

West Thornhill Stormwater Flood Control Implementation Strategy

**Report to General Committee
October 31, 2011**

Agenda

- **Class Environmental Assessment Study Re-issue and Approval**
- **Implementation Strategy**
 - Phasing
 - Town-wide implications
 - Value engineering
 - Design and construction schedule
 - Financing options

Class EA History

- **Aug. 2005 storm resulted in extensive flooding in West Thornhill;**
- **Staff present system review and are authorized to conduct Class EA (Sept. 2007);**
- **Class EA Study initiated 2008;**
- **Staff report to General Committee with preferred alternative solution (Dec. 2009);**
- **Issued EA Notice of Completion / 1st Public Review (Feb. - Mar. 2010);**
- **Resident filed objection (requested a “Part II Order”) (Mar. 2010) with numerous concerns;**

Class EA History – Cont'd

- **MOE requires documentation updates and further consultation (Aug. 2010);**
- **Consultation with requester and report updates (Sep.- Nov. 2010)**
- **Re-issued Class EA / 2nd Public Review (Nov.- Dec. 2010);**
- **Received MOE approval (Aug. 2011)**
- **Development of Implementation Strategy**

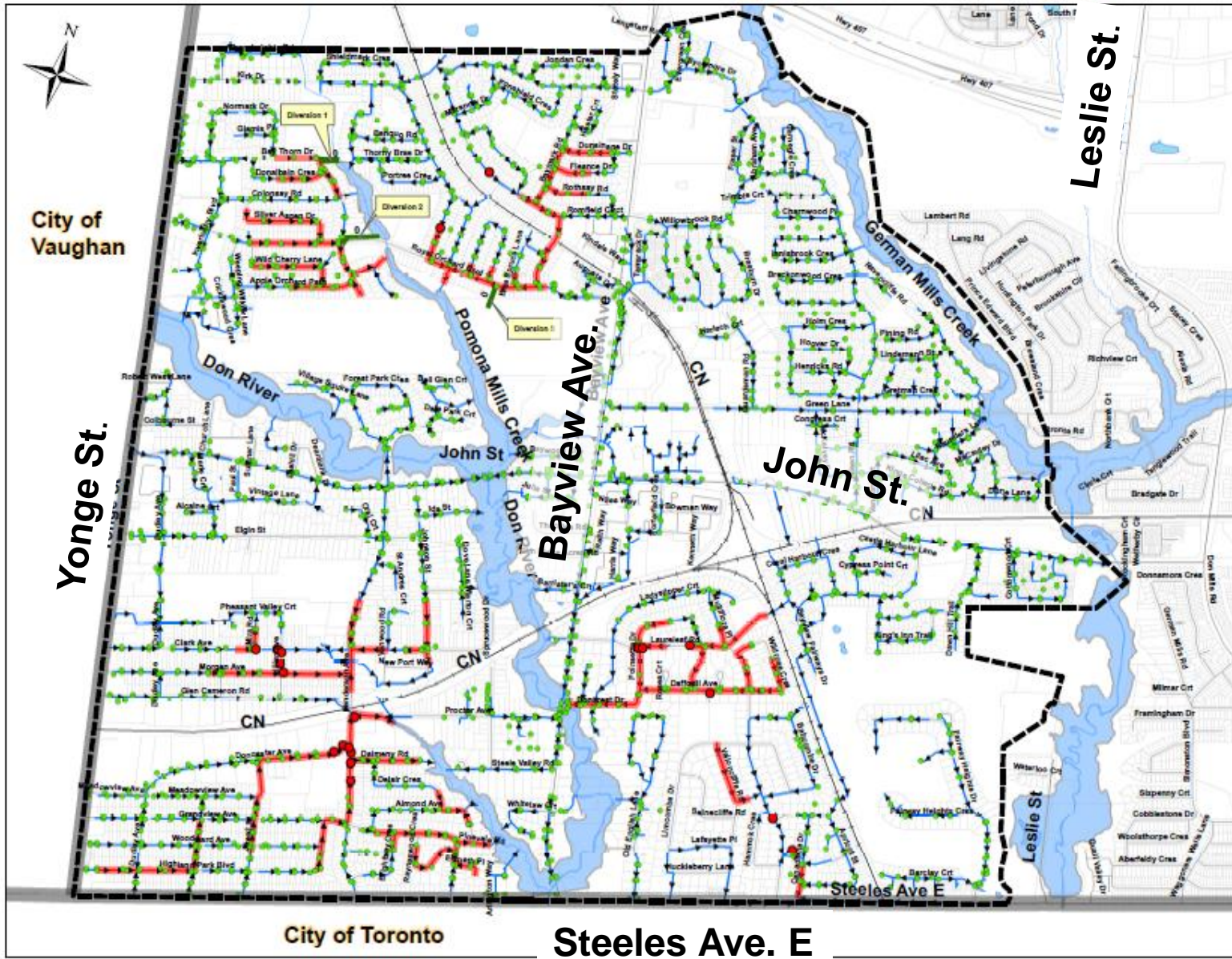
Implementation Strategy

- **Purpose : to implement recommendations of the West Thornhill Stormwater Flood Remediation Class Environmental Assessment Study.**
- **To report back on the following aspects (Dec. 15, 2009 Council resolution) :**
 - phasing strategies,
 - Town-wide implications,
 - value engineering,
