

Infrastructure Master Plan

Committee of the Whole – April 4, 2022

Agenda

- Part 1: Meeting Objectives
- Part 2: Masterplan and Municipal Class Environmental Assessment
- Part 3: infrastructure Masterplan Status
- Part 4: Schedule
- Part 5: Growth Planning for Water and Wastewater Treatment Facilities
- Part 6: Project Problems and Opportunities
- Part 7: Closing Comments and Questions

Meeting Objectives

1. Provide a status report on the progress of the **Infrastructure Masterplan (IMP)**.
2. Explain the importance of the Township's water and wastewater treatment reserve capacity as it relates to Loyalist's growth scenarios
3. Provide Council with an updated list of problems and opportunities which are being evaluated within the IMP

Part 2: What is a master plan and MCEA?



WATER



SANITARY



STORMWATER



TRANSPORTATION



GROWTH



REMEDIAL



REGULATORY



TECHNOLOGY



CLIMATE
CHANGE

Part 3: Municipal Class EA Status



Masterplans include Phases 1 and 2 of MCEA requirements.

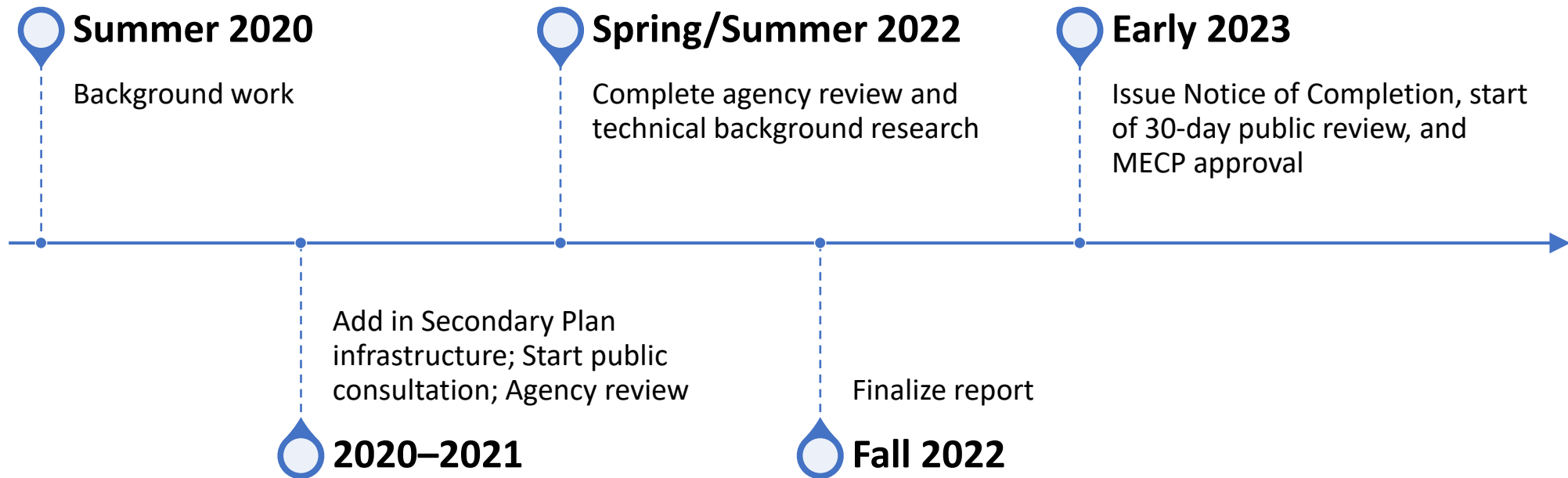
What does this mean?

Loyalist IMP has completed Phase 1.

Phase 2 Activity – Now in Progress

- Identify alternative solutions to problems and opportunities
- Inventory natural, cultural, social and economic environment
- Identify impacts of alternative solutions on the environment
- Evaluate alternative solutions
- Consult review agencies and public on alternative solutions
- Select and confirm preferred solution

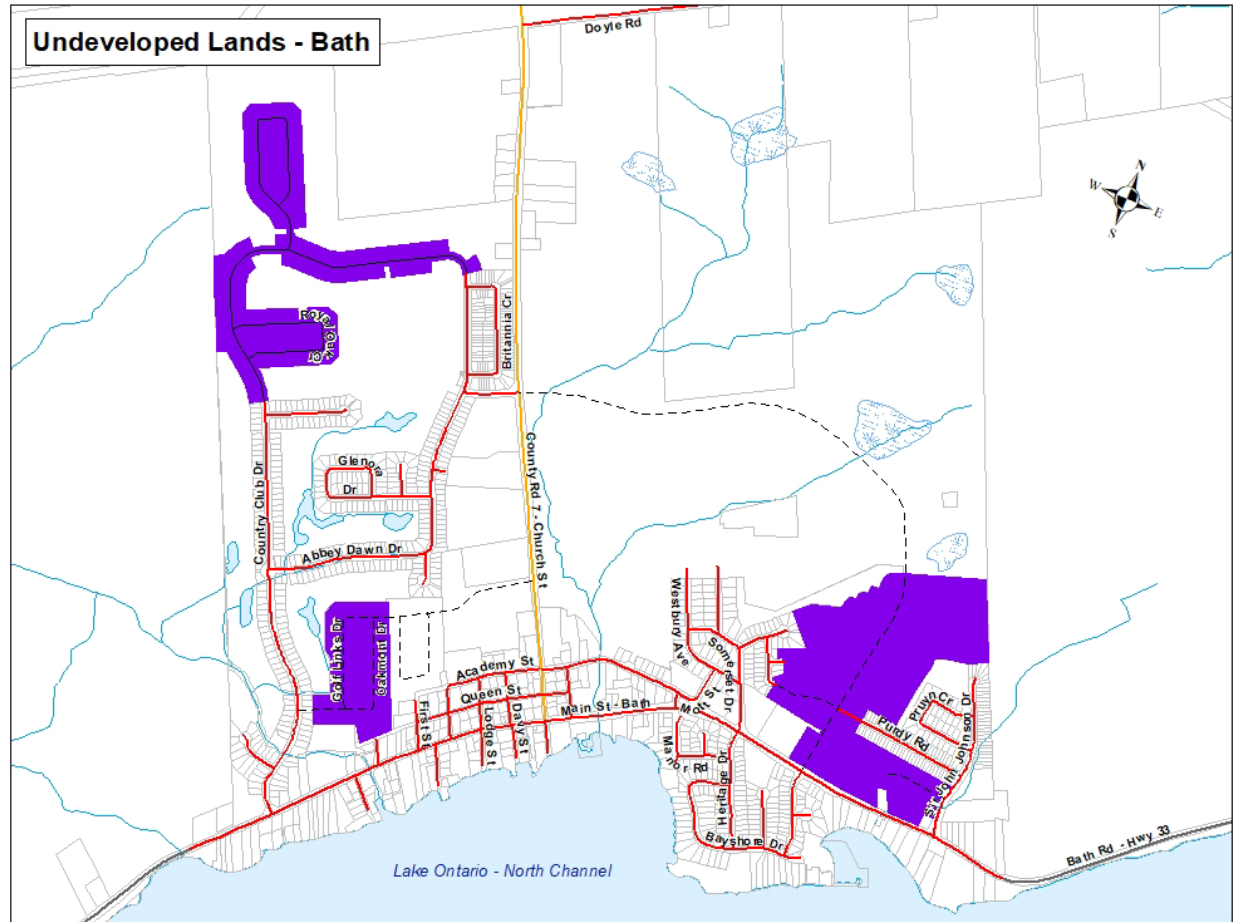
Part 4: Schedule



Questions

Any questions on this section?

