LAWSS Master Plan Update

Municipal Class Environmental Assessment Study (MCEA)

Public Information Centre 2

LAWSS
Lambton Area Water Supply System

CIMA+

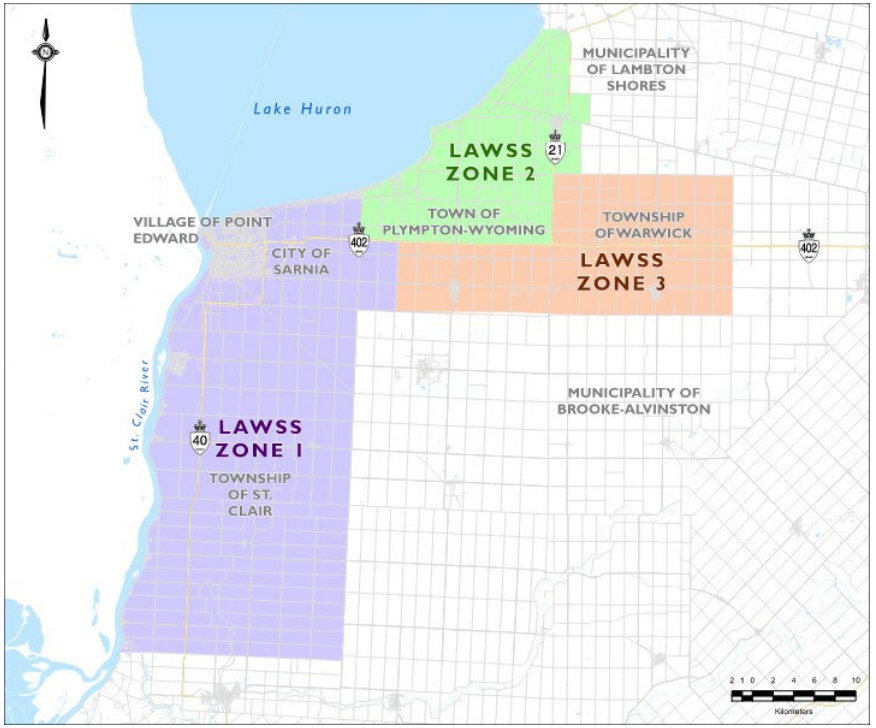
Lambton Area Water Supply System

The Lambton Area Water Supply System (LAWSS) supplies water to over 100,000 customers within three supply zones and is owned by six member municipalities:

- City of Sarnia
- St. Clair Township
- Town of Plympton-Wyoming
- Municipality of Lambton Shores
- Township of Warwick
- Village of Point Edward

LAWSS also supplies Brooke-Alvinston and has emergency connections to Petrolia and Chatham-Kent.

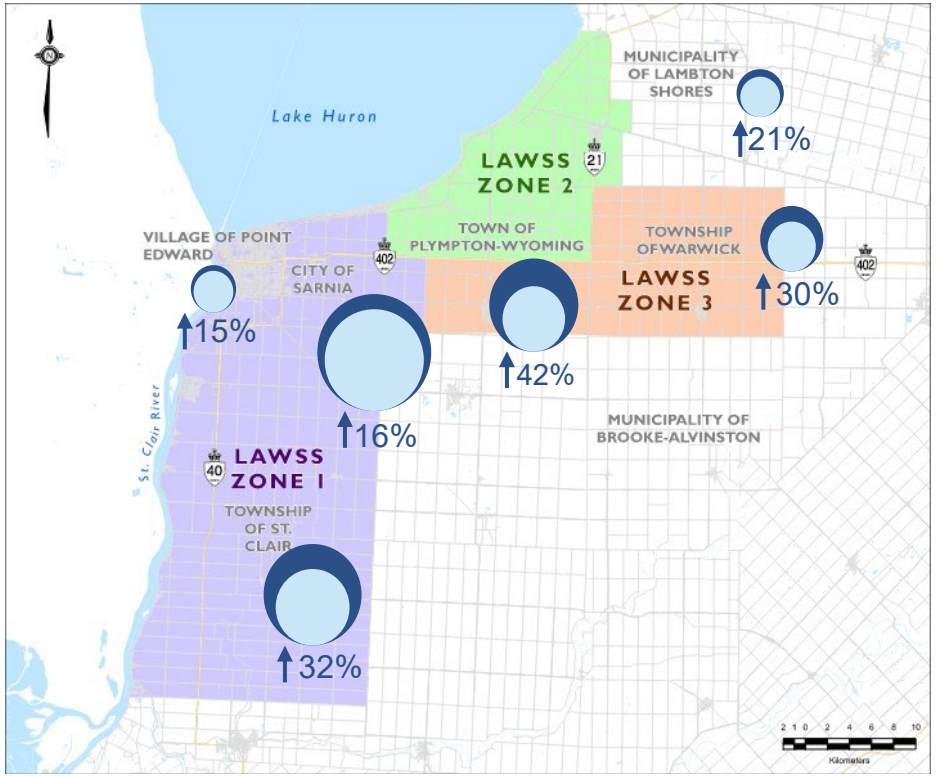
LAWSS is reviewing and updating its 2021 Master Plan with a 20-year planning horizon (2026–2046).



LAWSS Service Area

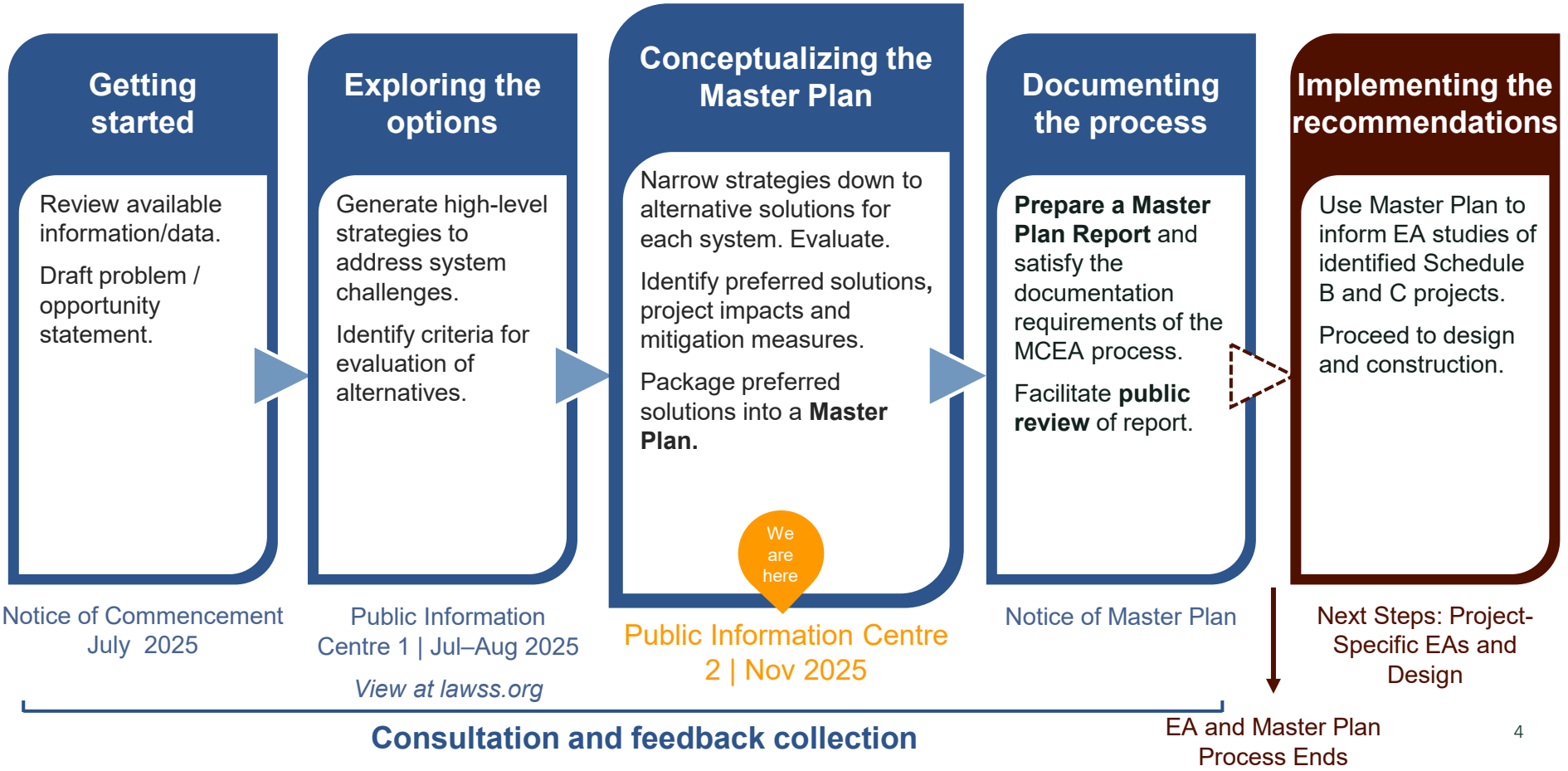
Projected Growth in LAWSS Service Area

- Population growth has accelerated in much of Lambton County since the 2021 Master Plan and will likely continue
- Possibility of new customer and increased customer demands
  - Chippewas of Kettle and Stony Point First Nation connection
  - Increased demands in Brooke-Alvinston



Projected growth by municipality (2024–2046)

Municipal Class EA Process - Master Plans



Objectives

Main objectives of this MCEA:

1. Carry out meaningful consultation with the public and other interested parties, then apply feedback in Master Plan development
2. Satisfy requirements for MCEA Approach #1 for Master Plans

   → Identify high-level potential impacts of the LAWSS Master Plan projects to inform future project-specific EA studies

This virtual Public Information Centre (PIC) presents:

- Updates on planned upgrades
- Servicing challenges and alternative solutions identified in this EA study
- Evaluation of alternative solutions
- Preliminary preferred solutions and phasing plans

We want to hear from you

- Current or future water service concerns?
- Input on the proposed solution alternatives?
- Additional solutions or evaluation criteria that should be considered?

