CORPORATION OF THE COUNTY OF HURON

ASSET MANAGEMENT PLAN

June 2022

This document is available in alternate formats upon request.

INTRODUCTION

The County of Huron is an upper tier municipal corporation. Huron County, Ontario's West Coast is located along the shores of Lake Huron. The County has a current population of approximately 61,366 people, 25,334 households and covers an area of 3,402 square kilometers. This rural community is the most agriculturally productive county in Ontario, and is a leader in numerous areas of agricultural technology and innovation.

The AMP Team used The "Asset Inventory and Valuation and Asset Management Plan for Road/Bridge Network Infrastructure Building Structures, Vehicle Fleet and Equipment." (This report was presented to County's Committee of the Whole on June 17, 2008, and was moved and seconded to be received). Dillon Consulting Limited (Dillon**),** in association with ASi Technologies Inc. and KPMG, was engaged by the County to develop an inventory of the County's tangible capital assets in accordance with the Canadian Institute of Chartered Accountants Public Sector Accounting Board Section 3150 (PS 3150). The mandate also required the Dillon Team to perform a historical valuation to these same assets as well as calculate the amortized value of the assets. In addition, the County of Huron required the development of an Asset Management Plan for the short and long-term rehabilitation, reconstruction and replacement of these same tangible capital assets.

In order for Council to continue to provide an adequate level of service to their residents, it is essential to have a plan to ensure sustainability of those assets. The County currently builds upon and continually updates original Dillon plan and Property and Housing Services building condition assessments. The County's formal plan is in place for the maintenance, renewal and replacement of all its assets.

What is new for the 2022 Plan?

- The County's asset management plan has been revisited and updated for:
    - Compliance with ONTARIO REGULATION 588/17 July 1, 2022 deadline for Core Infrastructure Assets – Roads, Bridges and Large Culverts. This includes:
        - Current and proposed condition levels of service
        - Current and proposed performance levels of service
        - Levels of Service risk analysis
        - Asset information and lifecycle events and 10 year lifecycle costing
        - Impacts to Core Infrastructure based on population growth and employment forecasts
    - Some updates to non-core asset categories where information was available. Additional work is required for all non-core assets.
    - Worktech asset management software updated for updated inventory assessments of bridges, roads and large culverts (>2.5m) Updates includes history of

expenditures and future rehabilitation needs, including both major and minor expenditures.
- Large Culverts >3 meters were expanded to include culverts > 2.5 meters as culverts over that size require structural engineering.
- More information has still being gathered for small culverts which were previously not identified in the County's paper records. The values for these small culverts have not yet been updated in the 2022 plan.
- Staff are able to have better visibility of the timing of major capital expenditures for the County's linear assets, rather than relying solely of their estimated useful lives, and being able to provide detailed reporting.
- Integration of Worktech asset management software with GIS
- Development of crystal reports to provide detailed analysis for roads, bridges and large culverts (note, this reporting will be transitioned to SQL reporting)
- In 2019, the County approved it's Strategic Asset Management Policy as required by legislation
- More detailed financing strategy and debt management policy.

What are the future plans for the Asset Management Plan?

This plan is an ever-evolving document and will be reviewed and enhanced in the years to come with the timing and enhancements based on the availability of staff resources.

Some specific enhancements will include:

- Compliance with July 1, 2024 deadlines for all County assets
- Refine life cycle costing for all existing assets
- Expand risk based needs assessments and define current and proposed service levels for all assets
- Further refinement of the condition ratings for Fleet, Property Services, Homes for the Aged, Public Works Yards and Social Housing
- Identification and inclusion of asset classes currently not included in the plan, such as IT infrastructure, storm sewers, small culverts, and small driveway culverts etc.
- Develop more comprehensive financing strategies with updated information

EXECUTIVE SUMMARY

The infrastructure assets reviewed in this project include:

- 773 kilometers of paved roads and associated storm sewers;
- 81 bridges; 210 large culverts; small culverts are still being inventoried with 1,220 currently identified; and an estimated 8,934 entrance way steel culverts.
- 4 public works yards
- Housing Services of 16 apartments (including Countyview) and 84 family units

- Property Services of 13 building structures
- 2 Homes for the Aged
- The County's fleet of vehicles and other heavy machinery and equipment.
- Emergency Services fleet of vehicles.

The current estimated replacement value of the County's assets based on current service levels is **$1.1 Billion**. The majority of this falls under the Public Works departments with their infrastructure accounting for approximately 87% of all County assets.

On a per household basis, this represents approximately $44,400 in assets being supported in the County.

Asset expenditure needs over the **next 10 years** are **$230,000,000**, with the majority of requirements being years 6-10. Over the next 20 years, a total of $555 million is estimated.

Strategies will have to continue to be developed and refined to mitigate the immediate needs and long term needs of the County. Strategies will include, increasing the levy, utilizing reserves, reliance on funding from senior levels of government and utilizing debt. A sample funding scenario is provided at the end of this plan.

There is a significant amount of work that is still required to move this plan forward, involving implementing an asset management software program, identifying and measuring additional asset categories that should be included in the plan (ie IT infrastructure), regular building condition assessments, refinement of building condition ratings and more detailed analysis of the conditions and replacement costs of the County's small culverts and driveway entrances.

CLIMATE CHANGE ADAPTATION PLAN

The County has approved a Corporate Climate Change Adaptation Plan in 2020 with many key priority actions items. This document will assist in defining the asset management strategies moving forward. The document is located on the County's website -

https://www.huroncounty.ca/wp-content/uploads/2022/01/Climate-Change-Adaptation-Plan_Update.pdf

Specific goals related to infrastructure include: Determine the impacts of climate change on the County's built infrastructure; Invest in modifications to improve the resiliency of County infrastructure and buildings to the impacts of climate change; Continue to identify and mitigate risks associated with stormwater management and flooding; and, Improve the capacity of the County's natural environment to adapt to future changes.

ROADS INFRASTRUCTURE

Roads Infrastructure

What does the County own?

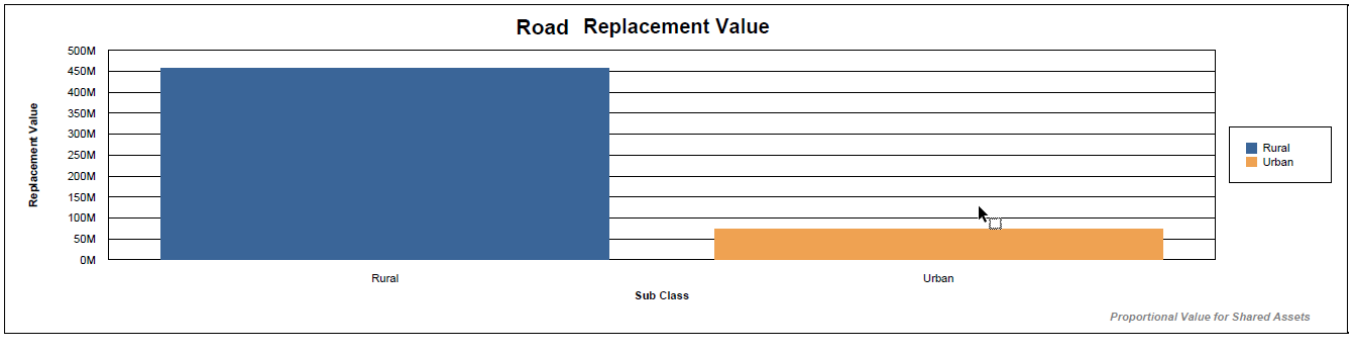
The County of Huron has 33 County Roads with a total of 773 paved lane kilometers. The road infrastructure assessments are carried out in the Public Works department.

What is it worth?

Before managing an asset, it is important to know the value to determine if the maintenance dollars spent are justified to protect the asset. Based on the asset valuation process carried out as part of this assignment, Public Works staff calculated an approximation of the total estimated value of the assets of $537 million based on current 2022 valuations.

It is important to note that the value of the roads will require to be updated for the value of ditching, driveway culverts, and guiderails. This are asset types that are currently being inventoried and expect to be in future Asset Management Plan updates.

The following chart shows the breakdown of the replacement valuation of the road network by rural vs urban roads.



What condition is it in?

Condition assessment rating was carried out on the Roads asset network, in consultation with Public Works Department using the PCI (paving condition index) to identify the level of service considered acceptable by staff.

Replacements are based on optimal timing for the cost benefit of rehabilitation vs reconstruction, and also proximity of other road segments requiring paving to maximize the economies of scale for paving contracts. The identified range for optimal rehabilitation is a PCI rating of 6-7.

The current PCI rating for the entire road network for 2022 is 8.6, or in an overall good condition.

The PCI condition rating relates to the condition of the overall road structures and is a rating out of 10. When the rating is between 0 and 3 the item needs to be reconstructed. The **PCI *(Pavement Condition Index)*** rating is a combination of the RCR ***(Ride Comfort Rating)*** and DMI ***(Distress Manifestation Index)***. The RCR can be gathered through a subjective method (drive through at posted speed). The DMI is calculated by combining the density and severity of all distresses. The PCI rating was reported on a scale from 0 to 10 with 10 being a road in perfect condition.

The rating system is as follows:

Excellent:	9– 10	No evident defects
Good:	7 – 8	Slight decline
Fair:	5– 6	Decline asset apparent
Poor:	3– 4	severe decline or failure

What do we need to do for 2022?

List of priority Road projects based on optimal timing for rehabilitation to be included in the 2022 Budget:

PriorityProjects		
County Rd. No	**PCI**	**Comments**
County Rd 84	67	This road currently has a PCI of 67 and 74 with an AADT of 2,400. Last Rehabilitated in 2000 using CIR. CR 84 has narrow to wide transverse and longitudinal cracking, narrow to wide edge cracking, and localized alligator cracking. The County has replaced any small culverts needing replacement in 2020 prior to this work. The Public Works Department is proposed to cold-in-place recycle this road and is expecting to get 20+ years before another treatment is required.
County Rd 25		This project is currently going through the Municipal Class Environmental Assessment process. It is anticipated that construction can proceed in 2022 and Huron County Council has approved budgeting for this project as such. It is anticipated that the preferred alternative will be the installation of a set of traffic signals with the inclusion of turning lanes, as required based on traffic studies.
RDMS-21	74 72 75	CR5 (PCI 74 - 2.0km), CR21 (PCI 72 - 1.7km), CR31 (PCI 75 - 4.1km) Micro-surfacing to extend the life of pavement to align with next major pavement treatment of adjacent sections of road. Applying a micro-surface to a road that is good condition extends the life of the underlying asphalt by several years.

County Rd 30	60	This road currently has a PCI of 60 with an AADT of 1,100. Last Rehabilitated in 2009 using CIR. CR 30 has narrow to wide transverse and longitudinal cracking, narrow to wide edge cracking, and localized alligator cracking. The County has repaired multiple sections on CR 30 using Hot Mix Asphalt Patching as well as spray patching over the last 2 years. The Public Works Department is proposed to cold-in-place recycle this road and is expecting to get 20+ years before another treatment is required.
County Rd 84 Urban Renewal		This urban section of County Road 84 was last rehabilitated in 2000 using a Mill & Pave (50mm) treatment. Preliminary storm sewer inspections indicate the urban drainage is in fair condition but is undersized and may require some re-configuration. In collaboration with the Municipality of Bluewater, work will begin on the design, public consultation, permit applications, and tender package preparation for the re-construction planned for 2024. This project will also include water and sanitary system renewals as well other urban streetscape enhancements in collaboration with local businesses.

Gas Tax Agreement incremental requirement annual base threshold – $2,232,399.20.

The following tables highlight the existing reports that are available from our asset management software. Recommended actions, condition ratings and estimated costs can be reported upon for the purposes of the long term asset management planning. Estimated needs for 2022 are included below, with the remainder up to 2032 included in Appendix A.

2022 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost
							$7,647,162
RD0504-00:County Rd 5 (Mt. Carmel Drive) - (to) Airport Line-to-Highway 4	1989	74	$750,000	**DMS** Double Micro-Surfacing	$105,626	50%	**$52,813**
RD2101-00:County Rd 21 (Airport Line) - (to) Huron Park Rd-to-CountyRoad 10 (Crediton Road)	1998	72	$696,000	**DMS** Double Micro-Surfacing	$80,090	100%	**$80,090**
RD3004-00:County Rd 30 (Fordwich Line) - (to) CountyRoad 87 (Harrison Road) -to-CountyRoad 7 (Howick-Turnberry Road)	1984	60	$4,500,000	**CIR** Cold-In-Place Recycling	$1,137,406	100%	**$1,137,406**
RD3005-00:County Rd 30 (Fordwich Line) - (to) CountyRoad 7 (Howick-Turnberry Road)-to-Howick-Minto Line (Wellington Boundary)	1988	60	$5,900,000	**CIR** Cold-In-Place Recycling	$1,373,051	100%	**$1,373,051**
RD3101-00:County Rd 31 (Parr Line) - (to) CountyRoad 84 (Zurich-Hensall Road) -to-Kippen Road	2000	75	$1,636,000	**DMS** Double Micro-Surfacing	$188,259	100%	**$188,259**
RD8402-00:County Rd 84 (Zurich Main Street) - (to) 162m West of Walnut St. (W. Limit Zurich)-to-150m East of East St. (E. Limit Zurich)	2000	49	$3,216,000	**U-REC** Urban Reconstruction	$2,808,000	100%	**$2,808,000**
RD8403-01:County Rd 84 (Zurich-Hensall Road) - (to) 150m East of East St. (E. Limit Zurich)-to-CountyRoad 31 (Parr Line)	2000	67	$2,750,000	**CIR** Cold-In-Place Recycling	$926,558	100%	**$926,558**
RD8403-02:County Rd 84 (Zurich-Hensall Road) - (to) CountyRoad 31 (Parr Line) -to-190m West of Elizabeth St. (W. Limit Hensall)	2000	74	$4,000,000	**CIR** Cold-In-Place Recycling	$1,080,985	100%	**$1,080,985**

When do we need to do it?

One criterion critical to rating the roads structure for the purposes of developing the AMP is the service life of the structure and its elements. As assets age, infrastructure managers must use experience and judgment to decide when maintenance is no longer cost effective thereby requiring that the structure be replaced. While the useful life of an asset is suitable for

accounting purposes, Public Works will base asset replacement and pavement resurfacing on PCI ratings. The Public Works Department has prepared a pavement management strategy and presentation. These documents are being included as an appendix to this plan – Appendix B. Note, this strategy will be reviewed and updated with new term of Council.

Asset Estimated Useful Life in Years	
Asset Type	Useful Life
Roads Surface	22
Roads Base	50

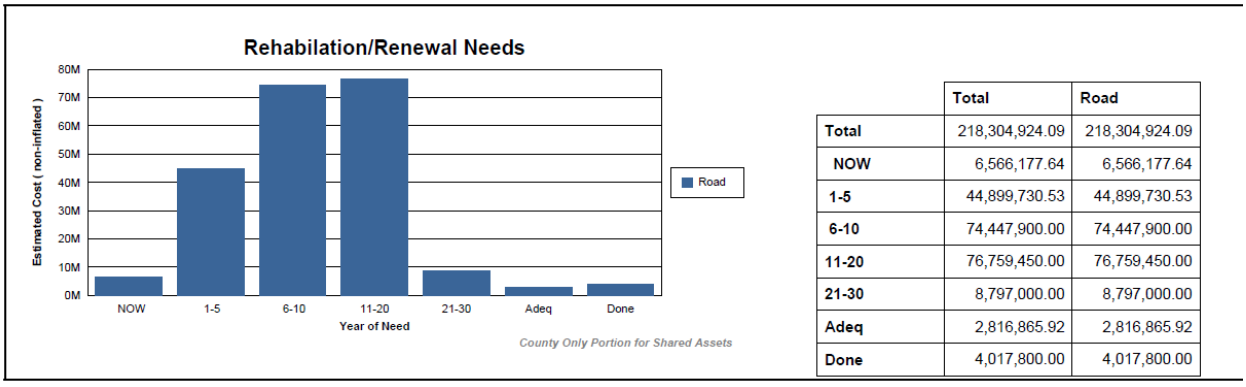
How much money do we need?

The County's asset management software has been updated to include a significant amount of detail with respect to the linear assets of the County. Details will include previous rehabilitation work along with condition assessments and future year's rehabilitation needs.

An example of a lifecycle plan of the Road assets by asset record is as follows:

RD2202-01 (to) 530m N of Cty Rd 25-to-CountyRoad 20 (Belgrave Road) : County Rd			1986		Active	$4,068,000	93	Rural	100%	1,324	
	Year	Time of Need		Priority	Status	StatusComments				Cost	Contractor
	1997 P&P1L Pad & Pave 1 Lift HMA	Adeq		0.00	Completed					$0	
	2018 RECL Reclamite Asphalt Rejuvenator	Adeq		0.00	Completed					$152,550	
	2029 CIR Cold-In-Place-Recycling and Pave	6-10		0.00	Pending					$1,728,900	

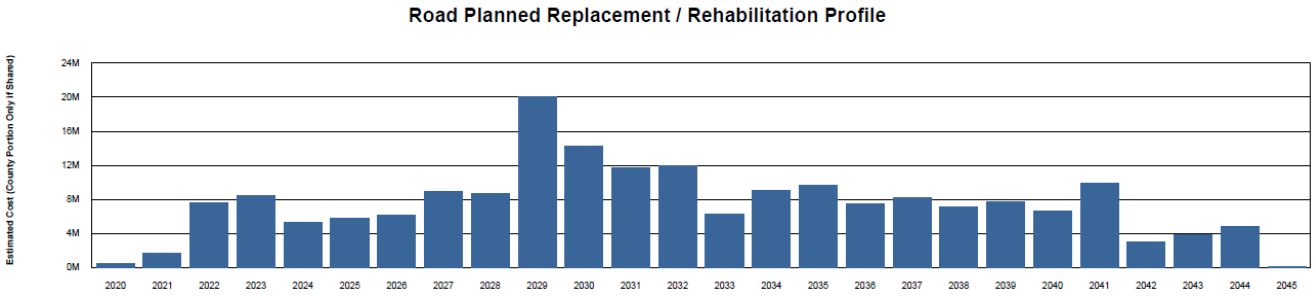
Rehabilitation requirements for the next 30 years are illustrated in the following chart, however, it is important to note that the values past 20 years are understated as they only include major rehab as we are currently manually updating life cycle costs for the next treatments:



	Total	Road
Total	218,304,924.09	218,304,924.09
NOW	6,566,177.64	6,566,177.64
1-5	44,899,730.53	44,899,730.53
6-10	74,447,900.00	74,447,900.00
11-20	76,759,450.00	76,759,450.00
21-30	8,797,000.00	8,797,000.00
Adeq	2,816,865.92	2,816,865.92
Done	4,017,800.00	4,017,800.00

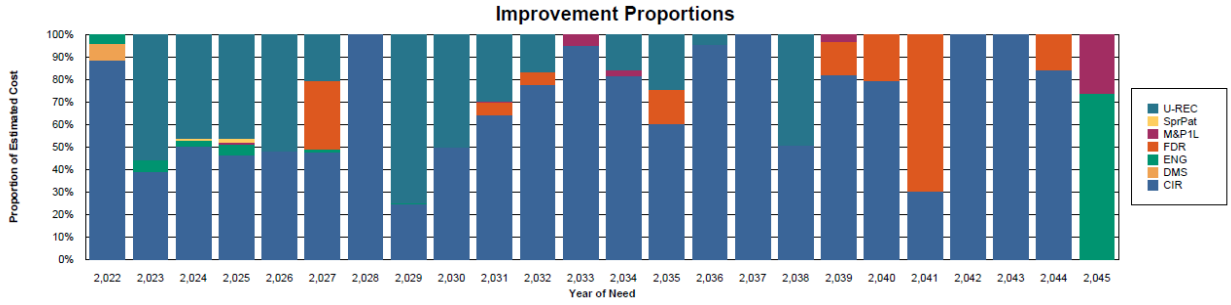
As illustrated in the chart, a total of $218 million is required in the next 30 years to rehabilitate the existing road network. $44 million is required in the next 1-5 years, and $74 million is required in the next 6-10. Annually an average of $7.3 million is required per year.

The following chart shows the rehabilitation needs over the next 20 years by each year:



As seen in this chart, there is a spike in needs for 2022-2023, and then again a more significant spike in rehabilitation needs from 2029-2030. This will prove to be very challenging period for the County as that coincides with the peak rehabilitation needs for the County's bridge and large culvert structures. The work required for 2029 will require to be managed where some projects are moved ahead and some will be required to be deferred to ensure more stable funding.

The following table is the same annual rehabilitation profile, however, it illustrates the nature of the work that is being done based on the Pavement Management Strategy. The goal is to ensure the lowest lifecycle costs for our assets to ensure best value for the residents. The details for the annual work also will be included in Appendix A.



Based on the current stage in the life cycle of our road, much of the required rehabilitation work will be a cold in place recycling and pave. The legend in the chart is based on the table below:

Improvement Type	Class	Description
CRK	Rehab to achieve life	Rout and seal existing cracks
M&P1L	Rehab to achieve life	Mill 50 mm - Pave 50 mm
SGR	Rehab to achieve life	Shouldering
CIR	Rehab with Life Extension	Cold-InPlace-Recycling and Pave
FDR	Rehab with Life Extension	Full Depth Recycling & Pave
U-REC	Asset Replacement	Urban Reconstruction
RECL	Rehab to achieve life	Reclamite Asphalt Rejuvenator
P&P1L	Rehab with Life Extension	Pad & Pave 1 Lift HMA
SS	Rehab to achieve life	Slurry Seal
ENG	Engineering Design	Engineering Work
SprPat	Maintenance	Spray Patching
HIR	Rehab with Life Extension	Hot-In-Place Recycling
DMS	Functional Improvement	Double Micro Surfacing

How do we reach sustainability?

The analysis revealed that the average yearly revenue required is $14.2 million (operating and capital) to ensure that the level of service is maintained at today's level over the next 20 years for the County's road network. The previous graph also indicates that at that rate of funding the road network needs are expected to be somewhat variable over the next 20 years. Costs are estimated to peak in years 2029-2032 for the road rehabilitation program.

Current depreciation of public works assets being raised through the levy is approximately $4,500,000. The net book value (NBV) of the road network is $57,000,000 as reported in our 2022 financial statements. It is important to note that the County cannot rely solely on depreciation alone to fund its future capital replacement. Inflationary pressures continue to drive future replacement costs higher that what is being reflected in our statements. The net book value is an accounting figure for what value remains for an asset as it depreciates over its estimated useful life.

Currently there is an estimated Public Works reserve balance of $16.05 million which could be utilized for roads/bridges/public works yards.

With a prudent asphalt management plan, despite the base being close to the end of its estimated useful life, the life of the base can be extended out much longer if the asphalt is replaced at the right time (ie PCI above 6), where minimal work is required to maintain it (the base) at acceptable service levels. At a PCI of 5, the base is already damaged and this is the most valuable piece of our infrastructure. This is critical for the long term sustainability of our road network.

What are we spending on roads maintenance?

An important consideration of asset management is the on-going maintenance related expenditures that are being incurred in order to maintain the County's assets. As assets deteriorate, it becomes more expensive to maintain those assets, therefore it is important for staff to assess condition ratings to ensure the optimal timing of asset replacement.

Road and roadside maintenance and repair costs, including labour costs, are approximately $2.4 million annually. This does not include any costs for ditching or drainage. More work is required on ditching and drainage as we move forward as we will see an escalation in those costs as those too are reaching end of useful life and will require significant work.

10 Year Life Cycle Costing

10 YEAR LIFECYCLE COSTING				
		Average Years 1-5	Average Years 6-10	Total Average Years 1-10
ROADS	Capital	$ 7,643,573	$ 15,974,160	$ 11,808,866
	Operating	$ 2,229,837	$ 2,584,992	$ 2,407,415
	Total	$ 9,873,410	$ 18,559,152	$ 14,216,281

Over the next 10 years, the total average cost of Road Capital and Operating expenses is expected to increase, from $9.8 million per year to $18.5 million per year.

Levels of Service

Service	Program Service Objectives	Community Levels of Service	Service Division	Supporting Asset Classes	Target Asset Levels of Service (by Asset Class)	Current Asset Levels of Service					
						Asset Class Average	Distribution by Asset Rating				
							%	%	%	%	%
ROADS	A safe, reliable, efficient road network accessible year round	Roads are kept in good condition	Roads	Roads (summary)	Condition	Condition					
					PCI = 80	86	72%	16%	10%	0%	3%
					Performance	Performance					
					Operational Functionality = Good	Good		100%			
					Capacity - Good	Good		98%	2%		
					Environmental Resiliency = Good	Good		100%			

The targeted condition rating for Roads is 80 (PCI) and a performance level of Good. The average current condition rating for Huron County roads is 86, with the performance level of Good being achieved for most roads.

FCM and Asset Management Ontario have provided County staff with templates and training on levels of service, risk analysis and life cycle costing. This training has been embedded within the plan.

Key Performance Indicators

Key Indicator:
Pavement Condition Index (PCI), International Roughness Index (IRI), Ride Comfort Rating

(RCR), and Distress Manifestation Index (DMI)

Issue:
As roads age, they begin to deteriorate due to exposure to environmental elements such as UV damage, freeze/thaw cycles, vehicle load stresses, and oxidization. As the roads age, they become more brittle and less flexible, creating shrinkage cracks, visual defects, wheel rutting, and potholes.
Allowing the road surface to deteriorate allows the elements to seep into the road base, shortening the life of the road base. The road base is much more expensive to repair.

Potential Impact:
Potential impacts of deteriorating roads include safety hazards, increased number of accidents, increased maintenance costs, load restrictions, poor drainage, increased liability, and increased costs of repairs. Wear and tear on vehicles and reduced fuel economy contributing to greenhouse gas emissions.