We will answer general questions at the end of the presentation.

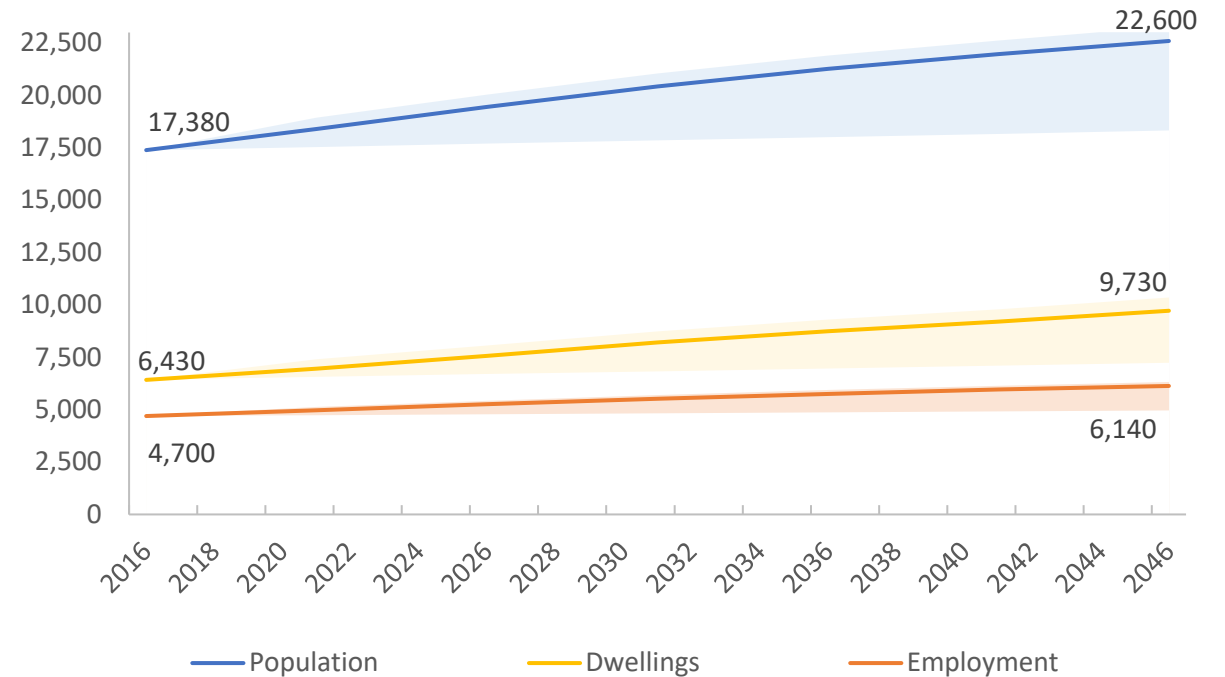




Part 5: Growth Planning for
Water and Wastewater
Treatment Facilities

Growth Projections (Hemson, 2019)

- Growth study commissioned by the Township in 2019
- Reference scenario = “Most likely”
- Moderate growth projected between 2016 and 2046
- Housing projected to outpace population growth



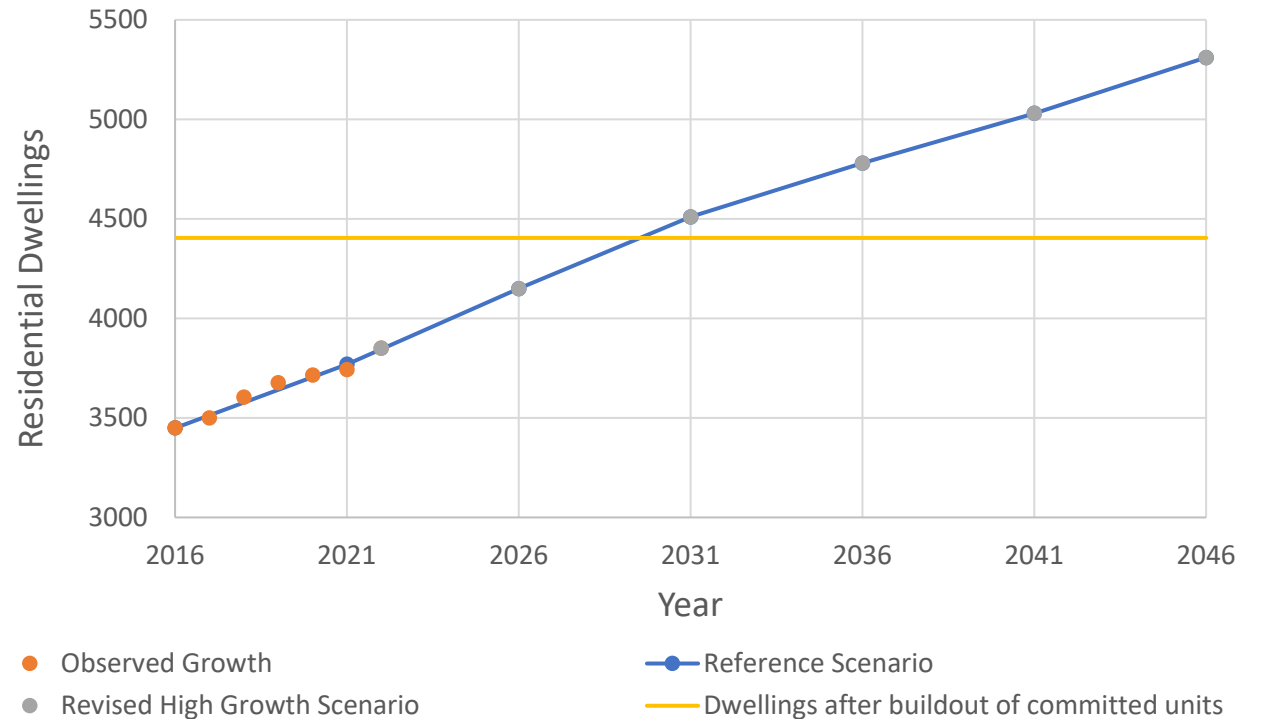
Observed Dwelling Growth (2016 – 2021)

	2016	2021 Projected (Growth Study Reference Scenario)	2021 Calculated*	Difference
Amherstview	3,450	3,770	3,743	-0.7%
Odessa	490	510	652	22%
Bath	1,150	1,310	1,214	-8%
Rural & Amherst Island	1,340	1,370	1,396	2%
Total	6,430	6,960	7,005	0.6%