View the virtual PIC online starting on November 20th. Access at the LAWSS website.

Email us your feedback by December 19th. Please include your address or postal code.

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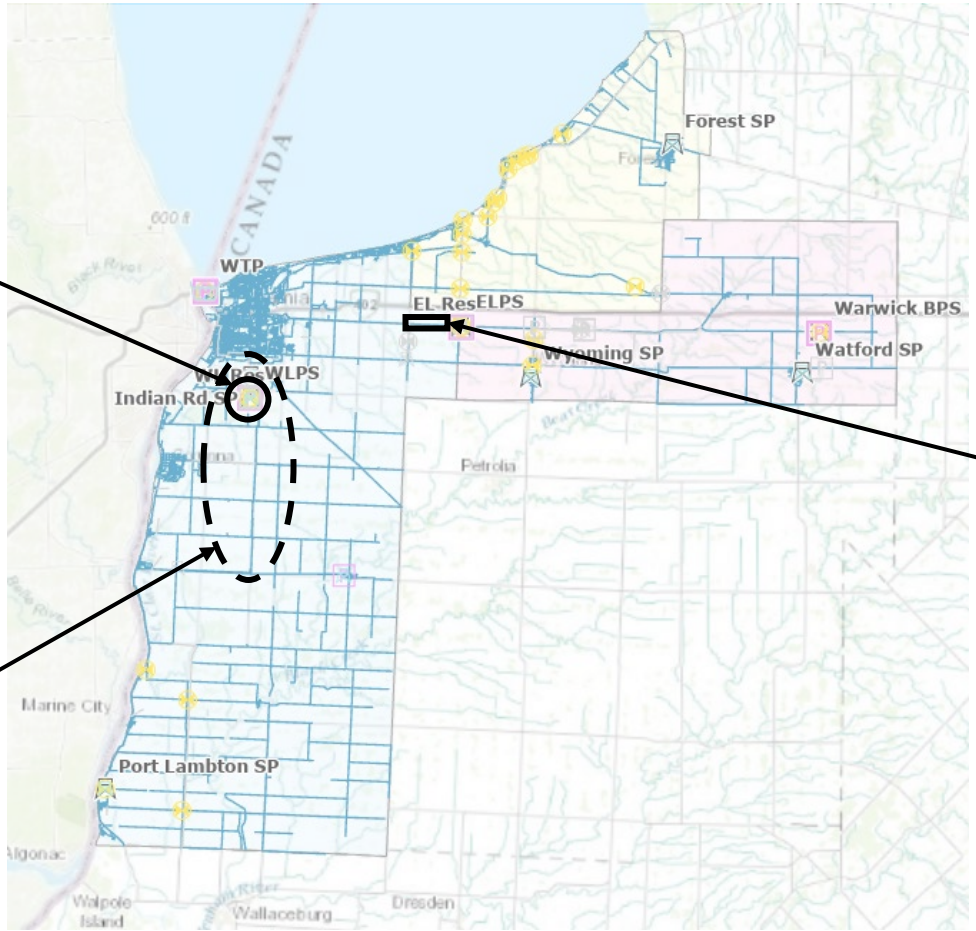
To request access to PIC materials in a different format, please contact LAWSS at (519) 344-7429 or by email.

Planned Upgrades

Upgrades at West Lambton Pump Station (WLPS)



Grid Reinforcement and Twinning

East Lambton Booster Station (ELBS) Fill Constraints

Planned Upgrades - Cost

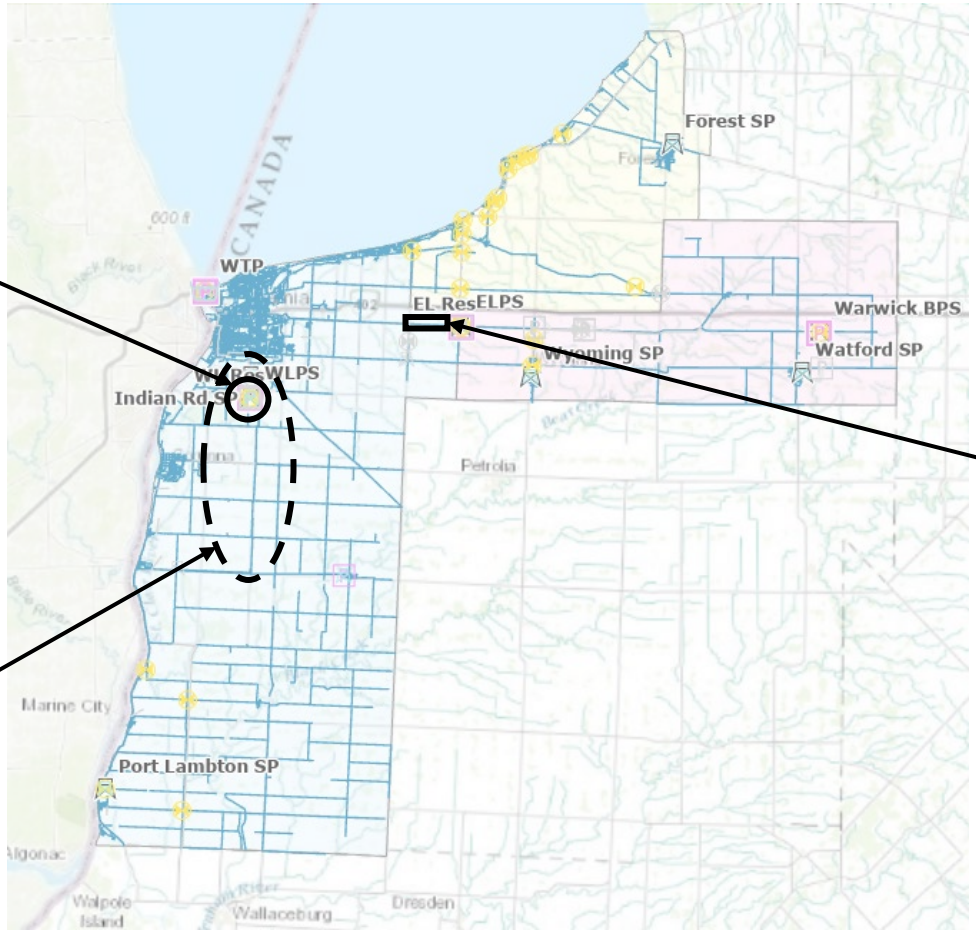
Upgrades at West Lambton Pump Station (WLPS)

$7M - $10M

(interior upgrades only)

Grid Reinforcement and Twinning

$115M



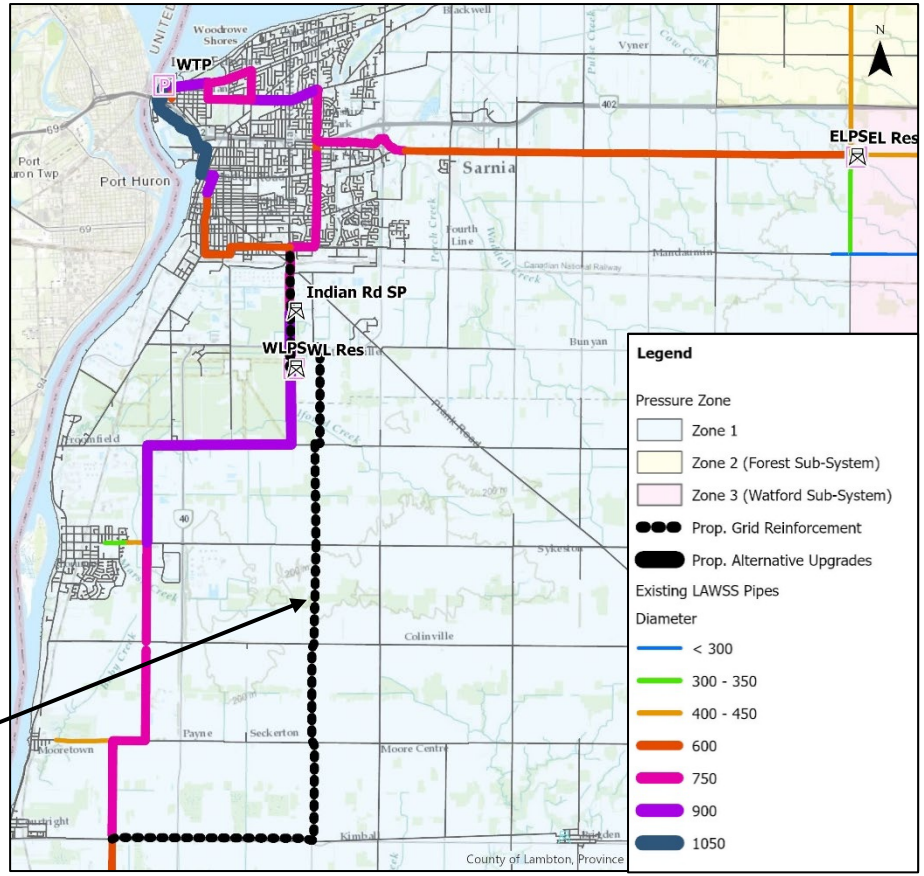
East Lambton Booster Station (ELBS) Fill Constraints

$5.1M

Zone 1 Grid Reinforcement and Twinning

- Grid reinforcement and twinning projects were previously proposed to provide additional redundancy
- Hydraulic analysis, based on current system demand, indicates that the grid reinforcement and twinning projects are now required upgrades for the short-term in order to support indicated system growth.

