

A photograph of a flooded area with trees and a bridge. The water is murky and reflects the overcast sky. Two large, leafless trees stand in the water. In the background, a bridge with a metal railing spans the water. A dark car is parked on the bridge. The foreground shows a grassy bank with patches of snow.

# Drainage Master Plan

City Building Committee  
January 29, 2019  
Tom Reeve





## Infrastructure Master Plans

- Studies started in 2017
- Based on long term population and employment projections for the City
- Studies follow the municipal class environmental assessment process for master plans

# Infrastructure Master Plans

Where are they used?

## OFFICIAL PLAN UPDATE

The Master Plans are key input to the Official Plan Update as they outline the infrastructure required to provide key municipal services into the future.



## TOOL FOR FUTURE STUDY

The tools created and updated in the Master Plans provide tools the City can use to advance understanding and study of infrastructure.

## DC BACKGROUND STUDY

As the Master Plans use growth predictions as key input they are important to the development charges background study.

## FINANCIAL AND ASSET MANAGEMENT PLANNING

The information from the Master Plans will be considered when developing the long range financial plan and asset management strategies.

## CAPITAL PLANNING

Annually as the City prepares their capital budget, the Master Plans provide direction to the projects required.



# Why Does Barrie Need a Drainage Master Plan?



## New Standards and Regulations

Phosphorus reduction credits, volume reduction targets, compliance requirements.



## Evolving Science and Techniques

Climate change impacts, new rainfall data, low impact development (LID).



## Consolidate Previous Studies

Past studies have covered parts of Barrie. New tools will improve design and review of municipal and development projects.

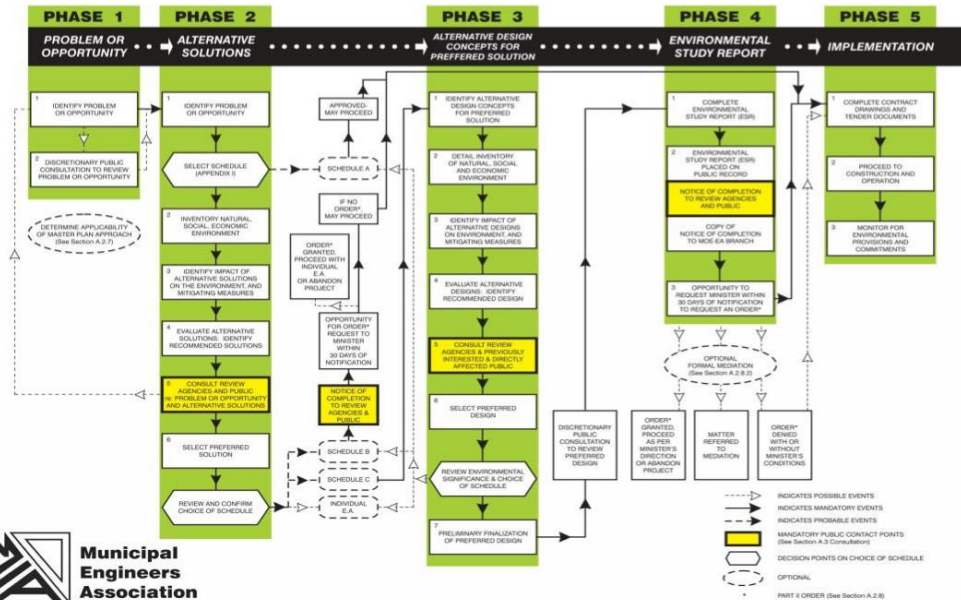


## Protect People and Property

Reduce the risk of flooding and address known issues.

# Summary to Date

## MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS



## Citywide Modelling Completed

In a previous project, a consultant had developed City wide stormwater computer models. This is the first time the City has had a tool that would allow analysis on a City wide scale.

## Consultant Team Retained

The City retained C.C. Tatham and their sub-consultants Azimuth (environmental), Peto MacCallum (geotechnical), Water's Edge (geomorphologist), Archeowork (Archaeological), and Rudy Mak (survey).

## Consultation Undertaken

There was a Public Information Centre in November 2017 to introduce the project and ask the public about their existing concerns. In April 2018, there was a second PIC to show the preliminary preferred alternative projects. There have also been individual property owner meetings.

## Preliminary Preferred Alternative

Through technical analysis and evaluation, the project team has developed a preferred alternative.