*estimates based on number of new building permits issued in each study area

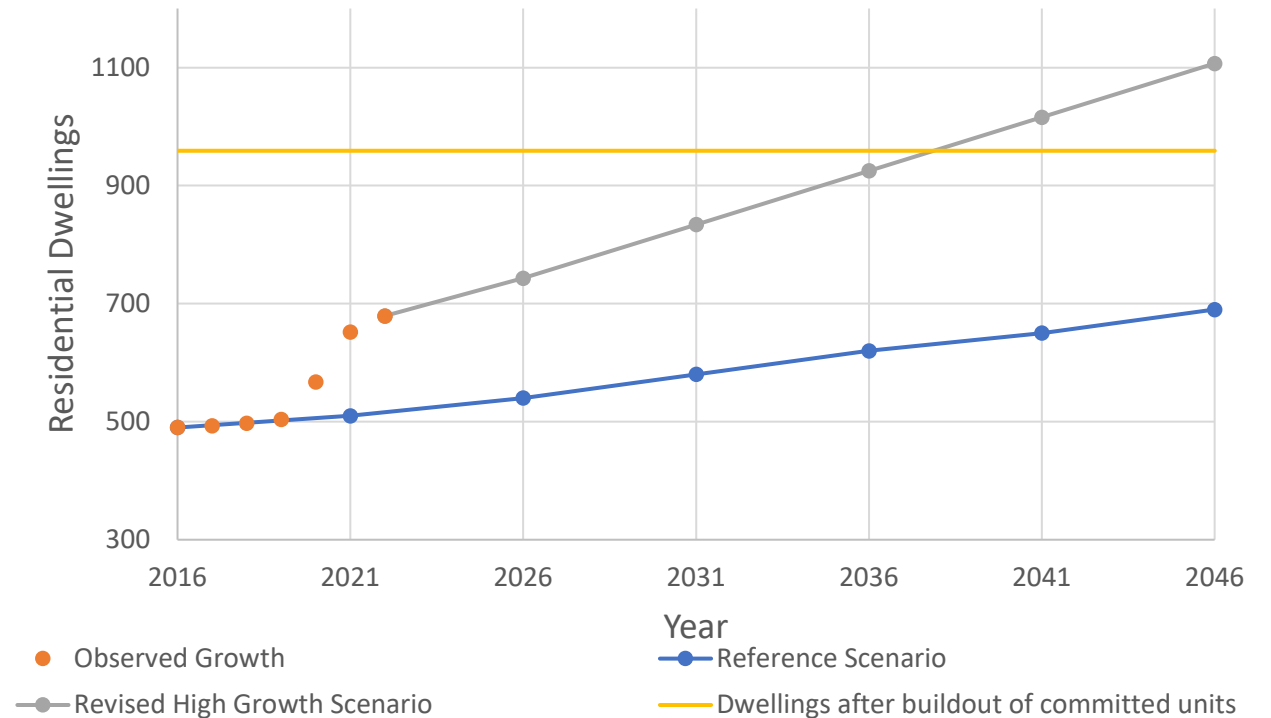
Revised Growth Scenarios - Amherstview

- Observed growth closely matched projected growth
- 448 committed-but-unbuilt residential units remaining in Amherstview
- Build-out of these units expected by 2028



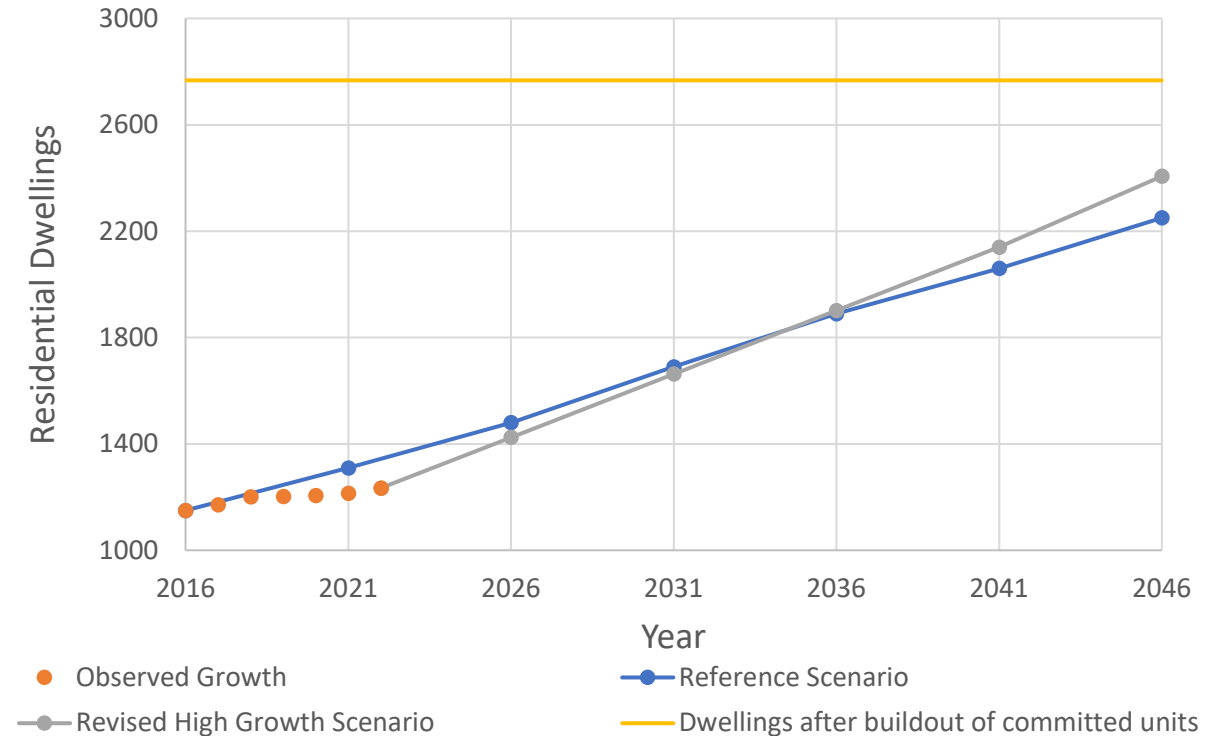
Revised Growth Scenarios - Odessa

- Observed growth significantly outpaced projected growth
- 280 committed-but-unbuilt residential units remaining in Odessa
- Build-out of these units expected by 2038