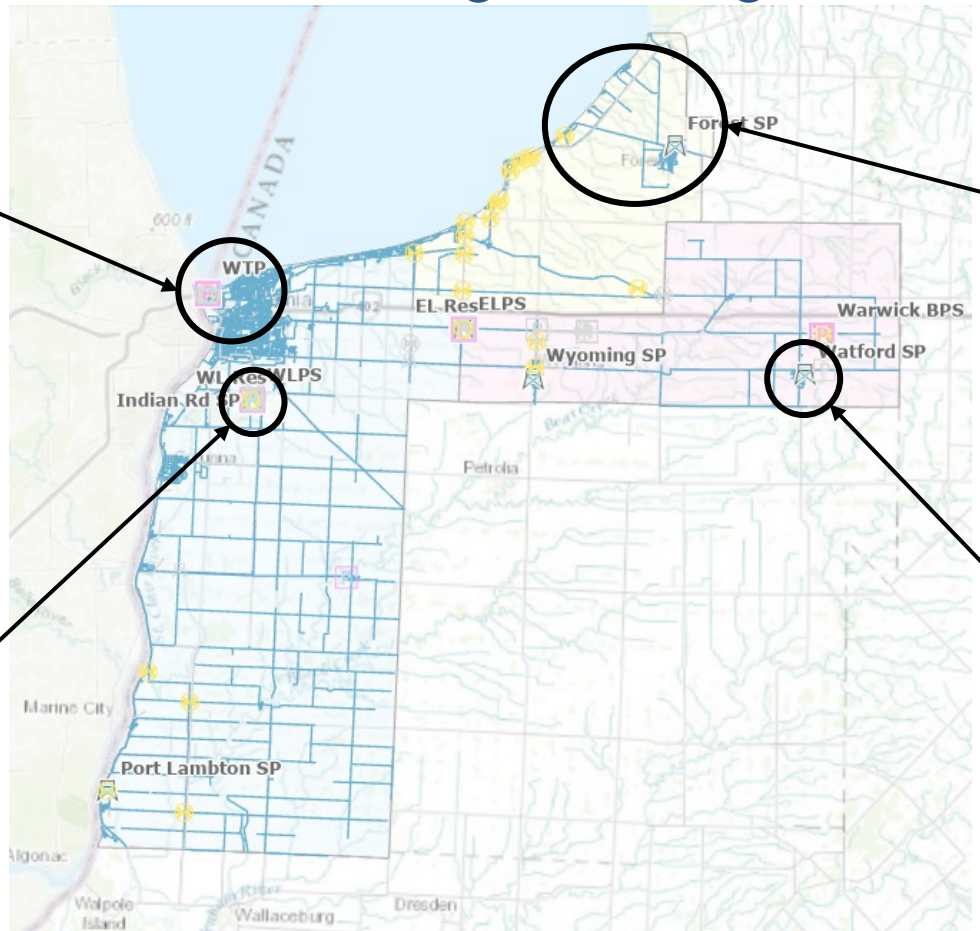
Watermain grid Reinforcement



Forecasted Servicing Challenges in 2046

Need for pump optimization at LAWSS Water Treatment Plant

Zone 1
Fill constraints at West Lambton Reservoir (WL Res)

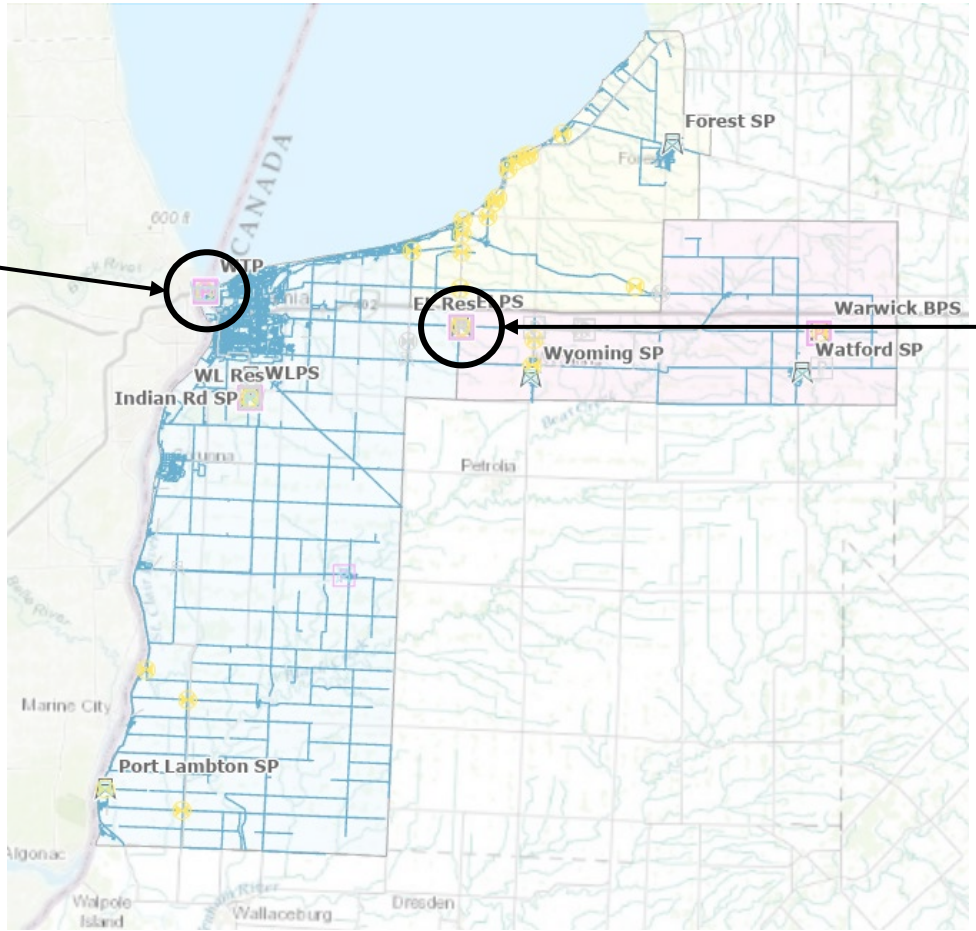


Zone 2
Low pressures in Forest area <u>if additional municipal customer connects</u>

Zone 3
Fill constraints at Watford Standpipe, low pressures in Watford area

Other Forecasted Servicing Challenges

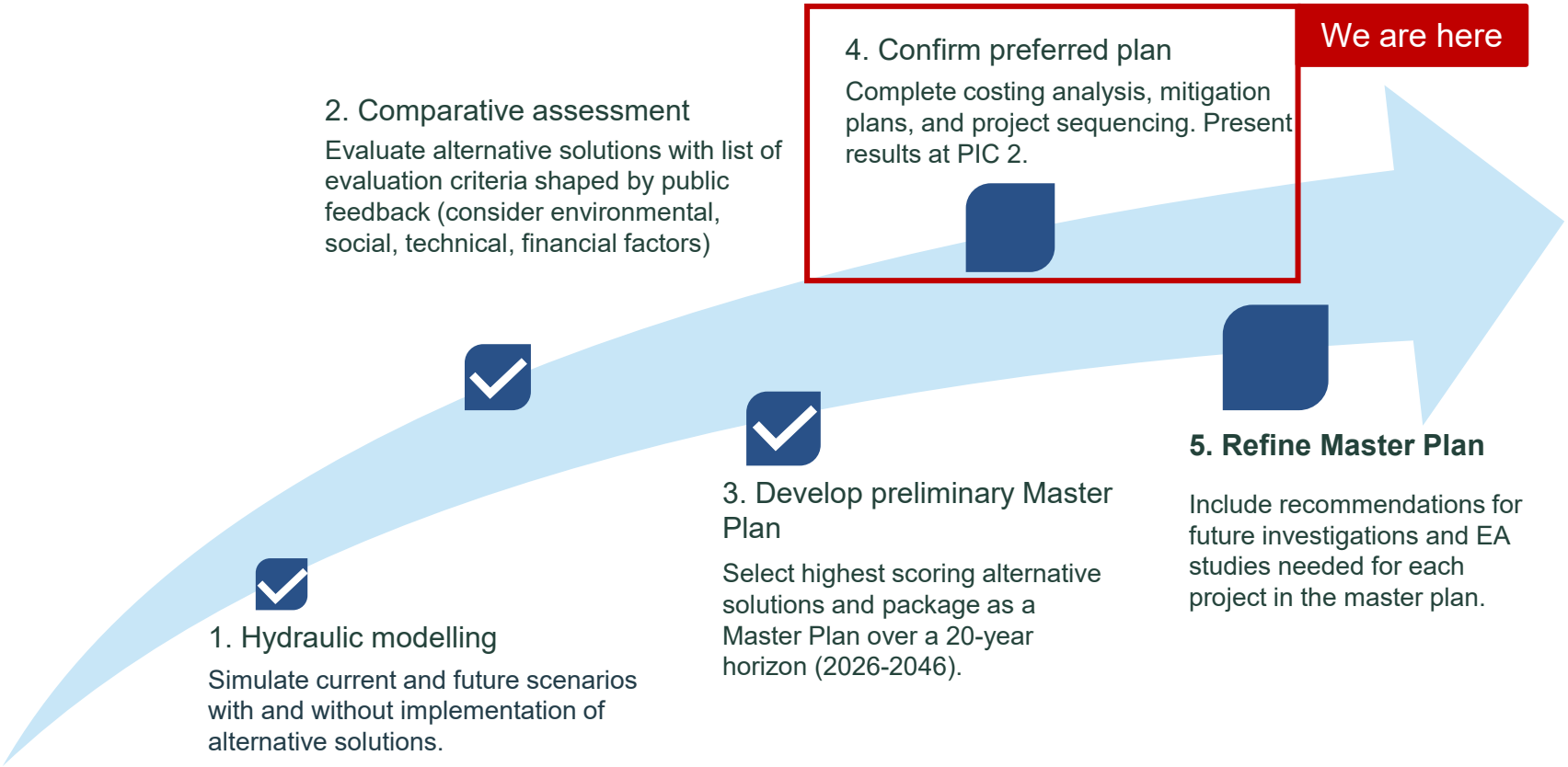
Demands projected to approach 80% of LAWSS Water Treatment Plant capacity by 2046.



