Flood Reduction Strategies in the City of Ottawa

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Flooding in Ottawa

- Since amalgamation in 2000, there has been 4 significant flooding events in Ottawa.
- On Sep 9, 2004 hurricane Frances caused over 1200 incidents of Basement flooding throughout the city, giving us a snapshot of how the sanitary system performs.
- Convection storms in 2002, 2006 and 2009 were also responsible for flooding occurrences.
Types of Flooding in Ottawa

- Basement flooding due to storm sewer surcharge
- Basement flooding due to sanitary sewer surcharge
- Overland Flooding.
Types of Flooding Events

- 2004 - High volume
- 2009 - High Intensity
- 2002 - High Intensity

July 2009
June 2002
September 2004
Types of Systems

Combined (pre 1950)

Separated (post 1961)

Partially Separated (1950-1961 and converted combined systems after 1961)
Location of Sewer Types
City Initiatives

- Wet Weather Infrastructure Management Plan

Objectives: Recommend Initiatives to provide...

- **Flood Protection** - Reduce threats to human health and property damage from flooding;

- **Capacity for Growth** - and intensification in areas with infrastructure capacity restrictions; and,

- **Pollution Control** - Minimize adverse impacts on water quality in watercourses.
Wet Weather Infrastructure Management Pan

OBJECTIVES
- Flood Protection
- Capacity for Growth
- Pollution Control

PROGRAMS
- Capacity Management
- Extraneous Flow Reduction
- Flood Control
- Operation & Maintenance
- Pollution Prevention & Control Plan
- Sewer Separation

SUPPORT PROGRAMS
- Modelling
- Flow & Rainfall Monitoring
- Inspections & CCTV
- First Response
- Sewer Design Guidelines
- Public Education/Communication
- Bylaw Review & Enforcement

Data Management / GIS
Current Ongoing Initiatives

- Residential Plumbing Protection Program
- Changes to guidelines
- Ongoing flood remediation projects
- RTC / Central Storage Tunnel
- Sewer separation
- Extraneous flow reduction
- Flow monitoring and modelling
- Public education
Residential Plumbing Protection Program

- Homes in high risk areas that have experienced flooding are eligible for a 100% subsidy up to $5000 (or $7,500 depending on the area).

- Homes that are in high risk areas but have not experienced flooding are eligible for a 50% subsidy ($2,500 or $3,500 max).

- Work includes extraneous flow removal, backwater valve installation, flat roof disconnect, and a sump pump if required.
Sewer separation
Dual Drainage Implementation

- Installation of Inlet Control Devices in separated areas.
- Overland Flow Improvements
- Replacement of MH covers
Orleans Flood Investigation
Orleans Flood Investigation

- Basement flooding due to surcharge of Storm Sewers. Over 800 basements flooded in 2006.
- Poor overland drainage system was also an issue.
- Most homes did not have backwater valves.
Minor system analysis
Hydraulic Analysis – XP-SWMM
Major system analysis
Alternatives

K2 - Do not provide ICs in catchbasins at the intersection of Preston and Gez Fences.

K3 - Depress curb, upgrade pedestrian path linking Chalmers and Preston to provide overland flow route to Preston.

K1 - Provide grade raise (speed bump) on Summerlands S. just before intersection with Preston to keep water on Preston; depress curb above easement adjacent to 1662 Preston and provide Armande overland channel through easement to ravine.

Note: Only Preferred Alternatives shown.
Orleans Dual Drainage Project

- Flood remediation measures were completed in 2008 and 2009.
- In 2011, a large event again hit the area. There were no reports of basement flooding.
- Some overland drainage issues were reported (excessive ponding) and are currently being addressed.
SANDY HILL FLOOD CONTROL STUDY
Sandy Hill Topography

This project...

Rideau River

Rideau Canal

Rideau River
SANDY HILL FLOOD CONTROL STUDY

Storage in Sandy Hill Park

- Surface Storage in Sandy Hill Park
- Strathcona Park
- Rideau River Collector Pipes
- Flow Control Chamber
- Somerset Sewer
- Underground Storage
- Collector Pipes
SANDY HILL FLOOD CONTROL STUDY

Storage in Sandy Hill Park
SANDY HILL FLOOD CONTROL STUDY

Storage in Sandy Hill Park

Somerset Street

Sweetland Avenue

Nelson Street

Park Storage

Templeton Avenue

Surface Storage
SANDY HILL FLOOD CONTROL STUDY

Construction
SANDY HILL FLOOD CONTROL STUDY

Park Before and After
Sandy Hill Tank

- Since being in service in 2009, the tank has been used 8 times, protecting the community during storm events, including the large 2009 event.
- Even during construction, the tank unexpectedly protected the community (and made the contractor very unhappy)
Other initiatives by the City

- Revising design guidelines to account for new densities.
- Temporary orifice controls during subdivision construction.
- Climate Change: Stress test storm system by adding 20% to 100 year IDF curve.
Other initiatives by the City

- CSO reduction: Real Time Control, Storage Tunnel
THANK YOU

QUESTIONS?