



BUILDING MARKHAM'S
FUTURE TOGETHER



June - July 2017 Storm Events Review and Follow-up Activities

General Committee
September 18, 2017

Background

- Markham experienced large rainfall events on June 17th, July 7th and July 16th.
- Storms had high rainfall intensities and moderate to high total storm volumes in local areas.
- Numerous flood reports were received including:
 - basement flooding related to storm sewer back-up;
 - basement flooding related to sanitary sewer back-up;
 - basement flooding due to groundwater intrusion from foundation walls.
- Localized damage to culverts, sewer outfalls and channels occurred due to high flows and erosion.

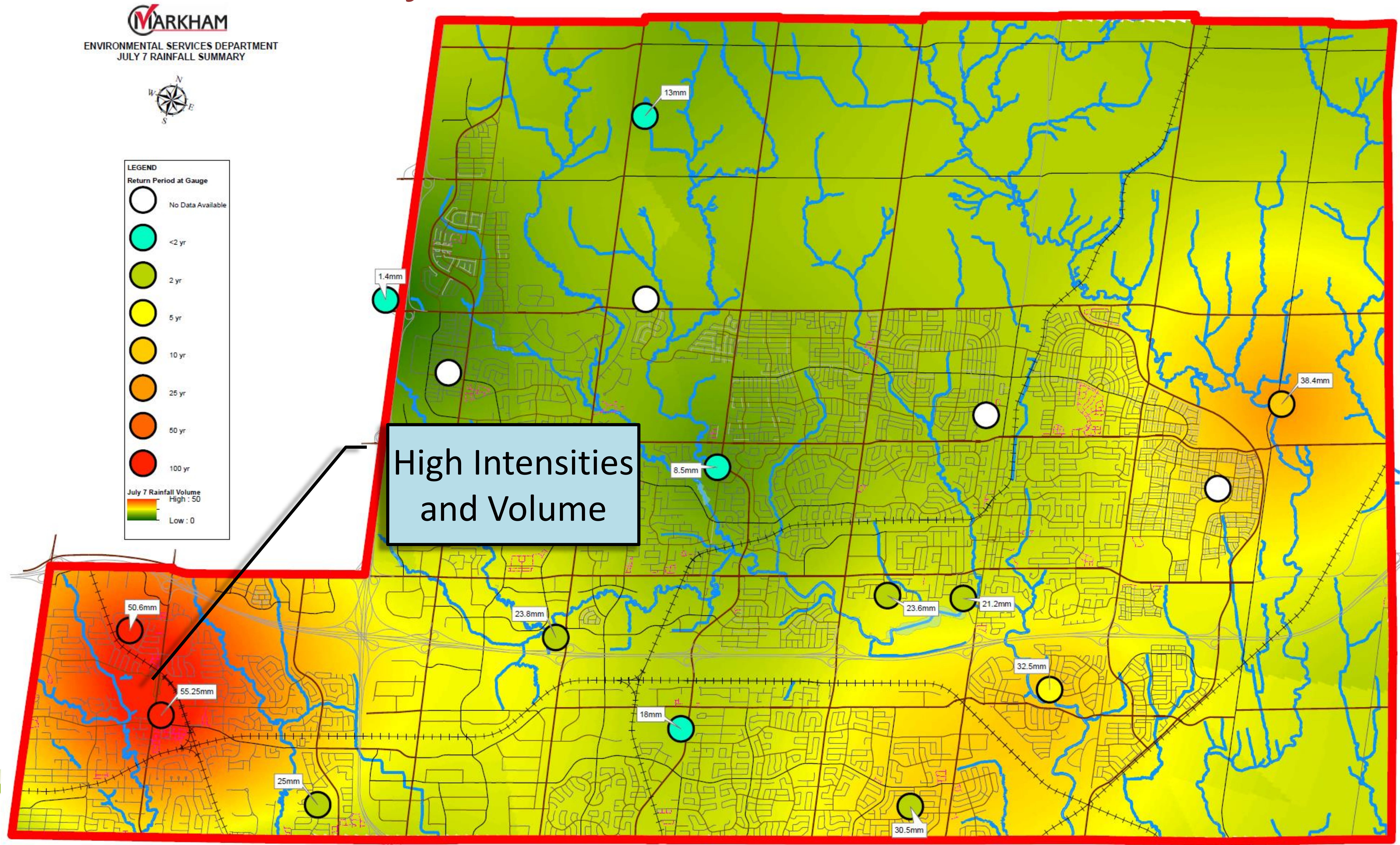




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July 7, 2017 Storm Volumes



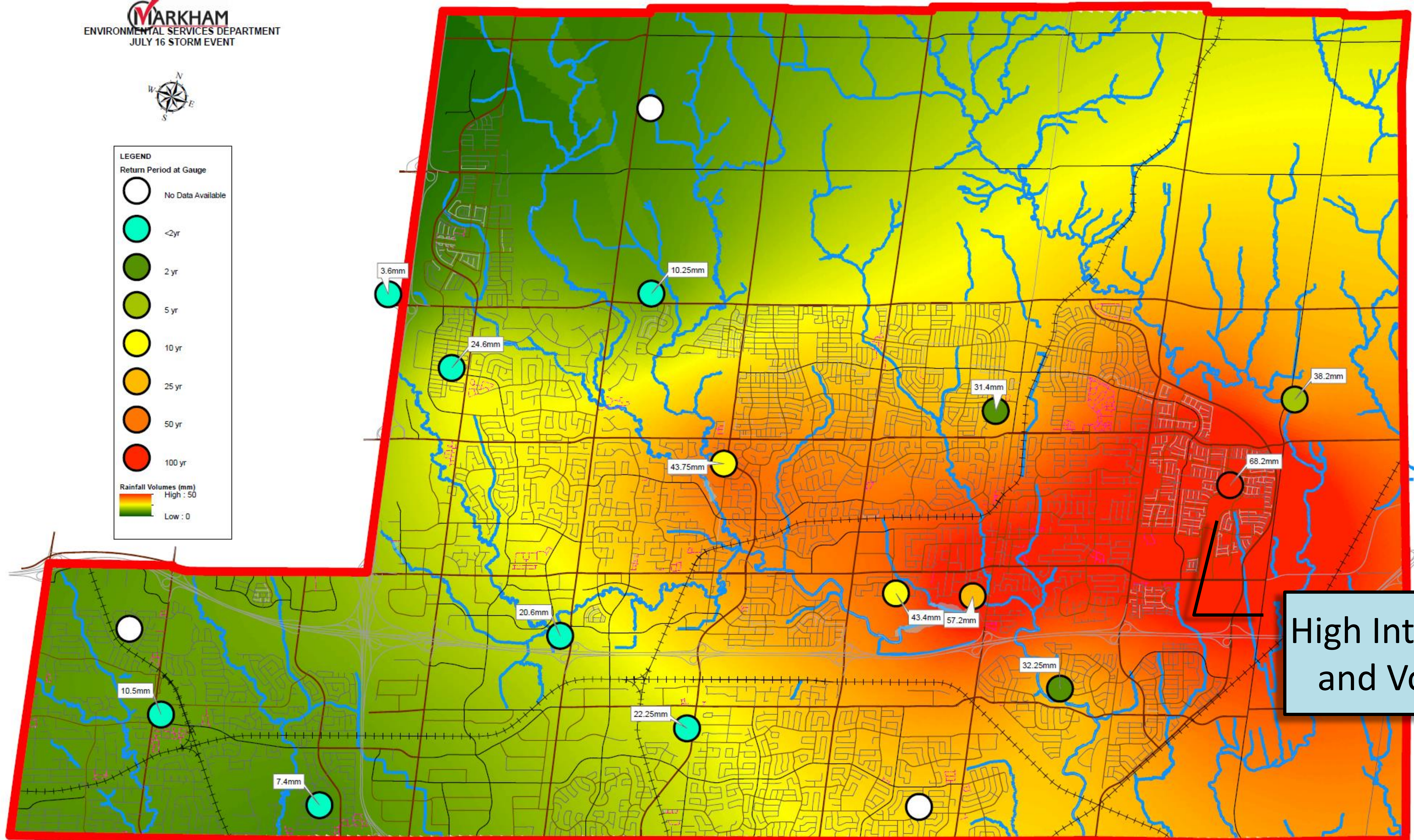
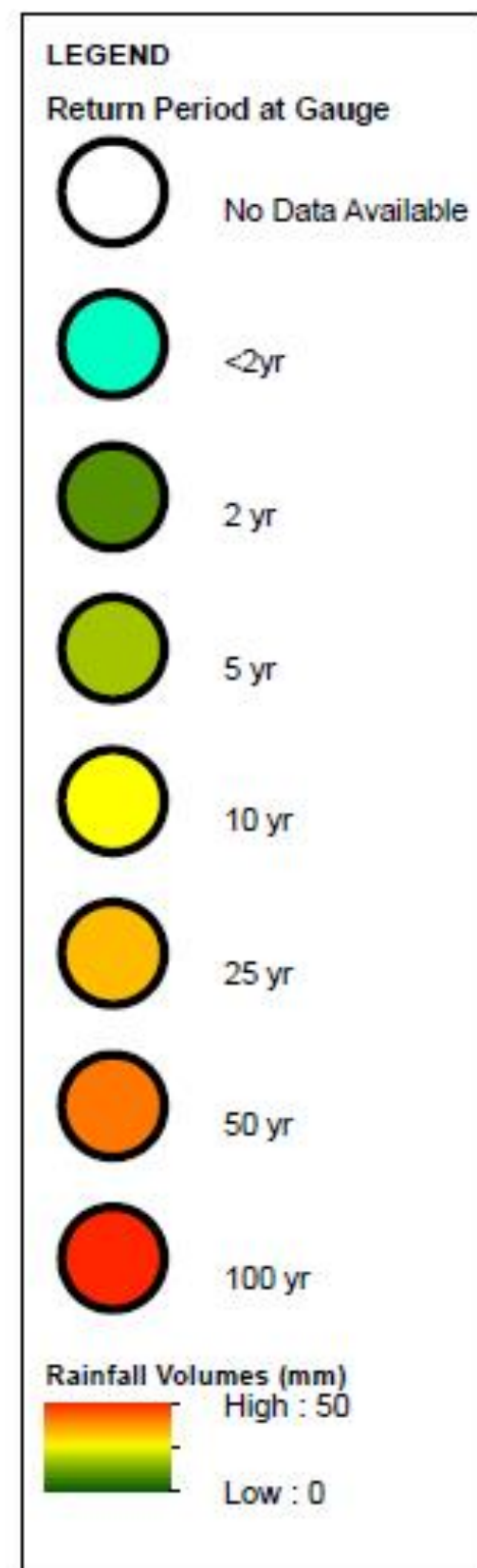