Current Controls:
Twice weekly, patrols are carried out to monitor road conditions. If issues are detected, they are repaired immediately, or seasonally, after the Project Manager, Roads inspects and perform test to determine PCI, IRI, DMI and RCR. Roads have a fairly predictable life span of 18 – 22 years, and during this time, PCI evaluation is completed every 1-2 years, or more often as needs arise.

Preventative Maintenance is also carried out, and if key indicators such as repetitive occurrences of pothole repairs, or crack sealing, can indicate an underlying issue that is further investigated by staff and/or an engineering consultant.

Roads are built and maintained to established standards, such as Ontario Provincial Standards, Transportation Association of Canada Standards, the Ontario Traffic Manuals, Canadian Highway & Bridge Design Code, and Ontario Structure Inspection Manual. Regular inspections are carried out to meet established thresholds. **The established target PCI threshold is 80%.**

Legislation is also in place as a legal framework for road and bridge maintenance. The Public Works department ensures that these requirements are met, such as road construction and maintenance conditions to meet Minimum Maintenance Standards (MMS), as well as the Highway Traffic Act.

In addition to this, requests are received on a regular basis from tax payers, businesses, and agricultural entities for such services as seasonal road maintenance, roadside tree trimming, grass cutting, weed spraying, and garbage and debris clean-up. These requests are integrated into the regular preventative maintenance schedule to accommodate the needs of our constituents.

Action plan:
Continue with preventative maintenance and inspection. As asphalt has a fairly predictable life cycle due to the impacts of environmental elements, preventative maintenance and rehabilitation is planned and budgeted accordingly. The average road maintenance costs are approximately $2.2 million in 2022 and are expected to increase, due to inflation, to $2.4 million over the next 10 years.

BRIDGE and CULVERTS > 2.5 meters
INFRASTRUCTURE

Bridge and Large Culverts Infrastructure

What does the County own?

The County of Huron has a total of 81 bridges and 210 large culverts. All asset field assessments are carried out in the Public Works department by internal staff and external engineering firms. These two assets are being grouped together as both types of structures require similar structural inspections, review, analysis, and design efforts.

What is it worth?

Before managing an asset, it is important to know the value of the asset to determine if the maintenance dollars spent are justified to protect the asset. Based on the asset valuation process carried out as part of this assignment, Public Works staff estimated the current value of the large overhead structure assets at $240 million. The current estimates are based on 2021 values and have not be indexed into future values.

The following table lists the total estimated replacement value of the County's more significant structures.

Bridges and Large Culverts Replacement Value	
Structure	Estimated Replacement Cost
Bridges	$ 157,269,240
Large Culverts	$ 83,409,850
Total	**$ 240,679,090**

County Owned Bridges

The County of Huron has 81 bridges for which it is currently responsible to inspect, maintain, and repair and/or replace. The County's percentage of ownership varies from 33% to 100% at each of these sites depending on geographic location within the County. Partners may include lower tier municipalities within the County, lower tier municipalities in adjacent Counties, or adjacent Counties themselves.

All Bridges	
County Ownership (%)	Quantity
100%	72
50%	8

33%	1
	81

Since the previous update to the Asset Management Plan, the County has been actively "downloading" bridges to the lower tiers meaning they are no longer maintained by the County and that ownership has been transferred. This process can only take place when a structure falls on a road that does not belong to the County. The County has plans to continue downloading structures that are not on County roads. Currently, six (6) structures in the inventory are eligible for transfer to the lower tiers.

Downloadable Bridges	
County Ownership (%)	Quantity
100%	1
50%	5
	6

What is it worth?

It is important to know the value of all bridge infrastructure assets to determine if the maintenance dollars spent are justified. The Current Replacement Value (CRV) is calculated by using the total quantity of material and established unit rates as shown above. It is important to remember that the CRV is based on replacing the current structure with an exact replica of what is currently there. The County has a total of $157 million worth of bridge structures based on current replacement values.

The following table provides additional details on the current Bridge inventory:

Current Replacement Value by Bridge Type			
Asset Class	Quantity	Total Replacement Costs	Average Replacement Cost
Box Beam	2	$3,703,000	$1,851,500
Rigid Frame	49	$63,263,240	$1,291,087
Slab on I-Girder (Concrete)	15	$49,941,000	$3,329,400
Slab on I-Girder (Steel)	8	$14,601,000	$1,825,125
Spandrel Arch	1	$4,500,000	$4,500,000
T-Beam	5	$15,900,000	$3,180,000
Voided Slab	1	$5,361,000	$5,361,000
	81	**$157,269,240**	**$1,941,596**

As shown in the table above, a rigid frame structure has the lowest average replacement cost but also the second highest cost per meter of bridge. In most cases, a rigid frame structure is replaced with either a Box Beam Bridge or Slab on I-Girder (Concrete) bridge which both have a lower cost per meter. Unfortunately, most rigid frames are being replaced with longer spanning structures to accommodate increased hydraulic flows and to avoid blocking the

channel so the actual construction cost is greater than the CRV. Therefore, spending money early on rehabilitating rigid frames can help the County minimize the financial impact due to the difference in costs per structure type.

What condition is it in?

In Ontario, structures spanning 3.0m or greater are required to be inspected biennially by a trained Bridge Inspector or licensed Engineer. The inspection shall be performed in accordance with the Ontario Structure Inspection Manual (OSIM) and archives basic inventory data like bridge type, deck length, deck width, skew etc. It also lists any material and structural defects on individual bridge elements with associated quantities, costs, and timelines for repair. These quantities, costs, and timelines change with each inspection and are what Asset Managers use to cost and predict future rehabilitation or replacement.

All bridges in Ontario are rated on a scale from 0-100. This numerical value is known as the Bridge Condition Index (BCI) value. The formula below is how a BCI is calculated for a bridge.

BCI = Current Value / Replacement Value x 100

Where:

Replacement Value = Sum of Element replacement value = Sum of (Element Unit Cost x Element Quantity)

Current Value = Sum of Current Element Value = Sum of (Element Unit Cost x (1.0*E +0.75*G + 0.4*F + 0.0*P)

Where:

E – quantity of element in excellent condition state
G – quantity of element in good condition state
F – quantity of element in fair condition state
P – quantity of element in poor condition state

Simply stated, the BCI is a ratio of current value over replacement value with current value being determined by the condition state of key bridge elements.

The rating system reflects comments and quantities documented in the OSIM form. The Ministry of Transportation Ontario (MTO) has established BCI ranges corresponding to single word descriptors to represent bridge condition. The descriptors and ranges are as follows:

Bridge Condition based on Bridge Condition Index (BCI)	
Condition	BCI Range
Excellent	80 – 100
Good	70 – 80
Fair	60 – 70
Poor	0 – 60

The County has an average BCI value of 70 and is in considered fair by MTO standards.

The distribution of the bridges amongst the BCI condition scale is as follows:

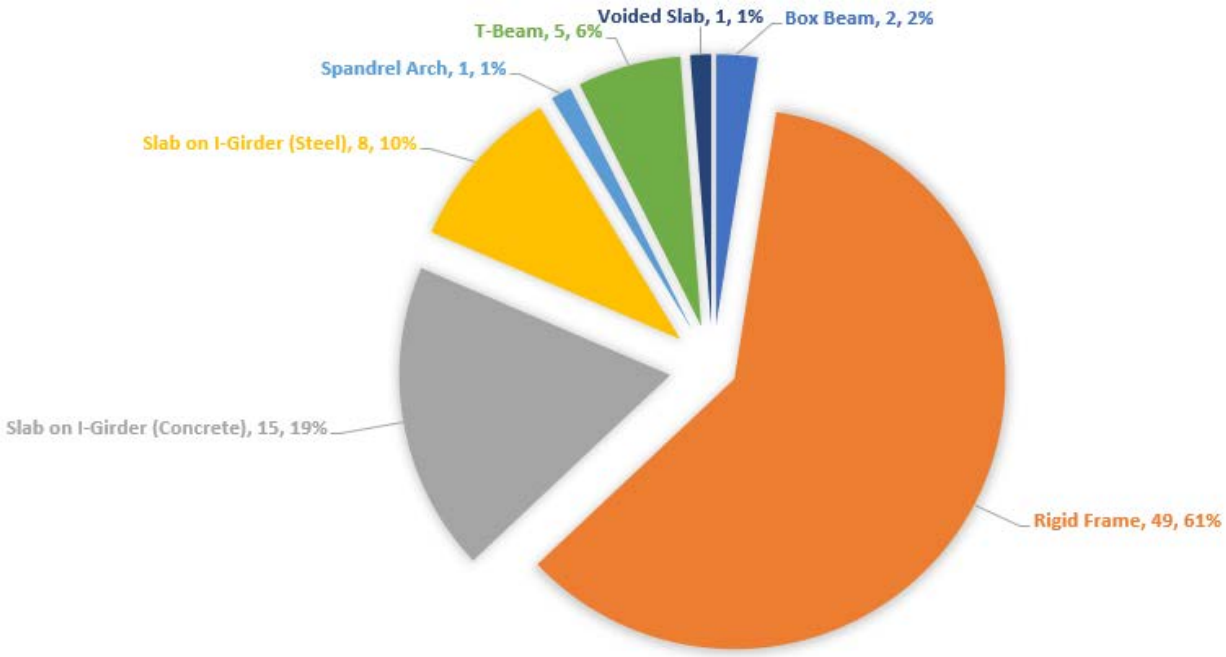
Structure Condition Rating		
BCI Scale	**# of Structures**	**% of Total**
Bridges		
Excellent	4	5%
Good	45	55%
Fair	32	39%
Poor	2	2%
Total Bridges – Avg 70 BCI	**81**	**100%**

When do we need to do it?

According to the Canadian Highway Bridge Design Code (CHBDC) all new structures shall have an expected service life of 75 years. A structure is not expected to reach the ESL if regular maintenance and rehabilitation is not completed. The amount of maintenance and capital investment required to achieve the ESL will vary depending on structure type, quality of materials, traffic volumes, environmental conditions, adequate annual maintenance, drainage, how often the structure is rehabilitated and/or size of capital investments made. Some bridges may be able to reach the ESL with minimal interference while others require substantial investment or early replacement based on the factors outlined above.

Types of Bridges in Huron County

Different types of bridges exhibit different ways in how they deteriorate and the amount of capital required throughout its service life. By understanding the types of structures throughout Huron County, the Public Works Department can select projects that have the greatest opportunity to meet or exceed the expected life of the bridge. Below is a breakdown by bridge type throughout the County.



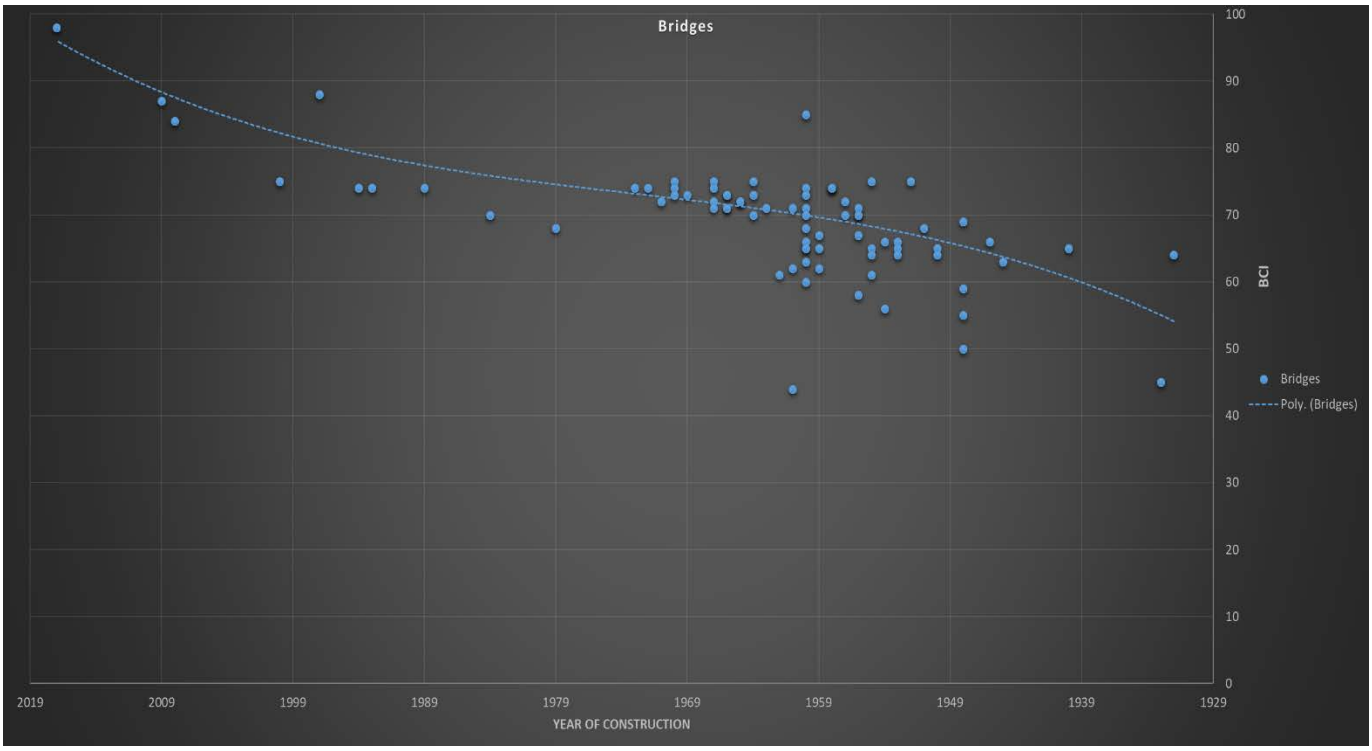
Fortunately for the County, a large portion of our bridges are Rigid Frames. It is generally understood that Rigid Frame bridges will meet the expected service life with regular capital investment as long as the deck is free from chloride contaminated concrete and full concrete barriers are installed to prevent salt spray. Historically the County has done a good job to install full barriers at many of the rigid frame bridges in hopes to achieve or extend the ESL. We are continuing to identify Rigid Frame bridges that are in good condition where a full barrier would be beneficial to extending the ESL.

Deterioration in Bridges

Ideally, the overall bridge condition deteriorates at a predictable rate that the Asset Manager can use to forecast future capital projects. Unfortunately, all bridge inspections are based on judgement, experience of the inspector and interpretation of the OSIM. Therefore, bridges do not tend to deteriorate in a linear or predictable manner because the inspector or firm does not remain constant. Additionally, the OSIM is written in a way that forces inspectors to reduce the BCI at ages 5, 15, and 25 regardless of defects found on the bridge. Due to this fact, a bridge deterioration curve should show a quick decline in BCI to year 25 and then begins to level off with minor increases due to capital investments until it reaches a point beyond repair.

The Public Works Department has elected to use a polynomial trendline to the 4th order. This is due to the expected deterioration based on a thorough understanding of OSIM. A 4th order trendline was best suited for the expected deterioration of a bridge because there should be four (4) hills/valleys in the data. The Public Works Department has graphed all bridges in the County showing their year built vs. condition. This will help determine which bridges are beginning to fall below the deterioration curve. Identifying problem bridges early will allow Public Works to

intervene and help the asset achieve its ESL. Below is the graphed trendline for all County owned bridges. As of 2019, anything built in 1944 or earlier has already reached its ESL.

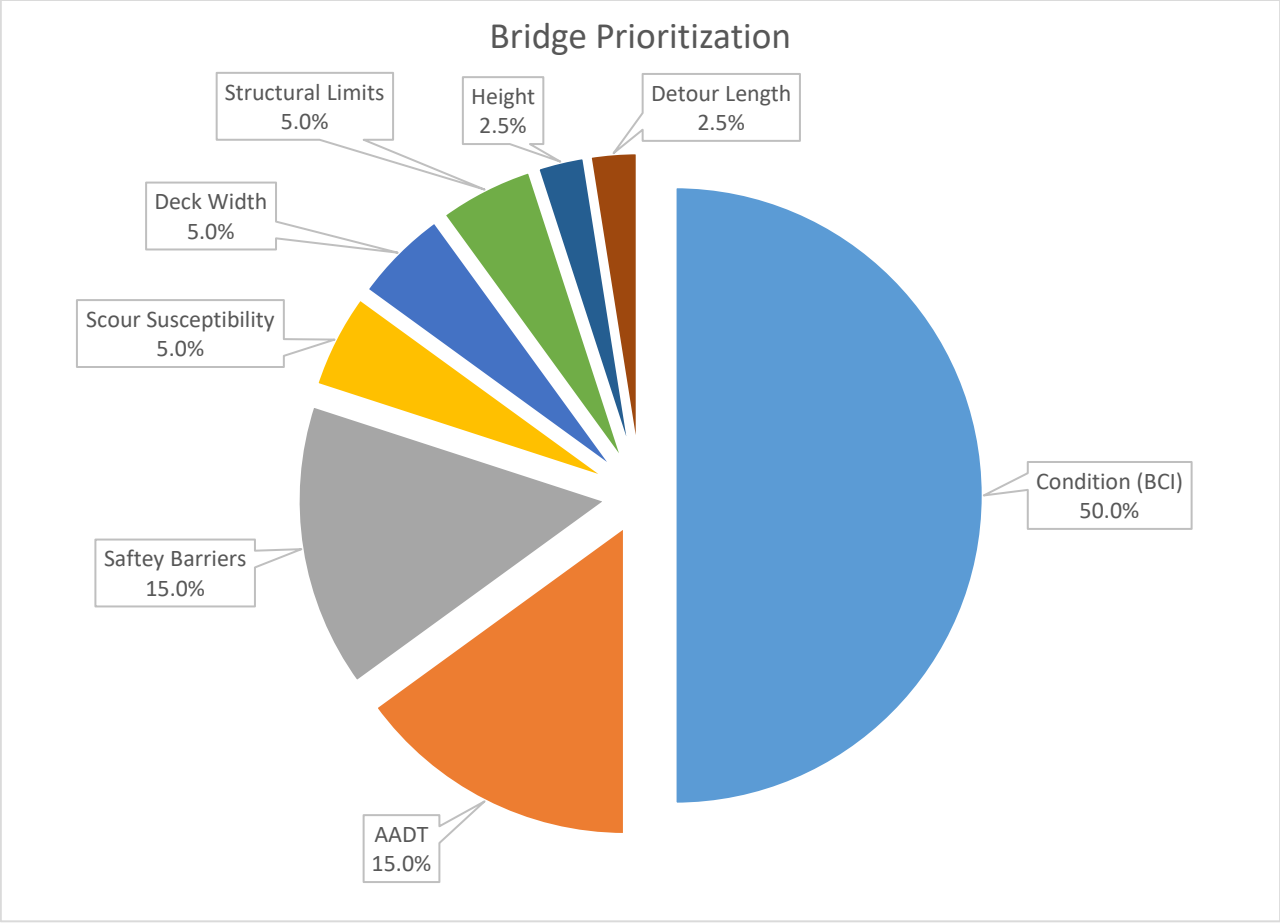


How do we select structures for rehabilitation or replacement?

The County uses the trendline above to identify bridges suitable for rehabilitation. One widely agreed upon engineering principle is that bridges should be patched, waterproofed, and paved at a maximum every 25 years. While trying to achieve that standard, the County also looks for bridges that are beginning to fall below the trendline. This usually means replacing old substandard barriers and patching areas of poor concrete. Full deck replacements may also be recommended if the area of deck patching is too high and new barriers are required.

When identifying bridges for replacement, the County uses a priority based approach that accounts for condition and risk. This approach is successful because bridges with low BCI's are heavily weighted and typically fall far below the trendline making them unsuitable for rehabilitation. Risk needs to be considered when replacing bridges to avoid catastrophic failure. Bridges with high traffic volumes, substandard barriers, or with high abutments/piers have a greater risk to the public. Age has not been included in the priority rankings.

The following is how the Public Works Department is prioritizing bridge replacements.

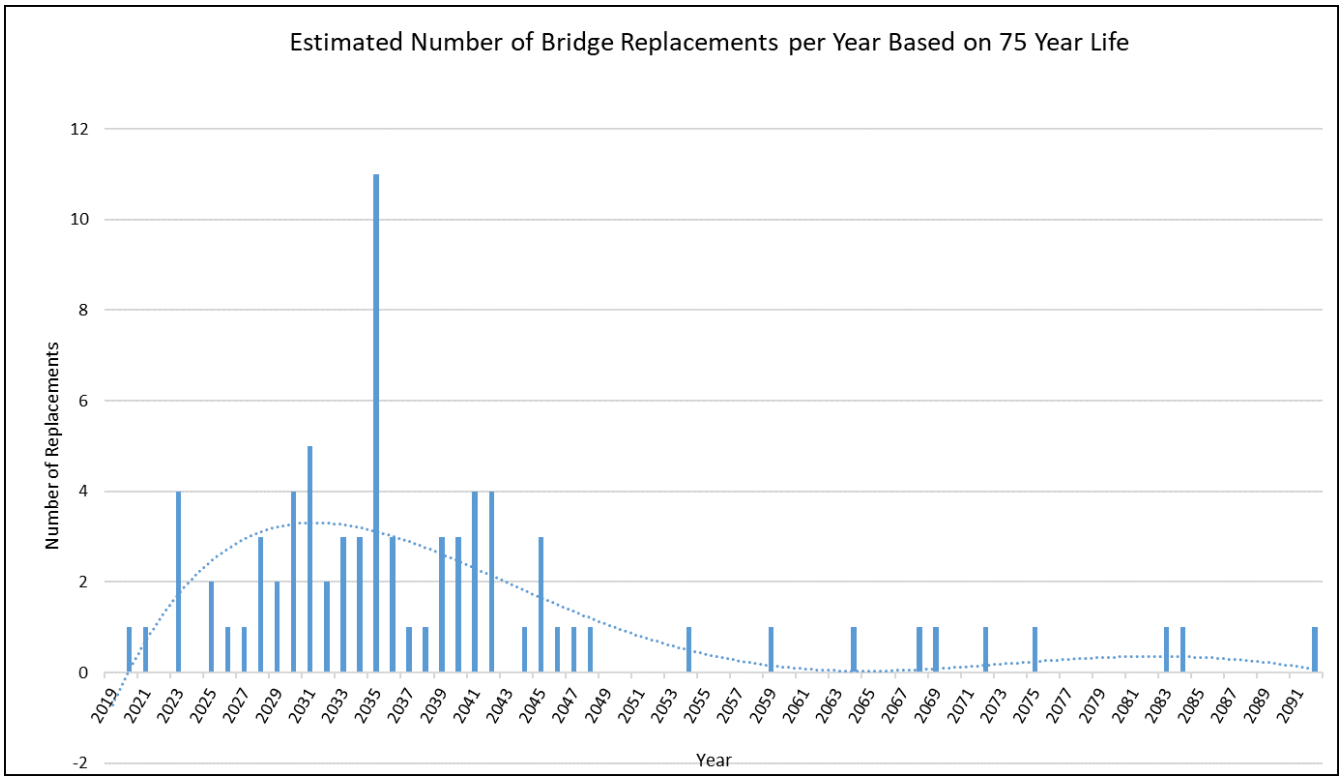


If a bridge ranks high in the replacement priority an Average Annual Cost (AAC) comparison is completed to ensure replacement is preferred. Even though age is not a direct factor into selecting rehabilitation or replacement, having a strong understanding of the County's inventory and aging infrastructure helps make the decision when AAC is close.

How old is the current infrastructure?

One important factor when creating an Asset Management Plan is the medium to long term planning to ensure there will be sufficient capital available to maintain the assets. It is essential to avoid delaying projects so that big clusters of structures need rehabilitation and or replacement at the same time. Not only is it restricted financially but road closures and detours need to be considered as well. Based on an absolute bridge life of 75 years, the graph below illustrates this upcoming cluster of aging bridges which will achieve their 75 expected life. This is a very important graph because it illustrates the large group of structures reaching their ESL at the around the same time.

As of 2022, the County of Huron has an average bridge age of 61 years.



It should be noted that bridges often last longer than their useful life with good annual maintenance and it is up to the Asset Manager to select candidates for delayed and early replacements. The tools previously mentioned are ways to help the County prioritize rehabilitations and replacements. The new risk assessments discussed in this plan will also assist in this prioritization of needs.

What do we need to do for 2022?

The following table presents the more significant needs for 2022:

Structure	BCI	Rehabilitation
15-06.9 Westerhout Bridge	65	Rigid Frame, Built = 1960, Current BCI = 65, Deck Length = 11.3m, Spans = 1, 15 year life extension to 2050, Design in 2021, Construction in 2022, Last rehab in 1992 (patch, waterproof and pave)
15-14.6 Wallace Bridge	58	Rigid Frame, Built = 1956, BCI = 58, Deck Length = 21.0m, Spans = 1, 19 year life extension to 2050, Design in 2021, Construction in 2022
31-26.6 Forester's Bridge	70	Deck on Concrete Girders, Built = 1984, BCI = 70, Deck Length = 150m, Spans = 5, Design in 2021, Construction in 2022, Last rehab in 2011 (slope protection)

86-32.8 Zetland Bridge	72	Deck on Steel Girders, Built = 1965, BCI = 72, Deck Length = 93m, Spans = 3, 15 year life extension to 2055, Design in 2021, Construction in 2022, Last rehab 2007 (abutment bearing replacement, expansion joint seal replacement, and some structural steel girder repairs)

The following tables highlight the existing reports that are available from our asset management software. Recommended actions, condition ratings and estimated costs can be reported upon for the purposes of the long term asset management planning. Estimated needs for 2022 are included below, with the remainder up to 2032 included in Appendix A.

