Infrastructure Masterplan

Loyalist Township 2024

Notice of Completion

The Corporation of Loyalist Township
Notice of Study Completion
Infrastructure Masterplan

The Corporation of Loyalist Township has undertaken an Infrastructure Masterplan (IMP) designed to address core infrastructure needs, specifically road right-of-way, potable water, sanitary sewage, and stormwater systems within Loyalist Township to 2046. The study area and identified project locations for all Schedule B and C projects are shown on the key plan attached to this notice.

This study has been conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA), an approved process under the Environmental Assessment Act. The Township has followed Approach 2 as noted in Appendix 4 of the MCEA. The Masterplan incorporates comments received from technical agencies and the public during the study. This is a sufficient level of detail to fulfil the requirements for projects classified as Schedule B in the Municipal Class Environmental Assessment; however, more detailed studies for each of the projects in the Masterplan classified as Schedule C will be done at a later date.

Identified Projects, Schedule B or C

The Masterplan has been completed at a level of detail sufficient to fulfill the requirements of the Municipal Class Environmental Assessment process for the following Schedule B and C projects identified in the Masterplan:

W1 Bath WTP GAC filters and UV disinfection system	**W30** Fairfield Water Treatment Plant expansion to 10,750 m^3
W31 Bath Water Treatment Plant expansion to 7,200 m^3	**San7** Biosolids dewatering and cake storage facility
San41 Amherstview Water Pollution Control Plant expansion to 9,200 m^3	**San42** Bath Sewage Treatment Plant expansion
St1 Harvard Place/Dinosaur Park drainage	**St7** Lodge Street
St8 Factory Lane	**St10** 155 Main Street – Bath
R19 Wing Road Bridge	**R20** Bridge railings

Additionally, following consultation with Indigenous Communities and subject to successful completion of archaeological and/or collector road screening, Loyalist

Township proposes to reclassify the following projects to Exempt status in accordance with the MCEA as amended in 2023:

San1 Amherstview Water Pollution Control Plant peak flow equalization and headworks upgrade

R19 Wing Road Bridge replacement of south structure

T38 Babcock Boulevard collector road extension

T39 New Street “A” collector road

T40 Extension of Windermere Boulevard

Infrastructure Masterplan

The Infrastructure Masterplan report and supporting documentation has been completed and placed on the public record for a 30-day comment period starting on March 14, 2024, and ending on April 13, 2024. The report is available for review online at www.loyalist.ca/infrastructuremasterplan and in person at the Loyalist Township office at 18 Manitou Crescent West, Amherstview, Ontario (appointments requested).

Opportunities for Comment

Interested persons may provide written comments to our Project Team by April 13, 2024. All comments and concerns should be sent directly to:

Luke MacDonald, P.Eng.
Manager of Engineering and Environment
Loyalist Township
263 Main Street, PO Box 70
Odessa, ON K0H 2H0
Email: infrastructuremasterplan@loyalist.ca

In addition, a request may be made to the Ministry of the Environment, Conservation and Parks for an order imposing additional conditions or requiring an individual environmental assessment may be made only on the grounds that the requested order may prevent, mitigate, or remedy adverse impacts on constitutionally protected Indigenous and treaty rights. Requests on other grounds will not be considered. Requests should include the requester contact information and full name and be received by April 13, 2024.

Requests should specify what kind of order is being requested for what project(s) (additional conditions or an individual environmental assessment), explain how an order may prevent, mitigate, or remedy potential adverse impacts, and can include any supporting information.

The request should be sent in writing or by email to:

Ministry of the Environment, Conservation and Parks

777 Bay Street, 5th Floor
Toronto ON M7A 2J3
Email: minister.mecp@ontario.ca

and

Director, Environmental Assessment
Ministry of the Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
Email: EABDirector@ontario.ca

Requests should also be copied to Luke MacDonald, Loyalist Township, by mail or by email (at the address shown above). Please visit the ministry's website for more information on requests for orders under section 16 of the Environmental Assessment act at (https://www.ontario.ca/page/class-environmental-assessments-part-ii-order

This Notice issued March 14, 2024.

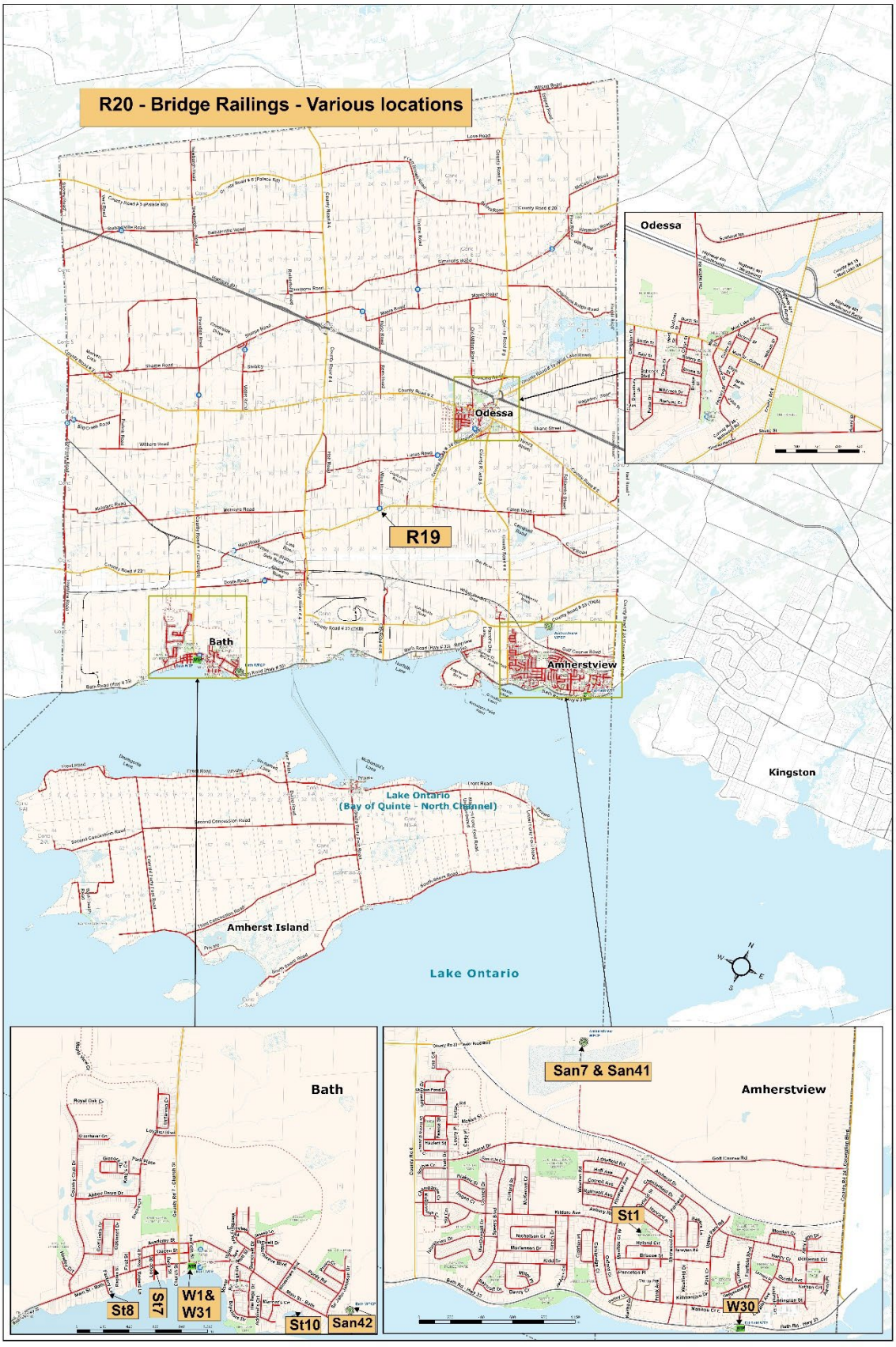
Notice of Collection

All personal information included in your request – such as name, address, telephone number and property location – is collected, under the authority of section 30 of the Environmental Assessment Act and will be used to assist in making a decision on this matter and is collected and maintained for the purpose of creating a record that is available to the general public. As this information is collected for the purpose of a public record, the protection of personal information provided in the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) does not apply. Personal information you submit will become part of a public record that is available to the general public unless you request that your personal information remain confidential. For more information on the collection and use of the personal information, please contact Luke MacDonald at the above address.

Accessibility

If this information is required in an accessible format, please notify the Project contact identified above.

Key Plan


R20 - Bridge Railings - Various locations
Odessa
R19
Bath
Amherstview
Kingston
Lake Ontario
(Bay of Quinte - North Channel)
Amherst Island
Lake Ontario
Bath
St8
St7
W1&
W31
St10
San42
San7 & San41
Amherstview
St1
W30

Executive Summary and List of Projects

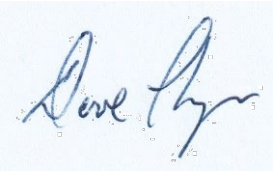
Loyalist Township issued its formal Notice of Commencement of the Infrastructure Masterplan (IMP) on May 21, 2021. This IMP has been designed to identify core infrastructure needs; specifically, road right-of-way, potable water, sanitary sewage, and stormwater systems within Loyalist Township for the next 25 years. The IMP has suggested policies and procedures where it was felt that these policies would support infrastructure.

The study is being conducted in accordance with the requirements of the Municipal Class Environmental Assessment (MCEA), June 2000, as amended in 2015 and 2023; and addresses Phases 1 and 2 of the MCEA process. The Masterplan is intended to follow a "Modified Approach 2", as noted in Appendix 4 of the MCEA. Any projects which fall under the Schedule C category, that are projected with the potential for major environmental impacts such as capacity expansions at water and sanitary sewage treatment facilities, will require further studies and will need to be evaluated under the Phase 3 & 4 processes of the Class EA after this project.

The IMP is designed to be a document that complements the Asset Management Plan (AMP). The IMP will focus on new assets to be constructed or existing assets that require modification for the identified rationale. The IMP list of projects **excludes renewal projects** included in the current version of the AMP; with exceptions where the analysis of the IMP recommends that the normal asset replacement or renewal processes and/or timelines be amended to accommodate the needs of the IMP.

Projects within the Infrastructure Masterplan are supported by five themes, being growth, addressing remedial issues, new legislation/regulations, new technology, and adapting core infrastructure to address climate change. The themes in a general manner identify the problem or opportunity for each project within the IMP.

The table on the following pages presents all projects that are being recommended through the IMP. Many of the projects in this list are considered exempt from the MCEA process, but have been included for a holistic view of infrastructure needs in the Township throughout the study period.



David C. Thompson, P.Eng.

Luke MacDonald, P.Eng.

Category	Project ID	Project	MCEA Schedule	Cost Estimate	Timeline Short 0-5 yr Medium 6-15 yr Long 16-25 yr	DC or Impost Eligible (Y/N)
Water	W1	BWTP - GAC filters and UV disinfection system	Exempt	$8,300,000	Medium	Y - Impost
	W2	BWTP - Raw water intake structure assessment	Exempt	$50,000	Short	N
	W3	BWTP - Chlorine contact tank and clearwell assessment	Exempt	$50,000	Short	N
	W4	BWTP - Pump VFDs (x3 high lift pumps)	Exempt	$120,000	Medium	N
	W5	FWTP - Raw water intake structure assessment	Exempt	$50,000	Short	N
	W6	FWTP - Chlorine contact tank and clearwell assessment	Exempt	$50,000	Short	N
	W7	FWTP - Pump VFDs (x3 high lift pumps)	Exempt	$180,000	Short	N
	W8	WDS - Mott Street PRV	Exempt	$250,000	Medium	N
	W9	WDS - County Road 6, Main Street – Odessa to Millhaven Road Service and Valve Upgrades	Exempt	$90,000	Long	N
	W10	WDS - Bath transmission main (relocation of main to adjacent streets as development continues)	Exempt	$910,426	Long	N
	W11	WDS - Church Street water line update	Exempt	$350,000	Short	N
	W12	WDS - Odessa Main Street reconstruction - oversizing and extending watermain (concurrent with County Road upgrade)	Exempt	$4,562,182	Short	Y - Impost

	W13	WDS - Water Haulers Facility - vehicle protection barrier	Exempt	$30,000	Short	N
	W14	WDS - Upsizing Main Street Bath watermains	Exempt	$519,000	Medium	Y - Impost
	W15	WDS - Lakeside ponds watermains - oversizing and extensions (McKee Street, Speers Boulevard)	Exempt	$500,000	Short	Y - Impost
	W16*	WDS - Amherst Drive watermain - oversizing and extensions	Exempt	$110,200	Long	Y - Impost
	W17*	WDS - Walden Pond Drive watermain - extension	Exempt	Developer Funded	Medium	N
	W18*	WDS - Kildare Drive watermain - extension	Exempt	Developer Funded	Medium	N
	W19	WDS - Babcock Boulevard watermain - extension (Fields of Loyalist)	Exempt	Developer Funded	Medium	N
	W20	WDS - Proposed Street A watermain - establish (Fields of Loyalist)	Exempt	Developer Funded	Medium	N
	W21	WDS - Main Street Odessa watermain - extension (315 Main St. - Shane St. Development)	Exempt	Developer Funded	Short	N
	W22	WDS - Country Club Drive watermain - extension	Exempt	Developer Funded	Short	N
	W23	WDS - Windermere watermain - extension	Exempt	Developer Funded	Long	N
	W24*	WDS - Amherstview West Miscellaneous trunk water connections	Exempt	Developer Funded	Long	N
	W25	WDS - Taylor Kidd watermain extension to County Road 4	Exempt	$1,797,822	Long	Y - Impost
	W26	Storage - EA study on storage options for both distribution systems	Exempt	$100,000	Short	Y - Impost

	W27	Water loss reduction program	Exempt	$20,000	Short	N
	W28	Fairfield WTP plant expansion to 10,750 m^3 (GAC third unit)	C	$850,000	Medium	Y - Impost
	W29	Bath WTP plant expansion to 7,200 m^3 (high lift pumps, low lift pumps, backwash pumps, generator, intake)	C	$3,150,000	Long	Y - Impost
	W30	Water storage - review and update emergency contingency plan	Exempt	NA	Short	N
	W31	Water storage - amend CSC agreements	Exempt	$10,000	Short	N
	W32	WDS - Windermere PRV	Exempt	$250,000	Short	Y - Impost
Sanitary	San1	Amherstview WPCP peak flow equalization and headworks upgrades	B (ASP)	$3,500,000	Short	Y - Impost
	San2	Amherstview WPCP effluent monitoring facility power supply	Exempt	$100,000	Short	N
	San3	Amherstview WPCP, 3 VFD for blowers	Exempt	$210,000	Long	N
	San4	Amherstview WPCP, reduce potable water demand	Exempt	$20,000	Short	N
	San5	Amherstview WPCP test polymer dosing for dewatering	Exempt	$30,000	Short	N
	San6	Amherstview WPCP evaluating hauling costs for different biosolids handling options	Exempt	$10,000	Short	N
	San7	Amherstview WPCP biosolids dewatering and cake storage facility	B	$3,112,000	Medium	Y - Impost
	San8	Bath STP sludge hauling pilot study (capital)	Exempt	$50,000	Short	N

	San9	Bath STP CSC flow monitoring upgrades	Exempt	$40,000	Short	N
	San10	Bath STP, 3 VFD for blowers	Exempt	$90,000	Short	N
	San11	Bath STP reduce potable water demand	Exempt	$20,000	Short	N
	San12	Wet weather sanitary model	Exempt	$250,000	Short	N
	San13	System connection - feasibility study	Exempt	$150,000	Short	Y - Impost
	San14	Bayview Bog Study	Exempt	$15,000	Short	Y - Impost
	San15	Bath SPS #1 pump upgrades	Exempt	$1,197,000	Medium	Y - Impost
	San16	Bath SPS #2 installation of standby generator and flow meter	Exempt	$320,000	Medium	N
	San17	Bath SPS #3 installation of standby generator and flow meter	Exempt	$320,000	Medium	N
	San18	Bath SPS #4 installation of flow meter	Exempt	$20,000	Medium	N
	San19	Islandview SPS installation of flow meter	Exempt	$20,000	Medium	N
	San20	Bridge Street SPS capacity assessment	Exempt	$20,000	Short	N
	San21	Bridge Street SPS capacity upgrades	Exempt	$4,500,000	Medium	Y - Impost
	San22	Lakeview SPS Stage 1, pump #2 replacement	Exempt	$905,000	Short	Y - Impost

	San23	Lakeview SPS Stage 2, facility classification compliance upgrades	Exempt	$600,000	Short	Y - Impost
	San24	Lakeview SPS Stage 3, pumps #1 and #3 replacement	Exempt	$2,300,000	Medium	Y - Impost
	San25	Taylor-Kidd SPS capacity upgrades	Exempt	$3,000,000	Long	Y - Impost
	San26*	Walden Pond Drive extension and oversizing of sewer	Exempt	$58,000	Medium	Y - Impost
	San27*	Oversizing of trunk sewer to Taylor-Kidd Boulevard from Walden Pond Drive extension	Exempt	$70,000	Long	Y - Impost
	San28*	Oversizing of sewer from Walden Pond Drive to Amherst Drive	Exempt	$98,000	Long	Y - Impost
	San29*	County Road 6 and Taylor-Kidd Boulevard sewer extension	Exempt	$35,000	Short	Y - Impost
	San30*	Lakeside Phase 8 sewer extension	Exempt	$28,000	Short	Y - Impost
	San31	McKee Street sewer - establish	Exempt	Developer Funded	Short	N
	San32	Speers Boulevard sewer - extension	Exempt	Developer Funded	Short	N
	San33	Babcock Boulevard sewer - extension (Fields of Loyalist)	Exempt	Developer Funded	Medium	N
	San34	Proposed Street A sewer - establish (Fields of Loyalist)	Exempt	Developer Funded	Medium	N
	San35	Shane Street sewer extension (315 Main Street – Odessa)	Exempt	Developer Funded	Short	N
	San36	Country Club Drive sewer extension	Exempt	Developer Funded	Short	N

	San37	Windermere Boulevard sewer extension	Exempt	Developer Funded	Long	N
	San38	Main Street – Odessa sewer replacement (concurrent with County Road 2 road upgrade)	Exempt	$3,562,061	Short	N
	San39	Review of sewer use and sewage works by-laws	Exempt	$10,000	Short	N
	San40	Additional considerations in Engineering Development Guidelines (I&I, sewer cleanouts, backflow preventers)	Exempt	NA	Short	N
	San41	Amherstview WPCP plant expansion to 9200 m^3 (Aeration tanks, secondary clarifiers, potentially disinfection)	C	$4,500,000	Medium	Y - Impost
	San42	Bath STP plant expansion to 3800 m^3 (headworks, aeration tanks, secondary clarifier, disinfection)	C	$3,000,000	Long	Y - Impost
Stormwater	St1	Harvard Place and Dinosaur Park extension of underground storm sewer to provide major storm relief for Harvard Place	B	$495,354	Long	N
	St2	84 Mortensen Drive swale, catch basin and extend piping to storm system	Exempt	$75,929	Long	N
	St3	Willie Pratt Park drainage improvements	Exempt	$932,995	Medium	N
	St4	Lakeview Park storm outlet, reserve use of land for future enhanced storm outlet	Exempt	NA	NA	N
	St5	2 Quinte Avenue improvement of outlet to street drainage (yard basin or diversion to Quinte swale)	Exempt	$50,077	Medium	N
	St6	Church Street, south of Main Street – Bath, drainage improvements	Exempt	$30,000	Short	N
	St7	Lodge Street from Queen Street to Lake Ontario and Second Street from Main Street – Bath to Queen Street, new storm sewer	B	$848,698	Medium	N

	St8	Factory Lane re-establish ditch outlet and incorporate additional treatment	B	$519,157	Medium	N
	St9	Raglan Street drainage improvements	Exempt	$492,442	Medium	N
	St10	155 Main Street Bath - negotiate easement with owners of 153 Main Street, outlet improvements, inlet requires slope improvements, erosion control, sidewalk protection,	B	$338,133	Short	N
	St11	Odessa comprehensive stormwater review and upgrades - focus on area between Factory Street and Millhaven Creek, Centre Street, Gore Street, Elgin Street, and William Street	Exempt	$1,759,528	Short	N
	St12	Potter Drive, South Street West, Creighton Drive drainage improvements, concurrent with Potter Drive-Main Street – Odessa improvements)	Exempt	$470,000	Short	N
	St13*	Amherstview West - North stormwater management pond	Exempt	$1,185,000	Short	Yes - DC
	St14*	Amherstview West - South stormwater management pond	Exempt	$1,740,000	Short	Yes - DC
	St15	Lakeside Ponds Phase 2 stormwater management pond (near Speers Boulevard)	Exempt	Developer Funded	Short	N
	St16	Fields of Loyalist stormwater management pond expansion of existing facility, same outlet	Exempt	Developer Funded	Short	N
	St17	Shane Street development stormwater management pond (315 Main Street – Odessa)	Exempt	Developer Funded	Short	N
	St18	As road rehabilitation occurs, upgrade stormwater infrastructure where necessary	Exempt	NA	Ongoing	N
	St19	Wilton Road Dam - Safety and Maintenance Improvements	Exempt	$619,000	Short	N
	St20	Millhaven Creek frazil Ice and flood protection	Exempt	TBD	TBD	N

	St21	Babcock Mill Dam Study	Exempt	TBD	TBD	N
	St22	Amherstview evaluation of Keitha Drive and Penny lane drainage deficiencies	Exempt	TBD	Ongoing	N
	St23	Amherstview evaluation of major storm outlet determination, culvert crossing near 18 Amherst Drive	Exempt	TBD	Ongoing	N
	St24	Odessa, Mill Street swale and outlet improvements	Exempt	TBD	Short	N
Roads	R1	Amherst Drive multi-use pathway, Coronation Boulevard to Speers Boulevard	Exempt	$1,632,000	Long	Y - DC
	R2	Main Street – Bath multi-use pathway and urbanization, Centennial Park easterly to village limit	Exempt	$895,000	Medium	Y - DC
	R3	Main Street – Bath multi-use pathway, Centennial Park westerly to village limit	Exempt	$846,000	Long	Y - DC
	R4	Windermere Boulevard intersection	Exempt	$1,800,000	Short	Y - DC
	R5	County Road 6 multi-use pathway, Bath Road/Highway 33 to Taylor-Kidd Boulevard	Exempt	$637,000	Long	Y - DC
	R6	Empey Road multi-use pathway	Exempt	$254,000	Short	Y - DC
	R7	Lakeview Park multi-use pathway	Exempt	$753,000	Medium	Y - DC
	R8	Multi-use pathway connecting Lakeview Park to Amherst Drive	Exempt	$376,000	Medium	Y - DC
	R9	Loyalist East Business Park connection, multi-use pathway connecting the intersection of County Road 6 and Taylor-Kidd Boulevard to Jack Davey Drive	Exempt	$267,000	Short	Y - DC
	R10	Lot 32 Conc 3, multi-use pathway along the unmaintained road allowance between Timmerman Street and Caton Road	Exempt	$588,000	Short	Y - DC

	R11	Marshall Forty-Foot Road allowance conversion to multi-use pathway	Exempt	$214,000	Medium	Y - DC
	R12	Millhaven Creek Corridor continuation of existing multi-use pathway from natural playground to Main Street – Odessa	Exempt	$1,181,178	Long	Y - DC
	R13	Stella Forty-Foot Road multi-use pathway, Amherst Island ferry dock southerly to Lanes End Park	Exempt	$1,446,000	Medium	Y - DC
	R14	Windermere loop multi-use pathway, Briscoe Park westerly to County Road 7	Exempt	$941,000	Long	Y - DC
	R15	Purdy Road sidewalk, eastern limit of Aura by the Lake subdivision easterly to Sir John Johnson Drive	Exempt	$238,000	Long	Y - DC
	R16	Sir John Johnson Drive sidewalk, Main Street – Bath north to Briscoe Park	Exempt	$315,000	Short	Y - DC
	R17	Substandard sidewalk width replacement program (various locations listed in tech memo)	Exempt	$6,129,000	Ongoing	N
	R18	Main Street – Odessa reconstruction: sidewalk and multi-use path construction (concurrent with County Road 2 upgrade)	Exempt	$2,518,106	Short	Y - DC
	R19	Wing Road Bridge (culvert section) replacement	B (ASP)	$236,000	Short	N
	R20	Bridge railing deficiencies (includes 6 locations listed in memo)	A and B	$240,000	Ongoing	N
	R21	Intersection signage review and updates	Exempt	$30,000	Short	N
	R22	Amherst Island - speed limit review and updates	Exempt	$20,000	Short	N
	R23	Replacement of Simmons Road twin culverts at Thorpe Road intersection	Exempt	$372,046	Medium	N
	R24	Replacement of Third Concession Road culvert at Miller Municipal Drain	Exempt	$562,801	Medium	N

	R25	Replacement of Townline Road culvert at Switzerville Road intersection	Exempt	$550,321	Long	N
	R26	By-law/policy updates (administrative improvements listed in tech memo)	Exempt	$10,000	Short	N
	R27	Amherst Drive traffic calming pilot study	Exempt	$400,000	Short	N
	R28	Traffic calming technical reviews on priority roads	Exempt	$100,000	Short	N
	R29	Review of traffic crossing, traffic calming, and parking policies	Exempt	$20,000	Short	N
	R30	Amherst Drive & Speers Boulevard intersection improvements (roundabout)	Exempt	$1,800,000	Long	Y- DC
	R31	Amherst Drive, Speers Boulevard to County Road 6 (urbanization of cross section and road widening)	Exempt	$2,786,349	Short	Y - DC
	R32	McKee Street (collector road)	Exempt	Developer Funded	Short	N
	R33	Speers Boulevard extension (collector road)	Exempt	Developer Funded	Short	N
	R34*	Amherst Drive extension west of County Road 6 (collector road)	C (ASP + CR)	Developer Funded	Long	N
	R35*	Walden Pond Drive extension west of County Road 6 (collector road)	C (ASP + CR)	Developer Funded	Short	N
	R36*	Kildare Drive extension west of County Road 6 (collector road)	C (ASP + CR)	Developer Funded	Short	N
	R37	Babcock Boulevard extension (collector road) Fields of Loyalist	C (ASP + CR)	Developer Funded	Medium	N
	R38	Proposed Street A (collector road) Fields of Loyalist	C (ASP + CR)	Developer Funded	Medium	N

	R39	Country Club Drive extension (collector road)	Exempt	Developer Funded	Short	N
	R40	Windermere extension - collector road	C (ASP + CR)	Developer Funded	Long	N
	R41*	Multi-use pathway around northern stormwater management pond in Amherstview West Secondary Plan	Exempt	$232,000	Short	Y - DC
	R42*	Multi-use pathway from Taylor-Kidd Boulevard to Parrott's Bay	Exempt	$640,000	Long	Y - DC
	R43*	Multi-use pathway from County Road 6 to Parrott's Bay, close to Highway 33 with connection to Kildare Drive extension	Exempt	$672,000	Long	Y - DC
	R44	Multi-use pathway from County Road 6 from Kildare Avenue to Highway 33 (storm requirement with quality control)	Exempt	$1,447,479	Long	Y - DC
	R45*	Multi-use pathway connecting from Amherst Drive extension to Parrott's Bay	Exempt	$300,000	Long	Y - DC
	R46	Roads Garage expansion	Exempt	TBD	Long	Y - DC
	R47	Road maintenance fleet expansion	Exempt	TBD	Ongoing	Y - DC
	R48	EV charger strategy	Exempt	TBD	Ongoing	N
	R49	Waterfront Strategy	Exempt	$100,000	Medium	N
Miscellaneous	M1	Snow dump	Exempt	TBD	TBD	N
	M2	Green infrastructure asset inventory	Exempt	$30,000	Short	N

	M3	Valuation of natural assets and inclusion in Asset Management Plan	Exempt	$200,000	Short	N
	M4	Establish source water protection reserve fund	Exempt	$150,000	Short	N
	M5	Conduct watercourse monitoring program for sediment/suspended solids in Bath	Exempt	$50,000	Short	N
	M6	Complete a source water "budget" study	Exempt	$50,000	Long	N
	M7	Rural groundwater policy updates	Exempt	$10,000	Short	N
	M8	Identifying future employment lands	Exempt	NA	Short	N
	M9	Engineering Development Technical Guidelines	Exempt	NA	Short	N
	M10	Develop detailed workflow procedures	Exempt	$10,000	Medium	N
	M11	Cyber Security Upgrades	Exempt	NA	Ongoing	N

*Subject to separate MCEA Masterplan process and included on this sheet solely to complete future financial evaluations.

The MCEA includes screening processes which may be completed for some Schedule B and C projects to determine if they can be considered exempt.

ASP = Archaeological screening process
CR = Collector road screening process

Land Acknowledgment

Loyalist Township is located on the ancestral lands of the Haudenosaunee, Mississauga, and Omámíwinini Peoples. These lands are recognized in the Two Row Wampum, Dish with One Spoon Treaty, Treaty 27, and the Crawford Purchase.

The shores of Loyalist, the place of white rocks, were a traditional place of gathering, commerce, and peaceful negotiations We are grateful for the opportunity to meet here, and we thank all the generations of people who have cared for, and continue to take care of, the land since time immemorial.

We recognize the past and present systemic harms committed against Indigenous Peoples in Loyalist and throughout Canada. These atrocities have resulted in continual intergenerational trauma and are enabled by racist attitudes and imperialist and colonial ideologies. They include the dispossession of Indigenous Peoples from their ancestral lands, and acts of cultural genocide by the Crown, the government, and the churches.

The Township is committed to moving forward together in the spirit of the Two-Row Wampum and Dish with One Spoon Treaty. This spirit is one of partnership and of serving each other. We will do this by respectfully acknowledging the enduring and continued presence of Indigenous Peoples. As part of this partnership, we will listen to their knowledge, wisdom, and counsel and learning about their history, language, customs, and traditions.

Nya:wen, Miigwetch, Marcí, Thank You

Infrastructure Masterplan Team

The following current and past Loyalist Township staff contributed significantly to the development of this document and the technical memoranda and studies which inform the conclusions herein:

Project lead: David C. Thompson, P.Eng.

Project co-lead: Luke MacDonald, P.Eng.

Former project co-lead: Jenna Campbell, P.Eng.

Marie-Josée Merritt, P.Eng.

Madison Lockwood, E.I.T.

Rami Maassarani, P.Eng.

Joe Gratton, C.Tech.

Shawn Young

Birgit Piberhofer, P.Eng., C.Chem.

Justina Poisson, C.Tech.

Alex Scott, C.Tech.

Cory Grant, C. Tech.

Dan Hendry

Katie Amey

Bailey Labbett-Sands, C.Tech.

Sarah (Doherty) Craig, P.Eng.

Richard Cox, P.Eng.