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July 16, 2017 Storm Volumes

MARKHAM
ENVIRONMENTAL SERVICES DEPARTMENT
JULY 16 STORM EVENT



Storm Comparison & Contact Centre Flood Reports

Table 1: Severe Storm and Flood Report Summary

Characteristic	Storm Event			
	August 19, 2005	June 17, 2017	July 7, 2017	July 16, 2017
Rainfall Intensities (over 10 min.)	50-100 Year (191 mm/hr)	5-10 Year (126mm/hr)	25 Year (164 mm/hr)	10 Year (84 mm/hr)
Storm Volume (24 hour)	> 100 Year (113 mm)	5-10 Year (64 mm)	2-5 Year (55 mm)	5-10 Year (68 mm)
Area Affected by 100-Year Rainfall	Southern Markham	mostly West Thornhill (mid – south portion)	West Thornhill (north portion / Royal Orchard Area)	Markham Village / Cornell
Number of Flood Reports	230	40	104	207

Actions Taken in Response to June – July Storm Events

- Prior to Storm Event:
 - Staff from Operations cleared debris from priority grates and inlets in advance as a result of severe weather forecasts.
- After Storm Event:
 - Staff responded immediately to clear any blockages at inlets and culvert grates and visited homes to investigate reasons of flooding.
 - The Proctor Avenue culverts/storm sewer outfalls that were partially displaced were restored on a temporary basis.
 - Staff worked with local councillors on developing consistent messaging and arranged for special garage pickup in the impacted areas.
 - Calls and emails were directed to the Contact Centre for tracking purposes.
 - Staff updated the City website to ensure information on procedures to take in case of property flooding is up to date.
 - Claims have been received by City Clerks, and staff conducted site visits and is working with our insurance representative in response to the claims.

