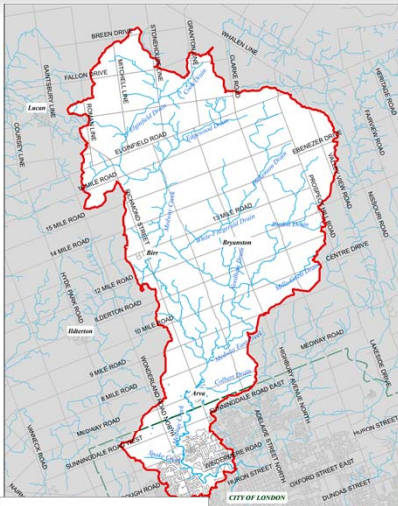
Public Meeting 1  
March 7, 2013



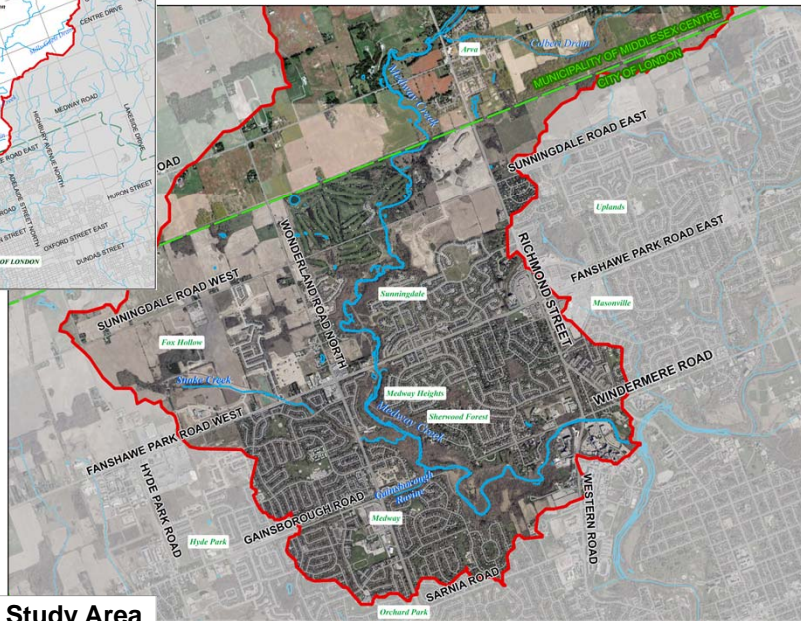


# Our Study Area

This study is focused on updating information and performing evaluations within the City of London only.



Medway Creek Subwatershed



Study Area

- The Medway Creek Subwatershed has a total area of 20,500 ha
  - 10% of the subwatershed is within the City of London
- Medway Creek has many small tributaries that discharge to the creek
- Most of the Study Area has been developed or has begun the development approval process within the City of London

# Existing Conditions

The existing conditions:

- Identify opportunities and constraints
- Update the water resources modelling and slope stability analysis
- Provide a baseline condition in the subwatershed

*Understanding existing conditions is critical to developing successful water resources, storm/drainage and stormwater management strategies*

