South Huron Water and Wastewater Master Plan

October 15, 2024
South Huron Committee of the Whole
322 Main Street South, Exeter ON

What is Driving the South Huron Water and Wastewater Master Plan?

Responsible Management

- Essential to Revisit Needs Periodically
- Support Other Needs (Capital Program, Utility Rates, Development Charges, Etc.)
- Long-Term Plan for a Water Distribution System is a Regulatory Requirement (DWQMS) to Own/ Operate a Drinking Water System

Planning for Buildout

- Support Responsible Development
- Supply and Treatment Capacity
- Flexibility in Servicing Strategy

Capital Program Development

- Coordination and Consolidation of Renewal and Growth Needs
- Long-Term Visioning of System Needs

Capital Program Development

- Understanding of Servicing Impacts and Costs
- Capital Forecast to Service Existing and Support Future Growth

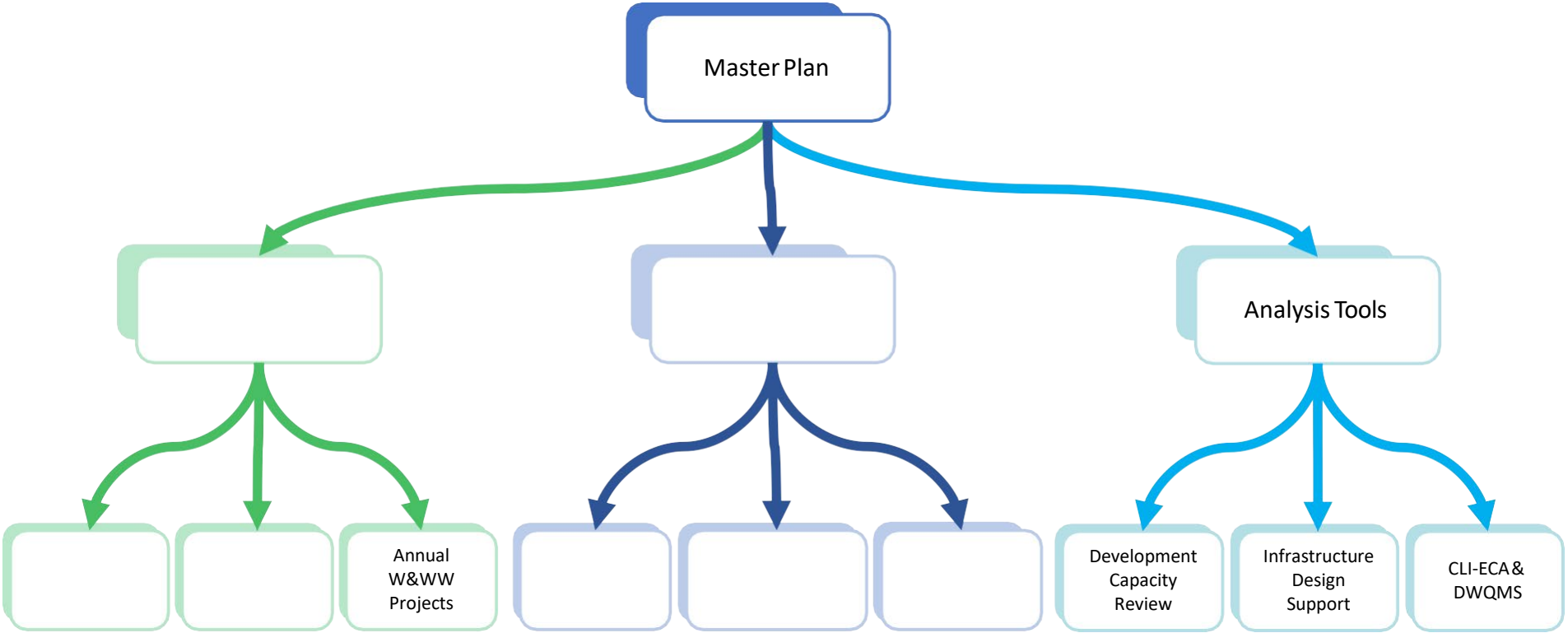
South Huron Water and Wastewater Master Plan Objectives

- Review potential residential and employment redevelopment and growth impacts on servicing needs (including allowances for future expansion of the existing settlement area boundaries);
- Review and integrate the system renewal and replacement needs;
- Evaluate the ability of existing systems and planned upgrades to efficiently and effectively service the existing users and potential growth;
- Re-evaluate long-term and water supply and wastewater treatment capacities and needs;
- Develop servicing solutions that include flexibility and economic efficiency; and,
- Update the long-term financial planning; including identification of growth tigered projects, to be used as basis for future Infrastructure management Decisions.

Master Servicing Plan Deliverables

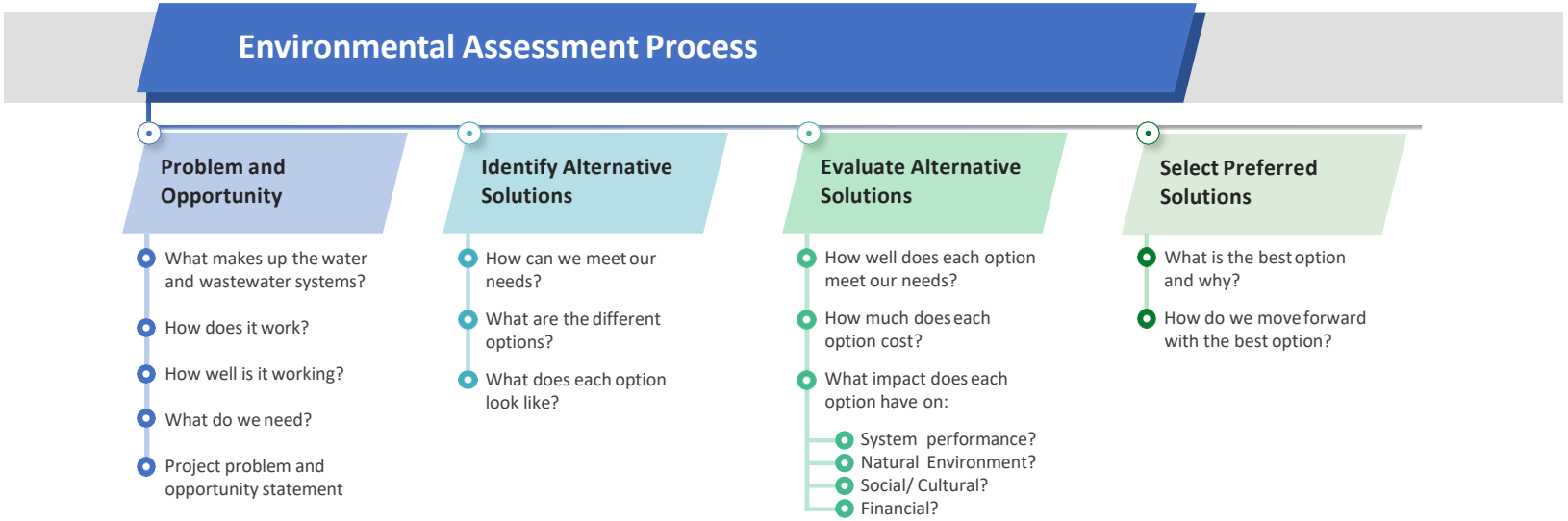
- Water and Wastewater System Design Criteria and Hydraulic Performance Criteria Review
- Baseline Inventory of the Existing Water and Wastewater System (Capacity, Condition, and Performance)
- Improved Analysis and Assessment Tools (Hydraulic models and Capacity Tables)
- Clear Long-term vision for maintenance and expansion of the Water and Wastewater Systems
- System Operational and Militances Program Recommendations
- Identification of Short and Long-Term system upgrade needs (Justification, and Trigger)
- Short and Long-Term capital program and financial costs