Pump upgrades recommended at ELBS to restore firm pumping capacity.

What is the evaluation process?

Alternative solutions will be assessed and consolidated into a Master Plan with the following steps:



1. Hydraulic modelling

Simulate current and future scenarios with and without implementation of alternative solutions.

2. Comparative assessment

Evaluate alternative solutions with list of evaluation criteria shaped by public feedback (consider environmental, social, technical, financial factors)

3. Develop preliminary Master Plan

Select highest scoring alternative solutions and package as a Master Plan over a 20-year horizon (2026-2046).

4. Confirm preferred plan

Complete costing analysis, mitigation plans, and project sequencing. Present results at PIC 2.

5. Refine Master Plan

Include recommendations for future investigations and EA studies needed for each project in the master plan.

Long-Listed Alternatives

Zone 1		Zone 2*		Zone 3	
Zone 1 Alt. #	**Zone 1 Action**	**Zone 2 Alt. #**	**Zone 2 Action***	**Zone 3 Alt. #**	**Zone 3 Action**
0	Do nothing	0	Do nothing	0	Do nothing
1	Increase pressure at WTP	1	Full feedermain upsizing	1	Moderate pump upgrades and feedermain upgrades
1A	Increase pressure at WTP, increase fill rate at WLPS Reservoir	2A	Minor feedermain upsizing, moderate pump upgrades	2	New BPS and reservoir
2	Increase pipe capacity between WTP and WLPS	2B	Major feedermain upsizing, minor pump upgrades		
3A	Replace Indian Rd standpipe (SP) with larger tank, same location	3A	Full twin to subsystem north end		
3B	Replace Indian Rd SP with larger tank, new location	3B	Partial twin, moderate pump upgrades		
3C	Replace Indian Rd SP with larger tank at ELBS site (and recommission EL Res)	4	ELBS pump upgrades only		
4	Direct feedermain from WTP to WLPS				

*Zone 2 upgrades only required if new customers connect

Screening Process

Zone 1		Zone 2*		Zone 3	
Zone 1 Alt. #	**Zone 1 Action**	**Zone 2 Alt. #**	**Zone 2 Action***	**Zone 3 Alt. #**	**Zone 3 Action**
~~0~~	~~Do nothing~~	~~0~~	~~Do nothing~~	~~0~~	~~Do nothing~~
~~1~~	~~Increase pressure at WTP~~	1	Full feedermain upsizing	1	Moderate pump upgrades and feedermain upgrades
1A	Increase pressure at WTP, increase fill rate at WLPS Reservoir	2A	Minor feedermain upsizing, moderate pump upgrades	2	New BPS and reservoir
2	Increase pipe capacity between WTP and WLPS	2B	Major feedermain upsizing, minor pump upgrades		
3A	Replace Indian Rd standpipe (SP) with larger tank, same location	3A	Full twin to subsystem north end		
3B	Replace Indian Rd SP with larger tank, new location	3B	Partial twin, moderate pump upgrades		
3C	Replace Indian Rd SP with larger tank at ELBS site (and recommission EL Res)	~~4~~	~~ELBS pump upgrades only~~		
4	Direct feedermain from WTP to WLPS				

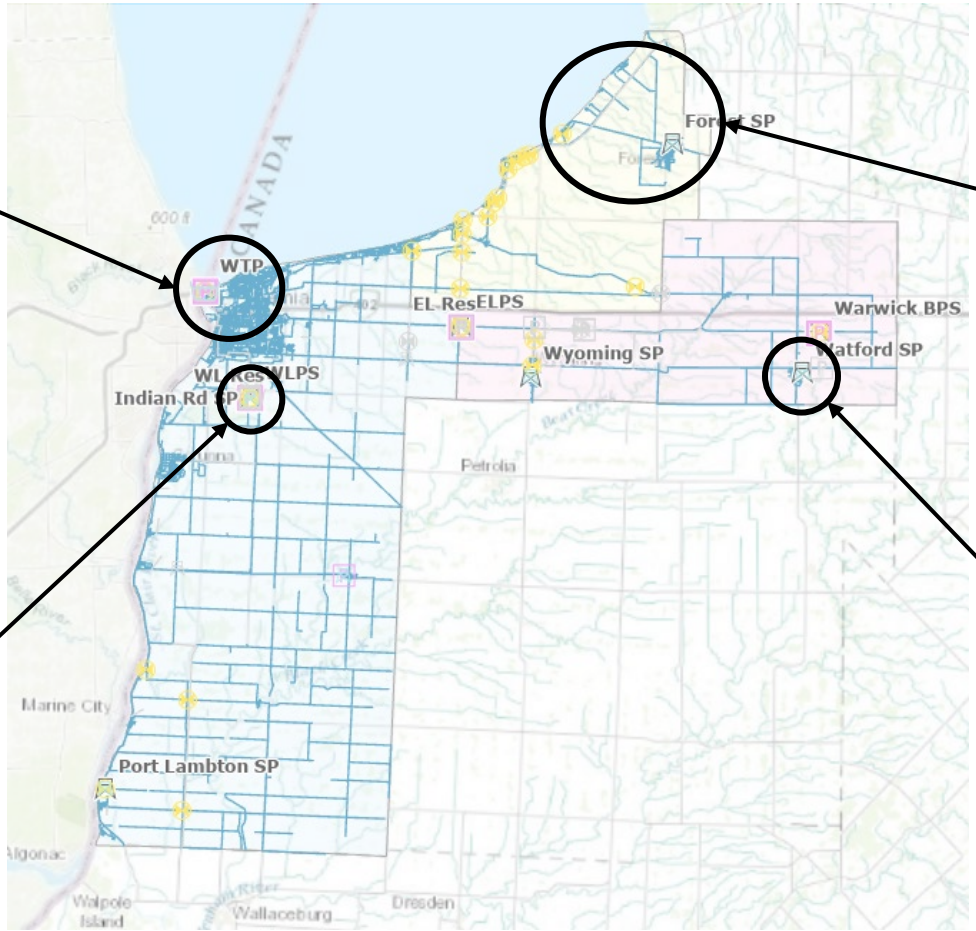
*Zone 2 upgrades only required if new customers connect

Mandatory criteria:

1. Maximum day demands can be met
2. Appropriate range of service pressures
3. Compatibility with existing facility capacities, processes, and key operations

Forecasted Servicing Challenges in 2046 - WTP

Need for pump optimization at LAWSS Water Treatment Plant



Zone 1
Fill constraints at West Lambton Reservoir (WL Res)

Zone 2
Low pressures in Forest area <u>if additional municipal customer connects</u>

Zone 3
Fill constraints at Watford Standpipe, low pressures in Watford area

Optimization of Pumps at WTP

Pumps at the existing WTP High-Lift Pumping Station are not optimally sized for system operations. Possible benefits of pump upgrades include:

- Better handling of demand variability
- Greater energy efficiency and lower GHG emissions
- Increased ease of operation and maintenance

The suggested treatment plant design flow of at least 2100 L/s is being considered to meet future demands and match the WTP capacity.

Recommendations:

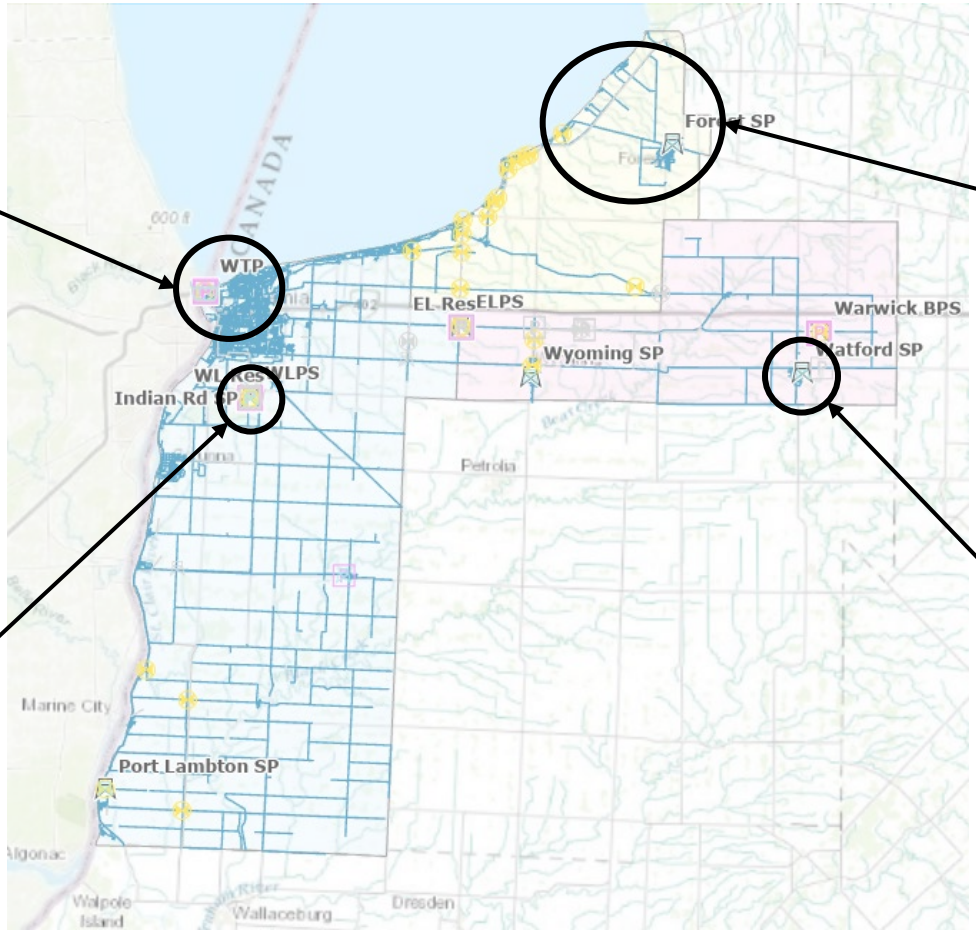
1. Install variable frequency drive (VFD) on existing pump HLP2
2. Install a second backwash pump for redundancy
3. Systematic pump replacement to achieve design flow and pressure

