



Small Areas Flood Control Request Process

General Committee
October 4, 2021



Background

- At the Council meeting on September 24, 2019, Council has asked:
- “That staff advise Council on possible smaller additional projects to add to the Flood Control Program (e.g., similar to the Private Plumbing Protection Rebate Program), with their recommendations including stormwater fee impacts.”

Purpose

- To develop a process to address Small Area upgrade requests within the current Flood Control Program

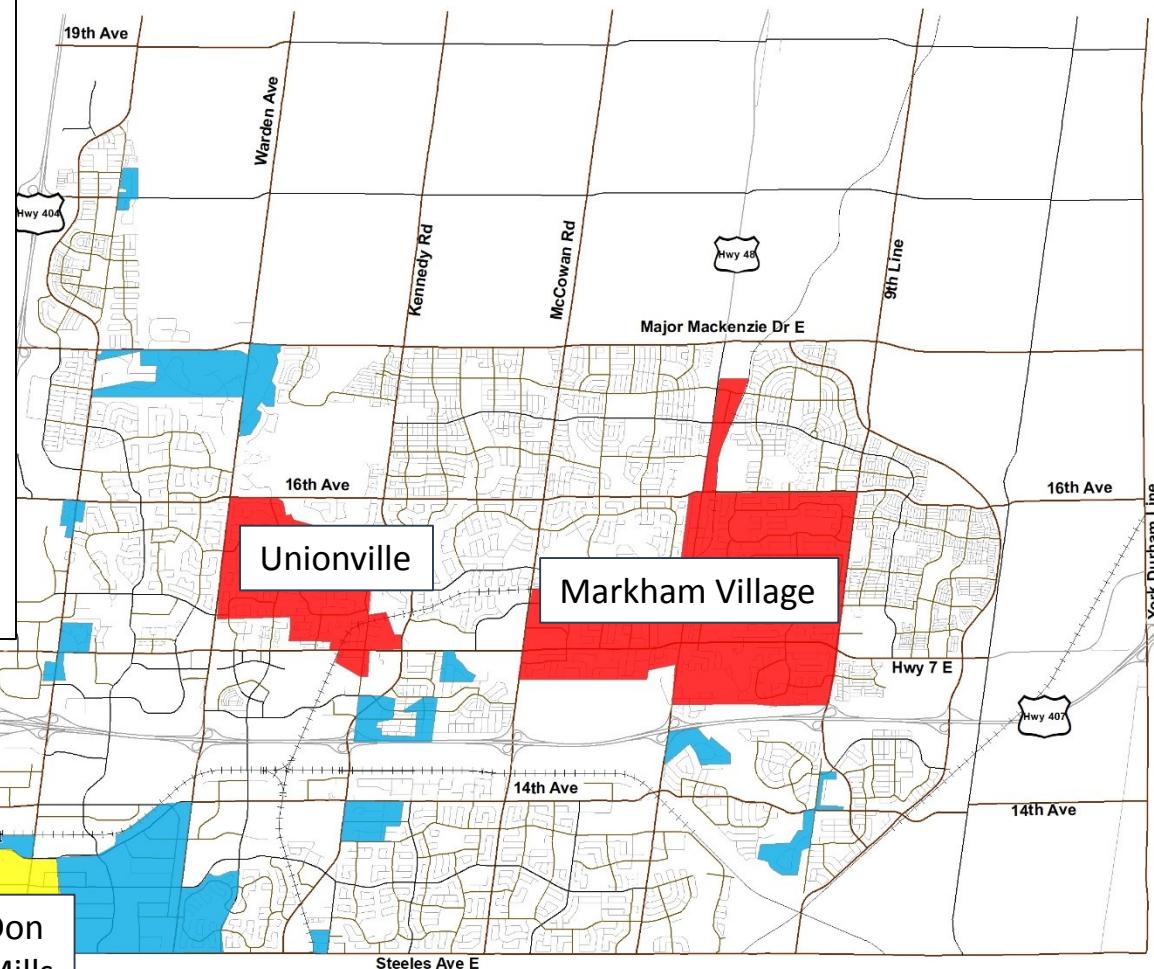
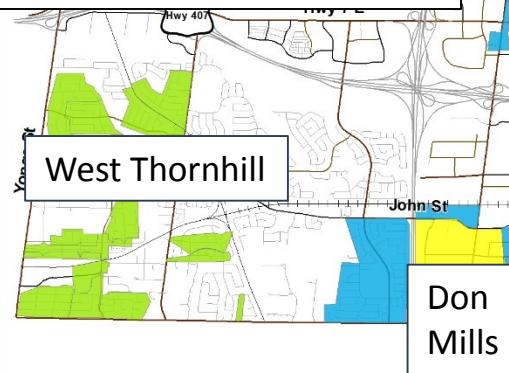


Overview – Flood Control Program

- The City adopted a 100 year level of service for the City's storm drainage systems, with the exception of the Don Mills Channel (5 year level of service)
- The program was intended to be implemented over 30 years, and funded by the City's stormwater rate