Laurissa Tassielli

As well as this core group, numerous Loyalist Township staff in both management operational roles contributed their vast expertise and institutional knowledge.

Additionally, the team extend thanks to Chris Wagar and other Infrastructure Services staff at the County of Lennox and Addington for their contribution.

Glossary of Acronyms

Acronym	Meaning
AADT	Annual average daily traffic
AMP	Asset management plan
ATAD	Autothermal thermophilic aerobic digestion
AWPCP	Amherstview Water Pollution Control Plant
BWTP	Bath Water Treatment Plant
C&D	Collection (sewage) and distribution (water)
CLI-ECA	Consolidated Linear Infrastructure Environmental Compliance Approval
CSC	Correctional Services of Canada
DC	Development Charges
DWQMS	Drinking Water Quality Management Standard
DWS	Drinking water system
EA	Environmental assessment
ECA	Environmental compliance approval
FM	Forcemain (sanitary)
FWTP	Fairfield Water Treatment Plant
GHG	Greenhouse gas(es)
I&I	Inflow and infiltration
IDF	Intensity-frequency-duration
IMP	Infrastructure Masterplan
LEBP	Loyalist East Business Park
LID	Low impact development
MCEA	Municipal Class Environmental Assessment
MECP	Ministry of Environment, Conservation, and Parks
MMS	Minimum Maintenance Standards
MTO	Ontario Ministry of Transportation
O.Reg.	Ontario Regulation
OP	Official Plan
PLC	Programmable logic control
PRV	Pressure-reducing valve
QMS	Quality Management System
SCADA	Supervisory control and data acquisition
STP	Sewage treatment plant
SWMF	Stormwater management facility
SWP	Sourcewater protection
TKIP	Taylor-Kidd Industrial Park
TWAS	Thickened waste activated sludge
UCRC	Uncommitted reserve capacity
WAS	Waste activated sludge
WDS	Water distribution system

WM	Watermain
WPCP	Water pollution control plant
WTP	Water treatment plant

How to navigate this document

The digital version of this document has been optimized for navigation in Adobe Acrobat. Please expand the Bookmarks toolbar in Adobe Acrobat or Reader.

Additionally, the section headings/subheadings in the Table of Contents are clickable links, which will jump to the relevant section.

The foundational reports and documentation for this Masterplan are contained in its appendices, with the five files comprising the complete document:

- Appendix Section 1 – Technical Memoranda
- Appendix Section 2 – Project Summaries
- Appendix Section 3 – Consultant Reports
- Appendix Section 4 – Consultation Record

Accessibility

If you require this information in a different format, please contact Loyalist Township at 613-386-7351, ext. 100# during office hours, or email info@loyalist.ca.

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Four appendices accompany this Infrastructure Masterplan under separate cover, and their contents are referenced throughout:

- Appendix 1 – Technical Memoranda
- Appendix 2 – Project Summaries
- Appendix 3 – Consultant Reports
- Appendix 4 – Consultation Record

1. Introduction and Approach to the Infrastructure Masterplan

1.1. Introduction

1.1.1. Purpose

Loyalist Township issued its formal Notice of Commencement of the Infrastructure Masterplan on May 21, 2021.

This IMP has been designed to identify core infrastructure needs; specifically, road right-of-way, potable water, sanitary sewage, and stormwater systems within Loyalist Township for the next 25 years. The IMP has suggested policies and procedures where it was felt that these policies would support infrastructure.

1.2. Approach

1.2.1. Integration with MCEA

The Environmental Assessment Act of Ontario applies specifically to municipal transportation, potable water, sanitary sewage, and stormwater projects. The Province has approved the Municipal Class Environmental Assessment (MCEA) process as an acceptable streamlined approach for the planning of these types of municipal projects that meet the requirements of the Environmental Assessment Act. For larger projects such as the Township's IMP, the process includes a review of technical data, public and agency engagement, Indigenous consultation, and determination of preferred alternatives through the evaluation of environmental, economic, social, and cultural criteria.

In early 2023 the Province of Ontario established an amendment to the MCEA process (Municipal Engineers Association, 2023). Some of the amendments reduce the level of effort required for approvals of some planned projects. Since the Notice of Commencement for this IMP was issued before the 2023 amendments, the Township had a choice, as part of the transition process, to follow the older MCEA requirements or the updated requirements. To be eligible to follow the new requirements, the Township has notified its Indigenous contacts of the proposal to transition to the requirements of the recent amendment. Staff issued this Transition Notice in December 2023. No concerns have been expressed with respect to Indigenous or Treaty rights, the Township will be able to proceed under the 2023 amendment regulations.

The updated MCEA requirements include modifications to the meaning of exempt projects. Exempt projects, most of which were formerly classed as Schedule A and A+ projects, include various municipal maintenance, operational activities, rehabilitation works, minor reconstruction, replacement of existing facilities, and new facilities that are

limited in scale and have minimal adverse effects on the environment. Many projects identified in this IMP meet the requirements for exemption. All projects in the project list marked in green and labeled “Exempt” are not subject to the requirements.

Throughout the project staff have provided notifications to our Indigenous contacts on the status of the project and when archaeological field work was being planned.

This IMP has been conducted in accordance with the requirements of the MCEA and addresses Phases 1 and 2 of the MCEA process. It is intended to follow a “Modified Approach 2” as noted in Appendix 4 of the MCEA.

Phase 1 includes identifying problems and opportunities and may include a discretionary public meeting. IMP project team members have met with operations staff and identified potential projects. A virtual Public Open House introduced the project in June 2021, and in late 2021, surveys were undertaken to gather information from the public regarding active transportation and traffic calming needs. Phase 2 involves identifying alternative solutions to problems identified in Phase 1, developing an inventory of natural and cultural environment, and evaluation of alternative solutions. Phase 2 also includes consultation with the public, agencies, Indigenous communities, and developers.

Any projects that fall under the Schedule C category, with the potential for major environmental impacts such as capacity expansions at water and sanitary sewage treatment facilities, will require further studies and will need to be evaluated under the Phase 3 & 4 processes of the MCEA before proceeding.

1.2.2. Scope and Exclusions

1.2.2.1. Scope

The primary focus of the IMP will be on the Township’s existing and growth-related urban core infrastructure additions and modifications. For the purposes of the IMP core infrastructure is defined as potable water, sanitary, urban stormwater works, and the Township’s urban road and trail network. Water and sanitary infrastructure encompass the entire systems and will include collection and distribution networks, pumping and storage facilities, as well as treatment plants. Roads will mean all elements within the road right-of-way, including the travelled road itself, sidewalks, lighting, and other items as applicable. Road projects include any road related infrastructure within the public right-of-way. Features such as road granular base, pavement, curb and gutter, roadway shoulders, earth grading, barriers, signage, traffic calming features, fencing, lighting, multi-use paths, road markings, sidewalks drainage features are all considered, in broad terms, as road infrastructure. Stormwater will include urban ditches, the stormwater collection network, oil/grit hydrodynamic separators, and stormwater management facilities and related works.

Comments received from various stakeholders throughout the public consultation process were considered, leading to some modifications to the final scope of the project. The project received valuable public feedback, both directly and in response to online surveys. Indigenous communities with interest within Loyalist Township have been notified of the commencement of the IMP and received invitations to archeological field work completed by the Township. Loyalist Township retained a variety of specialists to complete technical evaluations when the level of complexity required of an evaluation exceeded the expertise or capacity of the project team and operations staff.

The ultimate scope of the IMP remained flexible until all of the consultations and technical analysis were complete.

1.2.2.2. Exclusions

The IMP is designed to complement the Asset Management Plan (AMP). It focuses on new assets to be constructed or existing assets that require modification for the identified rationale. The IMP list of projects excludes like-for-like renewal projects included in the current version of the AMP, with exceptions where analysis recommends that the normal asset replacement or renewal processes and/or timelines be amended to accommodate the needs identified in the IMP.

Municipal recreation and office projects that are subject to Planning Act approvals are not subject to the MCEA requirements and have been excluded from the IMP. These projects will be included in the recreation masterplan.

At the time of commencement of the IMP, Loyalist Township was involved in some projects designed to evaluate specific topics of interest. A formal plan for the improvement of rural roads and a local transit service evaluation were projects running concurrently with the IMP, and were expected to be completed prior to the completion of the IMP. Therefore, rural roads and transit were excluded from the IMP.

The Amherst Island ferry docks and the new ferry were projects previously initiated with the Ontario Ministry of Transportation (MTO) as the proponent and owner of these projects, and were therefore excluded from the IMP.

The roads, water, sanitary sewage, and storm sewer systems within the Amherstview West Secondary Plan are being undertaken as an independent masterplan in accordance with MCEA requirements. As such, the IMP is not evaluating any of the projects within the Secondary Plan area; but the project list does acknowledge some of the associated projects for the sake of having a complete list of projects in one document.

Landfill projects are not included in the list of projects covered by the MCEA and have been excluded from the IMP.

The provincial highway and county road systems are administered by upper levels of government; as such, these roads are not included in the masterplan process unless

they impact Township infrastructure in the right-of-way, i.e., underground sewer and water pipes. In many cases the Township owns infrastructure within these rights-of-way.

Local roads and servicing in new subdivisions are subject to Planning Act approvals and not MCEA processes. The IMP does not include new local services on private property. Non-local projects related to development, such as collector roads, watermain extension and oversizing, sewer extension and oversizing, and stormwater management facilities have been listed in the IMP. These projects have been identified in the IMP in order to meet the requirements of the integrated process. The project list clarifies if these projects are funded by the developer or the Township.

None of the proposed projects are expected to be constructed on lands deemed suitable for agriculture. Where there is the potential for a small number of projects to impact agricultural operations, it has been noted that as part of detailed design processes that these impacts be planned for and mitigated.

1.2.3. Themes

The identified projects in the Infrastructure Masterplan are supported by five themes, being growth, addressing remedial issues, new legislation/regulations, new technology, and adapting core infrastructure to address climate change.

Phase 1 of the MCEA refers to “identifying problems or opportunity” of each project, and these themes serve to generally identify the problem or opportunity for each project within the IMP, pointing to the impetus for change and form the problem/opportunity statement.

- Growth: This theme identifies projects that will support growth (residential and employment) in Loyalist Township to the end of the planning horizon.
- Remedial: This recognizes projects that will improve existing Township infrastructure.
- Regulatory: This identifies projects that will be undertaken to address regulatory changes within the term of the IMP study period.
- New Technology: This theme is a driver to identify projects that will help the Township in adapting to new infrastructure related technology that becomes available within the study period.
- Climate Change: This theme has been throughout the IMP when evaluating projects to give consideration towards meeting the Township’s climate action goals.

1.2.4. Financial Analysis

One primary purpose of the IMP is to inform financial policies in the future. This information provided in this study will support the development of future water and

sewer rate studies, impost fee studies, development charges (DC) studies, and long-term capital plans.

The IMP is complementary to the Township's Asset Management Plan. All projects and recommendations in the IMP are either new infrastructure, or improvements to existing infrastructure.

The IMP reflects the capital-intensive costs of delivering infrastructure, with assets that may last for generations. It should be noted that all cost estimates provided in the IMP are Class D estimates, as outlined below. At the time of implementation the costs will need to be updated.

Table 1 Capital cost estimate classification system

Class	Type	Description	Contingency	Level of Accuracy
A	Pre-tender	A detailed estimate based on complete contract documents	5% to 10%	+/- 10%
B	Design level	An estimate based on design completed to a preliminary to detailed level, after site investigations and studies have been completed	10% to 20%	+/- 15%
C	Planning level	A "ball-park" estimate used for planning purposes, prepared based on functional requirements/environmental assessments with limited site information	20% to 30%	+/- 20%
D	Conceptual level	A rough order-of-magnitude estimate used for comparison based on historical costs for similar work	40% to 50%	+/- 25%

Choices made during the design and implementation of some IMP projects will have a major impact on some departmental operations costs.

1.2.5. Consultation

An integrated public and stakeholder consultation strategy began with the Notice of Commencement issued on June 1, 2021, advertised to the public by digital and print media.

A detailed page was maintained on the Township's website throughout the development of the IMP, including an evolving project list. At all times throughout the process, a

dedicated IMP email address was maintained to receive feedback and submissions, and for the project team to respond to these.

Directed engagement opportunities included public information sessions, several presentations to Loyalist Township Council throughout the process, public surveys on specific topics of interest, focused discussions with local developers and agencies, and consultation with/participation by Indigenous Nations.

A detailed summary of engagement is provided in Appendix Section 4.

1.2.6. Planning Horizon

The IMP has a 25-year study term. Initiated in 2021, the term therefore has a view to 2046. Infrastructure requirements inside this horizon have been determined using the five key themes as a basis for identifying projects.

1.2.7. Council Endorsement

Once endorsed by Council, the IMP becomes a policy document for Loyalist Township. It should be noted that the included cost estimates are not approved project budgets; and will need to be revisited regularly and as projects approach implementation. Loyalist Township Council is the formal authority to approve individual project budgets prior to implementation.

2. Infrastructure Policy

2.1. Policy Directions

In general, infrastructure policies identify the mechanisms by which services for new growth will be provided, how levels of service will be established, and the limitations and restrictions on infrastructure services, both existing and new growth. The goal is to provide efficient, safe, and socially and environmentally sound infrastructure.

2.1.1. Municipal Class Environmental Assessment (2023)

The Environmental Assessment Act (EAA) allows for certain “classes” of routine projects with predictable environmental effects that can be readily managed to follow a streamlined Environmental Assessment process, referred to as a Class EA. Provided the approved process is followed, projects and activities included in a Class EA do not require individual review and approval under the EAA. This project is being conducted in accordance with the Municipal Class Environmental Assessment (MCEA) process, described in the MCEA guide prepared by the Municipal Engineers Association (MEA) (October 2000, as amended in 2007, 2011, 2015, & 2023).

The Class EA planning process requires the integration of sound engineering judgement, prudent long-term planning, and protection of all aspects of the environment (natural, social, economic, and cultural). This includes consultation with the public and affected agencies to obtain comments and input throughout the decision-making process before identifying a preferred alternative. The overall result of the Class EA process is the identification of a recommended plan that considers and minimizes impacts on the environment.

The MCEA process is made up of five phases: (1) definition of problems/opportunities; (2) development and evaluation of alternative solutions; (3) development and evaluation of alternative design concepts; (4) preparation of an Environmental Study Report for public review; and (5) implementation. Since projects undertaken by municipalities can vary in their environmental impact, projects are classified under the MCEA in terms of “Schedules.” The project Schedule dictates which phases of the MCEA process must be completed before proceeding to implementation.

2.1.2. Asset Management Plan

The Asset Management Plan (AMP) is a key strategic tool for the municipality to manage its long-term capital budget and funding requirements. Municipalities deliver many services that are critical to residents and these services rely on well-planned, well-built, and well-maintained infrastructure. Municipalities in Ontario are required to complete an Asset Management Plan that meets all requirements outlined within Ontario Regulation 588/17. A thorough AMP will communicate the investment required

to sustain delivery of services associated with the desired infrastructure levels of service.

The Township's AMP includes all assets owned and capitalized by the Township, with additional prescriptive information on Core Assets. Furthermore, the plan provides the respective financial obligations of all asset categories required to maintain the Township's current Levels of Service.

2.1.3. Strategic Plan

The Loyalist Township Strategic Plan outlines strategic priorities, objectives, and initiatives that will guide the direction of the community for the next four years. The Township is currently undergoing the process of updating the Strategic Plan for 2024-2027. The Strategic Plan update involves consultation with staff and residents. Staff involved with the IMP process have provided feedback to ensure the goals of the IMP were considered in the update.

2.1.4. Financial Policies

Loyalist Township has a variety of financial policies and strategies that help inform how different infrastructure projects are funded. The IMP will be used along with the Asset Management Plan to form the foundation for developing various financial policies in the Township. These policies include:

- Impost fee studies: All water and sanitary infrastructure projects related to growth are evaluated to update Township impost fees every 5 years.
- Development charges: Infrastructure that supports new development in Loyalist Township, based on the requirements stated in the Development Charges Act, are evaluated to update Township Development Charges every 5 years.
- Asset Management Plan Policy: All existing infrastructure is categorized based on condition and/or age of the asset and analyzed to develop annual capital programs.
- Water and sewer rates: Operational costs and remedial projects associated with water and sanitary infrastructure are used to develop Loyalist Township water and sewer rates.
- General rate: Operational expenses and the Asset Management Plan are analyzed to develop total general rate budgets.
- Reserve and Reserve Fund Policy: Establishes targets for increasing contributions to the capital reserve fund, including asset management, in order to close the infrastructure gap.

In addition to the financial strategies and policies outlined above, the municipality will make the most of opportunities to use grant funding where possible. Debt financing may also be used for projects, in accordance with Township policies.

2.1.5. Climate Action Plan

The International Council for Local Environmental Initiatives' (ICLEI) Local Governments for Sustainability is a network of more than 2,500 local and regional governments in over 125 countries, committed to sustainable urban development. ICLEI has partnered with the Federation of Canadian Municipalities (FCM) to create the Partners for Climate Protection (PCP) program for assist members to quantify, monitor, and manage greenhouse gas (GHG) emissions generated locally.

Figure 1 Five milestones in the Partners for Climate Protection program

Through the PCP program, our community built the ResiLienT Loyalist Township Climate Action Plan (Corporation of Loyalist Township, 2021). ResiLienT Loyalist Township is a set of strategies intended to guide community efforts for reducing greenhouse gas emissions (GHG), improve our health, grow our local economy, and increase social equity. On February 8th, 2021, Council unanimously passed the motion to accept the ResiLienT Loyalist Township Climate Action Plan to act as a road map for local action and keep climate action as a priority for decisions.

The ResiLienT Loyalist Township Climate Action Plan contains goals and strategies for both the Loyalist Township corporate and community reductions. With a corporate GHG reduction target of a 49% reduction in GHG emissions below 2016 levels by 2031 & a community GHG reduction target of 25% below 2017 levels by 2031 was approved by Council in November 2020.

The IMP was developed with consideration for the goals set out in the ResiLienT Loyalist Township Climate Action Plan.

In 2021 Township staff and other stakeholders participated with ICLEI in the development of the Loyalist Climate Science Report, intended to provide a high-level overview of the anticipated local impacts of climate change under several scenarios, and how these may affect Township infrastructure (ICLEI, 2021). The findings of this report were subsequently referenced extensively throughout the technical memoranda that form the conclusions of this IMP.

2.1.6. Loyalist Township Official Plan

The Official Plan (OP) is the policy structure the Township uses to manage and direct land use planning and development. The OP outlines the Township's goals and objectives, states our policies, and identifies how we will achieve our goals by following our policies. The OP guides how the municipality will grow and develop until 2036.

Loyalist Township adopted the Official Plan Comprehensive Review Amendment on September 27, 2021. Subsequently, the County of Lennox and Addington approved it, with two modifications, on March 23, 2022.

2.1.7. Amherstview West Secondary Plan

Amherstview is experiencing the most rapid growth of Loyalist Township's three (3) urban settlement areas. Housing demand is outpacing population growth and average household size is declining; as such, existing residential land supply is expected to last five (5) to ten (10) years in the community. Proximity to the City of Kingston to the east has also influenced the distribution of growth in Loyalist Township and in Amherstview, where residential growth in the Township is focused.

To plan for the growing population, Loyalist Township has retained WSP Canada Inc. (WSP) to prepare a Secondary Plan and Master Plan in accordance with the Municipal Class Environmental Assessment (MCEA) process to plan for the future community of Amherstview West. The Secondary Plan will provide a policy and implementation framework to guide the future growth and development of Amherstview West to the year 2046. The plan will consider future needs and priorities for the new community, including housing types, urban design, community amenities, protection of the natural environment, servicing, stormwater management, and transportation, including active transportation.

This is a separate master planning process to the IMP but is proceeding along a similar timeframe. Projects resulting from the Amherstview West Secondary Plan have been noted in the IMP for a holistic view of projects in the Township; however, approval of these projects are subject to their respective master plan

2.1.8. Provincial Policy Statement

The Provincial Policy Statement (PPS) is an integral part of Ontario's planning system (Province of Ontario, 2020). The PPS sets policy direction on matters of provincial

interest related to land use planning, growth management, environmental protection, public health, and public safety, while aiming to provide a stronger policy structure that guides communities in Ontario toward a higher quality of life and a better long-term future.

The PPS establishes the various municipalities' roles in planning for growth, intensification, and redevelopment. New settlement area policies will only permit expansions when it is demonstrated that opportunities for growth are not available through intensification or redevelopment or in designated areas. The PPS also requires municipalities to coordinate and provide direction on policies with cross-municipal boundaries, such as natural heritage systems and resource management. The PPS provides the basis or context for all Provincial Plans and Municipal Official Plans.

The PPS outlines policies and policy reviews related to water, sanitary, and stormwater infrastructure planning. These policies are based on addressing long-term population projections while creating sustainable, reliable, and financially feasible resources for the Province.

2.1.9. Other Related Documents & Policies

In addition to the policies and documents described above, the following have also been considered through the IMP development:

- Cataraqui Region Conservation Authority (CRCA) Source Protection Plan (2014)
- County of Lennox & Addington Transportation Master Plan (2014)
- City of Kingston Transportation Plan (2015)
- Loyalist Township Recreation Master Plan (2017)
- Loyalist Township Rural Roads Improvement Plan (In Progress)
- Lake Ontario Waterfront Trail Policy (2007)
- Agreements with Correctional Services of Canada (Water – 2006, Sanitary – 1994)
- The Township's Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) (2023)
- Loyalist Township Zoning By-law (2001)

2.2. Infrastructure Planning

2.2.1. Infrastructure Design Standards and Guidelines

Infrastructure projects are designed based on standards and guidelines established by the Township. Township staff have recently compiled an Engineering Development Technical Guidelines policy that is anticipated to be adopted in 2024. This policy is the first comprehensive document of its kind to be utilized within the Township. These guidelines will provide a technical framework for the development of future infrastructure

projects in the Township and thereby improve consistency across projects and developments.

2.2.2. Long-term Infrastructure Planning

Historically, the policies and documents highlighted above have been combined with staff's knowledge and observations to inform infrastructure planning. When adopted the IMP will be used as the basis for future infrastructure planning. The master planning process will be repeated regularly to update and alter the recommendations made through this foundational IMP study.

2.2.3. By-law and Policy Updates

While developing the IMP, a number of existing by-laws and policies were identified as needing updates. Additionally, some new policies must be developed. They will need to be drafted such that they support infrastructure and improve methods of maintaining infrastructure information.

Staff have created a tracking list for by-law and policy updates to monitor progress in this regard. As an example, a by-law on water and sanitary sewage capacity allocation is currently in development, for anticipated adoption in 2024. This will inform how treatment plant capacity is allocated and assist staff to plan the timing of plant expansion.

3. Land Use, Population, and Employment Considerations

Infrastructure planning is dependent on growth patterns and trends, as well as how land is being used by residents and industries. The basis for this data has been gathered from the 2021 Census. Data from building permits and utilities connections were referenced to help inform growth rates.

3.1. Land Use

The Township's Zoning By-law informs how land may or may not be used within the Township. Lands are designated by zones with various classifications and permitted uses, all of which are detailed in the by-law.

3.2. Census Data

The most recent Census of Population was conducted in 2021 (Government of Canada, 2021). The data following was obtained during that census.

3.2.1. Population

The 2021 Census reported the population of Loyalist Township as 17,943. This is an increase of 5.7%, or 972 individuals, from the 2016 Census. Based on building permit data, the majority of this growth is happening in the Township's urban centres, being Amherstview, Odessa, and Bath.

3.2.2. Households

In 2021 there were 6,380 households in the Township. The average household size in Loyalist Township is 2.5, with 42.3% of households consisting of 2 persons. The average household size did not change from 2016's data.

3.2.3. Dwelling Types

Single-family detached dwellings comprise 78.3% of residential dwellings, followed by row houses at 8.6%, apartment in building that <5 storeys at 5.6%, and semi-detached houses at 4.1%.

3.2.4. Industrial, Commercial, and Institutional Activity

The County of Lennox and Addington conducted a Growth Analysis and Urban Land Needs Report in 2023. This report noted that 36% of employment area land in Loyalist Township is industrial, 14% is commercial, and 18% is institutional.

3.2.5. Employment

The population of Loyalist Township aged 15 years and over is 14,095. 8,375 individuals are identified as belonging to the labour force. Of these, 7,555 are employed and 815

are unemployed. 5,720 are identified as not in the labour force. The employment rate of Loyalist Township is 53.6%, and the unemployment rate is 9.7%.

3.3. Growth Expectations

3.3.1. Growth Projections

In 2016, Loyalist Township was home to 17,390 residents living in 6,430 households. Most of this population, approximately 80%, was spread out over the Township's three main urban centres: Amherstview, Bath, and Odessa, with the balance residing on Amherst Island or in rural areas and Hamlets spread out across the Township.

A housing and employment projections study for Loyalist Township was undertaken by the Hemson Consulting Ltd. Group in September 2019. The growth study found that the Township experienced moderate growth between 2001 and 2016, with housing growth outpacing population growth. The disparity between these growth rates was attributed to a reduction in average household size.

The growth study went on to project moderate growth in Loyalist Township between 2016 and 2046, with housing growth predicted to outpace population growth due to a continued anticipated decline in average household size. Modest employment growth is also expected over the same period, reflecting a continued shift towards service-based sectors and some growth in traditional industries.

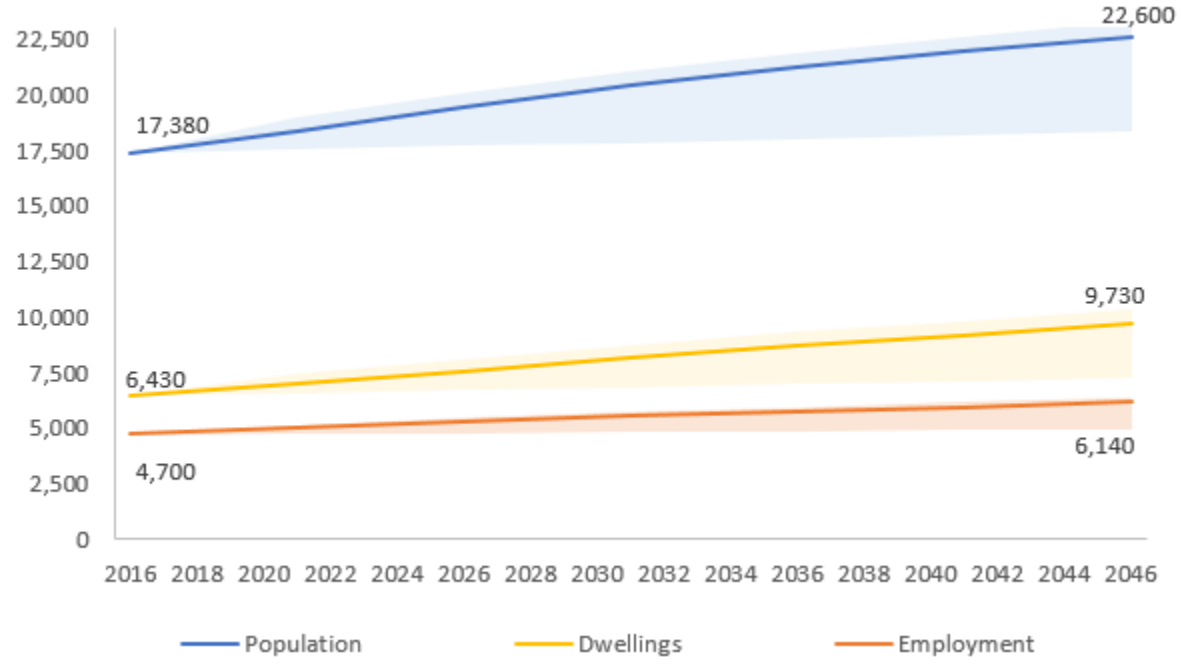

Figure 2 Projected population, household, and employment growth rates in the study period

It should be noted that the above projections were sourced from the Growth Study's Reference Scenario, which can be described as the most likely projected outcome. Low and High scenarios were also presented in the Growth Study and presents the range which the projections may fall within.

Trends observed in the number of yearly building permits issued by the Township since 2016 suggested that the number of new residential dwellings has increased at a faster rate than projected by the Growth Study's reference scenario. The calculated number of residential dwellings up to the end of 2021 was compared to the number of households projected in the Reference Scenario of the growth study for each of the four different areas within the Township (Amherstview, Odessa, Bath, as well as Amherst Island and the rural areas of the Township).

Table 2 Projected compared with actual growth, by geographical area

	2016 Census	2021 Projections (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%**

The following observations can be made from Table 2:

- Growth in Amherstview matched the projections presented in the reference scenario of the Growth Study;
- Observed household growth in Odessa was substantially higher than predicted by the Growth Study;
- Growth in Bath was lower than predicted by the Growth Study; and
- Growth in the rural areas of the Township and on Amherst Island were slightly higher than anticipated.

Based on these observations, and in addition to observed growth trends in the area, it was concluded that a modified version of the High Scenario presented in the Growth Study should be developed to support the Infrastructure Master Plan.

The high growth rates observed in certain areas of the Township in the previous two to three years, most notably in Odessa, would suggest that more aggressive growth models should be used to forecast upcoming growth. However, historical data suggest that, while growth rates for a few years between 2016 and 2021 may have been higher

than usual, overall growth in that five-year period was within range of what has previously been experienced:

Table 3 Annual growth averages, 2006-2021

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%

As such, it was determined that, the High Growth Scenario presented in the Growth Study, with a few modifications, would be most suitable to model growth within Loyalist Township until 2046. The revised model includes the following assumptions:

- Growth in Amherstview will continue to follow the projections laid out in the Growth Study Reference Scenario. This is consistent with the assumptions made as part of the Amherstview West Secondary Plan review.
- Growth in Bath will follow the High Growth scenario from the Growth Study. Although observed data suggests that growth in this area has been lower than initially projected, recent servicing completed in the area by local developers indicate that rapid growth is expected in the near future. As such, planning for higher growth rates in Bath as part of the IMP process was deemed to be prudent.
- Growth in Odessa will follow the High Growth Scenario for the Growth Study.
- The incremental growth in Amherstview (i.e. the difference in projected dwellings under the reference scenario and high growth scenario) would be redistributed to Odessa.
- A portion, approximately 30%, of the incremental growth in Amherst Island and rural areas of the Township (i.e. the difference in projected dwellings under the reference scenario and high growth scenario) would also be redistributed to Odessa.

Table 4 Projected dwellings in 2046 under reference and revised high growth scenarios

	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**

For the purpose of the IMP, it is generally assumed that linear growth will occur between 2021 and 2046. While growth is unlikely to occur in a linear fashion over the course of 25 years, this assumption will be sufficient to plan for the Township's infrastructure needs over the course of the study period. Growth projections for each of the four study areas are further detailed as follows:

3.3.1.1. Amherstview

The observed and projected number of residential dwellings in Amherstview between 2016 and 2046 is illustrated below. This demonstrates that observed growth patterns, based on the number of building permits issued in each year, closely followed the projections presented in the Reference Scenario of the growth study.