LAWSS Water Treatment Plant High Lift Pump Station

Forecasted Servicing Challenges in 2046 – Zone 1

Need for pump optimization at LAWSS Water Treatment Plant

Zone 1
Fill constraints at West Lambton Reservoir (WL Res)



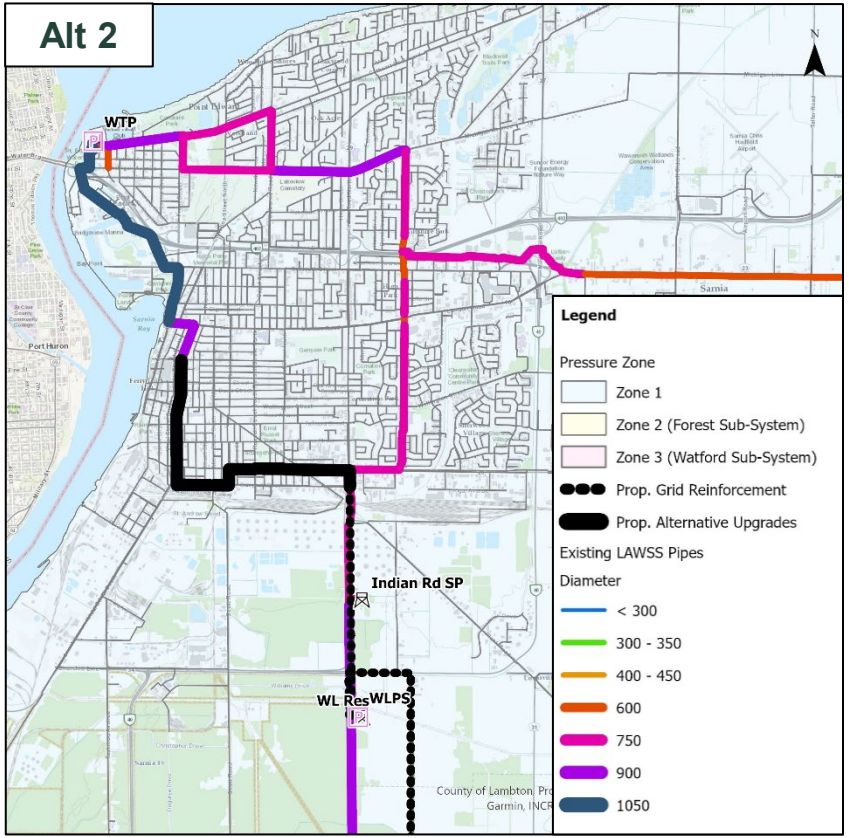
Zone 2
Low pressures in Forest area <u>if additional municipal customer connects</u>

Zone 3
Fill constraints at Watford Standpipe, low pressures in Watford area

Short-Listed Alternatives – Zone 1 (1)

Zone 1 – Water Treatment Plant (WTP) Subsystem

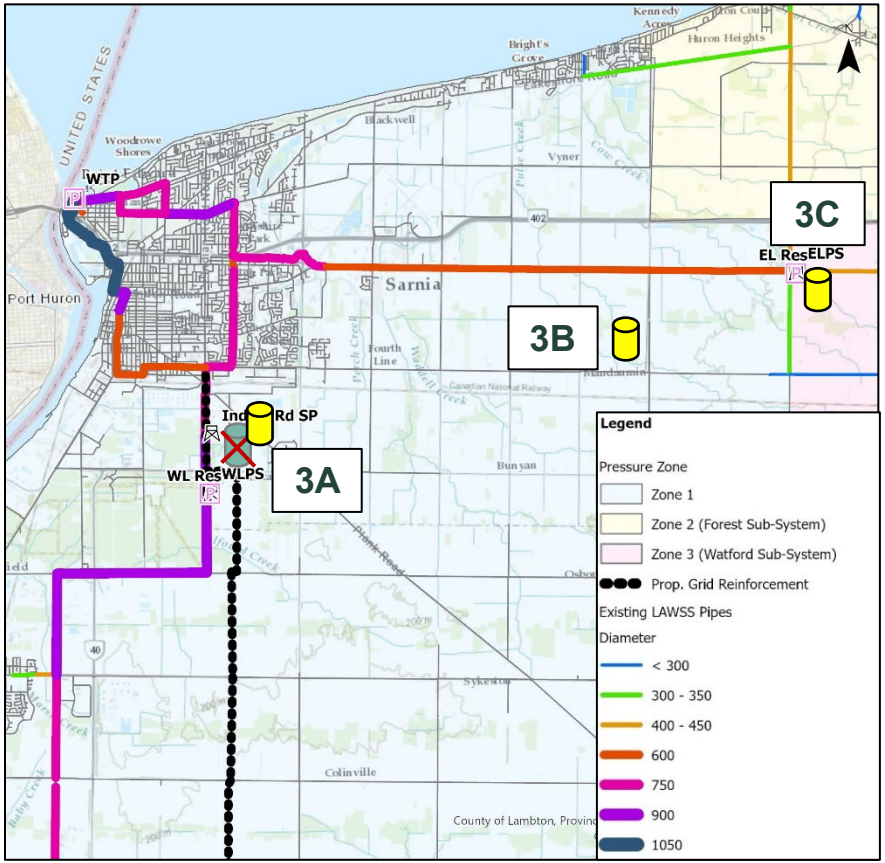
Alt. #	Action	Description
1A	Increase pressure at WTP, increase fill rate at WLPS Reservoir	Slight increase in discharge pressure (+3psi) from WTP, Lower inlet pressure to WL reservoir (allow more frequent filling)
2	Increase pipe capacity between WTP and WLPS (pictured)	Upsize 4.5km of existing watermain to 900mm



Short-Listed Alternatives – Zone 1 (2)

Zone 1 – WTP Subsystem

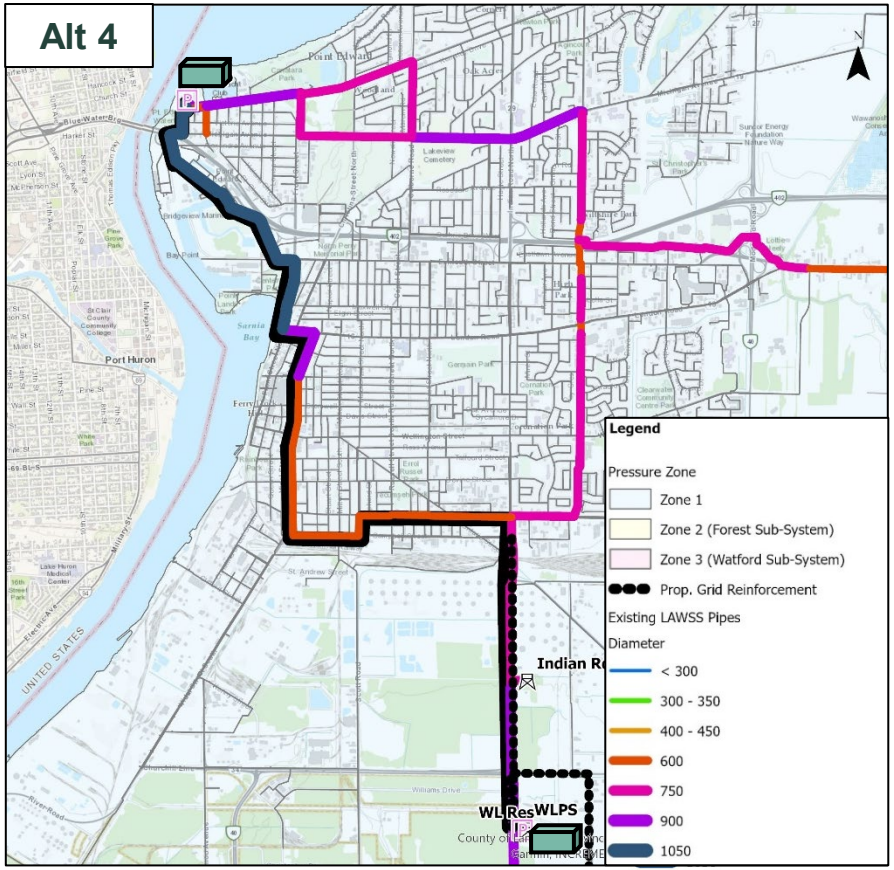
Alt. #	Action	Description
3A	Replace Indian Rd SP with larger tank, same location	Demolish Indian Rd tank, new 7ML Elevated Tank at same location
3B	Replace Indian Rd SP with larger tank, new location	Demolish Indian Rd tank, new 7ML elevated tank at new location
3C	Replace Indian Rd SP with larger tank at ELBS site	Demolish existing Indian Rd tank, new elevated tank on ELBS property (7ML)