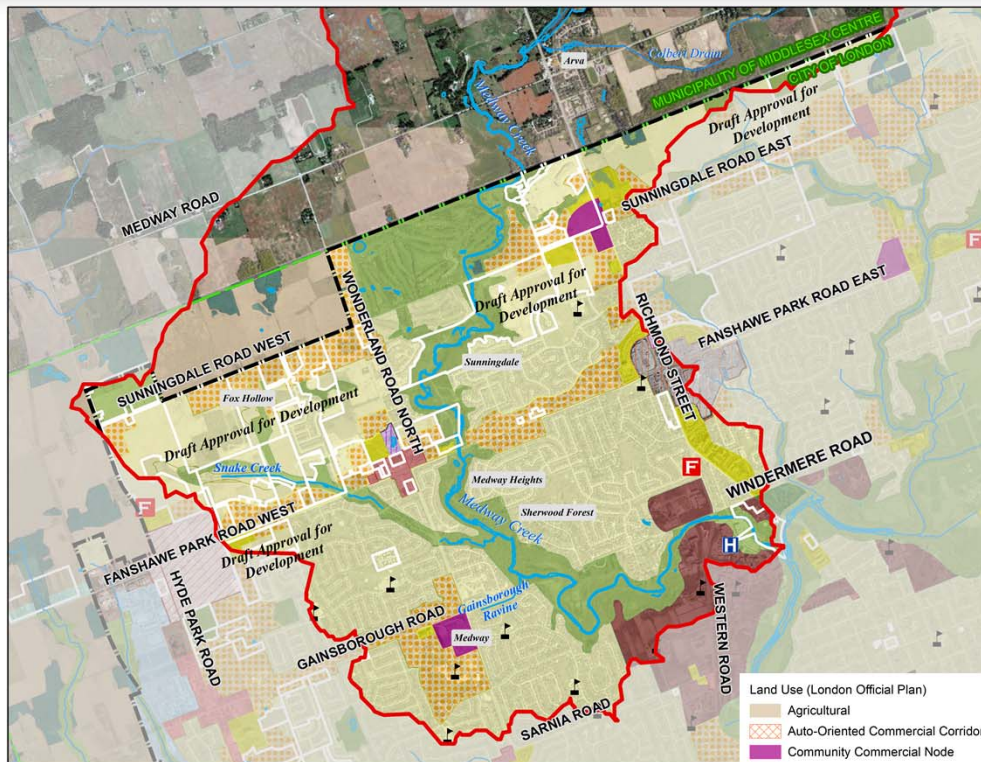


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March 7, 2013





# Land Use and Planning



<p>Land Use (London Official Plan)</p> <ul style="list-style-type: none"> <li> Agricultural</li> <li> Auto-Oriented Commercial Corridor</li> <li> Community Commercial Node</li> <li> Community Facility</li> <li> Downtown Area</li> <li> Environmental Review</li> <li> Enclosed Regional Commercial Node</li> <li> General Industrial</li> <li> Low Density Residential</li> </ul>	<ul style="list-style-type: none"> <li> Light Industrial</li> <li> Multi-Family, High Density Residential</li> <li> Multi-Family, Medium Density Residential</li> <li> Main Street Commercial Corridor</li> <li> Neighbourhood Commercial Node</li> <li> New Format Regional Commercial Node</li> <li> Office Area</li> <li> Open Space</li> <li> Regional Facility</li> <li> Rural Settlement</li> </ul>	<ul style="list-style-type: none"> <li> Medway Creek Watershed</li> <li> Fire Hall</li> <li> Hospital</li> <li> School</li> <li> Planning Applications Open For Comment</li> <li> Municipal Boundary</li> <li> Urban Growth Boundary</li> <li> Watercourse</li> </ul>
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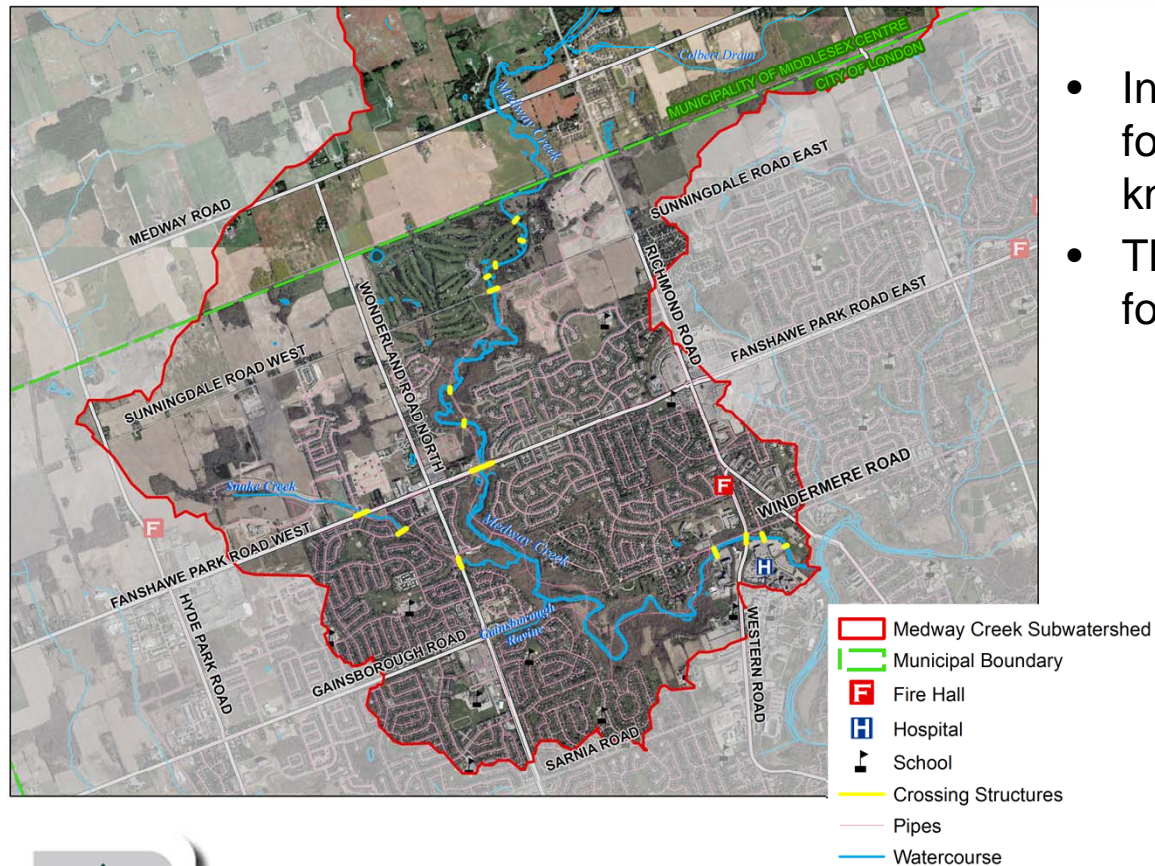
- Low density residential is the predominant land use within the study area
- Commercial uses are present at major intersections
- The University of Western Ontario and the Richmond/Fanshawe intersection represent commercial and institutional uses
- Approved land developments consist primarily of residential with some commercial uses