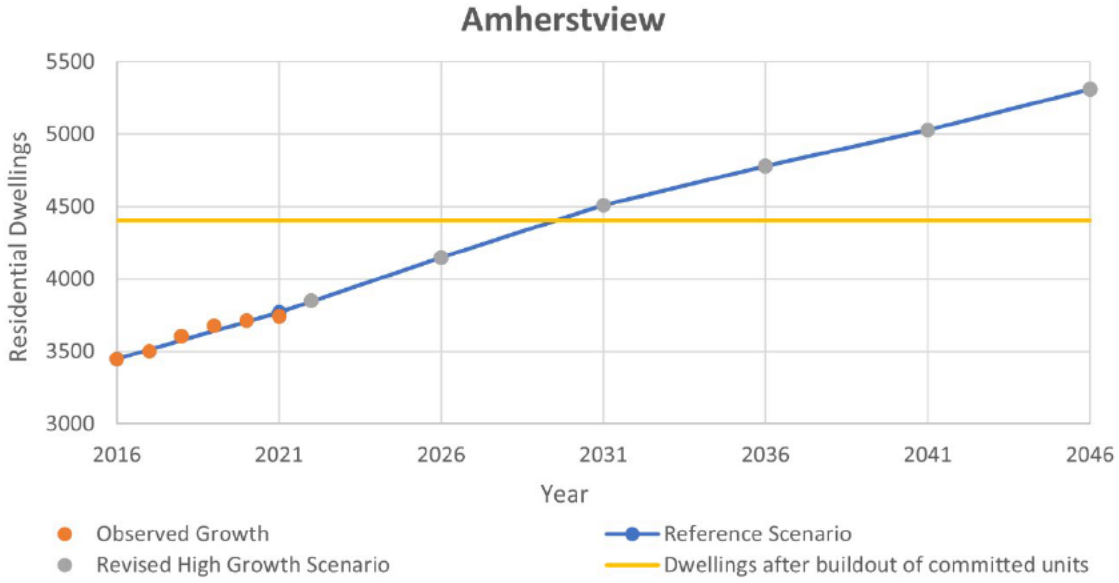

Figure 3 Growth projections and observed growth in Amherstview

- Observed Growth: Actual growth in the specified area based on the number of building permits that have been issued each year.
- Reference Scenario: The growth scenario presented in the Hemson Growth Study as the most likely projected outcome.
- Revised High Growth Scenario: A modified version of the High Growth Scenario presented in the Hemson Growth Study, to be used in the IMP.
- Dwellings after Buildout of Committed Units: The complete number of dwellings that will exist after approved developments have been constructed.

3.3.1.2. Bath

The increase in dwellings observed in the community of Bath between 2016 and 2021 was slightly lower than what was projected in the Growth Study's Reference Scenario. Approximately 1,214 residential dwellings were estimated in the area by the end 2021, compared to projected 1,310 projected by the Growth Study's Reference Scenario. However, based on feedback from local developers and servicing of ample new development that is in progress or was completed in late 2021, rapid growth is expected in Bath in the near future, prompting a need to develop a Revised High Growth scenario for Bath. Staff noted that in early 2022 there was an unprecedented level of almost 200 recently serviced lots within the community and this vacant inventory supports the use of the Revised High Growth Scenario for the purposes of infrastructure planning.

The figure below illustrates the observed growth in residential dwellings in Bath between 2016 and 2021 and compares the Reference Scenario to the Revised High Growth Scenario which will be used as part of the Infrastructure Master Plan.

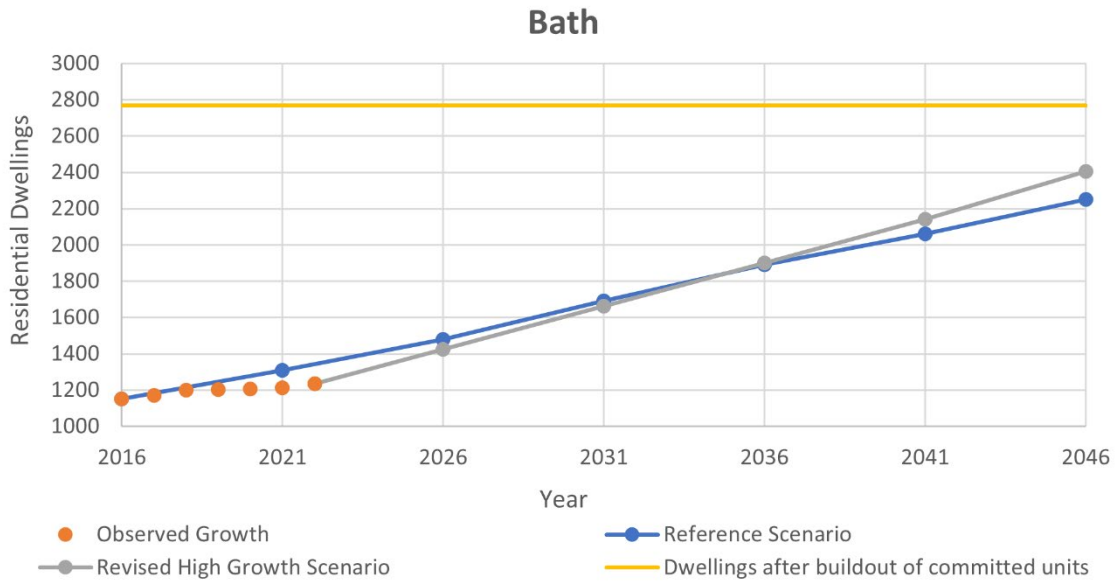

Figure 4 Growth projections and observed growth in Bath

- Observed Growth: Actual growth in the specified area based on the number of building permits that have been issued each year.
- Reference Scenario: The growth scenario presented in the Hemson Growth Study as the most likely projected outcome.
- Revised High Growth Scenario: A modified version of the High Growth Scenario presented in the Hemson Growth Study, to be used in the IMP.
- Dwellings after Buildout of Committed Units: The complete number of dwellings that will exist after approved developments have been constructed.

It should be noted that the vast majority of committed-but-unbuilt units in Bath are under the control of closely linked development corporations, as opposed to multiple individual

entities. Committed-but-unbuilt units are dwellings that have been approved for development by the Township but have not yet been constructed. As such, growth in Bath will likely be controlled, to a degree, by these corporations. Based on the projected increase in dwellings for this area, it is expected that the committed-but-unbuilt units will not be constructed in their entirety by the end of the study period.

3.3.1.3. Odessa

Based on the number of building permits issued between 2016 and 2021, the increase in dwellings in Odessa significantly surpassed the expected growth rates presented in the Growth Study's Reference Scenario. Approximately 650 residential dwellings were estimated in the area by 2021, compared to the 510 projected by the Growth Study's Reference Scenario. As additional context, the 650-dwelling threshold for Odessa was not predicted to be passed until 2041 under the Reference Scenario presented in the Growth Study.

The figure below illustrates the observed growth in residential dwellings in Odessa between 2016 and 2021 and compares the Reference Scenario to the Revised High Growth Scenario which will be used as part of the Infrastructure Master Plan.

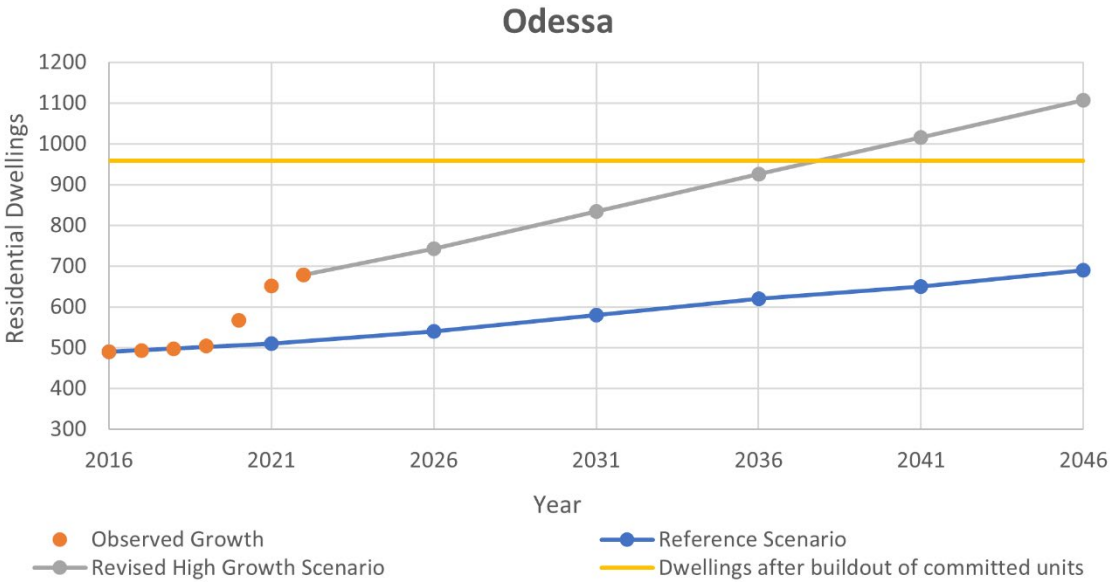

Figure 5 Growth projections and observed growth in Odessa

- Observed Growth: Actual growth in the specified area based on the number of building permits that have been issued each year.
- Reference Scenario: The growth scenario presented in the Hemson Growth Study as the most likely projected outcome.
- Revised High Growth Scenario: A modified version of the High Growth Scenario presented in the Hemson Growth Study, to be used in the IMP.
- Dwellings after Buildout of Committed Units: The complete number of dwellings that will exist after approved developments have been constructed.

Prior to completing the sanitary sewer force main to Amherstview in 2008 the community of Odessa was constrained by a combination of potable water and sanitary sewage treatment capacity limitations for several decades. As a result, Odessa had limited ability to grow even though its location close to County Road 2 and Highway 401 were very favourable. Once the water and sewer constraints were removed growth momentum was stronger than expected in Odessa.

3.3.1.4. Amherst Island and rural areas

The increase in dwellings observed in Amherst Island and rural areas of the Township between 2016 and 2021 was higher than the growth rates projected in the Growth Study's Reference Scenario. Approximately 1,396 residential dwellings were estimated in these areas by the end 2021, compared to projected 1,370 projected by the Growth Study's Reference Scenario. As such, a Revised High Growth Scenario was developed for Amherst Island and Rural Areas of the Township.

The figure below illustrates the observed growth in residential dwellings in Amherst Island and rural areas of the Township between 2016 and 2021. The figure also compares the Reference Scenario to the Revised High Growth Scenario which will be used in the IMP.

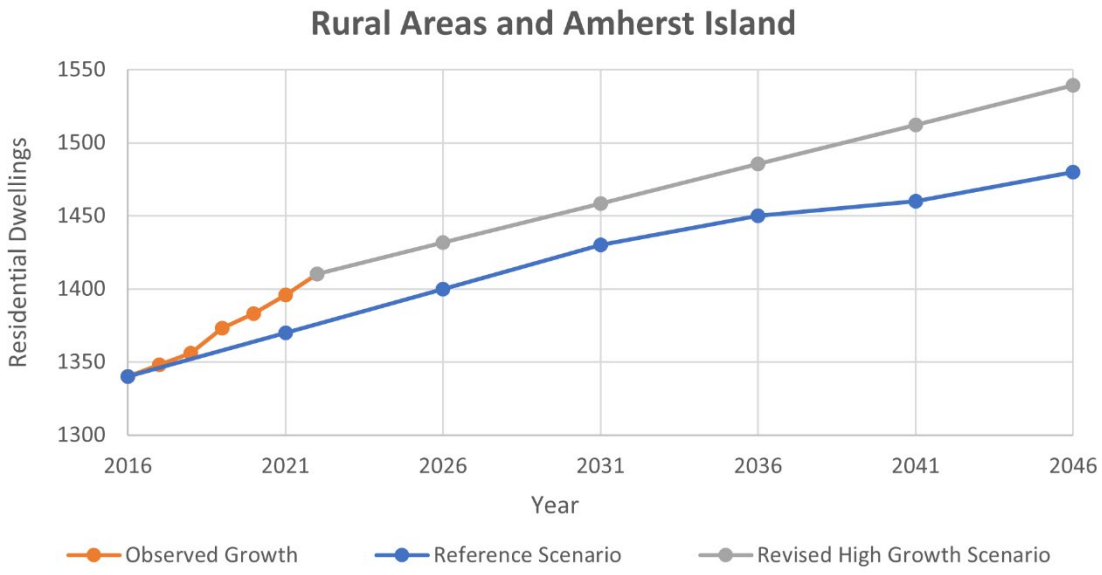

Figure 6 Growth projections and observed growth on Amherst Island and rural Loyalist Township

- Observed Growth: Actual growth in the specified area based on the number of building permits that have been issued each year.
- Reference Scenario: The growth scenario presented in the Hemson Growth Study as the most likely projected outcome.
- Revised High Growth Scenario: A modified version of the High Growth Scenario presented in the Hemson Growth Study, to be used in the IMP.

It should be noted that most of the growth experienced in this study took place on the mainland. Specifically, out of the 10 rural building permits for new homes issued in 2022, only 2 of them were issued on Amherst Island.

3.3.2. Population Growth

Based on the residential dwelling projections developed as part of the Revised High Growth Scenario, population growth in Loyalist Township can also be estimated over the course of the study period. For the purpose of this study, an average 2.5 persons per dwelling is assumed to be the average household size in Loyalist Township between 2021 and 2046. Table 5 outlines estimates in five-year increments throughout the four population divisions:

Table 5 Historical and projected future population growth

	Amherstview	Odessa	Bath	Amherst Island and Rural	Total
2016	9,150	1,270	3,420	3,540	**17,380**
2021	9,446	1,311	3,531	3,655	**17,943**
2026	10,141	1,857	3,562	3,579	**19,139**
2031	10,925	2,085	4,158	3,646	**20,814**
2036	11,708	2,312	4,754	3,713	**22,488**
2041	12,492	2,540	5,350	3,781	**24,162**
2046	13,275	2,767	6,016	3,848	**25,906**

Based on these projections, it is estimated that the overall population in Loyalist Township will be just under 26,000 residents by the year 2046. This contrasts with the original estimate of 22,600 presented in the Reference Scenario of the Growth Study.

A more detailed analysis of growth expectations is provided in the technical memorandum TM-2 Population and Dwelling Growth, found at Appendix Section 1.

4. Existing Infrastructure Overview

4.1. Water

Loyalist Township owns and operates two water distribution systems (WDS); the Fairfield WDS and the Bath WDS. These systems service the Township's three urban centres, Amherstview, Odessa, and Bath.

4.1.1. Fairfield Water System

The Fairfield water system currently serves the communities of Amherstview and Odessa; the Harewood and Brooklands subdivisions; the Loyalist East Business Park; and Taylor-Kidd Industrial Park. The total served population throughout this area is 10,980.

This system is serviced by the Fairfield Water Treatment Plant (WTP), located in Amherstview. The Fairfield WTP is rated at 8,000 m^3/day and draws raw water from Lake Ontario. The treatment facility consists of a membrane ultrafiltration system followed by chlorination for disinfection, as seen in the following figure.

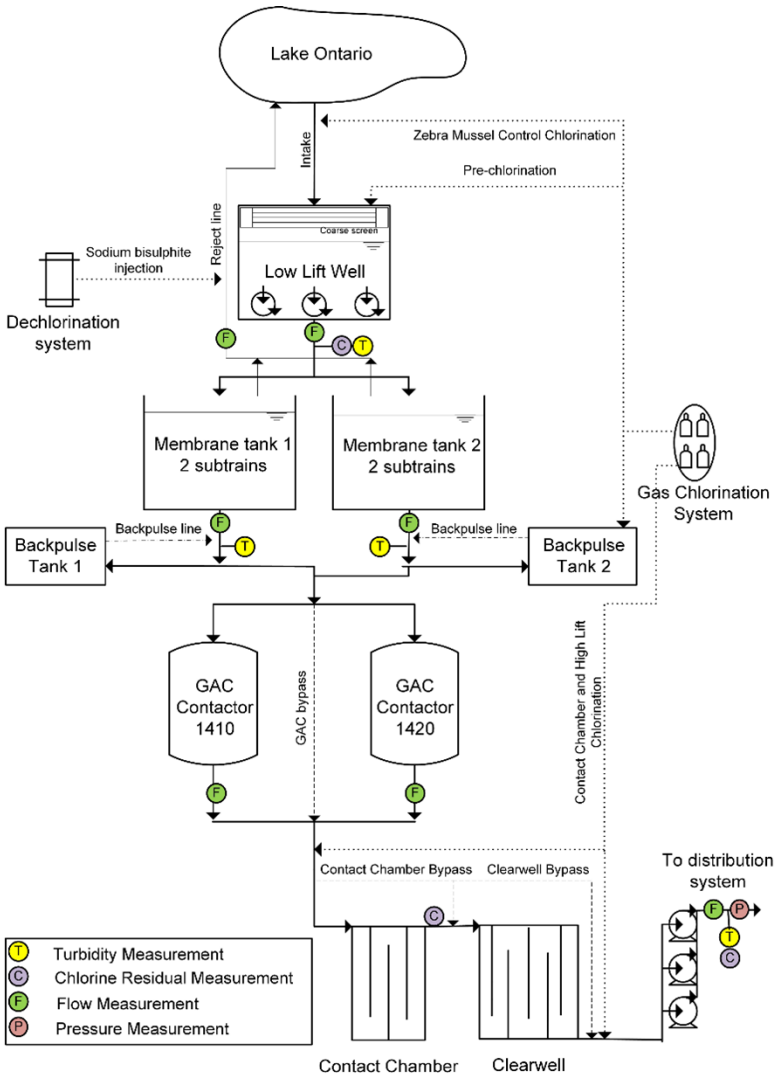

Figure 7 Fairfield WTP process flow diagram

As seen in the following figure, the distribution system consists of elevated storage located in Amherstview (1,100 m^3) and in Odessa (900 m^3). There is a booster pumping station on County Road 6, north of Taylor Kidd Boulevard, with a storage reservoir (4,224 m^3). The booster station separates the Odessa pressure zone from the Amherstview pressure zone.

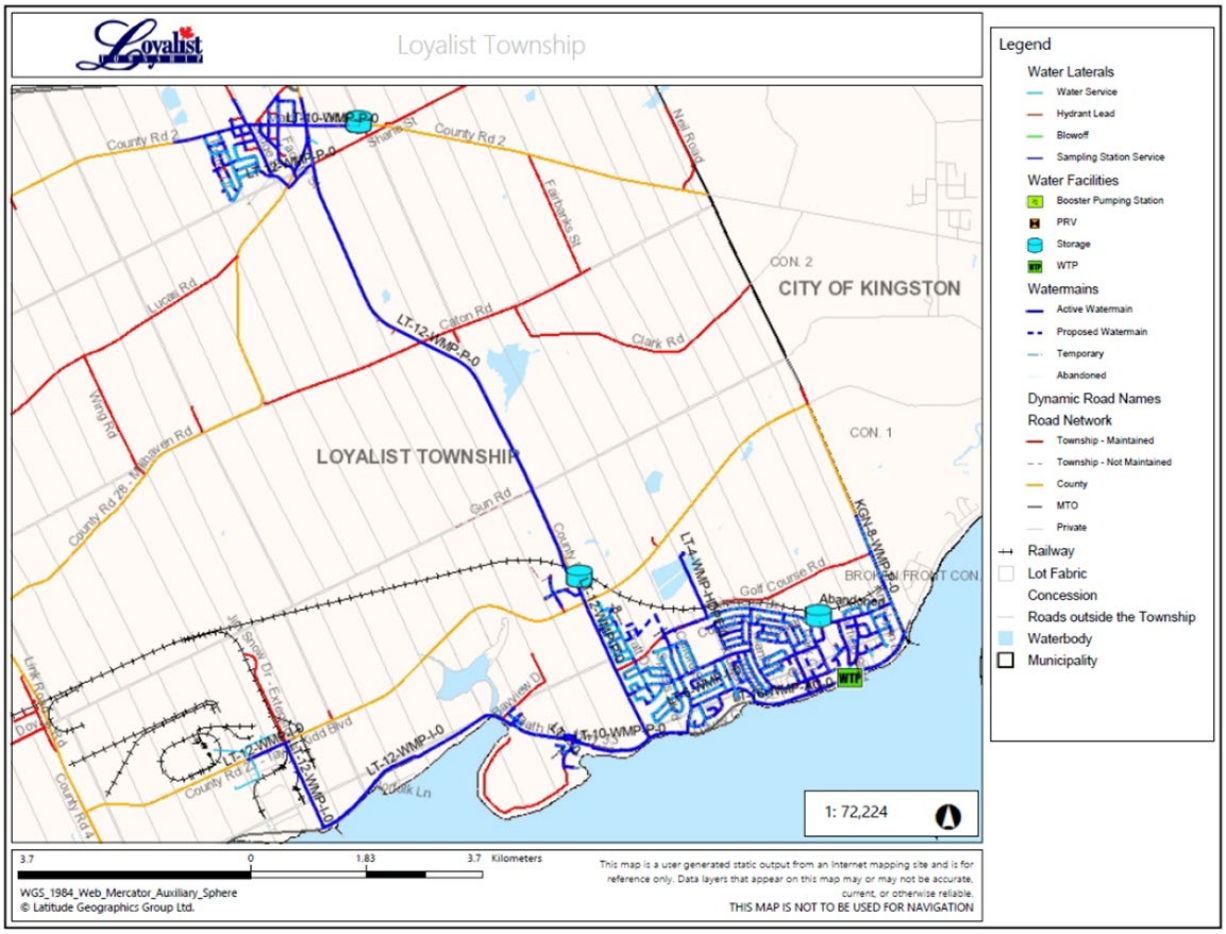

Figure 8 Fairfield WDS area

4.1.2. Bath Water System

The Bath Drinking Water System currently services the community of Bath; and the Bath and Millhaven Correctional Services Canada (CSC) Institutions. The equivalent served population throughout this area is 3,334.

This system is serviced by the Bath Water Treatment Plant. This plant is rated at 6,000 m^3/day and draws raw water from Lake Ontario. Through previous agreements, 2,672 m^3/day of potable water is allocated to CSC, leaving 3,328 m^3/day to service the Village of Bath. The treatment facility consists of a membrane gravity filtrations system followed by chlorination for disinfection, as seen in the following figure.

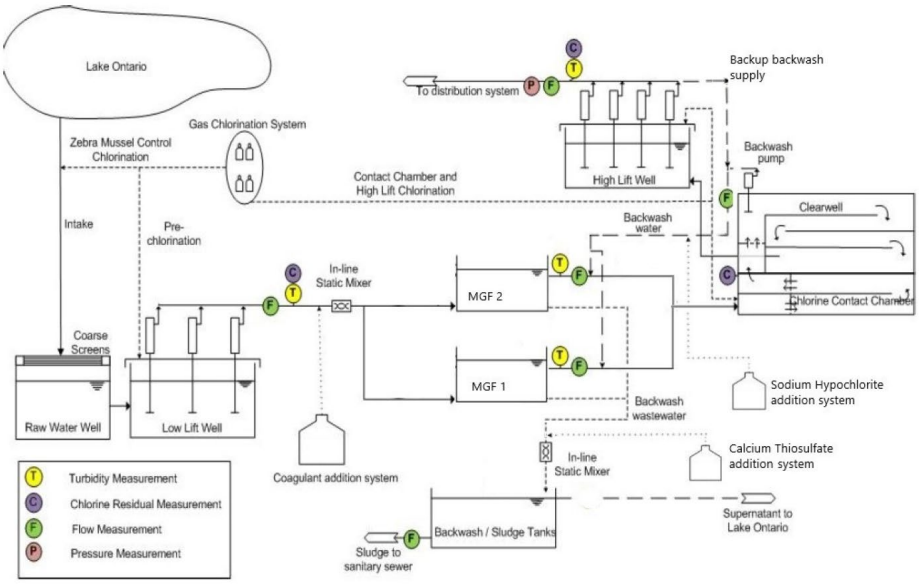

Figure 9 Bath WTP process flow diagram

As seen in the following figure, the distribution system has an elevated storage tank (1,900 m^3) located adjacent to the CSC property, in the east end of the village. Through previous agreements, 568 m^3 of elevated potable water storage is allocated to CSC, leaving 1332 m^3 to service the community of Bath. CSC owns and operates its own potable water storage tank. The water in this tank is not available to the Bath distribution system, even in an emergency due to hydraulic constraints.

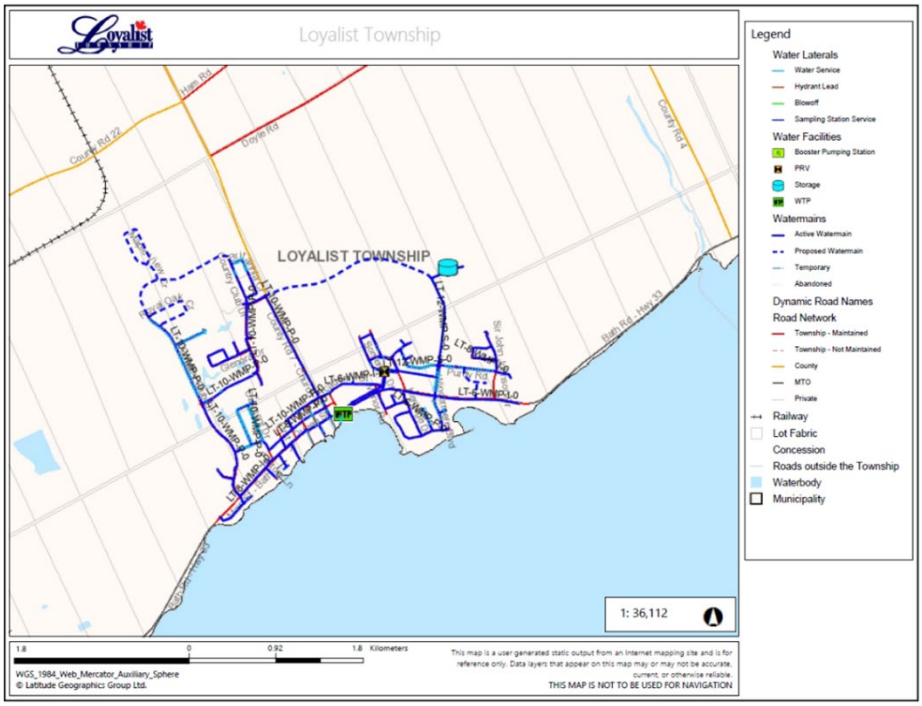

Figure 10 Bath WDS area

4.2. Sanitary

Loyalist Township owns and operates two sanitary collection systems: the Loyalist East Sanitary Collection System and the Bath Sanitary Collection System. These systems service the Township's three urban centres, Amherstview, Odessa, and Bath.

4.2.1. Loyalist East Sanitary System

The Loyalist East system services the communities of Amherstview and Odessa, and the Loyalist East Business Park. Flows from this system are sent to the Amherstview Water Pollution Control Plant (WPCP). This plant has a rated capacity of 6,400 m^3/day and a peak flow capacity of 16,000 m^3/day.

As shown in the following figure, raw sewage enters through the headworks for grit removal, then receives secondary treatment through an activated sludge process. Solids that settle to the bottom of the clarifier undergo thickening and then are stabilized using an Autothermal Thermophilic Aerobic Digester (ATAD). Treated flows from the plant discharge continuously to a leg of the Bayview Bog after disinfection and pH attenuation of the effluent in two polishing lagoons (Cell 2 and Cell 1) and a wetland.

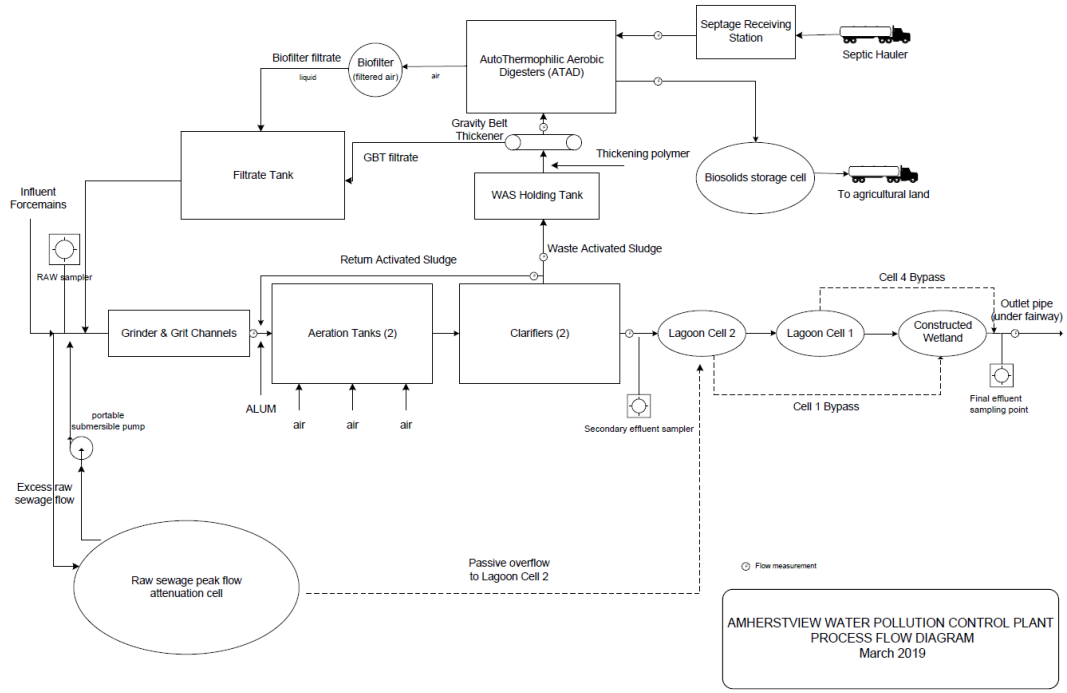

Figure 11 Amherstview WPCP process flow diagram

Sanitary sewage throughout the Loyalist East system is pumped to the plant via four sewage pumping stations: Bridge Street SPS, Taylor Kidd SPS, Islandview SPS, and Lakeview SPS. The following figure shows the Loyalist East sanitary system.