# Lot Level and Linear LID

## Lot Level LIDs



LIDs can be constructed at the lot level to capture, filter and infiltrate rainwater at the source. Examples of these include infiltration pits and rain barrels.

## Linear LIDS



Through roadways, the City has a potential to filter or infiltrate water within the right-of-way. Engineering is developing standards and guidelines on where and how this could be done.

## Benefits



LIDs can reduce the impact of smaller storms, help restore the natural water balance, and improve water quality.

## Limitations



LIDs don't have a major impact on larger storm events. In a decentralized form, there are challenges to monitoring and maintaining their effectiveness. There are also risks to increasing groundwater and seepage problems in the local area.





# Conveyance Improvements

## Opportunities



The City has extensive storm sewers, culverts and open channels that convey stormwater flows. Making improvements can reduce the potential for flood damage to both public and private property.

## Channels



Channel erosion and conveyance can be improved in areas where flooding risks exist.

## Culverts



There are a number of culverts identified that do not meet current City design standards.

## Storm Sewers



The system wide stormwater model has identified a number of storm sewers to be updated at the time of infrastructure renewal.



# Stormwater Ponds

## Opportunity



Stormwater ponds are a proven method of reducing the impact of urbanization. Due to the age of some neighbourhoods in the City, stormwater ponds do not treat all runoff.

## Retrofits



Many existing stormwater ponds could be altered to provide more storage and enhanced water quality treatment.

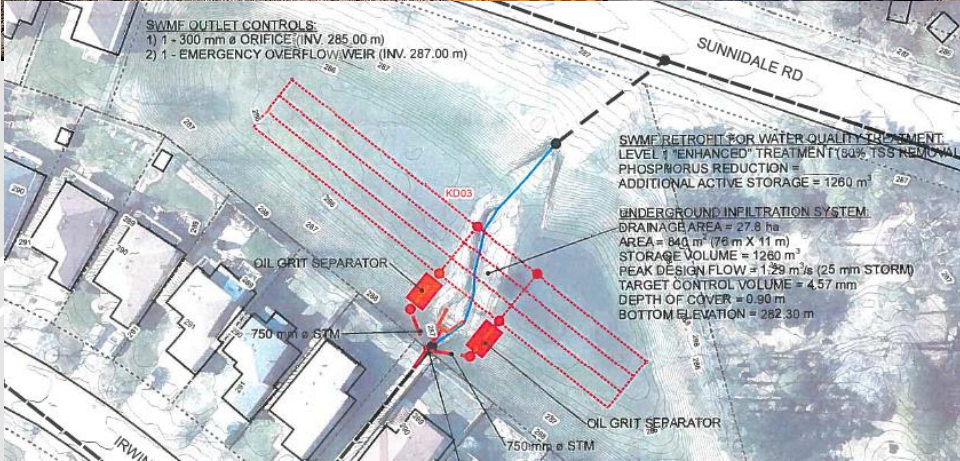
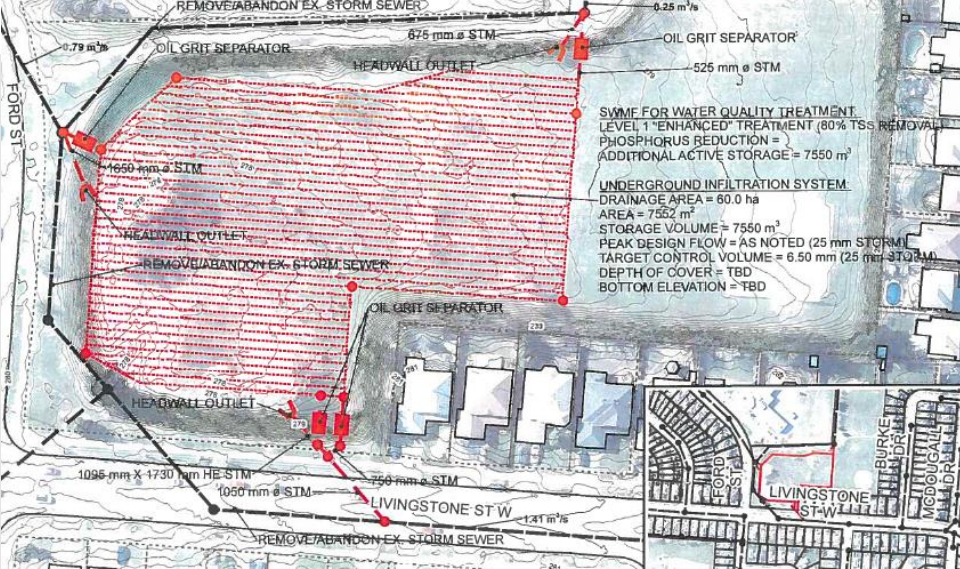
## New Ponds



Many areas of the City discharge directly into creeks without the benefits of treatment in a stormwater pond. There are some opportunities to construct new stormwater ponds.







