Infrastructure Masterplan

Appendix Section 2:
Schedule B and C
Project Summaries

Loyalist Township 2024

How to navigate this document

This document has been created as a binder in Adobe Acrobat. For easy navigation, please expand the Bookmarks toolbar in Adobe Acrobat or Reader.

Additionally, the project summary titles in the Table of Project Summaries are clickable links which will jump to the first page of each memorandum.

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
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

Table of Project Summaries

Project summaries have been provided for Schedule B and C projects to demonstrate that Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA) process have been completed. Many of the projects being recommended through the IMP are exempt from the MCEA and therefore do not need to meet these requirements.

W30 Fairfield WTP expansion to 10,750 m^3

W31 Bath WTP expansion to 7,200 m^3

San1 Amherstview WPCP peak flow equalization and headworks upgrade

San7 Biosolids dewatering and cake storage facility

San41 Amherstview WPCP expansion to 9,200 m^3

San42 Bath STP 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

Project: Fairfield Water Treatment Plant Expansion **Cost Estimate:** $850,000
Schedule: C **Location:** Fairfield Water Treatment Plant
MCEA Table: Table B #15c **Timing:** Medium (6 to 15 years)

Opportunity: Expand the FWTP to accommodate growth in the Fairfield water distribution system.

Options Evaluation:

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. JLR reviewed three possible options at the plant based around the potential membrane capacities.

- *Option 1:* Do nothing (maintain existing capacity)
- *Option 2:* Expand to 10,750 m^3
- *Option 3:* Expand to 15,000 m^3

Upgrade Option	Advantages	Disadvantages
Option 1	• No capital cost	• Does not accommodate growth in the Township beyond 2033 • Limits residential and industrial growth
Option 2	• **Lower capital costs** • **Plant footprint should not need to be expanded** • **Allows for an incremental increase in capacity without significantly expanding a large amount of equipment**	• **With current growth projections, flows will be at 70% capacity by the end of the IMP study period**
Option 3	• Will accommodate growth far beyond the IMP study period	• Higher capital costs • Possible need for plant footprint expansion

Based on the evaluation of options, Option 2 – expansion to 10,750 m^3, is the preferred option.

Identified Impacts:

Impacts should be minimal with expansion to 10,750 m^3. When the plant is eventually expanded to 15,000 m^3, the plant footprint will likely need to be expanded. This expansion will likely need to occur to the north of building. The MTO would need to be consulted for this expansion due to the proximity to Highway 33.

Scope:

Option 2 – expand to 10,750 m^3 is the preferred option for Fairfield WTP. To reach this capacity the major upgrade that will be required is the addition of a GAC contactor. Other minor process upgrades will also be required, such as improvements to contact tank and clearwell baffling and intake structure upgrades. Some pumps may have to be upgraded if larger pumps have not been acquired through the life cycle replacement process.

Completed Studies:

J.L. Richards & Associates Limited – Fairfield WTP Capacity Assessment.

Project ID: W31 Themes: Growth
TM-4: Bath WTP Needs Assessment Infrastructure Category: Water

Project: Bath Water Treatment Plant Expansion **Cost Estimate:** $3,150,000
Schedule: C **Location:** Bath Water Treatment Plant
MCEA Table: Table B #15c **Timing:** Long (16 to 25 years)

Opportunity: Expand the BWTP to accommodate growth in the Bath water distribution system.

Options Evaluation:

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 which point the process for plant expansion will be initiated. JLR reviewed three possible options at the plant based around the potential membrane capacities.

- *Option 1*: Do nothing (maintain existing capacity)
- *Option 2*: Expand to 7,200 m^3
- *Option 3*: Expansion beyond 7,200 m^3

Upgrade Option	Advantages	Disadvantages
Option 1	• No capital cost	• Does not accommodate growth in the Township beyond 2039 • Limits residential and industrial growth
Option 2	• **Lower capital costs** • **Allows for growth in the service area of Bath beyond the IMP study period**	• **Plant footprint may need to be expanded**
Option 3	• Will accommodate growth far beyond the IMP study period	• Higher capital costs • Definite need for plant footprint expansion • Will need additional filtration (membrane) capacity

Based on the evaluation of options, Option 2 – expansion to 7,200 m^3, is the preferred option.

Identified Impacts:

When these upgrades occur the footprint of the building will need to be analyzed. If the footprint needs to be expanded to accommodate these upgrades, CRCA will need to be consulted due to the plant being located in a floodplain.