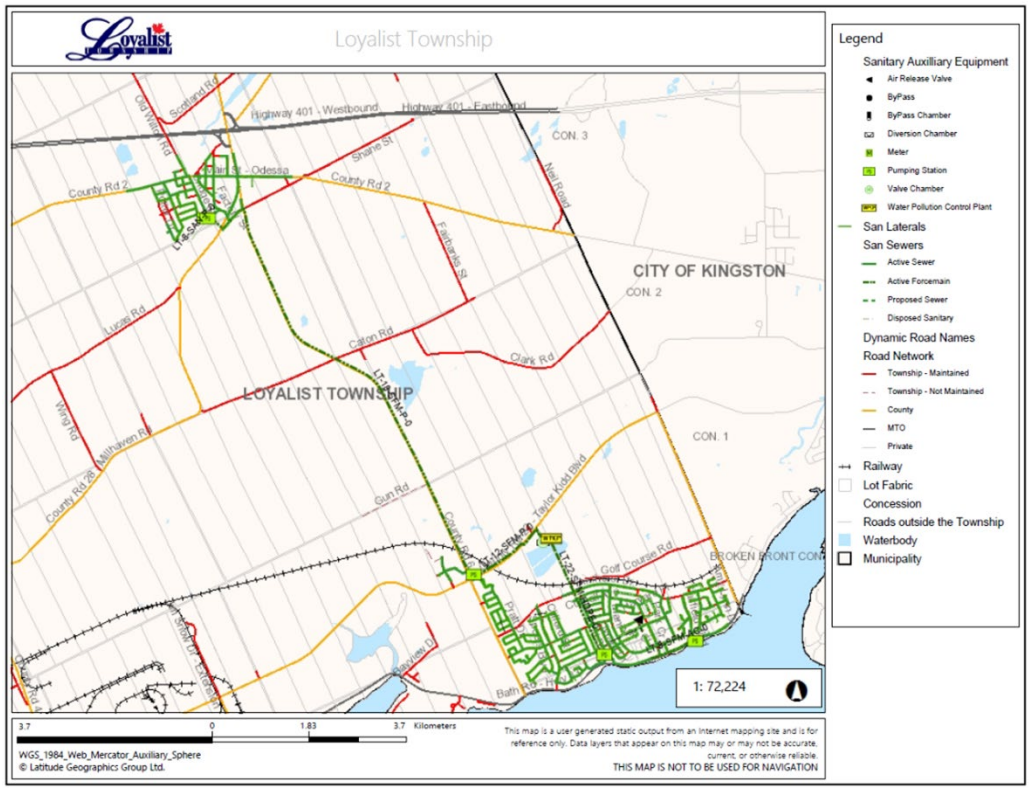

Figure 12 Loyalist East Sewage Collection System area

4.2.2. Bath Sanitary System

The Bath sanitary system services the community of Bath, and the Bath and Millhaven Institutions operated by Correctional Services Canada (CSC). Flows from this system are sent to the Bath Sewage Treatment Plant (STP). This plant has a rated capacity of 3,008 m^3/day and a peak flow capacity of 12,032 m^3/day.

As shown in the figure below, raw sewage enters the headworks for grit removal and screening. The secondary treatment process consists of three aeration tanks for extended aeration. Solids settle to the bottom of the clarifier and then are trucked away. The effluent is disinfected using UV and then is discharged to Lake Ontario.

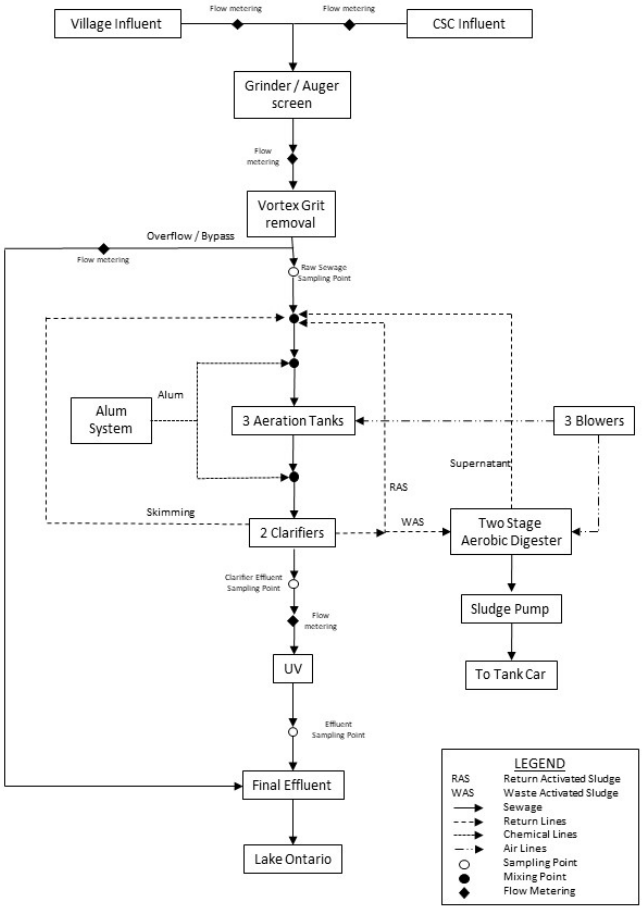

Figure 13 Bath STP process flow diagram

Sanitary sewage throughout the Bath system is sent to the plant via four sewage pumping stations, Bath SPS #1, #2, #3, #4, and via a common gravity sewer directly to the plant. The following figure shows the Bath sanitary system.

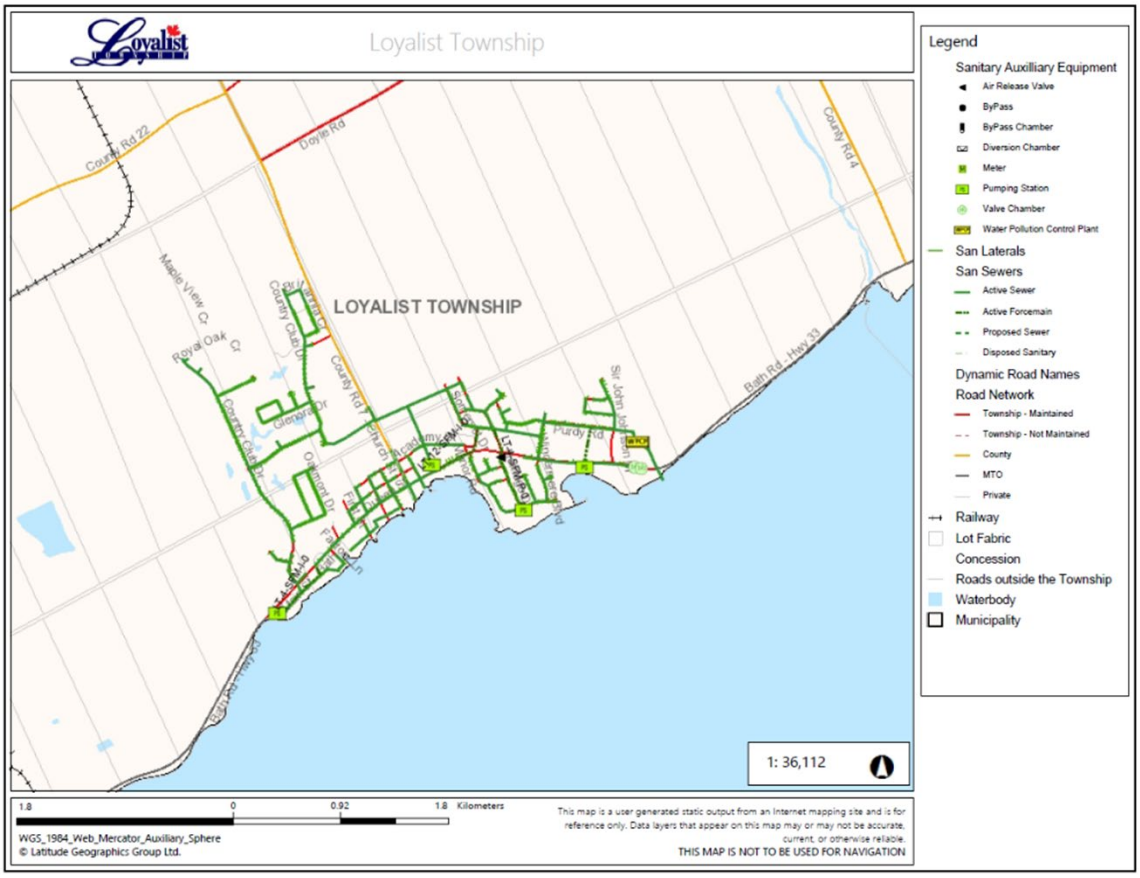

Figure 14 Bath Sewage Collection System area

4.3. Stormwater

Stormwater management deals with the implications of surface water runoff generated from precipitation, primarily from active sources like rainfall or snowfall, but also from snowmelt. As changes to land use alters the surface features of the Township, the nature of runoff changes. It is the goal of stormwater management to ensure that these development changes minimize the effects of the change in runoff on the natural environment, as well as the risk to the people and property using the development.

Most of Loyalist Township has similar surficial geology consisting of a thin soil veneer over limestone bedrock. A typical total soil depth throughout the Township is 0.5 m. The limestone is often fractured in its upper most layers but quickly transitions to a relatively impermeable mass, often within 1.0-2.0 metres below the surface. This combination of soil and rock results in a generally low ability for surface water to infiltrate into the ground, typically much lower than would occur in other areas with deeper soil. Occasionally the local surface limestone is classified as karst. Karstic characteristics include open cracks, small caves, and springs; and have been known to occasionally prompt complex, localized urban drainage problems.

With Loyalist Township adjacent to Lake Ontario, much of the Township's drainage system including Amherst Island drains directly into the Lake. An exception is the community of Odessa, draining into Millhaven Creek and the Wilton Creek watershed, both of which drain into Lake Ontario. Amherst Island is served by the Miller Drain which drains much of the central and southwestern portion of the Island and eventually into Lake Ontario.

4.3.1. Minor Storm

In general terms, the minor stormwater system addresses frequent and minor storm events with the goals to prevent soil erosion and to minimize the effect of pollutants and suspended solids on the receiving body of water, such as Lake Ontario.

The minor system handles surface runoff and local infiltration. However, it is not cost effective to try to build a minor system with the capacity to handle all potential runoff including the largest storm event. Hence, the minor system of stormwater ditches and pipes are sized to be large enough so that the vast majority of precipitation events do not travel overland, but not so large as to be financially crippling. Most jurisdiction agencies design a minor system to handle a design storm from a 1:2 year event up to a 1:10 year event. Most newer minor systems in Loyalist Township are designed for a 1:5 year event. Some older urban areas within the Township are designed for a 1:2 year event.

Many of the oldest urban areas of the Township in the communities of Bath and Odessa were developed without neighbourhood drainage in mind. Drainage concerns at that time focused on keeping main thoroughfares passable and buildings free of standing water. Concepts such as 1:2 year design event did not exist in these communities prior to the 1950s, aside from the County Road 2 and Highway 33 corridors where drainage for the highways was more advanced.

The minor system begins with collection of local runoff. In areas with urban road cross-sections, runoff from properties is collected by curb and gutter and directed to catch basins or ditch inlets. It is then piped, with the pipes increasing in size heading downstream until discharged. In areas with semi-urban road cross-sections, the local ditches lead eventually to ditch inlets or major channels before being discharged. Culverts that cross under roads to allow the flow to proceed downstream are part of the minor system, as are driveway culverts in these local ditches.

Stormwater treatment comes in many forms. In urban sections, the catch basins contain a sump that will intercept the sand and grit accompanying stormwater flow. In semi-urban sections, the roadside ditches will trap sand and grit in the grass bottom. Smaller suspended particulate and dissolved contaminants are carried by the minor system downstream to the end of pipe. In modern stormwater designs are treatment structures intended to remove suspended particles and grit within the system. Often these

structures are stormwater management ponds; but when space is restricted, more compact structures are used.

4.3.2. Major Storm

The major system addresses major storms and extreme rainfall through management of flood risk. A major storm event is a significant rainfall event between the design limit of the minor storm and the one-in-100-year storm event. Stormwater systems are designed to safely convey the 100-year storm event and ideally have some resilience to handle larger flows. The major storm exceeds the capacity of the minor stormwater system and therefore drains primarily overland across the catchment area toward the outlet.

Major flow routes are the overland pathways that the major or extreme storm will travel to get to the outlet. By far the most common intentional route is a road network. Most houses and buildings are constructed above the roadway, with either storm sewers below the road or ditches along either side as the minor system. When the minor system overflows during a major or extreme event, the ditches flood and catch basins can’t accept any more water. The additional flow will travel over the roadway, following the designed route to the outlet. An open channel can be designed take the overland flow, to move this flow off the roadway due to a steep downhill road section, a significant intersection or other geometric road feature; or simply to move the overland flow from the road network to an open channel, leading to the stormwater management pond for detention storage.

Stormwater management ponds (SWMP) have two primary functions: major and minor flow quantity control, and water quality control. In major storm events, the stormwater pond retains peak flow and stores the runoff for gradual and controlled discharge, with the peak flow rate from the pond less than or equal to the calculated pre-development flow rate. In some instances, the permitted peak flow rate is further limited by the capacity of downstream major stormwater infrastructure. These restrictions are placed on the designers of the stormwater system to minimize negative downstream effects, especially flooding and erosion. The pond is sized according to provincial design standards, which have evolved over time to facilitate adequate levels of treatment and a sufficient reduction in peak outlet flows to match pre-development flows. Typically, this infrastructure is designed to adequately control 100-year storm events, plus an additional 20% to account for climate change.

Refer to the following figures for stormwater management systems in each of the Township’s urban centers.

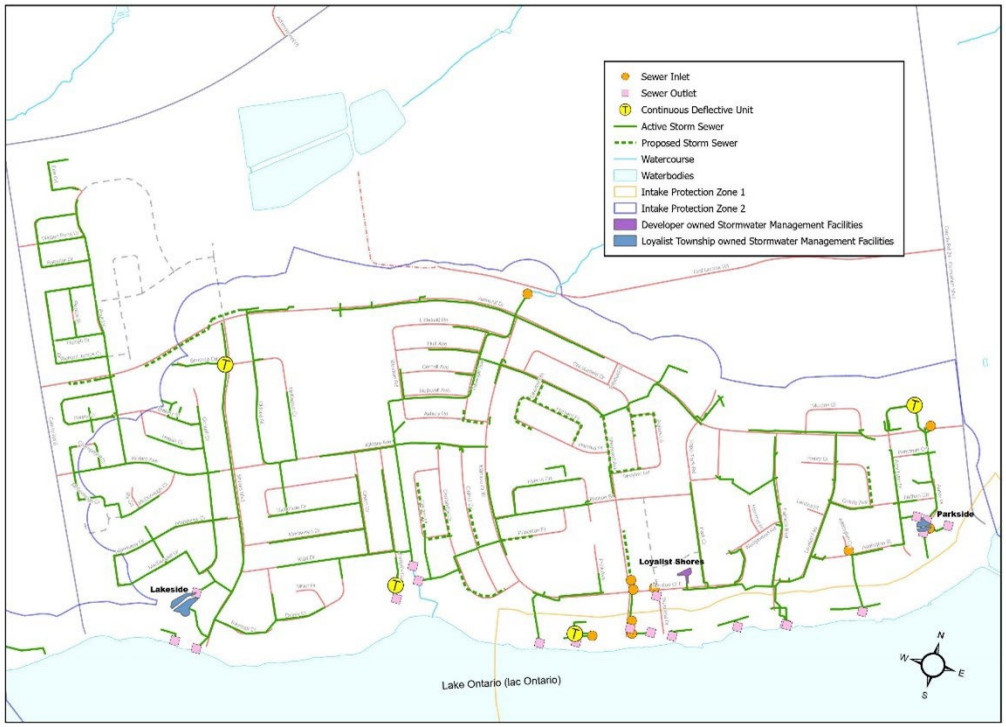

Figure 15 Amherstview stormwater system

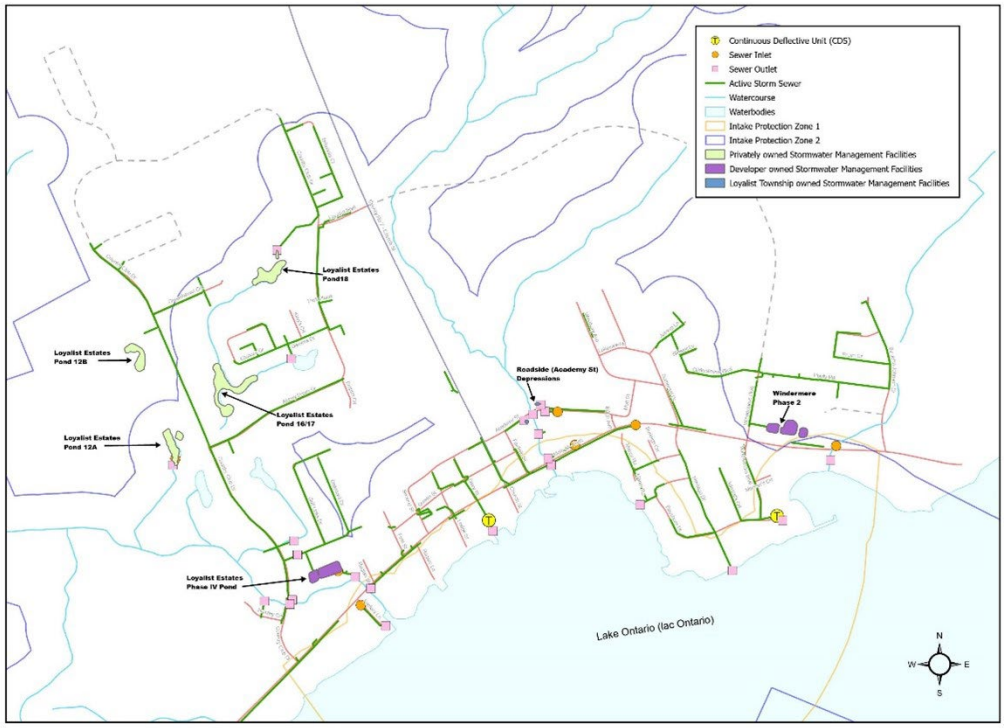

Figure 16 Bath stormwater system

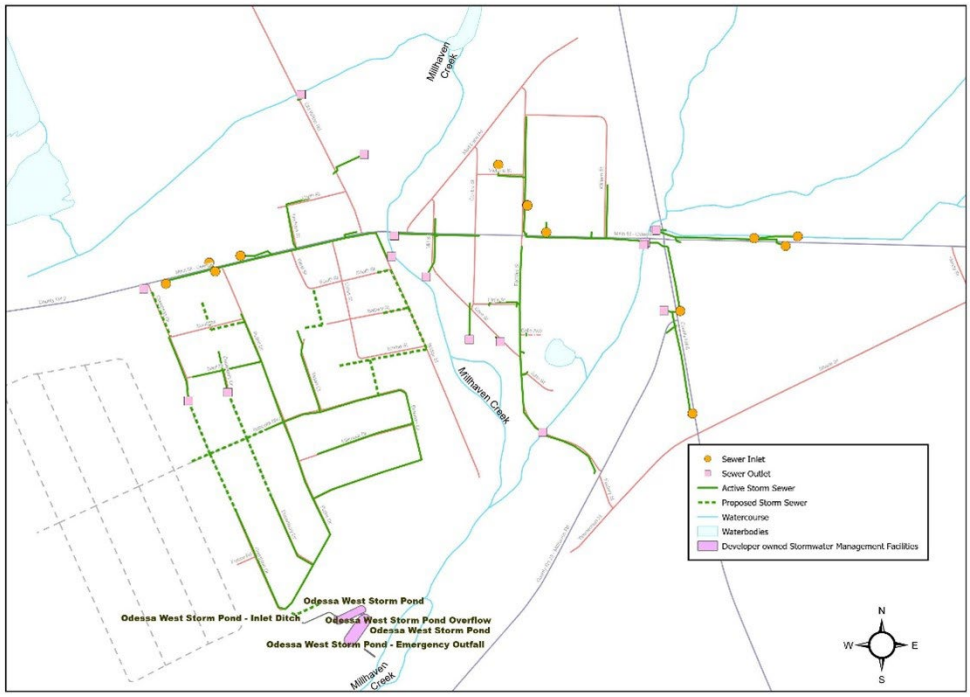

Figure 17 Odessa stormwater

4.4. Roads

Roads throughout Loyalist Township are owned and maintained by a variety of governing bodies. The Ministry of Transportation of Ontario (MTO) is responsible for the section of Highway 401 that passes through the Township as well as Highway 33 (excluding Main Street Bath). Lennox and Addington County is owner and responsible for all County roads in the Township. The remaining roads are municipal and are the responsibility of Loyalist Township.

4.4.1. Road Network

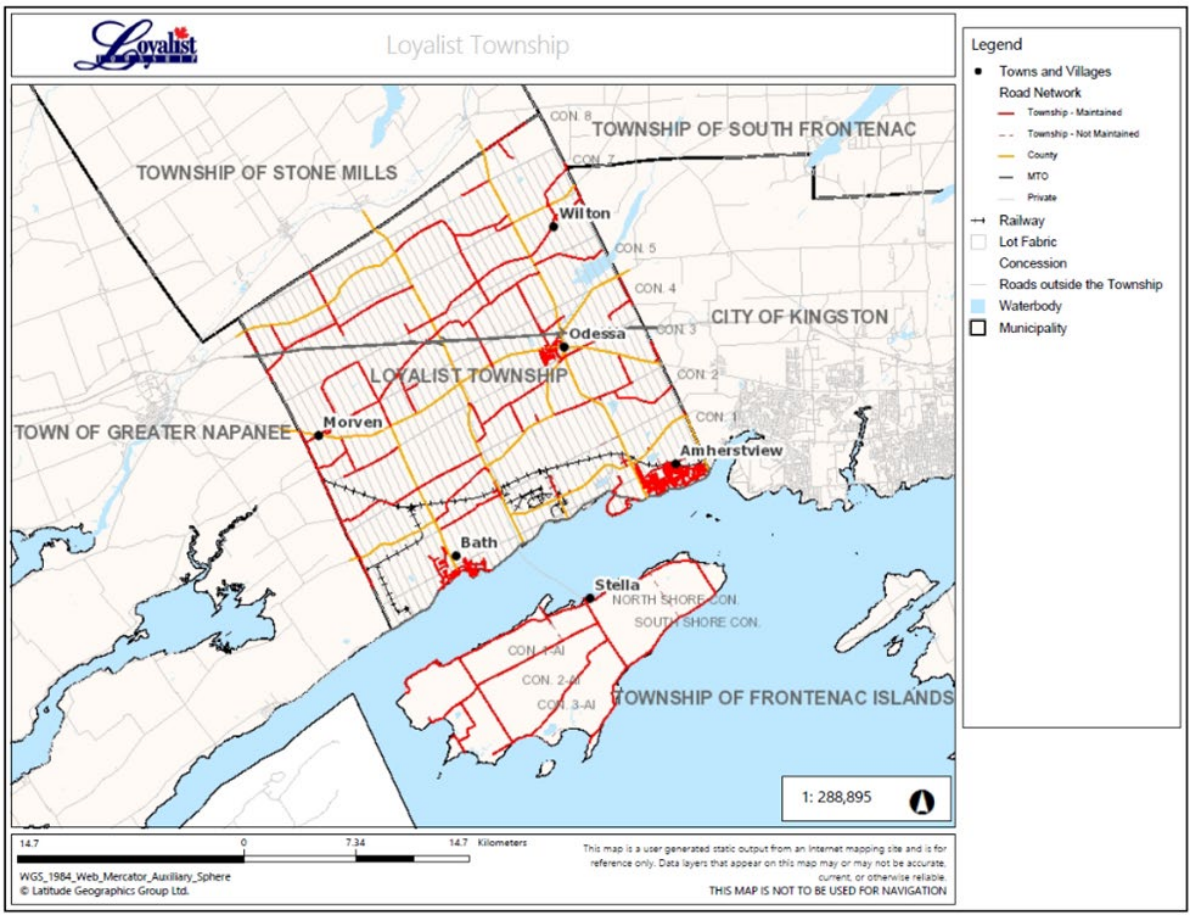

Figure 18 Roads in Loyalist Township

The municipality owns and maintains rural and urban roads. The Infrastructure Masterplan considers urban roads as any municipal road located within one of the Township's three urban centers.

4.4.1.1. Amherstview

In the Amherstview settlement area, Amherst Drive was particularly evaluated through the IMP due to the projected impact from development in the area. Since its initial construction, traffic on Amherst Drive has gradually increased as the community of Amherstview was developed. The original design included a three-lane wide paved surface with an urban style cross-section. Amherst Drive is complete east of Speers Boulevard, urbanization has not been completed west of Speers Boulevard, towards future development lands.

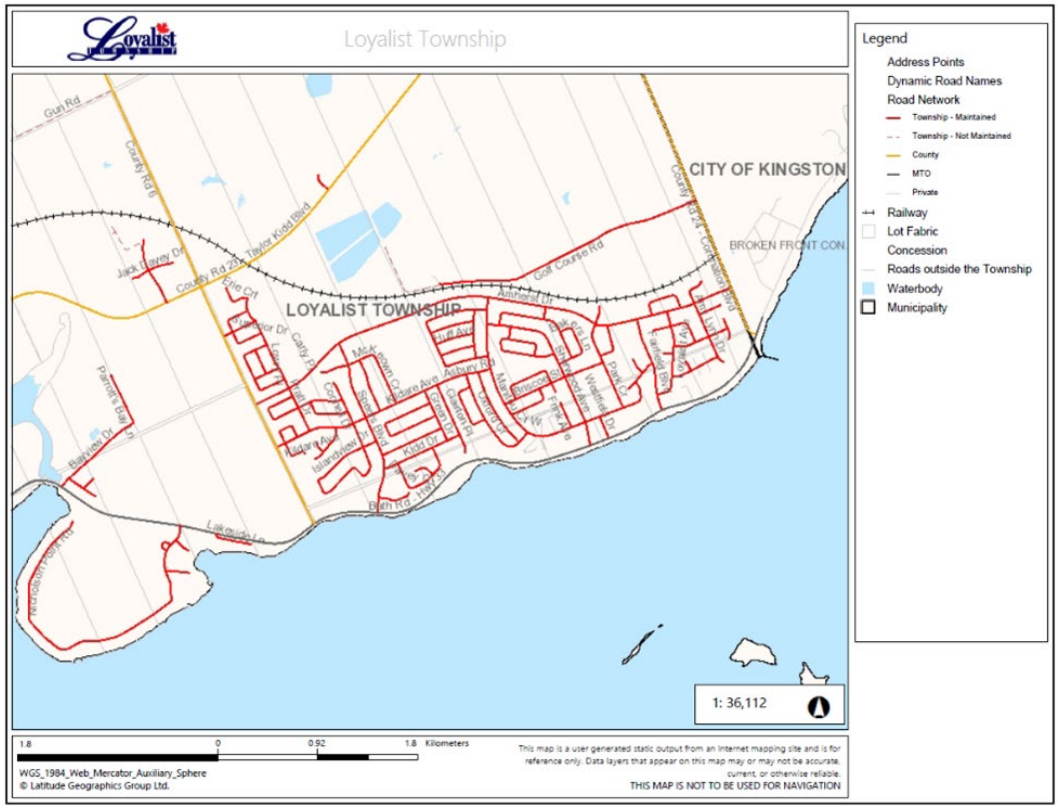

Figure 19 Road network in Amherstview

4.4.1.2. Odessa

Main Street – Odessa was specifically evaluated through the IMP due to many remedial and growth needs. Prior to the mid 1990s, Main Street – Odessa was under the authority of MTO and known as King's Highway 2. The road was downloaded to the County of Lennox and Addington ("the County") and is now known also as County Road 2, with the County administering of the right-of-way. MTO was responsible for the current road design, apart from the County Road 6 intersection which was upgraded in the early 2000s by the County. There are a variety of cross-sections along the urban sections. At the two extremities of the community boundaries, the highway has a typical rural cross-section. This cross-section transitions to an urban section with paved boulevards and sidewalks on each side. The boulevards allow for some parking. Drainage is a problem along the corridor and there are many inconsistencies regarding the provision of adequate sidewalks for a right of way for a roadway with the volume of vehicle and pedestrian traffic experienced.

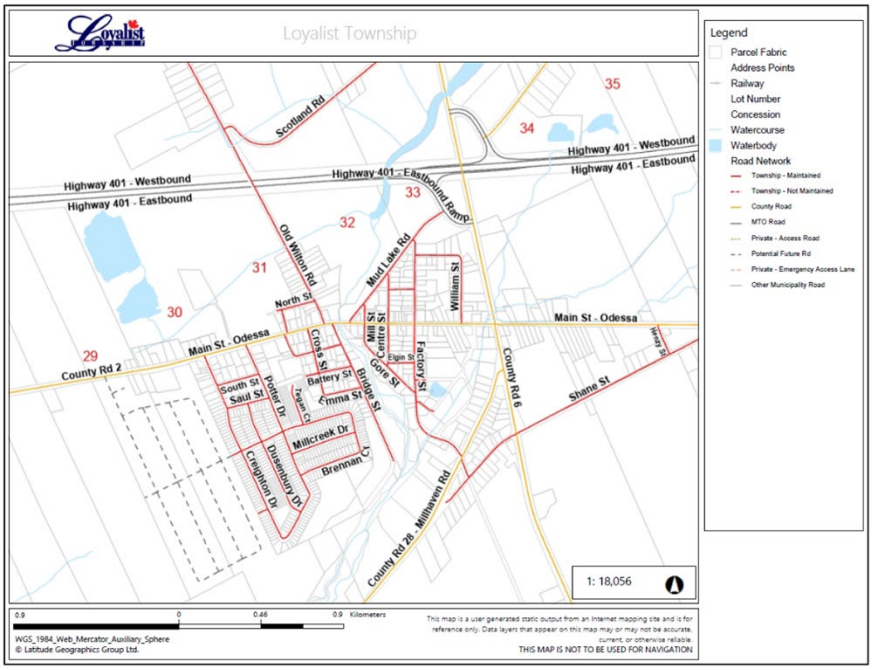

Figure 20 Road network in Odessa

4.4.1.3. Bath

Main Street – Bath was specifically evaluated through the IMP due to remedial and growth needs. Main Street – Bath is owned and maintained by Loyalist Township. Loyalist Township has a Connecting Link agreement with the Province. As Main Street – Bath connects two sections of Highway 33, this roadway is eligible for the Connecting Link program. The Connecting Link agreement applies to that portion of road between the former Village of Bath corporate limits. This section of road is being provided additional attention in the IMP, as several infrastructure improvements (non-life cycle replacements) are expected over the term of the IMP. These improvements are being planned in a coordinated fashion such that aging infrastructure within the corridor can be replaced in a cost-efficient manner.