Leveraging the Master Plan Recommendations



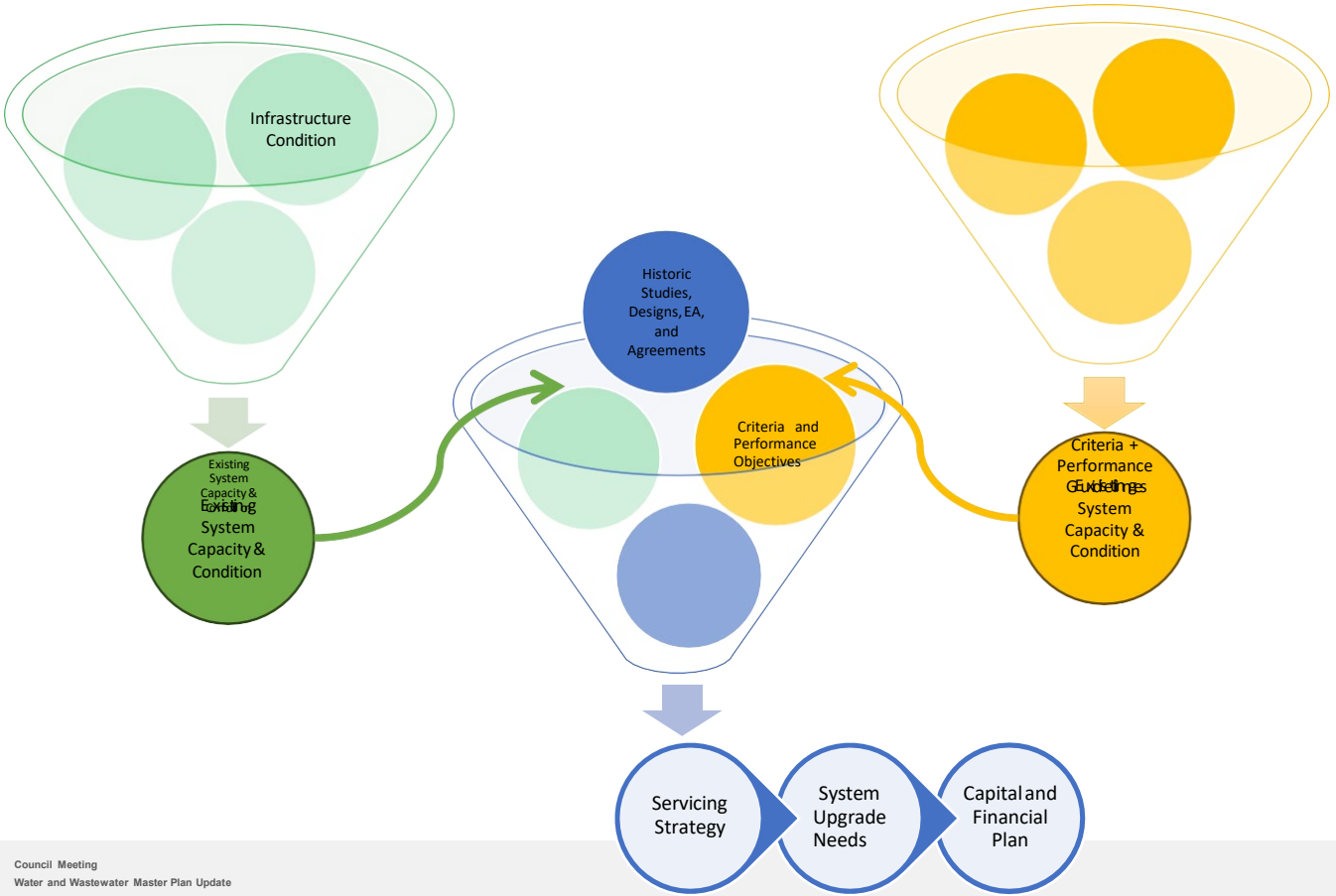
Municipal Class Environmental Assessment Process

The South Huron Water and Wastewater Master Servicing Plan involves the completion of Phases 1 and 2 of the MEA Municipal Class EA process.



The study follows the Master Plan process as outlined in Section A.2.7 of the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (Oct 2000, as amended in 2007, 2011 and 2015).

Master Servicing Plan Capital Program Development Process



Evaluation Methodology

Criteria Scoring and Selection

For each individual project, the evaluation of each criteria will be completed using the following ranking approach:

- "High" Solution generates beneficial impacts and/or has no substantial technical challenges
- "Medium" Solution to a mix of positive and negative elements with some impacts
- "Low" Solution presents permanent negative impacts and/or presents significant technical challenges

Selection will be guided by the **Reasoned Argument Approach**

- Clear and thorough rationale of the tradeoffs among the various criteria
- Highlights the reasons why one alternative is the best alternative

Environmental Factors

- Protects environmental features.
- Protects wildlife and species-at-risk.
- Minimizes climate change impacts.

Financial Viability

- Capital and life-cycle costs.
- Operation and maintenance costs.