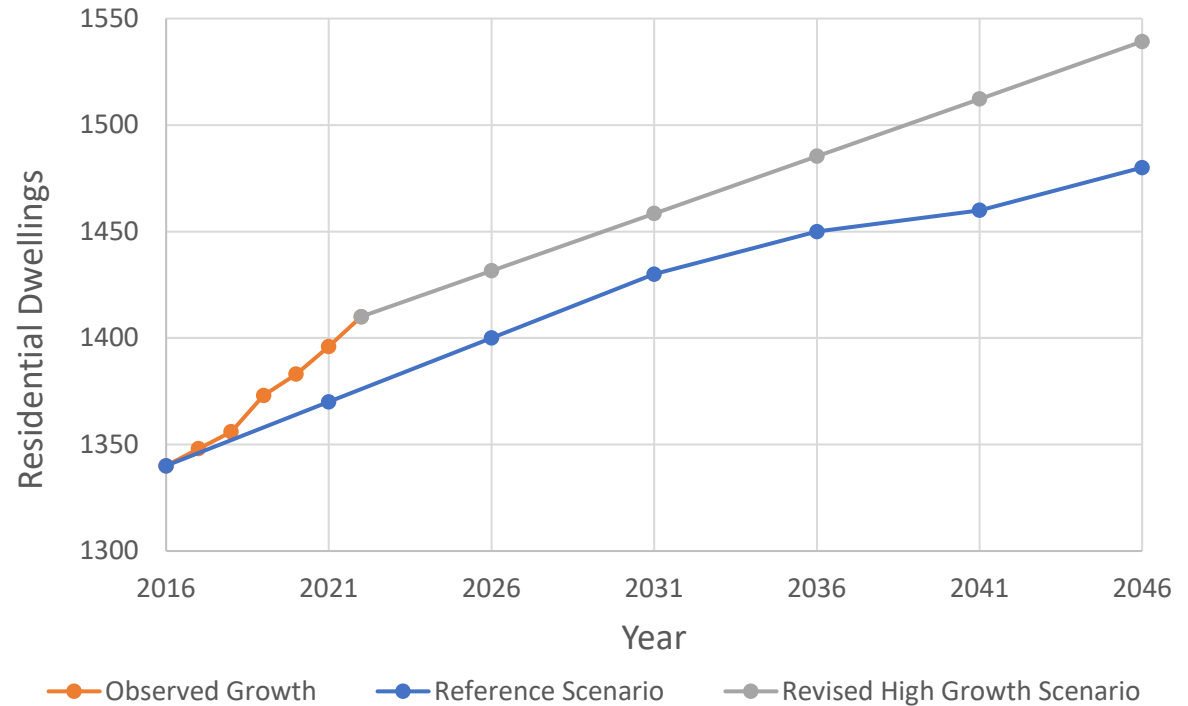
Revised Growth Scenarios - Bath

- Observed growth lower than projected growth
 - Stakeholder consultation and field observations indicate rapid growth incoming
 - Revised high growth scenario
- 1,533 committed-but-unbuilt units
- Not projected to be completed by end of study period



Revised Growth Scenarios – Amherst Island and Rural Areas of Township

- Observed growth higher than projected growth
- Growth primarily projected to occur on mainland



Revised Growth Scenarios - Summary

- Maintain same growth scenario for Amherstview
- Revised high-growth scenarios for Odessa, Bath, and Amherst Island / Rural areas of the Township

	Projected dwellings (2046)	
	Growth Study Reference Scenario	Revised High Growth Scenario
Amherstview	5,310	5,310
Odessa	690	1,107
Bath*	2,250	2,406
Rural and Amherst Island	1,480	1,539
Total	9,730	10,362

**despite historical data indicating that observed growth rates in Bath were lower than initially projected, deemed prudent to use high growth scenario based on amount of servicing recently completed by developers in this area*

Revised Growth Scenarios - Summary

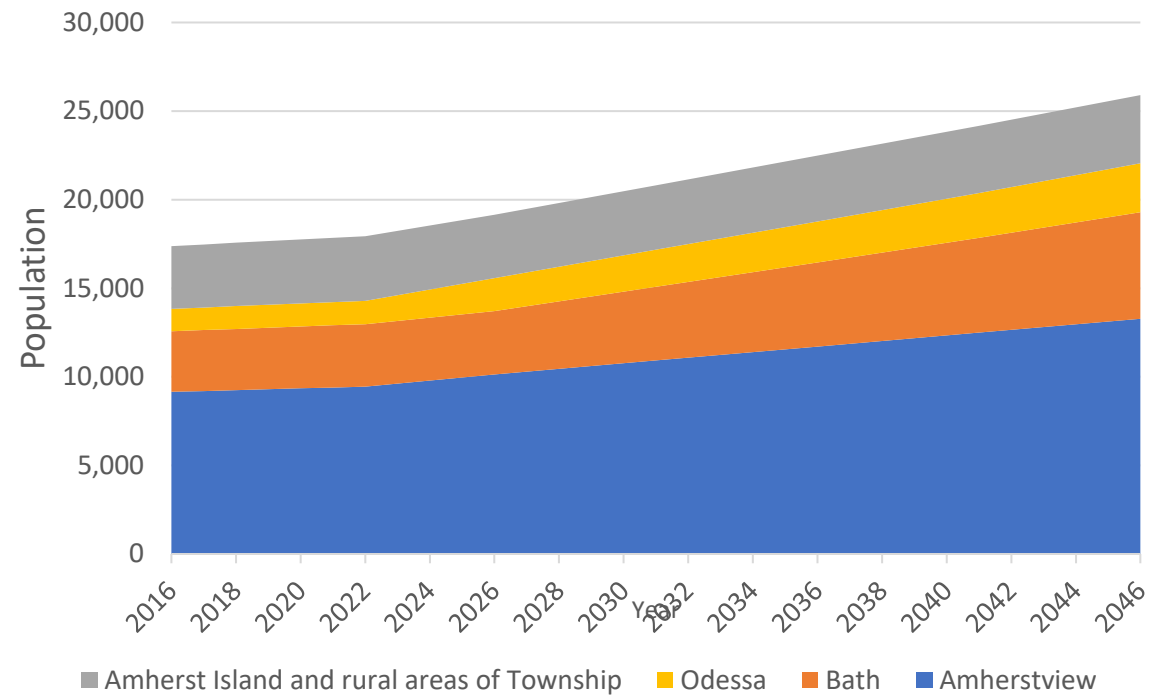
- Projections for Township as a whole generally accurate to date
- Developed revised growth rates for certain areas in the Township.
- NB: High growth rates in individual years typically balance out over longer periods

Year	Population	5-year Growth %	Yearly Growth %
2001	15,140		
2006	15,570	2.8%	0.6%
2011	16,630	6.4%	1.3%
2016	17,390	4.3%	0.9%
2021	18,352	5.3%	1.1%

Population Growth

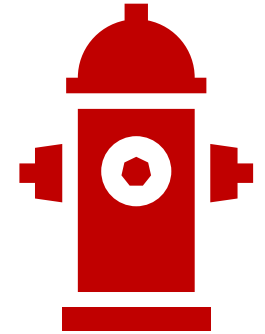
- Develop corresponding population projections based on dwellings
- Assume 2.5 residents per household

Year	Reference Scenario	Revised High Growth
2026	19,450	19,139
2031	20,430	20,814
2036	21,260	22,488
2041	21,960	24,162
2046	22,600	25,906