# Centralized LID

## Opportunities

- Opportunities exist to implement bio-retention facilities and infiltration galleries within existing parkland, storm ponds, and at locations absent of any water quantity or quality controls.

## Parks

- Parks can be a good location for LIDs as after construction there would be no impact on the use of the park.

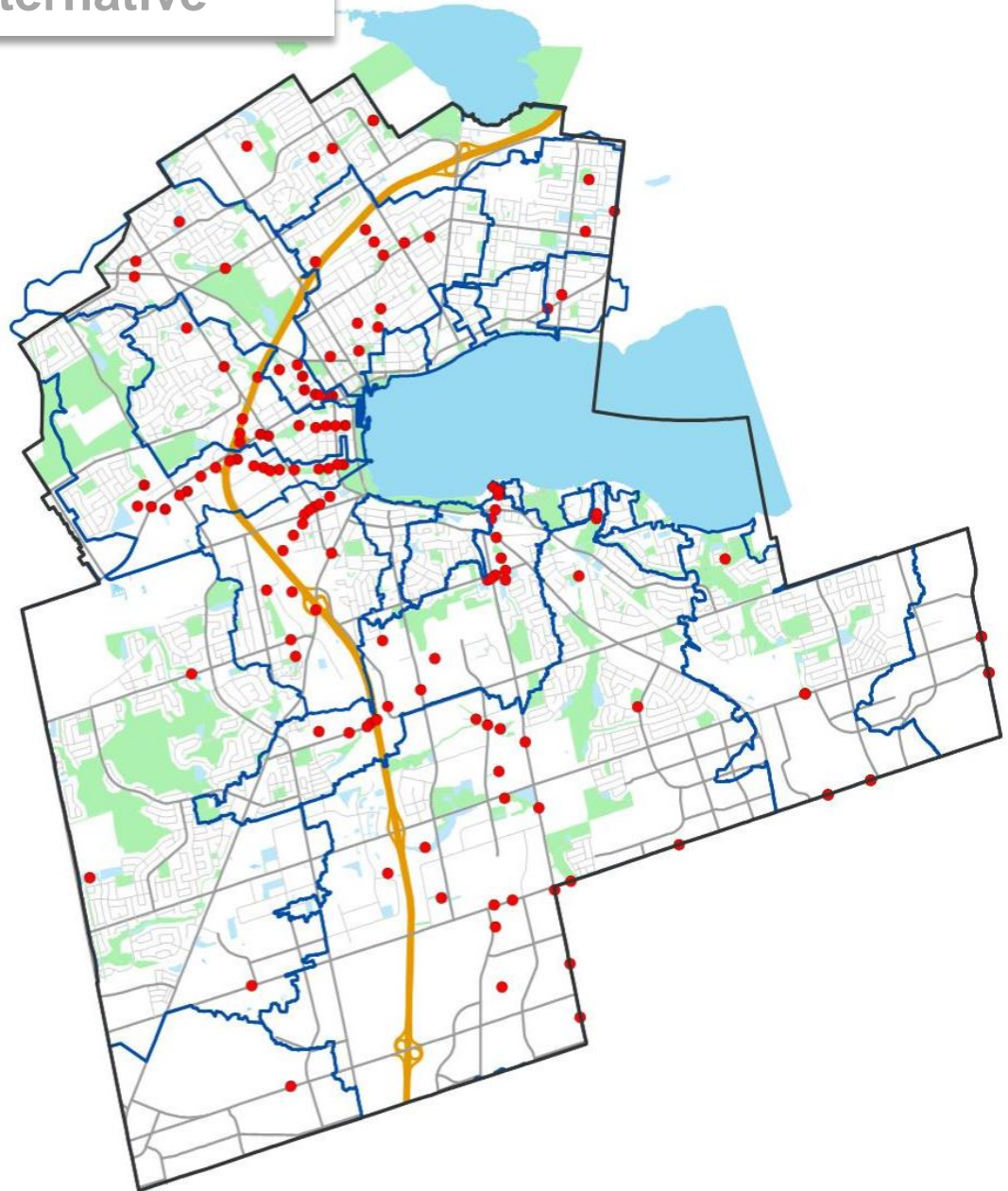
## Stormwater Ponds

- Some of the City's older stormwater management ponds could be retrofitted to include an LID component. In many cases, these ponds don't meet current design standards and the LID could be part of bringing them up to date.



