Welcome

Lakeshore Stormwater Master Plan Study
Phase 1

Presentation to Council

July 14, 2020

Presented by Nick Emery, P.Eng. and Clarence Jubenville, P. Eng.

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Presentation Outline

- Study Purpose
- Study Area
- Master Plan Process and Approach
- Problem/Opportunity Statement
- Solutions
- Implementation Costs
- Next Steps
- Questions

Purpose of This Study

- Goal is to reduce the risk of basement flooding and property damage caused by significant rainfall events, such as the September 2016 and August 2017 storms.
- Perform a comprehensive review and analysis of stormwater infrastructure and identify areas of need for infrastructure improvements.
- Prioritize improvements based on level of service/risk to develop phasing and sustainable cost strategy.

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Study Area

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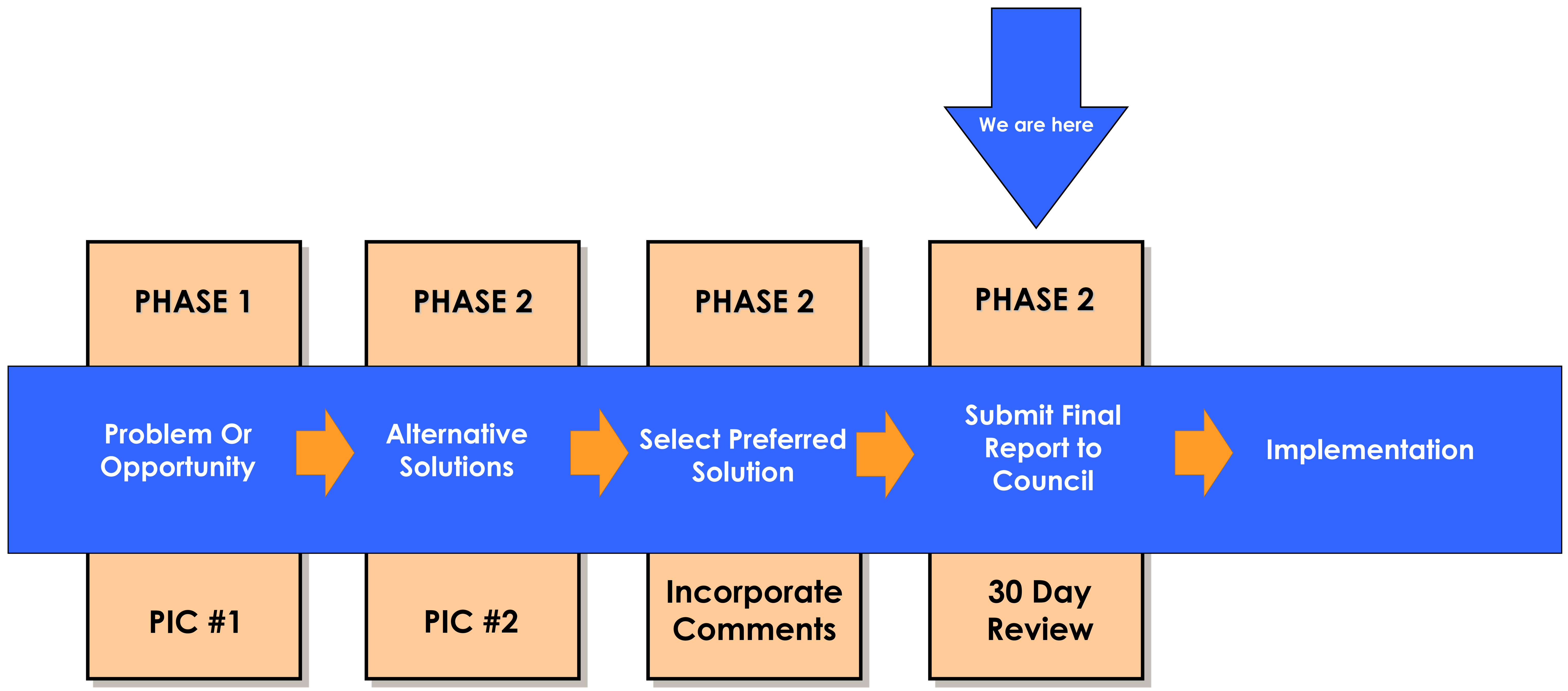
Municipal Class Environmental Assessment Process