Public Meeting 1  
March 7, 2013



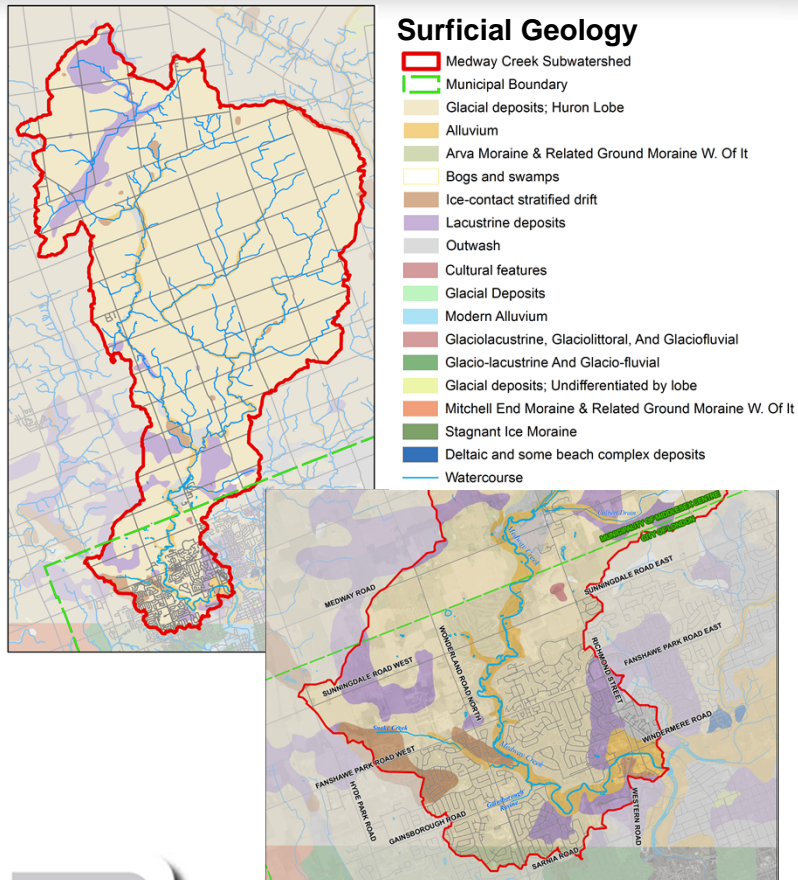
# Physical Environment



- Infrastructure considered essential for the functioning of the City is known as “critical infrastructure”
- The study area contains the following critical infrastructure:
  - Bridges (trail and traffic)
  - Hospital
  - Emergency Services (Fire Stations, EMS, Police)
  - Municipal water and sewer infrastructure
  - Schools