Flood Control Program Areas

- West Thornhill (green areas)
- Don Mills Channel (yellow area)
- Markham Village / Unionville (red areas)
- City Wide (Rest of City - blue area + other areas if required)





Background – Flood Control Program

Area	Original Implementation Schedule	Current Implementation Schedule	Notes
West Thornhill	2014-2025	2014-2025	9 out of 14 phases completed
Don Mills Channel	2018-2030	2018-2027	Class EA approved
Markham Village/ Unionville	2030-2044	2018-2032	Feasibility Study completed
City Wide Program (Remainder of City)	2030-2044	2030-2044	Not started
Private Plumbing Protection Program	N/A	2018-2022	Rebate for upgrades to private systems



Problem Statement

From time to time, Environmental Services receives requests from area residents for sewer upgrades in their neighbourhood. Requests fall under the following categories:

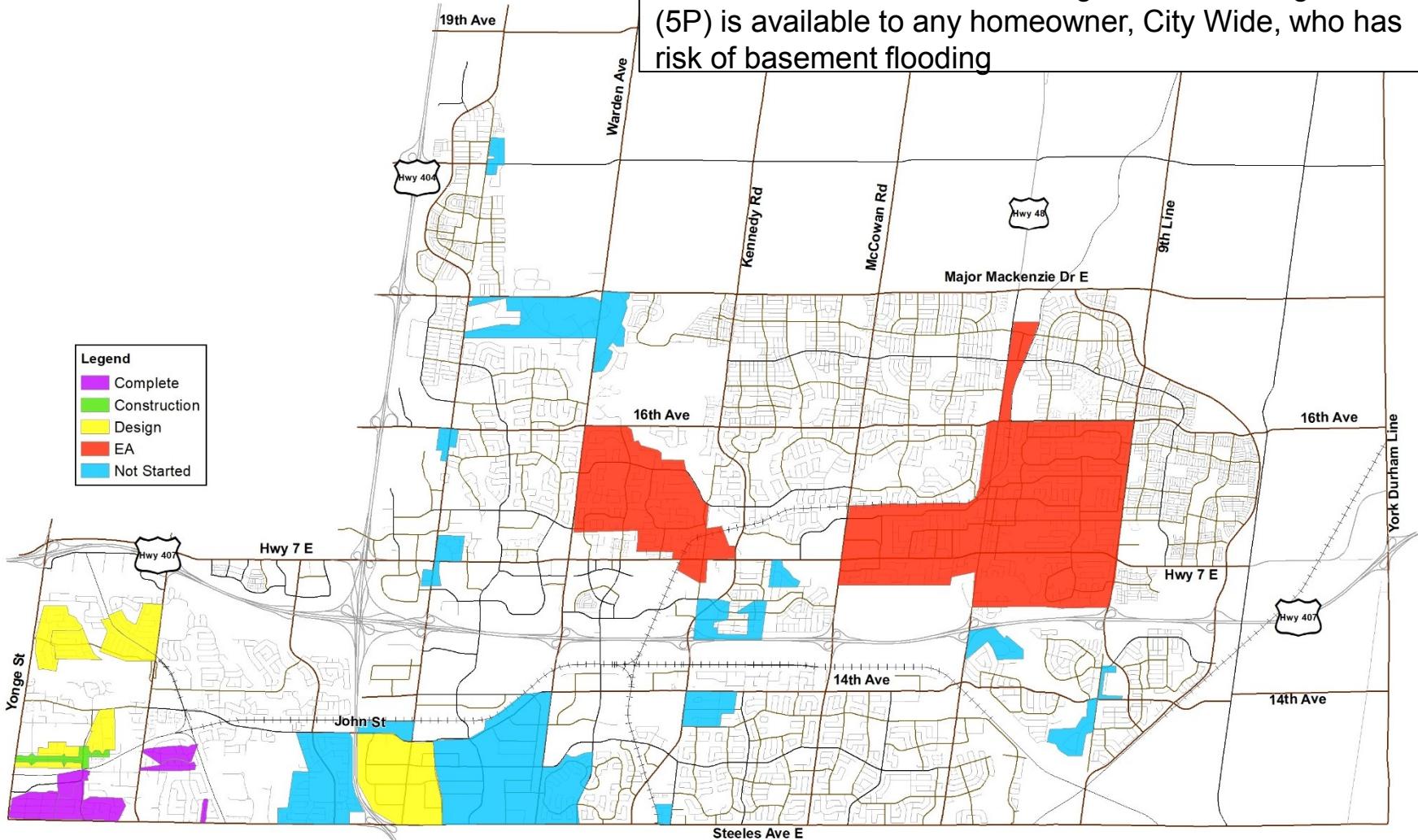
- Resident's home is not in any of the Flood Control Program areas
- Resident's home is in the flood control program areas, but has not yet been assessed (blue areas)
- Resident's home is in a Flood Control Program area, has been assessed, but work is not prioritized for immediate construction (red areas)
- Resident's home is in a Flood Control Program area, work has been prioritized for construction (green or yellow areas)

A process for identifying, prioritizing, assessing and implementing mitigations measures for future works under the Flood Control Program is required for the Rest of the City.