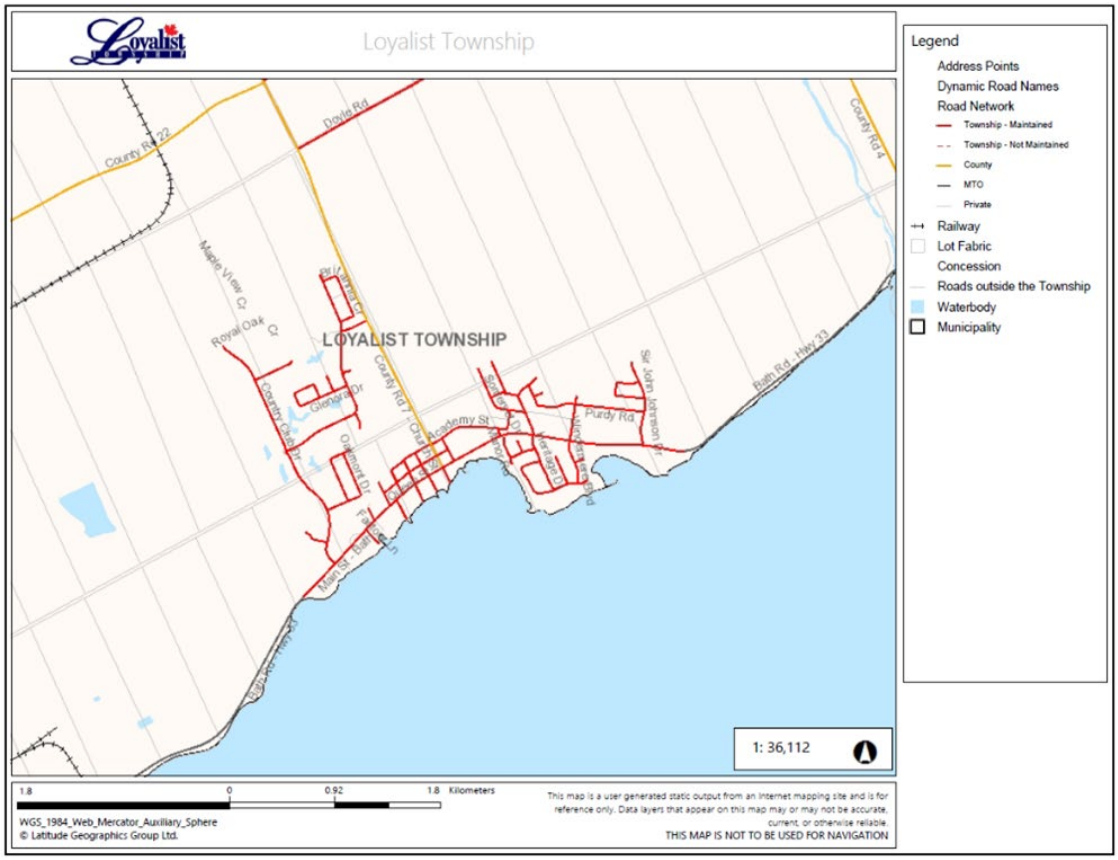

Figure 21 Bath road network

4.4.2. Roads Facility

The existing Public Works Garage is located at 746 County Road 6 south of Odessa. The original facility was constructed due to departmental needs after amalgamation in 1998 and the decision to combine the Township's road maintenance operations with those of the County of Lennox & Addington.

Continued growth in the Township has resulted on the need for additional equipment and operations staff since the initial construction of the facility. In 2023 an expansion of the facility was completed that added six bays and improved work bays and office areas for mechanics. With the expansion the garage now has twenty bays.

The current site is almost entirely situated within the environmentally sensitive area locally known as the Asselstine Alvar (GHD, 2023). In addition to the garage, the site houses salt and sand storage facilities, exterior equipment storage area, and the Loyalist Township Emergency Services' Fire Training Centre on the southern section. The area immediately north of the expansion is used as an informal snow dump. As a result, much of the native vegetation has been replaced by the developments on the site. Future expansion of the snow dump is potentially limited by the new garage extension and potential ecological constraints associated with the alvar and the ability of the site to process the meltwater from an expanded snow dump.

4.4.3. Roads Equipment

Loyalist Township maintains a fleet of road and sidewalk maintenance vehicles. The municipality performs all road and sidewalk maintenance duties in-house and provides a similar function for the County of Lennox and Addington roads in the Township, through a service agreement.

The Public Works division currently has a fleet of 38 vehicles, not including graders, loaders, or excavators. The fleet is made up of 20 lighter service vehicles (pick-ups trucks, etc.), 4 sidewalk snowploughs, and 13 heavy trucks.

4.4.4. Active Transportation

Active transportation can be defined as moving from one place to another under one's own power. Infrastructure to support active transportation includes trails, pathways, and sidewalks. The Township is responsible for all pedestrian facilities, including those along upper tier roadways.

Loyalist Township's Official Plan includes a high-level identification of proposed pathway routes within the Township. Very little of this pathway system has been developed to date. Current pathways in each of the urban centers are highlighted in green in Figure 23, Figure 24, and Figure 25.

The level of service for sidewalk installations has varied over time, with the result that not all areas are served as well as others. Typically, older sections of the Township's urban communities were constructed without sidewalks, or the sidewalks were constructed at widths now considered substandard. In many places existing sidewalks present both accessibility and continuity issues. The current sidewalks throughout the urban centers are shown in purple in Figure 23, Figure 24, and Figure 25. It should be noted that some sidewalks that are being constructed in new developments may not be shown in these figures.

Figure 22 Amherstview sidewalks and multi-use pathways

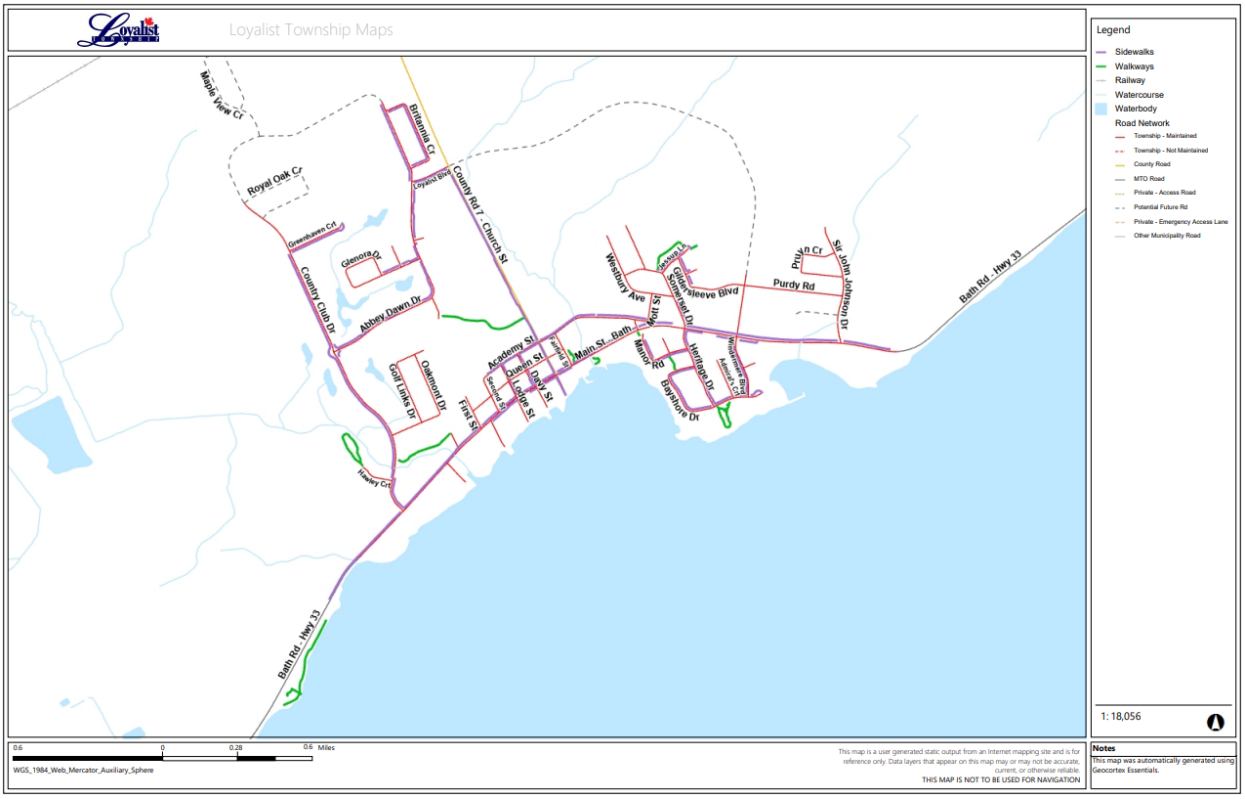

Figure 23 Bath sidewalks and multi-use pathways

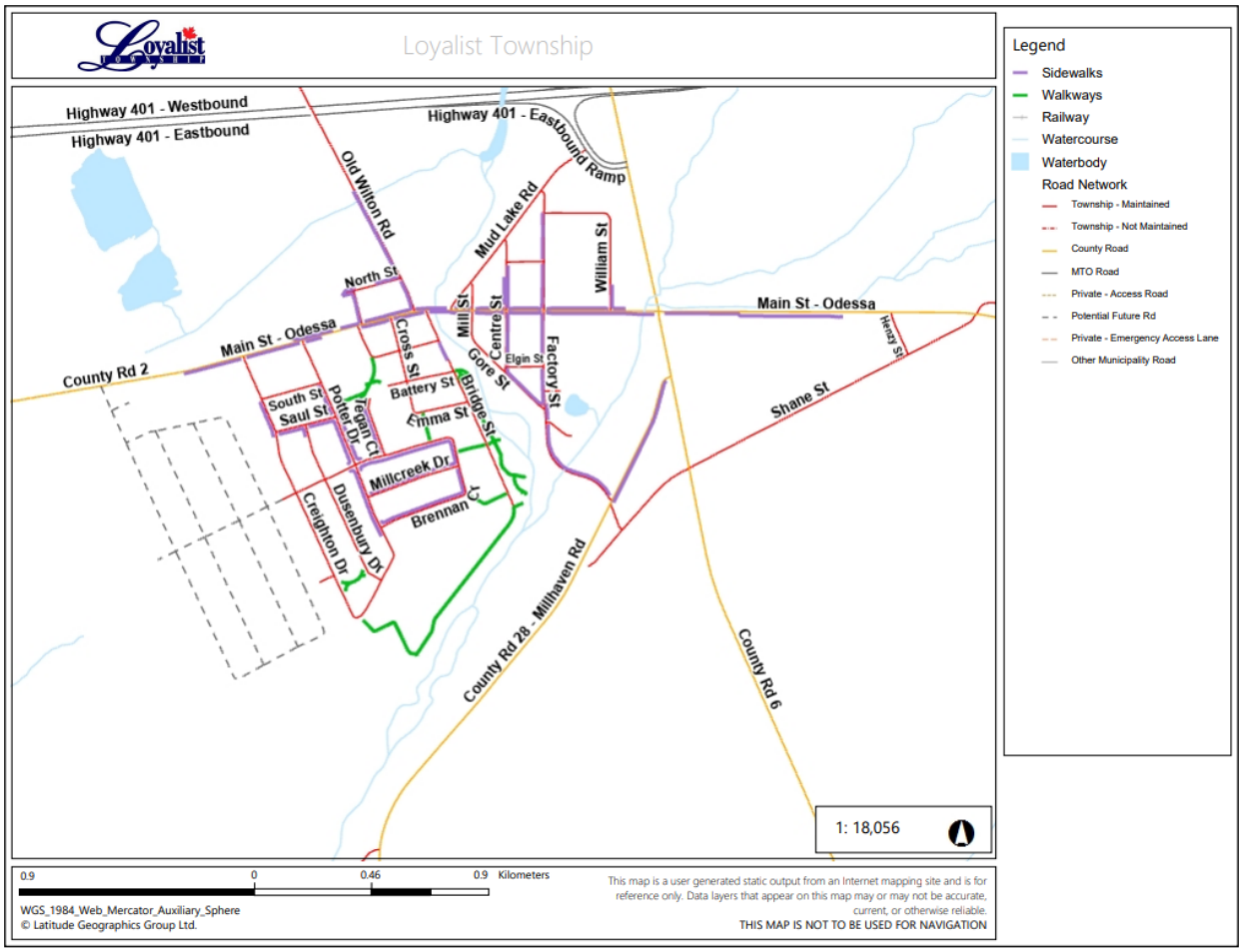

Figure 24 Odessa sidewalks and multi-use pathways

4.5. Miscellaneous Assets

The IMP process included the review of some miscellaneous projects that impact infrastructure in some manner. Following evaluation, none of the projects within this category meet the requirements for an elevated (Schedule B or C) Municipal Class Environmental Assessment with one potential exemption, a municipal snow dump site.

4.5.1. Municipal Snow Dump Facility

The usual practice of municipal snow storage for the transportation system is to wing back the snow onto boulevards using traditional snowploughs. Where space allows, snow is stored on site at various Township facilities.

This practice is not practical in commercial areas such as Main Street – Bath and Main Street – Odessa. In recent years the trend to narrower lot widths in new subdivisions has resulted in a significant reduction in the volume of available snow storage along the streets. In these areas, Township crews remove snowbanks once the snow event has passed and haul the snow to another location for storage.

Loyalist Township has historically used vacant space adjacent to the Public Works Garage site (748 County Road 6) as an informal snow storage site since the building was constructed. This site does not meet current regulatory standards for this type of facility. Continued growth in the urban communities is another factor for requiring a new site.

4.5.2. Cyber Security

The primary mandate of the Township's potable water and sanitary sewage systems is to provide safe and environmentally acceptable levels of treatment and minimize pipe failures. With an ever-increasing level of automation incorporated into the operation of the Township's systems, the stability and safety of the water and sanitary sewage information technology (IT) infrastructure is an important element that can be overlooked until an issue emerges.

Over the last three decades Loyalist Township has experienced an increasing dependence on supervisory control and data acquisition (SCADA) systems. This has resulted in a unique blend of the use of digital and analog communications; both old and modern electrical, mechanical, and instrumentation controls; and a mix of manual and automated mechanical controls within the Township's water and sanitary sewage systems.

All the Township's potable water and sanitary sewage treatment plants and water storage facilities are primarily operated using SCADA systems with varying levels of human interface. Many of the Township's sanitary sewage pumping stations are also monitored and operated using SCADA systems. SCADA allows the pump stations, plants, and storage reservoirs to be operated automatically based on pre-determined programmable settings. With communications either by internet, analogue signals (telephone), or by radio signals, facilities can be monitored and operated remotely. A full description of the Township's SCADA system and integration utilized and of current security protocols and vulnerabilities are not included in this document, for security purposes.

4.5.3. Industrial Park Servicing

The Taylor-Kidd Industrial Park is located along Taylor-Kidd Boulevard between Jim Snow Drive and County Road 4. Industries in this area include the GIP Millhaven Terminal, Direct Coil, Alstom Transport Canada, and Validus Power Corporation. Existing industries have a service agreement with Validus Power Corporation for the supply of raw water from Lake Ontario, which serves as both process water and fire water supply. These properties, aside from GIP Millhaven, are also connected to the municipal distribution system. Each industry has an individual agreement that limits that quantity of municipal water that is available to each site for potable use only.

This municipal main provides potable water for domestic purposes and limited use as process water; however, the pressure and flow rate are not suitable for industrial fire suppression. The Township has included the statement that the potable water system is not to be used for fire suppression in the servicing agreements for these industrial properties. The main is 300mm in diameter and was sized for future servicing of properties in the area, improved fire demand capability, and as a future potential back-up linkage between the Amherstview and Bath distribution systems. The watermain follows Bath Road/Highway 33 westerly to Jim Snow Drive and then tracks north on the east side of Jim Snow Drive to Taylor-Kidd Boulevard, before extending westerly again along the south side of Taylor-Kidd Boulevard, to the main entrance of Alstom Transport Canada.

For a variety of reasons, municipal sanitary servicing is not available to these industrial properties. If required, some industries may elect to construct private sanitary sewage facilities on site.

In 2022 Umicore N.V. purchased approximately 140 hectares of industrial land just west of the Validus property for the development of a new facility that will produce cathode active battery materials and their precursor materials. Based on initial conversations, it is assumed that Umicore N.V. will develop their own sanitary sewage processing facilities and a raw water intake from Lake Ontario for fire and process water. It is also anticipated that Umicore N.V. will utilize potable water from the municipally owned water main, which will need to be extended to service their site.

4.5.4. Natural Assets

Municipal natural assets are natural resources and/or ecosystems that contribute to the provision of one or more services required for the health, well-being, and long-term sustainability of a community and its residents. Natural assets and green infrastructure are terms often used interchangeably, although natural assets are technically a subset of green infrastructure. The Province of Ontario defines green infrastructure as follows:

> “Natural and human-made elements that provide ecological and hydrological benefits. Green infrastructure can include components such as natural heritage features and systems, parklands, storm water management systems, urban forests, permeable surfaces, and green roofs.” (Province of Ontario, 2017)

Green infrastructure can generally be split into three categories: natural (i.e., natural assets), engineered, or combined. Natural green infrastructure includes solutions such as wetlands, lakes, and forests. Engineered green infrastructure describes low impact solutions such as rain gardens, green roofs, and urban trees. A high-level overview of potential green infrastructure in the Township identified the following items:

Table 6 Green infrastructure potential in Loyalist Township

Green Stormwater Infrastructure	Urban Forests	Parks and Recreation
• Wetlands	• Streets	• Trails (paved, woodchips)
• Waterbodies (rivers, creeks, streams)	• Meadows (savannah, tall grass)	• Parks (parkette, neighbourhood destination)
• LID (bioswales, green roofs, permeable pavements, etc.)	• Forests (natural, managed)	

There are many benefits to implementing green infrastructure. Wetlands can help treat and polish sanitary sewage, which is currently achieved by the constructed wetland located at the Amherstview Water Pollution Control Plant. LID and wetlands also help to improve flood resiliency and reduce the amount of runoff entering the stormwater system. Waterbodies are important in improving resiliency to extreme storms, and also provide an opportunity for recreation.

Urban forests offer increased tree cover, offering a variety of benefits. Tree cover helps to reduce air temperature through shade and evapotranspiration. The canopy also reduces the amount of rainwater that makes it to the ground, which reduces runoff and can help protect habitats. Urban forests also provide a more balanced ecosystem that helps to improve pest control. Increased root systems from a variety of plants also help to prevent erosion.

Trails and parks offer many of the same benefits described above. In addition to this, trails create active transportation opportunities. An increase in active transportation helps to reduce greenhouse gas emissions that are typically caused by vehicular transportation. Trails and parks also provide safe areas for residents to enjoy the outdoors.

The green roof over the Fairfield Water Treatment plant offers a prime location for passive recreation, while reducing drainage needs and assisting with the reduction of urban heat.

This overview demonstrates that green infrastructure plays a key role in the services provided by the Township. These assets should be recognized formally so they can be maintained or replaced as required.

4.5.5. Source Water Protection

Source water is the untreated water from lakes, rivers, and aquifers that is used for drinking water. Source water protection is considered the first layer of protection in the multi-step process to protect drinking water. A major component of source water protection is developing a source protection plan. The 2014 source protection plan highlights areas of sensitive groundwater and surface water intake protection zones. In the Township, surface water intakes are the primary concern since the source for the two municipal system is Lake Ontario (Cataraqui Source Protection Committee, 2014). Both the Fairfield Water Treatment Plant (WTP) and Bath WTP take raw water from Lake Ontario.

Each plant intake has an intake protection zone (IPZ). An IPZ will show where in Lake Ontario the supply of water is coming from, and how long it takes to reach the intake. The IPZs for each plant can be seen in the following figures.

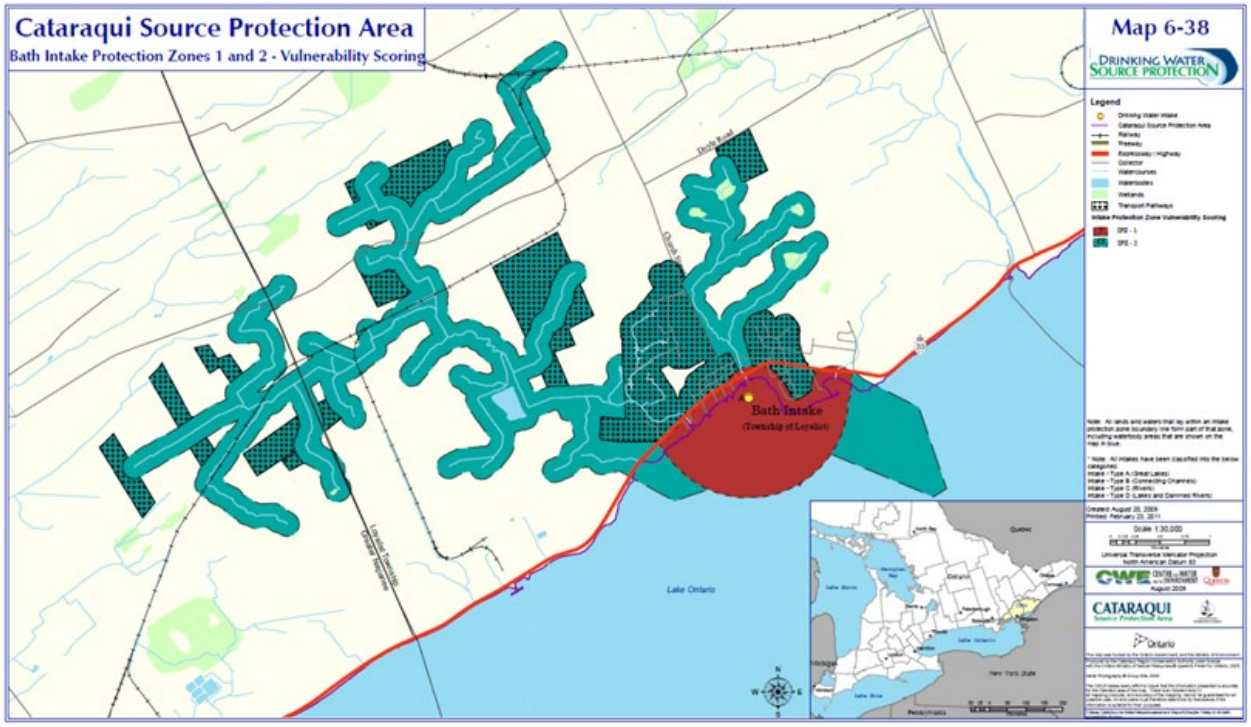

Figure 25 Bath WTP intake protection zones

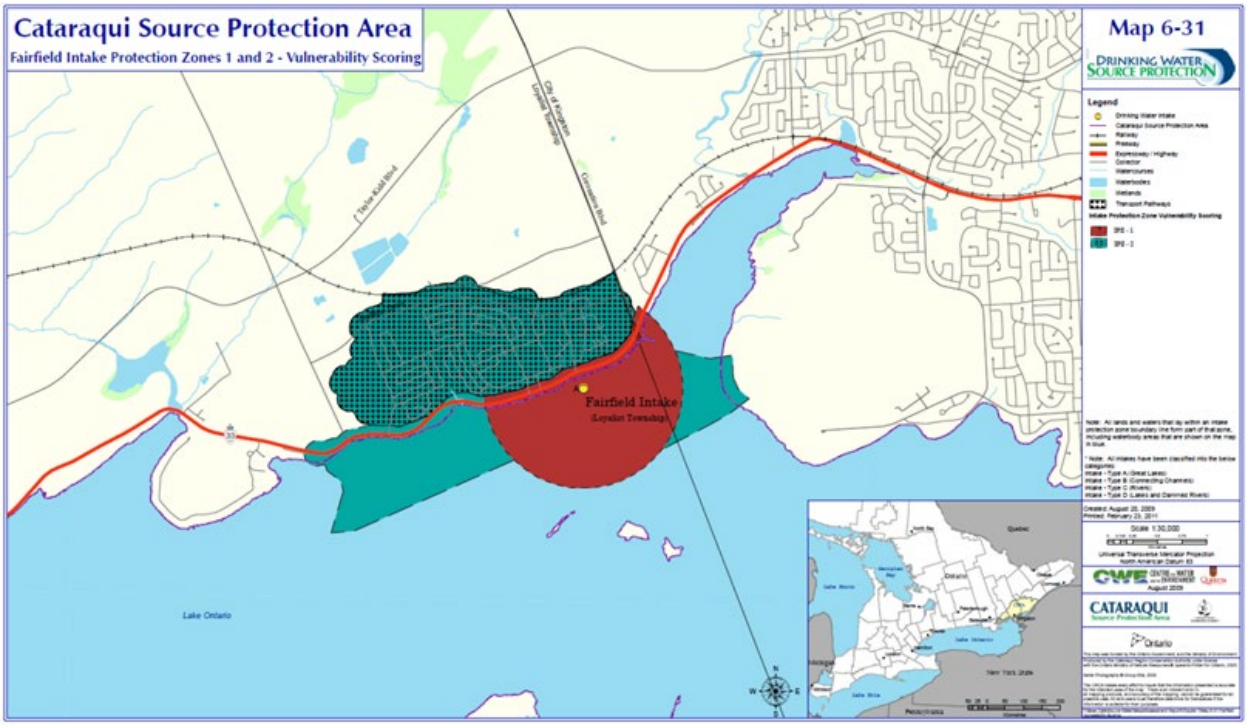

Figure 26 Fairfield WTP intake protection zones

Each IPZ is also assigned a vulnerability score based on the vulnerability of the intake and surrounding area. The vulnerability scores consider factors such as how deep and close to shore the intake is, the geography and topography of land in the IPZ (how easily surface contaminants could reach the intake), and the time it would take contamination to reach the intake. The scores are between one (low) and ten (high). The vulnerability scores for each WTP intake are:

- Bath WTP: IPZ 1 – 7.0. IPZ 2 – 6.3
- Fairfield WTP: IPZ 1 – 7.0. IPZ 2 – 6.3.

4.5.6. Rural Groundwater

Groundwater is an important natural asset that is often not available to rural residents within Loyalist Township at a quality and quantity level that most Ontarians are accustomed to. Contaminated groundwater is not uncommon within the Township, posing a threat to public health. Groundwater concerns are experienced across the broader region beyond the Township, wherever the limestone bedrock is found at or near the surface.

Although groundwater is not a part of the Township's municipal water infrastructure, there are many residents in rural areas of the Township who rely on private wells. It is important to consider the Township's current practices with respect to rural development, and best practices which could be adopted to improve rural groundwater concerns.

5. Remedial Infrastructure Needs

This section discussed projects staff are recommending through the IMP to address remedial infrastructure needs. The purpose of remedial projects is to rectify issues with and/or improve upon existing infrastructure.

The foundational information from which these recommendations arise is found in the various technical memoranda, as referenced in the respective tables. These memos are found at Appendix Section 1. Estimated project costs and timing are described for each recommended project in the Project Summaries found at Appendix Section 2.

5.1. Water

The table below provides a summary of recommended remedial projects for water infrastructure, and subsequent subheadings describe the projects in greater detail.

Table 7 Recommended remedial projects - water

Project ID	Project	Technical Memo Reference
W5	FWTP – Raw water intake structure assessment	TM-3
W9	County Road 6, Main Street Odessa to Millhaven Road service and valve upgrades	TM-5
W12	Odessa Main Street reconstruction – watermain oversizing and extension	TM-5
W13	Water hauler facility – vehicle protection barrier	TM-5
W1	BWTP – Installation of GAC filters	TM-4
W2	BWTP – Raw water intake structure assessment	TM-4
W8	Mott Street PRV	TM-5
W10	Bath Transmission main	TM-5
W11	Church Street water line update	TM-5
W27	Water loss reduction program	TM-6, TM-7

5.1.1. Fairfield Water System Remedial Projects

5.1.1.1. Fairfield Water Treatment Plant

W5 - Raw water intake structure assessment: The water intake at this plant was constructed in 1992. It is recommended that the intake at the water treatment plant be

evaluated prior to any expansion project to determine if any upgrades would be required.

5.1.1.2. Fairfield Water Distribution System

W9 – County Road 6 service and valve upgrades, Main Street – Odessa to Millhaven Road: Water services to properties on the west side of County Road 6 between Millhaven Road and Main Street – Odessa have not yet been moved to the newer section of main. Following this, the old section of main needs to be decommissioned. Operations staff have also noted that the valving at the intersection of Main Street – Odessa and County Road 6 is difficult to operate due to high traffic volumes and the location of the existing valves in the traffic, and the unusual layout of the piping. A practical solution is to complete the remedial servicing and valve/piping modifications in the intersection prior to reconstruction of the adjacent road surfaces. The road reconstruction is planned for the near term by the County of Lennox and Addington. It is expected that this project will be one of several sub-projects linked to the resurfacing of Main Street – Odessa.

W12 – Main Street – Odessa reconstruction: Main Street – Odessa will undergo road reconstruction within the IMP study period. As a part of this project the watermain along Main Street – Odessa will be replaced with a 300mm diameter main and extended to Shane Street. The replacement of the current main is considered remedial; however, the watermain oversizing and extension are growth costs.

W13 – Water haulers' facility vehicle protection barrier: Bulk water haulers fill at the booster pump station located at 243 County Road 6, south of the CN Rail crossing and adjacent to the ground-level water storage reservoir. Operations staff have raised concerns regarding the road that provides access to the bulk water facility, as the access lane is close to the reservoir. Staff are concerned that a large truck could collide with the reservoir and damage the tank. It is recommended that the tank be protected by a row of precast concrete Jersey barrier walls.

W29 - Water loss reduction program: There is notable water loss in the Fairfield water distribution system. It is recommended that a water loss reduction program is implemented with the objective to improve the efficiency of the system. This project should be prioritized.

5.1.2. Bath Water System Remedial Projects

5.1.2.1. Bath Water Treatment Plant

W1 - GAC filters: Staff and customers have expressed taste and odour concerns with the treated water that enters the distribution system in Bath. It is recommended that a pressurized granular activated carbon (GAC) system is installed at the Bath WTP to address the taste and odour concerns in this system. This upgrade will occur along with the installation of a UV disinfection system, which is considered a growth project and will be discussed further in Section 6.1 of this document.

W2 - Raw water intake structure assessment: There are operational challenges with the raw water intake at Bath WTP. The intake is relatively shallow and short, which can result in elevated levels of suspended solids in the raw water during storm events. It is recommended that the intake structure is evaluated to determine what upgrades would be required in the future

5.1.2.2. Bath Water Distribution System

W8 - Mott Street PRV: The existing PRV receives water directly from the transmission watermain that links the Bath WTP to the Bath elevated storage tank. The PRV and associated piping is in a small underground chamber, located at the intersection of Westbury Avenue and Mott Street. The unit needs to be replaced to address operating constraints with the existing location, chamber floods, aging, and rust.

W10 - Bath Transmission main: The transmission main is an essential component of the Bath water distribution system. As infill development occurs around the alignment of the main, there is an opportunity to replace the main in a relocated position, coordinated with the new development. A section of transmission main was recently relocated with the extension of Gildersleeve Avenue easterly. It is recommended that this process of relocation proceed concurrent with development in the area, as the existing main is approaching the end of its useful service life. The transmission main was originally installed with a cathodic protection system which has failed in at least two locations, and potentially others. One known location is near the creek running through Centennial Park, and the other is adjacent to the sections where the main was relocated to Gildersleeve Boulevard. It is recommended that the cathodic protection system be repaired for those sections of transmission main that are not expected to be replaced or rehabilitated over the next few years.