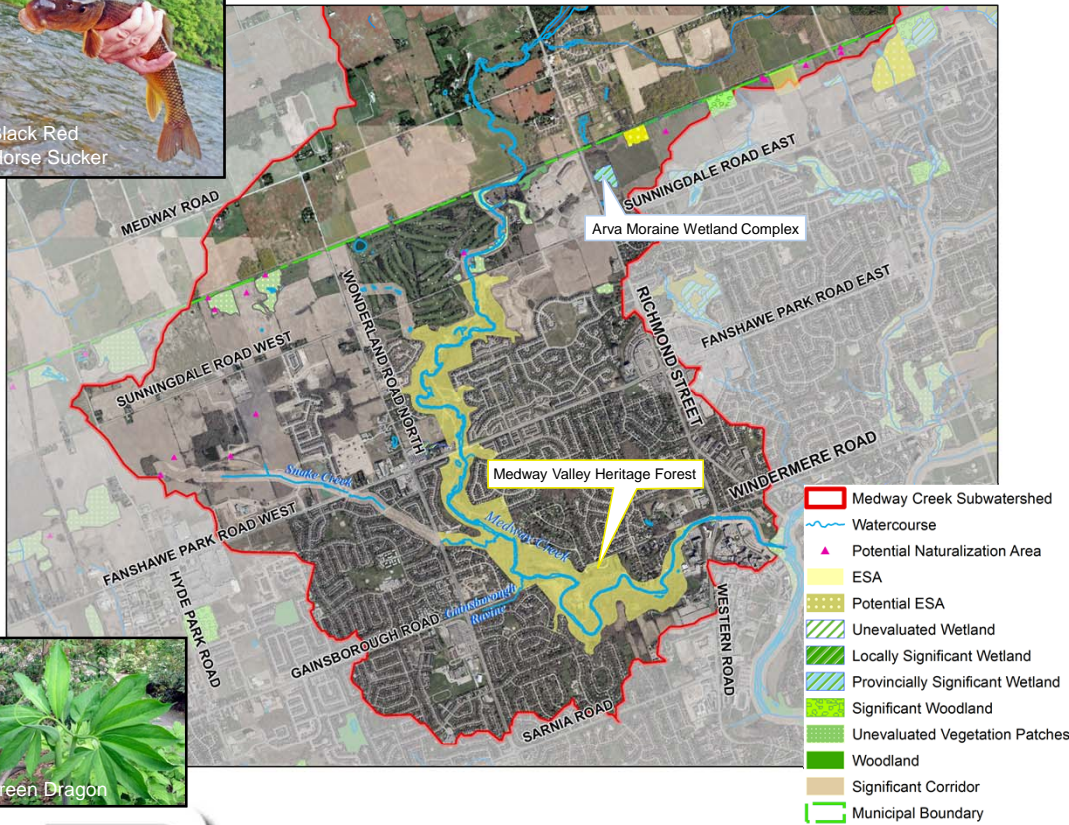
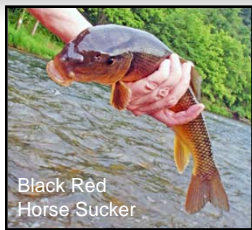
# Hydrogeology



Hydrogeology will review the relationship between land use, infiltration, water balance, and base flow to both the tributaries and main channel of the Medway Creek.

*The review of baseflow provides input to stream morphology and erosion modelling.*