2022 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$2,557,500		
RB0011:County Rd 15 (Londesborough Road) - 15-06.9 (Westerhout Bridge)	1960	65	$757,000	**MajorMtce** Barrier/Parapet Replacement	$200,000	100%	**$200,000**	Recommended	Central Huron AUBURN
				MajorMtce Patch, Waterproof, Pave	$110,000	100%	**$110,000**	Recommended	
RB0028:County Rd 15 (Londesborough Road) - 15-03.6 (Bob Edgar Bridge)	1989	74	$5,195,000	**ENGdesign** Engineering Design Work	$30,000	100%	**$30,000**	Recommended	ACW AUBURN
RB0030:County Rd 15 (Londesborough Road) - 15-14.6 (Wallace Bridge)	1956	58	$1,169,000	**MajorMtce** Barrier/Parapet Replacement	$200,000	100%	**$200,000**	Recommended	Central Huron AUBURN
				MajorMtce Patch, Waterproof, Pave	$110,000	100%	**$110,000**	Recommended	
RB0043:County Rd 16 (Newry Road) - 16-20.0 (Cunningham Bridge)	1993	73	$3,947,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	Huron East WROXETER
RB0052:County Rd 13 (Bayfield Road) - 13-09.7 (Tricks Creek Bridge)	1964	70	$702,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	Central Huron ZURICH
RB0060:County Rd 22 (Donnybrook Line) - 22-06.4 (Donnybrook Bridge)	1965	69	$4,633,000	**ENGdesign** Engineering Design Work	$100,000	100%	**$100,000**	Recommended	ACW AUBURN
RB0065:County Rd 31 (Sharpes Creek Line) - 31-26.6 (Foresters Bridge)	1984	70	$5,946,000	**RSP** Patch girder ends.	$0	100%	**$0**	Recommended	ACW AUBURN
				EIR Replace slope protection at south abutment	$0	100%	**$0**	Recommended	
				PWP Patch, Waterproof and Pave	$375,000	100%	**$375,000**	Recommended	
				TJR Transverse Exp Joint Replacement	$125,000	100%	**$125,000**	Recommended	
RB0069:County Rd 86 (Amberley Road) - 86-32.8 (Zetland Bridge)	1965	70	$3,987,000	**CSS** Coat Structural Steel	$550,000	100%	**$550,000**	Approved	North Huron AUBURN
				PWP Patch, waterproof, and pave.	$200,000	100%	**$200,000**	Approved	
				RRH Replace curb and barrier	$400,000	100%	**$400,000**	Approved	
				RSB Rehabilitate Substructure	$100,000	100%	**$100,000**	Approved	
RB0091:Line 17 - Boundary Bridge #24	1979	68	$345,500	**IAG** Install Approach Guiderail	$35,000	50%	**$17,500**	Recommended	South Huron ZURICH

How much money do we need?

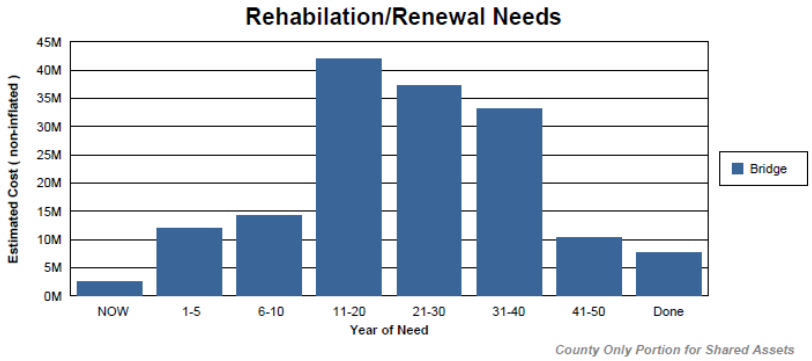
The County's asset management software has been updated to include a significant amount of detail with respect to the linear assets of the County. Details will include previous rehabilitation work along with condition assessments and future year's rehabilitation needs.

Example of Asset Record and Life-cycle plan for a bridge structure. The records have been updated to include what history is available. The records will include major capital needs along with minor rehabilitation or maintenance requirements and engineering.

Bridge	YrBuilt	Status	Replacement Value	Current Condition	Sub Class	Share	AADT	Municipality - Patrol
RB0063 25-17.1 (Dyers Bridge) : County Rd 25 (Blyth Road)	1950	Active	$937,000	67	Rigid Frame	100%	0	North Huron AUBURN

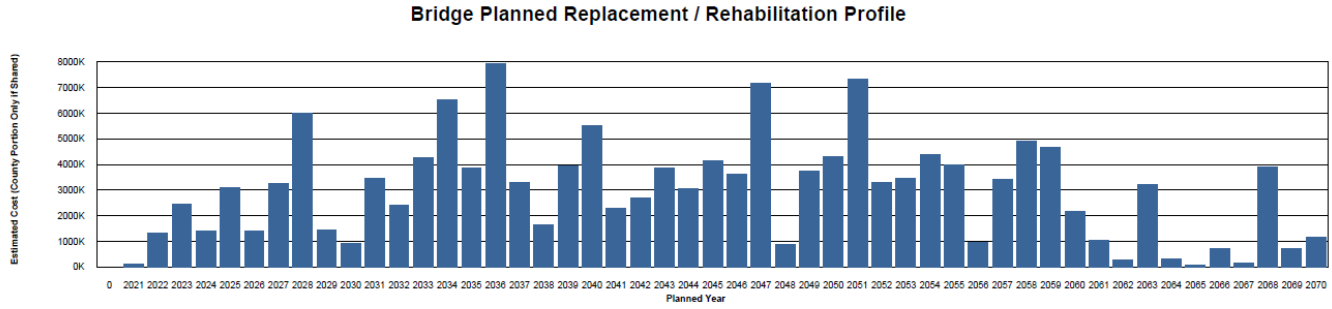
Year	Time of Need	Priority	Status	StatusComments	Cost	Contractor
2009 **WAP** Waterproof and Pave	Done	0.00	Completed		$0	
2009 **RCS** Rehabilitation / Replacement of Safety Curbs / Sidewalks	Done	0.00	Completed	New curbs	$0	
2009 **RRH** Barrier/Parapet Replacement	Done	0.00	Completed		$0	
2036 **ENGdesign** Engineering Design Work	11-20	0.00	Recommended		$100,000	
2037 **RSL** Replace Bridge - Same Location	11-20	0.00	Recommended		$937,000	
2061 **ENGdesign** Engineering Design Work	41-50	0.00	Recommended		$20,000	
2062 **WAP** Waterproof and Pave	41-50	0.00	Recommended		$150,000	

The following table illustrates the estimated rehabilitation needs for the County's bridges over the next 50 years. The total estimated requirements for rehabilitation is $159 million. The majority of the needs are in the next 11-40 years with approximately $112 million being required.

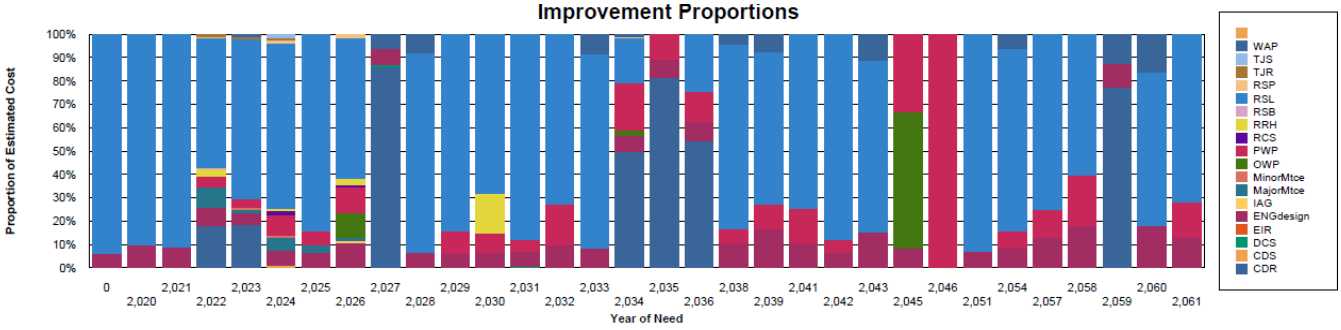


	Total	Bridge
Total	159,156,170.00	159,156,170.00
NOW	2,557,500.00	2,557,500.00
1-5	11,895,000.00	11,895,000.00
6-10	14,210,000.00	14,210,000.00
11-20	42,008,500.00	42,008,500.00
21-30	37,298,000.00	37,298,000.00
31-40	33,241,920.00	33,241,920.00
41-50	10,290,000.00	10,290,000.00
Done	7,655,250.00	7,655,250.00

The rehabilitation needs by year are broken out in the table below, with significant peaks in the late 2020's, 2030's, 2040's and 2050's.



The following table is the same annual rehabilitation profile, however, it illustrates the nature of the work that is being done based on the current estimated required work to be performed. The goal is to ensure the lowest lifecycle costs for our assets to ensure best value for the residents.



The legend details for the nature of the required work is as follows:

Improvement Type	Description	Class
REB	Remove Existing Bridge	Asset Replacement
RRH	Barrier/Parapet Replacement	Asset Component Replacement
NEW	Build new bridge	Asset Replacement
RNL	Replace Bridge - New Location	Asset Replacement
RSL	Replace Bridge - Same Location	Asset Replacement
TEB	Twin Existing Bridge	Capacity Improvement
RSP	Rehabilitate Superstructure	Rehab to achieve life
RSB	Rehabilitate Substructure	Rehab to achieve life
WSO	Widen Superstructure Only	Capacity Improvement
WSS	Widen Superstructure and Substructure	Capacity Improvement
RRW	Rehabilitate / Replace Retaining Walls	Rehab to achieve life
VCI	Vertical Clearance Improvement	Capacity Improvement
HCI	Horizontal Clearance Improvement	Capacity Improvement
BIR	Bearing Improvement / Replacement	Asset Component Replacement
WSR	Wearing Surface Rehabilitation	Rehab to achieve life
RWS	Removal of Existing Asphalt Wearing Surface and Waterproofing	Rehab to achieve life
CPS	Cathodic Protection System	Functional Improvement
PWP	Patch Waterproof Pave	Rehab to achieve life
LMC	Latex Modified Concrete Overlay	Rehab with Life Extension
OWP	Overlay Waterproof Pave	Rehab with Life Extension
CSR	Coating Steel Railings	Rehab to achieve life
PDR	Partial Deck Replacement	Rehab with Life Extension
WAP	Waterproof and Pave	Rehab to achieve life
TJS	Transverse Exp Joint Seal Replacement	Rehab to achieve life
TJM	Transverse Exp Joint Seal Modification	Rehab to achieve life
TJR	Transverse Exp Joint Replacement	Rehab with Life Extension
LJR	Longitudinal Exp Joint Replacement	Rehab with Life Extension
RCS	Rehabilitation / Replacement of Safety Curbs / Sidewalks	Asset Component Replacement
CSS	Coating Structural Steel	Rehab with Life Extension

C/R	Channel Realignment	Rehab with Life Extension
C/I	Channel Improvements	Functional Improvement
SPI	Scour Protection Improvements	Functional Improvement
EIR	Embankment Improvements / Rehabilitation	Functional Improvement
OTH	Other	Non - Standard Improvement
IAB	Install Approach Barrier	Safety Improvements
IAG	Install Approach Guiderail	Safety Improvements
RDI	Enhanced OSIM Inspection	Engineering Design
DCS	Deck Condition Survey	Engineering Design
C/S	Condition Survey of Other Components	Engineering Design
CN/I	Condition Inspection	Engineering Design
MajSR		Rehab to achieve life
Replace	Replace	Asset Replacement
RBC	Replace Bridge with Culvert	Asset Replacement
PPT	Provision for Pedestrian Traffic	Capacity Improvement
CDS	Concrete Deck Soffit Repairs	Rehab to achieve life
CDR	Complete Deck Replacement or Superstructure Replacement	Asset Component Replacement
ENGdesign	Engineering Design Work	Engineering Design

County Owned Large Culverts

The County of Huron has 210 large culverts for which it is currently responsible to inspect, maintain, and repair and/or replace. The County's percentage of ownership varies from 50% to 100% at each of these sites depending on geographic location within the County. Partners may include lower tier municipalities within the County, lower tier municipalities in adjacent Counties, or adjacent Counties themselves.

All Culverts	
County Ownership (%)	Quantity
100%	185
50%	25
	210

Since the previous update to the Asset Management Plan, the County has been actively "downloading" bridges to the lower tiers meaning they are no longer maintained by the County and that ownership has been transferred. This process can only take place when a structure falls on a road that does not belong to the County. The County has plans to continue downloading all structures that are not on County roads. Currently, one (1) culvert in the inventory is eligible for transfer to the lower tiers.

Downloadable Culverts	
County Ownership (%)	Quantity
100%	0
50%	1
	1

What is it worth?

It is important to know the value of all infrastructure assets to determine if the maintenance dollars spent are justified. The Current Replacement Value (CRV) is calculated by using the total quantity of material and established unit rates as shown above. It is important to remember that the CRV is based on replacing the current structure with an exact replica of what is currently there. The County has a total of $83 million worth of large culvert structures based on current replacement values.

The following table provides additional details on the current Bridge inventory:

Current Replacement Value by Culvert Type				
Asset Class	Quantity	Total Replacement Costs	Average Replacement Cost	
ACH - Arch	8	$2,911,750	$363,969	
BOX - Box	9	$7,167,500	$796,389	
FRA - Frames, Articulated	33	$14,396,100	$436,245	
FRR - Frames, Rigid	120	$46,843,000	$390,358	
OTH - Other	1	$726,000	$726,000	
PA - Pipe Arch	8	$4,496,000	$562,000	
PR - Pipe Round	31	$6,869,500	$221,597	
	210	**$83,409,850**		

As shown in the table above, a PR – Pipe Round (which is a circular corrugated steel pipe) has the cheapest average cost and cost per linear meter. However, due to its round shape there are limitations to the span sizes because it requires a deeper amount of fill. PR – Pipe Round culverts are smaller in diameter which is why the average replacement cost is the lowest.

What condition is it in?

In Ontario, structures spanning 3.0m or greater are required to be inspected biennially by a trained Bridge Inspector or licensed Engineer. The inspection shall be performed in accordance with the Ontario Structure Inspection Manual (OSIM) and archives basic inventory data like culvert type, length, width, skew etc. It also lists any material and structural defects on individual elements with associated quantities, costs, and timelines for repair. These quantities, costs, and timelines change with each inspection and are what Asset Managers use to cost and predict future rehabilitation or replacement. The County has decided have

inspections on all structures that are 2.44m (8') or larger because the information collected is so valuable and is the first step in establishing a complete Asset Management Plan.

All culverts in Ontario are rated on a scale from 0-100. This numerical value is known as the Bridge Condition Index (BCI) value. The formula below is how a BCI is calculated for a bridge.

BCI = Current Value / Replacement Value x 100

Where:

Replacement Value = Sum of Element replacement value = Sum of (Element Unit Cost x Element Quantity)

Current Value = Sum of Current Element Value = Sum of (Element Unit Cost x (1.0*E +0.75*G + 0.4*F + 0.0*P)

Where:

E – quantity of element in excellent condition state
G – quantity of element in good condition state
F – quantity of element in fair condition state
P – quantity of element in poor condition state

Simply stated, the BCI is a ratio of current value over replacement value with current value being determined by the condition state of key structural elements.

The rating system reflects comments and quantities documented in the OSIM form. The Ministry of Transportation Ontario (MTO) has established BCI ranges corresponding to single word descriptors to represent culvert condition. The descriptors and ranges are as follows:

Culvert Condition based on Bridge Condition Index (BCI)	
Condition	BCI Range
Excellent	80 – 100
Good	70 – 80
Fair	60 – 70
Poor	0 – 60

The County has an average BCI value of 66 and is in considered fair by MTO standards. The distribution of the bridges amongst the BCI condition scale is as follows:

Structure Condition Rating		
BCI Scale	**# of Structures**	**% of Total**
Large Culverts		
Excellent	15	7%

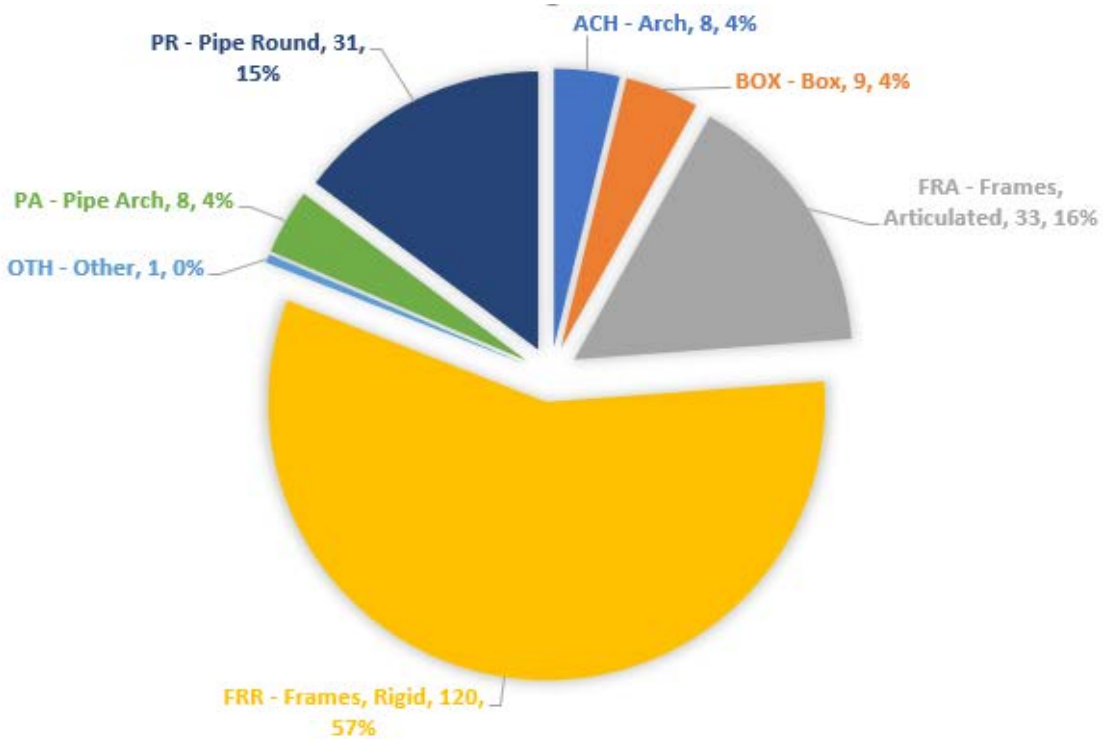
Good	69	33%
Fair	107	51%
Poor	19	9%
Total Large Culverts – Avg 66 BCI	**210**	**100%**

When do we need to do it?

Section 7 of the Canadian Highway Bridge Design Code (CHBDC) also pertains to buried structures made of metal and reinforced concrete. As per the CHBDC, all new structures shall have an expected service life of 75 years. Throughout Ontario, it is expected than concrete culverts will achieve a 75 service life. However, the industry has widely accepted that steel structures rarely meet this ESL and therefore should have an ESL of 50 years unless a protective coating is applied to the metal upon fabrication.

Types of Culverts in Huron County

Different types of culverts exhibit different ways in how they deteriorate and the amount of capital required throughout its service life. By understanding the types of structures throughout Huron County, the Public Works Department can select projects that have the greatest opportunity to meet or exceed the expected life of the culvert. Below is a breakdown by culvert type throughout the County.



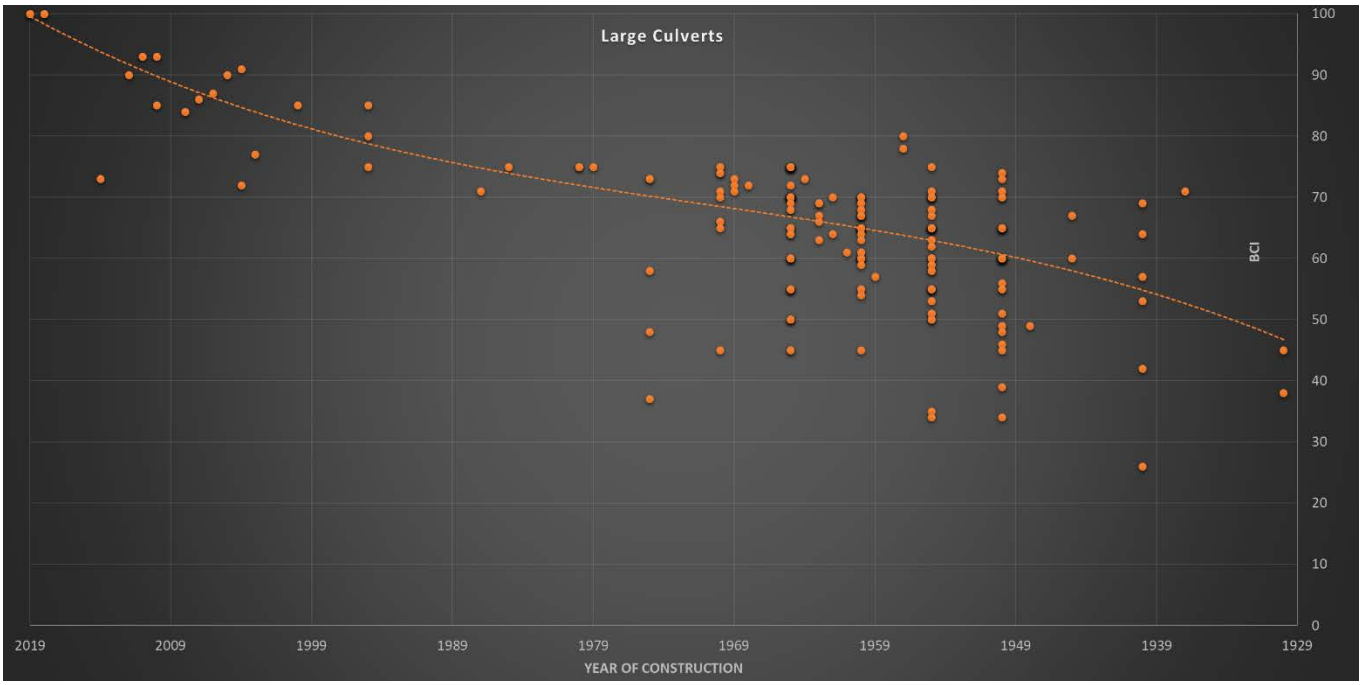
FRR – Frames Rigid and FRA – Frames Articulated are both open footing concrete culverts. Articulated culverts have joints that allow for minor movements in the soils below without cracking the walls of the culvert. Articulated culverts tend to leak from above if they are not waterproofed and show signs of deterioration around the joints. Not many of the County's culverts are waterproofed except for newer precast structures. Open footing concrete culverts are susceptible to scour and undermining which may require additional capital to prevent the walls from moving. It is generally accepted that these culvert types will meet the expected service life of 75 years with minor capital improvements.

It should be noted that 40 (19%) of the County's culverts are steel and many of those are only estimated to achieve a 50 year service life as previously mentioned.

Deterioration in Culverts

Ideally, the overall culvert condition deteriorates at a predictable rate that the Asset Manager can use to forecast future capital projects. Unfortunately, all culvert inspections are based on judgement, experience of the inspector and interpretation of the OSIM. Therefore culverts do not tend to deteriorate in a linear or predictable manner because the inspector or firm does not remain constant. Additionally, the OSIM is written in a way that forces inspectors to reduce the BCI at ages 5, 15, and 25 regardless of defects found. Due to this fact, a culvert deterioration curve should show a quick decline in BCI to year 25 and then begins to level off until it reaches a point beyond repair.

The Public Works Department has elected to use a polynomial trendline to the 4^{th} order. This is due to the expected deterioration based on a thorough understanding of OSIM. A 4^{th} order trendline was best suited for the expected deterioration of a culvert because there should be four (4) hills/valleys in the data. The Public Works Department has graphed all culverts in the County showing their year built vs. condition. This will help determine which structures are beginning to fall below the deterioration curve. Identifying problem structures early may allow Public Works to intervene and help the asset achieve its ESL. Below is the graphed trendline for all Large Culverts owned by the County.



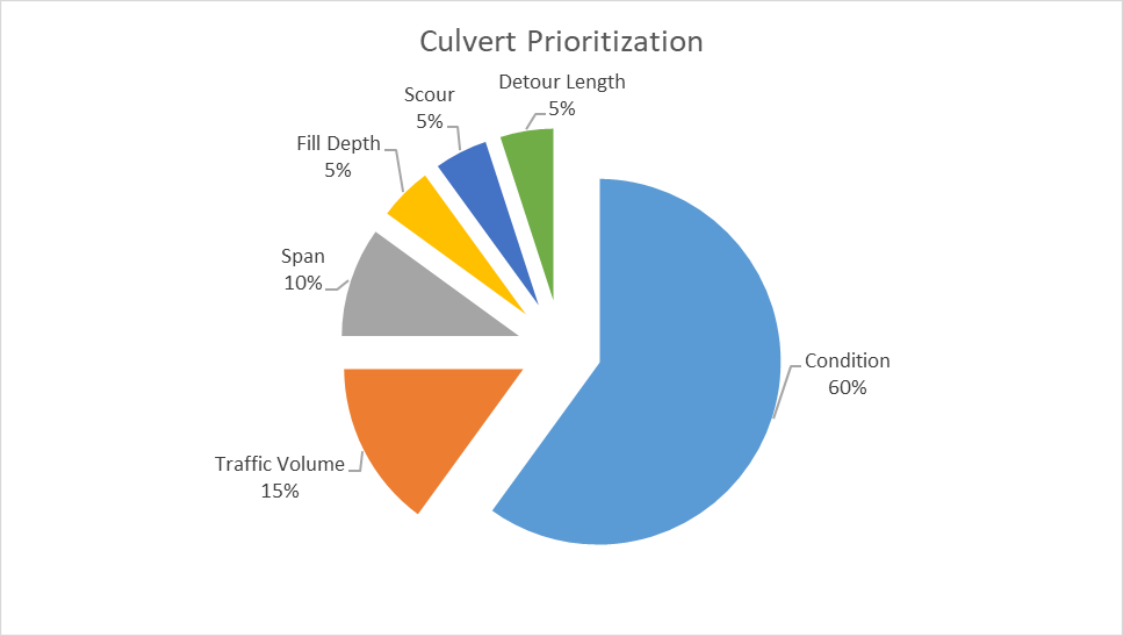
How do we select structures for rehabilitation or replacement?