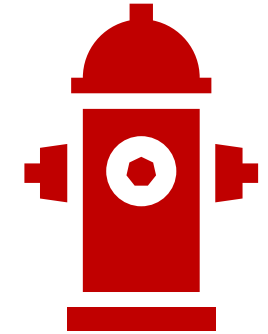
Water and Wastewater Demand

- How will growth impact water and wastewater treatment demand?
- Consider:
 - Residential Demand
 - Industrial, Commercial, and Institutional (ICI) demand
 - Committed but unbuilt residential units
- Use of Equivalent Residential Units (ERUs) for analysis



Water and Wastewater Demand

- Use revised high growth scenarios to calculate residential and ICI demand
 - Assume ICI growth same as residential growth
- Use historical flow data to determine flow/ERU
 - 3-year max day flow for water
 - 3-year average day flow for wastewater
- Repeat process for all 4 plants
 - 2 water (Fairfield and Bath)
 - 2 wastewater (Amherstview and Bath)



Fairfield Water Treatment Plant

- Services Amherstview and Odessa
- Rated capacity: 8,000m³/day
- 4,085 ERUs
 - 4,021 residential
 - 665 ICI

Year	Max day flow / ERU
2016	1.10
2017	1.03
2018	1.02
2019	1.02
2020	1.06
2021	1.00

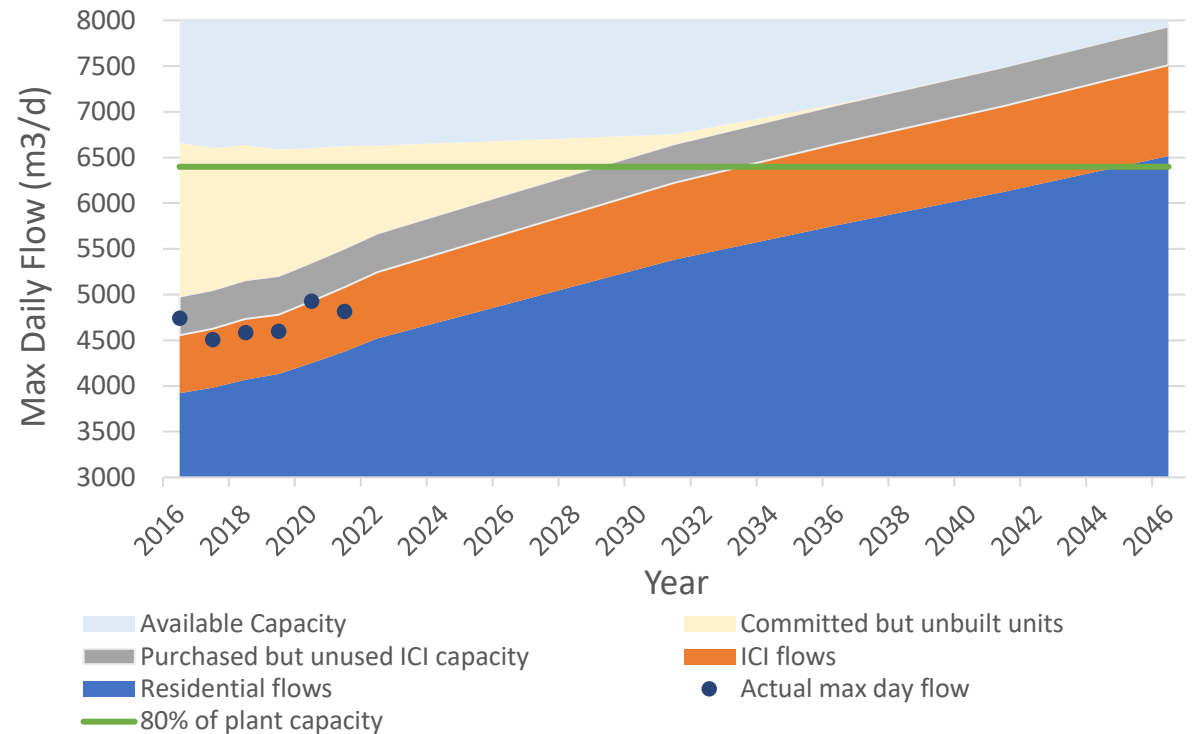
Fairfield Water Treatment Plant

- Services Amherstview and Odessa
- Rated capacity: 8,000m³/day
- 4,085 ERUs
 - 4,021 residential
 - 665 ICI

Year	Max day flow / ERU
2016	1.10
2017	1.03
2018	1.02
2019	1.02
2020	1.06
2021	1.00

Fairfield WTP – Projections

- Potable water demand not projected to exceed plant capacity by 2046
- Potable water demand will reach 80% of capacity around 2033
- Still need to account for available capacity when allocating new capacity



Bath Water Treatment Plant

- Services Bath & CSC Institutions
- Rated capacity: 6,000m³/day
 - CSC: 2,672 m³/day
 - Bath: 3,328 m³/day
- 4,085 ERUs
 - 1,065 residential
 - 389 ICI

Year	Max day flow / ERU
2016	1.25
2017	1.06
2018	1.01
2019	1.05
2020	0.93
2021	0.97