 - a detailed design and construction schedule for the initial phases,
 - resource requirements, and
 - financing options.

Class EA Recommended Solution

- **Storm sewer system upgrades to provide flood protection during extreme rainfall events up to a 100-Year level of service:**
 - Meets the minimum level of a protection required in new development
 - 1% chance of being exceeded in any year
- **Flow balancing measures to capture more runoff into the storm sewer system, or restrict capture depending on the local conditions and capacity.**
- **Upgrades are identified for over 10 independent sewer systems and can be implemented in phases and stages.**

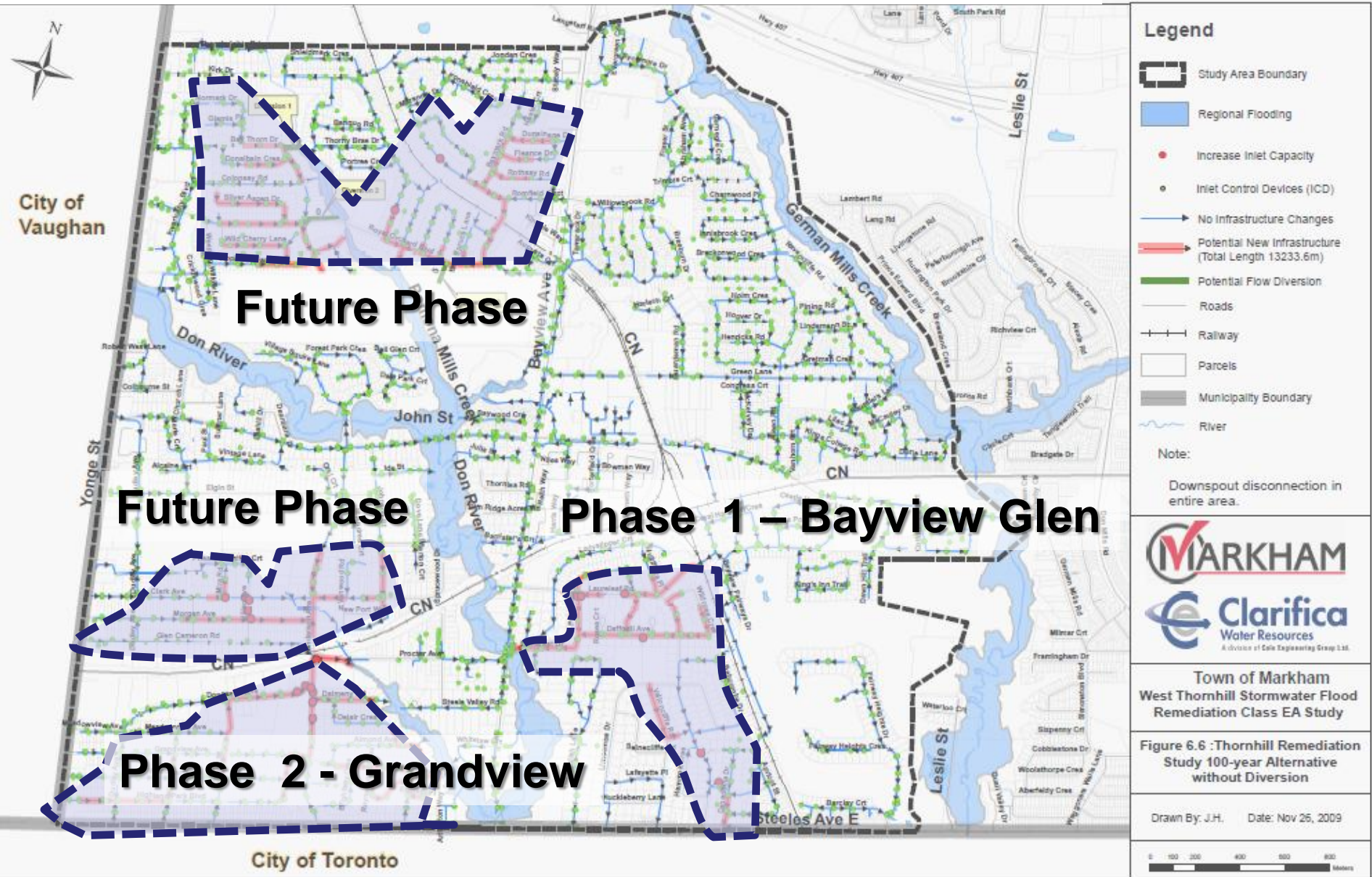
Attachment 'A' – Potential New Storm Sewer Infrastructure – West Thornhill