- The Town will meet the requirements of Ontario's Environmental Assessment (EA) Act for infrastructure projects.
- The project is being completed as a Master Plan - Approach 2 which includes completion of Phases 1 and 2 of the Class EA process as set out by the Municipal Engineers Association. We are currently in the Phase 2 stage.
- The EA process is an opportunity for the public and agencies to provide input.



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Problems and Opportunities

The cause of basement flooding at each individual home can be the result of one or many factors. The findings of our study suggest the following:

- The **primary cause** of basement flooding is **deficient private drainage** systems (i.e. – cracked pipes, sump pump failure, sanitary backflow valve failure, tree roots, grading around the house, etc.)
- **Surface ponding in itself is not a cause of basement flooding**, but it can challenge the private drainage system and expose any existing deficiencies.

Reducing the possibility of basement flooding requires a two-part solution:

Part 1. Maintain and **improve private drainage systems** to ensure adequate drainage of surface, roof and groundwater around the home; and

Part 2. **Improve the public drainage system** (i.e. the Town's stormwater system) to reduce the duration and frequency of storm sewer surcharging during intense rainfall events.

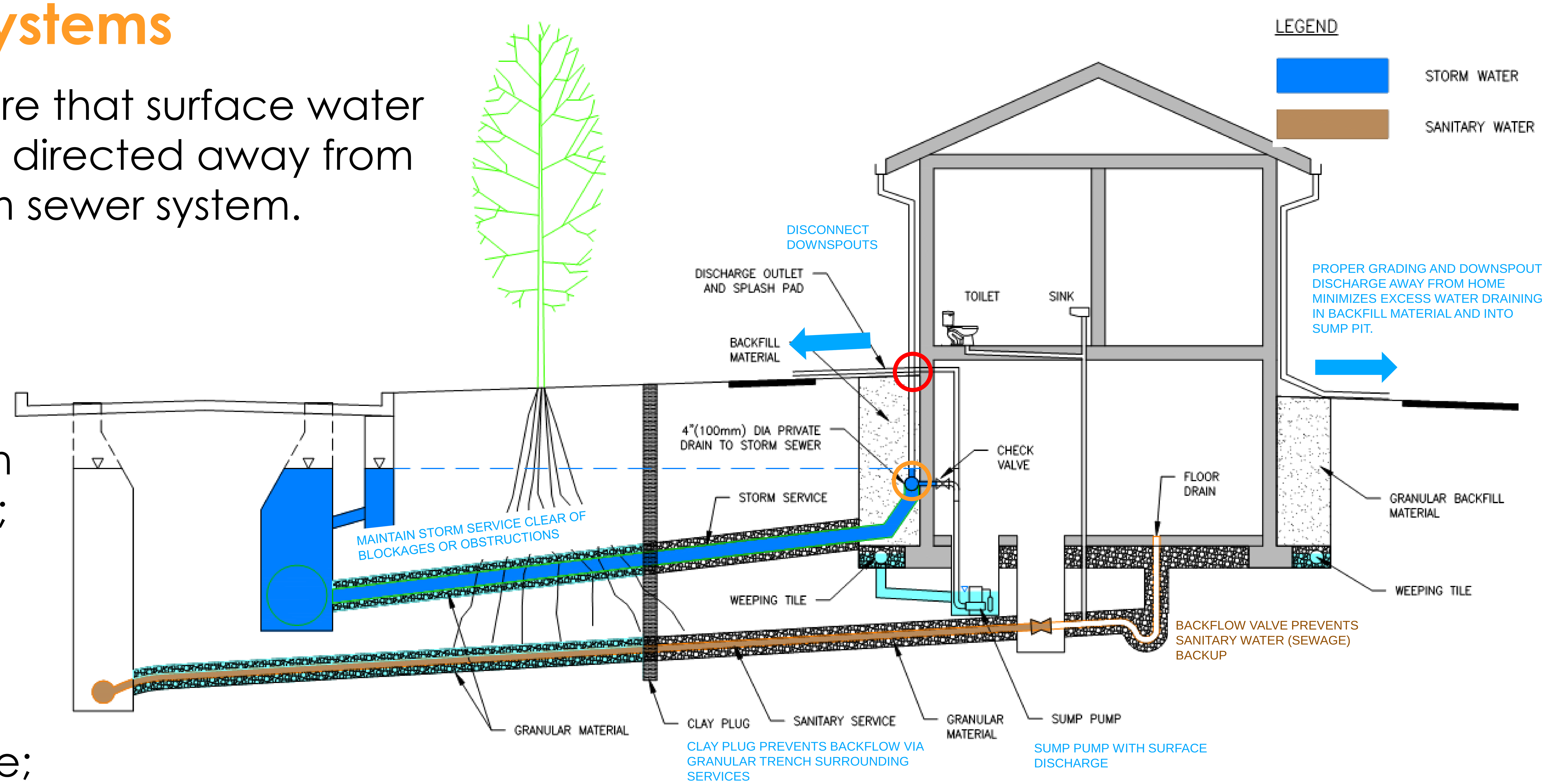
Solution Part 1

PRIVATE DRAINAGE SYSTEM MAINTENANCE AND IMPROVEMENTS

Maintaining Private Drainage Systems

Maintain private drainage systems to ensure that surface water and groundwater surrounding the home is directed away from the home and towards the roadway/storm sewer system. Potential improvements may include:

- Ensure ground surface is graded away from home;
- Disconnect downspouts from foundation drain and direct them away from house;
- Verify that sump pump is in proper working order;
- Provide backup power for sump pump;
- Discharge sump pump to ground surface;
- Install sanitary backflow preventor and verify that it is in proper working order;
- Inspect private drains (storm and sanitary) for cracks or roots; and
- Install clay plugs in private drain trenches.



NOTE:

PRIVATE DRAINAGE SYSTEMS CAN BE COMPLEX AND COULD DIFFER FROM THAT SHOWN. IT IS CRITICAL THAT THE HOME OWNER CARRY OUT A SITE ASSIGNMENT WITH A LICENSED PLUMBER, DRAIN CONTRACTOR, OR DRAINAGE ENGINEER TO UNDERSTAND HOW THE EXISTING DRAINAGE SYSTEM OPERATES BEFORE DETERMINING THE APPROPRIATE SYSTEM IMPROVEMENTS.

