MASTER PLAN TIMELINES

Preliminary Background Review	March – May 2025
Initial Notice Published	May 2025
Identified Known Drainage Issues	May – June 2025
Review Input from Initial Consultation	July – September 2025
Identify Major Problem Areas	Fall 2025
Drainage Inventory and Mapping	Fall & Winter 2026
Preliminary Recommendations	Winter 2026
Public Open House	June 2026
Additional Public/Agency/FN Consultation	June – July 2026
Additional Engineering Review	July 2026
Finalize Master Plan	Summer 2026

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Data Collection

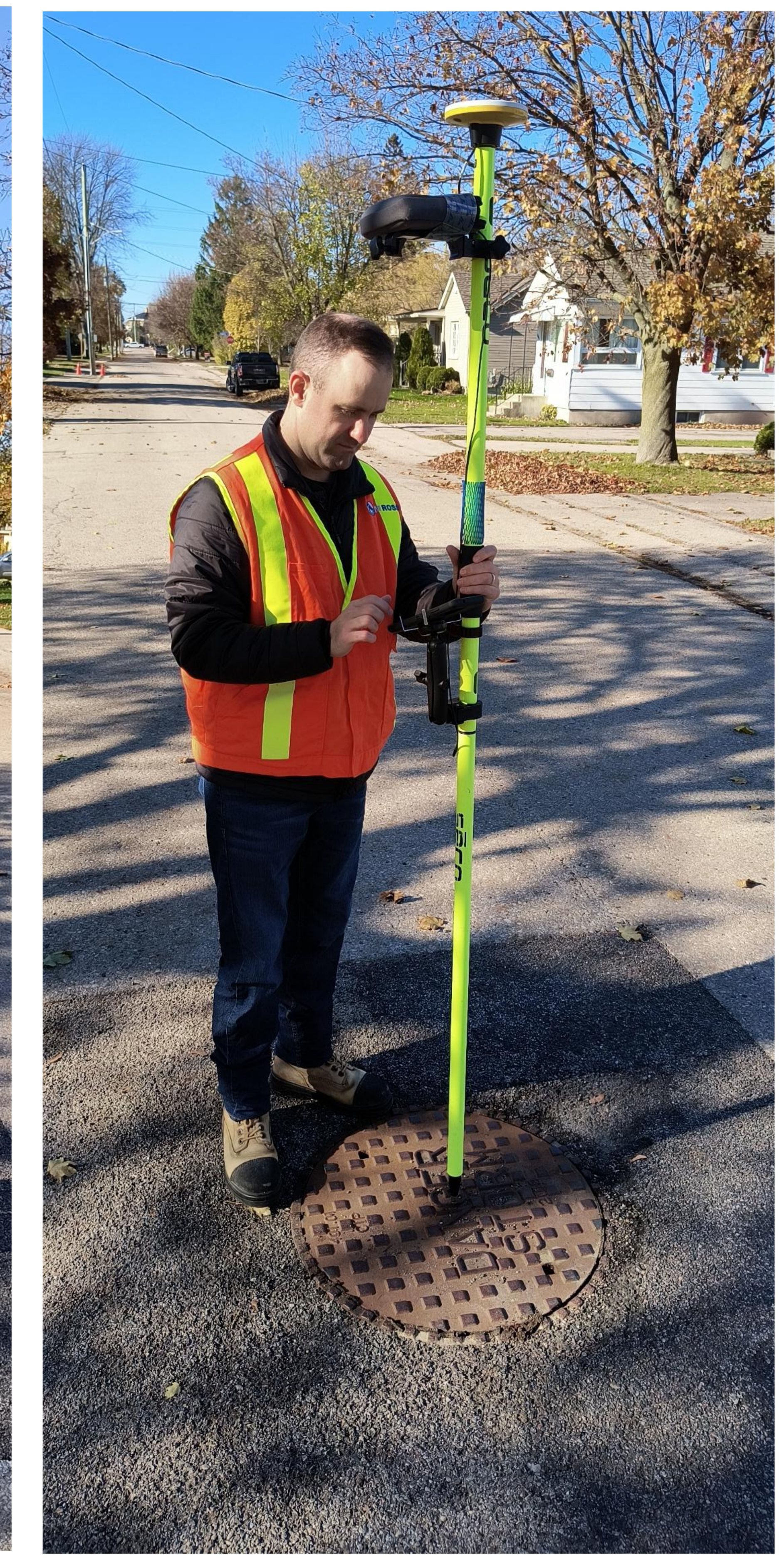
- To determine capacity of the existing water, sewage or stormwater systems, modeling of the network is required.
- To undertake the modeling, the existing infrastructure's size and location needs to be verified.
- Existing plans, as-built drawings and existing digital data is reviewed.
- Data gaps are identified and then field work is completed to fill the data gaps.
- A GPS Unit with accuracy to 1cm, is used in the field to collect pipe inverts.
- The data is recorded on an ArcGIS Online FieldMaps App.
- The GPS Unit records the pipe's location using x, y and z coordinates.