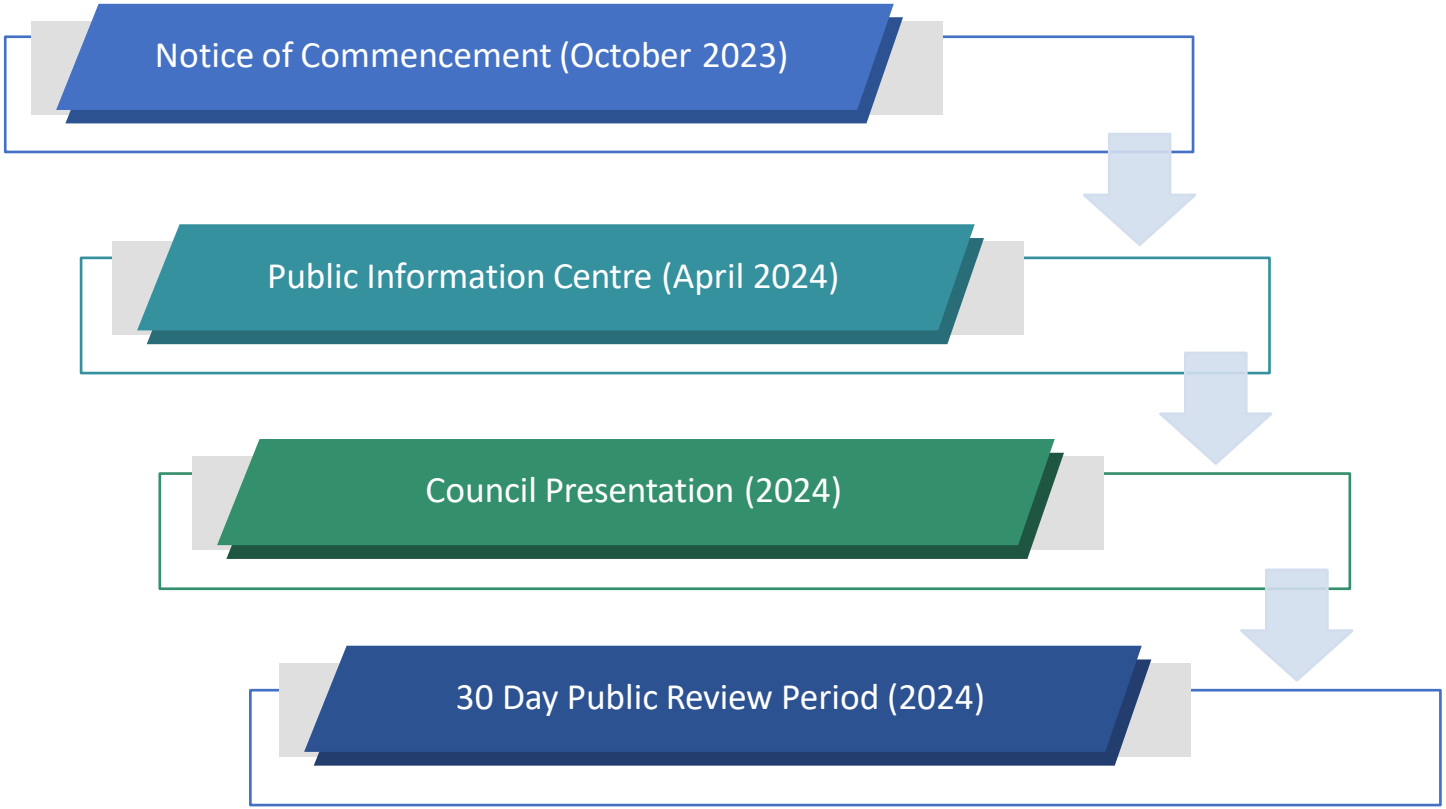
Technical Factors

- Meets existing and future servicing needs.
- Supports phased expansion of the system.
- Provides a reliable service.
- Minimizes and manages construction risk.
- Aligns with approval and permitting process.
- Ability to adapt to climate change.

Social and Cultural Factors

- Protects resident quality of life.
- Manages and minimizes construction impacts.
- Protects cultural heritage features.
- Protects archaeological features.

Public Consultation



Planning for Growth

Growth Uncertainty

- Location of growth – What infrastructure is needed?
- Rate of growth – When is infrastructure needed?
- Servicing outside existing Settlement Area Boundaries

Draft Plans and Concepts

- Where available approved draft plans or Developer's concept plans were used to project growth

Remaining Development Lands

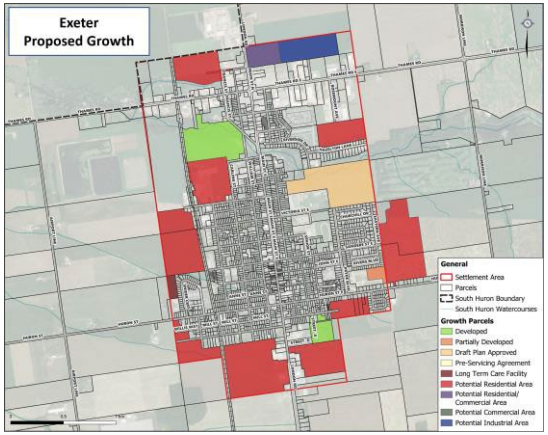
- For potential development lands, growth has been projected based on:
  - Where development units were known: 2.3 people per unit
  - Where units were unknown: 40 people per hectare

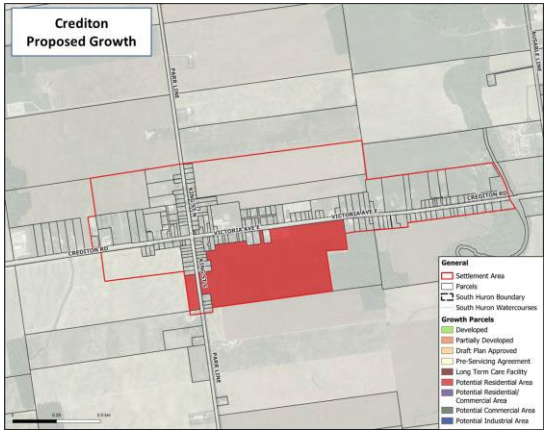
South Huron Master Servicing Plan Focuses on Buildout Potential

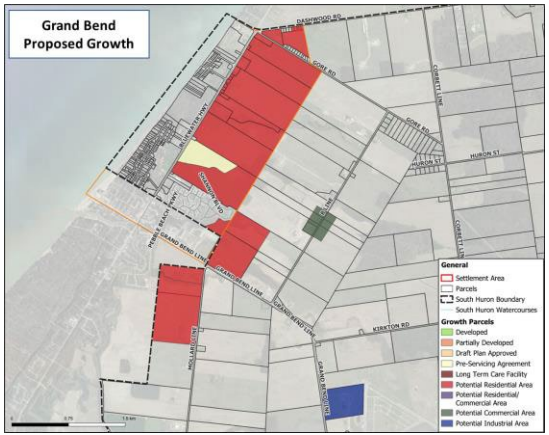
- Clarity in long-term needs
- Flexibility to respond to changes
- Helps to guide and manage growth