Scope:

Option 2 – expand to 7,200 is the preferred option for BWTP. This expansion will involve upgrades to high-lift pumps, low-lift pumps, and backwash pumps. In addition to various pump upgrades, the generator will need to be upgraded. The raw water intake may also need structural upgrades based on the results of the intake assessment. The intake assessment study will also inform if extending the intake to deeper water may be beneficial at this time.

Completed Studies:

J.L. Richards & Associates Limited – Bath WTP Capacity Assessment.

J.L. Richards & Associates Limited – Bath WTP Taste and Odour Control Technology Review

Project ID: San1 Themes: Remedial, Growth
TM-8: Amherstview WPCP Needs Assessment Infrastructure Category: Sanitary

Project: Peak flow equalization and headworks upgrades **Cost Estimate:** $3,500,000
Schedule: B (ASP) **Location:** Amherstview WPCP
MCEA Table: Table B #30a **Timing:** Short (0-5 years)

Opportunity: Address capacity limitations with headworks and secondary treatment at Amherstview WPCP to improve current operations and to accommodate growth.

Options Evaluation:
Option 1 – WPCP Expansion: An expansion of Amherstview WPCP through the addition of a secondary clarifier and headworks improvements which will include an upsized grinder, with potential upgrades to the inlet channel.

Option 2 – IFAS Retrofit: The addition of Integrated Fixed Film Activated Sludge (IFAS) modules in the aeration tank and headworks improvements which will include an upsized grinder, with potential upgrades to the inlet channel.

Option 3 – Peak Flow Equalization and Headworks Upgrade: Conversion of existing lagoon into an equalization lagoon, connected with a 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.

Option 4 – Do Nothing: Do not conduct any upgrades at the AWPCP.

Upgrade Option	Advantages	Disadvantages
Option 1	• Increased solids handling and hydraulic capacity during peak flows.	• Will result in more Return Activated Sludge (RAS) – ultimately requiring an increase in RAS pump capacity. • Cost: $2.5 - $3.0M • Sub-optimal use of existing assets. • Low ROI during peak flows. • Significant construction will be required.
Option 2	• Secondary treatment will be able to treat higher flows, avoiding solids overloading to the secondary clarifier. • Moderate utilization of existing assets. • Cost: $300 - $500k • Minimal construction required.	• No increase in hydraulic capacity of the secondary clarifier – meaning the clarifier efficiency may be limited despite the IFAS retrofit.

Option 3	• **Provides hydraulic capacity to all process units in the plant.**
	• **Upgraded headworks protects downstream processes and improves operation of the equalization facility.**
	• **Most optimal use of existing assets.**
	• **Eliminates need to upgrade secondary clarifier.**
	• **Peak flow equalization**
	  ○ **Cost: $300-$450k**
	  ○ **Minimal construction**
		• **Headworks upgrades**
		  ○ **Cost: $2.5-3.0M**
		• **Scheduled maintenance will be required for lagoon clean-up every 5 to 10 years.**

Option 4	• No capital costs	• Does not accommodate growth

		• Does not improve operational efficiency of the system

Based on the evaluation and discussion with operations staff, Option 3, peak flow equalization and headworks upgrades, is the preferred option.

Identified Impacts:

Excavation will be required for this project; although the site has been previously disturbed, a stage one archaeological assessment of the work site will be completed prior to commencing work.

Scope:
Option 3 entails conversion of a part of existing lagoon into equalization lagoon (EQ lagoon) for equalizing flows in excess of 16,000 m3/d connected with a new wet well pumping station for discharging overflows into headworks as indicated in Figure 4.5. During wet-weather conditions, the excess sewage will be by-passed to the EQ lagoon and as the liquid rises in the lagoon, the level in wet well rises triggering the pumps to operate and discharging the excess water towards headworks.

Upgrading the headworks including mechanical fine screens (and a new grit removal system if needed), will prevent rags and large debris from entering the aeration tanks and secondary clarifiers. The headworks upgrade would also include ancillary equipment including screening wash press and bagger, grit classifier/washer (if/as required), control panels and a prefabricated FRP building.

Completed Studies:
GHD – Ecological and Natural Heritage Investigation, 50 Sir John Johnson Drive, 88 Main Street, 4326 Taylor-Kidd Boulevard

R.V. Anderson Associates Limited – Amherstview WPCP and Bath STP Wastewater Modelling and Capacity Assessment Report.