Short-Listed Alternatives – Zone 1 (3)

Zone 1 – WTP Subsystem

Alt. #	Action	Description
4	Direct feedermain from WTP to WLPS	12km of new 900mm pipe



Preliminary Cost Estimates – Zone 1 (1)

Zone 1 – WTP Subsystem

Alt. #	Action	Capital Cost	Operating Cost for Maximum Day ($/year)
1A	Increase pressure at WTP, increase fill rate at WLPS Reservoir. Control programming updates only.	minimal	Similar to other alternatives
2	Increase pipe capacity between WTP and WLPS	$22.6M	Similar to other alternatives
3A	Replace Indian Rd standpipe (SP) with larger tank, same location	$7.6M	Similar to other alternatives
3B	Replace Indian Rd SP with larger tank, new location	$15M	Similar to other alternatives
3C	Replace Indian Rd SP with larger tank at ELBS site (and recommission EL Res)	$8.3M	Similar to other alternatives
4	Direct feedermain from WTP to WLPS	$62M	Lower than other alternatives

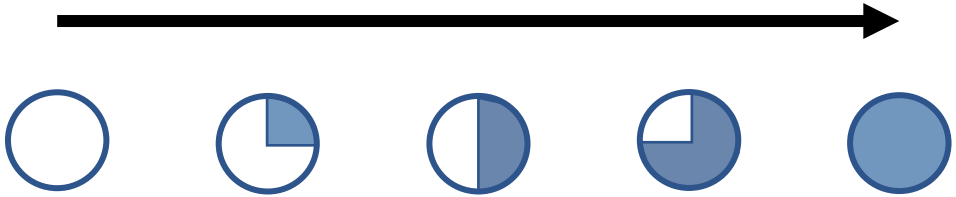
Evaluation Criteria

Land Use	• Conformance with approved local, county, and provincial plans and policies. • Potential effects on existing and approved / planned land uses.
Technical	• Potential constructability with the system – requirement for system upgrades. • Potential constructability and minimum utility conflicts. • Ability to meet long-term water servicing requirements including flow, pressure and fire flow for the servicing area.
Natural Environment	• Potential to impact sensitive ecosystems / habitats • Potential to impact surface or groundwater • System or facility vulnerability to climate change effects (e.g., algal blooms, changing water chemistry, flooding if applicable) • System or facility vulnerability to adverse events (e.g., contamination) • Relative GHG contributions of facilities
Socio-Economic	• Potential effects (Noise, vibration, dust, access to property) related to disruption to residences, agricultural, businesses, and travelling public during construction and operation. • Degree of property acquisition / easement requirements.
Cost	• Cost of Construction (including property acquisition) • Operations / maintenance costs

Evaluation Criteria - Scoring

- Land Use
- Technical
- Natural Environment
- Socio-Economic
- Cost

Scoring



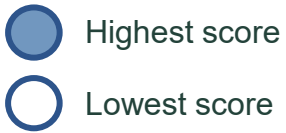
Lowest Category Score

Highest Category Score

Greatest impact / lowest level of service

Lowest impact / highest level of service

Alternatives Evaluation – Zone 1



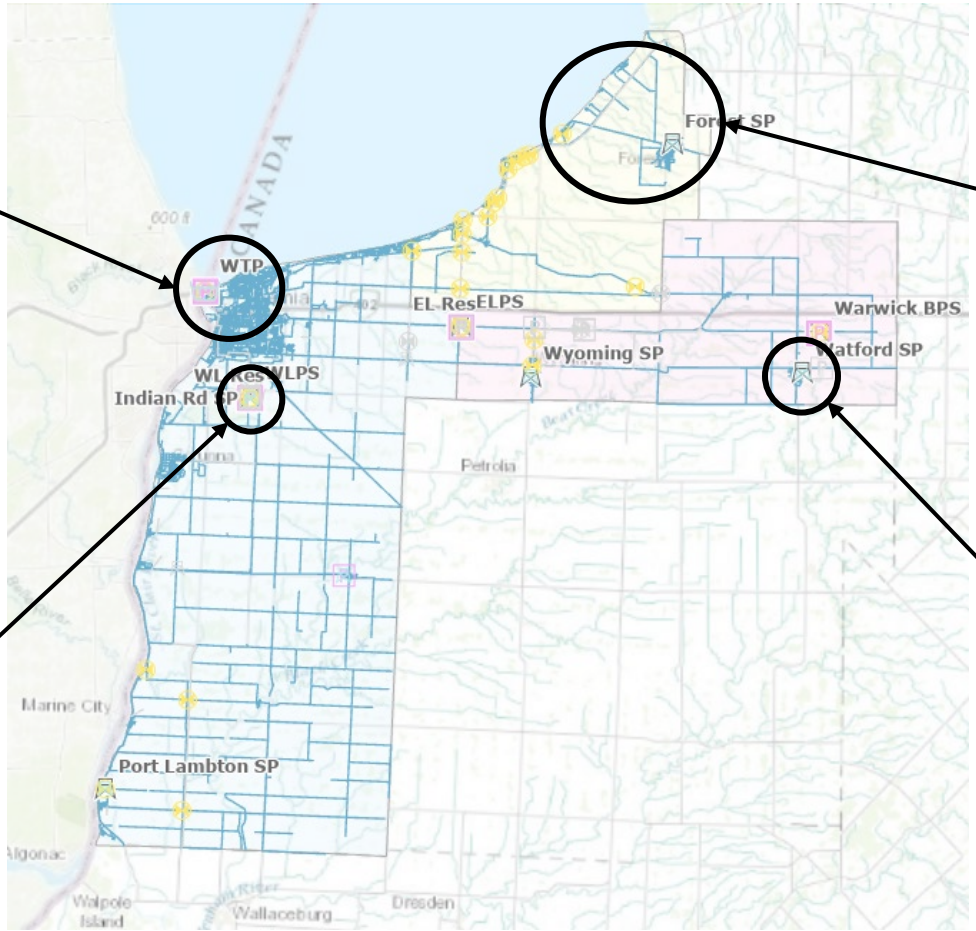
Zone 1 – WTP Subsystem

Alt. #	Action	Overall	Land Use	Technical	Natural Environment	Socio-Economic	Cost
1A	Increase pressure at WTP, increase fill rate at WLPS Reservoir	Highest					
2	Increase pipe capacity between WTP and WLPS						
3A	Replace Indian Rd standpipe (SP) with larger tank, same location						
3B	Replace Indian Rd SP with larger tank, new location						
3C	Replace Indian Rd SP with larger tank at ELBS site (and recommission EL Res)						
4	Direct feedermain from WTP to WLPS						

Forecasted Servicing Challenges in 2046 – Zone 2

Need for pump optimization at LAWSS Water Treatment Plant

Zone 1
Fill constraints at West Lambton Reservoir (WL Res)



Zone 2
Low pressures in Forest area <u>if additional municipal customer connects</u>

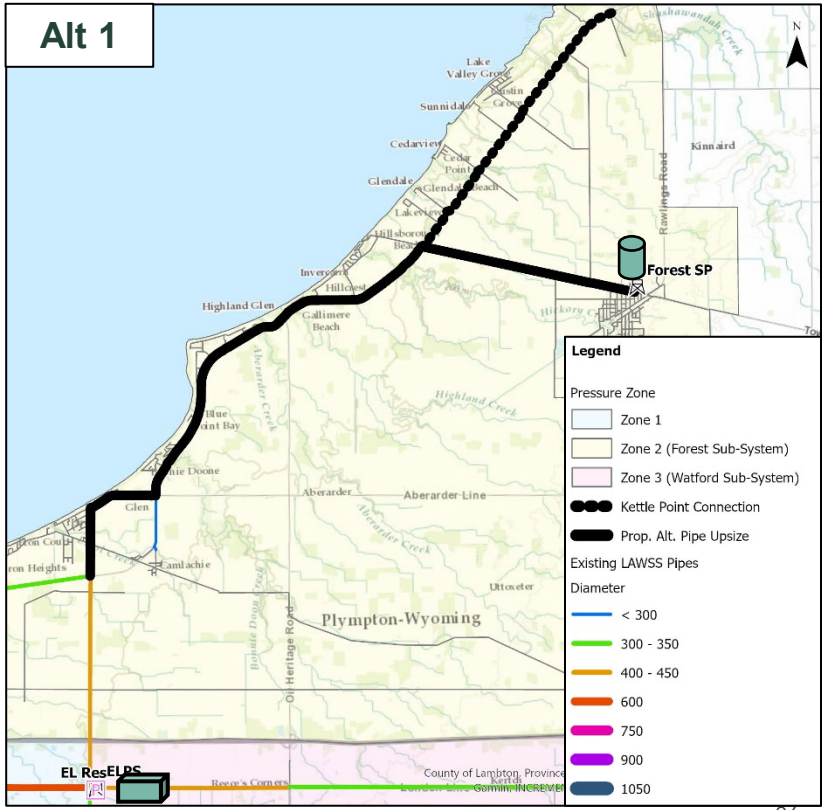
Zone 3
Fill constraints at Watford Standpipe, low pressures in Watford area

Short-Listed Alternatives – Zone 2 (1)

Zone 2* – Forest Subsystem

Alt. #	Action	Description
1	Full feedermain upsizing	Upsize existing watermain • 1km to 450mm • 12km to 400mm • 6.25 km to 350mm