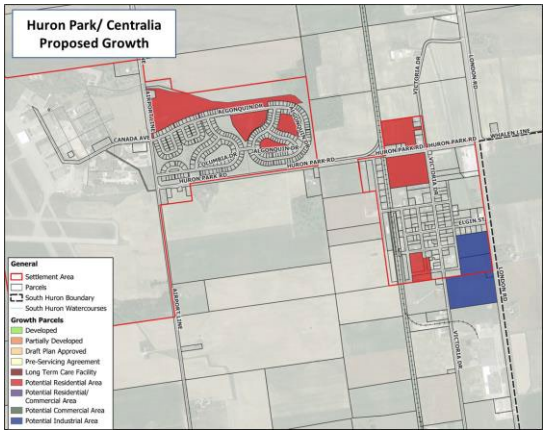
Location	Area (ha)	Units	Potential Population
Centralia	33.6	13	1,236
Exeter	180.7	1,620	6,181
Grand Bend	317.5	2,105	6,684
Crediton	42.3	345	1,091
Huron Park	16.3	146	445
Total	**590.5**	**4,229**	**15,639**

Planning for Growth









Existing Water System

Supply

- Water supply originates from Lake Huron and is treated at the Lake Huron Primary Water Supply System (LHPWSS). The LHPWSS delivers water to five connection points in the Municipality's water system which typically divide the pressure zones

Pressure Zones

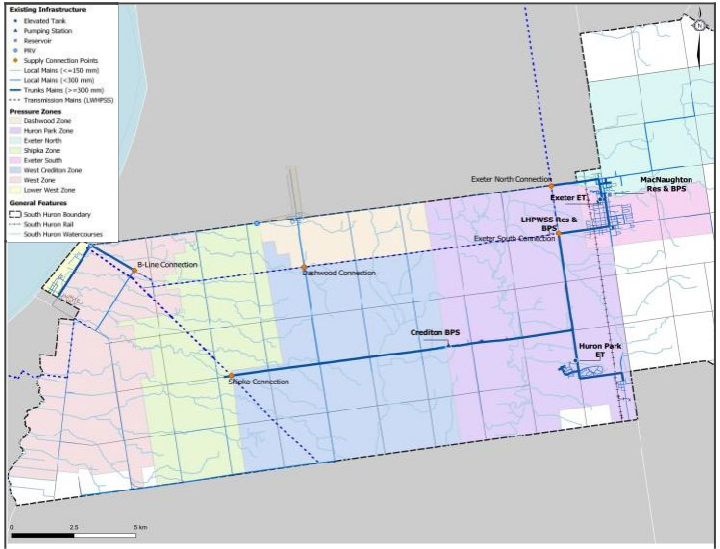
- Eight (8) Pressure Zones
- Boundaries typically consist of closed valves and pipes, and pressure reducing valves to decrease the pressure to the acceptance range of level of service

Storage

- Two (2) Elevated Tanks (ET); Huron Park ET, Exeter ET, and one (1) Reservoir (Res); MacNaughton Res operated by the Municipality
- One (1) Reservoir; Airport Line and Huron Street Res owned and operated by the LHPWSS

Pumping

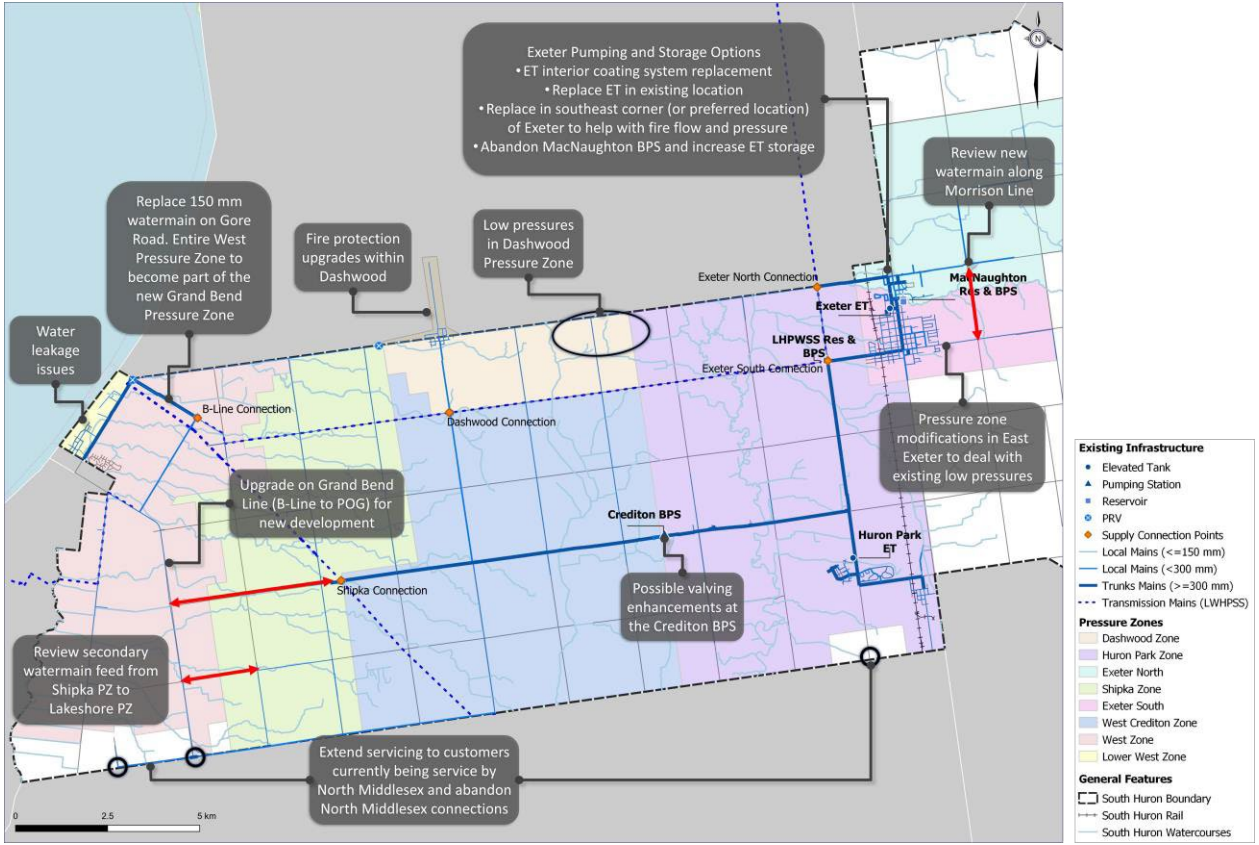
- Two (2) Booster Pumping Station (BPS); Crediton BPS and MacNaughton BPS



South Huron Existing Average Day Demands (L/s)

Pressure Zone	Existing	Existing + Growth
Lower West & West	12.6	36.1
Shipka	1.7	1.7
Dashwood	4.0	4.0
West Crediton	0.9	4.7
Huron Park	5.5	11.9
Exeter South	11.3	26.7
Exeter North	8.9	15.2
Total	**44.9**	**100.2**