The County uses the trendline above to identify culverts suitable for rehabilitation. Unlike bridges, there are limited cost effective rehabilitation options available to boost the condition of a culvert which is why culvert rehabilitation occurs less often than bridge rehabilitation.

For concrete culverts, concrete patching tends to be the most common recommendation by Engineers. However, this can be expensive because the work usually requires dewatering and the working conditions are unfavorable in smaller structures. Concrete patching is usually a short to medium term solution because it does not fix whatever is causing the deterioration. For steel culverts, there are even less options for rehabilitation. When steel culverts are severely corroded, exhibit cracking at bolt holes, or are severely deformed replacement is typically recommended. Some culverts may be lined if the hydraulic capacity of the liner is sufficient to convey the design flows.

When identifying culverts for replacement, the County uses a priority based approach that accounts for condition and risk. This approach is successful because culverts with low BCI's are heavily weighted and typically fall far below the trendline making them unsuitable for any type of rehabilitation. Risk needs to be considered when replacing culverts to avoid catastrophic failure. Culverts with high traffic volumes, larger spans, and shallow cover are a greater risk to the public. Age has not been included in the priority rankings.

The following is how the Public Works Department is prioritizing culvert replacements.



Even though age is not a direct factor into selecting rehabilitation or replacement, having a strong understanding of the County's inventory and aging infrastructure helps the Public Works Department make a decision on whether to rehabilitate or replace a culvert. The risk analysis with levels of service discussed later in this plan will also be used to assist with prioritization.

How old is the current infrastructure?

One important factor when creating an Asset Management Plan is the medium to long term planning to ensure there will be sufficient capital available to maintain the assets. It is essential to avoid delaying projects so that big clusters of structures need rehabilitation and or replacement at the same time. Not only is it restricted financially but road closures and detours need to be considered as well.

As of 2022, the County of Huron has an average culvert age of 56 years.

Due to a lack of culvert drawings, the year of construction for many culverts has been estimated by identifying construction methods over time.

What do we need to do for 2022?

The following table presents the more significant needs for 2022:

Structure	BCI	Rehabilitation
Culvert 08-14.0	45	Replacement of Culvert 08-14.0 Built = 1970, BCI = 45, Span = 1.83m, 75 year expected life, design in 2021, construction in 2022.

Culvert 17-06.1	35	Replacement of Culvert 17-06.1 Built = 1955, BCI = 35, Span = 2.44m, 75 year expected life, design in 2021, construction in 2022.
New Culvert 25-20.8		This culvert is completely funded by RTO4 and/G2G Trail Inc. The County is working with BM Ross to complete a design for the replacement of a tunnel below County Road 25 west of Blyth. Construction is dependent on funding from RTO4.
Culvert 15-22.1	37	Replacement of Culvert 15-22.1 Built = 1975, BCI = 37, Span = 2.6m, 75 year expected life, design in 2022, construction in 2023.
Culvert 86-02.4	41	Replacement of Culvert 86-02.4 Built = 1930, BCI = 41, Span = 7.3m, 75 year expected life, design in 2022, construction in 2023. ***Shared project with Bruce County***

The following tables highlight the existing reports that are available from our asset management software. Recommended actions, condition ratings and estimated costs can be reported upon for the purposes of the long term asset management planning. Estimated needs for 2022 are included below, with the remainder up to 2032 included in Appendix A.

2022 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$985,000		
RB0131:County Rd 84 (Zurich Main Street) - 84-06.9	1955	60	$225,000	**cRSL** Replace Culvert - Same Location	$250,000	100%	**$250,000**	Approved	Bluewater ZURICH
RB0150:County Rd 17 (Winthrop Road) - 17-06.1	1970	35	$350,000	**cRSL** Replace Culvert - Same Location	$400,000	100%	**$400,000**	Approved	Huron East AUBURN
RB0163:County Rd 8 (Base Line/Maitland Terrace) - 08-14.0	1970	45	$225,000	**cRSL** Replace Culvert - Same Location	$200,000	100%	**$200,000**	Approved	Central Huron AUBURN
RB0186:County Rd 86 (Amberley Road) - 86-02.4	1930	41	$410,000	**cENGdesign** Engineering Design Work	$120,000	50%	**$60,000**	Approved	ACW AUBURN
RB0261:County Rd 15 (Kinburn Line) - 15-22.1	1975	37	$488,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	Central Huron AUBURN
RB0400:County Rd 81 (Grand Bend Line) - 81-07.7	1955	51	$732,000	**cRSB** Rehabilitate Substructure	$25,000	100%	**$25,000**	Recommended	South Huron ZURICH

How much money do we need?

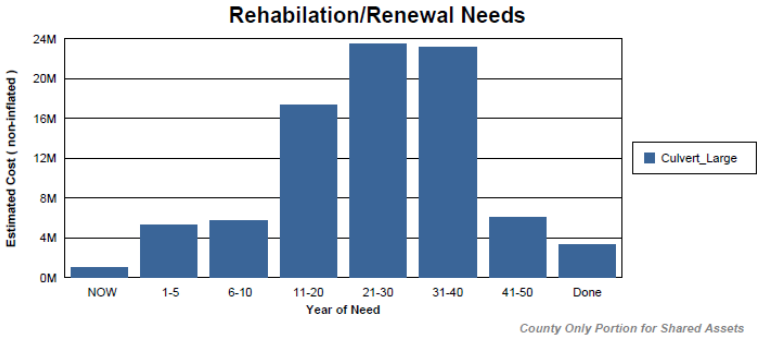
The County's asset management software has been updated to include a significant amount of detail with respect to the linear assets of the County. Details will include previous rehabilitation work along with condition assessments and future year's rehabilitation needs.

The records have been updated to include what history is available. The records will include major capital needs along with minor rehabilitation or maintenance requirements and engineering.

Example of Asset Record and Life-cycle plan for a large culvert structure.

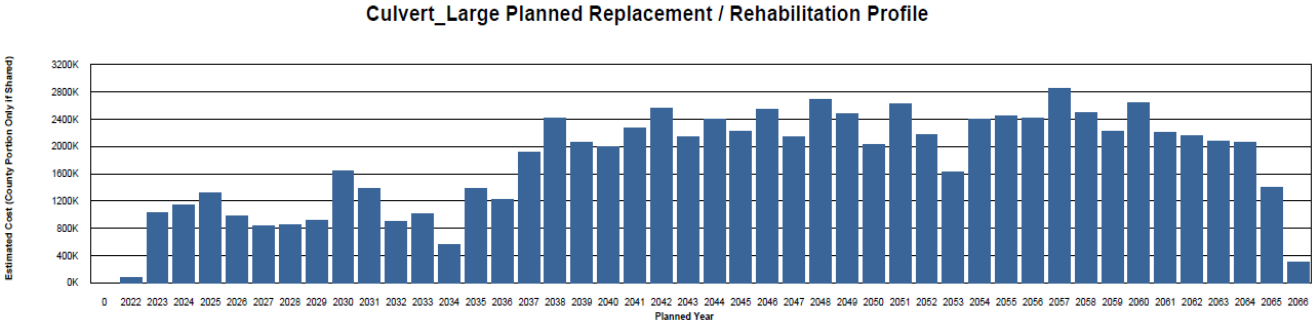
RB0293 06-14.1 : County Rd 6 (Kirkton Road)			1950	Active	$466,000	55	Cast-in-place Recti	100%	0	South Huron ZURICH
Year		Time of Need	Priority	Status	StatusComments				Cost	Contractor
2022	**cRSP** Rehabilitate Superstructure	1-5	0.00	Recommended					$50,000	
2022	**cIAG** Install Approach Guiderails	1-5	0.00	Recommended					$50,000	
2034	**cENGdesign** Engineering Design Work	11-20	0.00	Recommended					$50,000	
2035	**cRSL** Replace Culvert - Same Location	11-20	0.00	Recommended					$466,000	

The following table illustrates the estimated rehabilitation needs for the County's large culvert structures over the next 50 years. The total estimated requirements for rehabilitation is approximately $85 million. The majority of the needs are in the next 21-40 years with approximately $46 million being required.

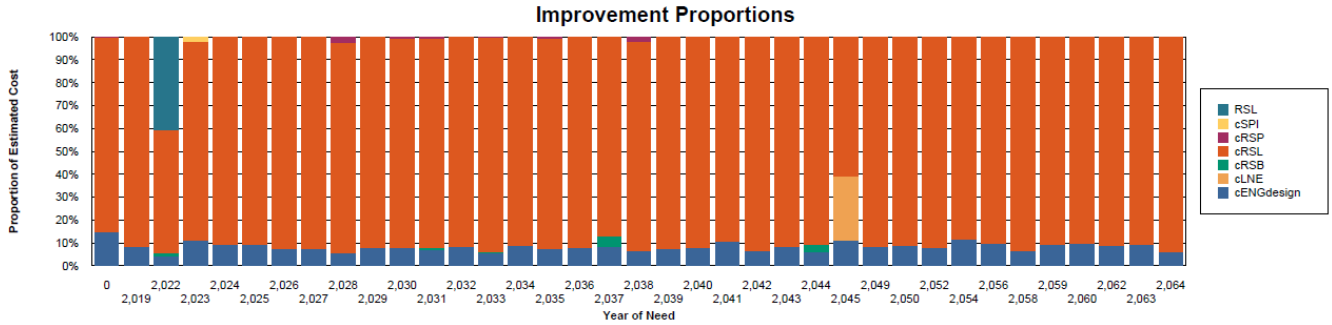


	Total	Culvert_Large
Total	85,442,500.00	85,442,500.00
NOW	985,000.00	985,000.00
1-5	5,317,500.00	5,317,500.00
6-10	5,700,000.00	5,700,000.00
11-20	17,397,000.00	17,397,000.00
21-30	23,476,500.00	23,476,500.00
31-40	23,193,500.00	23,193,500.00
41-50	6,093,500.00	6,093,500.00
Done	3,279,500.00	3,279,500.00

The rehabilitation needs by year are broken out in the table below, with significant peaks in the 2030's, 2040's, 2050's and 2060's.



The following table is the same annual rehabilitation profile, however, it illustrates the nature of the work that is being done based on the current estimated required work to be performed. The goal is to ensure the lowest lifecycle costs for our assets to ensure best value for the residents. Most of the upcoming work is the full replacement of culvert.



The legend details for the nature of the required work is as follows:

Improvement Type	**Description**	**Class**
REB	Remove Existing Bridge	Asset Replacement
RRH	Barrier/Parapet Replacement	Asset Component Replacement
NEW	Build new bridge	Asset Replacement
RNL	Replace Bridge - New Location	Asset Replacement
RSL	Replace Bridge - Same Location	Asset Replacement
TEB	Twin Existing Bridge	Capacity Improvement
RSP	Rehabilitate Superstructure	Rehab to achieve life
RSB	Rehabilitate Substructure	Rehab to achieve life
WSO	Widen Superstructure Only	Capacity Improvement
WSS	Widen Superstructure and Substructure	Capacity Improvement
RRW	Rehabilitate / Replace Retaining Walls	Rehab to achieve life
VCI	Vertical Clearance Improvement	Capacity Improvement
HCI	Horizontal Clearance Improvement	Capacity Improvement
BIR	Bearing Improvement / Replacement	Asset Component Replacement
WSR	Wearing Surface Rehabilitation	Rehab to achieve life
RWS	Removal of Existing Asphalt Wearing Surface and Waterproofing	Rehab to achieve life
CPS	Cathodic Protection System	Functional Improvement
PWP	Patch Waterproof Pave	Rehab to achieve life
LMC	Latex Modified Concrete Overlay	Rehab with Life Extension
OWP	Overlay Waterproof Pave	Rehab with Life Extension
CSR	Coating Steel Railings	Rehab to achieve life
PDR	Partial Deck Replacement	Rehab with Life Extension
WAP	Waterproof and Pave	Rehab to achieve life
TJS	Transverse Exp Joint Seal Replacement	Rehab to achieve life
TJM	Transverse Exp Joint Seal Modification	Rehab to achieve life

TJR	Transverse Exp Joint Replacement	Rehab with Life Extension
LJR	Longitudinal Exp Joint Replacement	Rehab with Life Extension
RCS	Rehabilitation / Replacement of Safety Curbs / Sidewalks	Asset Component Replacement
CSS	Coating Structural Steel	Rehab with Life Extension
C/R	Channel Realignment	Rehab with Life Extension
C/I	Channel Improvements	Functional Improvement
SPI	Scour Protection Improvements	Functional Improvement
EIR	Embankment Improvements / Rehabilitation	Functional Improvement
OTH	Other	Non - Standard Improvement
IAB	Install Approach Barrier	Safety Improvements
IAG	Install Approach Guiderail	Safety Improvements
RDI	Enhanced OSIM Inspection	Engineering Design
DCS	Deck Condition Survey	Engineering Design
C/S	Condition Survey of Other Components	Engineering Design
CN/I	Condition Inspection	Engineering Design
MajSR		Rehab to achieve life
Replace	Replace	Asset Replacement
RBC	Replace Bridge with Culvert	Asset Replacement
PPT	Provision for Pedestrian Traffic	Capacity Improvement
CDS	Concrete Deck Soffit Repairs	Rehab to achieve life
CDR	Complete Deck Replacement or Superstructure Replacement	Asset Component Replacement
ENGdesign	Engineering Design Work	Engineering Design

How do we reach sustainability – Bridges and Large Culverts?

The analysis revealed that the average yearly revenue required is $5.2 million to ensure that the level of service is maintained at today's level, over the next 10 years.

It is important to note that the County cannot rely solely on depreciation alone to fund its future capital replacement. Inflationary pressures continue to drive future replacement costs higher than what is being reflected in our statements. The net book value is an accounting figure for what value remains for an asset as it depreciates over its estimated useful life.

The current net book value for accounting purposes for the bridges and large culverts is $46.2 million.

The depreciation that we are raising in the levy are based on the historical values, and thus we are not raising anywhere near the amounts required to sustain our assets moving forward.

The County is raising a total of approximately $1.3 million in funds (depreciation) through the budget process which falls far short of our annual requirements. There is currently an estimated $16.05 million in the Public Works Reserve fund which could be used for Roads/Bridges/Patrol Yards.

The sustainability of bridges and large culverts will be assessed in total for the Public Works department.

What are we spending on bridge and culvert maintenance?

An important consideration of asset management is the on-going maintenance related expenditures that are being incurred in order to maintain the County's assets. As assets deteriorate, it becomes more expense to maintain those assets, therefore it is important for staff to assess condition ratings to ensure the optimal timing of asset replacement.

Bridge and culvert maintenance and repair costs, including labour costs, are approximately $343,000 annually.

10 Year Life Cycle Costing

10 YEAR LIFECYCLE COSTING				
		Average Years 1-5	Average Years 6-10	Total Average Years 1-10
Bridges/Large Culverts	Capital	$ 3,896,422	$ 5,837,033	$ 4,866,728
	Operating	$ 318,548	$ 369,285	$ 343,917
	Total	$ 4,214,970	$ 6,206,318	$ 5,210,644

Over the next 10 years, the total average cost of Bridge Capital and Operating expenses is expected to increase, from $4.2 million per year to $6.2 million per year.

Levels of Service

Service	Program Service Objectives	Community Levels of Service	Service Division	Supporting Asset Classes	Target Asset Levels of Service (by Asset Class)	Current Asset Levels of Service					
						Asset Class Average	Distribution by Asset Rating				
							%	%	%	%	%
ROADS	A safe, reliable, efficient road network accessible year round	Roads are comfortable to drive at posted speeds	Culverts	Major Culvert > 2.5 m	Condition	Condition					
					BCI = 70	66	11%	30%	36%	14%	9%
					Performance	Performance					
					Operational Functionality = Good	Good		100%			
					Capacity - Good	Good		100%			
					Environmental Resiliency = Good	Good	5%	95%			
				Minor Culvert < 2.5m	Condition	Condition					
					BCI = 65	69	5%	31%	35%	19%	10%
		Roads are safe and accessible throughout the year			Performance	Performance					
					Operational Functionality = Good	Good		100%			
					Capacity - Good	Good		100%			
					Environmental Resiliency = Good	Good		98%	2%		
			Bridges	Bridges (summary)	Condition	Condition					
					BCI = 70	70	5%	47%	40%	6%	2%
					Performance	Performance					
					Operational Functionality = Good	Good	14%	76%	10%		
					Capacity - Good	Good	1%	98%	1%		
					Environmental Resiliency = Good	Good	2%	96%	2%		

The targeted condition rating for Culverts is 70 (BCI - Major) and 65 (BCI – Minor) and a performance level of Good. The average rating for Huron County Culverts is 66 (Major) and 69 (Minor), with the performance level of Good being achieved for most culverts, and others being Very Good and Fair.

The targeted condition rating for Bridges is 70 (BCI) and a performance level of Good. The average rating for Huron County Bridges is 70, with the performance level of Good being achieved for most bridges, and others being Very Good and Fair.

Key Performance Indicators

Key Indicator:
Bridge Condition Index (BCI)

Issue:
As bridges age, they begin to deteriorate due to exposure to environmental elements such as extended water exposure, freeze/thaw cycles, vehicle load stresses, and corrosion/oxidization. Cumulative damage leads to more expensive repairs and rehabilitation if not properly maintained.

Potential Impact:
Potential impacts of deteriorating bridges include road/bridge closures, load restrictions, safety hazards, and increased number of accidents, increased maintenance costs, increased exposure to liability, and increased costs of repairs.

Current Controls:
Annual bridge cleaning and inspection is carried out on each County bridge. The bridges are pressure washed, and assessed for loose concrete. Inspections include examinations of the parapet walls, railings, expansion joints and seals, caulking, guide rail components, catch basins and drainage, bridge bearings, and various other bridge components.

Annual maintenance is carried out by Public Works personnel on small components that can be completed to bring the bridge back to standards, including caulking and patching to ensure that all components are functioning correctly. Preventative maintenance such as tree trimming around the bridge to ensure moisture evaporates from sun exposure, reducing moisture damage.

If repairs are not able to be completed in the current year, they are added to the list of maintenance and rehabilitation projects in the following year or the multi-year plan, and budgeted for accordingly.

Bridges are built and maintained to established standards, such as Ontario Provincial Standards, Transportation Association of Canada Standards, Ontario Traffic Manuals, Canadian Highway & Bridge Design Code, and Ontario Structure Inspection Manual. Regular inspections are carried out to meet established thresholds. The Ontario Structure Inspection Manual (OSIM) inspections are carried out every two years through external engineering firms, and bridges are rated for their conditions.

Culverts with 2.5m-6m spans are built and maintained to established standards, such as Canadian Highway and Bridge Design Code, and inspected per the Ontario Structure Inspection Manual. Regular inspections are carried out to meet established thresholds. The BCI threshold is 50. Ontario Structure Inspection Manual (OSIM) inspections are carried out every two years through external engineering firms, and the culverts are rated for their conditions.

In addition to this, comments and requests are received on a regular basis from tax payers, businesses, and agricultural entities for such issues as bridge repair traffic restrictions, project delays, and detour routes. These comments and requests are integrated into future plans for bridge projects and maintenance activities to accommodate the needs of our constituents.

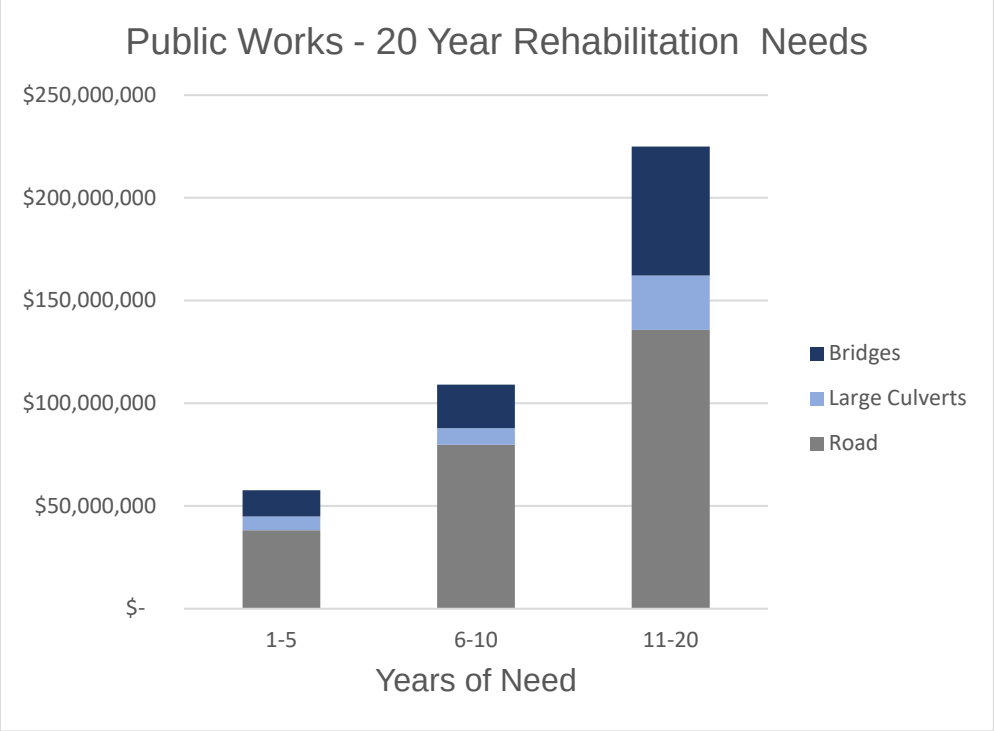
Action plan:
Continue with preventative maintenance and inspection. Annual inspections and preventative maintenance are key to ensure that small issues are rectified before they develop into major problems that are much more costly to correct. Regular rehabilitation is normally required every 18-22 years, and rehabilitation is planned and budgeted accordingly. The average bridge/culvert maintenance costs are approximately $318,000 in 2022 and are expected to increase, due to inflation, to $343,000 over the next 10 years.

Public Works – Summary of Core Infrastructure - Roads, Bridges and Large Culverts

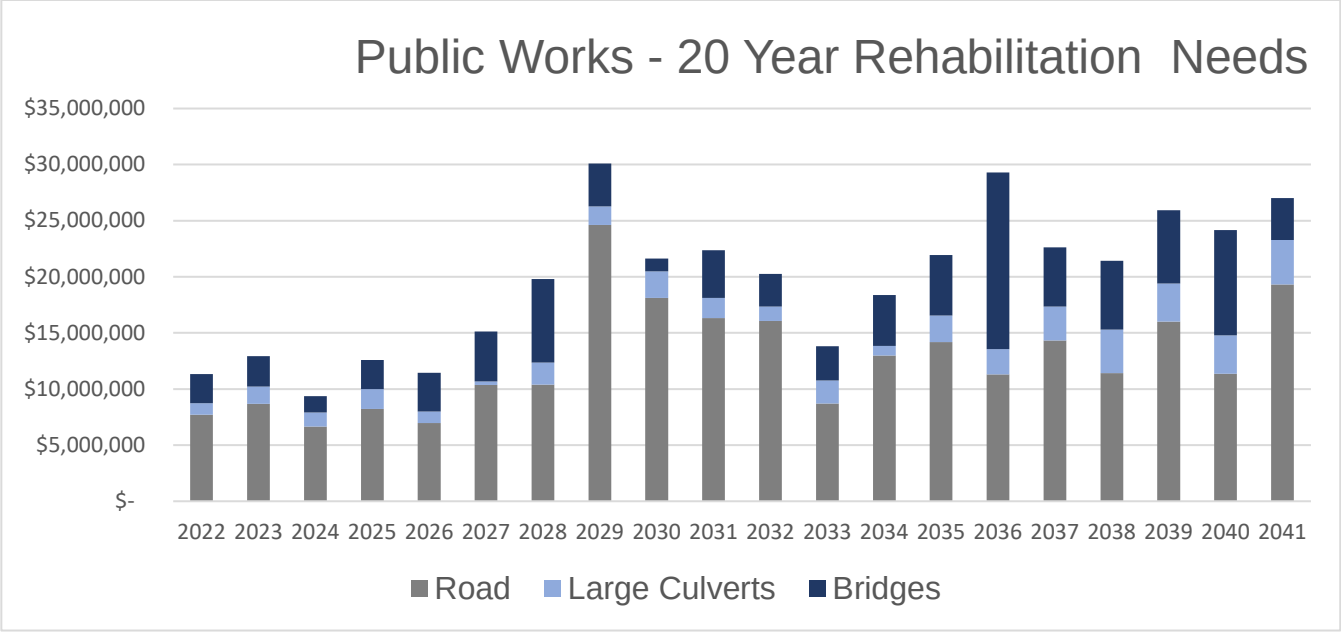
The following table begins to identify the average annual investments required for the County's roads, bridges and large culverts over the next 20 years.