Technical staff collecting data

Remove maintenance hole lid

Pipe-Mic attachment to measure pipe dia.

Measuring pipe invert and diameter



Using Trimble Catalyst GPS to record lid

- Once the data is downloaded and all data gaps have been resolved, maps can be produced showing the location of existing infrastructure
- The information can also be used to model existing sewage, water and stormwater systems to determine their capacity
- Modeling data is used to identify areas needing to be upgraded or to determine appropriate sizing for future expansions.

Stormwater Modelling 1D

- Modelling was completed using PCSWMM with a Dual Drainage Network
- To determine the limits of a watershed, a Watershed Delineation Tool (WDT) from PCSWMM has been used, further subdivision and combinations was completed to accurately route stormwater
- Following a raindrop's flow path
    1. Subcatchments – Determine how much water makes it to the sewer and how much soaks into the ground using what is built on the ground, what type of soil, and how steep the surface is.
    2. First Drainage Network – Overland flow paths which include swales, ditches, roads and drainage easements
    3. Second Drainage Network – Underground storm sewer infrastructure. This is linked to the first drainage network by catchbasins and flow curves to ensure the balance of flow between the dual drainage network is accurate

Rainfall Data

- Historical rainfall is measured, and a statistical analysis is completed to generate Intensity-Duration-Frequency (IDF) curves for that area.
- Design Storm with a probability of occurring that year (1:2, 1:100, etc.) can be made.
- These Design Storms are used in the model to find and/or confirm problem areas and solutions
- Using Historical rainfall events and measured depths the model can be calibrated and checked for accuracy

Model components

- Subcatchments – Capture the rain in an area and route it to a junction to enter the model
- Junctions – Start and end of conduits (similar to maintenance holes)
- Conduits – Convey flow through the network (storm sewers, ditches, roads, etc.)
- Storages – Used to model areas that flood and will have standing water that backs up. (Stormwater management Ponds)
- Orifice, Outlets, & Wiers – Used to control flow through the model and connect the overland and underground drainage networks
- Outfalls – The outlet for the water for the model

1-Dimensional Modelling Limits

- 1 dimensional modeling is great for looking at areas with sewers and catchments that don't have larger surface water flooding.
- 2D modelling can be used to better model the limits of flooding in particular areas

Stormwater Modelling 2D

- Modelling was completed using PCSWMM 2D modelling
- To determine the limits of a watershed, the limits of the subcatchments from the 1D model used
- Following a raindrop's flow path
    1. Rain falls on the model mesh and routes water through the mesh to the lowest point
    2. Low points backup and spill occurs to the next lowest point
    3. Repeat the step until the flow gets to the outlet

Rainfall Data

- Historical rainfall is measured, and a statistical analysis is completed to generate Intensity-Duration-Frequency (IDF) curves for that area.
- Design Storm with a probability of occurring that year (1:2, 1:100, etc.) can be made.
- These Design Storms are used in the model to find and/or confirm problem areas and solutions
- Using Historical rainfall events and measured depths the model can be calibrated and checked for accuracy

Model components

- Model Mesh Network made of nominally spaced junctions and conduits draped over the existing ground data for Overland Flow
- Connections to storm sewers and culverts
- Same sewer components as 1D models

Why 2D modeling

- For complex overland watersheds, it is the best way to model the limits of flooding and flow routes

2-Dimensional Modelling Limits

- Similar assumptions to 1D modelling are to made
- Very computationally expensive

  (It takes a very long time)

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