Water System Opportunities and Constraints



Water Servicing – Capital Program

Preferred Water Capital Program - Stephen

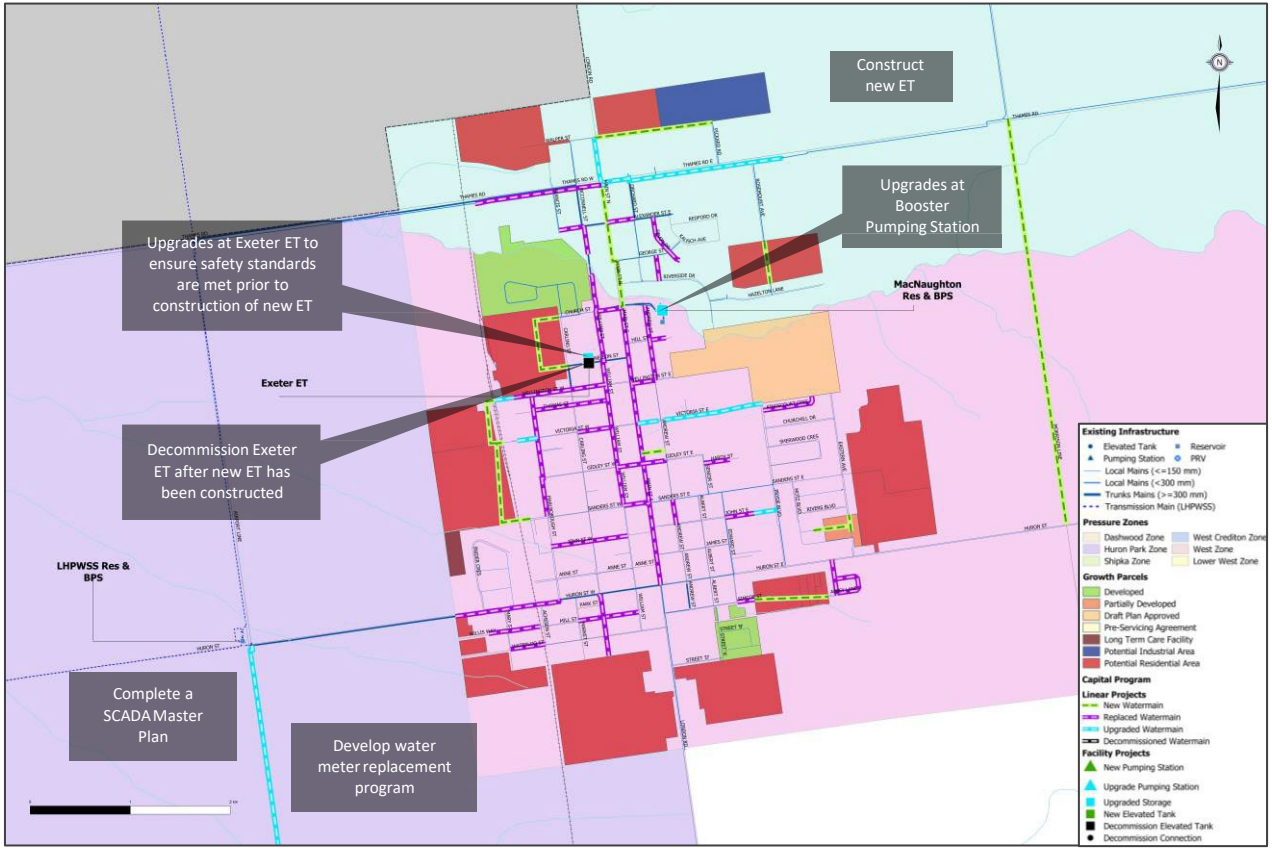
- Moderate alterations to the existing pressure zones to improve system pressures and operations
- Increase system resiliency and water transfer in by installing a new watermain along South Road between Corbett Line and Grand Bend Line
- Investigation of the Airport Line watermain to determine existing condition and cause for frequent breaks
- Ensure logical watermain looping occurs in line with development area to address fire flow deficiencies
- Upsize conveyance watermain to Dashwood to achieve fire flow requirements
- Extend servicing to customers currently serviced by North Middlesex and abandon current North Middlesex connections
- Targeted Non Revenue Water (NRW) reduction program including:
  - Implement boundary water metering program of private and semi-private water systems
  - Leak detection program for watermains Water Metering Program in select areas

Preferred Water Capital Program - Exeter

- Align growth strategy and watermain looping with the ongoing road reconstruction projects to improve fire flows for existing and growth demand
- Install a new ET in North Exeter and operating Exeter as one Pressure Zone at a higher HGL
- New trunk watermain along Morrison Line from North Exeter to southeast Exeter for additional system flexibility and looping and improved pressures

Capital Project	Exeter Project Costs	Stephen Project Costs	Total Project Costs
Linear Projects	$ 42,220,000	$ 105,021,000	$ 147,241,000
Facility Projects	$ 13,981,000	$ 500,000	$ 14,481,000
Studies	$ 560,000	$ 850,000	$ 1,410,000
Total Water Capital Project Costs	**$ 56,761,000**	**$ 106,371,000**	**$ 163,132,000**

Water Servicing – Capital Program (Exeter)



Water Servicing – Capital Program (Stephen)

Water Servicing – Capital Program (Huron Park, Centralia, and Crediton)

Existing Wastewater System

Exeter Wastewater Treatment Facility (WWTF)

- The Exeter WWTF is a sewage lagoon that services the Town of Exeter, and villages of Crediton, Huron Park and Centralia

Exeter Sanitary Pumping Stations (SPS)

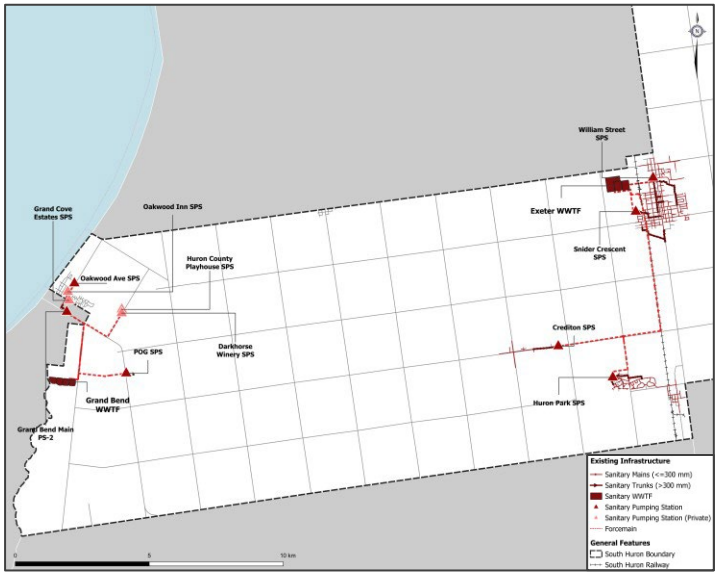
- Four (4) Sanitary Pumping Stations (SPS); William Street SPS and Snider Crescent SPS in Exeter, Crediton SPS and Huron Park SPS that all pump wastewater to the Exeter WWTF