Years	Road	Large Culverts	Bridges	TOTAL
1-5	$ 38,217,865	$ 6,659,103	$ 12,823,008	$ 57,699,976
6-10	$ 79,870,798	$ 8,059,751	$ 21,125,413	$ 109,055,962
11-20	$ 135,726,753	$ 26,407,042	$ 62,758,431	$ 224,892,226
TOTAL	**$ 253,815,416**	**$ 41,125,896**	**$ 96,706,852**	**$ 391,648,164**
Average Annual Investment	**$ 12,690,771**	**$ 2,056,295**	**$ 4,835,343**	**$ 19,582,408**

The following is a chart of the same data:



The requirements broken down by year are illustrated below.



On average, over the next 20 years, Public Works will require an estimated capital budget of $19.5 million for just Road, Bridges and Large Culverts. This does not include the other asset classes, such as small culverts, patrol yards and driveway culverts. More work is required to determine future needs for these asset classes.

Funding will have to be achieved by a combination of levy, reserve, external funding and debt. The needs will be too great to rely on the levy alone. Also, service levels will have to be assessed with Council to determine the service levels of the bridges and culverts (close, load limits etc).

Long term sustainability will be reviewed and enhanced as we move forward into 2022-2023. It is essential that staff develop a long term plan and asset management systems to ensure we have the financial capabilities to meeting the upcoming infrastructure requirements.

Asset construction history for the County's roads, bridges and large culverts is as follows:

The majority of the overhead structures were constructed in the 1950's and 1960's and as such we will be experiencing peak rehabilitation periods for these assets as they reach the end of their useful lives.

Asset Levels of Service - Risk Assessment

County staff worked with FCM and Asset Management Ontario on assessing risk for the core infrastructure assets with respect to levels of service. Appendix C shows the detailed risk analysis charts. Based on the consequences and likelihood of failure for each class, roads, bridges and culverts, it was determined that based on current condition ratings, we have some elevated risks in our bridge and culvert classes. This is not surprising to see considering the age of the structures in the County. They are reaching end of life. Bridges and culverts failures have a significant impact on consequences to the local community and as such, this risk analysis will formulate an integral part of the lifecycle replacement cycle and annual budget requests.

MINOR CULVERTS (<2.5 meters and driveway) INFRASTRUCTURE

Minor Culvert (<2.5 meters) and Driveway Culvert Infrastructure

NOTE: THIS SECTION HAS LIMITED UPDATES FOR THE 2022 UPDATE. These minor culverts are not considered part of the core infrastructure for the purposes of the legislation. 2.5 meters is now the cutoff for Major vs Minor Culverts. Additional minor culverts have been identified in our road network through staff's efforts with asset management planning activities and now include a total of 1220. These small culverts and driveway culverts continue to be inventoried into 2022 with current figures understated.

What does the County own?

The County of Huron has: 1220 Culverts less than 2.5 meters (CULVERT<2.5m) and approximately 8,934 driveway culverts. These minor structures continue to be updated and inventoried as time permits.

All asset field assessments are carried out in the Public Works department by internal staff. The results of the detailed inventory assessment of the targeted structures are summarized below. Culverts <2.5 m have been separated from the culverts > 2.5 m due to the fact that they are inspected by County staff rather than by external engineering firms.

It is important to note that more work will be required to access the full number of driveway culverts across the County road network. This work will be ongoing into 2023. The figure in the table below is an estimate estimated by the GIS department, consisting of both rural and urban entrances.

Minor Culvert Inventory	
Structure	Quantity
Culverts <2.5 meter	1,220
Driveway culverts	8,934

What is it worth?

Before managing an asset, it is important to know the value of the asset to determine if the maintenance dollars spent are justified to protect the asset. Based on the asset valuation process carried out as part of this assignment, the AMP Team, in consultation with staff calculated an approximation of the total estimated value of the culverts<2.5 m of $131.9 million and $27 million for the driveway culverts/entranceways. The value of small culverts under 2.5 m remains estimated from 2016, as more accurate information is currently not known.

Minor Culvert Replacement Value	
Structure	Value

Culverts <2.5 meter (not updated from 2016)	$	131,913,321
Driveway culverts	$	33,800,000
Total		$165,713,321

What condition is it in?

Only culverts >2.5m are rated by engineers, culverts <2.5m are inspected by staff on a semi-regular basis. These personnel are trained in culvert inspection by the OGRA, and there is at least one certified employee on each patrol.

A comprehensive listing of all minor culverts with a condition rating currently does not exist for the purposes of the asset management plan.

This is one significant gap that we have identified where we will require additional work to identify the condition of the County's minor culvert structures. This was initiated in 2017 and is expected to continue into 2023-2024.

What do we need to do?

There are no minor culverts listed in the 2022 capital budget for rehabilitation.

When do we need to do it?

One criterion critical to rating the Culverts structure for the purposes of developing the AMP is the service life of the structure and its elements. As assets age, infrastructure managers must use experience and judgment to decide when maintenance is no longer cost effective thereby requiring that the structure be replaced.

Asset Useful Life in Years	
Asset Type	Useful Life
CULVERT<2.5m	75
Driveway Culverts	75

How much money do we need?

This will be worked on through 2023 as we further develop our asset management systems.

Simplistically, if we were to calculate the average per year required over the estimated useful life of the minor culverts, the County would require an average investment of $2.2 million per year to maintain the current number of minor culvert/driveway structures.

How do we reach sustainability?

The life cycle analysis revealed that the average yearly revenue required is $2.2 to ensure that the level of service is maintained at today's level, over the life of the minor culvert structures.

Please note that up to this point, driveway culverts were not set up in our financial statements as assets through the PSAB process. When installed, they are paid for by the property owner and then the County assumes future replacement costs.

What are we spending on minor culvert maintenance?

We currently do not have sufficient information to be able to assess the expenditures for minor culverts as they are aggregated with the culverts > 2.5 years in our job costing system.

Levels of Service

Key Performance Indicators

Key Indicator:
To be developed 2022-2023.

Issue:
As the culverts age, they begin to deteriorate due to exposure to environmental elements such as extended salt and water exposure, freeze/thaw cycles, and corrosion/oxidization. As concrete culverts age and defects appear, the structures have more potential for expensive repairs and rehabilitation if not properly maintained.

Potential Impact:
Potential impacts of deteriorating culverts include road closures, load restrictions, safety hazards, accidents, increased maintenance costs, liability, and increased costs of repairs.

Current Controls:

Small culverts with 1m-2.5m spans are inspected by staff on an as-needed basis. Maintenance can be carried out by Public Works staff on small components that can be completed to bring the culvert back to design standards.

In addition to this, comments and requests are received on a regular basis from tax payers, businesses, and agricultural entities for such issues as structure repair work, traffic restrictions, project delays, and detour routes. These comments and requests are integrated into future plans for culvert projects and maintenance activities to accommodate the needs of our constituents.

Action plan:
Continue with preventative maintenance and enhance the inspection program. Annual inspections and preventative maintenance are key to ensure that small issues are rectified before they develop into major problems that are much more costly to correct. Regular rehabilitation is normally required every 18-22 years, and rehabilitation is planned and budgeted accordingly

PUBLIC WORKS BUILDINGS INFRASTRUCTURE

Public Works Buildings Infrastructure

NOTE: THIS SECTION HAS HAD SOME LIMITED UPDATES FOR 2022 UPDATE. Not part of core infrastructure definition as per regulations. Additional work to be performed for 2023.

What does the County own?

The County of Huron has: 4 Public Works patrol yards. Within the patrol yards include salt and sand storage buildings, office/maintenance buildings. The assets are located within the Public Works Buildings network. All asset field assessments are carried out in the Public Works department. The results of the detailed inventory assessment of the targeted structures are summarized below.

PW Patrol Yards
AUBURN WORKS YARD
WINGHAM WORKS YARD
WROXETER WORKS YARD
ZURICH WORKS YARD

What is it worth?

Before managing an asset, it is important to know the value of the asset to determine if the maintenance dollars spent are justified to protect the asset. Based on the asset valuation process carried out as part of this assignment, the AMP Team, in consultation with staff calculated an approximation of the total estimated value of the assets of $15 million.

PW Patrol Yard Replacement Value			
Yard	**Value**		**% of Total**
AUBURN WORKS YARD	$	6,292,600	42%
WINGHAM WORKS YARD	$	2,385,600	16%
WROXETER WORKS YARD	$	2,948,400	20%
ZURICH WORKS YARD	$	3,404,000	23%
TOTAL	**$**	**15,030,600**	100%

The estimated life of the Patrol Yards are as follows:

Asset Useful Life in Years	
Asset Type	Useful Life

Building works 30yr	30
Building works 60yr	60
Building Equipment	5
Building Exterior	20
Building Interior	20
Building Mechanical	20
Building Electrical	20
Building Site	22

How much money do we need?

An estimated $4.7 million is required in Public Works patrol yard capital investments over the next 10 years. The majority of this is due to the replacement of the Wingham patrol yard estimated at $3.7 million.

How do we reach sustainability?

Staff are projecting an estimated total of $4.7 million in expenditures over the next 10 years. The bulk of the expense is due to the replacement of the key structures at the Wingham patrol yard.

The current funding being raised each year through the budget process for the Public Works buildings is approx. $181,000 per year. This current level of funding falls far short of our estimated requirements in the next 10 years, thus additional funding is required.

There is currently a total of $900,000 set aside in the Public Works reserve for the Wingham Patrol Yard replacement plus $200,000 for an office addition at Auburn. The total estimated reserve is $16.05 million. These funds could be used to manage the funding requirements upcoming for 2023. Additional funding sources will be required for this, whether raised through the levy, reserves or through debt financing.

The sustainability for Public Works will be assessed together as a whole rather than individually.

Levels of Service for the Public Works patrol yards will be updated for the 2023 plan updates along with the other non-core assets.

10 Year Life Cycle Costing

10 YEAR LIFECYCLE COSTING				
		Average Years 1-5	Average Years 6-10	Total Average Years 1-10
PW PATROL YARDS	Capital	$ 902,050	$ 45,926	$ 473,988
	Operating	$ 175,202	$ 203,106	$ 189,154
	Total	$ 1,077,251	$ 249,033	$ 663,142

Over the next 10 years, the total average cost of operating the Public Works Patrol Yards is expected to increase due to inflation, from $175,000 per year to $203,000 per year.

Levels of Service

Key Performance Indicators

Key Indicator:
Building condition

Issue:
As buildings age, they are subject to deterioration due to exposure to climate, and through usage.

Potential Impact:
If a building declines into poor condition, there may be health and safety issues. Failure to respond to issues may lead to increased damage and more expensive repairs. The building condition will worsen at an accelerated pace if preventative maintenance steps are not taken.

Current Controls:
Inspections are carried out semi-annually. Issues identified are rectified, with smaller repairs being performed by County personnel, while larger issues are addressed by third party providers as needed. Any larger items or items that are coming to the end of their life cycle are often identified several years in advance, such as roofing replacement, and budgeted and scheduled accordingly.

Action plan:
Continue to carry out semi-annual inspections and perform preventative maintenance as required.

FLEET

Fleet

NOTE: THIS SECTION HAS HAD SOME LIMITED UPDATES FOR 2022 UPDATE. Not part of core infrastructure definition as per regulations. Additional work to be performed for 2023.

What does the County own?

The County of Huron has: approximately 35 vehicles and equipment at a 5 years cycle, 49 vehicles at a 10 years cycle and 44 vehicles at a 15 years cycle. The assets are located within the Fleet network. All asset field assessments are carried out in the Public Works department. The results of the detailed inventory assessment of the targeted structures are summarized below.

County's inventory of Fleet infrastructure in accordance with best practices and current legislation.

Fleet Inventory		
Asset Type	Asset Component	Quantity
Fleet 5 year	Trucks, Vans, Mowers, etc.	35
Fleet 10 year	Tandem Trucks, Tractors, Forklifts, etc.	49
Fleet 15 year	Graders, Backhoes, Large Loaders, etc.	44

Note – The 5, 10 and 15 years classes are based on PSAB Tangible Capital Asset reporting, the actual replacement cycle may vary for each type of equipment/vehicle for anywhere from 3 to 30 years

What is it worth?

Before managing an asset, it is important to know the value of the asset to determine if the maintenance dollars spent are justified to protect the asset. Based on the asset valuation process carried out as part of this assignment, the AMP Team, in consultation with staff calculated an approximation of the total estimated value of the assets of $15.9 million.

Fleet Replacement Value				
Asset Type	**Quantity**	**Original Cost**		**% of Total**
Fleet 5 year	35	$	1,342,000	16%
Fleet 10 year	49	$	7,876,000	52%
Fleet 15 year	44	$	6,744,000	32%

TOTAL	**128**	**$**	**15,962,000**	**100%**

What condition is it in?

Condition assessment rating was carried out on the Fleet asset network, in consultation with Public Works Department, to identify the level of service considered acceptable by staff. The overall result is that the County's Fleet is in a Fair condition. The results of the detailed condition assessment of the targeted assets are summarized below in the table.

Fleet Condition Rating

Asset Type	Condition Rating	
Fleet 5 year	62	Fair
Fleet 10 year	64	Fair
Fleet 15 year	62	Fair
Total	**63**	Fair

The following table highlights the number of the Fleet vehicles and equipment within each condition rating category.

Condition Rating	# of Fleet Units
Excellent	22
Good	20
Fair	33
Poor	53
Total	**128**

The condition rating relates to the age and usage of the overall vehicles or devices group and is a rating out of 100. When the rating is between 30 and 50 the item needs to be replaced. The rating system is as follows:

Excellent:	91 – 100	No evident defects
Good:	70 – 90	Slight decline
Fair:	51 – 69	Decline asset apparent
Poor:	30 – 50	Severe decline or failure

What do we need to do?

Addressing Asset Needs

Assets	Needs 1-5 yrs	Needs 6-10 yrs
Fleet 5 year	1,449,000	1,396,500
Fleet 10 year	2,804,000	5,072,000
Fleet 15 year	1,983,000	3,174,500
TOTAL	**6,236,000**	**9,643,000**

2022 priority projects include replacement of 3 tandem trucks (backordered from 2021), as well as 3 ordered in 2022, as well as a payloader and wood chipper.

When do we need to do it?

One criterion critical to rating the fleet structure for the purposes of developing the AMP is the service life of the structure and its elements. As assets age, infrastructure managers must use experience and judgment to decide when maintenance is no longer cost effective thereby requiring that the structure be replaced.

Fleet vehicle maintenance costs are estimated to average $1.49 million annually.

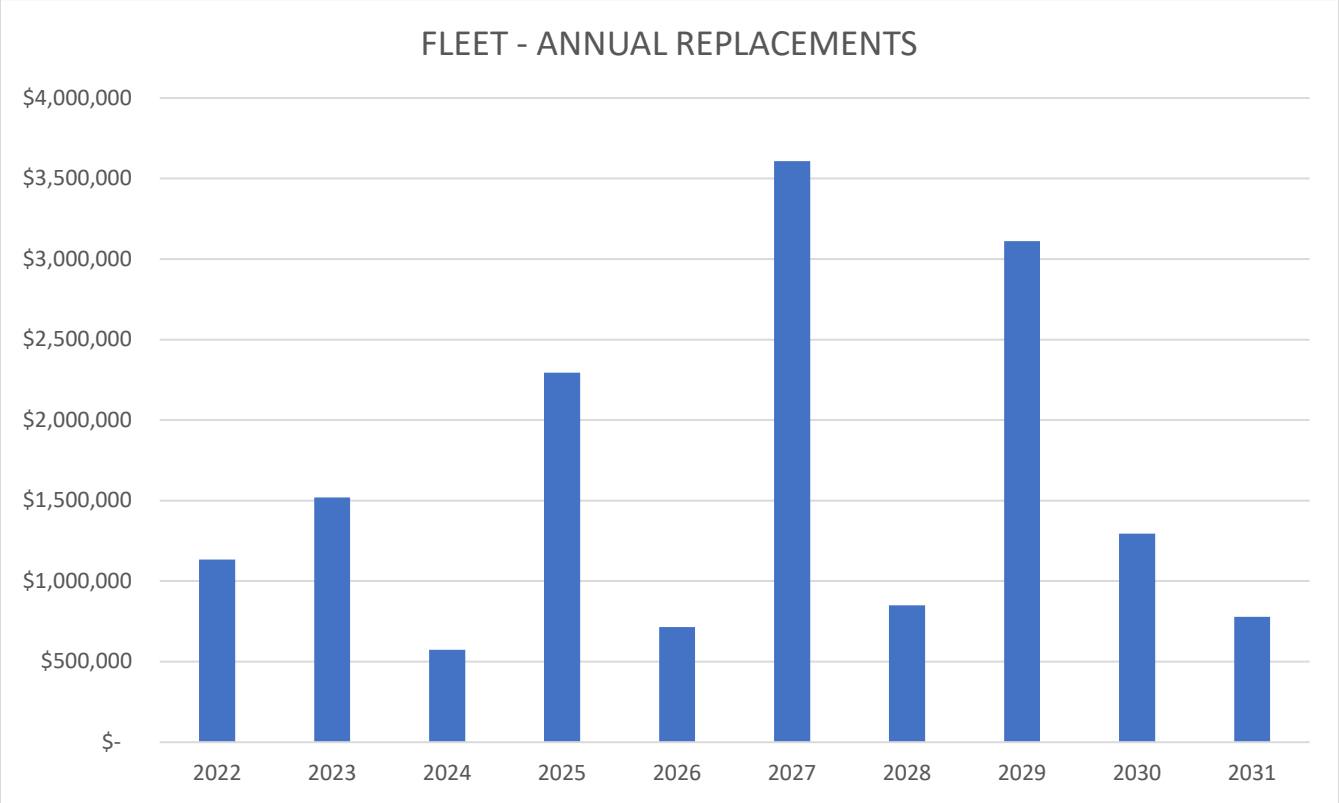
10 YEAR LIFECYCLE COSTING				
		Average Years 1-5	Average Years 6-10	Total Average Years 1-10
Fleet	Capital	$ 6,236,000	$ 9,643,000	$ 7,939,500
	Operating	$ 1,380,375	$ 1,600,233	$ 1,490,304
	Total	$ 7,616,375	$ 11,243,233	$ 9,429,804

Note: Fleet maintenance cost figures currently include fuel related expenses in addition to maintenance

How much money do we need?

This scenario is used to analyze and determine how much money is required on a yearly basis to replace all assets as they become in need of replacement. The following graph illustrates the results of our analysis for the Public Works Fleet Department.

Asset Replacement Summary



The average annual capital investment over the next 10 years is $1,587,900.

How do we reach sustainability?

The analysis revealed that the average yearly revenue required for capital is $1,587,900 to ensure that the level of service is maintained at today's level, over the next 10 years. The above graph also indicates that at that rate of funding the network needs are expected to be greater in the next 5-10 years, primarily due to the timing of some of the loaders and graders.

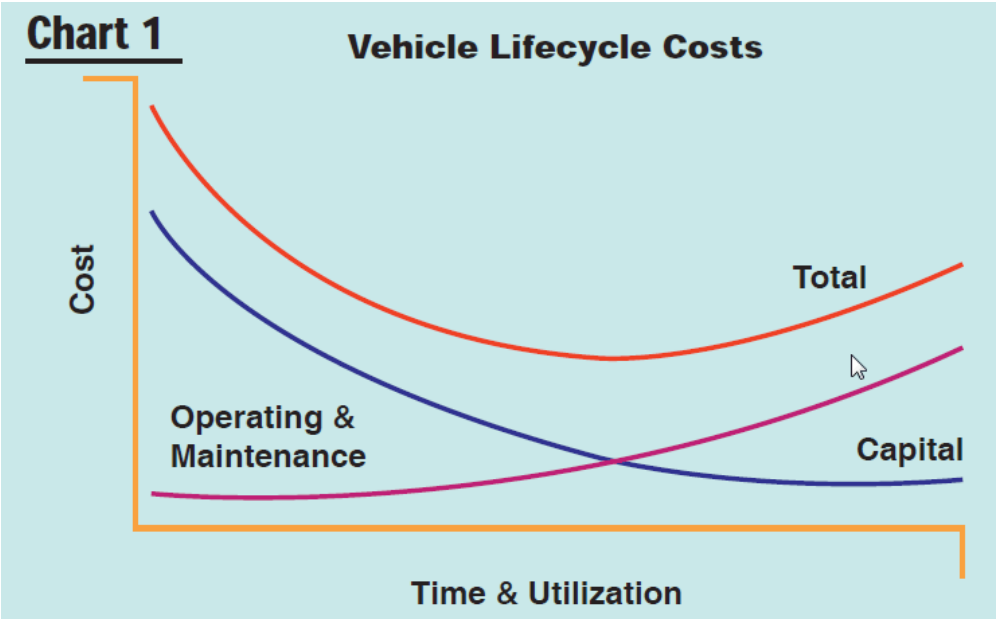
With the current Fleet reserve at approximately $6.3 million, and current funding being raised through the budget process, there are sufficient funds available to manage the Fleet replacements over the next 10 year cycle. There will be an increase in the levy requirements based on the increases in annual leasing costs to Public Works and other departments.

YEAR	Capital Expenditures	Trade In Value	Lease Funding	Reserve Balance
2022	$ 1,134,000	$187,000	$821,148	$6,233,942
2023	$ 1,519,500	$220,500	$870,358	$5,805,299

2024	$	573,500	$55,800	$968,749	$6,256,348
2025	$	2,295,000	$266,500	$929,595	$5,157,443
2026	$	714,000	$91,800	$1,132,980	$5,668,223
2027	$	3,608,000	$365,300	$1,186,876	$3,612,399
2028	$	850,500	$105,000	$1,428,324	$4,295,222
2029	$	3,110,500	$395,000	$1,476,901	$3,056,623
2030	$	1,295,000	$176,800	$1,479,534	$3,417,957
2031	$	779,000	$124,800	$1,547,258	$4,311,015

Levels of Service

Huron County currently has assets totaling over $16 million dollars in licensed and un-licensed equipment. This equipment includes a fleet of 13 tandem trucks, three graders, four one ton trucks, four front end loaders, three tractors, 22 pickups/crew cab pickups, also various specialty equipment for the fleet department and others within the County.
While fleet preventative maintenance is important, effective equipment management should go well beyond fixing a break down. A program is in place that preserves the value of equipment investments, minimizes the incidents of unscheduled repairs, and collect, analyzes, and reports necessary data so that informed and intelligent asset management decisions can be made.
Reliable vehicles and equipment in good working order are essential to ensure roads are maintained in a timely and professional manner. When to replace a vehicle is one of the most significant decisions facing fleet managers. Without a viable and comprehensive replacement program, management is not able to replace equipment when needed at the optimum replacement time as illustrated below in Chart 1.



Over time, vehicle capital costs decline, while vehicle operating costs increase. The combination of these two cost functions produces a U-shaped total cost curve. Ideally, vehicles should be replaced around the time that annual operating costs begin to outweigh annual capital costs – that is, when the total cost curve begins to turn upward. As illustrated by the graph, deferring replacement of vehicles and equipment beyond a certain point actually causes total vehicle costs to rise, making a fleet more costly to own and operate.

A fleet replacement plan can accomplish the following:

1. Less equipment downtime and lower operating/maintenance costs by eliminating high cost intensive vehicles.
2. An assurance that vehicles are rotated out in a planned schedule.
3. Modernize the fleet for peak performance in both technical and employee safety areas.
4. Allows you to document future year funding requirements.

We project that by using our equipment replacement schedule and asset plan that it will bring credibility to the replacement process for prioritizing vehicle replacement funds.

PROPERTY SERVICES INFRASTRUCTURE

Property Services Infrastructure

NOTE: THIS SECTION HAS HAD SOME LIMITED UPDATES FOR 2022 UPDATE. Not part of core infrastructure definition as per regulations. Additional work to be performed for 2023.

What does the County own?

The County of Huron has: 3 historical buildings, 2 office buildings, 2 storage buildings, 4 ambulance buildings, 1 transformer building, and 1 pump house building. The assets are located within the Property Services network. All asset field assessments are carried out in the Property Services department. This plan includes the Health and Library Complex which is still under the ownership of the County.

The results of the detailed inventory assessment of the targeted structures are summarized below.

Property Services	
Building Type	**Quantity**
Historical Buildings	3
Office Buildings	2
Transformer Building	1
Storage Buildings	2
Ambulance Stations	4
Pump House	1
TOTAL	**13**

What is it worth?

Before managing an asset, it is important to know the value of the asset to determine if the maintenance dollars spent are justified to protect the asset. Based on the asset valuation process carried out as part of this assignment, the AMP Team, in consultation with staff calculated an approximation of the total estimated value of the assets of $50.9 million.

Property Services Replacement Value		
Building Type	**Replacement Value**	**% of Total**
Historical Buildings	$29,911,800	69%
Office Buildings	$8,633,000	20%
Transformer Building	$50,000	0%

Storage Buildings	$949,900	2%
Ambulance Buildings	$3,350,500	8%
Pump House Building	$662,700	2%
TOTAL	$43,557,900	100%

Note: The Courthouse is included under historical buildings.

What condition is it in?

Condition assessment rating was previously carried out on the Property Services asset network, in consultation with Property Services department, to identify the level of service considered acceptable by staff. Staff attempted to develop a Facility Condition Rating that would make sense to use for the County's facilities. The rating was developed based on current capital needs relative to the replacement value of the building.

This has not been updated for 2022 as work is required for our Facilities through building condition assessments to assess current conditions and upcoming required capital works. This is planned for 2022-2023. Building condition assessments were last completed in 2011.

It is important to note that the ratings do not attempt to quantify whether or not the space is functional and efficient.