W11 - Church Street water line update: The original servicing at this location consists of a 19 mm line feeding two homes. The service line is insufficient for servicing two homes, and it is therefore recommended that the service line be replaced. When this work is done the need for fire hydrants should also be evaluated. Ideally this work will be coordinated with road reconstruction.

W28 - Water loss reduction program: There is notable water loss in the Bath water distribution system. It is recommended that a water loss reduction program is implemented to improve the efficiency of the system. This project should be prioritized.

5.2. Sanitary

The table below provides a summary of recommended remedial projects for sanitary sewage infrastructure, and subsequent subheadings describe the projects in greater detail.

Table 8 Recommended remedial projects - sanitary

Project ID	Project	Technical Memo Reference
San1	AWPCP - Peak flow equalization and headworks upgrades	TM-8
San2	AWPCP - Effluent monitoring facility power supply	TM-8
San4	AWPCP - Reduce potable water demand	TM-8
San19	Islandview SPS - installation of flow meter	TM-11
San38	Odessa Main St Reconstruction - sewer replacement (concurrent with County Road upgrade)	TM-10, TM-23
San9	BSTP - CSC flow monitoring upgrades	TM-9
San11	BSTP - Reduce potable water demand	TM-9
San16	Bath SPS #2 - installation of standby generator and flow meter	TM-16
San17	Bath SPS #3 - installation of standby generator and flow meter	TM-17
San18	Bath SPS #4 - installation of flow meter	TM18

5.2.1. Loyalist East Sanitary System Remedial Projects

5.2.1.1. Amherstview Water Pollution Control Plant

San1 - Peak flow equalization and headworks upgrades: This project is primarily driven by growth and therefore is discussed in more detail in Section 6.2. The remedial aspects of this project include protecting downstream processes and improving operation of the existing equalization facility.

San2 - Effluent monitoring facility power supply: The effluent monitoring facility power supply is energized by a solar panel and battery storage system which periodically has insufficient power for the continuous monitoring requirements. The facility is geographically isolated, meaning that a direct connection to the site's AC electrical supply has not been made, for reasons both technical and economical. It is recommended that Loyalist Township engage the services of an electrical contractor familiar with alternative power supply to provide an upgrade to this facility.

San4 - Reduce potable water demand: The water pollution control plant is one of the Township's largest consumers of potable water. Potable water is primarily used for

cleaning at various points of the treatment process. Previous attempts to reduce potable water demand have been unsuccessful. It is recommended that staff continue to address this issue through projects such as replacing water meters at the plant and restoring the existing process water treatment system for use in cold weather months when algae are less active.

5.2.1.2. Loyalist East Collection System

San19 - Islandview SPS installation of flow meter: This station does not have a flow meter, and as a result the only method of estimating sewage flows is to measure pump operating time. This is the largest pump station in the system without flow metering, and it is recommended that it be the highest priority for a flow meter installation.

San38 - Main Street – Odessa Reconstruction - sewer replacement: Main Street – Odessa will undergo road reconstruction within the IMP study period. As a part of this project, the sanitary infrastructure in the area will be replaced.

5.2.2. Bath Sanitary System Remedial Projects

5.2.2.1. Bath Sewage Treatment Plant

San9 - CSC flow monitoring upgrades: Since the last plant upgrade a decade ago, the flow meter that measures the flow from the Correctional Services of Canada (CSC) properties has not functioned properly. The issue relates to the poor hydraulics associated with the outlet, headworks, and inlet well, and minimum elevation difference available to obtain suitable flow characteristics necessary for optimum meter operation. Staff are working towards a solution to more accurately record the flows received from CSC. Along with improved flow measurements staff are also recommending increased sampling of flows from CSC so that the impact of high fats, oils, and grease (FOG) levels and toxic loadings can be more closely monitored.

San11 - Reduce potable water demand: The sewage treatment plant consumes a large amount of potable water. Potable water is primarily used for cleaning at various points of the treatment process. As with the Amherstview plant it is recommended that staff continue to address this issue through projects such as replacing water meters at the plant and restoring the existing process water treatment system for use in cold weather months when algae are less active.

5.2.2.2. Bath Collection System

San16 - Bath SPS #2 installation of standby generator and flow meter: This pumping station does not have a standby generator. In the event of a power outage, a portable generator is used. Installation of a standby generator is recommended. Current pump rates and volumes at this station are estimated based on pump run times. Installation of a totalized flow meter is recommended to improve accuracy of data collection and calculation of flow rates.

San17 - Bath SPS #3 installation of standby generator and flow meter: This pumping station does not have a standby generator. In the event of a power outage, a portable generator is used. Installation of a standby generator is recommended. Current pump rates and volumes at this station are estimated based on pump run times. Installation of a totalized flow meter is recommended to improve accuracy of data collection and calculation of flow rates.

San18 - Bath SPS #4 installation of flow meter: Current pump rates and volumes at this station are estimated based on pump run times. Installation of a totalized flow meter is recommended to improve accuracy of data collection and calculation of flow rates.

5.3. Stormwater

The table below provides a summary of recommended remedial projects for stormwater infrastructure, and subsequent subheadings describe the projects in greater detail.

Table 9 Recommended remedial projects - stormwater

Project ID	Project	Technical Memo Reference
St1	Harvard Place/Dinosaur Park - extension of underground storm sewer to provide major storm relief for Harvard Place	TM-19
St2	84 Mortensen Swale - catch basin and extend piping to storm system	TM-19
St3	Willie Pratt Park - drainage improvements	TM-19
St4	Lakeview Park storm outlet - reserve use of land for future enhanced storm outlet	TM-19
St5	2 Quinte Avenue - improve outlet to street drainage (yard basin or diversion to Quinte swale)	TM-19
St6	Church Street (south of Main St. Bath) - Drainage improvements	TM-19
St7	Lodge Street (Queen St to Lake) + Second Street (Main St to Queen St) - new storm sewer	TM-19
St8	Factory Lane - re-establish ditch outlet and incorporate additional treatment	TM-19
St9	Raglan - drainage improvements	TM-19
St10	155 Main Street Bath - negotiate easement with owners of 153 Main Street, outlet improvements, inlet requires	TM-19

	slope improvements, erosion control, sidewalk protection,	
St11	Odessa - comprehensive stormwater review and upgrades - focus on area between Factory St. and Millhaven Creek, Centre St, Gore St, Elgin St, and William St	TM-19
St18	As road rehabilitation occurs - upgrade stormwater infrastructure where necessary	TM-19
St22	Amherstview - Evaluation - Keitha Drive and Penny Lane drainage deficiencies	TM-19
St23	Amherstview - Evaluation - Major storm outlet determination, Culvert crossing near 18 Amherst Drive	TM-19
St24	Odessa - Mill Street - swale and outlet improvements	TM-19
St12	Potter St South St Creighton Drainage improvements (concurrent with Potter /Main St Odessa improvements)	TM-19, TM-20
St19	Wilton Road Dam - Safety and Maintenance Improvements	TM-20
St20	Millhaven Creek - Frazil Ice and flood protection	TM-20
St21	Babcock Mill Dam Study	TM-20

5.3.1. Minor Storm Remedial Projects

St1 - Harvard Place/Dinosaur Park: Prior to re-ditching, the area's outlets couldn't keep up to the largest storms. Driveway culverts were replaced and ditching redone in approximately 2010. Hyland Court had storm sewers installed in 2017, which improved drainage on the south side of the area. The drains in the park need to be kept working. The Township will look at extending underground storm leads into the area to provide additional relief and will maintain the ditches for storage as well.

St2 - 84 Mortensen Swale: A rear yard swale from Speers Boulevard empties onto Mortensen Street, east of civic 84. In the winter this causes ice build-up on the street. Staff recommend intercepting this flow with a catch basin and extending piping to the storm system.

St3 - Willie Pratt Park: Drainage from north to south and along adjacent properties remains an issue. Staff recommend a drainage evaluation. Existing outlets connect to the Amherst Drive storm system.

St4 - Lakeview Park storm outlet: Staff recommending reserving some land for an enhanced storm outlet to improve stormwater quality.

St5 - 2 Quinte Avenue: The portion of the yard facing Loyalist Boulevard needs to be assessed to improve outlet to street drainage. Options may include the installation of a yard basin or diversion to the Quinte Avenue swale.

St6 - Church Street, south of Main Street – Bath: Ditches along this section of road have not been maintained; the outlet to the lake is blocked. Evaluation is needed to develop a functional drainage strategy for this section of the street.

St7 - Lodge Street, Queen Street to Lake Ontario, and Second Street, Main Street – Bath to Queen Street: The depth and steepness of the ditch on the southeast corner of the Lodge Street- Queen Street intersection poses a safety concern. The outlet on this corner drains the piecemeal storm system coming from upstream inlets at Queen Street and Second Street. Lodge Street has inadequate shoulders due to ditch.

Stormwater entering the area around the Queen Street-Second Street intersection drains south on Second Street to inlets located mid-block, where there is a localized sag in the street elevation. The two inlets drain easterly under a privately-owned building through piping, then daylight into an open swale behind the post office. The Township does not have any information on the characteristics or condition of the pipe used on private property. There is no easement in place for this pipe. The swale then swings southeasterly across the former Bath firehall site, and stormwater flows south within the Lodge Street roadside gutter(s) toward Main Street – Bath. There is one inlet on the north side of Main Street that carries the stormwater under Main Street – Bath to the ditch running between Main Street – Bath and Lake Ontario.

The ideal solution for this area involves improving this system from Queen Street to a new Lodge Street outlet, with a new storm sewer starting at the Queen Street and Second Street intersection, constructed sufficiently deep to pick up catch basins that drain under the private property (408 Main Street – Bath) and extending easterly along Queen Street to Lodge Street. From Lodge Street the piping would flow southerly until a suitable storm sewer outlet elevation is achieved, likely at or near the shore of Lake Ontario. An alternative route is to construct the storm sewer through the Township's property on Lodge Street and pick up the low spot behind the post office. This outlet is expected to require an oil-grit separator (OGS) unit.

St8 - Factory Lane: It is recommended to re-establish a proper ditch outlet at the shore of Lake Ontario, at a location that has municipal control. The existing road allowance is not maintained, but it extends to the lake. This location will require an OGS unit or alternative form of treatment.

St9 - Raglan Street at the Queen Street right-of-way: This low spot collects water from west of First Street and north of Queen Street, as well as potentially runoff from the undeveloped Township-owned lands behind the Bath Fire Station. There is a need to

pick up the drainage that collects at the north end of Raglan Street, and convey it westerly towards Bath Creek, or northerly to the new system on Oakmont Drive. Raglan Street doesn't have a formal outlet: water runs across the front lawn of 458 Main Street – Bath, with no easements in place. It's difficult to fix Raglan Street as a shared pedestrian route without addressing drainage. If a comprehensive drainage strategy can be developed in coordination with Kaitlin Corporation as developer of Loyalist Estates, staff can examine using the Loyalist Estates Phase 4 outlet.

St10 - 155 Main Street – Bath: This is a major stormwater outlet for which there is no easement in favour of the Township. The condition of the outlet is deteriorating. A pipe on private property is in poor condition and adjacent to a steep bank. The catchment area extends northeasterly and includes the southwest corner of CSC's large property. It is recommended that Township staff negotiate with the owners of 153 Main Street – Bath for easement rights, to allow the Township to maintain the outlet. The inlet on the north side of Main Street – Bath requires slope improvements, erosion control, and sidewalk protection. Once an easement is established the Township can develop plans to rehabilitate the outlet and look at options to enhance stormwater treatment at the outlet.

St11 - Odessa comprehensive stormwater review and upgrades: Apart from Factory Street, all side streets entering Main Street – Odessa have drainage deficiencies. The oldest section of the Odessa West neighbourhood, comprised of Emma, Bridge, Cross, Battery, and South (East) Streets is currently undergoing construction to rehabilitate infrastructure, including drainage improvements. The next area for improvements is the northern end of Potter Drive, South Street West, and Creighton Drive. This work is proposed to be constructed concurrent with the proposed upgrade of the intersection of Potter Drive and Main Street – Odessa. The following areas will require stormwater upgrades after the work outlined above is completed:

- The neighbourhood of Centre, Gore, and Elgin Streets
- West Street
- William Street
- Old Wilton Road
- Main Street – Odessa ditches east of County Road 6

St18 – Ongoing stormwater infrastructure upgrades as road rehabilitation occurs: It is recommended that drainage issues such as those listed above be addressed when road rehabilitation in the area occurs.

St22 - Keitha Drive and Penny Lane drainage deficiencies: If heavy flows bypass the Manitou Crescent West catch basins, the stormwater flows along the curb line and down the private driveway of Penny Lane. Adding a gutter across the entrance would help to divert flows to two catch basins immediately downstream of the Penny Lane driveway. It is suspected that this route is a major flow route, and if not protected by

easements, the Township should attempt to obtain easement rights to maintain the storm system outlets.

St23 - Culvert crossing near 18 Amherst Drive: There is a concern that if the cross culvert becomes blocked, the only flow option is the overland route. Based on design grades, flows may possibly be diverted easterly on Amherst Drive to Coronation Boulevard, as opposed to accessing the overland route along the sidewalk to the cul-se-sac bulb of Benjamin Court. This is because the curbs would contain the water and the existing overland outlet elevation in the Parkside storm system may be too high to take water. There is a concern that the older Coronation Boulevard west side ditching system may not have sufficient capacity for this situation. The system is complicated, as it appears that many Coronation Boulevard properties have side yard swales that flow west to the rear property line and into the Parkside stormwater facility via three ditch inlets located along the rear property line. It is recommended that elevations be confirmed in this area and prepare necessary action plan.

St24 - Mill Street: It is recommended to clean out the swale and ensure adequate outlet for the swale in the easement south of the former Township roads garage, behind Main Street – Odessa properties.

5.3.2. Major Storm Remedial Projects

St19 - Wilton Road Dam: In 2022-23 the Cataraqui Conservation commissioned a safety study of the Wilton Road Dam, to which Loyalist Township contributed financially as the beneficiary of the control structure. Results from this study have identified the need to address several safety deficiencies:

- Catwalk access safety concerns
- Cattail mat accumulation
- Public and operator safety
- North deck access
- Sluiceway gate design safety concerns

St20 - Millhaven Creek frazil ice and flood protection: In the section of Millhaven Creek between Main Street – Odessa and the former Babcock Mill Dam, the creek has on numerous occasions experienced flooding that affected property and infrastructure. This section of the creek experiences localized ice jams which are suspected to be more restrictive due to the build-up of frazil ice. Frazil ice forms under specific conditions that exist in this shallow section of Millhaven Creek when extremely cold air conditions are prevalent.

The Township has previously looked at solutions for this problem but there are few examples where projects have been initiated to address similar concerns. It is recommended that Loyalist Township continue to look for solutions that would minimize flooding events along the stretch of Millhaven Creek between Main Street – Odessa and Babcock Mill and make efficient use of public investment.

St21 - Babcock Mill Dam Study: Babcock Mill Dam consists of three distinct components. Some of the area is covered by a historical cultural designation which may restrain the options available for future site improvements including the existing dam.

The Township commissioned an environmental assessment of the dam (G.D. Jewell Engineering Inc and WaterPlan Associates, 2011). The report suggested that under draft guidelines of the day, the dam would be classified as Low Hazard because expected damage downstream of the dam would be minimal were the dam's control to fail. Under this classification it is generally difficult to obtain funding from upper levels of government for a project to rehabilitate a dam. After assessing the alternatives, the EA recommended that the control structure be fully decommissioned and removed. This EA is over ten years old and should be updated, especially since the cultural designation has been assigned to some components of the site. Other factors used in the evaluation may also have changed over time.

5.4. Roads

The table below provides a summary of recommended remedial projects for stormwater infrastructure, and subsequent subheadings describe the projects in greater detail.

Table 10 Recommended remedial projects - roads

Project ID	Project	Tech Memo Reference
R2	Main Street – Bath multi-use pathway and urbanization, Centennial Park easterly to village limit	TM-22, TM-46
R3	Main Street – Bath multi-use pathway, Centennial Park westerly to village limit	TM-22, TM-46
R4	Main Street – Bath and Windermere Boulevard intersection improvements	TM-22
R18	Main Street – Odessa reconstruction sidewalk and multi-use pathway construction (concurrent with County Road upgrade)	TM-23
R19	Wing Road Bridge (culvert section) replacement	TM-21
R20	Bridge railing deficiencies	TM-21
R23	Replacement of Simmons Road twin culverts at Thorpe Road Intersection	TM-21

R24	Replacement of Third Concession Road culvert at the Miller Municipal Drain	TM-21
R25	Replacement of Townline Road culvert at Switzerville Road intersection	TM-21
R27	Amherst Drive traffic calming pilot study	TM-24, TM-35
R28	Traffic calming technical reviews on priority roads	TM-24
R17	Substandard sidewalk replacement program	TM-24

5.4.1. Main Street – Bath Remedial Projects

The following projects related to Main Street – Bath are considered to have both remedial and growth aspects, as they improve existing infrastructure while also accommodating growth in the community. Projects T2 and T4 will be in design in 2024. Construction of these projects will be phased over the following years once design and public consultation is completed.

R2 - Centennial Park easterly to village limit: It is expected that the road surface between Centennial Park and the eastern limit of the former Village will be upgraded early in the IMP term, with drainage improvements included in the project scope. These expenses are eligible Connecting Link expenses, subject to grant approval. It is recommended that as the various stages of the work progress, the underground water and sanitary infrastructure be replaced concurrently, and active transportation infrastructure upgraded.

R3 - Centennial Park westerly to village limit: No major road work is anticipated west of Church Street until the end of the study period at the earliest. At that time full replacement of underground water and sewer infrastructure should be considered prior to any major resurfacing projects. Additionally, as the Township addresses local remedial drainage issues in the older areas of Bath, there may be a need for localized storm sewer placement within the right-of-way.

Prior to the next resurfacing of the west end of Main Street – Bath, it may make financial sense to replace Bath Creek Bridge. The pre-cast sidewalk and boulevard pavement found in the central area of Bath will also need to be refurbished or replaced. Consideration should be made to defer replacement of this surface until the scope of the waterfront trail is defined. Potential improvements of the sidewalks through the Bath community should consider the long-term active transportation objectives of this corridor and the provision of vehicle parking for the commercial area.

R4 - Windermere Boulevard intersection improvements: For a couple of decades various traffic impact studies (TIS) for the community of Bath have indicated the need of a new collector road, Windermere Boulevard, which would extend from County Road 7

south easterly to Main Street – Bath as the east side of Bath continues to develop. The most recent traffic impact study indicates that the intersection of Main Street – Bath and Windermere Boulevard meets the warrants for a controlled intersection with the development of Aura by the Lake Phase 1, which has now been serviced (GHD, 2021).

With the traffic volumes projected in GHD's evaluation, there are only two options for a controlled intersection that satisfactorily meet the needs of Loyalist Township: installation of traffic signals, or construction of a roundabout. The Township's current design consultants will be reviewing feedback from the public and agencies and will develop an intersection that best suits the Township's needs, with input from MTO and the County of Lennox and Addington.

5.4.2. Main Street – Odessa Remedial Projects

R18 – Main Street – Odessa reconstruction, sidewalk and multi-use pathway construction: The entire corridor of Main Street – Odessa needs remedial work. There are inconsistencies in sidewalk standards along much of the route. There are drainage concerns at almost every intersection. The current design has minimal allowance for bicycles. School crossings are inadequate, especially when considering the recent development in the west end of the community and traffic volumes. The County has indicated that this section of County Road 2 is slated for reconstruction, and preliminary planning is underway. Loyalist staff met with County officials to review the known deficiencies within and adjacent to the right-of-way. Loyalist staff will continue to meet with County staff to develop a work plan.

As of May 2023, a preliminary overall phasing plan has been developed as follows:

- Phase 1, Potter Street to West Street/Durham Street.
- Phase 2, Potter Street to west community limit
- Phase 3, balance of Main Street - Odessa to east community limit

Phase 1 design began in 2023, with construction planned for 2024-2025. Construction for Phases 2 and 3 is currently scheduled to begin in 2026 and expected to extend over multiple seasons due to the inclusion of underground utility revitalization.

As each phase is completed, it is expected that the Township will address all remedial water and sanitary issues within and adjacent to the corridor. The schedule is subject to change and will be administered by the County of Lennox and Addington.

5.4.3. Bridges Remedial Projects

R19 - Wing Road Bridge (culvert section) replacement: The Wing Road crossing of Millhaven Creek consists of two structures. The north structure is a precast concrete arch culvert, and the south structure is an oval coiled steel culvert with an open bottom. The south structure is very near Millhaven Road. Wing Road narrows to a width supporting only one lane of traffic across the two structures, a length of approximately

60 metres, and there is little space for queuing between Millhaven Road and the one-lane structures.

Recent formal Ontario Structure Inspection Manual (OSIM) (Ontario Ministry of Transportation, 2008) inspections have noted declining conditions of the Wing Road culvert section at Millhaven Creek, and the structure was recently noted for replacement. As traffic volumes increase on Millhaven Road, it is more difficult for traffic to turn from Millhaven Road onto the single-lane structures, especially if an oncoming vehicle is met on the structure and particularly if the turning vehicle is a truck or bus. To address this safety concern, staff are recommending that the current single-lane steel culvert be replaced with a two-lane structure.

R20 - Bridge railing deficiencies: In 2022 Loyalist Township utilized the service of Keystone Bridge Management Corporation (Keystone) for the biannual OSIM bridge inspections (Keystone Bridge Management Corp., 2022). Railing systems utilized on bridge approaches and on the structures themselves are updated periodically as safety design develops. With structures designed to last for several decades, it is not unusual for bridge railing systems become to become outmoded. Several structures have been noted by Keystone as requiring railing upgrades due to updated standards. This list does not include railing systems which have been noted for upgrades due to life cycle replacement, or those that have been damaged but are still compliant with current design standards.

- Amey’s Bridge, Doyle Road
- Manore Bridge, Brandon Road
- Violet Bridge, Violet Road
- Wilton Bridge, Simmons Road
- Stella Forty-Foot Road Culvert, Stella Forty-Foot Road –
- Townline Road Culvert, Townline Road (north leg at Switzerville Road intersection)

It is recommended that the railing system improvements on the structures listed above be deferred until such time when a comprehensive structure rehabilitation project is required, based on priorities identified through the OSIM process, or when the existing railings no longer perform to the intent of their original design.

5.4.4. Culverts Remedial Projects

Keystone noted that the structures listed below were expected to be replaced within the planning period of the IMP. Based on expected traffic volumes and development patterns, it is expected that these replacements would be treated as lifecycle replacements.

R23 - Replacement of Simmons Road twin culverts at Thorpe Road intersection: The Keystone inspection report recommended that the Simmons Road twin culverts at Thorpe Road be rehabilitated in the near future.

R24 - Replacement of Third Concession Road culvert at the Miller Municipal Drain: The Keystone inspection report recommended that the Third Concession Road culvert at the Miller Municipal Drain be rehabilitated in the near future.

R25 - Replacement of Townline Road culvert at Switzerville Road intersection: The Keystone inspection report recommended that the Townline Road culvert at Switzerville Road be rehabilitated in the near future.

5.4.5. Traffic Calming Remedial Projects

R27 - Amherst Drive traffic calming pilot study: Amherst Drive was identified as a high priority road for the implementation of traffic calming, and was reviewed for traffic calming (GHD, 2023). GHD has recommended various approaches that could be implemented on a temporary basis, and if successful could be used in a permanent configuration. These temporary approaches are being recommended as a part of a traffic calming pilot study.

R28 - Traffic calming technical reviews on priority roads: Through the IMP priority roads for traffic calming were identified. It is recommended that technical reviews are completed for these priority roads.

5.4.6. Sidewalks Remedial Projects

R17 - Substandard sidewalk replacement program: As part of the IMP, staff have organized sidewalk improvements based on the following criteria:

- Remedial need to link disparate areas of the community
- Improper mid-block discontinuity of sidewalks, not meeting AODA criteria, and improper crossing alignments
- Sidewalks with sub-standard widths

The objective of the Accessibility for Ontarians with Disabilities Act (AODA) is to “achieve accessibility in goods, services, facilities, accommodation, employment, buildings, structures, and premises” (Province of Ontario, 2005). Loyalist Township is required to abide by this legislation. Sidewalks are required to meet specific standards; however, the Act allows for certain existing infrastructure which does not meet current requirements. It is the intent of Loyalist Township for sidewalks within any street improvement projects to meet or exceed the AODA requirements. Similarly, the existing network shall be upgraded to meet current requirements wherever feasible. Many of these upgrades will be most efficiently dealt with when the street is eligible for lifecycle improvements or addressed as part of a focused sidewalk improvement project. It is not the intent of the IMP to suggest that every sidewalk upgrade should be immediately addressed. Ideally, all sub-standard elements of the sidewalk would be replaced in the 25-year horizon of the IMP.

6. Growth-related Infrastructure Impacts

This section discusses projects that are recommended through the IMP to address growth-related infrastructure impacts. The goal of growth projects is to ensure sufficient infrastructure is in place to accommodate the growing population of the Township.

The foundational information from which these recommendations arise is found in the various technical memoranda, as referenced in the respective tables. These memos are found at Appendix Section 1. Estimated project costs and timing are described for each recommended project in the Project Summaries found at Appendix Section 2.

6.1. Water

6.1.1. Growth Projections Impact

Amherstview and Odessa are serviced by the Fairfield Water Treatment Plant (WTP), while the community of Bath is serviced by the Bath WTP. The increase in population and residential dwellings in these serviced areas will inevitably lead to an increase in demand for potable water. As a municipality, the Township has a responsibility to ensure that an acceptable quantity and quality of water treatment capacity is available for future development, and that the approval or buildout of new connections does not exceed the design capacity of the systems. As such, it is necessary to ensure that future demand will be met over the long term and that that sufficient time be allocated to plan for expansion activities, as required.

The following sections of this report will present the projected water demand for the Fairfield and Bath water systems. The residential growth data presented above, along with flow data from each plant and utility billing information was used to develop these projections.

6.1.1.1. Fairfield Water Treatment Plant

The Fairfield WTP has a rated capacity of 8,000 m^3/day and services the areas of Amherstview and Odessa. When determining the amount of capacity that remains available, the following must be considered:

- Residential flows – The amount of capacity used daily to service residents.
- ICI flows – The amount of capacity used daily to service the Industrial, Commercial, and Institutional (ICI) sectors.
- Purchased but unused ICI capacity – The amount of capacity that is connected for ICI customers but goes unused.
- Committed but unbuilt units – The amount of capacity that has been committed to new development or subdivision but is not yet connected. Although these units may not consume water until they are officially connected to the system, the theoretical amount of water that they will eventually consume must be subtracted.

The projected amount of available capacity can then be calculated for various intervals over the study period.

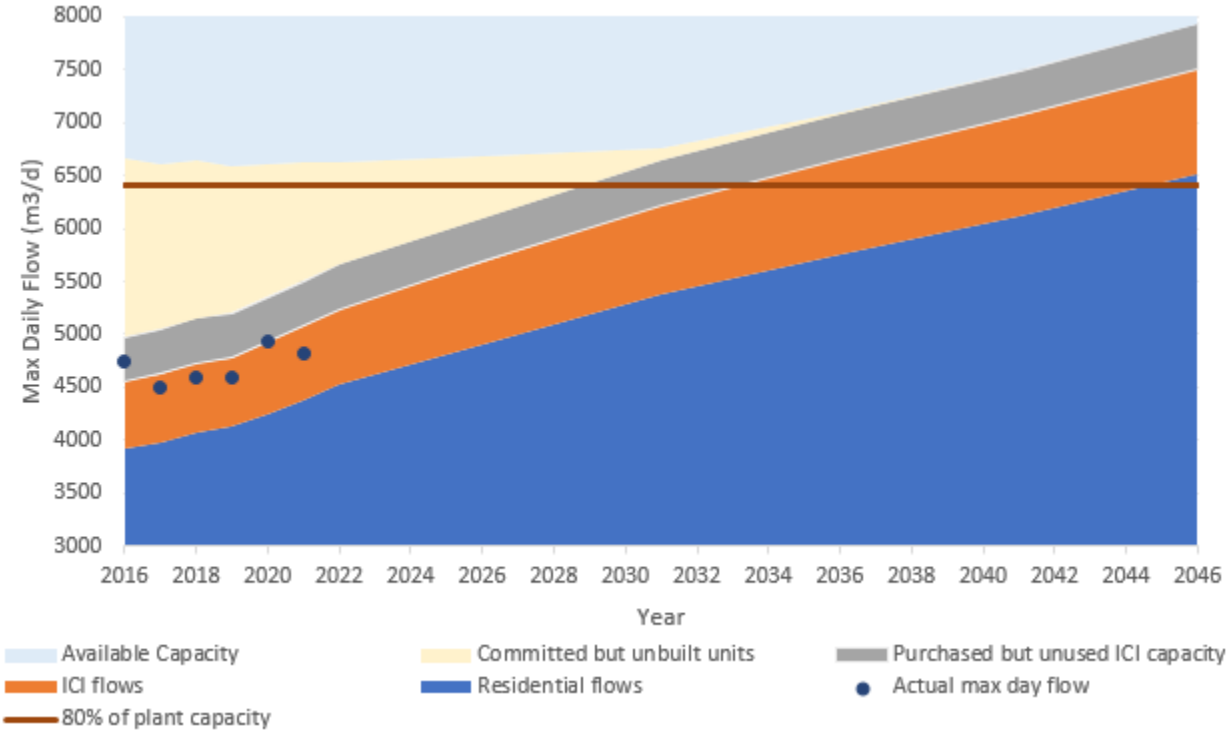

Figure 27 Projected capacity at Fairfield WTP to 2046

Figure 28 illustrates the gradual increase in residential and ICI water demand over the course of the study period, as well as the purchased-but-unused ICI capacity and the theoretical flow which must be set aside for committed-but-unbuilt residential units.

Based on these projections, the potable water demand up to 2046 is not expected to exceed the Fairfield WTP's rated capacity. Furthermore, potable water demand is anticipated to reach 80% of the plant's capacity around 2033, at which point the Township should begin planning for the facility's expansion. Details of this analysis can be found in TM-25.

6.1.1.2. Bath Water Treatment Plant

Bath WTP has a rated capacity of 6,000 m^3/day and services the community of Bath and the Correctional Services of Canada (CSC) facilities located in the area. Through previous agreements, 2,672 m^3/day of potable water is allocated to CSC, leaving 3,328 m^3/day to service Bath. When determining the amount of capacity that remains available, these factors must be considered:

- Residential flows – The amount of capacity used daily to service residents.
- ICI flows – The amount of capacity used daily to service the Industrial, Commercial, and Institutional (ICI) sectors.