Grand Bend Wastewater Treatment Facility

- The Grand Bend WWTF is a mechanical treatment plant
- Jointly owned and administered by Lambton Shores and operated by Jacobs Engineering Group
- South Huron is allocated 35.7% of the plant capacity

Grand Bend Sanitary Pumping Stations

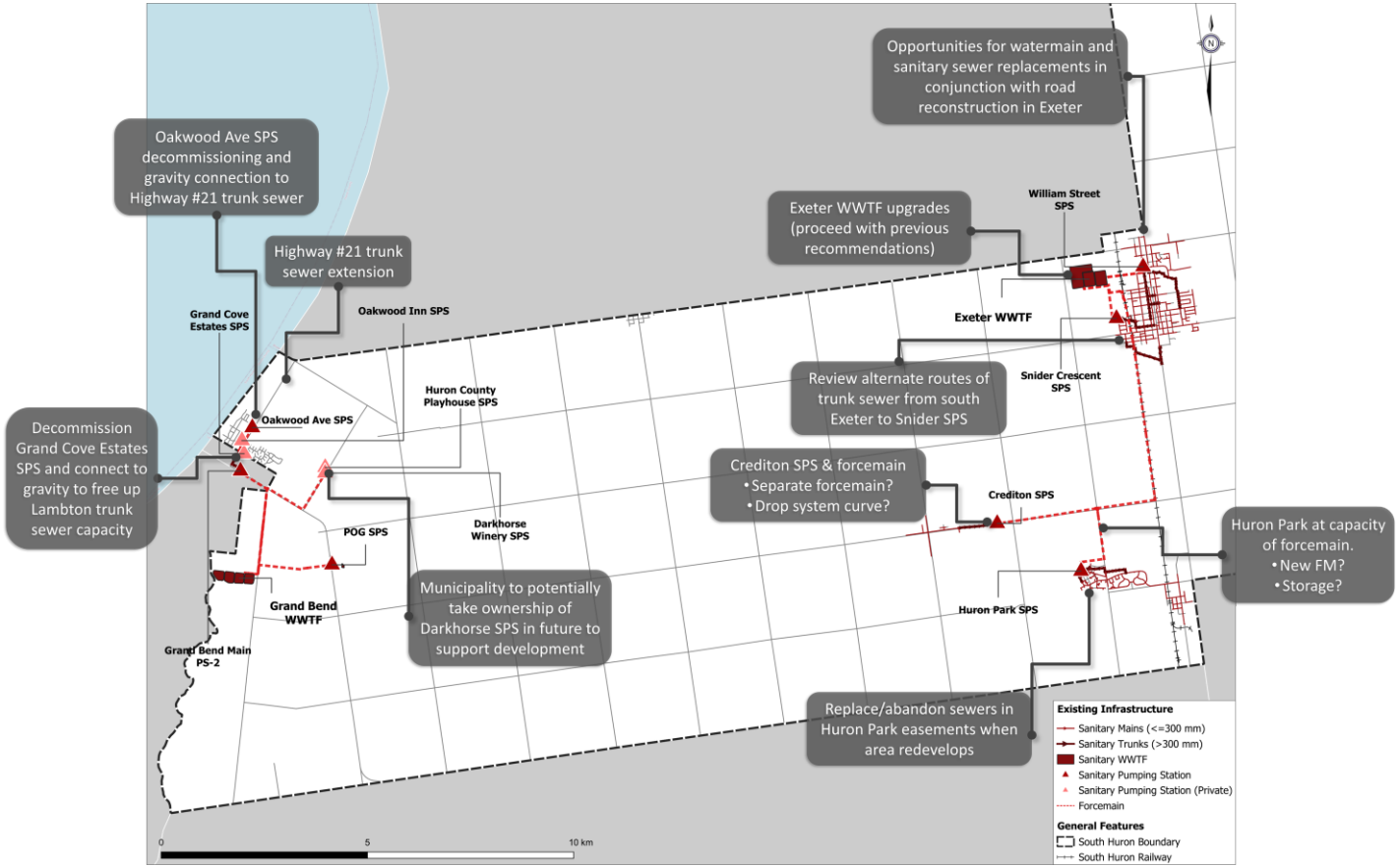
- Three (3) Municipal owned SPS; Oakwood Area SPS, POG SPS, and Grand Bend Main PS-2
- Grand Bend Main PS-2 is jointly owned with the Municipality of Lambton Shores. South Huron is allocated 50% of station capacity
- Four (4) Privately owned SPS; Oakwood Inn SPS, Darkhorse Winery SPS, Huron County Playhouse SPS and Grand Cove Estates SPS
- All SPS outlet at the Grand Bend WWTF



South Huron Existing Average Day Wea ther Flows (L/s)

WWTF	SPS	Existing	Existing + Growth
Exeter	William Street SPS	10.3	20.7
	Snider Crescent SPS	6.4	13.4
	Crediton SPS	9.1	12.2
	Huron Park SPS	3.6	9.0
Exeter WWTF Total		**36.8**	**62.8**
Grand Bend	Grand Bend Main PS2	8.6	25.2
	POG SPS	No existing data	2.4
Grand Bend WWTF Total		**8.6**	**27.5**