## Preferred Alternative

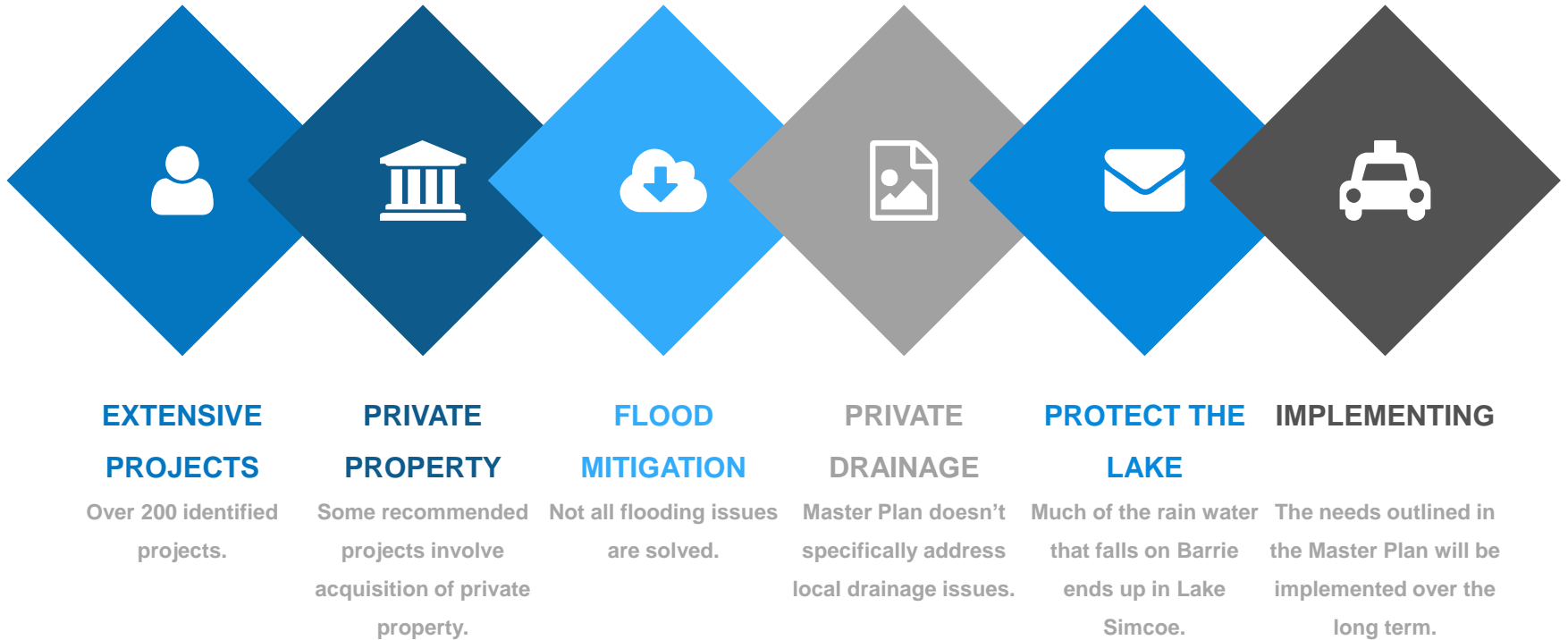
There are about 200 projects located across the City. There are a higher concentration of projects in older areas of the City.





# HIGHLIGHTS

Some key findings to be aware of



# Next Steps

## Within this Drainage Master Plan Project



### Finalize Draft Report

Consultant will summarize in a Master Plan report including costs and property requirements. Staff will bring this to General Committee and Council.



### Stakeholder Letters

Staff will be following up with stakeholders who are impacted by the projects or who have previously commented on the study.



### Notice of Completion

Once the study is endorsed by Council, a Notice of Completion will be filed in accordance with the requirements of a Municipal Class EA.