Phasing Strategies

- **Phasing of sewer upgrades will be based on prioritization of the individual sewer systems and current flood risk.**
- **Phasing considers related sanitary system works.**
- **Risk is based on :**
 - service calls,
 - damage claims,
 - technical assessments in the Class EA
- **The highest risk Phase 1 area is the Bayview Glen Area.**
- **The Phase 2 area includes the Grandview Area systems.**

Attachment 'B' – Phasing of Potential New Storm Sewer Infrastructure



Town of Markham
West Thornhill Stormwater Flood Remediation Class EA Study

Figure 6.6 : Thornhill Remediation Study 100-year Alternative without Diversion

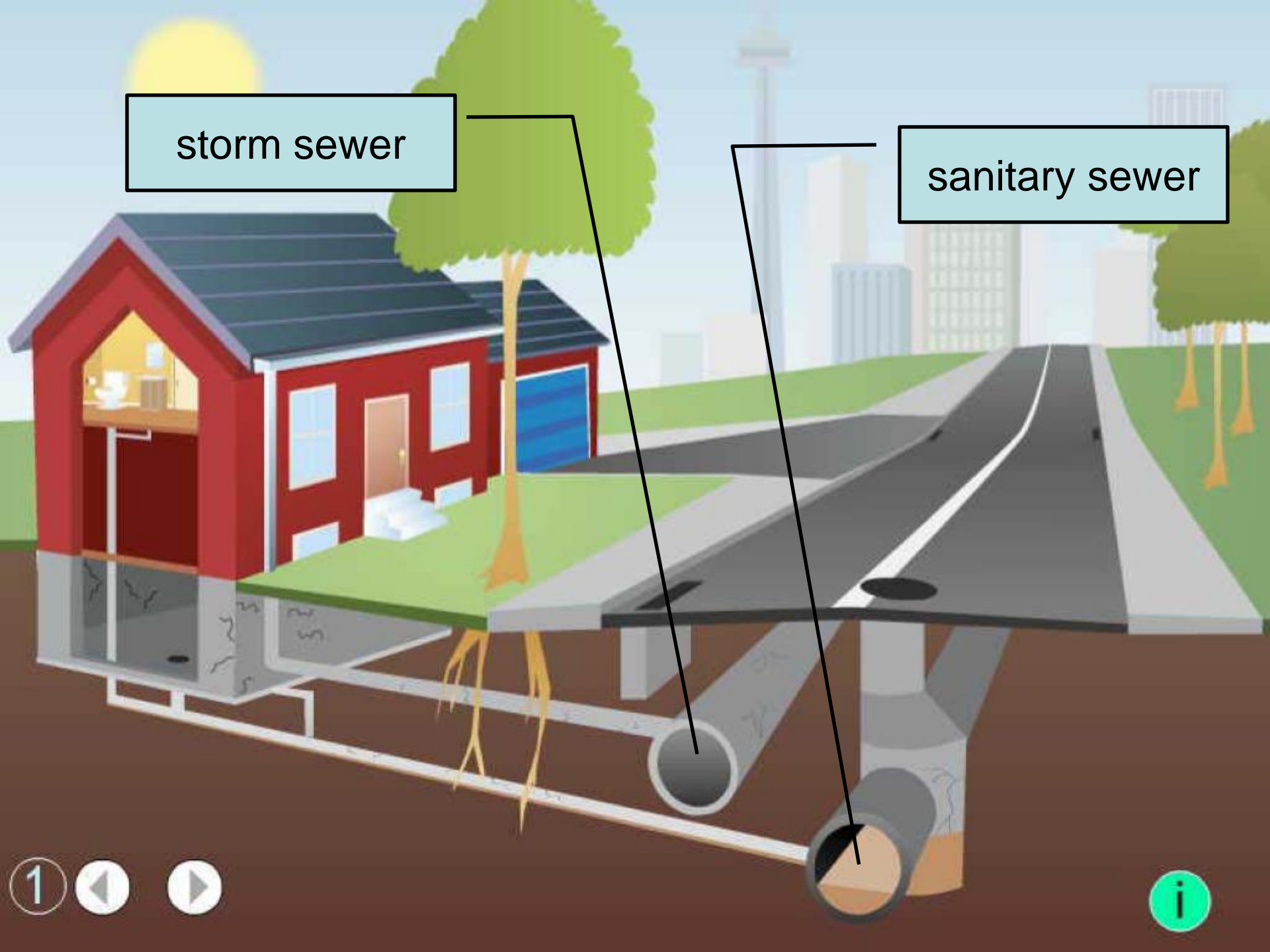
Drawn By: J.H. Date: Nov 26, 2009

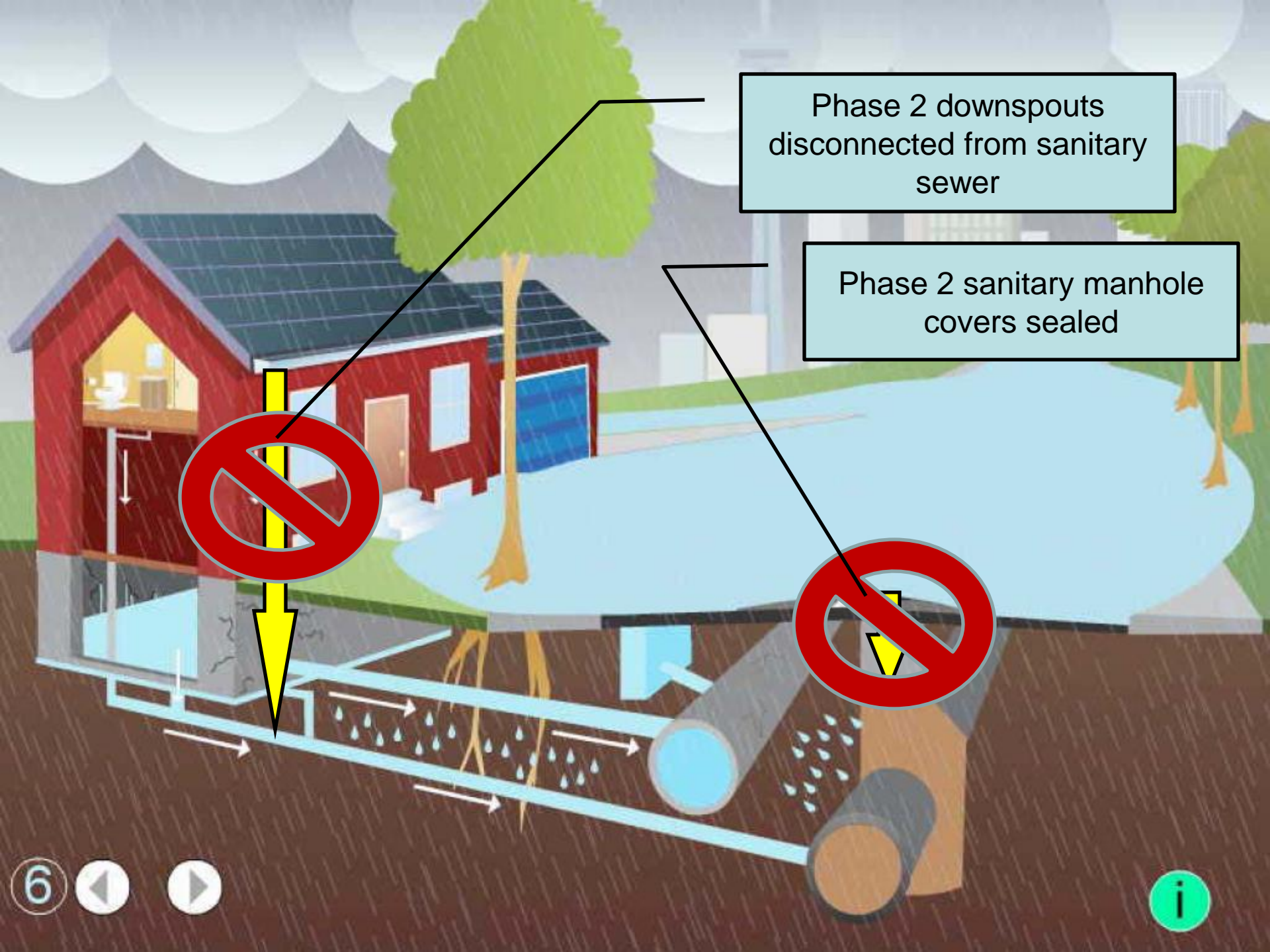
Phasing Strategies – Cont'd

- **Phase 1 and Phase 2 areas both experienced extensive flooding during the Aug. 2005 storm.**
- **Phase 1 area experienced the highest flooding during the Jul. 2008 storm.**
- **Phase 2 area currently has a lower flooding susceptibility given effective risk reduction measures that have been completed:**
 - disconnection of roof downspouts to prevent runoff into the Phase 2 sanitary system,
 - sealing of sanitary manhole covers to prevent inflows by stormwater flowing or ponded on the street.

storm sewer

sanitary sewer





Phase 2 downspouts disconnected from sanitary sewer

Phase 2 sanitary manhole covers sealed

Phasing Strategies – Cont'd

- **Storm system improvements will be coordinated with sanitary system improvements and road rehabilitation.**
- **Further sanitary system improvements may include:**
 - inflow and infiltration reduction (Phase 1 storm sewer upgrades are beyond potential Bayview Glen sanitary rehabilitation areas),
 - sanitary sewer and lateral lining (Phase 2 storm upgrades will be designed to not interfere with Grandview area lining),
 - potential Royal Orchard sanitary capacity upgrades (will consider Future Phase storm sewer twinning).