Wastewater Opportunities and Constraints



Wastewater Servicing – Capital Program

Preferred Wastewater Capital Program - Exeter

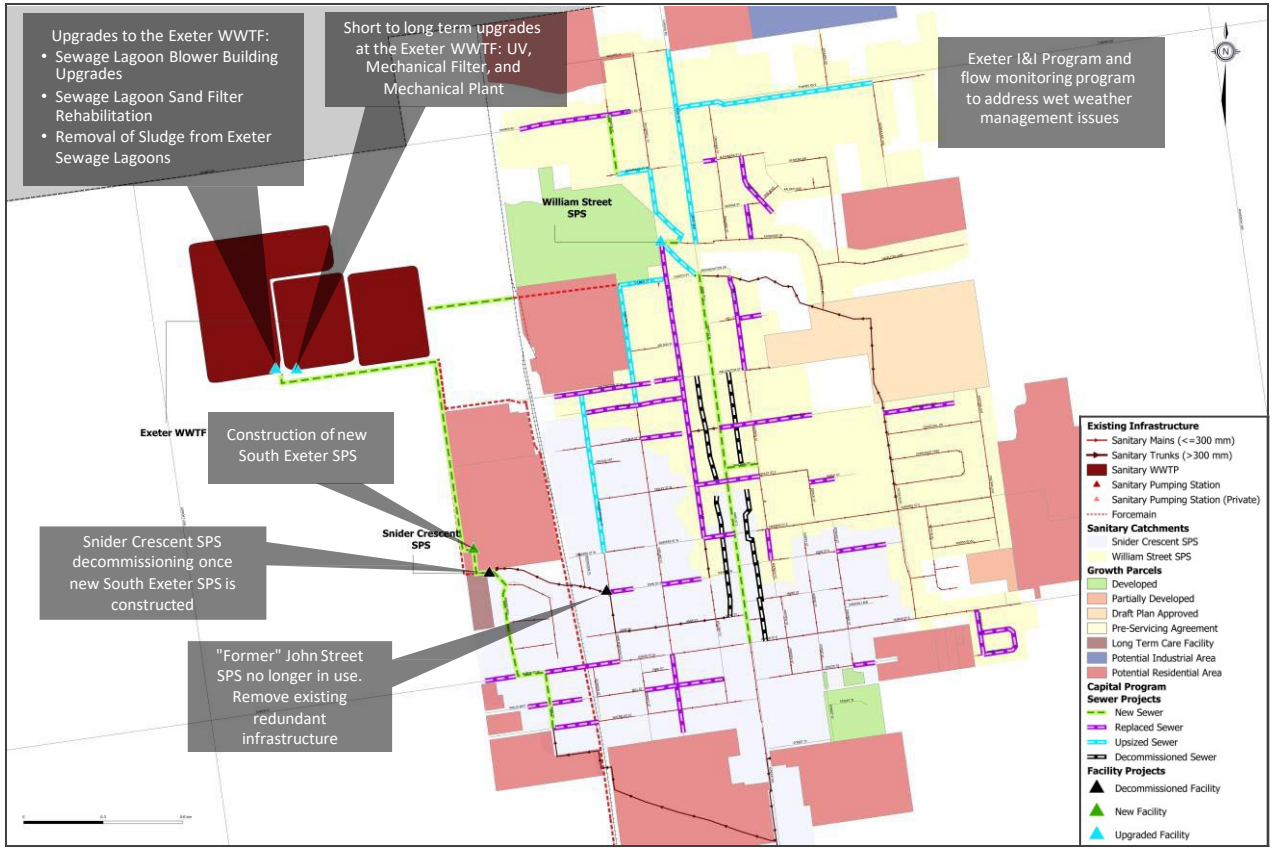
- Continued upgrades at the Exeter WWTF in line with the long-term strategy and as triggered by capacity and effluent criteria
- New South Exeter SPS and forcemain to service proposed growth and consolidate existing Snider Crescent SPS flow
- Upsize sewer from Waterloo Street to the Snider Crescent SPS to accommodate existing and growth flows in south Exeter
- Implementing an I&I Reduction program to address existing high peak wet weather flows
- Upgrade sewers in line with planned road reconstruction projects
- New trunk sewer along Main Street with services from all buildings fronting Main Street to allow for decommissioning of back-alley sewers

Preferred Wastewater Capital Program - Stephen

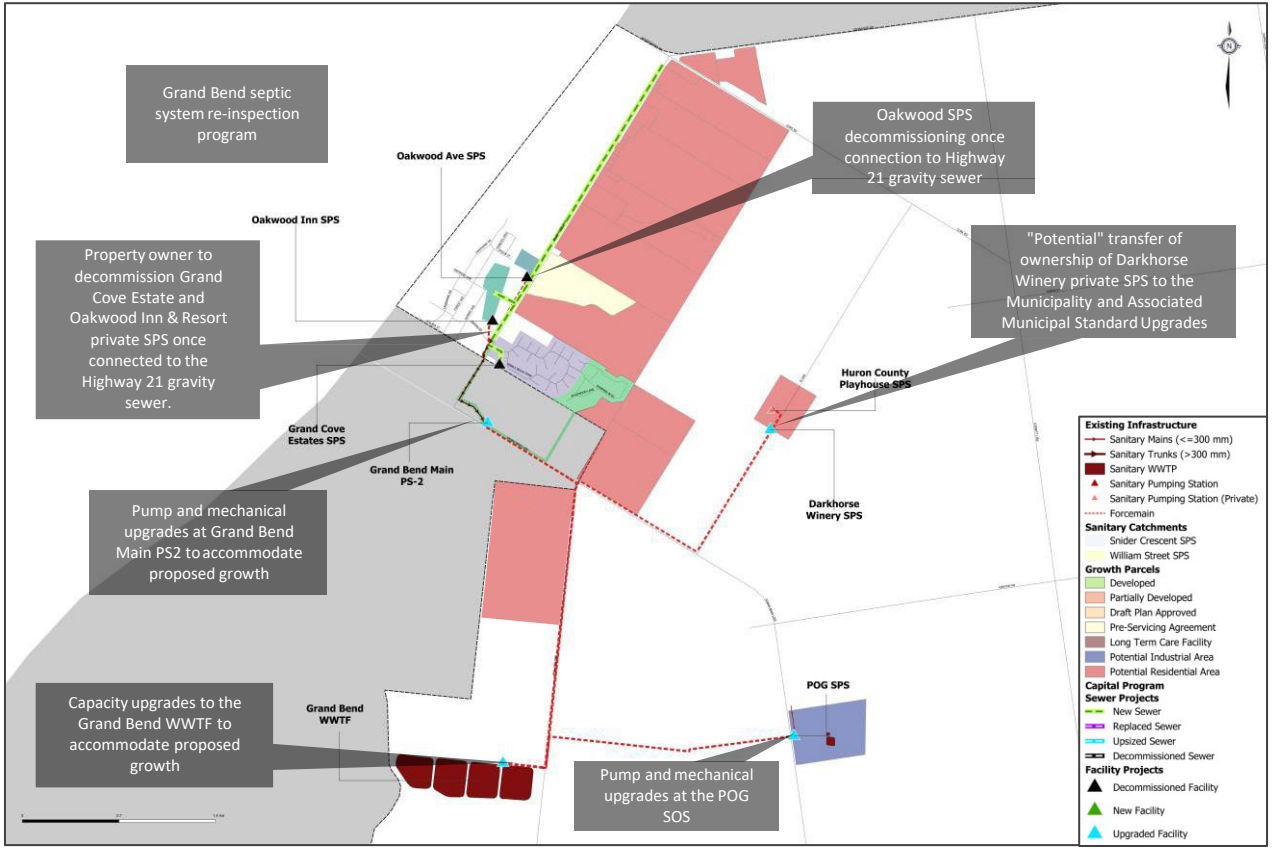
- Extending the trunk sewer along Highway #21 to service development in Grand Bend
- Decommissioning private sanitary pumping stations and connecting to the existing gravity network along Highway #21
- Implementing an I&I Reduction program in Huron Park to address existing high peak wet weather flows

Capital Project	Exeter Project Costs	Stephen Project Costs	Total Project Costs
Linear Projects	$ 36,150,000	$ 12,298,000	$ 48,448,000
Facility Projects	$ 50,114,000	$ 13,160,000	$ 63,274,000
I/I Reduction Program	$ 6,235,000	$ 847,000	$ 7,082,000
Total Wastewater Capital Project Costs	**$ 92,499,000**	**$ 26,305,000**	**$ 118,804,000**