City Internal Department - Roles / Responsibilities

- In the event of major storm, response is coordinated between Operations & Environmental Services under the direction of Commissioner of Community & Fire Services

Roles / Responsibilities	Department / Key Contact
Overall stormwater management/Citywide flood control program/ downspout disconnection program (wastewater I&I)/ mapping/ analysis	ES – Rob Muir (Manager, Stormwater)
Receive calls / enquiries from residents	Contact Centre
Response to Calls:	
Backyard/ Road Flooding/ River/ Erosion	Operations
Basement Flooding	ES - Waterworks
Special Waste Collection	ES – Waste Management
Claims to City	Clerks – MaryLou Papa
Media Enquiries	Corporate Communications

Note: Environmental Services Department (ES)

Background – Flood Risk Reduction Activities

- Following the August 19, 2005 storm Markham initiated several flood risk reduction initiatives and actions related to wastewater and stormwater systems including:
 - Wastewater pipe upgrades and diversions to address bottlenecks in capacity.
 - Mandatory downspout disconnection program to eliminate stormwater into the City-wide wastewater system.
 - Wastewater pipe lining in pilot areas to limit groundwater infiltration that affects sanitary sewer capacity.
 - Initiated the West Thornhill Stormwater Flood Remediation Class EA to identify sewer system upgrades to meet “100 year storm” design standard requirements in high flood risk areas.
 - Developed a long-term City-wide Flood Control Program and sustainable funding source (Stormwater Fee) for city-wide stormwater system upgrades.

West Thornhill Flood Control Program – Project Status

- Initiated the design and construction of West Thornhill Flood Control Program and spent approx. \$33.0M to date to address the critical infrastructure upgrades.

Project / Phases	Status
West Thornhill	Class EA initiated in 2006, and approved in Aug 2011
1	Design commenced in April 2012 and completed in Feb 2014
1A	Construction commenced in June 2014 and completed in Nov 2015
1B	Construction completed in Aug 2016
1C	Construction completed in Dec 2016
2A	Construction completed in Dec 2016
2B	Construction In Progress; Anticipated Completion June 2018
2C	Design 90% completed; Construction in 2018/2019
2D	Design 60% completed; Construction in 2019/2020
3A, 3B & 3C	Design Commenced in May 2017; Construction in 2020 - 2022

Don Mills Channel Flood Control Program – Project Status

- Initiated Don Mills Channel Class EA to identify storm drainage upgrades.

Project	Status
Don Mills Channel	Class EA Study commenced in Jan 2016; Anticipated EA Study Completion April 2018; Planned Implementation 2021 - 2030



Next Steps in response to 2017 Storm Events

Project / Phases	Status
West Thornhill	Class EA initiated in 2006, and approved in 2011
1A	Completed in Nov 2015
1B	Completed in Aug 2016
1C	Completed in Dec 2016
2A	Completed in Dec 2016
2B	In Progress; Anticipated Completion June 2018
2C	Design 90% completed; Construction in 2018/2019
2D	Design 60% completed; Construction in 2019/2020
3A, 3B & 3C	Design Commenced in May 2017; Construction in 2020 - 2022
4	Design 2019; Construction in 2022 – 2025
Don Mills Channel	EA Study commenced in Jan 2016; Anticipated EA Study Completion April 2018; Construction 2021 - 2030
City-Wide Areas	Design/ Construction 2027 - 2044