Bath Water Treatment Plant

- Services Bath & CSC Institutions

- Rated capacity: 6,000m³/day

 - CSC: 2,672 m³/day

 - Bath: 3,328 m³/day

- 4,085 ERUs

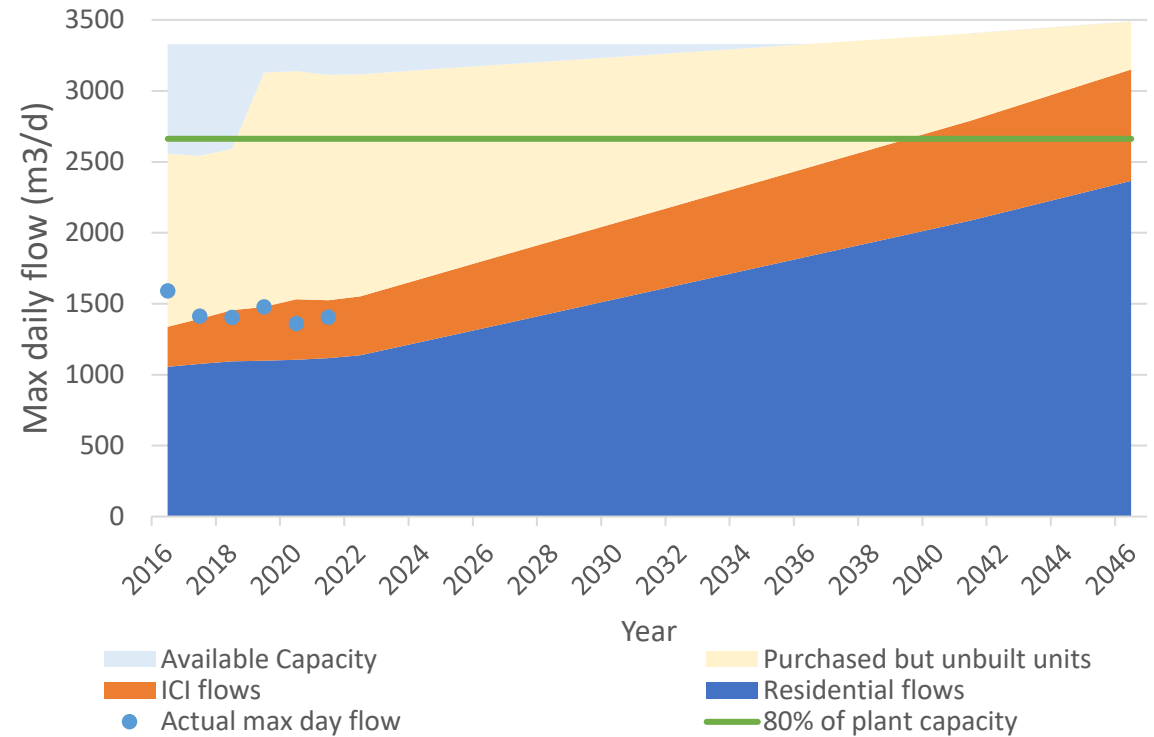
 - 1,065 residential

 - 389 ICI

Year	Max day flow / ERU
2016	1.25
2017	1.06
2018	1.01
2019	1.05
2020	0.93
2021	0.97

Bath WTP – Projections

- Potable water demand not projected to exceed plant capacity by 2046
- Potable water demand will reach 80% of capacity around 2038
- Anticipated that no further capacity will be available for allocation after 2034



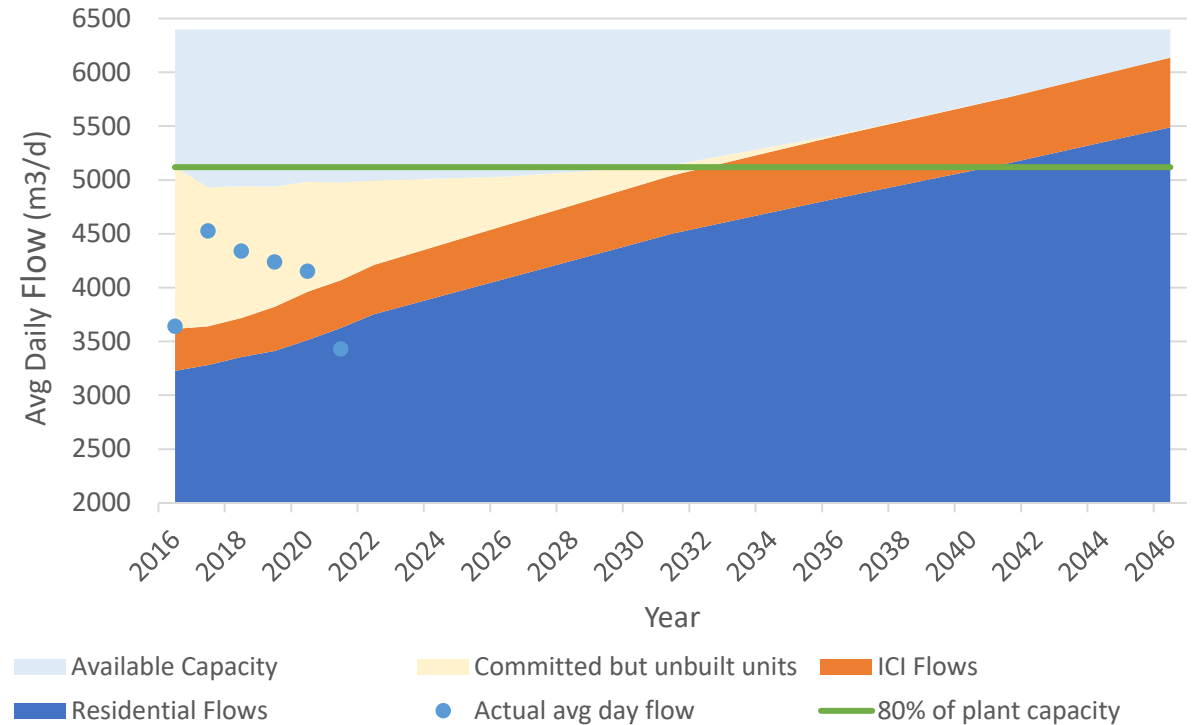
Amherstview Water Pollution Control Plant

- Services Amherstview and Odessa
- Rated capacity: 6,400m³/day
- 4,421 ERUs
 - 3,938 residential
 - 483 ICI

Year	Avg day flow / ERU
2016	0.93
2017	1.14
2018	1.07
2019	1.02
2020	0.96
2021	0.78
3 year avg	0.92

Amherstview WPCP – Projections

- Wastewater treatment demand not expected to exceed plant capacity
- Demand for wastewater treatment will reach 80% of capacity around 2032
- Plant expansion activities not anticipated in foreseeable future but individual treatment processes should be reviewed



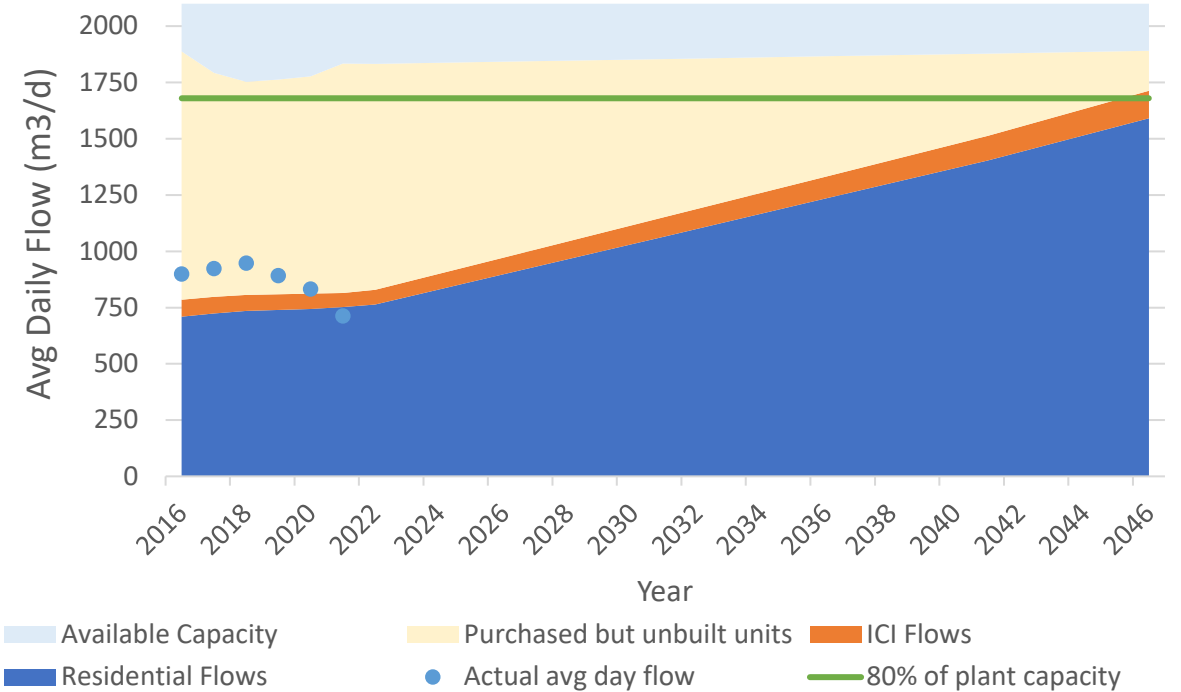
Bath Sewage Treatment

- Services Bath & CSC Institutions
- Rated capacity: 3,008m³/day
 - CSC: 909 m³/day
 - Bath: 2,099 m³/day
- 1,156 ERUs
 - 1,066 residential
 - 90 ICI