Project ID: San7 Themes: Remedial, Growth
TM-41: Biosolids Management Infrastructure Category: Sanitary

Project: Biosolids dewatering and cake storage **Cost Estimate:** $3,112,000
Schedule: B **Location:** Amherstview WPCP
MCEA Table: Table B #33c **Timing:** Medium (6-15 years)

Opportunity: Address inefficiencies with current biosolids handling and storage.

Options Evaluation:
The following options were considered for biosolids management and storage at AWPCP. For each of the options below, consideration was also given to hauling either all or excess sludge from Bath STP. Further detail on the impact from hauling sludge from Bath is provided in the technical memorandum from the consultant.

Option 1: Liquid biosolids storage at the AWPCP

Option 2: Biosolids dewatering and Storage at the AWPCP

a) Centrifuge
b) Rotary Press – *after evaluation of dewatering technology, rotary press was identified as the recommended option.*
c) Screw Press

Option 3: Maintain current operations

Upgrade Option	Advantages	Disadvantages
Option 1	• Reduces biosolids volume compared to current process • More straightforward operations than current process	• Still a large volume of biosolids relative to dewatering options • High upfront capital costs
Option 2 b)	• **Significant reduction in biosolids volume, reducing the amount of hauling required** • **Lower upfront capital costs** • **Reduces environmental impact**	• **Required loading of trucks via telehandler** • **Impact on the plant nitrogen loadings (noted as minimal through model)**
Option 3	• No capital costs	• Does not address current inefficiencies with biosolids management

Based on the evaluation and discussion with operations staff, Option 2 b), biosolids dewatering (with rotary press) and cake storage, is the preferred option.

Identified Impacts: Option 2 increases the complexity of the system and may involve re-rating the classification of the plant. This will also mean that the operators will need additional training to operate the facility. Utilities staff have indicated that an additional operator position would be required to accommodate these upgrades. All of the above impacts were considered when RVA completed their NPV analysis to compare the different options.

Scope: Option 2 includes installation of a biosolids dewatering system at the plant to convert the liquid biosolids to dewatered cake with 25% TS. The dewatered biosolids, or cake, would then be stored in an onsite storage facility until it can be hauled away for land application. This will involve installation of a rotary press, polymer dosing system, biosolids pumping, cake conveyer, rotary press building, piping, and the cake storage facility.

Project ID: San7 Themes: Remedial, Growth
TM-41: Biosolids Management Infrastructure Category: Sanitary

Completed Studies:

GHD – Ecological and Natural Heritage Investigation, 50 Sir John Johnson Drive, 88 Main Street, 4326 Taylor-Kidd Boulevard.

R.V. Anderson Associates Limited – Amherstview WPCP and Bath STP Wastewater Modelling and Capacity Assessment Report.

R.V. Anderson Associates Limited – Amherstview WPCP and Bath STP Technical Memorandum 1: Sludge Digestion Options.

R.V. Anderson Associates Limited – Amherstview WPCP and Bath STP Technical Memorandum 2: Biosolids Storage Options.

Project ID: San41 Themes: Growth
TM-8: Amherstview WPCP Needs Assessment Infrastructure Category: Sanitary

Project: AWPCP plant expansion
Schedule: C
MCEA Table: Table B #29c
Cost Estimate: $4,500,000
Location: Amherstview WPCP
Timing: Medium (6-15 years)

Opportunity: Expand Amherstview WPCP to accommodate growth in the Loyalist East Sanitary System.

Options Evaluation:

In order to accommodate growth, the Amherstview WPCP will need to be expanded within the IMP study period. The following options will be considered for the expansion of the plant. It should be noted that the exact increase in capacity resulting from expansion may changed depending on growth.

- *Option 1:* Do nothing
- *Option 2:* Expand to 9,200 m^3
- *Option 3:* Expand beyond 9,200 m^3

Based on current information, the plant will likely be expanded to around 9,200 m^3 due to capacity limitations with the sludge digestor aeration equipment. This will be re-evaluated after various studies have been completed at the Amherstview WPCP. Further option evaluations for specific process unit upgrades will be considered as growth projections are updated and the need for expansion is approached.

Identified Impacts:

Excavation may be required for this project, once the scope is confirmed, an archaeological assessment of the work site will be completed.

Scope:

If Option 2 is confirmed as the preferred option, the following upgrades will be required at the Amherstview WPCP:

- Aeration tanks
- Secondary clarifiers
- Disinfection

Completed Studies:

GHD – Ecological and Natural Heritage Investigation, 50 Sir John Johnson Drive, 88 Main Street, 4326 Taylor-Kidd Boulevard.