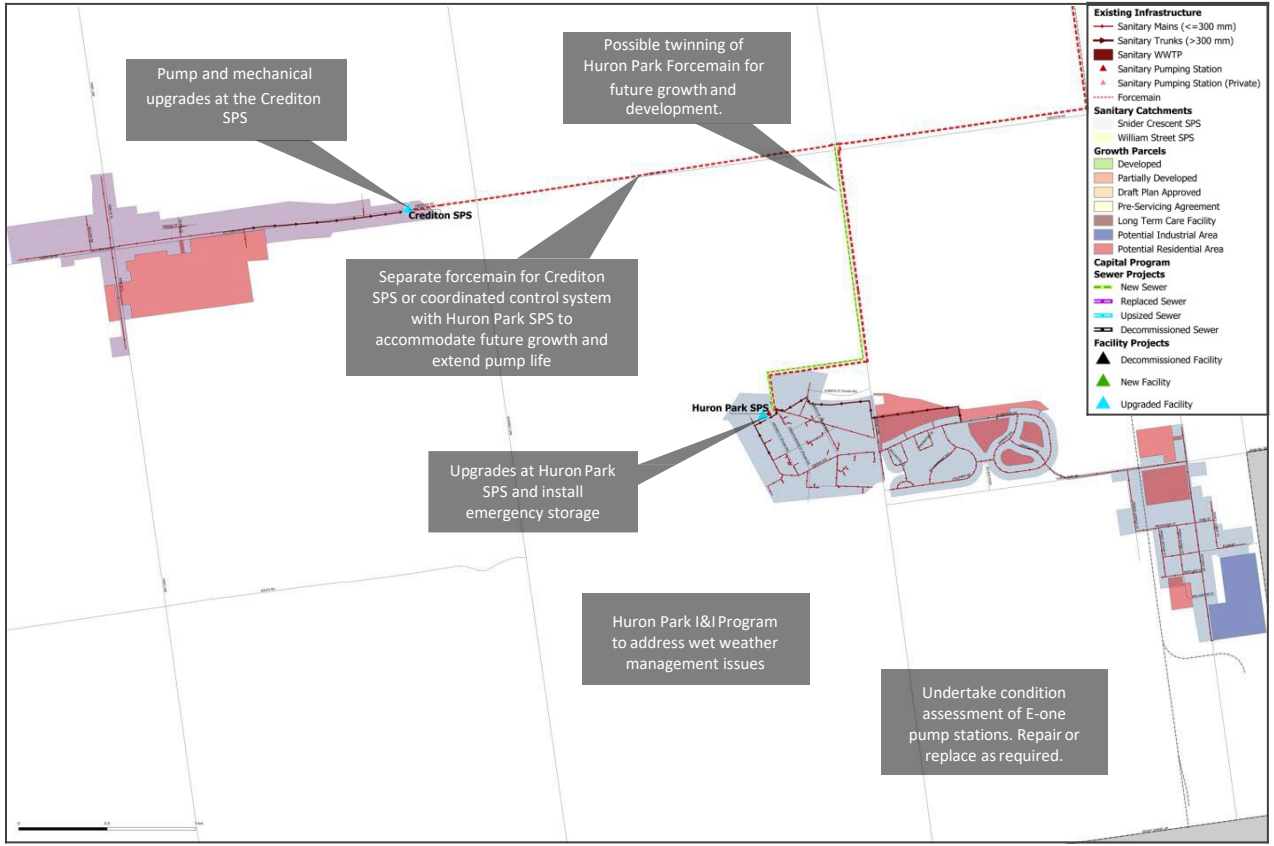
Wastewater Servicing – Capital Program (Exeter)



Wastewater Servicing – Capital Program (Grand Bend)



Wastewater Servicing – Capital Program (Huron Park, Centralia, and Crediton)



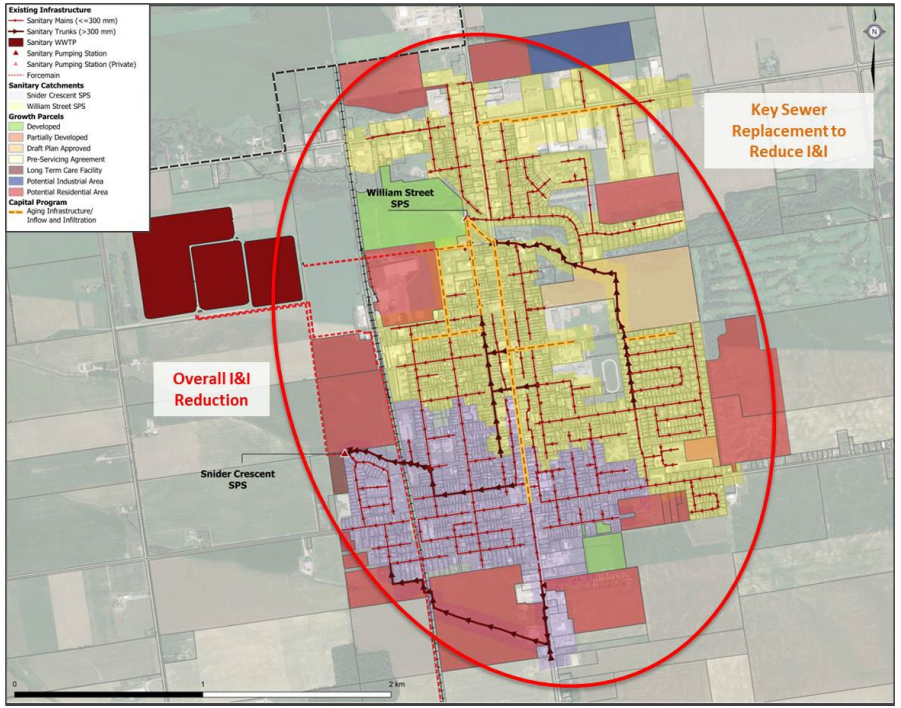
Wastewater Servicing – Wet Weather Management

Wet Weather Management Program

- Recommended to address areas of high inflow and infiltration (I&I) that result system capacity restrictions or basement flooding risk
- Is intended to deal with existing capacity constraints, and to provide growth-related capacity without expanding/upgrading existing infrastructure, or by minimizing the required expansion/upgrade
- Provides a proactive and targeted approach to addressing wet weather impacts

Reduction in Exeter and Huron Park Systems

- I&I reduction is required for the Municipality F-5-1 requirements for nominally separated sewer systems that does not allow for system overflows under typical annual precipitation conditions
- Reduction program, in combination with the identify sewer and SPS upgrades are required to achieving a net reduction in system overflows and longer-term objective of eliminating overflows
- As there are existing system overflows, there should be a short-term objective of removing wet weather flows at a rate equal to or greater than new development flows



Questions!

Thank You

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