## After the Drainage Master Plan is Complete



### Input Into Other Activities

The City will use the Master Plan as input into the DC update, asset management plan, stormwater utility study and capital budget process.



### Further EA

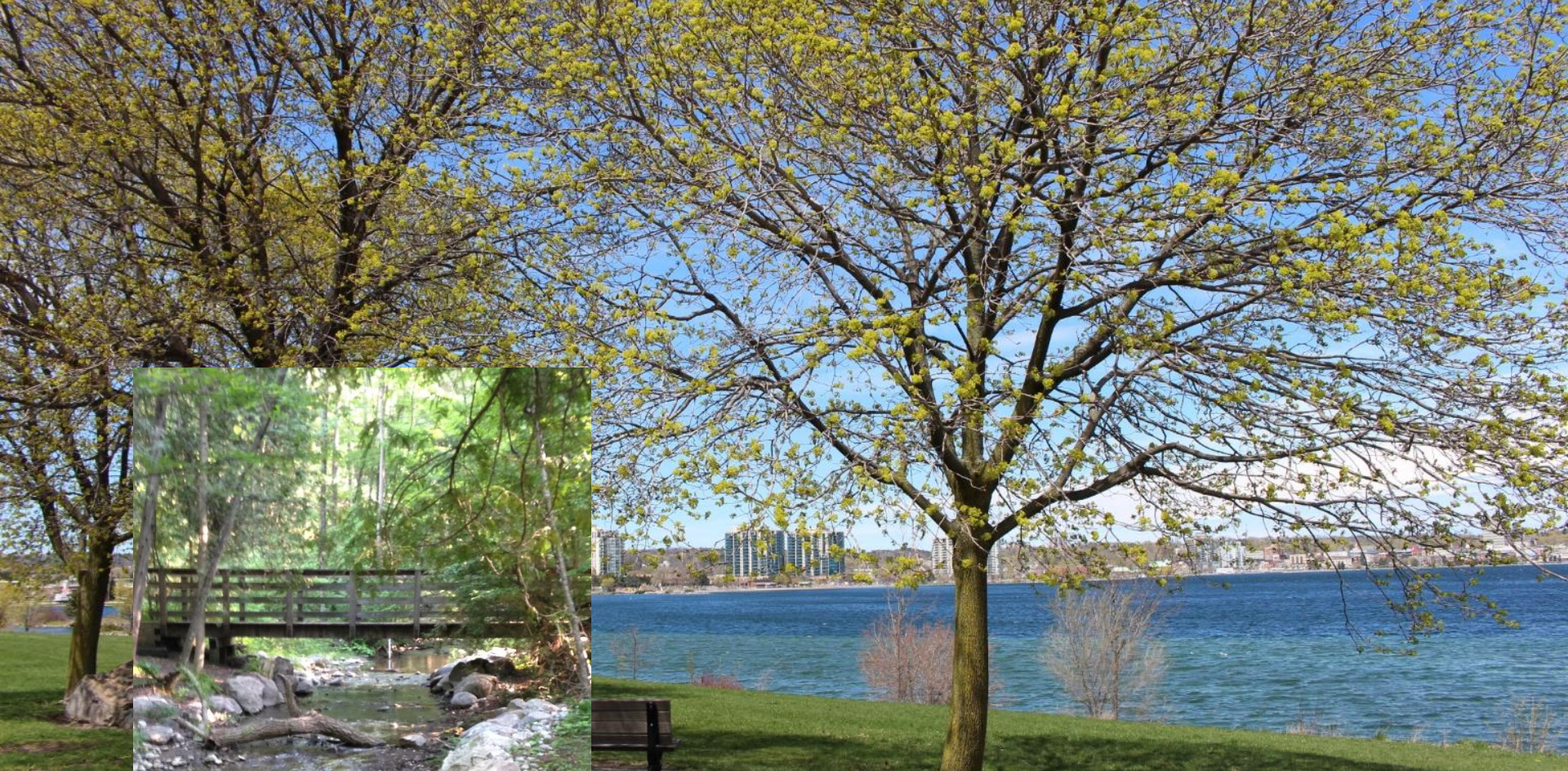
Some projects because of their complexity will require a further environmental assessment.



### Long Term Implementation

Stormwater management and drainage will be gradually improved as the City implements projects through the capital budget process.





Thank you