R.V. Anderson Associates Limited – Amherstview WPCP and Bath STP Wastewater Modelling and Capacity Assessment Report.

Project ID: San42 Themes: Growth
TM-9: Bath STP Needs Assessment Infrastructure Category: Sanitary

Project: BSTP plant expansion
Schedule: C
MCEA Table: Table B #29c
Cost Estimate: $3,000,000
Location: Bath STP
Timing: Long (16 to 25 years)

Opportunity: Expand Bath STP to accommodate growth in the Bath Sanitary System.

Options Evaluation:

In order to accommodate growth, expansion of the Bath STP will need to be initiated by the end of the IMP study period. The exact extent of the expansion will be dependent on growth projections, as well as the system connection study that will be conducted. A detailed options evaluation will be conducted as capacity at the plant is approached, at the end of the study period.

The analysis conducted by the consultant for the IMP indicated that most process units will require upgrades to expand to 3,800 m^3. The consultant provided potential unit upgrades that could be implemented to increase capacity. This list of upgrades and associated costs have been used as a placeholder in the IMP project list.

Identified Impacts:

The Bath STP site is limited in size. Any expansion at this site would need to be planned carefully to account for all required setbacks.

Scope:

The scope of the plant expansion is to be determined based on growth the outcomes of various studies at Amherstview WPCP.

Completed Studies:

GHD – Ecological and Natural Heritage Investigation, 50 Sir John Johnson Drive, 88 Main Street, 4326 Taylor-Kidd Boulevard.

R.V. Anderson Associates Limited – Amherstview WPCP and Bath STP Wastewater Modelling and Capacity Assessment Report.

Project ID: St1 Themes: Remedial
TM-19: Stormwater – Minor System Infrastructure Category: Stormwater

Project: Harvard Place/Dinosaur Park **Cost Estimate:** $495,400
Schedule: B **Location:** Dinosaur Park - Amherstview
MCEA Table: Table B #40b **Timing:** Long (16 to 25 years)

Opportunity:

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 area. Although improvements have been implemented, further drainage upgrades would be beneficial in this area.

Options Evaluation:

The options for this location are relatively straightforward, either leave the current system as it is, or conduct upgrades to improve drainage. The Township will look at extending underground storm sewers that lead into the area to provide additional relief and will maintain the ditches for storage. There is potential to add limited storage volumes in the open spaces to assist with high runoff events.

Identified Impacts:

No identified impacts at this time.

Scope:

This project will involve extending storm sewers and continued ditch maintenance.

Completed Studies:

At this time the Township doesn't foresee the need for additional studies based on expected impacts except as noted above.

Project ID: St7 Themes: Remedial
TM-19: Stormwater – Minor System Infrastructure Category: Stormwater

Project: Lodge St. and Second St. **Cost Estimate:** $850,000
Schedule: B **Location:** Village of Bath
MCEA Table: Table B #40b **Timing:** Medium (6 to 15 years)

Opportunity:

The depth and steepness of the ditch on the southeast corner of Lodge Street south of Main Street – Bath 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 midblock where there is a localized sag in the street elevation. The two inlets drain easterly, under a privately owned building through piping, and 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.

If the two Second Street inlets were unable to handle all the stormwater they received, there would likely be some flood damage to adjacent properties once the small road storage volume was fully used.

Drainage improvements would be beneficial throughout this area.

Options Evaluation:

The options for this location are relatively straightforward, either leave the current system as it is, or conduct upgrades to improve drainage. The ideal solution for Second Street involves improving this system from Queen Street to a new Lodge Street outlet.

Identified Impacts:

No identified impacts at this time.

Scope:

These stormwater upgrades will include 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 OGS unit.

Completed Studies:

At this time the Township doesn't foresee the need for additional studies based on expected impacts except as noted above.

Project ID: St8 Themes: Remedial
TM-19: Stormwater – Minor System Infrastructure Category: Stormwater

Project: Factory Lane
Schedule: B
MCEA Table: Table B #40b

Cost Estimate: $520,000
Location: Village of Bath
Timing: Medium (6 to 15 years)

Opportunity:

To improve drainage and establish a proper ditch outlet at the shore of Lake Ontario that has municipal control.

Options Evaluation:

The options for this location are relatively straightforward, either leave the current system as it is, or conduct upgrades to improve drainage. Improvements would involve establishing an outlet that includes treatment.

Identified Impacts:

Work for this project may need to be conducted in Lake Ontario. If work in the waterbody is required, the appropriate ecological and archaeological studies will be conducted.