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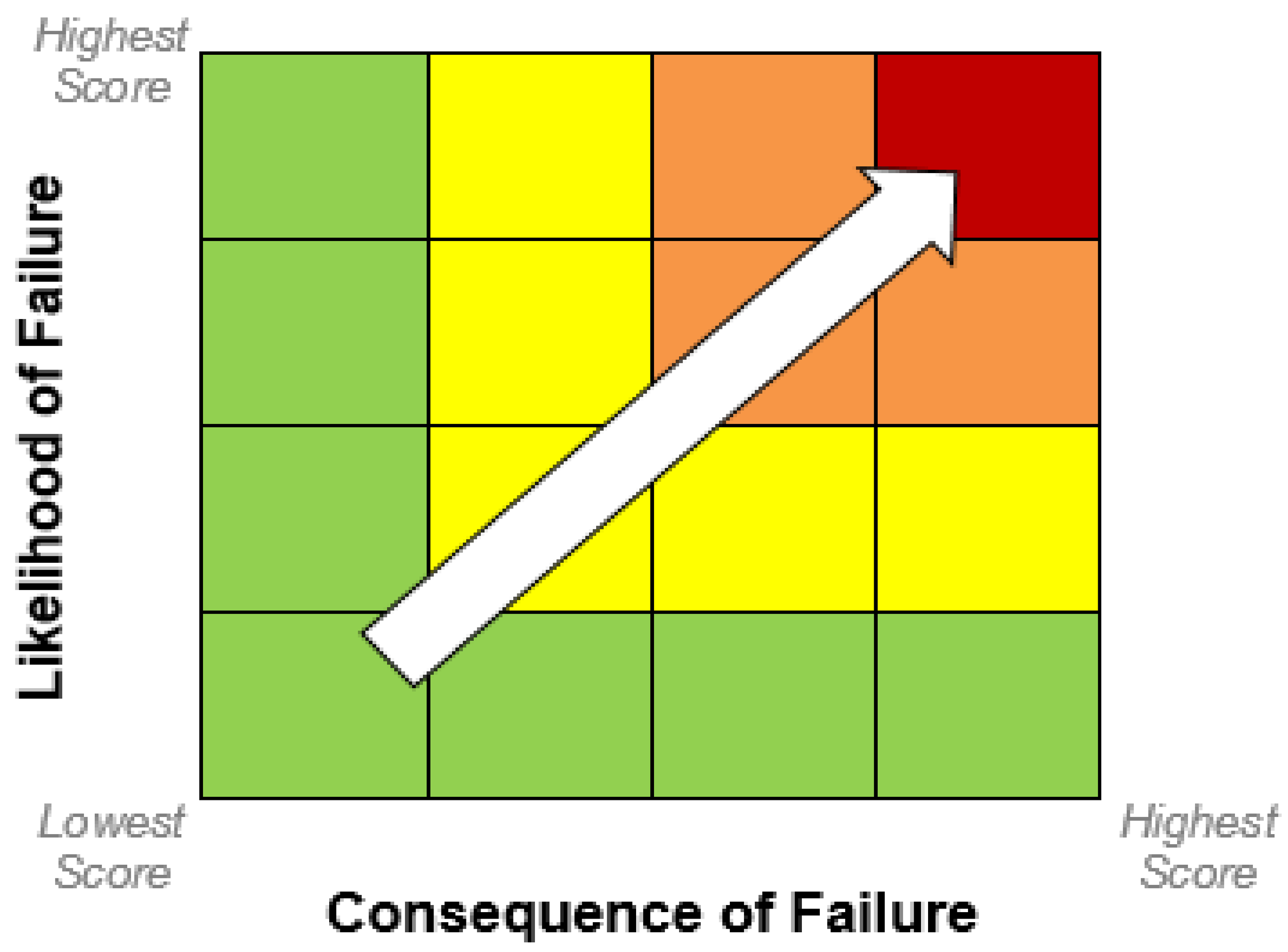
Solution Part 2
PUBLIC DRAINAGE SYSTEM IMPROVEMENTS

Storm Sewer Improvements

- The study area consists of approximately 112.2 kilometres of storm sewers and 1,135 storm manholes.
- Storm sewers provide quick and efficient drainage of urbanized areas to limit the inconvenience of stormwater ponding for most storm events. They are not designed to handle infrequent events such as those experienced in September 2016 and August 2017.

The performance of each storm sewer in the study area was evaluated based on its age, material, capacity, and the flooding that results if it fails.



Each storm sewer was assigned a score based on its performance to prioritize replacement.

Total Score	Prioritization Grade
8-10	Very Poor
6-8	Poor
4-6	Fair
2-4	Good
0-2	Very Good

Approximately 7.6 km of storm sewer received scores of “poor” or “very poor” and will be prioritized for future replacement.

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Solution Part 2
PUBLIC DRAINAGE SYSTEM IMPROVEMENTS

Catchment Improvements – Alternative Development

Alternative solutions were developed and evaluated for catchments where the following key issues were noted:

- **Minor System Capacity** – Systems with insufficient capacity to provide an adequate level of service during the 2-year storm event;
- **Major System Capacity** – Locations where buildings are likely vulnerable to flooding due to the capacity of the local major system and/or maximum road ponding depths are greater than 0.5 m;
- **Infrastructure Location** – Drainage infrastructure or overland flow routes located outside of the municipal right-of-way and/or drainage easement; and
- **Stormwater Management (SWM) Pond Capacity** – Areas where the existing SWM pond does not have sufficient capacity to accommodate the runoff from its maximum design storm.