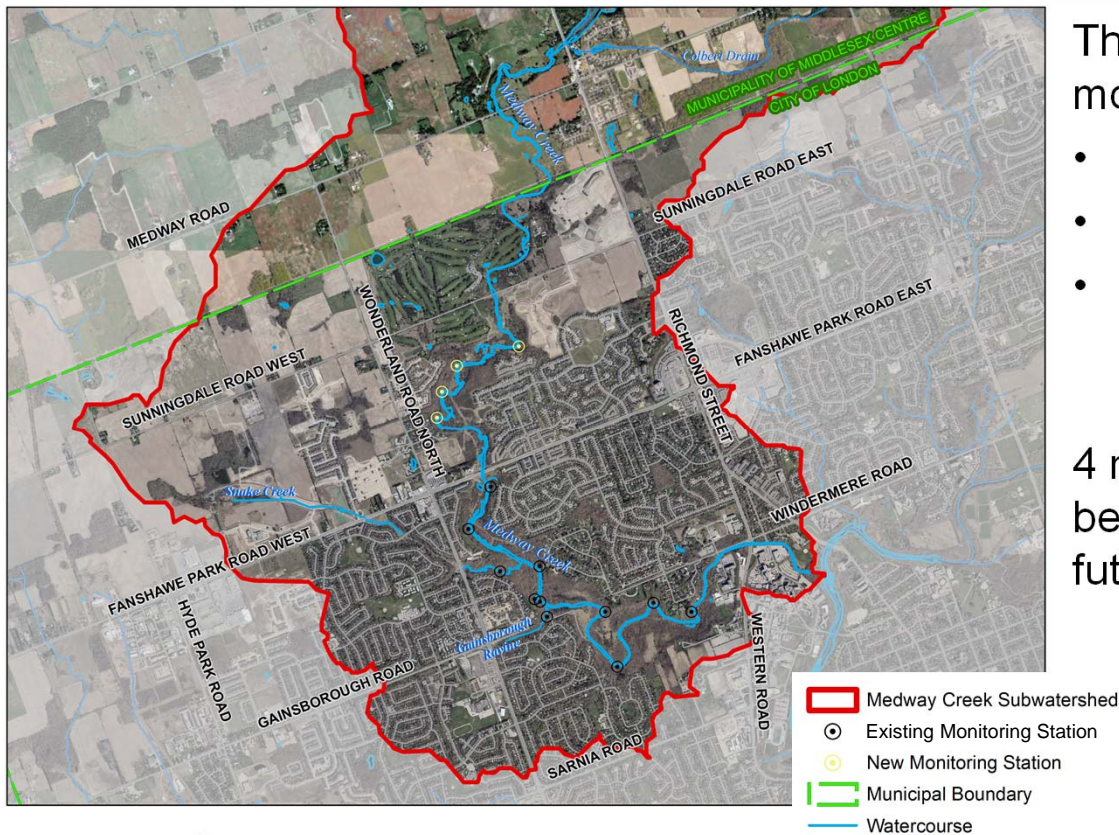
# Environmental Conditions



- Only 11% of the whole watershed is natural vegetation cover
- Two significant natural features exist within the study area:
  - Medway Valley Heritage Forest Environmentally Significant Area (ESA)
  - Arva Moraine Provincially Significant Wetland Complex (portion extends into the City boundary)
- There are rare, *Threatened* and *Endangered* species in the study area. These species include freshwater mussels, fish, birds, reptiles, and plants.



# Stream Morphology



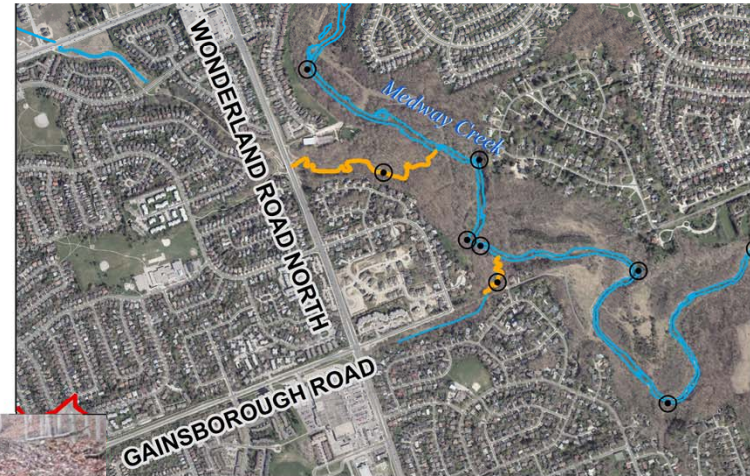
There are 11 existing erosion monitoring stations in the study area:

- Medway Creek - 9
- Gainsborough Ravine - 1
- Fox Hollow (Snake Creek) Ravine - 1

4 new erosion monitoring stations will be added during this study to support future work

# Stream Morphology

The Fox Hollow (Snake Creek) Ravine & Gainsborough Ravine have areas that are actively eroding.



- Medway Creek Subwatershed
- Known Active Erosion
- Existing Monitoring Station
- New Monitoring Station
- Watercourse