Scope:

Upgrades on Factory Lane will involve re-establishing a ditch outlet at the shore of Lake Ontario along the existing road allowance. The outlet will require an OGS for treatment.

Completed Studies:

At this time no additional studies have been completed. As noted above, if required, the appropriate studies will be conducted prior to the work.

Project ID: St10 Themes: Remedial
TM-19: Stormwater – Minor System Infrastructure Category: Stormwater

Project: 155 Main Street **Cost Estimate:** $340,000
Schedule: B **Location:** Village of Bath
MCEA Table: Table B #40b **Timing:** Short (0 to 5 years)

Opportunity:

The culvert under the road near 155 Main Street Bath is a major stormwater outlet. The Township does not have any easement rights for the outlet of the culvert where the culvert is located on private property. The condition of this outlet is deteriorating. There is also a pipe on private property that is in poor condition and adjacent to a steep bank. Any improvements at this location will require the approval of the landowner.

Options Evaluation:

The options for this location are relatively straightforward, either leave the current system as it is, or conduct upgrades to maintain drainage for the long term. Improvements would include negotiating an easement and upgrades to the inlet pipe.

Identified Impacts:

Work for this project may need to be conducted in Lake Ontario. If work in the waterbody is required, the appropriate ecological and archaeological studies will be conducted.

Scope:

The Township will negotiate with the owners of 153 Main Street – Bath for easement rights, to allow us to maintain the outlet. The inlet on 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.

Completed Studies:

A legal property survey is available for the adjacent properties.

Project ID: R19 Themes: Remedial
TM-21: Remedial Transportation Infrastructure Category: Roads

Project: Wing Road Bridge **Cost Estimate:** $236,000
Schedule: B (ASP) **Location:** Wing Road
MCEA Table: Table A #35 **Timing: Short** (0-5 years)

Opportunity: 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 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.

Options Evaluation:
The Wing Road Bridge structure will need to be replaced, the options evaluation for this project was relatively straightforward. The following options were considered by staff:

- *Option 1:* Do nothing
- *Option 2:* Replace the single-lane culvert like-for-like
- ***Option 3:*** **Replace the single-lane culvert with a two-lane structure**

Due to the condition of the current structure, Option 1 was not considered. The traffic analysis indicated that there are safety concerns with maintaining a single-lane culvert, therefore, Option 2 was not selected.

Option 3 – replacing the single-lane culvert with a two-lane structure was identified as the best option.

Identified Impacts:

Due to the location of this bridge and the proximity to a water body there is potential for ecological, cultural heritage, and archaeological impacts. The Township conducted the studies listed below to identify if there were any specific concerns at the proposed work site. It is likely that further evaluation will be required regarding cultural heritage due to the proximity to the Mill site.

Scope:

Option 3 will involve replacing the current culvert with a two-lane structure. The structure will be constructed in the same general location, but the Township will shift the centreline of the road upstream to allow for the existing road expansion to two lanes.

Completed Studies:

GDH – Ecological Characterization Assessment Wing Road Bridge.

WSP – Stage 1-2 Archaeological Assessment Wing Road Culvert Replacement.

Keystone Bridge Management Corp. – 2022 Bridge & Large Culvert Biennial Inspections Loyalist Township.

Project ID: R20 Themes: Remedial
TM-21: Remedial Transportation Infrastructure Category: Roads

Project: Bridge Railing Deficiencies
Schedule: B
MCEA Table: Table A #31b

Cost Estimate: $240,000
Location: Various Locations
Timing: Ongoing

Opportunity: In 2022 Loyalist Township utilized the service of Keystone Bridge Management Corporation (Keystone) for the biannual OSIM bridge inspections. Several structures have been noted by Keystone as requiring railing upgrades due to updated standards. These locations are listed below:

- 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)

These bridges meet the age criteria of 40 years and will therefore need to be evaluated for cultural heritage impacts prior to any rehabilitation or replacement. The outcome of the cultural heritage assessment will determine if the project is considered Schedule B.

Options Evaluation:
No in-depth options evaluation was conducted for these projects. The railing upgrades should be straightforward projects and there is no "Do Nothing" option as the work is required to meet standards.

Identified Impacts:

Depending on the location and age of each bridge there may be ecological, cultural heritage, and archeological impacts that need to be considered. These impacts will be evaluated prior to each project.

Scope:

These projects will involve upgrading the current bridge railing systems to meet current standards.

Completed Studies:

As highlighted above, the appropriate studies will be completed for each individual project as needed.