Solution Part 2

PUBLIC DRAINAGE SYSTEM IMPROVEMENTS

Catchment Improvements – Alternative Evaluation

Environmental Component	Evaluation Criteria
Social/Cultural	• Public Health and Safety • Property Impacts/Acquisitions • Municipal Policy/Guidelines
Natural Environment	• Erosion and Sediment Impacts • Aquatic Habitats • Terrestrial Habitats
Technical	• Effects on Surface Flooding • Compliance with Standards • Constructability
Economic/Financial	• Capital Costs • Property Costs • Operation and Maintenance Costs

Solution Part 2

PUBLIC DRAINAGE SYSTEM IMPROVEMENTS

Catchment Improvements – Preliminary Opinion of Probable Costs

Catchment	Project	Estimated Cost
Amy Croft Drive	SWM Pond Retrofit, Storm Sewer Replacement, Major Flow Improvements, Municipal Drain Abandonment	$800,000
Croft Drive	Major Flow Improvements	$80,000
Chelsea Parkway	Major Flow Improvements	$100,000
Optimist	Pump Station Replacement, Storm Sewer Replacement	$1,400,000
Seasons at the Creek	Pump Station Improvements	$140,000
Belle River West	New Pump Stations, Major System Improvements	$4,100,000
Terra Lou	Major System Improvements	$120,000
Bacon/Forest Hill	Pump Station Improvements	$1,700,000
Russell Woods	Pump Station Improvements, New Pump Station	$2,700,000
Lefaive Drain	New Storm Sewer, Pump Station Replacement, Municipal Drain Abandonment	$8,000,000
Hood and Leffler Drain	Pump Station Improvements, Municipal Drain Enclosure	$14,000,000
Country Walk and Dean Development	SWM Pond Retrofit	$700,000
Phase 1 Study Area	Storm Sewer Replacement	$10,000,000
	TOTAL	**$43,840,000**

Costs include engineering but do not include HST

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Solution Part 2

PUBLIC DRAINAGE SYSTEM IMPROVEMENTS

Additional Recommendations

- Expand existing sanitary sewer inflow & infiltration reduction program to mitigate significant wet weather flows;
- Adopt 5-year storm sewer design standard for all new construction, as per WERSMSM guidelines;
- Develop an annual operation & maintenance schedule for all SWM facilities and pump stations;
- Implement a comprehensive storm sewer video inspection and condition assessment and maintenance program to confirm replacement priorities; and
- Allocate minimum annual budget of approximately $700,000 for stormwater system operation & maintenance.

Solution Part 2

PUBLIC DRAINAGE SYSTEM IMPROVEMENTS

Recommended Annual Operation & Maintenance Budget

Asset	Quantity	Annualized O&M Cost ($)	Total Estimated Annual O&M Cost ($)
Town-Owned SWM Ponds	21	$13,000	$273,000
Town-Owned Storm Pump Stations	26	$10,000	$260,000
Storm Sewer Inspection and Flushing	Ongoing	$167,000	$167,000
		TOTAL	**$700,000**

Next Steps

- Council endorsement of the Environmental Study Report (ESR) for the Stormwater Master Plan – Phase 1;
- Notify the public and review agencies of completion of the Class EA;
- File the ESR with the Municipal Clerk and place on the public record for at least 30 calendar days for review by the public and agencies;
- Provision to request Part II Order. If no request for an order is received by the Minister within the review period, then proceed to implementation of the public drainage system improvements:
    - Complete contract drawings and tender documents
    - Obtain approvals including ECA amendments where necessary
    - Proceed to construction and operation
    - Monitor for environmental provisions and commitments

Thank You for Your Attention

Questions?

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