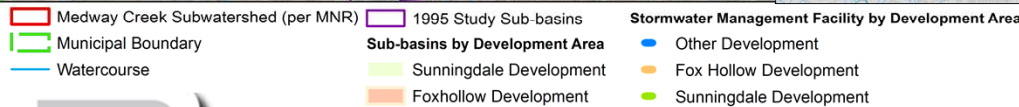
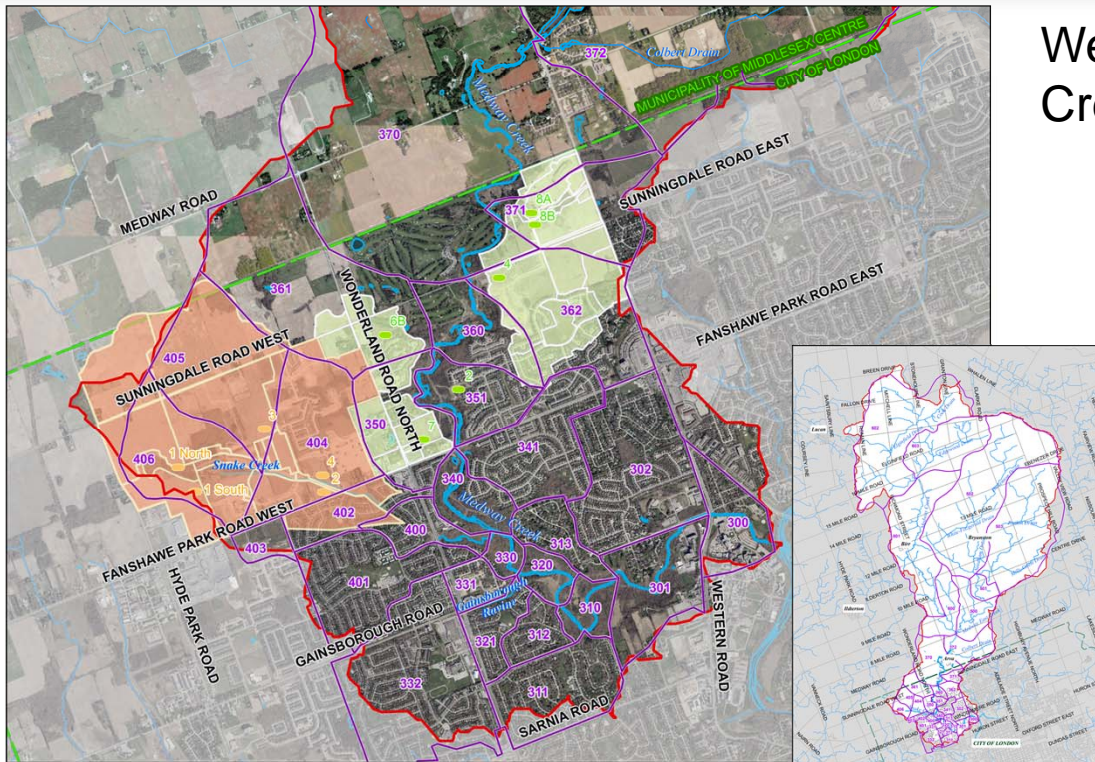
Concrete grouting was used as erosion protection for a section of the Gainsborough Ravine. As shown in the photo, this has failed and erosion is expected to continue without rehabilitation work.



# Hydrology

We are updating the 1995 Medway Creek hydrology models :

- Conversion to newer software programs and confirming hydrologic parameters
- Update for development areas and stormwater management ponds since 1995 study
- Update/calibration considering longer period of climate data
- Update for future land use and climate change scenarios