Year	Avg day flow / ERU
2016	0.81
2017	0.82
2018	0.83
2019	0.78
2020	0.72
2021	0.62
3 year avg	0.70

Bath STP – Projections

- Wastewater treatment demand not expected to exceed plant capacity
- Demand for wastewater treatment will reach 80% of capacity around 2046
- Plant expansion activities not anticipated in foreseeable future but individual treatment processes should be reviewed



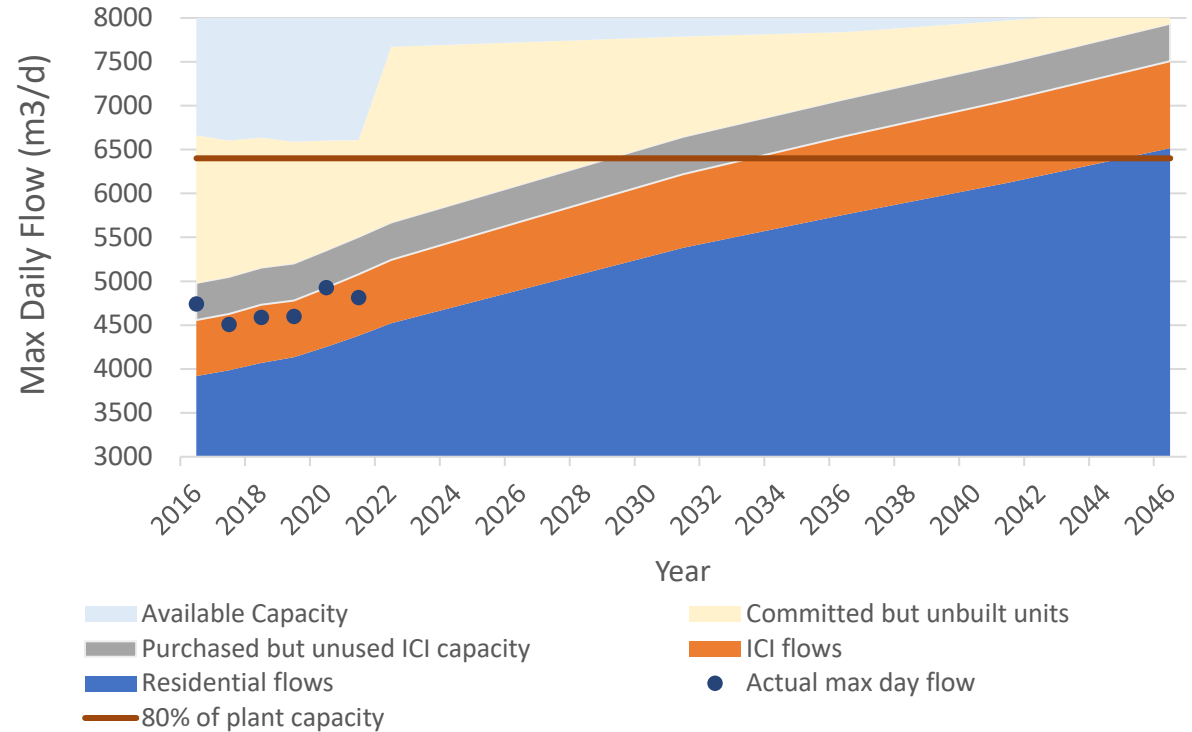
Impacts of Future Capacity Allocation or Heavy ICI Users

- Projected remaining available capacity based on business-as-usual scenario
- Does not account for additional residential capacity allocation or arrival of new heavy ICI user

Plant	Available Capacity (m3/day)	Available Capacity (ERU)
Fairfield WTP	1,377	1,302
Amherstview WPCP	1,423	1,547
Bath WTP	215	205
Fairfield WTP	266	377

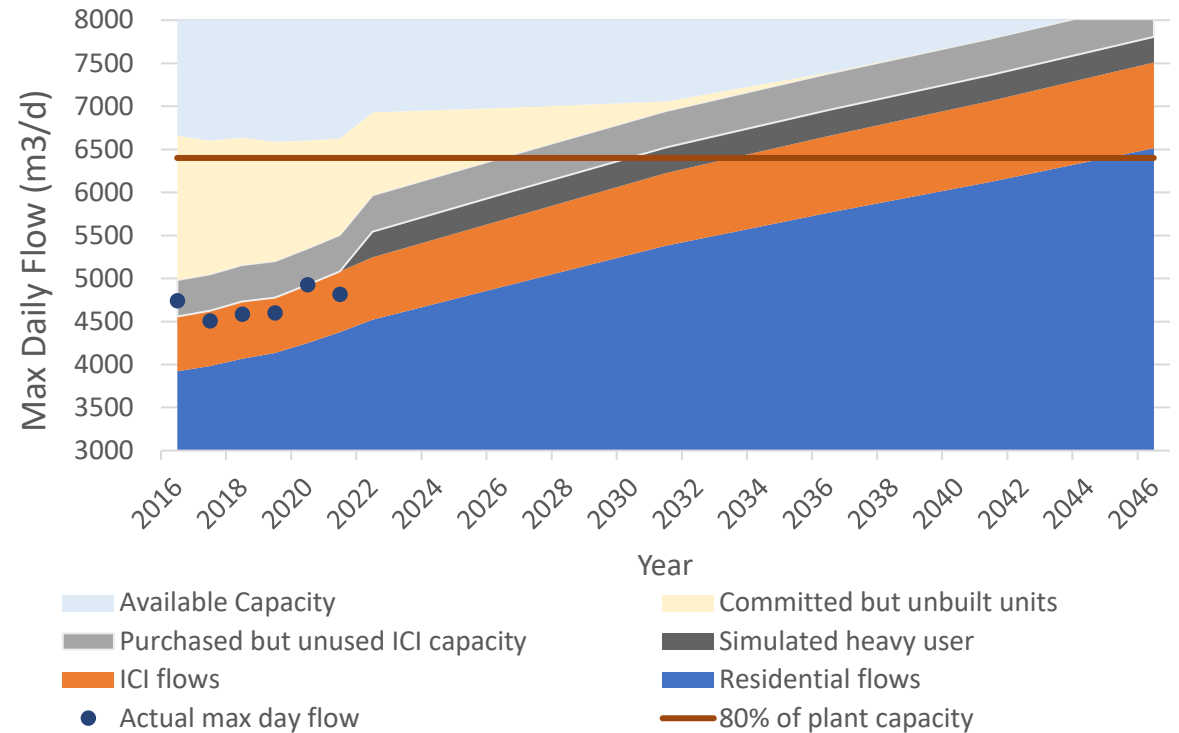
Scenario A

- Allocate 1,000 new residential ERUs in 2022 in Fairfield Water System
- Would not impact potable water production
- Available capacity would reach 0 by 2040