Town Wide Implications

- **Storm drainage systems have performed reasonably well over the past 50 years.**
- **Due to the severe rainfall event on August 19, 2005, West Thornhill encountered flooding problems in certain areas.**
- **If the other older areas across the Town were to experience the same rainfall, similar flooding problems would likely occur.**

Attachment 'C' – Town-wide Stormwater Study Areas

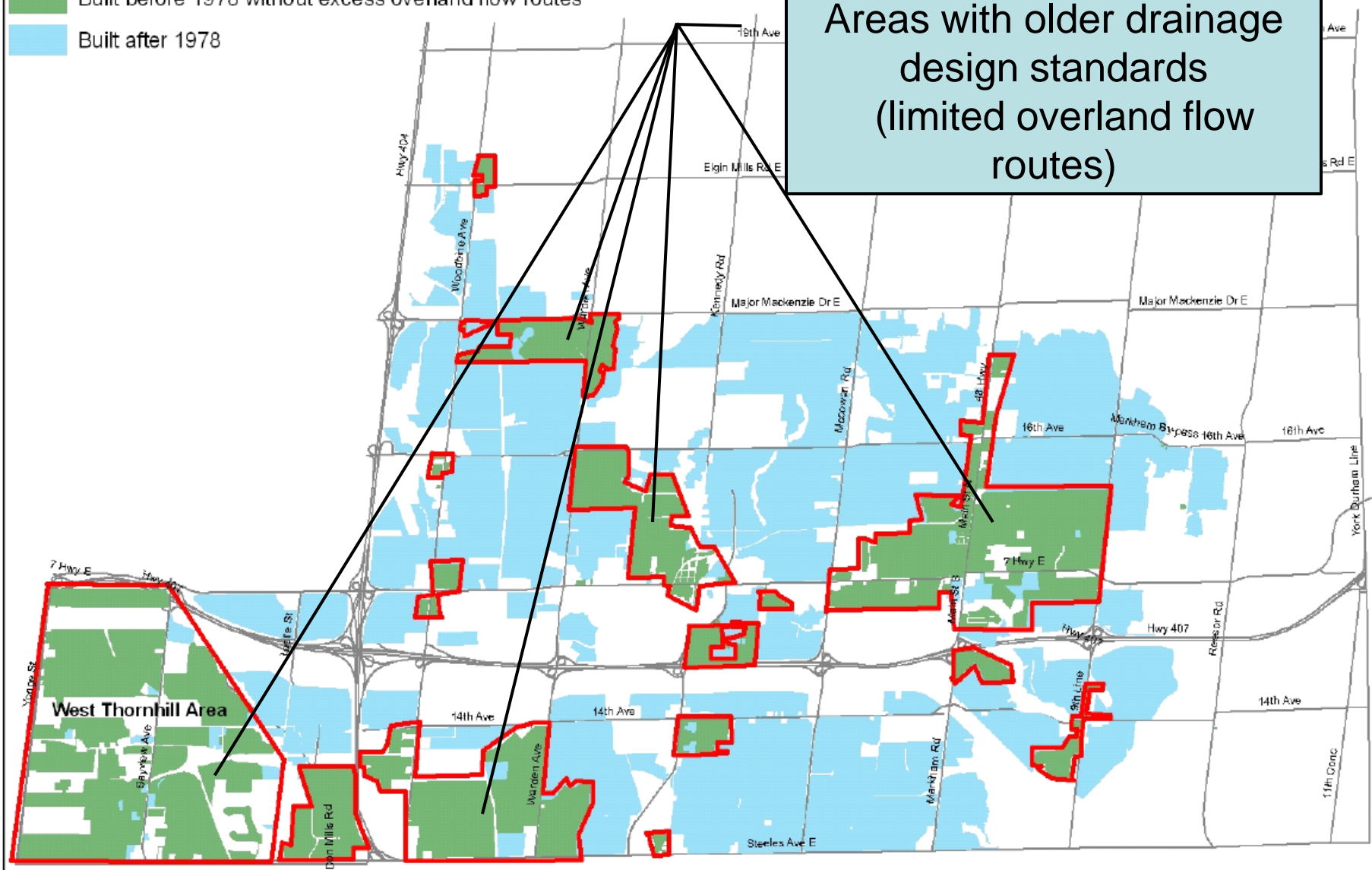
Legend

- Built before 1978 without excess overland flow routes
- Built after 1978

Location	Estimated Area(ha)
West Thornhill Study Area	(+/-) 1210
Other Areas	(+/-) 2300
Total	(+/-) 3510



Areas with older drainage design standards (limited overland flow routes)



Town Wide Implications – Cont'd

- Town-wide costs for storm sewer systems can be estimated based on prorating the cost of the Thornhill area Class EA estimates and applying it to the rest of the Town.
- Further risk assessment proposed to confirm other vulnerable areas.