- Purchased but unused ICI capacity – The amount of capacity that is connected for ICI customers but goes unused.
- Committed but unbuilt units – The amount of capacity that has been committed to new development or subdivision but is not yet connected. Although these units may not consume water until they are officially connected to the system, the theoretical amount of water that they will eventually consume must be subtracted.
- CSC allocation – The amount of capacity that has been allocated to CSC through previous agreements.

Figure 29 illustrates the projected residential and ICI water demand for connections to the Bath WTP, along with committed-but-unbuilt residential capacity and the projected available capacity over the course of the study period. This figure does not show the CSC allocation, as that is considered unavailable capacity.

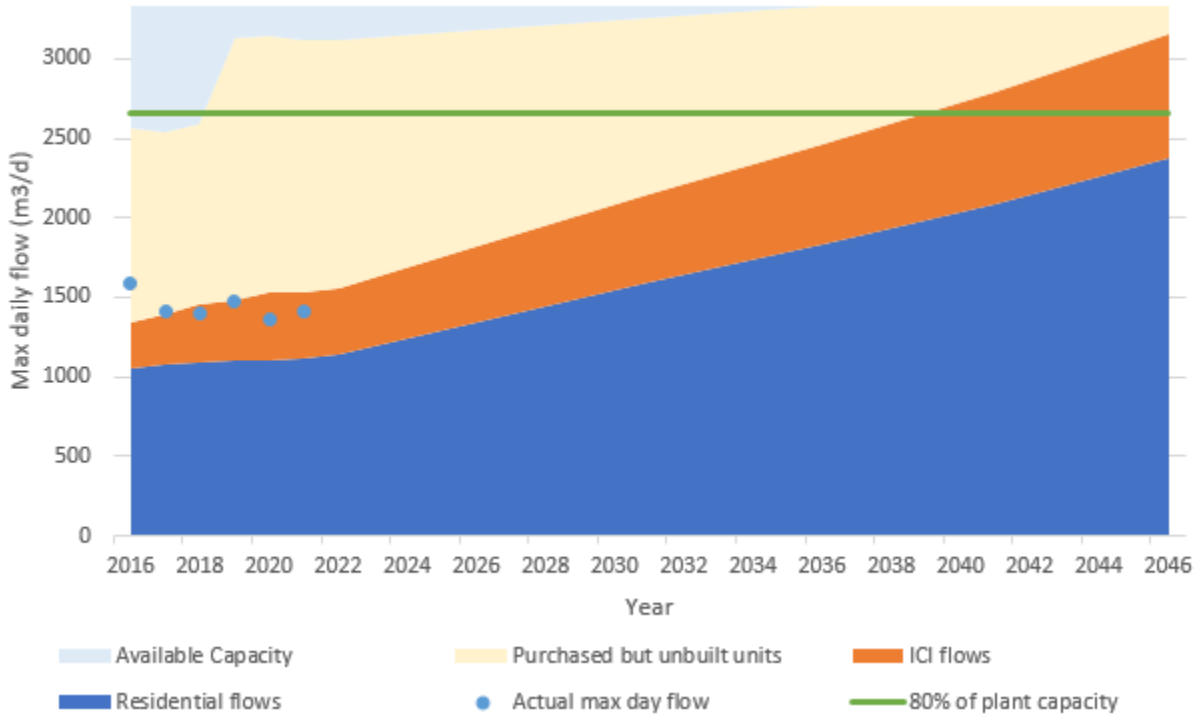

Figure 28 Projected capacity at Bath WTP to 2046

Based on these projections, the potable water demand up to 2046 is not expected to exceed the Bath WTP's rated capacity.

However, based on the graph interpretation it is expected that no capacity will be available for allocation after 2034 based on the expected rate of new connections. Furthermore, potable water demand is anticipated to reach 80% of the plant's capacity around 2039, at which point the Township should begin planning for the facility's expansion. Staff are looking at new policy concepts for an equitable and timely method

for administering water capacity for new development. Details of this analysis can be found in TM-26.

Though neither plant is expected to exceed rated capacity within the IMP study period, staff have contracted a consultant to confirm the plant capacity ratings and determine where upgrades may be needed in the future.

The table below provides a summary of recommended growth projects for water infrastructure, and subsequent subheadings describe the projects in greater detail.

Table 11 Recommended growth projects - water

Project ID	Project	Technical Memo Reference
W6	Fairfield WTP chlorine contact tank and clearwell assessment	TM-3
W28	Fairfield WTP plant expansion to 10,750 m^3 (GAC third unit)	TM-3
W26	EA study on storage options for both distribution systems	TM-28
W30	Review and update emergency contingency plan	TM-28
W15	Lakeside Ponds watermains oversizing and extensions (McKee Street, Speers Boulevard)	TM-29
W16(2)	Amherst Drive watermain oversizing and extensions	TM-29
W17(1)(2)	Walden Pond Drive watermain extension	TM-29
W18(1)(2)	Kildare Drive watermain extension	TM-29
W19(1)	Babcock Boulevard watermain extension (Fields of Loyalist)	TM-29
W20(1)	Proposed Street A watermain establishment (Fields of Loyalist)	TM-29
W21(1)	Main Street – Odessa watermain extension (315 Main Street – Odessa to Shane Street development)	TM-29
W24(1)(2)	Amherstview West miscellaneous trunk water connections	TM-27

W25	Taylor-Kidd watermain extension to County Road 4	TM-27
W1	Bath WTP UV disinfection system	TM-4
W3	Bath WTP chlorine contact tank and clearwell assessment	TM-4
W29	Bath WTP plant expansion to 7,200 m^3 (High lift pumps, low lift pumps, backwash pumps, generator, intake)	TM-4
W31	Amend CSC agreements	TM-28
W14	Upsizing Main Street – Bath watermains	TM-27
W22(1)	Country Club Drive watermain extension	TM-29
W23(1)	Windermere Boulevard watermain extension	TM-29
W32	Windermere PRV	TM-27

(1) Note that these projects are developer-funded and are not the responsibility of the Township; therefore, no further detail is provided below.
(2) Note that these projects are included in the Amherstview West Secondary Plan EA.

6.1.2. Fairfield Water System Growth Projects

6.1.2.1. Fairfield Water Treatment Plant

W6 - Chlorine contact tank and clearwell assessment: It is recommended that the Township review the minimum water level and free chlorine residual maintained in the clearwell. Changes to these values improve the contact time (CT), delaying the need clearwell expansion or disinfection upgrades. Township staff should investigate the option to increase the minimum clearwell water level and minimum free chlorine residual. A tracer study is recommended to determine baffling factors.

W28 - Plant expansion to 10,750 m^3: The Fairfield WTP will need to be expanded within the IMP study period. Current growth projections estimate that the plant will reach 80% capacity around 2033, at which point the process for plant expansion will be initiated. If growth continues at the current rate the plant will likely need to be expanded to the 10,750 m^3/day scenario. The scale of the plant expansion will be confirmed using updated growth projections when 80% capacity is reached. The following process upgrades will be required to reach 10,750 m^3/day:

- Raw water intake upgrades
- GAC upgrades – third GAC unit
- Additional chlorine cylinder
- Contact tank and clearwell baffling improvements

6.1.2.2. Fairfield Water Distribution System

W26 - EA study on storage options for both distribution systems: Storage requirements in the Fairfield system were also analyzed using the growth projections described above. Based on these projections, the storage requirements are expected to minimally exceed the systems current capacity around 2026. The increase in required storage is minimal out to 2041, at which point there is a large jump in required storage.

The storage capacity restriction is mainly a result of the quantity of fire storage required. This value is heavily dependent on the population being serviced, which has been projected based on a high growth scenario. Actual growth trends may adjust the timing of when the threshold is reached. The need for increased storage capacity could also be delayed through a reduction in the flow per capita, such as through a water loss reduction program. Recent trends have indicated that the flow per capita is decreasing. Staff will continue to monitor population growth and flow per capita trends to track when additional storage will be required. It is recommended that a separate EA study is conducted to review all possible storage options in both distribution systems in order to determine the best path forward.

W30 - Review and update emergency contingency plan: When the volume of available storage becomes restricted, it is important to have a contingency plan in place in case of an emergency. Staff will review these plans with the Fire Chief to ensure any storage concerns have been accounted for until additional storage is constructed.

W15 - Lakeside Ponds watermains oversizing and extensions (McKee Street, Speers Boulevard): The Township has elected to oversize some watermains in the Lakeside ponds subdivision. The oversizing ensures favourable hydraulics for conveying additional water to the County Road 6 trunk main from the core of Amherstview. The large main increases redundancy for the trunk main to Odessa and the ground-based water storage reservoir located at 243 County Road 6.

W16 - Amherst Drive watermain oversizing and extensions: The Township has elected to oversize the watermain along Amherst Drive, west of County Road 6. This oversizing is required to allow for full build-out of the Amherstview West Secondary Plan lands.

W25 – Taylor-Kidd watermain extension to County Road 4: The watermain on Taylor-Kidd Boulevard extends 460m westerly from the Jim Snow Drive intersection. This main is expected to be extended approximately 600-1,000 m further west to service the Umicore facility, currently in development. When the main is extended, consideration should be given to continuing the extension to County Road 4. The total distance from the current end of the watermain to County Road 4 is approximately 2,100 m. The main has a diameter of 300 mm and therefore capable of servicing a large area. The main when extended will be available to service other industries in the area as well as address remedial needs in the vicinity of the hamlet of Millhaven.

6.1.3. Bath Water System Growth Projects

6.1.3.1. Bath Water Treatment Plant

W1 - UV disinfection system: As discussed in Section 5.1.2.1, a pressurized GAC system has been recommended at the Bath WTP to address taste and odour concerns. It has been recommended that disinfection upgrades occur at the same time as the GAC installation. A UV disinfection system is the preferred option as it provides primary disinfection without expanding the contact tanks, and it will meet current and future disinfection requirements.

W3 - Chlorine contact tank and clearwell assessment: Changes to the minimum water level and free chlorine residual maintained in the clearwell improve chlorine contact time (CT), delaying the need for clearwell expansion or disinfection upgrades. It is recommended that Township staff investigate these adjustments.

W29 - Plant expansion to 7,200 m^3: The Bath WTP will need to be expanded within the IMP study period. Current growth projections estimate that the plant will reach 80% capacity around 2039. At this point the process for plant expansion will be initiated. The scale of the plant expansion will be confirmed using updated growth projections when 80% capacity is reached. Assuming the UV disinfection and GAC upgrades have taken place, several process upgrades will still be required to reach 7,200 m3/day:

- Low-lift pump upgrades
- High-lift pump upgrades
- Backwash pump upgrades
- Generator upgrades

6.1.3.2. Bath Water Distribution System

W26 - Additional storage in the Bath system: Storage requirements in the Bath system were also analyzed using the growth projections described above. Based on these projections, the total storage requirements for the Bath WDS have exceeded the current capacity. This capacity restriction is mainly caused by the requirement for fire flow storage reserved for Correctional Services of Canada (CSC). CSC has constructed storage on-site; therefore, it is possible they no longer require storage capacity from the Township.

The Township's first step should be to work towards amending their agreement with CSC so that the storage requirement can be removed. Depending on if the CSC agreement is amended or not, the timing for additional storage construction will be altered. Removal of this storage requirement will mean that the Township currently has sufficient storage available, and the need for additional storage will be based on residential growth and water usage. As with Fairfield, it is recommended that growth and flow per capita trends are monitored annually to provide staff with more accurate information on storage needs. With or without amendments to the CSC agreement, it is important to have an emergency contingency plan in place for Bath. It is recommended

that a separate EA study is conducted to review all possible storage options in both distribution systems, to determine the best path forward.

W30 - Review and update emergency contingency plan: When the volume of available storage becomes restricted it is important to have a contingency plan in place in case of an emergency. Staff will review these plans with the Fire Chief to ensure any storage concerns have been accounted for until additional storage is constructed.

W31 - Amend CSC agreements: As noted above, storage concerns in Bath are primarily related to the required reserve storage for CSC. Reviewing this agreement should be a priority to determine if the storage requirement can be altered.

W14 - Upsize Main Street – Bath watermains: The objective of this project is to replace aging infrastructure, and to increase the size of the main to assist in improved capacities in the east end of the growing community. The proposed section to be installed is from Mott Street to Heritage Drive. The Township intends to resurface the section of Main Street – Bath from Mott Street easterly to Sir John Johnson Drive in the next few years, and it is the intent to replace or rehabilitate all the watermain within the right-of-way, so that sidewalks and other active transportation infrastructure and boulevards can be constructed prior to or concurrent with road work.

W32 - Windermere PRV: As the community has grown with local interlinkages in the distribution system, the location and operating pressures of the Mott Street PRV are restrictive, and the unit is having difficulty meeting the expanding needs of the system. To accommodate new development and meet fire requirements, a new PRV will be required at Windermere Boulevard.

6.2. Sanitary

6.2.1. Growth Projections Impact

Amherstview and Odessa are serviced by the Amherstview Water Pollution Control Plant (WPCP), while the community of Bath is serviced by the Bath Sewage Treatment Plant (STP). The increase in population and residential dwellings in these serviced areas will inevitably lead to an increase in demand for sanitary sewage treatment services. As a municipality, the Township has a responsibility to ensure that an acceptable quantity and quality of sanitary sewage treatment capacity is available for future development, and that the approval or buildout of new connections does not exceed the design capacity of the systems. As such, it is necessary to ensure that future demand will be met over the long term and that that sufficient time be allocated to plan for expansion activities, if necessary.

The following sections of this report will present the projected sanitary sewage demand for the Amherstview and Bath sanitary sewage systems. The residential growth data presented above, along with flow data from each plant and utility billing information was used to develop these projections.

6.2.1.1. Amherstview Water Pollution Control Plant

The Amherstview WPCP services the communities Amherstview and Odessa, as well as the Loyalist East Business Park. The plant has a rated capacity of 6,400 m^3/d with a peak flow capacity of 16,000 m^3/day. When determining the amount of capacity that remains available, the following must be considered:

- Residential flows – The amount of capacity used daily to service residents.
- ICI flows – The amount of capacity used daily to service the Industrial, Commercial, and Institutional (ICI) sectors.
- Committed-but-unbuilt units – The amount of capacity that has been committed to new development or subdivision but is not yet connected. Although these units may not consume water until they are officially connected to the system, the theoretical amount of water that they will eventually consume must be subtracted.

Figure 30 illustrates the projected residential and ICI sanitary sewage demand for connections to the Amherstview WPCP, along with committed but unbuilt residential capacity and the projected available capacity over the course of the study period.

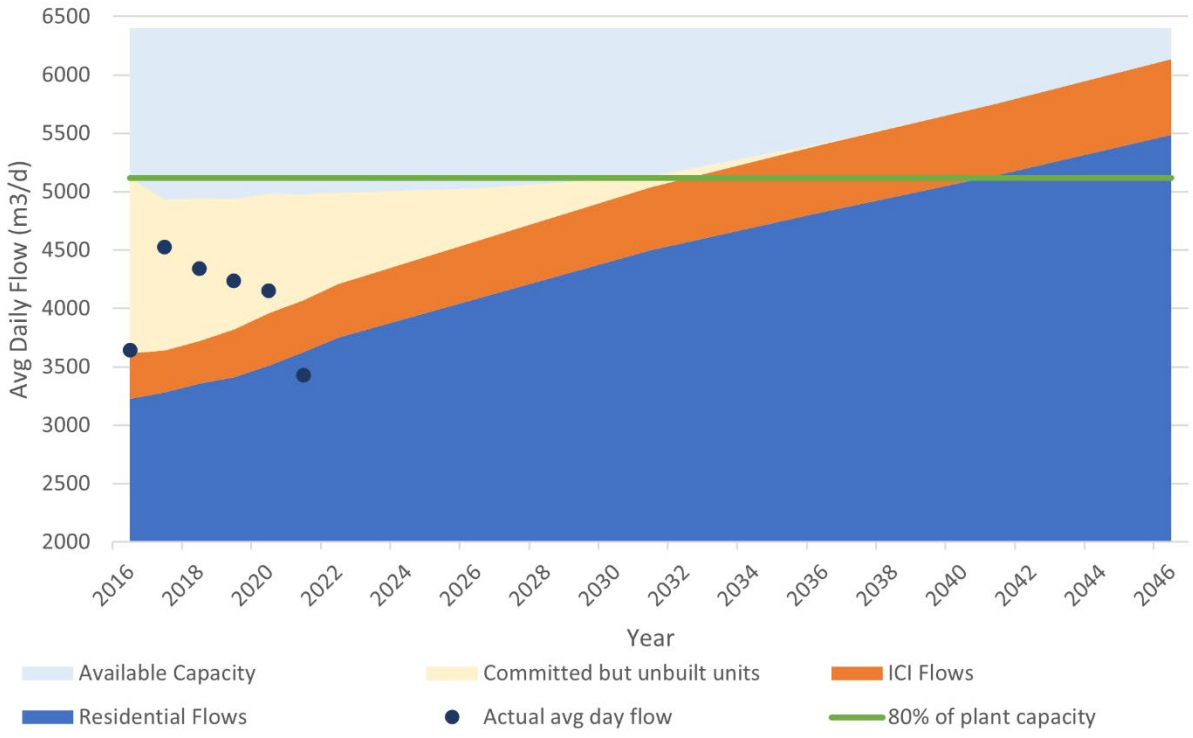

Figure 29 Projected capacity at Amherstview WPCP to 2046

Based on these projections, the demand for sanitary sewage treatment up to 2046 is not expected to exceed the Amherstview WPCP's rated capacity. Furthermore, sanitary sewage flows are expected to exceed 80% of the plant's capacity around 2032, at which point the Township should begin planning for the facility's expansion. It should be noted

that the actual average day flows measured at the Amherstview WPCP have been decreasing over time, despite the increase in connections to the system. This can likely be attributed to weather patterns and reductions in Inflow and Infiltration into the sewage collection system. Should these trends continue, the available capacity of this plant to be allocated to development activities could feasibly increase over time. Details of this analysis can be found in TM-30.

6.2.1.2. Bath Sewage Treatment Plant

The Bath STP has a rated capacity of 3,008 m^3/day and services the community of Bath as well as the CSC facilities located in the area. Through previous agreements, 909 m^3/day of sanitary sewage capacity is allocated to CSC, leaving 2,099 m^3/day to service the Village of Bath. When determining the remaining capacity available, the following must be considered:

- Residential flows – The amount of capacity used daily to service residents.
- ICI flows – The amount of capacity used daily to service the Industrial, Commercial, and Institutional (ICI) sectors.
- Committed-but-unbuilt units – The amount of capacity that has been committed to new development or subdivision but is not yet connected. Although these units may not consume water until they are officially connected to the system, the theoretical amount of water that they will eventually consume must be subtracted.
- CSC allocation – The amount of capacity allocated to CSC through previous agreements.

Figure 31 illustrates the projected residential and ICI sanitary sewage demand for connections to the Bath STP, along with committed but unbuilt residential capacity and the projected available capacity over the course of the study period. This figure does not show the CSC allocation, as that is considered unavailable capacity to the Township.

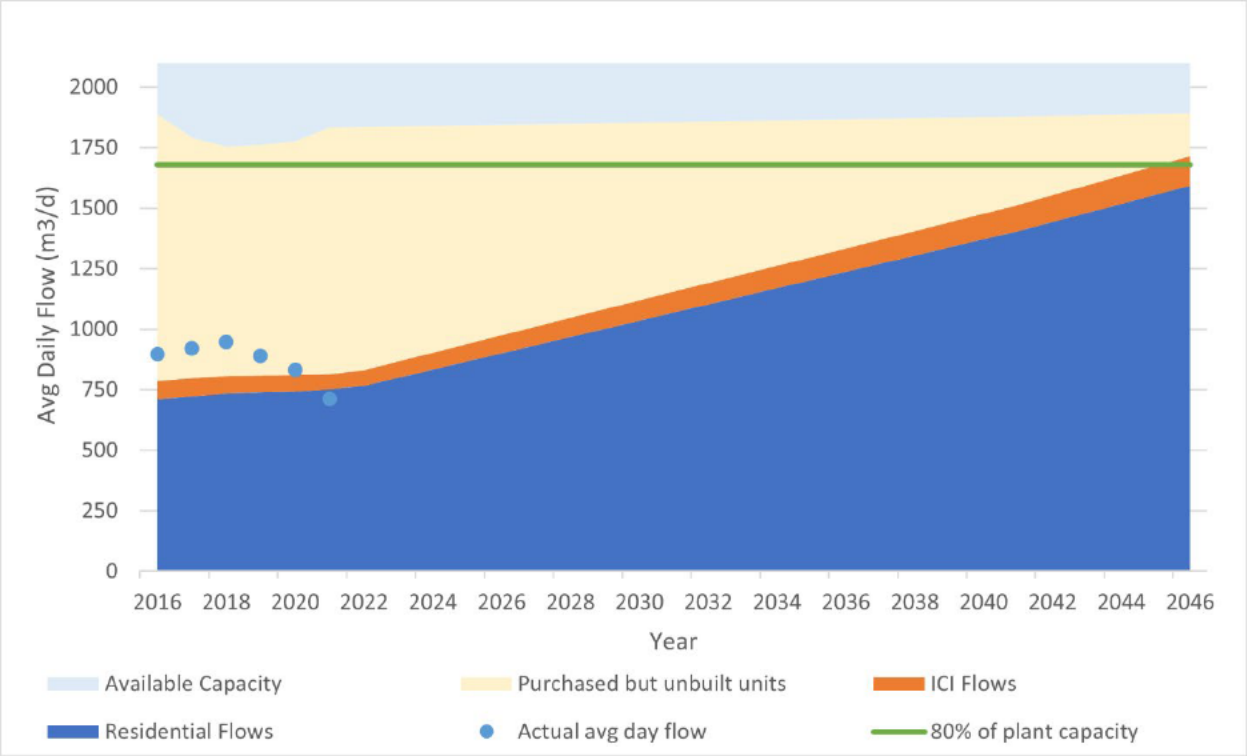

Figure 30 Projected capacity at Bath STP to 2046

Based on these projections, the demand for sanitary sewage treatment up to 2046 is not expected to exceed the Bath STP's rated capacity. Sanitary sewage flows at the plant are expected to reach 80% of its rated capacity around 2045. As such, plant expansion activities are not expected to commence in the foreseeable future, however a review of the plant's treatment processes should be undertaken to ensure that sufficient redundancy is built into the system. Details of this analysis can be found in TM-31.

The table below provides a summary of recommended growth projects for sanitary infrastructure, and subsequent subheadings describe the projects in greater detail.

Table 12 Recommended growth projects - sanitary

Project ID	Project	Technical Memo Reference
San1	AWPCP peak flow equalization and headworks upgrades	TM-8
San13	System connection feasibility study	TM-8
San14	Bayview Bog Study	TM-8
San41	AWPCP plant expansion to 9600 m^3 (aeration tanks, secondary clarifiers, sludge digestor aeration, potentially disinfection)	TM-8

San20	Bridge Street SPS capacity assessment	TM-12
San21	Bridge Street SPS capacity upgrades (450 L/s)	TM-12
San22	Lakeview SPS Stage 1, pump #2 replacement	TM-14
San23	Lakeview SPS Stage 2, facility classification compliance upgrades	TM-14
San24	Lakeview SPS Stage 3, pump #1 and #3 replacement	TM-14
San25	Taylor Kidd SPS capacity upgrades (132 L/s)	TM-13
San26[(2)]	Walden Pond Drive extension and oversizing of sewer	TM-32
San27[(2)]	Oversizing of trunk sewer to Taylor-Kidd Boulevard from Walden Pond Drive extension	TM-32
San28[(2)]	Oversizing of sewer from Walden Pond Drive to Amherst Drive	TM-32
San29[(2)]	County Road 6 and Taylor-Kidd Boulevard sewer extension	TM-32
San30[(2)]	Lakeside Phase 8 sewer extension	TM-32
San31[(1)]	McKee Street sewer establishment	TM-32
San32[(1)]	Speers Boulevard sewer extension	TM-32
San33[(1)]	Babcock Boulevard sewer extension (Fields of Loyalist)	TM-32
San34[(1)]	Proposed Street A sewer establishment (Fields of Loyalist)	TM-32
San35[(1)]	Shane Street sewer extension (315 Main Street – Odessa)	TM-32
San42	BSTP plant expansion (headworks, aeration tanks, secondary clarifier, disinfection)	TM-9
San15	Bath SPS #1 pump upgrades (140L/s)	TM-15
San36[(1)]	Country Club Drive sewer extension	TM-32
San37[(1)]	Windermere Boulevard sewer extension	TM-32

(1) Note that these projects are developer-funded and are not the responsibility of the Township; therefore, no further detail is provided below.

(2) Note that these projects are included in the Amherstview West Secondary Plan EA.

6.2.2. Loyalist East Sanitary System Growth Projects

6.2.2.1. Amherstview Water Pollution Control Plant

San1 - Peak flow equalization and headworks upgrades: This project will convert an existing lagoon into an equalization lagoon, connected with a new wet well pumping station for discharging overflows into headworks. Headworks improvements will include upgrades to the mechanical fine screens, grit removal system, and any ancillary equipment as required. This project will provide hydraulic capacity to all process units in the plant, helping to accommodate growth. It will also protect downstream processes and improve operation of the existing equalization facility.

San13 - System connection feasibility study: When required, expansions at the Bath STP will be costly, and likely challenging with the proximity to surrounding houses. Staff have noted an opportunity to connect the Bath sanitary system to the Amherstview system. This would involve converting the current Bath STP to a pumping station and sending all sewage to Amherstview WPCP via a sanitary forcemain. Appropriate upgrades would be required at Amherstview WPCP to accommodate the additional flows from Bath. This project is beyond the scope of the IMP study. It is recommended that this option is investigated in more detail though a feasibility study.

San14 - Bayview Bog Study: While conducting a study on system connection, Bayview Bog loading requirements should also be considered. MECP noted that the previous study undertaken through the last re-rating exercise could be used as a starting point. It is likely that as flows increase, the total phosphorus loading previously permitted would remain the same, meaning a reduction on a per litre basis. An updated Bayview Bog study is recommended along with the feasibility study to confirm what changes may be needed at the outlet of the plant.

San41 - AWPCP - Plant expansion to 9200 m^3: Plant expansion will need to be examined within the IMP study period. Current growth projections estimate that the plant will reach 80% capacity in 2033, at which point the process for plant expansion will be initiated. The increase in capacity will be based on updated growth projections in 2033. The extent of the plant expansion will be based around the updated Bayview Bog study and what capacity the bog can accommodate. If the results of past Bayview Bog study(s) do not change, and based on the capacity of other process units, the next plant expansion would likely be to 9200 m^3/day. The following processes would require upgrades for the plant to operate at 9200 ^{m3}/day (excluding projects listed previously in this memo that are to be completed throughout the IMP):

- Aeration tanks
- Secondary clarifiers
- Sludge digestor aeration
- Disinfection (if not already addressed by that time)

When initiating this process staff should also consider the outcome of the Future System Connection study. If connecting the Bath and Loyalist East systems is favourable, the plant expansion will need to account for all flows from Bath.

6.2.2.2. Loyalist East Sanitary Collection System

San20 - Bridge Street SPS capacity assessment: It is recommended that a more detailed analysis of the sewage pumping station (SPS) is conducted as capacity is approached. This analysis will provide more insight as to what specific upgrades will be required to meet the desired capacity. At that time staff will also have more concrete numbers for long-term development and will therefore be able to confirm the needed capacity. It should be noted that this assessment should include review of the forcemain that takes flows from Bridge Street to the Amherstview WPCP.

San21 - Bridge Street SPS capacity upgrades: Based on a high-level analysis, the SPS will be approaching its capacity in approximately 10 to 15 years. The equipment at Bridge Street is marked for replacement through the Township's asset management plan in 16 years. Staff should keep these timeframes under consideration so that the pumps can be appropriately upsized when required. When considering all the potential development in the Odessa catchment area, it is estimated that the SPS will need to be upgraded to meet a capacity of 450 L/s.

San22 - Lakeview SPS Stage 1, Pump #2 replacement: Lakeview SPS has three pumps, each with a capacity of 135 L/s. In May 2023, Pump #2 failed entirely. While the remaining two pumps are functioning, a third pump is required to maintain redundancy. Staff are in the process of replacing this pump with the support of R.V. Anderson Associates Limited (RVA). Following evaluation of the current system, it was determined that a like-for-like replacement would be the preferred option to replace Pump #2. The current plan is to install and commission the new pump in 2024, which will not alter the rated capacity of the station but is designed for future growth.

San23 - Lakeview SPS Stage 2, facility classification compliance upgrades: In order to allow for pump upsizing in the future, facility classification compliance upgrades will need to be completed at this station.

San24 - Lakeview SPS Stage 3, Pumps #1 and #3 replacement: Pumps #1 and #3 will eventually be replaced at Lakeview SPS to accommodate growth in the catchment area. Growth projections will need to be updated prior to determining the size of these upgrades.

San25 - Taylor-Kidd SPS capacity upgrades: Based on the capacity analysis, the SPS will be approaching its capacity in approximately 20 to 25 years. The equipment at Taylor-Kidd is marked for replacement through the Township's asset management plan in 20 years. Staff should keep these timeframes under consideration so that the pumps can be appropriately upsized at the time of replacement.

When considering all the potential development in the Taylor-Kidd SPS catchment area, the pumping station will need to be upgraded to meet a capacity of 135.24 L/s. It is recommended that further analysis is conducted as capacity is approached, or as the pumps approach end-of-life in terms of asset replacement.

6.2.3. Bath Sanitary System Growth Projects

6.2.3.1. Bath Sewage Treatment Plant

San42 – Bath STP plant expansion: Plant expansion may need to be considered within the IMP study period. Current growth projections estimate that the plant will reach 80% capacity in 2045, at which point the process for plant expansion will be initiated. The increase in capacity will be based on updated growth projections in 2045. It is likely that all process units will require upgrades at this time. Staff will have to consider the outcome of the Future System Connection study prior to the plant reaching 80% capacity, to determine if system connection is more favourable than expanding the plant.

6.2.3.2. Bath Sanitary Collection System

San15 - Bath SPS #1 pump upgrades: Based on the capacity analysis, the pumping capacity will need to be increased for SPS #1 as development continues. Two situations would initiate pump replacement, either the ongoing reduction in remaining capacity, signalling the need for upgrades; or when the pumps are planned for replacement through asset management. The Township's asset manager outlined that the pumps at this station will be due for replacement in 2031. It is recommended that staff continue to track development and increased flows at this station to determine if the need for increased capacity will result in pump upgrades prior to 2031. When upgrades are planned for this pumping station, the target pumping capacity should be between 90 to 100 L/s.

6.3. Stormwater

The table below provides a summary of recommended growth projects for sanitary infrastructure, and subsequent subheadings describe the projects in greater detail.