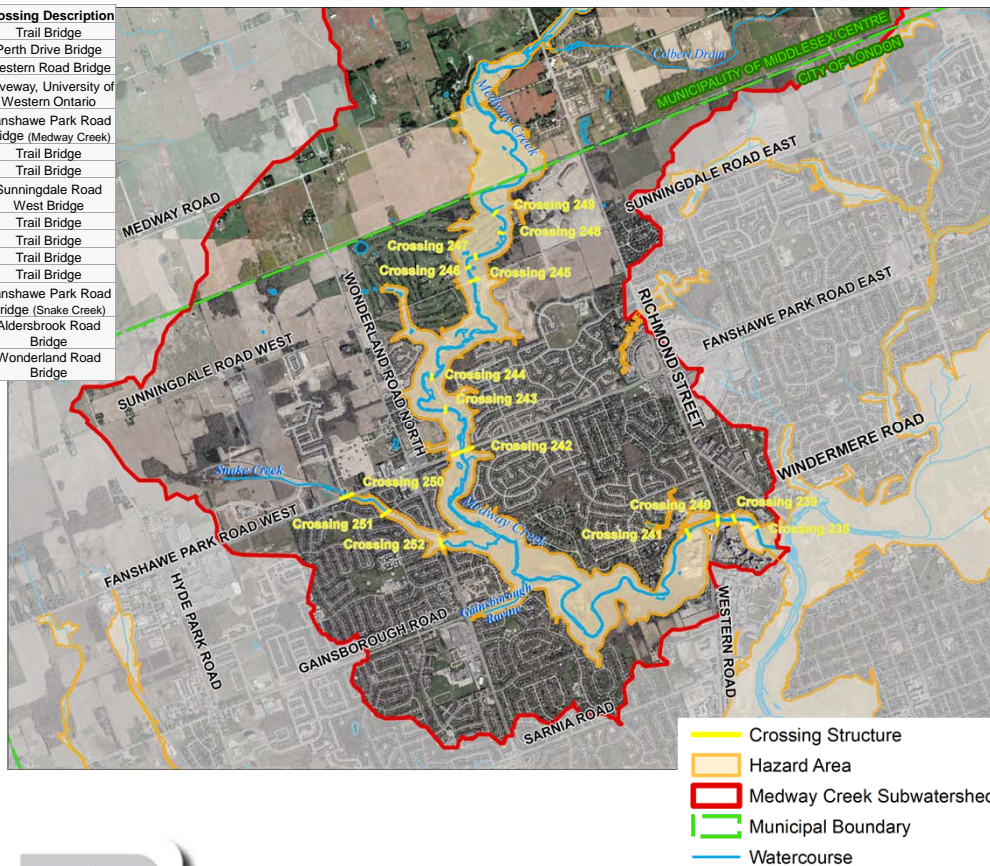


Public Meeting 1  
March 7, 2013



# River Hydraulics

ID	Crossing Description
238	Trail Bridge
239	Perth Drive Bridge
240	Western Road Bridge
241	Driveway, University of Western Ontario
242	Fanshawe Park Road Bridge (Medway Creek)
243	Trail Bridge
244	Trail Bridge
245	Sunningdale Road West Bridge
246	Trail Bridge
247	Trail Bridge
248	Trail Bridge
249	Trail Bridge
250	Fanshawe Park Road Bridge (Snake Creek)
251	Aldersbrook Road Bridge
252	Wonderland Road Bridge