Background - Flood Control Project Status (2020)

Note: The Pilot Private Plumbing Protection Program (5P) is available to any homeowner, City Wide, who has risk of basement flooding





Small Area Request - Process

Small Area Requests = Flood control upgrades outside of West Thornhill, Don Mills and Markham Village/Unionville (i.e., Rest of the City) that is currently not in any implementation plans, and is scheduled for review after 2030

The following process will be followed when a request is received:

- Step 1: Staff conduct preliminary assessment
- Step 2: Detailed assessment of the request
- Step 3: If area qualifies for upgrades, proceeds to design
- Step 4: Construction of Upgrades within the small Priority Areas



Step 1: Staff Preliminary Assessment

- Staff will review the area to estimate the level of service. The following will be used as the assessment criteria:
 - The City has received multiple reports of basement flooding in isolated areas, indicating there may be a problem with the municipal drainage system
 - The original system was designed prior to the City requiring a 100 year level of service
 - Preliminary technical assessments by staff indicate that a 100 year level of service may not be achieved
- Private drainage systems will only be reviewed at the request of Council
- If the area may not have a 100 year level of service, Staff to request for capital budget for following year to conduct Step 2 Detailed Assessment

Outcome: Recommend requested site to proceed to Step 2 - Detailed Assessment



Step 2: Detail Assessment

- External consultants to perform detailed modelling to understand the system capacity.
- A level of service (LOS) and risk level will be assigned to the existing system:
 - <10 year level of service High Risk
 - 10-25 year level of service Medium Risk
 - 25+ year level of service Low Risk
- Return on Investment (ROI) analysis will also be performed to compare the costs of the project to the damages averted over 100 years, where:

$$\text{ROI} = \frac{\text{Flood Damages Averted over 100 years}}{\text{Costs of Project}}$$

**Similar to a
Benefit-Cost
Ratio**

- Disaster Mitigation Adaptation Fund requires $\text{ROI} > 2$ for projects to be eligible for grant funding. Markham's DMAF projects achieved $\text{ROI} = 4.7$
- Others have applied cost-efficiency thresholds – Toronto uses “cost per benefiting property” to screen if a basement flood reduction project advances to design and construction. Projects with high cost and low benefits (low ROI) are deferred.



Step 2: Detail Assessment

- Outcome of the assessment will be categorized as follows:

Scenario	LOS Risk	ROI	Cost	Next Steps
1	High	ROI > 2	Less than \$1M	Then proceed to design
2	Med	ROI > 2	Less than \$500K	Then proceed to design
3	Low	ROI > 2	NA	Defer to 2030+
4	High/Med/Low	ROI < 2	NA	Plumbing Protection Program

- Scenario 1 and 2 projects proceed to design while Scenario 3 projects are deferred.
- Scenario 4 private plumbing protection projects can proceed at any time.

Outcome: If project meets the minimum criteria to qualify as a Small Area Project, it will proceed to the Design Stage, and Staff will request for capital budget for Design to be completed in the following year



Step 3 – 4: Design/Construction

- The detailed design is required to define the specific size, location and construction methods required to install the upgrades, and to receive final approval from other agencies such as Ministry of Environment, Conservation and Parks (MECP) and Toronto and Region Conservation Authority (TRCA);
- Prior to tender award, projects will be re-assessed to determine if they meet the small area criteria prior to proceeding (\$1M for high risk areas, \$500k for medium risk areas)
 - Projects that do not meet the criteria are deferred to after 2030
- If possible, construction tendering will be combined with other projects for project delivery efficiency and cost savings

Outcome: Small area construction projects will run in parallel with other major construction works



Financial Implications

- Stormwater fee includes \$89M for the City-wide portion of the program
 - This work is planned to be completed after 2030
- Costs of the Detailed Assessments, Design and Construction can vary depending on the size and complexity of the area
- Budget will be requested through the annual capital budget process if an eligible project exists
- Council will be informed of the “acceleration” of the funds from the original planned implementation timeline
 - The costs associated with the stormwater fee are to be reviewed every 5 years, with the next review to occur in 2024, for update the fee in 2025



Example – Locust Hill Flooding

Step 1: Staff conduct preliminary assessment

Not in any implementation plans, multiple reports of basement flooding, private drainage system reviewed at request of Council.

Step 2: Detailed assessment of the request

Locust Hill Drainage Feasibility Study managed by TRCA partially funded by City (December, 2020) findings:

LOS Risk = High (< 10 Year level of service)

Preferred Alternative Cost < \$1M (\$727k diversion swale)

ROI > 2 (damage reduction benefits exceed costs by 2:1)

Step 3: If area qualifies for upgrades, proceeds to design

Not proceeding to design as the land is owned by Parks Canada

Step 4: Construction of Upgrades within the small Priority Areas

N/A

No financial implications for Stormwater Fee



Recommendations

1. That the presentation entitled “Small Area Flood Control Request Process” be received; and,
2. That the Small Area Flood Control Program be instituted; and,
3. That staff be authorized and directed to do all things necessary to give effect to this resolution.