The following table summarizes the facility ratings:

Building Structure	**Facility Condition Rating**
Court House, Goderich	Good
Storage Building, Clinton	Good
Tuckersmith Ambulance Station, Clinton	Good
Goderich Ambulance Station, Goderich	Good
Exeter Ambulance Station, Exeter	Good
Pumphouse and Water Reservoir	Good
Huron County Museum, Goderich	Fair
Assessment Office, Goderich	Fair
Jacob Memorial Building, Clinton	Fair
Wingham Ambulance Station, Wingham	Fair
Huron County Gaol, Goderich	Poor
Airport Storage Building, Goderich	Poor
Transformer Building, Clinton	Vacant - tear down

What do we need to do?

Additional work is required to assess the long term needs on an individual building structure basis, and this work will continue into 2022-2023 through building condition assessments.

Looking at Property Services as a whole, the capital needs are relatively consistent on an annual basis and are limited by the availability of staff resources to manage the projects.

Property Services - Asset Needs		
	Years 1-5	**Years 6-10**
Property Services	$3,119,130	$2,808,137
Annual Average		$592,727

Key priorities for 2022 and beyond are:

- Accessibility Entrance Improvements to JMB
- Replace Boilers at Courthouse

This asset management plan update does not factor in any considerations for a new administrative building.

When do we need to do it?

One criterion critical to rating the Property services assets for the purposes of developing the AMP is the service life of the structure and its elements. As assets age, infrastructure managers must use experience and judgment to decide when maintenance is no longer cost effective thereby requiring that the structure be replaced.

Asset Useful Life in Years	
Asset Type	Useful Life
Building	60
Building Electrical	20
Building Equipment	5
Building Exterior	20
Building Interior	20
Building Mechanical	20
Building Site	22

How much money do we need?

As indicated in the previous table, total expenditures needs over the next 10 years are estimated to be:

Property Services - Asset Needs			
	Years 1-5	**Years 6-10**	**Total**
Property Services	$3,119,130	$2,808,137	$5,927,267

Annual Average		$592,727	

Again, more work is required to provide a more detailed building by building analysis as we move forward for the purposes of this plan.

Maintenance and repairs for property services average $175,000 - $200,000 per year, not including other costs such as snow removal, utilities and life safety systems.

How do we reach sustainability?

The analysis revealed that the average yearly revenue required is $593,000 to ensure that the level of service is maintained at today's level, over the next 10 years. The rate of funding the facility needs are expected to be somewhat constant over the next ten years.

At the end of 2021 capital reserves for facilities were at approximately $7,490,000, and for the ambulance base reserve they were at $2,129,000.

Current funding in the Property Services budget is $553,000.

Property Services – Capital Sustainability	
Current capital funding	$553,000
Required capital funding	$593,000
Annual capital shortfall	$40,000

For 2022, the estimated required work is $553,000 which represents a current shortfall of $40,000. This shortfall (current and 10 year average) can be managed into the future with a combination of small levy increases, deferral of projects, and reserve uses to mitigate the transition to the required annual funding amount.

Also, as buildings reach the end of their useful life, certain structures may not be replaced, therefore, this will be decisions Council will be required to make moving forward. For example, the Gaol has a significant replacement value, but would it ever be or could it ever be replaced?

10 Year Life Cycle Costing

10 YEAR LIFECYCLE COSTING				
		Average Years 1-5	Average Years 6-10	Total Average Years 1-10
Facilities	Capital	$ 623,826	$ 561,627	$ 592,727
	Operating	$ 175,202	$ 203,106	$ 189,154
	Total	$ 799,028	$ 764,734	$ 781,881

Over the next 10 years, the total average cost of Facilities Capital and Operating expenses is expected to average around $782,000 per year.

Levels of Service

Key Indicator: *Response time regarding requests for work*

Issue
Calls for work are assessed regarding the level of urgency. The clients who request work include external (MAG, Service Ontario) and internal (the Departments within the Corporation) should receive confirmation of receipt of their work order request within 24 hours, and be provided with an anticipated response time.

Potential Impact
Failure to assess and respond to problems may lead to increased damages if the maintenance concern is not identified within a timely manner. Also, a lack of a timely response to clients may lead to decreased client satisfaction.

Current Controls
The internal clients complete and submit an electronic Property Services Request form. Each PSR is received by the Maintenance Coordinator for Housing and Property Services and the County's Maintenance Technicians and Building Custodians are also able to view the PSR. The work is assigned, and this information is input; once the work is finished, the PSR is marked complete.
The external clients call or email their requests for maintenance service to the Maintenance Coordinator. An electronic work order is created through the Property Services Request form, and the protocols listed above for internal clients also then apply.

Action plan
The Maintenance Coordinator is to continually monitor the status of all PSR's that are incomplete. The continuous monitoring of all incomplete PSR's will help to ensure that work does not remain unfinished or "fall through the cracks".

Key Indicator: *Funding*

Issue - The funding mechanism relies on rental revenue from the County's three external tenants to provide the resources to maintain services for these properties; the remainder of funding required is from the County. There are no additional provincial or federal funds received for Property Services on a regular basis.
It is possible that occasional grant money is made available through agencies such as Heritage Canada, or one-time funding opportunities through the grant process for projects with specific eligibility criteria.

Potential Impact
A decrease in funding would result in a loss of services or maintenance repairs and capital projects

Current Controls
All work, both operational and capital, is monitored for efficiencies and cost controls.
The budget is monitored by the internal mechanisms of the County's Treasury Department and the Housing and Property Services Division.

Action plan
The annual budget reflects the operational and capital requirements to adequately maintain services and complete the more urgent capital upgrades. The capital work is selected based on recommendations from the building condition assessments along with the practical knowledge of the staff involved

Key Indicator: *Depreciation*

Issue
As the buildings begin to age, the required upkeep is expected to increase to maintain levels of service.

Potential Impact
Although the expected life spans are quite high, in practicality, buildings such as the JMB are currently 60 years old and will require increasing maintenance work to keep the building functional (ie, a HVAC system may have frequent temperature control issues).

Current Controls
By remaining diligent in completing the required repairs, the respective building life spans should be met

Action plan
The concept of building replacement may be a consideration in the future if the required repairs increase substantially for any building.

Key Indicator: *Capital*

Issue
The Building Condition Assessments completed in 2011 indicate a much more substantial requirement for capital repairs than what the County has historically provided for the capital works budget.

Potential Impact
Many projects, in future years, will have to be deferred as the average capital allocation is substantially lower than the cost of the recommended repairs within the Building Condition Assessments.

Current Controls
A thorough analysis of the capital requirements is undertaken by Housing and Property Services to determine which capital projects are able to be funded each year.

Action plan
It is anticipated that the process of completing the County's Asset Management Plan will result in a system within the County that recognizes the need for substantial capital repairs and works toward providing the funding allocations to enable the work to be completed.

Key Indicator: *Preventative Maintenance*

Issue
The role of preventative maintenance plays an important part in the longevity of a building and the cost efficiencies of a building.

Potential Impact
By monitoring building systems, providing a consistent, regular preventative maintenance program will significantly aid in reducing building costs. The cost savings will be realized through fewer system failures over time and the decreased need to replace components and systems.

Current Controls
The role of Preventative Maintenance Technician has develops and implements a preventative maintenance program to ensure the components within the building envelope operate as efficiently as possible, leading to fewer repairs and replacements.

Action plan
The preventative maintenance software allows for work necessary for completion to be tracked and monitored.

Key Indicator: *Energy Savings*

Issue
As energy costs increase, the need to reduce usage is recognized.

Potential Impact
Utility costs have increased substantially and are predicted to continue in this manner.

Current Controls
Building occupants are encouraged to reduce energy costs by keeping windows closed when heat or a/c is on, turning off lights, etc..
Low flush toilets and aerators have been installed, and some energy efficient lighting.

Action plan
The legislated Green Energy Act, O/Reg 397/11 requires all municipalities to have in place energy conservation and demand management plans and Huron County is in compliance with this legislation.

Management Strategies – Property Services

Strategic and Corporate Goals

Infrastructure levels of service are influenced and guided by the County's strategic planning initiative. It is anticipated that the County's strategic plan will provide direction regarding the allocation of resources and the prioritization of how municipal tax dollars will be spent in the future.

Expected Asset Performance

As the buildings continue to ago, the required upkeep is expected to increase to maintain levels of service. The County has an annual allocation for capital projects, with an increase year of approximately 2% spending each year.
The Building Condition Assessment indicates higher costs than are available within the annual capital budget for Property Services. This shortfall may eventually lead to component failures or decreased marketability of the properties. These buildings are substantial capital assets for the County, and the continued upkeep is vital to maintaining, or exceeding the life expectancy of the buildings.

Energy Savings

As energy costs increase, the need to reduce utility consumption is recognized. The *Green Energy Act, O/Reg 397/11* requires all municipalities to have in place energy conservation and demand management plans. The County is compliant with this request. Property Services recognizes the need for continuous energy upgrades, and targets capital and operating projects annually that will provide energy savings.

HOUSING SERVICES INFRASTRUCTURE

Housing Services Infrastructure

NOTE: THIS SECTION HAS HAD SOME LIMITED UPDATES FOR 2022 UPDATE. Not part of core infrastructure definition as per regulations. Additional work to be performed for 2023.

What does the County own?

The County of Huron has: 16 Apartments buildings and 84 Family units. These consist of detached dwellings, row townhouses and semi-detached townhouses. The assets are located within the Housing Services network. All asset field assessments are carried out in the Housing and Property Services division. The results of the detailed inventory assessment of the targeted structures are summarized below.

Housing Services	
Building Type	**Quantity**
Apartments	15
Residential Family Units	84
Countyview Apartments	1
TOTAL	**100**

The residential family units are further broken down into:

Family Units	**Quantity**
Single	36
Duplex	38
Row	10
Total	84

What is it worth?

Before managing an asset, it is important to know the value of the asset to determine if the maintenance dollars spent are justified to protect the asset. Based on the asset valuation process carried out as part of this assignment, the AMP Team, in consultation with staff calculated an approximation of the total estimated value of the assets of $67.6 million.

Property Services Replacement Value		
Building Type	**Replacement Value**	**% of Total**
Apartments	$41,566,900	61%
Residential Family Units	$18,858,900	28%

Countyview	$7,215,000	11%
TOTAL	**$67,640,800**	**100%**

What condition is it in?

Condition assessment rating was carried out on the Housing Services asset network, in consultation with Social and Property Services department, to identify the level of service considered acceptable by staff.

Staff attempted to develop a Facility Condition Rating that would make sense to use for the County's Housing units. The rating was developed based on current capital needs relative to the replacement value of the building. Please refer to the following table. The condition ratings have not been updated for 2022. More work with respect to refining the condition rating will continue as we move forward into 2022. Building condition assessments will also be required to further development life cycle costing. The last building condition assessments were completed in 2011.

Condition Rating	**Value**	**# of Structures**
Good	$32,121,300	55
Fair	$31,821,000	43
Poor	$3,698,500	2
TOTAL	**$67,640,800**	**100**

Conditions ratings further refined:

Condition	**Apartment**	**Duplex**	**Row**	**Single**	**Total**
Good	7	20	10	18	55
Fair	7	18		18	43
Poor	2				2
Total	**16**	**38**	**10**	**36**	**100**

What do we need to do?

Additional work is required to assess the long term needs on an individual housing structure basis, and this work will continue into 2022.

Looking at Housing Services as a whole, the capital needs over the next 10 years are relatively front loaded in years 1-5, and are limited by the availability of staff resources to manage the projects.

Housing Services - Asset Needs			
	Years 1-5	**Years 6-10**	**Total**
Housing Services - Capital	$5,623,379	$4,263,993	$9,887,372
Annual Average	$1,124,676	$852,799	$988,737

Priority projects for 2022 and beyond are:
- New Triplex Builds – Goderich
- Building condition assessments and energy audits – multiple sites
- Installation of Generator – Goderich
- Upgrade Exterior Cladding / Insulation

When do we need to do it?

One criterion critical to rating the Housing Services assets for the purposes of developing the AMP is the service life of the structure and its elements. As assets age, infrastructure managers must use experience and judgment to decide when maintenance is no longer cost effective thereby requiring that the structure be replaced.

Asset Useful Life in Years	
Asset Type	Useful Life
Building	60
Building Electrical	20
Building Equipment	5
Building Exterior	20
Building Interior	20
Building Mechanical	20
Building Site	22
Apartments	50
Residential Family Units	30

How much money do we need?

This scenario is used to analyze and determine how much money is required on a yearly basis to replace all assets as they become in need of replacement. The following table illustrates the results of our analysis for the Housing Services department.

Housing Services - Asset Needs			
	Years 1-5	**Years 6-10**	**Total**

Housing Services - Capital	$5,623,379	$4,263,993	$9,887,372
Annual Average	$1,124,676	$852,799	$988,737

Repairs and maintenance costs for Housing Services have been average $250,000 - $300,000 per year. This does not include operating costs such as utilities, snow removal or janitorial services.

How do we reach sustainability?

The analysis revealed that the average yearly revenue required for capital is $988,737 to ensure that the level of service is maintained at today's level, over the next 10 years. The current funding that is being raised through the County levy for Housing Services is $641,000.

It can be assumed that at some point, despite the ongoing rehabilitation of our social housing stock, that the units will have to be torn down and reconstructed. Many units see greater damage and wear than what would normally be expected from a residential deterioration curve. With approximately $67 million in housing units, our current reserve balances fall far short of what will be required in the future. At end of 2021, the reserve balance for Housing is $1,041,000.

Housing Services - Sustainability	
Current funding	$ 641,000
Required funding – 10 year average	$ 988,000
Annual shortfall	$ 347,000

10 Year Life Cycle Costing

10 YEAR LIFECYCLE COSTING				
		Average Years 1-5	Average Years 6-10	Total Average Years 1-10
HOUSING	Capital	$ 1,124,676	$ 852,799	$ 988,737
	Operating	$ 267,580	$ 310,199	$ 288,890
	Total	$ 1,392,256	$ 1,162,998	$ 1,277,627

Over the next 10 years, the total average cost of Housing Capital and Operating expenses is expected to average approximately $1.28 million.

Levels of Service

Desired levels of service

Key Indicator: *Response time to requests for work*

Issue
Calls for work are assessed regarding/based on level of urgency. The clients who request work include social housing tenants.
All tenants should receive confirmation of receipt of work order request within 24 hours, and be provided with an anticipated response time.

Potential Impact
Failure to assess and respond to problems may lead to increased damages if the maintenance concern is not identified within a timely manner. Also, a lack of a timely response to tenants may lead to decreased tenant satisfaction.

Current Controls
The tenants call the office and speak directly with the Maintenance Coordinator. The Maintenance Coordinator creates a work order in the property management software and advises the Maintenance Technician of the work to be completed via a phone call or faxes the work order to the site. When the work is completed, the Maintenance Technician indicates the completion information on the work order and faxes back to the office.

Action Plan
The Maintenance Coordinator is to continually monitor the status of all work orders that are incomplete. The continuous monitoring of all incomplete work orders will help to ensure that work does not remain unfinished or “fall through the cracks”.

Key Indicator: *Funding*

Issue
A variety of housing programs are currently running and funded through different mechanisms. The Huron County Housing Corporation and the five non-profits and one Housing Services cooperative are partially funded through provincial and federal dollars, however, a significant portion is provided by the County. The range of programs within the Investment in Affordable Housing program are cost shared between provincial and federal funding, with administration funding provided.

Potential Impact
A decrease in provincial or federal funding for the Housing Corporation would require an increased investment from the County to continue to meet basic levels of service and maintain service levels.

Current Controls
All work, both operational and capital, is monitored for efficiencies and cost controls.

The programs funded through outside sources have reporting mechanisms in place to provide the Ministry of Housing with program disbursements.
The budget is monitored by the internal mechanisms of the County's Treasury Department and the Housing and Property Services Division.

Action Plan
The 2020 budget reflects the operational and capital requirements to adequately maintain services and complete the more urgent capital upgrades. The capital work is selected based on recommendations from the building condition assessments along with the practical knowledge of the staff involved within capital works.
We continue to maximize additional program funding dollars to offer as many services as possible.

Key Indicator: *Depreciation*

Issue
As the buildings begin to age, the required upkeep is expected to increase to maintain levels of service.

Potential Impact
The expected life spans of the family units are now at approximately 30 years. Many of these single family homes were constructed in the late 1940s and early 1950s, and of basic construction. Over the years, these modest homes have had substantial wear and tear.
The apartment buildings have a predicted life span of approximately 50 years; however, they are beginning to show signs of age and future upkeep is essential.
It is important to note that under the *Housing Services Act, 2011,* Housing levels must remain identical, which means if a unit is removed from the Housing Services stock for any reason, it must be replaced. For example, it is not permissible to sell off a single family home and not replace it with another family unit.

Current Controls
By remaining diligent in completing the required repairs, the building respective life spans should be met.

Action Plan
The concept of building replacement may be a consideration in the future if the required repairs increase substantially for any building.
Social Housing, as a sector, has begun to identify regeneration as an identified solution; however, funding allocations are based on our size and the annual funding provided under the Affordable Housing Program – Rental Build Component is limited, and would necessitate "trading" funding for multiple years with other Service Manager areas to enable sufficient funding at one time for a new rental build.

Key Indicator: *Capital*

Issue

The Building Condition Assessments completed in 2011 indicate a much more substantial requirement for capital repairs than what the County has historically provided for the capital works budget.

Potential Impact
Many projects, in future years, will have to be deferred as the average capital allocation is substantially lower than the cost of the recommended repairs within the Building Condition Assessments.

Current Controls
A thorough analysis of the capital requirements is undertaken by Housing and Property Services to determine which capital projects are able to be funded each year.

Action Plan
It is anticipated that the process of completing the Asset Management Plan will result in a system within the County that recognizes the need for substantial capital repairs and works toward providing the funding allocations to enable the work to be completed.

Key Indicator: *Preventative Maintenance*

Issue
The role of preventative maintenance plays an important part in the longevity of a building and the cost efficiencies of a building.

Potential Impact
By monitoring building systems, providing a consistent, regular preventative maintenance program will significantly aid in reducing building costs. The cost savings will be realized through fewer system failures over time and the decreased need to replace components and systems.

Current Controls
The role of Preventative Maintenance Technician develops and implements a preventative maintenance program to ensure the components within the building envelope operate as efficiently as possible, leading to fewer repairs and replacements.

Key Indicator: *Energy Savings*

Issue
As energy costs increase, the need to reduce usage is recognized

Potential Impact
Utility costs have increased substantially and are predicted to continue in this manner.

Current Controls
Tenants are encouraged to reduce energy costs by keeping windows closed when heat or a/c is on, turning off lights, etc.
Low flush toilets and aerators have been installed, and some energy efficient lighting.

Action Plan
The legislated Green Energy Act, O/Reg 397/11 requires all municipalities to have in place energy conservation and demand management plans and Huron County is in compliance with this legislation.

Management Strategies – Housing Services

Legislative Requirements

The apartment buildings, detached houses and duplex units managed under the Huron County Housing Corporation are directly influenced by many legislative and regulatory requirements which prevent levels of service from declining below a certain standard, and ensures the total number of Social Housing units does not decrease.

Strategic and Corporate Goals

Infrastructure levels of service are influenced and guided by the County's strategic planning initiative. It is anticipated that the County's strategic plan will provide direction regarding the allocation of resources and the prioritization of how municipal tax dollars will be spent in the future.

Expected Asset Performance

As the buildings begin to age, the required upkeep is expected to increase to maintain levels of service. The detached houses, duplex units and row housing have an expected life span now at approximately 30 years. Many of these houses were constructed in the late 1940s and early 1950s, and are of basic construction. Although upgrades have been completed over the years, such as new windows, bathrooms, kitchens, toilets and insulation, these modest properties have had substantial wear and tear. Any strategic planning involving the County's buildings should include social housing properties. These are substantial asset for the County, and the regeneration of these properties is vital to maintaining, or exceeding life expectancy of the buildings, and retaining legislated service level numbers.

Housing and Homelessness Plan
The Ministry of Housing, under the *Housing Services Act, 2011*, required all service managers to develop a long-term 10 year Housing and Homelessness Plan. The Plan assists in establishing priorities for housing and homelessness services based on targeted consultations and research. Based on a projected need forecast, the Plan makes several recommendations that address homelessness and affordable housing options, and has a strong emphasis on a mixed approach to housing needs. Budget impact will depend greatly on the direction and recommendations of the Housing and Homelessness's Steering Committee and the ongoing and potentially shifting needs of the County. The impact of these recommendations will be brought to County Council as required.

Availability of Finances

Availability of finances will be a key component in maintaining desired levels of service. Housing Services receives provincial and federal grants each year. A review of the funding levels for the federal/provincial grants provided to the County will decrease significantly as the end of operating agreements and debenture expirations are reached This will require an increased investment from the County to meet basic levels of service.

Energy Savings

As energy costs increase, the need to reduce utility consumption is recognized. The *Green Energy Act, O/Reg 397/11* requires all municipalities to have in place energy conservation and demand management plans. The County is compliant with this request. Housing Services recognizes the need for continuous energy upgrades, and targets capital and operating projects annually that will provide energy savings.

HOMES FOR THE AGED INFRASTRUCTURE

Homes for the Aged Infrastructure

NOTE: THIS SECTION HAS HAD SOME LIMITED UPDATES FOR 2022 UPDATE. Not part of core infrastructure definition as per regulations. Additional work to be performed for 2023.

What does the County own?

The County of Huron has 2 Homes for the Aged:

- Huronview Home for the Aged with 120 beds and 20 apartments
- Huronlea Home for the Aged with 64 beds and 20 apartments

All asset field assessments are carried out in the Homes for the Aged staff. The results of the detailed inventory assessment of the targeted structures are summarized below.

What is it worth?

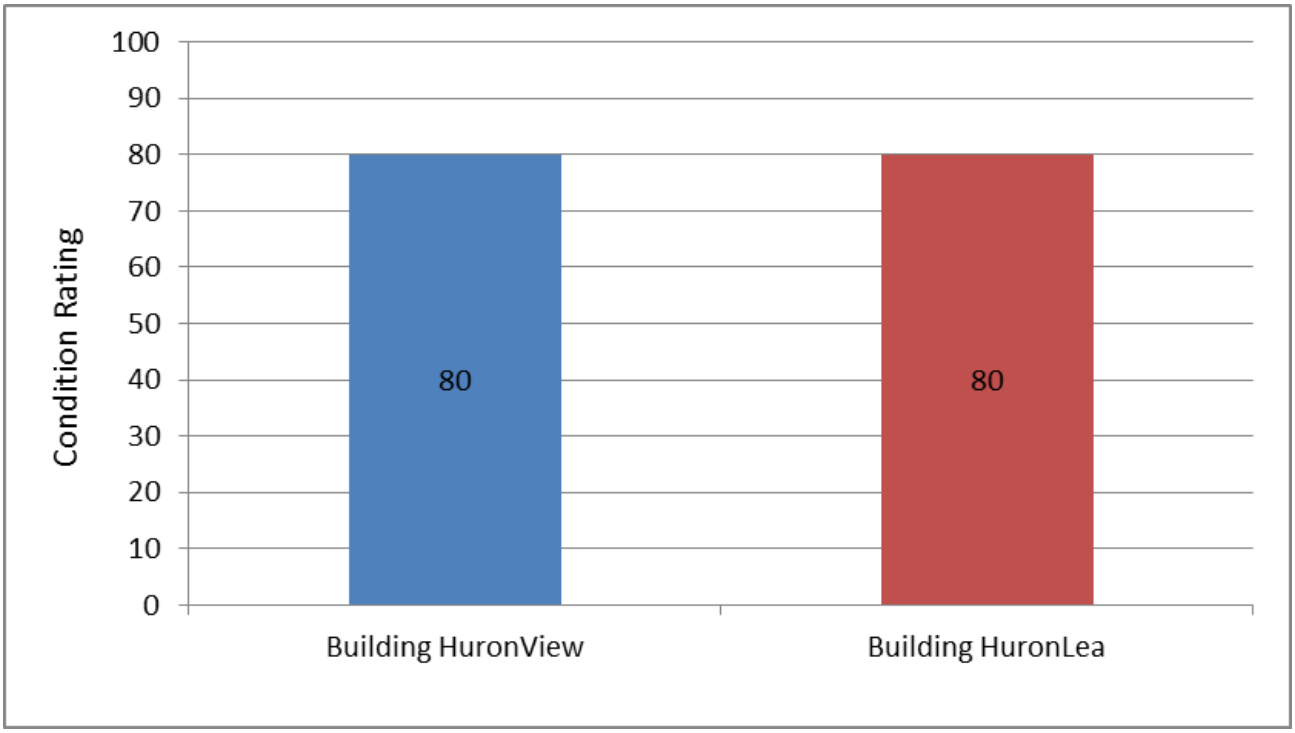
Before managing an asset, it is important to know the value of the asset to determine if the maintenance dollars spent are justified to protect the asset. Based on the asset valuation process carried out as part of this assignment, the AMP Team, in consultation with staff calculated an approximation of the total estimated value of the assets of $34.2 million.

Home For The Aged Replacement Value			
Asset Type	**Square Foot**	**2019 Replacement Cost**	**% of Total**
Huronview and Heartland	81,000	$19,798,200	58%
Huronlea and Highland	58,000	$14,399,600	42%
Total		$34,197,800	100%

What condition is it in?

Condition assessment rating was carried out on the Homes for the Aged asset network, in consultation with Homes for the Aged Department, to identify the level of service considered acceptable by staff. The following results were obtained: Huronview and Huronlea are in good condition. The results of the detailed condition assessment of the targeted Assets are summarized below in the graph.

Note: The condition rating below is from the 2013 Asset Management Plan. No update for 2022 as additional building condition assessments will be required for updated ratings and lifecycle costing.