Added Proctor and Woodland Parks Outlets Repair to Phase 2C in 2018

Advanced Design to 2018

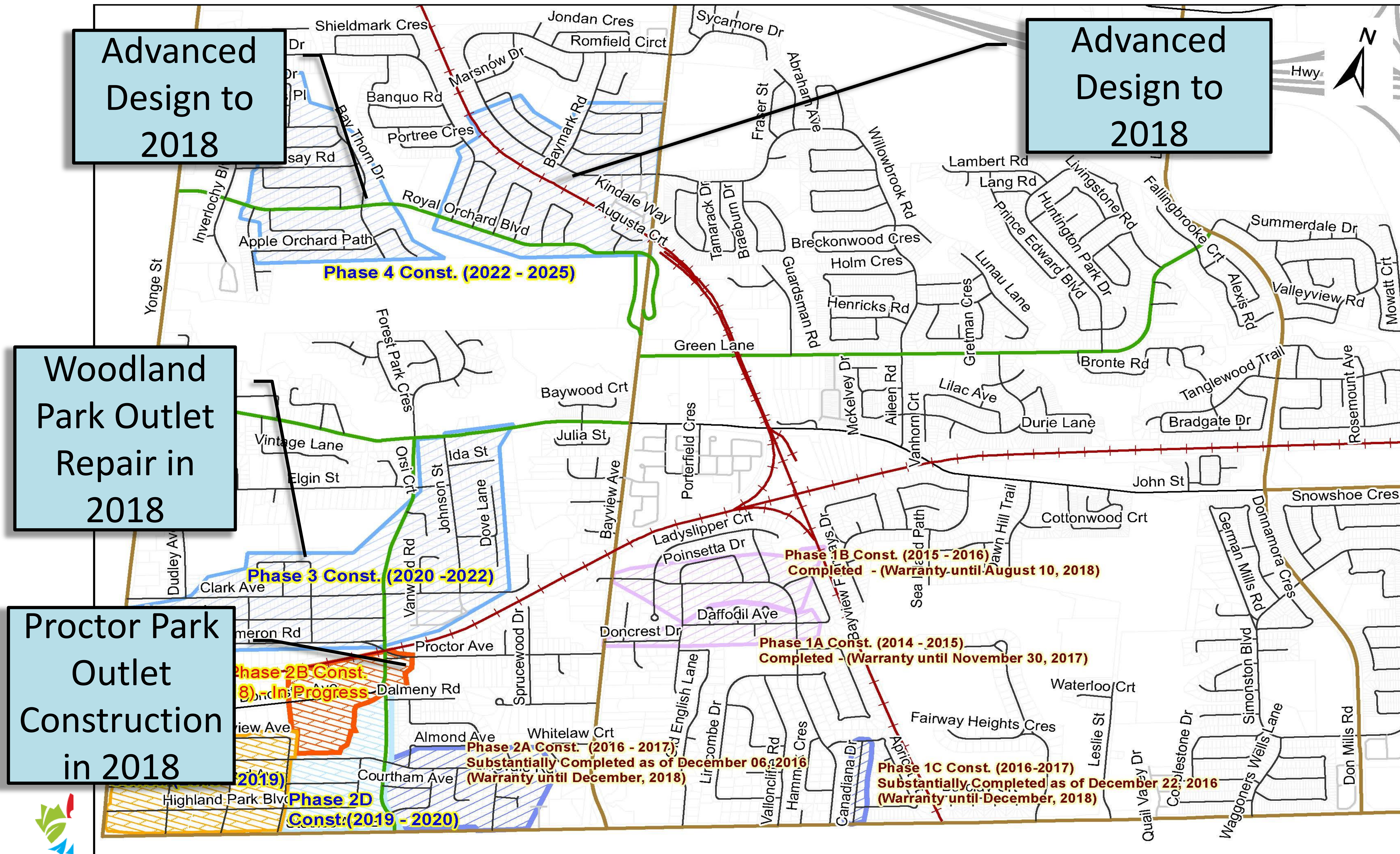
Advanced EA Study to Oct 2017

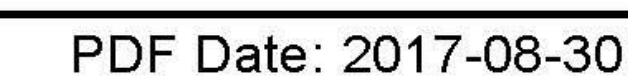


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MARKHAM ATTACHMENT "B" - WEST THORNHILL FLOOD CONTROL IMPLEMENTATION - PHASES