*Zone 2 upgrades only required if new municipal customer connects

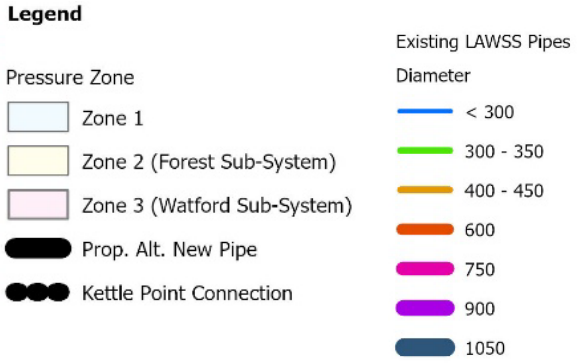


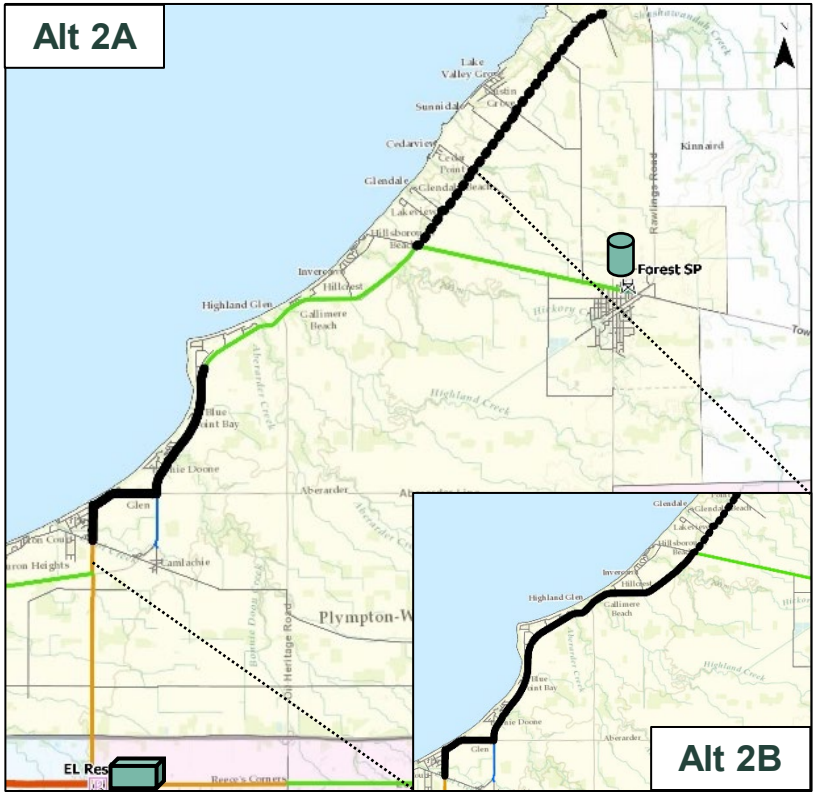
Short-Listed Alternatives – Zone 2 (2)

Zone 2* – Forest Subsystem

Alt. #	Action	Description
2A	Minor feedermain upsizing, major pump upgrades	• Upsize 7.5km of watermain to 400mm • Increase ELBS pump pressure by 11 psi.
2B	Major feedermain upsizing, minor pump upgrades	• Upsize 16km of watermain to 400mm • Increase ELBS pump pressure by 2 psi.

*Zone 2 upgrades only required if new municipal customer connects



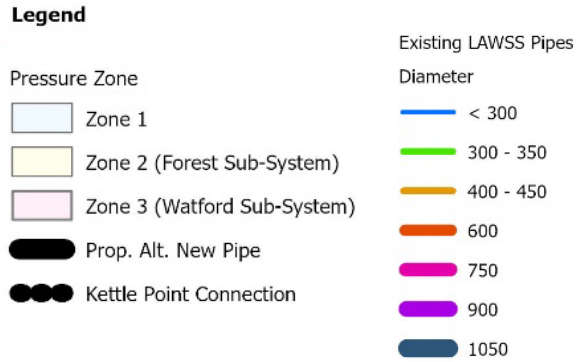


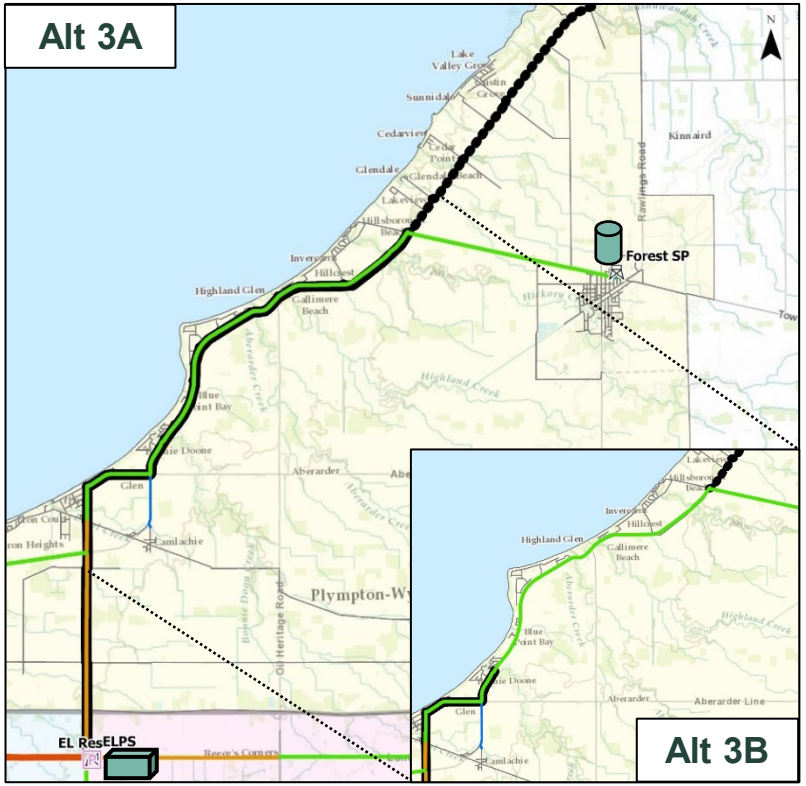
Short-Listed Alternatives – Zone 2 (3)

Zone 2* – Forest Subsystem

Alt. #	Action	Description
3A	Full twin to subsystem north end (pictured)	21 km of new 300mm watermain
3B	Partial twin, major pump upgrades	• 11 km of new 300m watermain • Increase ELBS pump pressure by 4psi

*Zone 2 upgrades only required if new municipal customer connects





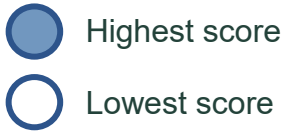
Preliminary Cost Estimates – Zone 2

Zone 2 – Forest Subsystem (required if new municipal customer connects)

Alt. #	Action	Capital Cost	Operating Cost for Maximum Day ($/year)
1	Extensive feedermain upsizing	$57.9M	Lower
2A	Minor feedermain upsizing, moderate pump upgrades	$18.8M	Higher
2B	Major feedermain upsizing, minor pump upgrades	$29.9M	Moderate
3A	Full twin to subsystem north end	$41.8M	Lower
3B	Partial twin, moderate pump upgrades	$22.5M	Higher

*All alternatives for Zone 2 include construction of a new 300mm watermain from Townsend line to the north end of the subsystem, at a capital cost of approximately $17.6M.

Alternatives Evaluation – Zone 2



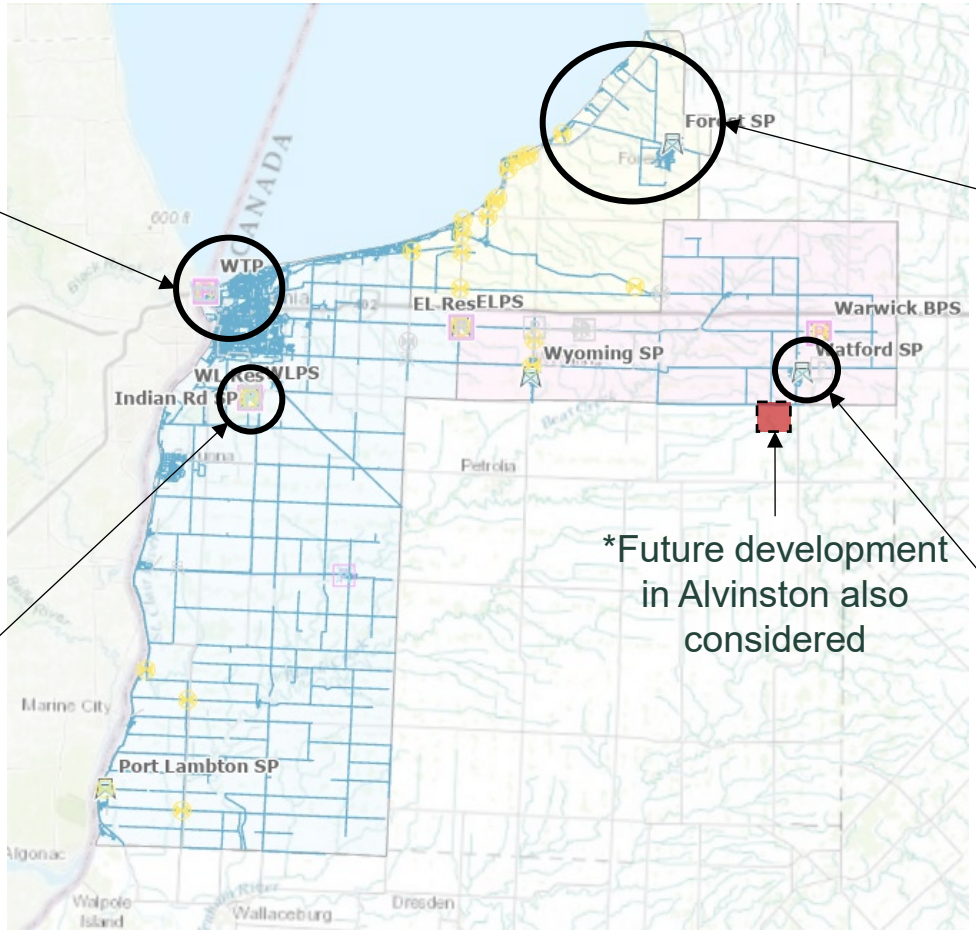
Zone 2 – Forest Subsystem

Alt. #	Action	Overall	Land Use	Technical	Natural Environment	Socio-Economic	Cost
1	Extensive feedermain upsizing						
2A	Minor feedermain upsizing, moderate pump upgrades						
2B	Major feedermain upsizing, minor pump upgrades						
3A	Full twin to subsystem north end	**Highest**					
3B	Partial twin, moderate pump upgrades						