The condition rating relates to the age and maintenance of the overall buildings and is a rating out of 100. When the rating is between 30 and 50 the item needs to be replaced. The rating system is as follows:

Excellent:	91 – 100	No evident defects
Good:	70 – 90	Slight decline
Fair:	51 – 69	Decline asset apparent
Poor:	30 – 50	Severe decline or failure

What do we need to do?

Addressing Asset Needs		
Assets	Needs 1-5 yrs	Needs 6-10 yrs
Huronview and Heartland	$2,087,361	$2,221,335
Huronlea and Highland	$1,629,780	$1,720,646
Total	$3,717,141	$3,941,981

Priority projects for the Homes for the Aged:
- Maintaining building mechanical systems
- Water heater upgrade and remove galvanized pipe

- Maintaining condition of shingled roof

When do we need to do it?

One criterion critical to rating the Homes for the Aged assets for the purposes of developing the AMP is the service life of the structure and its elements. As assets age, infrastructure managers must use experience and judgment to decide when maintenance is no longer cost effective thereby requiring that the structure be replaced.

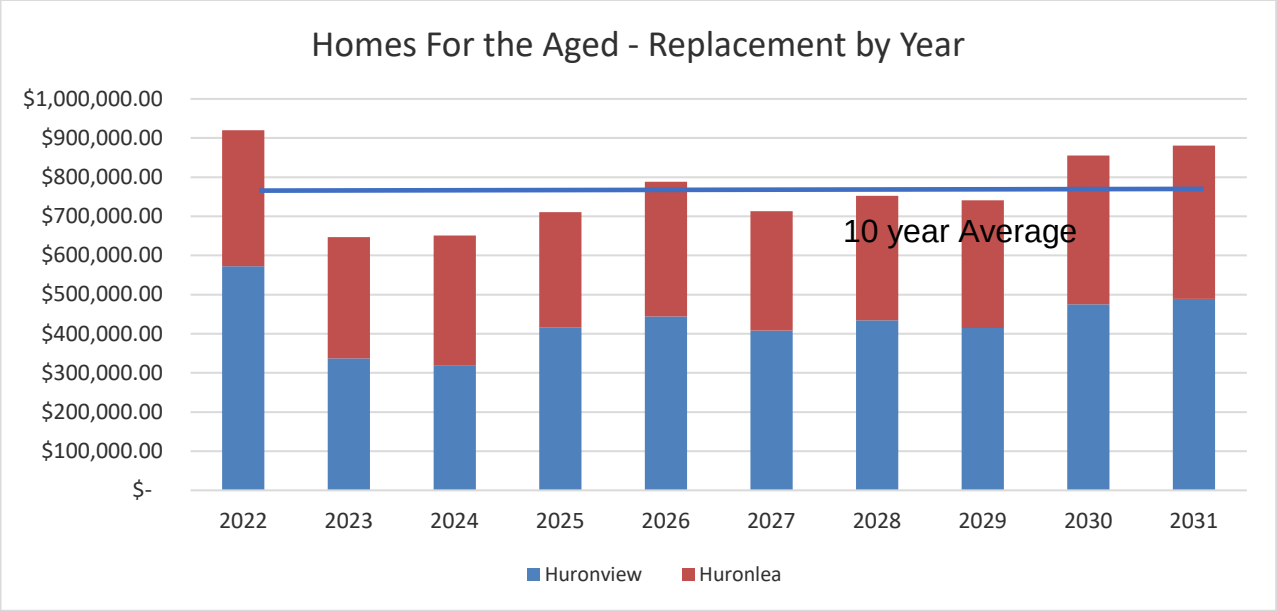
Asset Type - Homes for the Aged	**Useful Life (years)**
Building Envelope	60
Electrical	20
Equipment	5
Exterior	20
Interior	20
Mechanical	20
Site	22

Building and equipment repairs for the Homes over the past 4 years, average $147,000 per year.

How much money do we need?

This scenario is used to analyze and determine how much money is required on a yearly basis to replace all assets as they become in need of replacement. The following graph illustrates the results of our analysis for the Homes for the Aged Department.

Asset Replacement Summary



How do we reach sustainability?

The analysis revealed that the average yearly revenue required for capital is $766,000 to ensure that the level of service is maintained at today's level, over the next 10 years. The above graph also indicates that at that rate of funding the network needs are expected to increase in the short term and then level out for the remainder of the 10 year period.

Based on current levels of depreciation being raised through the levy of $682,000, there will be a small increase in annual funds required to manage the current replacement cycle of minor building components, providing that projects are deferred into future years to manage the peak. It is important to note, that the current replacement amounts do not account for the future replacement of each Home. The current reserve balance for the Homes is at $2.46 million.

10 Year Life Cycle Costing

10 YEAR LIFECYCLE COSTING				
		Average Years 1-5	Average Years 6-10	Total Average Years 1-10
HOMES	Capital	$ 743,428	$ 788,396	$ 765,912
	Operating	$ 159,274	$ 184,642	$ 171,958
	Total	$ 902,702	$ 973,038	$ 937,870

Over the next 10 years, the total average cost of Homes Capital and Operating expenses is expected to increase due to average approximately $959,000.

Levels of Service

Homes / Management Strategies

The Homes for the Aged have addressed infrastructure renewal strategies in their 10 year capital plan. The County of Huron's strategic planning initiative could impact the Homes direction in this regard. Should the Homes be required to continue to operate in their original facilities, according to the County's strategic planning initiative, necessary capital and operational measures will continue as outlined in the desired level of service and 10 year capital / operational plan the Homes have developed.

As the MOHLTC regulations change so do the demands on operational and capital improvements to the Homes. As these can be unforeseen budgetary pressures it is vital all departments at the Homes maximize purchasing efficiencies. As part of the budget planning process for the Homes it is recognized there will be upward pressure on various budget lines, at present and in the future, with consumables such as utility costs, resident care products and technology advancements being volatile commodities on the open market.

The Homes continue to address this with partnerships such as Complete Purchasing Services buying group which helps to ensure competitive pricing for a wide variety of products used at the Homes. Other costs saving initiatives are being examined on a regular basis to maximize efficiencies and enhance our purchasing powers, such as the competitive Request for Proposal process in accordance with the County of Huron procurement policy for capital projects.

Huron County Homes for the Aged have been maintained in excellent condition and are well situated to continue to meet the desired levels of service for the foreseeable future with the continued commitment the County of Huron has provided.

The County of Huron is currently responsible for the operation and maintenance of 2 Homes for the Aged which also contains 40 seniors' apartments:

Huronview Home for the Aged - 77722A London Rd. Clinton Ont. - 120 Long Term Care beds and 20 seniors' apartments

Huronlea Home for the Aged - 820 Turnberry St. S. Brussels, Ont. – 64 Long Term Care beds and 20 seniors apartments

Both Homes, built in 1992, have been well maintained and are now at an age when ongoing capital expenditures will be necessary to continue their excellent level of service to the community.

The Homes receive funding from the Ministry of Health and Long - Term Care (MOHLTC) and are governed by the Long- Term Care Homes Act – 2007 which legislates the operational standards the Homes must maintain. The County contributes the additional funds necessary to operate the Homes at a standard the community wishes to maintain.

The Homes had previously developed a 10 year Operational Plan to forecast approximated operational and capital requirements for the future, with adjustments for inflation. This will require to be updated as part of a building condition assessment.

The following capital assets are tracked to maintain the desired level of service:

HURONVIEW:

Parking Lot Pavement:
The front, apartment, staff parking lots and rear fire access lane was repaved in 2001 and has been well maintained. The staff parking lot was re-paved in 2016 which included additional parking spots. As per the Asset Management Plan, the front parking lot repaving is slated for 2022.

Shingled Roof:
The roof underwent a phased replacement from 2009 to 2011 and is in excellent condition. Some eaves troughs were replaced in 2019. In 2018 $30,000 was spend on shingle replacement. Will monitor remainder of roof and incorporate into asset management plan.

Main Chiller:
The main chiller unit was replaced in 2012 and is fully operational with no issues to report. The approximate replacement date for this chiller is 25 to 28 years and is beyond the 10 year capital replacement plan.

Heating Boilers:
Huronview has 3 original equipment hot water heating boilers which have been well maintained and one has undergone an emergency re-fitting to be fully functional for the 2013 – 2014 winter seasons. A phased replacement of the other two boilers has been addressed in the 10 year capital plan for 2022.

Domestic Hot Water Boilers:
The original equipment High Temp and Low Temp domestic hot water boilers were replace in 2012 with high efficiency units and are fully operational. Replacement will be address in mechanical upgrades but is beyond the 10 year capital replacement plan.

Diesel Generator:
The diesel generator is original equipment, has been well maintained and is fully operational. Upgrades to the generator were completed in 2016. Replacement for this unit is beyond the 10 year capital replacement plan.

Fire Alarm System:
As part of the replacement of the fire sprinkler system, all smoke and heat sensor equipment will be replaced which includes the fire panels.

Building Automation System (BAS):

This system is a vital component to the heating and ventilation systems at the Home and allows the Homes maintenance staff to monitor, make adjustments and troubleshoot heating and cooling issues. In 2016 the BAS was replaced.

Heartland Apartment Chiller:
In 2012 we installed a 5 ton chiller unit to temper humidity issues in the Heartland apartment corridors. This unit is fully operational and its replacement is beyond the 10 year capital replacement plan.

Commercial Washers:
Huronview laundry department has 2- 60lb Unimac commercial washing units which were replaced 2009 to 2011 are fully operational, are well maintained and their replacement is beyond the 10 year capital replacement plan.

Commercial Dryers:
Huronview laundry department has 3 – 75lb- commercial gas dryers which were replaced 2009 to 2011 are fully operational, are well maintained and their replacement is beyond the 10 year capital replacement plan.

Resident Call Bell System:
This system was replaced 2010 – 2011, is fully operational, well maintained and will require a major upgrade by 2021 which is addressed in the 10 year capital replacement plan.

Security Locks / Resident Wander Guard System:
In compliance with MOHLTC regulated requirements the Home underwent substantive changes to its door locks and egress security systems including an Elpas Wandering Resident System. The system warns staff should a Resident be attempting unauthorized egress from the Home. A major system upgrade will be required in 2021 in order to maintain the legislated and otherwise desired level of service for the Homes Residents.

Building Humidifier System:
In 2012 the Home installed a Nortec, ultra high efficiency, state of the art building humidifier system. As this is new and developing technology there were some engineering issues through the winter of 2011 – 2012. The engineers from Nortec have solved the issues to date and the system will undergo a thorough test through the 2012-2013 winter seasons. Its replacement is beyond the 10 year capital replacement plan.

Sewage Well Station:
The London Road sewage well was built in 1992 and serves several large public facilities including Huron County Health Unit & Library Complex, Huronview and Heartland Apartments, County View Seniors' Apartments and Jacob Memorial Building which houses Social & Property Services. Upgrades were made to the sewage well in 2018, in collaboration with Property Services. The sewage well is serviced by Huron East.

HURONLEA:

Parking Lot Pavement:
The front, apartment, staff parking lots and rear fire access lane was repaved in 2001 and has been well maintained. The staff parking lot was repaved in 2019 which included additional parking spots towards the back of the property.

Shingled Roof:
The roof underwent a phased replacement from 2010 to 2011 and is in excellent condition. Troughs and fascia are also in good condition. In 2019 $50,000 was spent on new shingles and it will be budgeted for $40,000 for 2020.

Main Chiller:
The main 100Ton chiller unit was replaced in 2015 for an estimated cost of $90,000. Yearly maintenance is noted for the 10 year capital replacement plan.

Heating Boilers:
The 3 stage heating boiler was replaced in 2015 and yearly maintenance is noted for the 10 year capital plan for 2020.

Domestic Hot Water Boilers:
The original equipment High Temp and Low Temp domestic hot water boilers were replaced in 2011 with high efficiency units and are fully operational. Replacement will be addressed in mechanical upgrades but is beyond the 10 year capital replacement plan.

Diesel Generator:
The diesel generator was replaced in 2016 and yearly maintenance is noted in the 10 year capital replacement plan.

Fire Alarm System:
As part of the replacement of the fire sprinkler system, all smoke and heat sensor equipment will be replaced which includes the fire panels.

Building Automation System (BAS):
This system is a vital component to the heating and ventilation systems at the Home and allows the Homes maintenance staff to monitor, make adjustments and troubleshoot heating and cooling issues. In 2016 the BAS system was replaced.

Highland Apartment Chiller:
In 2012 we installed a 5 ton chiller unit to temper humidity issues in the Highland apartment corridors. This unit is fully operational and its replacement is beyond the 10 year capital replacement plan.

Resident Call Bell System:
This system was replaced 2010 – 2011, is fully operational, well maintained and will require a major upgrade by 2021 which is addressed in the 10 year capital replacement plan.

Security Locks / Resident Wander Guard System:
In compliance with MOHLTC regulated requirements the Home underwent substantive changes to its door locks and egress security systems including an Elpas Wandering Resident System. The system warns staff should a Resident be attempting unauthorized egress from the Home. A major system upgrade will be required in 2021 in order to maintain the legislated and otherwise desired level of service for the Homes Residents.

Building Humidifier System:
The system is original equipment and will require complete replacement in 2015. Its replacement is scheduled in the 10 year capital replacement plan.

Both Huronview and Huronlea Homes have historically had excellent support from the County of Huron which has enabled the Home to be maintained at a high level of operational efficiency and a continued commitment by the County will ensure this desired level of service will continue for years to come.

EMERGENCY SERVICES

Emergency Services

NOTE: THIS SECTION HAS HAD SOME LIMITED UPDATES FOR 2022 UPDATE. Not part of core infrastructure definition as per regulations. Additional work to be performed for 2023.

What does the County own?

The County of Huron in 2022 has: 12 Ambulances, 3 Rapid Response units, 2 Command Vehicles, 1 Emergency Support Trailer, 17 Defibrillators, 19 Stretchers, 11 Power Load, 12 Stairchairs and 20 Autopulse. The assets are located within the Emergency Services network. All asset field assessments are carried out in the Emergency Services department. The results of the detailed inventory assessment of the targeted structures are summarized below.

ES Fleet Inventory		
Asset Type	**Asset Component**	**Quantity**
Ambulances	Vehicle	12
Rapid Response Units	Vehicle	3
Command Vehicles	Vehicle	2
Defibrillators	Vehicle Equipment	17
Autopulse	Vehicle Equipment	20
Stretchers	Vehicle Equipment	19
Power Load	Vehicle Equipment	11
Stairchair	Vehicle Equipment	12
EM Trailer	Vehicle Equipment	1
Total		**97**

Note, this does not include the enhancements with the Community Paramedicine Program, which will be updated in future updates.

The current estimated useful life of the EMS fleet and equipment is based on a 6 year replacement cycle.

What is it worth?

Before managing an asset, it is important to know the value of the asset to determine if the maintenance dollars spent are justified to protect the asset. Based on the asset valuation process carried out as part of this assignment, the AMP Team, in consultation with staff calculated an approximation of the total estimated value of the assets of $5.16 million.

EMS Fleet Replacement Value			
Asset Type	**Quantity**	**2022 Replacement Cost**	**% of Total**
Ambulances	12	$2,424,000	47%
Rapid Response Units	3	$285,000	6%
Command Vehicles	2	$146,500	3%
Defibrillators	17	$595,000	12%
Auto pulse	20	$330,000	6%
Stretchers	19	$532,000	10%
Power Load	11	$750,750	15%
Stair chair	12	$51,000	1%
EM Trailer	1	$50,000	1%
TOTAL	97	$5,164,250	100%

What condition is it in?

Condition assessment rating was carried out on the Emergency Services asset network, in consultation with Emergency Services Department, to identify the level of service considered acceptable by staff. The following results were obtained: the autopulse units are in fair condition, ambulances are in good condition, defibrillators are in fair condition, rapid response units are in good condition, stretchers are in poor condition, stairchair are in good condition, trailer is in good condition and command vehicles are in poor condition. The results of the detailed condition assessment of the targeted Assets are summarized below in the table.

EMS Fleet Condition Rating		
Asset Type	**Average Age - Years**	**Estimated Rating**
Ambulances	3.5	Good
Rapid Response Units	3.3	Good
Command Vehicles	7	Poor
Defibrillators	4.5	Fair
Auto pulse	5	Fair
Stretchers	6.4	Poor
Power Load	3	Good
Stair chair	3.4	Good
EM Trailer	4	Good

The condition rating relates to the age and usage of the overall vehicles or devices group. When the rating is greater than 5 Years the item needs to be replaced. The basic rating system used is as follows:

- Excellent < 2 Years

- Good < 4 Years
- Fair < 5 Years
- Poor > 5 Years

Additional work is required into 2023 to support enhanced review of the condition ratings for the EMS capital assets.

What do we need to do?

Addressing Capital Asset Needs		
Assets	**Needs 1-5 yrs**	**Needs 6-10 yrs**
Ambulances	$2,123,655	$2,461,898
Rapid Response Units	$260,281	$359,598
Command Vehicles	$202,592	$57,859
Defibrillators	$743,279	$861,663
Autopulse	$238,912	$276,963
Stretchers	$297,311	$344,665
Power Load	$690,188	$800,118
Stairchair	$42,473	$49,237
EM Trailer	$0	$23,269
Total	**$4,598,691**	**$5,235,270**

When do we need to do it?

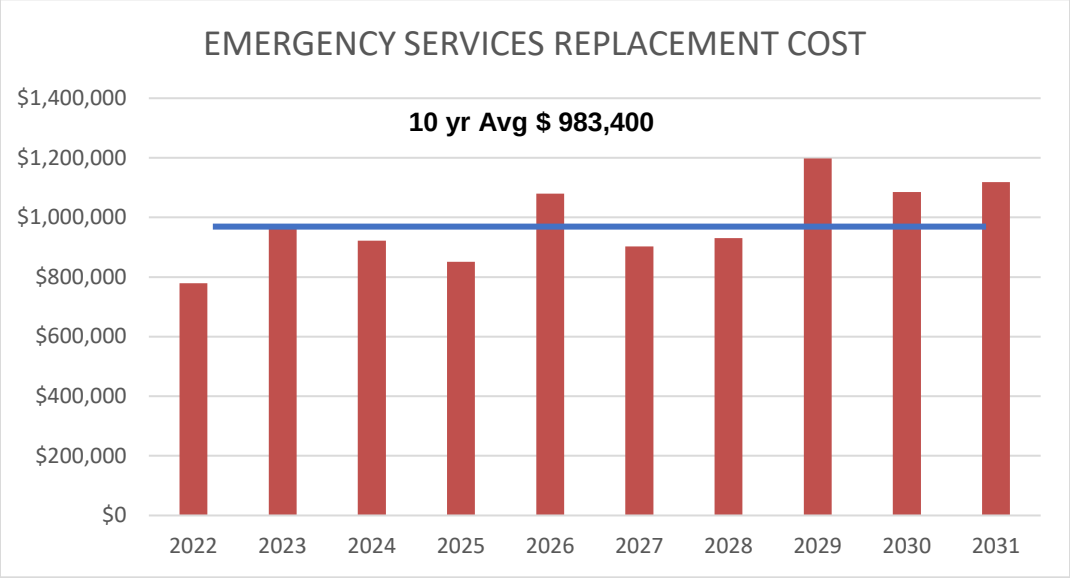
One criterion critical to rating the Emergency Services assets for the purposes of developing the AMP is the service life of the structure and its elements. As assets age, infrastructure managers must use experience and judgment to decide when maintenance is no longer cost effective thereby requiring that the structure be replaced.

Asset Useful Life in Years	
Asset Type	Useful Life
Ambulances	6
Rapid Response Units	6
Command Vehicles	6
Defibrillators	6
Autopulse	6
Stretchers	6
Stairchair	6
EM Trailer	12

How much money do we need?

This scenario is used to analyze and determine how much money is required on a yearly basis to replace all assets as they become in need of replacement. The following graph illustrates the results of our analysis for the Emergency Services Department.

Asset Replacement Summary



How do we reach sustainability?

The analysis revealed that the average yearly revenue required is $983,400 to ensure that the level of service is maintained at today's level, over the next 10 years. Due to the short term nature of the EMS Fleet, the above graph also indicates that at that rate of funding the network needs are expected to be somewhat constant over the next ten years.

Based on the 2022 depreciation of $834,000 being raised in the levy, there will be additional levy requirements required through the lifecycle of the EMS Fleet, although relatively small in nature relative to some of the County's other infrastructure. These minor shortfalls can easily be made up with levy in a pay as you go approach.

10 Year Life Cycle Costing

10 YEAR LIFECYCLE COSTING				
		Average Years 1-5	Average Years 6-10	Total Average Years 1-10
EMS FLEET	Capital	$ 919,738	$ 1,047,055	$ 983,396
	Operating	$ 207,056	$ 240,035	$ 223,546
	Total	$ 1,126,794	$ 1,287,089	$ 1,206,942

Over the next 10 years, the total average cost of EMS Capital and Operating expenses is expected to increase due to inflation, from $1.12 million per year to $1.28 million per year.

Levels of Service

The ambulances in our department cost approximately $202,000 each and we have increased the life cycle from 60 to 72 months. These units are used for the transport of patients who are sick and injured. At this time we do not believe that there needs to be more than eight transport ambulances with three spares to meet the needs of the fleet. Should the call volume increase or the response time needs decrease, then there will need to be an adjustment to the fleet compliments.

There are three rapid response units in our fleet which includes one spare. These vehicles are used for first response and help ensure our response time meets County Council decision to ensure a 40% commitment to meeting the 8 minute response for all CTAS 1 returns. As well, there is a Council decision to ensure a 65% commitment to meeting the 17 minute response for all CTAS 2 and a 50% commitment to meeting the 17 minute response for all CTAS 3 responses. There is also a Council decision to ensure a 65% commitment to meeting the 30 minute response for all CTAS 4 calls and finally, there is a Council decision to ensure a 50% commitment to meeting the 30 minute response for all CTAS 5 calls. This obligation indicates that the current vehicle commitment can meet our obligation as determined by County Council.

The Command vehicles are also able to be used as first response vehicles as they carry sufficient equipment to render care until an RRU or ambulance arrives on scene. These vehicles are also used to decrease costs for travel by departmental administrative staff in their normal duties. These units are also the command units at an incident, thus freeing up a transport unit should it be required.

There are 17 defibrillators for use in the ambulances and RRUs. These units are used to provide a controlled shock to the heart muscle in order to revert the heart to functioning rhythm. These devices are part of the chain of survival and we have had numerous saves in Huron County as a result of the efforts to meet the pre hospital cardiac needs of our citizens.

We have 20 autopulses in our system for providing cardiac compressions during a cardiac arrest. The ability of the unit to do compressions ensures that the patient is receiving the appropriate compressions over the length of the arrest and ensures that the paramedic is safe during the transport of cardiac arrest patients. Keeping health and safety in mind, this ensures

paramedics are able to wear their seatbelts in the back of the vehicle rather than standing up trying to do CPR.

Key Performance Indicators

Key Indicator:
Call Volume

Issue:
Increases to the various categories will cause change requirements to the deployment plan and positioning of resources.

Total call Volume (Code 1 – 4 + 8)

2008 – 7,203
2009 – 8,134
2010 – 9,433
2011 – 11,613
2012 – 12,378
2013 – 9,955
2014 – 13,407
2015 – 11,279

Potential Impact:
There is a need to ensure that we have ample vehicles available to meet the needs as assigned by the Central Ambulance Communications Centre (CACC). If the vehicles are not in the area of increasing call volume then either the vehicles positioning needs to be reassigned or there needs to be an increase in the vehicles available.

Current Controls:
The assignment of calls is controlled by the Dispatch. (CACC). CACC's operational policies are controlled by the EHSB (Province) with some input from operators; however, final decision rests with the CACC. The local deployment strategy assists both parties in meeting these objectives.

Action plan:
The call volume is continually monitored through both the Ambulance Dispatching Report System (ADRS) and Huron County's electronic Patient Call Report (EPCR) to ensure that the call volume increases are assessed and rationalized for spikes in call volume.

Key Indicator:
Response Times

Issue:
The standard for response times in Huron County is 8 minutes for CTAS 1; 17 minutes for CTAS 2; 17 minutes for CTAS 3; 30 minutes for CTAS 4 and 30 minutes for a CTAS 5. This changed in 2011 from the previous 90th percentile for Huron County of 17 minutes 22 seconds for all responses.

Potential Impact:
Increased high priority calls from hospitals (Code 4 response) results in that unit being committed and unable to respond to other calls while en-route. This creates a need for

increased vehicles as the originally assigned unit on a code 4 cannot be diverted even if they drive by a second code 4.

Current Controls:
The assignment of calls is controlled by the Dispatch. (CACC). The local service monitors the response time and takes appropriate steps to ensure that the response times meet the agreement and adjusts their actions based on the results.

Action plan:
Should call volume increase or we are unable to meet the agreed upon response times, an adjustment to both the location of vehicles and/or the number of vehicles available is determined and appropriate approvals are obtained to make these changes occur.

Asset Failure:
What is the likelihood of a major asset failure and what would be the impact to the service and the County? As an example, what happens when we delay purchasing and what is recommended to mitigate the deficiency? (i.e. – vehicle out of service due to usability resulting in increased response times, with an inferior patient outcome due to the delay in patient contact and care being rendered.

Action Plan:
To ensure appropriate redundancy is built in to reduce the likelihood of a major asset being totally unserviceable, it is important to have ample backup vehicles to replace the said unit and the ability to have the asset serviced in a timely fashion. As an example, if an engine was damaged and needed to be replaced, we would need our maintenance facility to be able to have the engine repaired and the vehicle back on the road in short order. This requires preferred servicing as well as having ample spare units available to replace the frontline vehicle. Further, an agreement with peripheral services to ensure that if necessary a spare can be obtained on short notice.