MARKHAM ATTACHMENT "C" – SANITARY SYSTEM DOWNSPOUT DISCONNECTION PROGRAM PHASES

Program - Areas

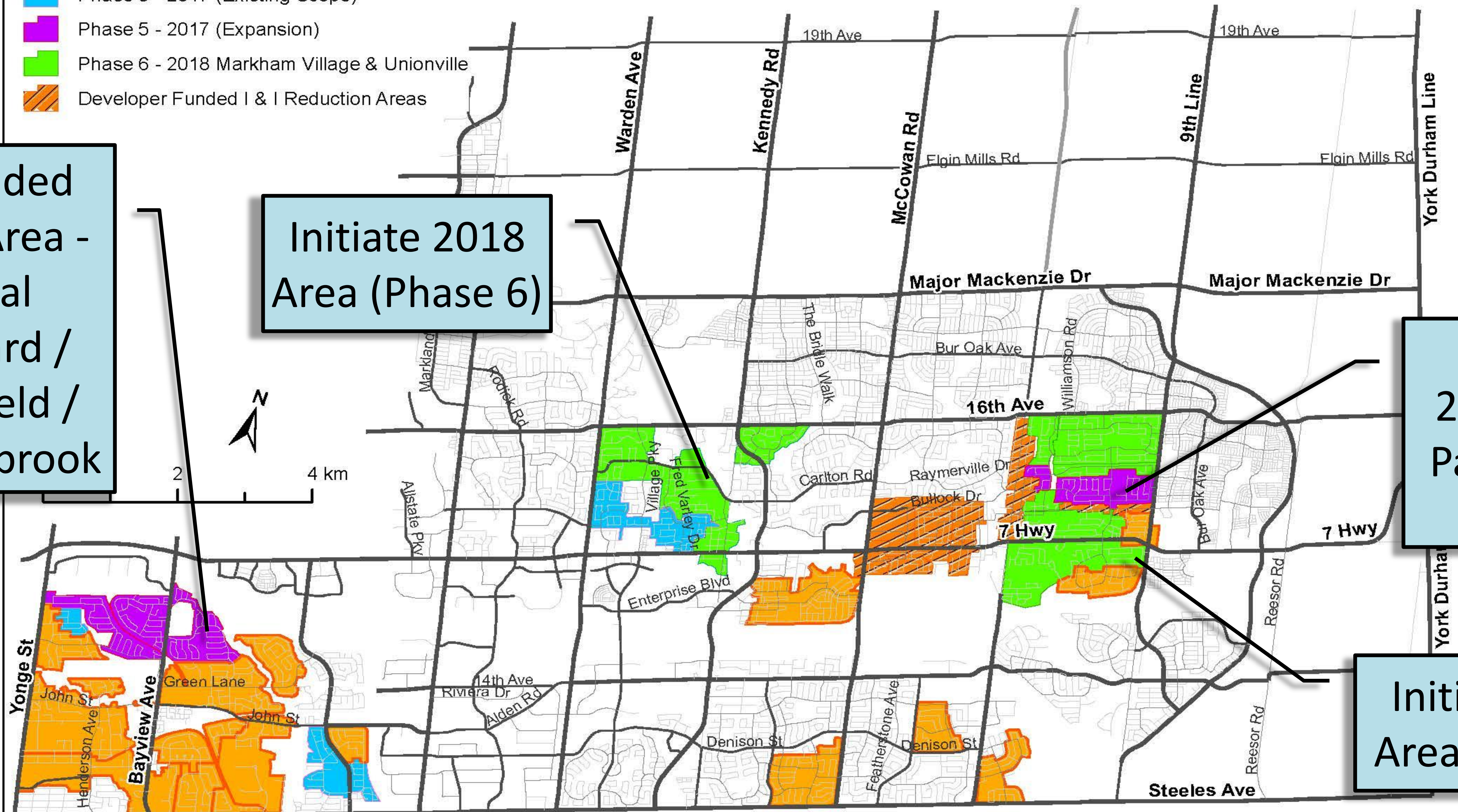
- Phases 1-4 (Completed)
- Phase 5 - 2017 (Existing Scope)
- Phase 5 - 2017 (Expansion)
- Phase 6 - 2018 Markham Village & Unionville
- Developer Funded I & I Reduction Areas

Expanded
2017 Area -
Royal
Orchard /
Romfield /
Willowbrook

Initiate 2018
Area (Phase 6)

Expanded
2017 Area –
Paramount /
Church

Initiate 2018
Area (Phase 6)



Recommendations

- 1) That the report entitled “June-July 2017 Storm Events Review and Follow-up Activities” be received; and
- 2) That Council pre-approve the 2018 Capital Budget request, project #18273 “Flood Control Remediation – Study” in the amount of \$1,274,000 to be funded in the amount of \$1,109,000 from the Stormwater Fee Reserve and the remaining balance of \$165,000 from the Waterworks Reserve; and
- 3) That Council pre-approve the 2018 Capital Budget request, project #18281 “Sanitary System Downspout Disconnection Program – Phase 6” in the amount of \$250,000 to be funded from the Waterworks Reserve; and
- 4) That staff bring forward the corresponding Capital Budget Request Forms for each of the pre-approved projects as part of the 2018 Capital Budget process; and
- 5) That Council approve the expansion of the Phase 5 Sanitary System Downspout Disconnection Program to include additional areas in Royal Orchard Blvd/ Romfield Circuit, Willowbrook Road, Markham Village between Church St and Paramount Road to be funded from existing capital project #17221 “Sanitary System Downspout Disconnection Program – Phase 5”; and

Recommendations (continued)

- 6) That staff report back on a proposed interim Private Property Plumbing Protection Program including backwater valve and sump pump subsidy program for high risk areas, which will include program criteria, budget requirements, funding source and communication plan; and
- 7) That Staff be authorized and directed to do all things necessary to give effect to this resolution.