Table 13 Recommended growth projects - stormwater

Project ID	Project	Technical Memo Reference
St13[2]	Amherstview West - North stormwater management pond	TM-33
St14[2]	Amherstview West - South stormwater management pond	TM-33
St15[1]	Lakeside Ponds Phase 2 stormwater management pond (near Speers Boulevard)	TM-33
St16[1]	Fields of Loyalist- stormwater management pond expansion of existing facility, same outlet	TM-33

St17[1]	Shane Street Development stormwater management pond (315 Main St. Odessa)	TM-33

(1) Note that these projects are developer-funded and are not the responsibility of the Township; therefore, no further detail is provided below.
(2) Note that these projects are included in the Amherstview West Secondary Plan EA.

6.3.1. Minor Storm Growth Projects

The projects recommended through the IMP for the minor storm system are all considered remedial and are discussed in Section 5.3.1.

6.3.2. Major Storm Growth Projects

St13 - North stormwater management pond: This is a new stormwater management pond that will be established as a part of the Amherstview West Secondary Plan. This pond will be required to allow for full build-out of the Secondary Plan lands.

St14 - South stormwater management pond: This is another new stormwater management pond that will be established as a part of the Amherstview West Secondary Plan. This pond will also be required to allow for full build-out of the Secondary Plan lands.

6.4. Roads

The table below provides a summary of recommended growth projects for roads infrastructure, and subsequent subheadings describe the projects in greater detail.

Table 14 Recommended growth projects - roads

Project ID	Project	Technical Memo Reference
R30	Amherst Drive & Speers Boulevard intersection improvements (roundabout)	TM-34, TM-35
R31	Amherst Drive cross-section urbanization and road widening, Speers to County Road 6	TM-34, TM-35
R32[1]	McKee Street (collector road)	TM-34
R33[1]	Speers Boulevard extension (collector road)	TM-34
R34[1][2]	Amherst Drive extension West of County Road 6 (collector road)	TM-34
R35[1][2]	Walden Pond Drive extension west of County Road 6 (collector road)	TM-34

R36[(1)(2)]	Kildare Drive extension west of County Road 6 (collector road)	TM-34
R37[(1)]	Babcock Boulevard extension (collector road) Fields of Loyalist	TM-34
R38[(1)]	Proposed Street A (collector road) Fields of Loyalist	TM-34
R39[(1)]	Country Club Drive extension (collector road)	TM-34
R40[(1)]	Windermere Boulevard extension (collector road)	TM-34
R46	Roads garage expansion	TM-36
R47	Roads maintenance fleet expansion	TM-37

(1) Note that these projects are developer-funded and are not the responsibility of the Township; therefore, no further detail is provided below.
(2) Note that these projects are included in the Amherstview West Secondary Plan EA.

6.4.1. Amherst Drive Growth Projects

R30 - Amherst Drive & Speers Boulevard intersection improvements (roundabout): When reviewing the Amherst Drive-Speers Boulevard intersection, WSP found that two-way stop controls would result in unacceptable traffic delays under the high-growth scenario, and they recommended improved intersection controls at this location. Having analyzed the impact of a signalized intersection versus a roundabout, they found that under the high-growth scenario, the traffic signals operated at levels A-D and the roundabout at levels A-C. Traffic signals generally do not have the equivalent benefit of traffic calming and safety offered by a roundabout. As this has been identified as a priority location for traffic calming, a roundabout is the preferred option for this intersection.

R31 - Amherst Drive cross-section urbanization and road widening, Speers to County Road 6: In consideration to improve active transportation opportunities, the whole Amherst Drive corridor is being re-evaluated for long term improvements that may include additional sidewalks and/or multi-use pathways. The traffic calming concerns are also acting as a stimulus for right of way improvements within the corridor. The initial concept is for Amherst Drive to have a consistent approach and presenting a similar “feel” for all right of way users.

6.4.2. New Developments Growth Projects

Projects R32 to R40 are collector roads that will be constructed as a part of new developments. The Township will be consulted throughout the design and construction

of these roads; however, the projects will be the responsibility of the developer. The proposed locations for these collector roads are shown below.

Figure 31 Proposed collector roads in Amherstview

Figure 32 Proposed collector roads in Bath

Figure 33 Proposed collector roads in Odessa

6.4.3. Transportation Facility Growth Projects

R46 – Roads garage expansion: The garage at the site houses the entire Public Works staff and equipment. The site includes winter maintenance storage for salt, sand, and brine. The initial expansion of the County Road 6 garage includes two distinct components. The initial component, currently nearing construction completion, is an expansion of the vehicle bays, a shift of the work area and offices for the mechanics and the Fleet Services Supervisor, and office space for 3-4 additional workstations. The second component will be an expansion of the staff facilities, utilizing approximately 214 m^2 of undeveloped space on the second floor of the building.

A second expansion of the number of truck/equipment bays is expected near the end of the IMP planning period, as well as a potential need for increased staff space. Potential options for expansion of the site are:

- Relocation of staff parking facilities to alternate locations, possibly along the existing County Road 6 buffer strip
- Adding auxiliary structures on previously disturbed areas of the site
- Potential relocation of the Emergency Services Department's Fire Training Centre
- Expansion of operations on a new site, location to be determined in the future
- No expansion

Further development on the current Public Works garage site is not expected to be straightforward. To preserve operational efficiencies, it is recommended that Loyalist Township carefully examine the various options for increased utilization of the site. With continued growth, the need for eventual expansion is certain. A detailed evaluation of fleet and seasonal operations may indicate opportunities to direct some equipment

storage away from the main garage floor area, or to relocate other activity such as office space in a way that optimizes the main functions of the garage.

6.4.4. Future Equipment Needs Growth Projects

R47 – Road maintenance fleet expansion: Loyalist Township maintains a fleet of roads and sidewalk maintenance vehicles. The municipality performs all the road and sidewalk maintenance duties in-house and provides a similar function for the County of Lennox and Addington roads in the Township, through a service agreement.

With population growth, the increase in active transportation infrastructure, new technology becoming available, and a push to minimize climate impact, there are many considerations when expanding the municipal fleet.

It is recommended that staff monitor the needs for additional plow routes for roads, sidewalks, and trails for growth areas as opposed to existing community needs, so that appropriate information is available for future DC calculations. It is also recommended that Loyalist Township closely monitor the advances in low-carbon fuel technology and other emerging powertrain technologies, and prioritize the acquisition of low-carbon-fueled vehicles as soon as efficient alternatives are available

6.5. Miscellaneous Assets

The table below provides a summary of recommended growth projects for infrastructure not otherwise classified, and subsequent subheadings describe the projects in greater detail.

Table 15 Recommended growth projects - miscellaneous

Project ID	Project	Technical Memo Reference
M8	Identifying future employment lands	TM-38
M1	Snow Dump	TM-47

6.5.1. Industrial Park Servicing

M8 - Identifying future employment lands: If the Township wishes to maintain a steady rate of industrial expansion, immediate steps will be required to evaluate and determine the appropriate locations for this type of development. The Official Plan and Zoning By-law will need to be amended to include the future industrial areas. It is recommended that the Township work in association with the County of Lennox and Addington in identifying future employment lands.

6.5.2. Municipal Snow Dump Facility

M1 - Snow Dump: After reviewing the interim findings and completing an initial site screening for a snow dump facility location it was decided that further evaluation of the project would be deferred until the masterplan process was completed. The following recommendations have been made through the IMP:

- That data for hauled snow volumes be maintained on annual basis in the future.
- That Loyalist consider a site selection process for a new snow dump location with a minimum size of 2.5-3.0 acres, or larger if access to sanitary sewers for the site are not available.
- That Loyalist prioritize the development of a snow dump site.

The snow dump site will be subject to approvals under the authority of the Planning Act. Depending on the final design of the facility there may be elements, such as stormwater management facilities that would be subject to future MCEA processes. The formal snow dump will primarily be driven by growth and is also considered a new initiative in the Township.

7. Regulatory, Technological, and New Initiatives

The following section discusses the projects that are being recommended to address regulatory or technological changes and new initiatives, to ensure Township preparedness. They also ensure that new initiatives are being accounted for in the future. Regulatory concerns for each infrastructure category have also been reviewed and noted.

The foundational information from which these recommendations arise is found in the various technical memoranda, as referenced in the respective tables. These memos are found at Appendix Section 1. Estimated project costs and timing are described for each recommended project in the Project Summaries found at Appendix Section 2.

7.1. Water

The table below provides a summary of recommended projects for water infrastructure to address regulatory and technological concerns and new initiatives, and subsequent subheadings describe the projects in greater detail.

Table 16 Recommended water projects - regulatory, technical, and new initiatives

Project ID	Project	Technical Memo Reference
W7	FWTP - Pump VFDs (x3 high lift pumps)	TM-3
W4	BWTP - Pump VFDs (x3 high lift pumps)	TM-4

General information regarding water regulatory concerns and emerging issues is discussed in TM-39.

7.1.1. Fairfield Water System Regulatory, Technological, and New Initiatives Projects

W7 – Pump VFDs: To improve efficiency and reduce greenhouse gas (GHG) emissions related to water treatment, it is recommended that variable-frequency drives (VFDs) are installed on the high-lift pumps when they are replaced during life cycle activities.

7.1.2. Bath Water System Regulatory, Technological, and New Initiatives Projects

W4 – Pump VFDs: To improve efficiency and reduce GHG emissions related to water treatment, it is recommended that VFDs are installed on the high-lift pumps when they are replaced during life cycle activities.

7.1.3. Water Regulatory Concerns Projects

The last few decades have seen improvements in treatment, sampling, and analysis capabilities, and increased concern on the forces that cause environmental degradation. The regulatory agencies can be expected to respond to these changes and update the regulatory framework accordingly. In turn the Township will need to analyze its requirements from time to time and update its processes and procedures. Currently the greatest concerns for Loyalist Township are:

- Staying abreast of THM and HAA concerns
- Source water protection requirements, and
- High turbidity events that impact the Bath WTP

The following recommendations have been made regarding regulatory concerns:

- That any future changes to disinfection processes should only be activated after careful consideration of the impacts on system-wide THM and HAA.
- That Loyalist Township staff monitor MECP and federal progress on the development of standards and regulations for PFAS substances.
- That Loyalist Township identify drinking water risks in the source protection zone and develop plans that will:
    - Eliminate source water risks for facilities that it owns.
    - Develop programs to assist private property owners reduce their potential for source water contaminations.
- That Loyalist Township complete a detailed review of its sewer use by-law and related by-laws to bring these instruments up to current standards, including the strengthening of source water protection elements.
- That Loyalist Township evaluate its data and operational needs, and then develop and maintain a data collection/storage plan for the Utilities Division. This plan would include the use of modern field data entry devices appropriate for the activity and would include processes leading towards continuous improvement of the plan.
- That the Township closely monitor trends in density changes including secondary unit consumption and modify Township policies accordingly.

7.2. Sanitary

The table below provides a summary of recommended projects for sanitary infrastructure to address regulatory and technological concerns and new initiatives, and subsequent subheadings describe the projects in greater detail.

Table 17 Recommended sanitary projects - regulatory, technical, and new initiatives

Project ID	Project	Technical Memo Reference
San3	Amherstview WPCP - Blower VFDs (x3)	TM-8
San5	Amherstview WPCP test polymer dosing for dewatering	TM-8
San6	Amherstview WPCP evaluating hauling costs for different biosolids handling options	TM-8, TM-41
San7	Amherstview WPCP biosolids dewatering and cake storage facility	TM-41
San10	Bath STP blower VFDs (x3)	TM-9
San8	Bath STP sludge hauling pilot study (capital)	TM-41
San12	Wet weather sanitary model	TM-10
San39	Review of sewer use/sewage works by-laws	TM-10
San40	Additional considerations in Engineering Development Guidelines (I&I, sewer cleanouts, backflow preventers)	TM-10

General information regarding sanitary regulatory concerns and emerging issues is discussed in TM-40.

7.2.1. Loyalist East Sanitary System Regulatory, Technological, and New Initiatives Projects

San3 – Blower VFDs: The blowers at Amherstview WPCP do not have variable frequency drives (VFDs) to regulate airflow. Without a VFD, a blower in operation is at 100%; however, only 39% of the air supply is required to meet demand. It was estimated that switching to a VFD could result in an annual energy saving of 410,625 kWh. It is recommended that this project be prioritized.

San5 - Test polymer dosing for dewatering: Prior to the implementation of biosolids storage and management improvements further information should be obtained. It was recommended to have the Township's polymer supplier undertake testing to determine an appropriate type and dosage of polymer for dewatering and provide updated costing information if necessary.

San6 - Evaluating hauling costs for different biosolids handling options: In addition to the additional information regarding polymer dosing, additional information regarding

hauling costs should be obtained. It is recommended to engage the Township's third-party contractor to determine how hauling rates may change under the various alternative presented and determine if any cost efficiencies can be found.

San7 - Biosolids dewatering and cake storage facility: Biosolids produced by the ATAD at AWPCP are stored in a biosolids lagoon where they are periodically hauled away for land application. The moisture content of these biosolids is high, making hauling expensive. As growth continues in the Township it is important to make biosolids management more efficient. It is recommended that a rotary press to dewater biosolids be installed at Amherstview WPCP. A cake storage building should also be constructed onsite to store the dried biosolids. After the implementation of this new equipment and operations step, an additional operations staff should be hired, along with conducting training for existing staff.

7.2.2. Bath Sanitary System Regulatory, Technological, and New Initiatives Projects

San10 – Blower VFDs: The blowers at Bath STP do not have VFDs to regulate airflow. Without a VFD, a blower in operation is at 100%; however, only 34% of the air supply is required to meet demand. It was estimated that switching to a VFD could result in an annual energy saving of 197,100 kWh. This project is recommended and has been commenced.

San8 - BSTP - Sludge hauling pilot study (capital): A desktop capacity assessment was conducted for the sludge digestion processes at both Bath STP and Amherstview WPCP, using projected average flows for 2046. This involved evaluating several alternatives to manage future sludge production and biosolids storage. The evaluation determined that there is excess capacity at Amherstview WPCP, whereas Bath STP is lacking in digestion capacity. It was recommended that excess sludge be hauled from Bath STP to Amherstview WPCP. Loyalist Township plans to conduct a pilot study hauling excess sludge from Bath the Amherstview WPCP. This project is also driven by growth.

7.2.3. Sanitary Regulatory Concerns Projects

San12 – Wet weather sanitary model: Development of a wet weather sanitary model is a requirement as a part of the CLI-ECA. This model can be used to help staff identify areas that experience high levels of I&I and see how the sanitary system is impacted by wet weather. Staff plan to start development of this model next year.

San39 – Review sewer use/sewage works by-laws: The Township's by-laws should be updated to reflect current topics and parameters of concern. The use of automatic fines instead of laying a charge should be promoted within the Township. Procedures could employ occasional inspections and monitoring to ensure compliance with the by-laws.

San40 – Additional considerations in Engineering Development Guidelines: Staff are in the process of updating Township Development Guidelines. It is recommended that the following items, related to sanitary collection, are included in these guidelines:

- Maintain I&I requirement
- Installation of sewer cleanouts at property line
- Installation of backflow preventers in new developments on private properties to prevent basement flooding

In addition to the above projects the following recommendations have been made regarding regulatory concerns:

- Increased resources be applied to the reduction of inflow and infiltration (I&I) within the municipal sanitary sewer systems.
- Continue to work with representatives from CSC in an effort to reduce peak flow variation, fat, oil and grease (FOG) content, and toxic loadings from sanitary sewage flows originating from the Millhaven and Bath Institutions.
- Monitor odour conditions at the Amherstview WPCP and develop standard operating procedures (SOP) that focus on operational strategies, and training that prove effective in managing the odours that originate from the site.
- Update sewer use and sewage works by-laws, to ensure the by-laws give staff the tools to reduce negative impacts to the Townships sanitary sewer system.
- It is recommended that Loyalist Township evaluate its data and operational needs and develop and maintain a data collection and storage plan for the Utilities Division. This plan would include the use of modern field data entry devices appropriate for the activity, as well as processes leading to continuous improvements of the plan.

7.3. Stormwater

The Ministry of Environment, Conservation, and Parks (MECP) and federal government have established various regulations that are designed to protect natural watercourses and waterbodies from all forms of pollution. Modern treatment and conveyance infrastructure has been designed to meet the established requirements. In addition to the above projects the following recommendations have been made regarding regulatory concerns:

- Study the possibility of implementing a Green Street program as a general policy within Loyalist Township.
- Monitor the results of municipal programs that have implemented stormwater service areas.
- Existing by-laws applicable to stormwater works and operation and lot grading be updated to reflect the changes in the regulatory environment.
- Completion of the Township’s stormwater design standards be maintained as a priority project.

- The use and funding of oil and grit separator (OGS) units and holding tank-style stormwater quality and quantity control systems, be reviewed considering the additional maintenance efforts required over the service life of these elements.
- Future retrofit projects should be designed such that storm water quality is improved whenever possible.

Further information regarding stormwater regulatory concerns and emerging issues is discussed in TM-42.

7.4. Roads

The table below provides a summary of recommended projects for roads infrastructure to address regulatory and technological concerns and new initiatives, and subsequent subheadings describe the projects in greater detail.

Table 18 Recommended roads projects - regulatory, technological, and new initiatives

Project ID	Project	Technical Memo Reference
R21	Intersection signage review and updates	TM-21
R22	Amherst Island speed limit review and updates	TM-21
R26	By-law/policy updates (administrative improvements listed in tech memo)	TM-21
R29	Review of traffic crossing, traffic calming, and parking policies	TM-24
R1	Amherst Drive multi-use pathway	TM-46
R5	County Road 6 multi-use pathway	TM-46
R6	Empey Road multi-use pathway	TM-46
R7	Lakeview Park multi-use pathway	TM-46
R8	Multi-use pathway connecting Lakeview Park to Amherst Drive	TM-46
R9	Loyalist East Business Park connection	TM-46
R10	Lot 32 Concession 3 multi-use pathway	TM-46
R11	Marshall Forty-Foot Road multi-use pathway	TM-46
R12	Millhaven Creek corridor multi-use pathway	TM-46
R13	Stella Forty-Foot Road multi-use pathway	TM-46

R14	Windermere Boulevard loop multi-use pathway	TM-46
R15	Purdy Road sidewalk	TM-46
R16	Sir John Johnson Drive sidewalk	TM-46
R41	Amherstview West Secondary Plan lands northern stormwater management pond multi-use pathway	TM-34
R42	Taylor-Kidd Boulevard to Parrott's Bay multi-use pathway	TM-34
R43	County Road 6 to Parrott's Bay multi-use pathway	TM-34
R44	County Road 6 from Kildare Avenue to Highway 33 multi-use pathway	TM-34
R45	Amherst Drive extension to Parrott's Bay multi-use pathway	TM-34
R48	EV charger strategy	TM-45
R49	Waterfront strategy	TM-46

7.4.1. Roads Administrative Changes Projects

R21 - Intersection signage review and updates: In preparing the IMP and through discussions with Township operation's staff, it has become apparent that Loyalist's standards for regulatory traffic signage should be reviewed. The scope of the review should include both the appropriateness of individual signage for the location and consistency of application throughout the Township.

R22 - Amherst Island speed limit review and updates: Most roads on Amherst Island are not posted with maximum speed signs. As such, they fall under the default Ontario regulation speeds of 80 km/hr in rural areas or 50 km/hr in urban areas. Roads with significant curvature, encroachments, and other safety concerns are subjects for reduced speed considerations. A full evaluation has never been undertaken for the Amherst Island system. An evaluation is being recommended for the Island roads system.

R26 - By-law/policy updates: The following administrative items have also been recommended for updates through the IMP to reduce municipal liability and increase public safety.

- Encroachment permits

- Review of unmaintained road allowances
- Road widening inventory
- Formal road classification and confirmation by Council based on Highway Traffic Act designations
- Update reduced loads by-law
- Update stop sign by-law and associated data

R29 - Review of traffic crossing, traffic calming, and parking policies: Traffic crossings and parking policies will be reviewed at a high-level Township wide with the objective of reviewing the current street layout and making appropriate recommendations with respect with respect to developing policies for improvements for safe pedestrian crossings. This will be done concurrently with the analysis of the need for traffic calming on the priority roads identified in the memorandum.

R49 - Waterfront Strategy: Recreation staff within Loyalist Township anticipate the initiation of a comprehensive Waterfront Strategy in the near future that will coordinate opportunities and provide vision for recreational services along the waterfront. It is recommended that Loyalist Township undertake a masterplan-level evaluation of the waterfront route and evaluate the best route and appropriate infrastructure type (sidewalk, pathway, etc.), so that elements with the corridor can eventually be provided for in a coordinated fashion. The plan should include a crossing of Bath Road/Highway 33 near Lakeview Park to Fairfield Park. This crossing should be considered a priority. A crossing will require approval from MTO.

7.4.2. Roads Regulatory Concerns Projects

R48 - EV Charger Strategy: It is recommended that the Township develop a corporate EV charger strategy to direct municipal decisions regarding installation of EV chargers, with an objective of rolling out a program as soon as possible.

In addition to the above projects the following recommendations have been made regarding regulatory concerns:

- Monitor advances in road construction and maintenance techniques and in powertrain alternatives. Significant changes can be expected in these topics, and it will be critical to be familiar with the impacts of the changes.
- If the trend for the use of bicycles and similar equipment increases as expected, there will be a need to review and modify roadways, especially those with higher traffic volumes and/or higher operating speeds, to safely accommodate the smaller vehicles.
- Consideration of employing as many features as possible of fifteen-minute communities into Loyalist’s new developments would be an improvement for many reasons, including traffic relief, more efficient community, and climate change benefits due to less use of vehicles.

7.4.3. Active Transportation Projects

Active transportation is a relatively new initiative in the Township. A variety of multi-use paths and sidewalks have been recommended through the IMP. The individual projects for each area have been listed below.

Amherstview

R1 - Amherst Drive multi-use pathway: Develop a multi-use pathway along the Amherst Drive right-of-way from Coronation Boulevard to Speers Boulevard.

R5 - County Road 6 multi-use pathway: Develop sidewalk or pathway infrastructure along County Road 6 from Taylor-Kidd Boulevard and the Loyalist East Business Park, southerly to Bath Road/Highway 33, where not already approved in existing development agreements.

R7 - Lakeview Park multi-use pathway: The new internal Lakeview Park pathway system will be designed to connect to any adjacent inter-block walkways and will include security lighting along the main corridor(s). Completing internal sidewalk or multi-use pathway infrastructure within Lakeview Park is intended to link active transportation features together, with the park acting as a hub. This project would connect the existing sidewalk constructed adjacent to Bath Road/Highway 33 and opposite Jordyn's Court to the new Lakeview Park routes, and then extend westerly to a new pedestrian crossing of Bath Road/Highway 33 to Fairfield Park and northwesterly to Davey Crescent.

R8 - Multi-use pathway connecting Lakeview Park to Amherst Drive: A new multi-use pathway extending from Lakeview Park northerly to Amherst Drive. The route would follow the location of the block of land used by the existing sanitary forcemain that extends north from the Lakeview Pumping Station. This route is east of Kidd Drive and west of Westran Road and Clairton Place.

R9 - Loyalist East Business Park connection: A multi-use pathway connecting the intersection of County Road 6 and Taylor-Kidd Boulevard to Jack Davey Drive.

R41 – Northern stormwater management pond multi-use pathway: A new multi-use pathway around the northern stormwater management pond in the Amherstview West Secondary Plan.

R42 - Taylor-Kidd Boulevard to Parrott's Bay: A new multi-use pathway from Taylor-Kidd Boulevard to Parrott's Bay in the Amherstview West Secondary Plan.

R43 - County Road 6 to Parrott's Bay: A new multi-use pathway from County Road 6 to Parrott's Bay, close to Highway 33 with connection to the Kildare Drive Extension in the Amherstview West Secondary Plan.

R44 - County Road 6 from Kildare Avenue to Highway 33: A new multi-use pathway County Road 6 from Kildare Avenue to Highway 33.

R45 - Amherst Drive extension to Parrott's Bay: A new multi-use pathway connecting from Amherst Drive extension to Parrott's Bay.

Odessa

R12 - Millhaven Creek Corridor: Continuation of existing multi-use pathway from natural playground to Main Street Odessa.

Bath

R14 – Windermere Boulevard loop multi-use pathway: New multi-use pathway connecting Briscoe Park to Main Street – Bath via the pathway linkage adjacent to the Aura by the Lake stormwater management facility, complete with a tie-in to Jessup Lane Park. The pathway would extend northwesterly in an alignment approximately parallel with the future alignment of Windermere Boulevard to County Road 7.

R15 - Purdy Road sidewalk: New sidewalk on Purdy Road from the eastern limit of Aura by the Lake subdivision to Sir John Johnson Drive.

R16 - Sir John Johnson Drive sidewalk: New sidewalk on Sir John Johnson Drive from Main Street – Bath, north to Briscoe Park.

Rural Areas

R6 - Empey Road multi-use pathway: Continue planning efforts to complete a trail route between Amherstview and the Cataraqui Trail via Empey Road with consideration for local agricultural practice.

R10 - Lot 32 Concession 3, multi-use pathway: Develop a multi-use path along the unmaintained road allowance within Lot 32, Concession 3 between Timmerman Street and Caton Road.

R11 - Marshall Forty-Foot Road: Conversion of Marshall Forty-Foot Road allowance to a multi-use pathway with consideration for local agricultural practices.

R13 - Stella Forty-Foot Road: Modification of Stella Forty-Foot Road to include a multi-use pathway, from Amherst Island ferry dock southerly to Lanes End Park.

7.5. Miscellaneous Assets

The table below provides a summary of recommended projects for miscellaneous infrastructure to address regulatory and technological concerns and new initiatives, and subsequent subheadings describe the projects in greater detail.

Table 19 Recommended miscellaneous projects - regulatory, technological, and new initiatives

Project ID	Project	Technical Memo Reference
M2	Green infrastructure asset inventory	TM-49

M3	Valuation of natural assets and inclusion in Asset Management Plan	TM-49
M4	Establish source water protection reserve fund	TM-50
M5	Conduct watercourse monitoring program for sediment/suspended solids in Bath	TM-50
M6	Complete a source water "budget" study	TM-50
M7	Rural groundwater policy updates	TM-51
M9	Engineering development technical guidelines	TM-52
M10	Develop detailed workflow procedures	TM-52
M11	Cyber Security Upgrades	TM-48

7.5.1. Cyber Security Concerns

This memorandum is not being made publicly available due to security concerns. The memorandum lists numerous recommendations to improve software procedures and administration of the SCADA systems used with the Township's water and sanitary sewage infrastructure. All the recommended projects are exempt from further EA requirements.

7.5.2. Natural Assets Projects

M2 - Green Infrastructure Asset Inventory: There is a requirement to include green infrastructure in the Township asset management plan. To address this, staff should work on developing a strategy to evaluate and include the infrastructure. Green infrastructure, specifically natural assets, bring different challenges when being evaluated for asset management. To initiate this process, it is recommended that an inventory of municipal owned green infrastructure and natural assets be undertaken. This inventory could be completed internally by staff through a desktop study and rapid field assessment or by an external contractor, depending on resources.

M3 - Valuation of natural assets and inclusion in Asset Management Plan: After the inventory described above has been completed, values will need to be assigned to each asset. The final task will be to complete the asset management plan for green infrastructure. This will include a summary of assets and implementation to the Township database. Some steps in the process may require support from an external consultant(s).

7.5.3. Source Water Protection Projects

M4 - Establish source water protection reserve fund: To undertake the recommended projects and initiatives, funding will be required. It is recommended that a source water protection reserve fund is developed in the Township. This fund could be set up to receive $25,000 each year for six years, then once at $150,000 it would be maintained at that level. This fund could be used to support projects that protect municipal intakes as well as groundwater.

M5 - Conduct watercourse monitoring program for sediment/suspended solids in Bath: The Township plans to conduct a monitoring program within the Bath intake protection zones (IPZ). This will involve sampling watercourses and storm sewers within the IPZ to try and determine the cause of increased sediment/suspended solids at the WTP intake. After monitoring is complete, the Township will work with landowners to reduce incidents and volumes of sedimentation.

M6 - Complete a source water "budget" study: A water budget is a study that accounts for all the water flowing in and out of a specific area. This study is recommended to be conducted in the Township, with the priority of examining private sources (groundwater).

7.5.4. Rural Groundwater Projects

M7 - Rural groundwater policy updates: A variety of policy updates have been recommended to protect groundwater throughout the Township:

- With guidance from the Township’s solicitor and MECP staff, consider establishing an enhanced policy for rural severances that includes the requirement of a pump test, prepared by a professional hydrogeologist, that considers the dry seasonal variances, based on Guide D-5-5, groundwater susceptibility, and other factors.
- Consider amending zoning requirements such that a property with an existing well that does not meet Ontario Provincial Guideline D-5-5 can connect to the municipal water system, with appropriate restrictions, if the property includes frontage on a road allowance that has a watermain in the right-of-way.
- Evaluate the costs and benefits of establishing a comprehensive septic system inspection program, perhaps gauging the level of inspection activity on the frequency of discovering failed systems.
- Develop processes to monitor local groundwater quantity and quality conditions.

7.5.5. Workflow Projects

M9 - Engineering development technical guidelines: The need for comprehensive engineering drawing and standards document has gradually been addressed over several years in the Engineering & Environment Division. Finalizing the draft document has recently been underway, with formal adoption planned for mid-2024. It is

recommended that the completion and support of the draft Development Engineering Technical Guidelines be prioritized.

M10 - Develop detailed workflow procedures: It is recommended that the Township formally implement a strategy to develop detailed workflow procedures for infrastructure data collection and maintenance, development, and construction activity, and include asset management requirements.

8. Future Planning Initiatives

The IMP will be used as a basis for many future planning initiatives. These initiatives are outlined below:

Impost fees study: The impost fees study is completed on a five-year cycle and is due to be updated in 2024. This study looks at potential projects and divides them into either benefit to existing (remedial) or growth-related projects. Projects identified through the IMP will be fed into the impost fees study so that growth projects will be accounted for when considering funding. It is important that the impost fees study examines the entire list of projects from the IMP, including long term, so fees don't have sudden spikes when large projects need to be undertaken.

Development Charges background study: Similar to with the impost fees study, the DC background study is done on a five-year cycle. The Township's next DC background study update will take place in 2026. Projects from the IMP will be considered in this study and any that impact development will be identified to help inform the changes to the development charges.

Rates Studies: Water and sewer rates studies are done based on a 10-year capital project list. The Township will update these studies along with the impost fees study in 2024. Remedial projects for water and sanitary infrastructure identified in the IMP will be considered in these studies.

Developer projects: There are some developer-driven projects not yet identified that will eventually need to be included in this EA. As development applications progress, amendments to this document may be made under the MCEA process to reflect conditions.

EA updates: The IMP is valid for 10 years under the MCEA. At the end of this timeframe, any projects that are not underway will need an updated EA. The Township plans to review and update the IMP document every five years to ensure projects and goals remain aligned with other planning initiatives such as impost fees and development charges studies.

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