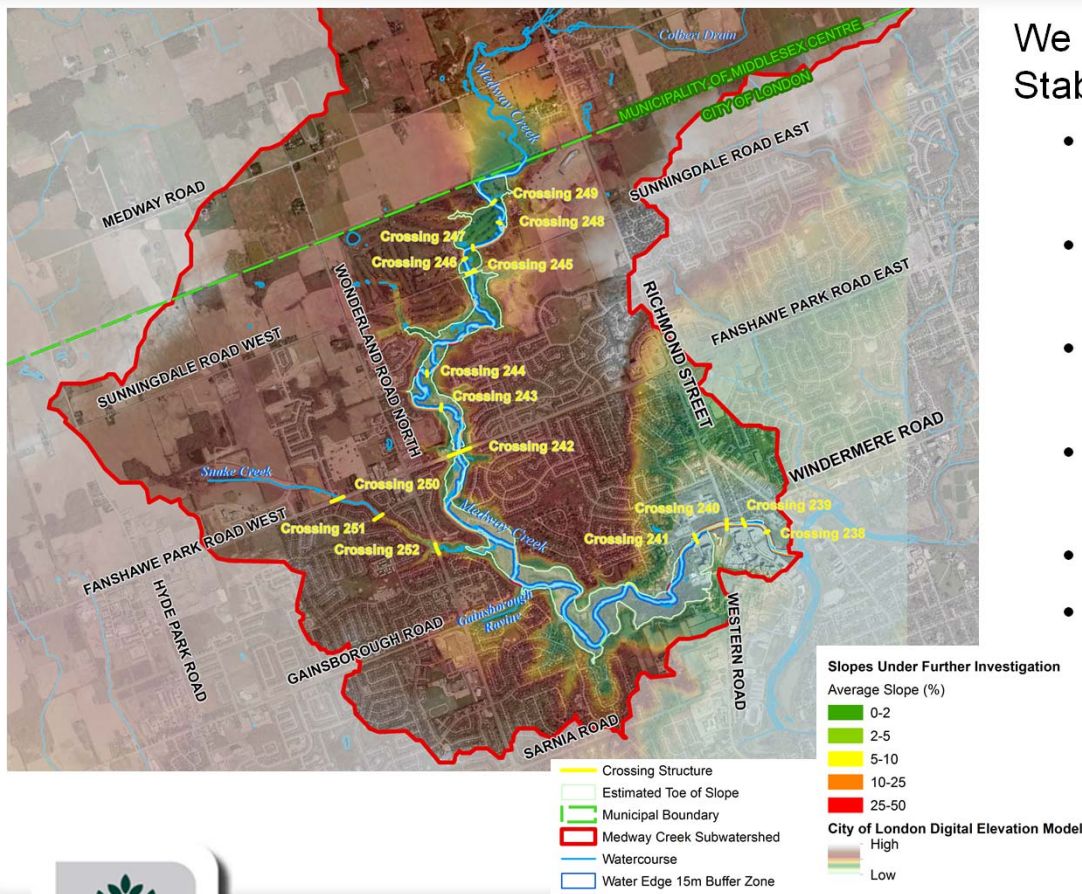


We are updating the 1995 Medway Creek HEC-2 Hydraulic River Model:

- HEC-2 Model conversion to HEC-GeoRAS software complete and new topographic data incorporated
- Update model with survey data and current bridge/channel geometry
- Apply existing and future land use hydrologic models and investigate potential changes to floodplain and vulnerability
- Apply climate change adaptation hydrologic models and investigate infrastructure vulnerability



# Slope Stability



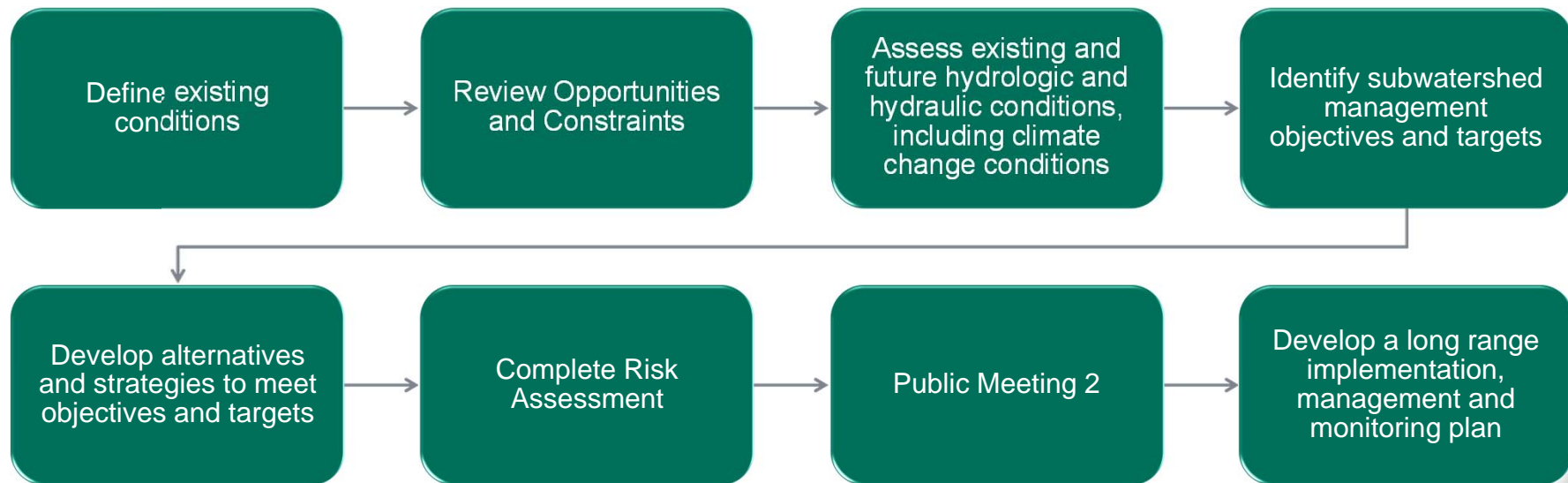
We are updating the 1995 Medway Creek Slope Stability Investigation:

- Development of a GIS-based over-steepened slope screening tool
- Refinement of screening criteria and general site investigations currently under way
- Apply refined screening criteria and complete prioritization of sites for detailed assessment
- Visual slope stability assessments following MNR guidelines
- Slope Analysis
- Apply climate change adaptation hydrologic/hydraulic models and investigate slope and related infrastructure vulnerability

# Next Steps

Following this public meeting, the study team will review your comments and address questions or concerns that were raised.

Please complete a comment form tonight, or respond by mail or email before March 28<sup>th</sup>, 2013.



Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.



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