Forecasted Servicing Challenges in 2046 – Zone 3

Opportunity for optimization at LAWSS Water Treatment Plant

Zone 1
Fill constraints at West Lambton Reservoir (WL Res)



*Future development in Alvinston also considered

Zone 2
Low pressures in Forest area <u>if additional municipal customer connects</u>

Zone 3
Fill constraints at Watford Standpipe, low pressures in Watford area

Short-Listed Alternatives – Zone 3

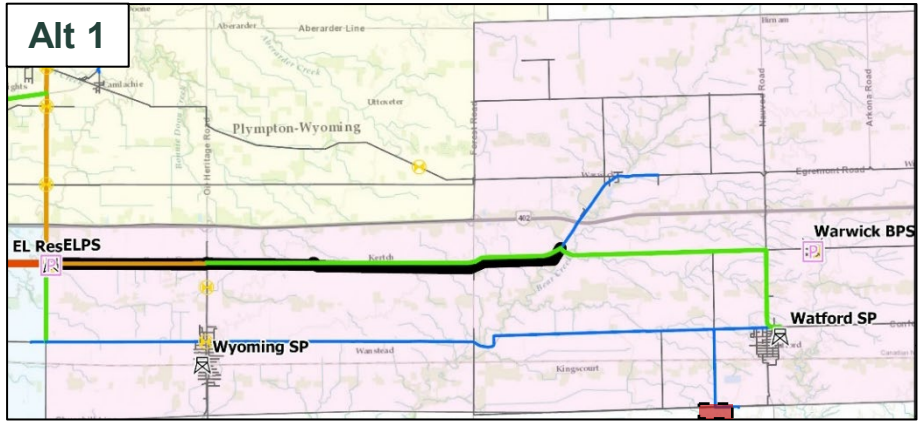
Zone 3 – Watford Subsystem

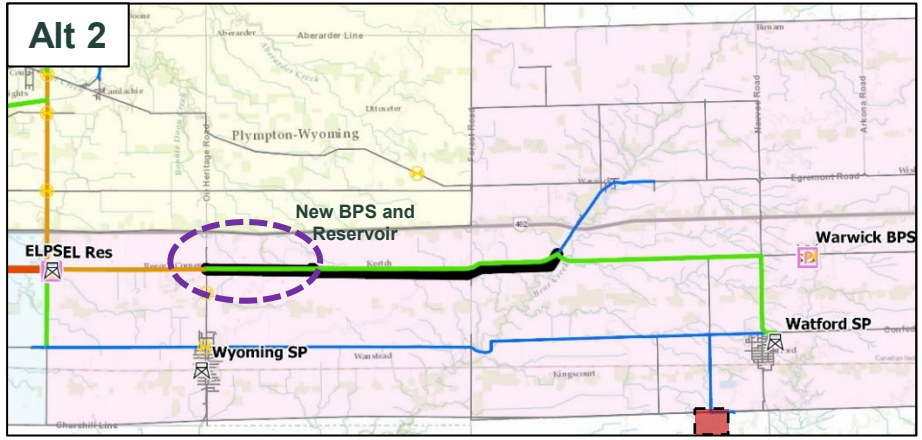
Alt. #	Action	Description
1	Feedermain upgrades	Upsize 18km of feedermain from ELBS towards Watford
2	BPS and Reservoir	New BPS and reservoir and feedermain

Legend

Pressure Zone
- Zone 1
- Zone 2 (Forest Sub-System)
- Zone 3 (Watford Sub-System)
- Prop. Alt. New Pipe

Existing LAWSS Pipes Diameter
- < 300
- 300 - 350
- 400 - 450
- 600
- 750
- 900
- 1050



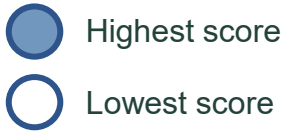


Preliminary Cost Estimates – Zone 3

Zone 3 – Watford Subsystem (including Alvinston growth)

Alt. #	Action	Capital Cost	Operating Cost for Maximum Day ($/year)
1	Feedermain Upgrades	$50M	Lower
2	New BPS and Reservoir	$43M	Higher

Alternatives Evaluation – Zone 3



Zone 3 – Watford Subsystem (incl. Alvinston connection)

Alt. #	Action	Overall	Land Use	Technical	Natural Environment	Socio-Economic	Cost
1	Feedermain upgrades						
2	New BPS and Reservoir	Highest					

*Preferred alternative to be confirmed following field testing

Summary – Planned Upgrades

Zone	Planned Projects	Capital Cost	Trigger Year or Condition
1	Grid Reinforcement and Twinning	$115M	Before 2046*
1	WLPS Upgrades	$7M-$10M	Detailed engineering underway, construction planned for 2027
1	ELBS Fill Line Upgrades	$5.1M	Detailed engineering complete, construction approved for 2026

*With agreements established for new and existing industrial & commercial customers

Summary – Assessment Recommendations

Zone	Alt. #	Description	Capital Cost	Trigger Year or Condition
1	1A	Increase pressure at WTP, increase fill rate at WLPS Reservoir. Control programming updates only.	minimal	Operational trials to commence after completion of planned WLPS upgrades
2	3A	Full forest feedermain twin to subsystem north end	$41.8M	By 2036, subject to new municipal customer
3	2	New BPS and Reservoir	$43.2M	BPS and Res.: 2046 Feedermains: 2046+
1	N/A	WTP Pump Optimization	$10M	Phased beginning in 2027
2 & 3	N/A	ELBS Pump Upgrades (restore firm pumping capacity)	$2M	2030, or sooner Immediate pump testing*
1	N/A	WTP Capacity Study	$150K (include findings in next MP iteration)	2030

2025 Master Plan

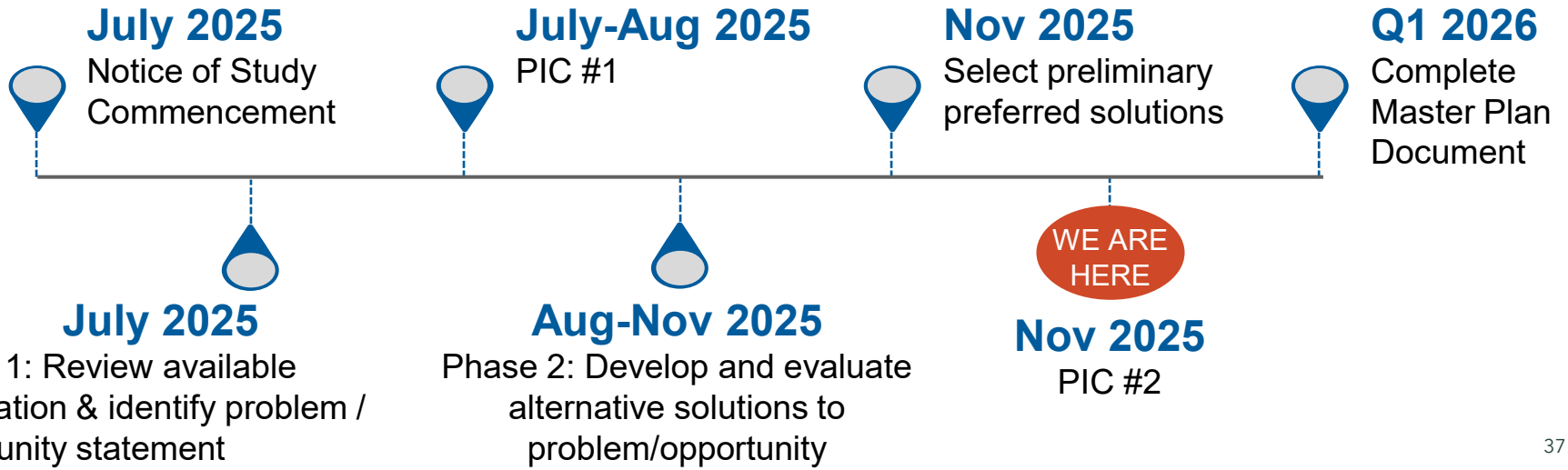
Additional

* Pump testing at ELBS recommended to confirm existing pump capacity to inform upgrade design and required timing

Next Steps and Project Timeline

After this PIC, the Project Team will:

- Review and consider input received during Public Information Centre #2.
- Finalize the preferred solution and develop the final recommendation.
- Prepare a report and satisfy the documentation requirements of the Class EA process.
- Make report available for public comments.



Thank You!

For more information about this project, please visit the LAWSS website and navigate to the 2025 Master Plan page:

https://lawss.org/lambton-area-water-supply-system-water-master-plan-update-2025/

Should you have any questions or comments at any time during the project, please contact a member of the project team:

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