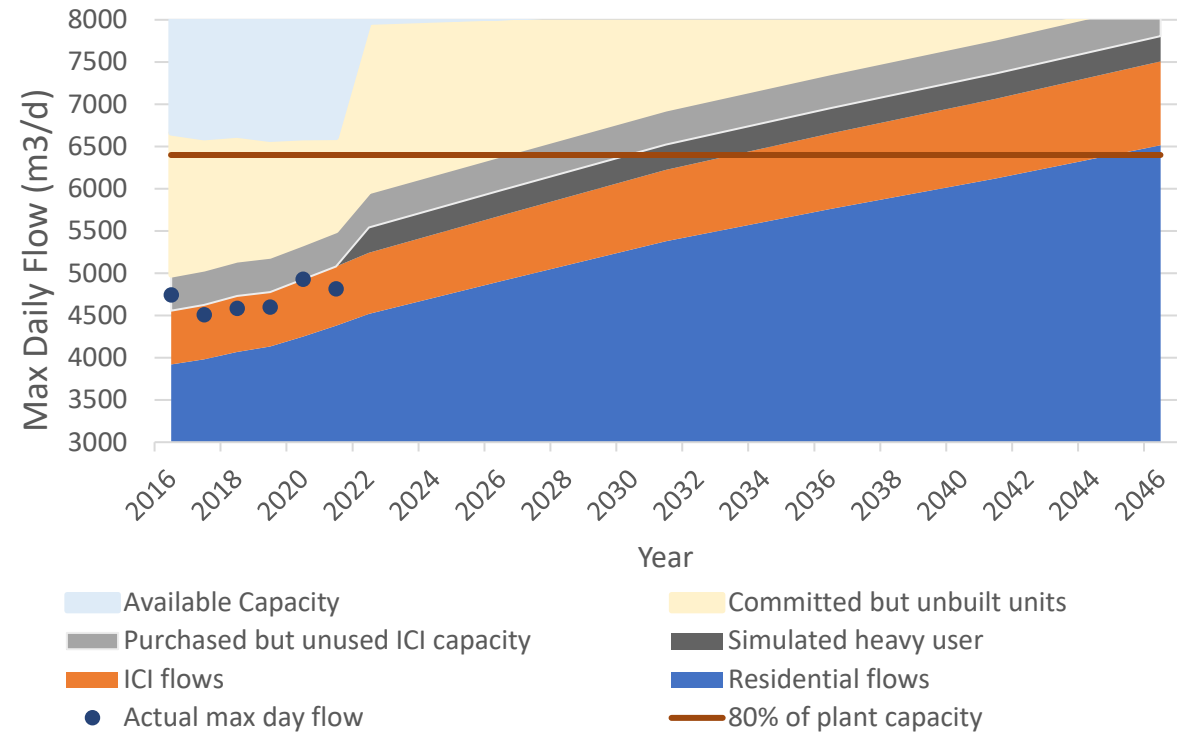
Scenario B

- A new commercial enterprise moves to the Township and asks for 300 m³/day of water capacity from the Fairfield system
- Close the plant's rated capacity by 2046
- 80% threshold would occur ~5 years earlier



Scenario A+B

- Taken individually, both scenarios won't have a significant impact on the Fairfield WTP
- If combined, no more available capacity beyond 2025
- Could impact future growth within the Township



Taylor-Kidd Industrial Park Servicing

Wastewater

Process water
and water for
fire prevention

Potable water

Water and Wastewater Next Steps

- Developer consultation
- Assess the growth plans of the development community
- Compare development needs for capacity with expected growth projections
- Develop appropriate expansion targets based on a combination of:
 - Developers' input
 - Growth projections
 - Financial and operational impacts of expansion
 - Physical constraints at plants, phasing requirements, and regulatory requirements

Any questions on the water and wastewater section?

General questions at the end.





Part 6: Problems and Opportunities

IMP Project Listings

- Listing of all projects within the scope of IMP are in the report appendix
- Presentation will focus on a few examples of how the various themes are analyzed throughout the IMP list of projects
- One practical aspect is that projects identified with a growth component will be partially funded by DC or impost fee revenue.



Transportation: Growth Projects



- Projects in IMP may include more than one theme
- Main Street Bath – Fairfield Street to east limits of village, including Windermere intersection

Transportation: Non-growth Projects

- South Shore Road
 - Shoreline stabilization (Phase II, post 2022 construction program)
Remedial



Transportation: New Technology



- Impacts due to use of autonomous vehicles

Transportation: Regulatory



- Future regulatory changes regarding the use of road salt

Stormwater: Growth Projects



Stormwater: Regulatory



Stormwater: Remedial Projects



- Examine Bath, Odessa, and Amherstview, and address remedial issues for minor and major storms:
 - Review of minor storm system
 - Review major storm system and ability to manage increased storm frequencies and intensities, ability to maintain all outlets and routes

Remedial and Climate Change

Water: Growth Projects



Review adequacy of storage facilities

Water: Remedial Projects



- Review level of non-revenue water and recommend action plan

Water: Regulatory & New Technology



- Emerging contaminants

Wastewater: Growth



- Add second auger at Bath Sewage Treatment Plant inlet screening process

Wastewater: Remedial Projects



- Review the various sub-processes at Bath Sewage Treatment Plant and address remedial needs: headworks, aeration, digester, and clarifiers. Major upgrades anticipated in near and medium term
- Evaluate improvements to sludge management



Wastewater: New Technology



- Potential alternative to provide smaller incremental increases in capacity using modular filters (membranes), to be evaluated against full expansion of tankage

Wastewater: Regulatory



- Potential for new regulations regarding emerging contaminants, i.e., pharmaceuticals, fire retardants



Miscellaneous Topics

- Evaluate developing Township soil storage and or process site that meets the requirements of new provincial Excess Soils Regulation, impacts on future projects
- New regulations...an opportunity?



Council or Public Comments



The best way for anyone to make an inquiry on an element of the IMP project or to ask a question is to submit the question to infrastructuremasterplan@loyalist.ca.

Alternately, individuals can phone with concerns to 613-386-7351, ext. 103.

All inquiries receive written responses.

MCEA requires all consultations be recorded in the project file.

Council Questions?

Dave Thompson dthompson@loyalist.ca

Jenna Campbell jcampbell@loyalist.ca

Rami Maassarani rmaassarani@loyalist.ca