Level of Protection	West Thornhill	Rest of Town (Projected)	Total Cost
Stormwater – 100 year level of protection	\$40 Million	\$ 77 Million	\$117 Million

Value Engineering

- **Preliminary design consultant will be directed to refine Class EA alternatives to identify cost savings while providing the approved level of service.**
- **Options to evaluate include, but will not be limited to**
 - storm sewer diversions
 - roadway grading to limit street flooding
 - the cost effective use of storage
 - more extensive use of inlet controls
 - allowing sewer surcharge where there are no connections
 - securing easements to protect private flow paths (to offset storm sewer costs), and
 - lot level measures that address localized risks.

Design and Construction Schedule

- **Complete background data collection activities including:**
 - o Downspout connection survey (all West Thornhill excluding areas completed for Grandview Downspout Disconnection Pilot Study),
 - o Foundation connection survey-inventory,
 - o Complete Archaeology Report (added emphasis on diversion locations and enlarged outfalls, to support refinement of Class EA alternatives),
 - o Sewer invert surveys (in progress to support hydraulic model refinement).
- **Engage engineering consultant to:**
 - o Refine Phase 1 and 2 Class EA alternatives and complete value engineering (2011-2012),
 - o Complete preliminary design of Phase 1 and 2 improvements,
 - o Identify stages for Phase 1 and Phase 2 implementation including cost estimates to support budget request for future construction works,

Design and Constr. Schedule (cont'd)

- **Engage engineering consultant to (continued):**
 - Identify where inlet controls, downspout disconnection, or minor grading can be implemented in the short-term.
- **Complete final design of Phase 1 initial stage works and submit approvals (2012) .**
- **Tender stage 1 of Phase 1 works in 2012.**

Resource Requirements

- **Requirements for staff resources will depend on results of the West Thornhill Phase 1 and 2 Design, and the Stormwater Funding Study recommendations:**
 - Engineering staff requirements to be assessed relative to capacity to administer design, tendering and construction of stormwater works
 - Requirements will depend on Town-wide level of service and implementation timelines
 - To be determined following completion of Stormwater Funding Study

Financing Options

- **Funding of \$2 million is available for 5.2 % of the estimated \$40 million improvement costs in West Thornhill (funding source was Gas Tax).**
- **Available funding will be directed to the first stage of the Phase 1 highest priority area.**
- **Phase 1 costs will be refined during preliminary design, which will also identify multi-year implementation stages within Phase 1.**

Financing Options - Cont'd

- **Recommend reallocation of approved Town-wide funding (\$2M) to the first stage of Phase 1 upgrades (funding source was Gas Tax).**
 - **Funding for :**
 - the balance of Phase 1,
 - next West Thornhill phases, and
 - potential Town-wide works
- ... will be evaluated as part of the ongoing Stormwater Funding Study.**
- **The Stormwater Funding Study is developing options to consider for funding the Town's overall stormwater management strategy, including flood control works.**

Next Steps

- **Stormwater Funding Study November 7, 2011 Workshop:**
 - Present Focus Group on Water Systems discussions on attitudes, values, perceptions and behaviour regarding water systems and issues,
 - Introduce options for funding Town-wide stormwater strategy, including flood control works in West Thornhill.
- **Post Request for Proposals for West Thornhill value engineering, and preliminary design (Nov. 2011).**
- **Detailed design for West Thornhill initial phases (Spring 2012)**
- **West Thornhill initial stage tender and construction within Phase 1 (2012 / 2013).**
- **Schedule for West Thornhill subsequent stages and phases dependant on stormwater funding study recommendations.**

Thank you.
Questions ?