The impact on the service would be an increased response time and/or calls not serviced in the time limits established within the standards and approved by Council. The impact on the County would be that there citizens are not receiving appropriate care as provided in the provincially published timelines and could result in litigation and increased concerns being raised.

POPULATION GROWTH AND EMPLOYMENT FORECASTS

Population Projections (2016 – 2041)

	2016	% of County	2021	2026	2031	2036	2041
Ashfield Colborne Wawanosh	5,422	9.1%	5477	5541	5587	5587	5559
Bluewater	7,136	12.0%	7209	7293	7353	7353	7317
Central Huron	7,576	12.8%	7653	7742	7806	7806	7768
Goderich	7,628	12.9%	7706	7796	7860	7860	7821
Howick	3,873	6.5%	3912	3958	3991	3991	3971
Huron East	9,138	15.4%	9231	9339	9416	9416	9370
Morris-Turnberry	3,496	5.9%	3532	3573	3602	3602	3585
North Huron	4,932	8.3%	4982	5040	5082	5082	5057
South Huron	10,096	17.0%	10199	10318	10403	10403	10352
County of Huron	59,300	100.0%	59,900	60,600	61,100	61,100	60,800

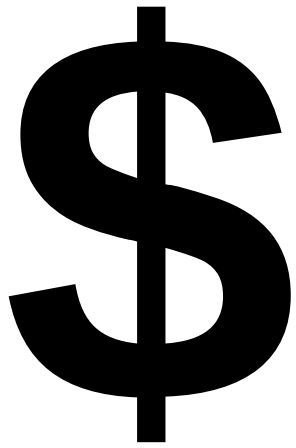
Employment Projections (2016-2041)

	2016 Participation Rate	2016	2021	2026	2031	2036	2041
Ashfield Colborne Wawanosh	0.627	3400	3434	3474	3503	3503	3486
Bluewater	0.653	4660	4707	4762	4801	4801	4778
Central Huron	0.629	4765	4814	4870	4910	4910	4886
Goderich	0.567	4325	4369	4420	4457	4457	4435
Howick	0.718	2781	2809	2842	2865	2865	2851
Huron East	0.688	6287	6351	6425	6478	6478	6446
Morris-Turnberry	0.735	2570	2596	2626	2648	2648	2635
North Huron	0.645	3181	3213	3251	3278	3278	3262
South Huron	0.622	6280	6344	6418	6471	6471	6439
County of Huron	0.644	38189	38576	39026	39348	39348	39155

The population trend is to increase over the next 15 years, and slightly decrease after 20 years. The employment trend is to increase over the next 15 years and decrease after 20 years.

The County is currently not anticipating significant impacts to current core infrastructure with respect to increases in population and employment growth. Traffic counts on County highways are continually monitored for and required enhancements with respect required safety precautions, such as traffic lights.

FINANCIAL ANALYSIS and SUSTAINABILITY



The County has a significant amount of infrastructure under its control, with current estimates of replacement value at approximately $1.1 billion in 2022. These figures are not adjusted for future inflation. Our current tax base (weighted assessment) is $9.7 billion. This represents a significant burden on our tax base to manage and maintain such a significant level of infrastructure – 11 cents on the dollar of weighted assessment. Looking at it per household, Huron County supports approx. $44,400 in infrastructure per household.

The following table provides the replacement value details by department and asset type. Note: This table was updated for all assets except for the small culverts and driveway culverts as more work is required to inventory and assess those assets.

County of Huron - Asset Replacement Value				
Department	**Asset Type**	**Total Qty**	**Current Replacement Cost**	**% of Total**
Public Works	Road Surface	773 km	$536,544,346	47.71%
Public Works	Bridges	81	$157,269,240	13.99%
Public Works	Culverts-Large	210	$83,409,850	7.42%
Public Works	Culverts-Small	1220	$131,913,321	11.73%
Public Works	Driveway culverts	8,934	$33,800,000	3.01%
Public Works	Auburn Patrol Yard	1	$6,292,600	0.56%
Public Works	Wingham Patrol Yard	1	$2,385,600	0.21%
Public Works	Wroxeter Patrol Yard	1	$2,948,400	0.26%
Public Works	Zurich Patrol Yard	1	$3,404,000	0.30%
Public Works	Fleet 5 year	35	$1,342,000	0.12%
Public Works	Fleet 10 year	49	$7,876,000	0.70%
Public Works	Fleet 15 year	44	$6,744,000	0.60%
Property Services	Historical Buildings	3	$29,911,800	2.66%
Property Services	Office Buildings	2	$8,633,000	0.77%
Property Services	Transformer Building	1	$50,000	0.00%
Property Services	Storage Buildings	2	$949,900	0.08%
Property Services	Ambulance Stations	4	$3,350,500	0.30%
Property Services	Pump House	1	$662,700	0.06%
Housing Services	Apartments	15	$41,566,900	3.70%
Housing Services	Residential Family Units	84	$18,858,900	1.68%
Housing Services	Countyview	1	$7,215,000	0.64%
Homes for the Aged	Huronview and Heartland	1	$19,798,200	1.76%
Homes for the Aged	Huronlea and Highland	1	$14,399,600	1.28%
EMS	Ambulances	12	$2,424,000	0.22%
EMS	Rapid Response Units	3	$285,000	0.03%
EMS	Command Vehicles	2	$146,500	0.01%
EMS	Other Assets	80	$2,308,750	0.21%
TOTAL			**$1,124,490,107**	**100%**
Historical Cost			**$610,450,000**	

The most significant assets fall under the Public Works department with approximately 87% of the estimated replacement value. It is important to note that the historical cost of the assets are significantly less than what it would cost to replace them today.

However, it is important to note, that not all of the existing assets would be replaced today, or at the same service level. As the County moves forward with its asset management planning, decisions will have to be made on the existing levels of service. For example, are their certain bridges that could be closed with minimal impact to traffic patterns?

As seen by the historical costs, when raising funds for infrastructure, you need more than the levy raised from deprecation to keep up with the needs of the County and to keep the level of service at the standards the County feels confident with. Current depreciation alone does not cover our future replacement needs.

The next table calculates what it would cost per year if we were to base the annual replacement on the estimated useful life of the assets for the non-linear assets, along with the better forecasts for the linear assets.

County of Huron - Asset Replacement/Rehabilitation/Renewal Value per Year			
Department	**Asset Type**	**Estimated Service Life**	**Repl. Cost/Year**
Public Works	Roads	Next 20 years	$12,690,771
Public Works	Bridges	Next 20 years	$4,835,343
Public Works	Culverts-Large	Next 20 years	$2,056,295
Public Works	Culverts-Small	75	$1,758,844
Public Works	Driveway culverts	40	$845,000
Public Works	Auburn Patrol Yard	60	$104,877
Public Works	Wingham Patrol Yard	60	$39,760
Public Works	Wroxeter Patrol Yard	60	$49,140
Public Works	Zurich Patrol Yard	60	$56,733
Public Works	Fleet 5 year	5	$268,400
Public Works	Fleet 10 year	10	$787,600
Public Works	Fleet 15 year	15	$449,600
Property Services	Historical Buildings	60	$498,530
Property Services	Office Buildings	40	$215,825
Property Services	Transformer Building	60	$833
Property Services	Storage Buildings	60	$15,832
Property Services	Ambulance Stations	60	$55,842
Property Services	Pump House	20	$33,135
Housing Services	Apartments	50	$831,338
Housing Services	Residential Family Units	30	$628,630
Housing Services	Countyview	50	$144,300
Homes for the Aged	Huronview and Heartland	60	$329,970
Homes for the Aged	Huronlea and Highland	60	$239,993
EMS	Ambulances	6	$404,000
EMS	Rapid Response Units	6	$47,500
EMS	Command Vehicles	6	$24,417
EMS	Defibrillators	6	$384,792
TOTAL			**$27,797,299**

As seen by this table, if we were to replace all assets we have today, at the same standard or level of service, the County would require to fund approximately $27.8 million per year to set aside for future replacement. While not all of the assets above may be replaced to their current service level, the opportunities for this are limited and will not make a meaningful difference to the bottom line.

Moreover, knowing that the bulk of the bridge and culvert network were constructed during the 1940's and 1950's, a significant amount of work will be required through 2030's-2050's. Therefore, just looking at an annual amount based on the lifecycle cost doesn't make sense as we have not been setting aside any significant amount of funding for bridge replacement up to this point in time and to start now based on the figures above would not get us to where we need to be.

Therefore, we will see a significant peak in needs shortly beginning in the current 10 year replacement cycle. This peak will have to be managed by a combination of levy, debt, reserves and service level review.

The table below shows the County's consolidated needs for the next ten years. This is an estimated forecast amount, as desired level of services can change; driven by the needs of the community, and or changes in legislation, or changes due to unforeseen circumstances.

Estimated Capital Needs (1-10 years)			
Department	**Asset Type**	**Needs 1-5 yrs**	**Needs 6-10 yrs**
Public Works	Roads	$38,217,865	$79,870,798
Public Works	Bridges and Culverts-Large	$19,482,111	$29,185,164
Public Works	Small Culverts and Driveway	$4,500,000	$4,500,000
Public Works	Patrol Yards	$4,354,000	$188,500
Public Works	Fleet 5 year	$1,449,000	$1,396,500
Public Works	Fleet 10 year	$2,804,000	$5,072,000
Public Works	Fleet 15 year	$1,983,000	$3,174,500
Property Services	Property Services	$3,119,130	$2,808,137
Housing Services	Housing Services	$5,623,379	$4,263,993
Homes for the Aged	Huronview and Heartland	$2,087,361	$2,221,335
Homes for the Aged	Huronlea and Highland	$1,629,780	$1,720,646
EMS	Ambulances	$2,123,655	$2,461,898
EMS	Rapid Response Units	$260,281	$359,598
EMS	Command Vehicles	$202,592	$57,859
EMS	Other Assets	$2,012,163	$2,355,915
TOTAL		**$89,848,317**	**$139,636,843**
Average per year		$17,969,663	$27,927,369
Total 10 year average			$22,948,516

The needs over the next 10 years are rear loaded with greater replacement needs in years 6-10. This is driven by the needs of the roads infrastructure rehabilitation requirements.

The County of Huron staff used several different resources to build the 10 year asset plan for the consolidated financial portion of the asset management plan. The County staff worked together to build a consolidated plan, but the plan is still in the preliminary stages, so this is a starting point. The asset management plan committee aims to see the plan implemented into asset software to be able to fully benefit from the plan.

As asset conditions change throughout the asset life cycle, the plan can be updated, making financial analyses more uniformed for staff. Utilizing asset management software makes yearly updates more efficient and accurate for providing reports and modelling to Council, Ministry, and the Public. This remains outstanding and is one of the top priorities moving forward to address.

The next table looks at what our potential debt capacity could be given current limits as established by the Ministry of Municipal Affairs, currently at annual repayment limit of $13,726,215. It is important to note that the repayment of debt will also drive up our current levy. Based on current interest rates, a 1% increase in the levy would support approx. $6.0 - $7.5 million in debt, depending on the term.

TERM	Rate	25% Annual Repayment Limit	12.5% Annual Repayment Limit	Debt raised with 1% Levy Impact
5Y	3.55%	$61,784,899	$ 30,892,447	$2,070,567
10Y	3.92%	$111,380,677	$ 55,690,342	$3,732,646
15Y	4.15%	$150,189,514	$ 75,094,763	$5,033,228
20Y	4.28%	$180,657,397	$ 90,328,705	$6,054,283
25Y	4.35%	$204,844,930	$ 102,422,472	$6,864,869
30Y	4.39%	$224,127,243	$ 112,063,630	$7,511,068
Levy Impact (%)		30%	15%	

Currently the County has $4 million in debt financing to support bridge infrastructure, and it is an important consideration in moving forward to address the pending peak for the County's bridge and culvert program, and potentially a consolidated County administration building. Debt alone will not solve our pending asset management deficits, it will have to be an integral part of a four pronged approach – senior government funding, reserves, debt and County levy.

Significant challenges remain for the County in addressing our needs moving forward, however, staff require time and resources to truly assess what the needs are going to be 10-30 years down the road. This includes asset management software, ongoing building

condition assessments, and also allocating a portion of the current gas tax funding to support our asset management needs.

FINANCING STRATEGY – 2022 - 2041

Staff have developed a financing strategy which will effectively address the upcoming infrastructure needs through to 2041. This strategy uses a combination of annual County levy increases for its capital, reserves

The table below looks at a potential scenario which can be used to address the County's asset needs in the long term. Leveraging reserves, County levy with annual levy increases, senior government funding, and debenture financing the County should be able to adequately fund the short and long term needs of the County.

Assumptions used in the Financing Strategy

- Extrapolated needs for Homes for the Aged, Housing and Property Services, and EMS based on 10 year averages.
- Does not included Public Works Fleet, as that is self-funding
- Based on limited 2022 valuations.
- Consistent annual funding levels for OCIF and Gas Tax Funding
- Does not include any costs for a new Administration Facility
- Reserve usage is from the Public Works reserve and three Capital reserves
- Debentures – Serial, 20 year term for amortization, a 4.3% interest rate consistent for each year
- Capital deferrals and bring forwards will be required as part of the strategy to smooth out peak years.
- The capital requirements does not include any costs for the small culverts, once included into the plan, will increase the annual expenditure requirements.

The following table shows the estimated capital needs for a 20 year period – 2022 – 2041. Total capital needs are estimated at $555,499,000, with the peak needs in 2028-2029. For the purposed of the strategy, some costs from these peak periods have been deferred through to 2038 in order to effectively manage peak needs.

Year	Capital Needs	Deferrals (illustrative)	Inflation	Revised Capital Needs
2022	$ 16,506,072			$ 16,506,072
2023	$ 21,929,600		$ 657,888	$ 22,587,488
2024	$ 19,328,632		$ 1,177,114	$ 20,505,746
2025	$ 16,352,883		$ 1,516,354	$ 17,869,237
2026	$ 16,023,125	$ 3,000,000	$ 2,387,570	$ 21,410,695
2027	$ 17,966,533	$ 3,000,000	$ 3,339,425	$ 24,305,958
2028	$ 25,420,535	$ (6,000,000)	$ 3,768,599	$ 23,189,134
2029	$ 29,597,282	$ (12,000,000)	$ 4,045,155	$ 21,642,437
2030	$ 21,426,178		$ 5,715,863	$ 27,142,041
2031	$ 22,781,045		$ 6,943,052	$ 29,724,097
2032	$ 20,223,025	$ 4,000,000	$ 8,330,695	$ 32,553,720
2033	$ 15,343,275	$ 4,000,000	$ 7,432,341	$ 26,775,616
2034	$ 18,051,125	$ 4,000,000	$ 9,388,507	$ 31,439,632
2035	$ 26,091,075	$ (5,000,000)	$ 9,881,880	$ 30,972,955
2036	$ 24,535,225		$ 12,576,504	$ 37,111,729
2037	$ 19,689,825	$ 2,500,000	$ 12,381,199	$ 34,571,024
2038	$ 18,509,125	$ 2,500,000	$ 12,704,353	$ 33,713,478
2039	$ 20,850,225		$ 13,612,020	$ 34,462,245
2040	$ 19,354,125		$ 13,594,977	$ 32,949,102
2041	$ 20,568,375		$ 15,498,395	$ 36,066,770
TOTAL	**$ 410,547,285**			**$ 555,499,176**

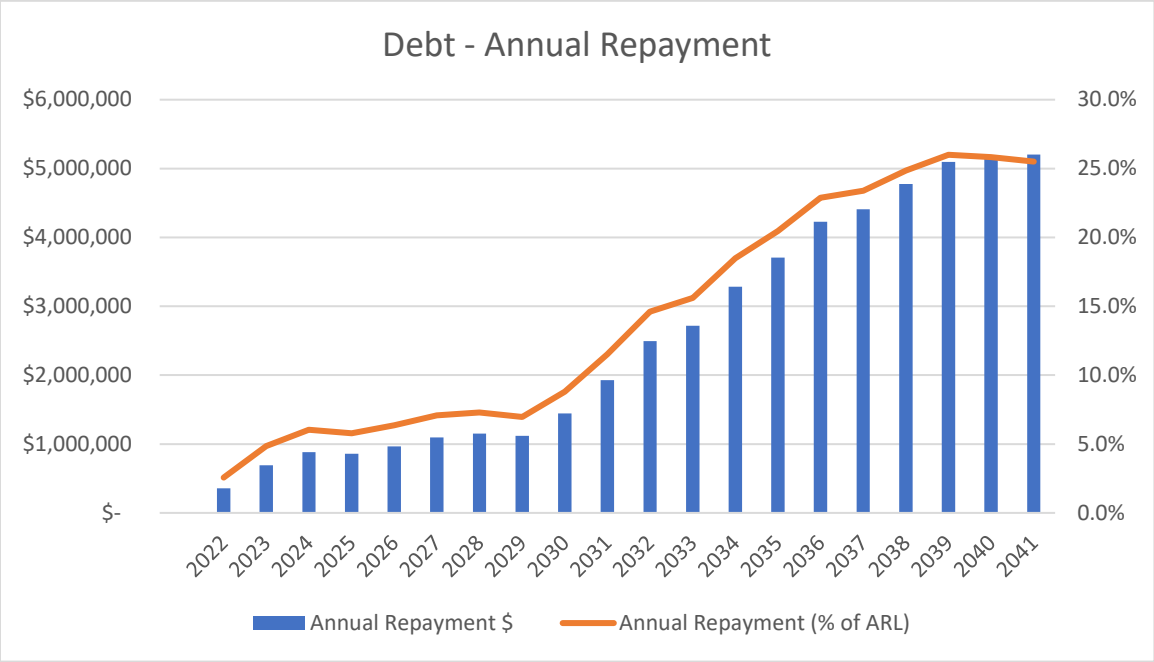
The following table illustrates one scenario developed by staff which addresses the future requirements using a combination of Levy, Senior Government Funding, Reserves and Debentures. The current funding in the County's budget is insufficient for the upcoming needs, therefore, staff have applied an average annual increase of 2.16% in annual capital funding through to 2041. This increases the capital budget from $7,300,000 (current) to $25,548,000 in annual funding from the County levy. Reserve usage of $36 million and $68.3 million in debentures are required to address the upcoming capital needs.

			Financing			
Year	Adjusted Capital		Capital Funding - Levy	Senior Government	Reserves	Debentures
	$ -					
2022	$ 16,506,072		$ 7,300,000	$ 6,276,000		
2023	$ 22,587,488		$ 8,030,000	$ 6,276,000	$ 4,545,488	$ 3,736,000
2024	$ 20,505,746		$ 8,833,000	$ 6,358,000	$ 3,100,000	$ 2,214,746
2025	$ 17,869,237		$ 9,716,000	$ 6,358,000	$ 1,795,237	$ -
2026	$ 21,410,695		$ 10,688,000	$ 6,358,000	$ 3,000,000	$ 1,364,695
2027	$ 24,305,958		$ 11,757,000	$ 6,358,000	$ 4,500,000	$ 1,690,958
2028	$ 23,189,134		$ 12,933,000	$ 6,358,000	$ 3,000,000	$ 898,134
2029	$ 21,642,437		$ 14,226,000	$ 6,358,000	$ 1,058,437	$ -
2030	$ 27,142,041		$ 14,937,000	$ 6,358,000	$ 2,000,000	$ 3,847,041
2031	$ 29,724,097		$ 15,684,000	$ 6,358,000	$ 2,000,000	$ 5,682,097
2032	$ 32,553,720		$ 16,468,000	$ 6,358,000	$ 3,000,000	$ 6,727,720
2033	$ 26,775,616		$ 17,291,000	$ 6,358,000		$ 3,126,616
2034	$ 31,439,632		$ 18,156,000	$ 6,358,000		$ 6,925,632
2035	$ 30,972,955		$ 19,064,000	$ 6,358,000		$ 5,550,955
2036	$ 37,111,729		$ 20,017,000	$ 6,358,000	$ 4,000,000	$ 6,736,729
2037	$ 34,571,024		$ 21,018,000	$ 6,358,000	$ 4,000,000	$ 3,195,024
2038	$ 33,713,478		$ 22,069,000	$ 6,358,000		$ 5,286,478
2039	$ 34,462,245		$ 23,172,000	$ 6,358,000		$ 4,932,245
2040	$ 32,949,102		$ 24,331,000	$ 6,358,000		$ 2,260,102
2041	$ 36,066,770		$ 25,548,000	$ 6,358,000		$ 4,160,770
TOTAL	**$ 555,499,176**		**$ 321,238,000**	**$ 126,996,000**	**$ 35,999,162**	**$ 68,335,942**

The following table illustrates the debenture financing, including, new annual debt, repayments, annual accumulated balance and interest. It also illustrates the annual repayment and the annual repayment in relation to the Annual Repayment Limit as established by the Ministry. The County is recommending a total Annual Repayment Limit of 50% of the established limit with 25% allocated to Asset Management Requirements and an additional 25% if required to respond to emergencies, peak period asset management pressures, and/or to meet senior government funding opportunities.

Debenture - 4.3% Serial 20 year							
Year	Beginning	New	Repayment	Ending	Interest	Annual Repayment $	Annual Repayment (% of ARL)
				$ -		$ -	
2022	$ 3,800,000	$ -	$ (200,000)	$ 3,600,000	$ 159,000	$ 359,000	2.6%
2023	$ 3,600,000	$ 3,736,000	$ (386,800)	$ 6,949,200	$ 307,000	$ 693,800	4.9%
2024	$ 6,949,200	$ 2,214,746	$ (497,537)	$ 8,666,409	$ 383,000	$ 880,537	6.0%
2025	$ 8,666,409	$ -	$ (497,537)	$ 8,168,871	$ 362,000	$ 859,537	5.8%
2026	$ 8,168,871	$ 1,364,695	$ (565,772)	$ 8,967,794	$ 398,000	$ 963,772	6.4%
2027	$ 8,967,794	$ 1,690,958	$ (650,320)	$ 10,008,432	$ 444,000	$ 1,094,320	7.1%
2028	$ 10,008,432	$ 898,134	$ (695,227)	$ 10,211,340	$ 454,000	$ 1,149,227	7.3%
2029	$ 10,211,340	$ -	$ (695,227)	$ 9,516,113	$ 424,000	$ 1,119,227	7.0%
2030	$ 9,516,113	$ 3,847,041	$ (887,579)	$ 12,475,575	$ 556,000	$ 1,443,579	8.8%
2031	$ 12,475,575	$ 5,682,097	$ (1,171,684)	$ 16,985,989	$ 756,000	$ 1,927,684	11.5%
2032	$ 16,985,989	$ 6,727,720	$ (1,508,070)	$ 22,205,639	$ 987,000	$ 2,495,070	14.6%
2033	$ 22,205,639	$ 3,126,616	$ (1,664,400)	$ 23,667,855	$1,054,000	$ 2,718,400	15.6%
2034	$ 23,667,855	$ 6,925,632	$ (2,010,682)	$ 28,582,805	$1,272,000	$ 3,282,682	18.5%
2035	$ 28,582,805	$ 5,550,955	$ (2,288,230)	$ 31,845,530	$1,419,000	$ 3,707,230	20.5%
2036	$ 31,845,530	$ 6,736,729	$ (2,625,066)	$ 35,957,193	$1,603,000	$ 4,228,066	22.9%
2037	$ 35,957,193	$ 3,195,024	$ (2,784,817)	$ 36,367,400	$1,624,000	$ 4,408,817	23.4%
2038	$ 36,367,400	$ 5,286,478	$ (3,049,141)	$ 38,604,737	$1,726,000	$ 4,775,141	24.8%
2039	$ 38,604,737	$ 4,932,245	$ (3,295,754)	$ 40,241,228	$1,801,000	$ 5,096,754	26.0%
2040	$ 40,241,228	$ 2,260,102	$ (3,408,759)	$ 39,092,571	$1,754,000	$ 5,162,759	25.8%
2041	$ 39,092,571	$ 4,160,770	$ (3,416,797)	$ 39,836,544	$1,786,000	$ 5,202,797	25.5%

Based on the scenario above, the County will maintain its annual repayment limit within the established goal of 50%, with the peak debt in 2039 at 26% of our annual repayment limit. This will still allow the County to maintain some flexibility for additional debt for emergencies or other requirements. The chart below illustrates the annual repayment in both dollars and %.



The County currently has approximately $31 million in its reserves that can be considered applicable for capital expenditures included in this plan. These funds will be required to be leveraged over the next 15 years in order to assist in addressing our asset management funding pressures to allow the capital levy funding to increase to required levels. Based on current scenarios, the capital reserves are not expected to replenish over the next 20 years.

County Capital Reserve Usage				
Year	**Beginning**	**Interest**	**Usage**	**Ending**
2022	$31,000,000	$ 465,000	$ -	$31,465,000
2023	$31,465,000	$ 471,975	$ (4,545,488)	$27,391,487
2024	$27,391,487	$ 410,872	$ (3,100,000)	$24,702,359
2025	$24,702,359	$ 555,803	$ (1,795,237)	$23,462,925
2026	$23,462,925	$ 527,916	$ (3,000,000)	$20,990,841
2027	$20,990,841	$ 472,294	$ (4,500,000)	$16,963,135
2028	$16,963,135	$ 381,671	$ (3,000,000)	$14,344,806
2029	$14,344,806	$ 322,758	$ (1,058,437)	$13,609,127
2030	$13,609,127	$ 306,205	$ (2,000,000)	$11,915,332
2031	$11,915,332	$ 268,095	$ (2,000,000)	$10,183,427
2032	$10,183,427	$ 229,127	$ (3,000,000)	$ 7,412,554
2033	$ 7,412,554	$ 166,782	$ -	$ 7,579,336
2034	$ 7,579,336	$ 170,535	$ -	$ 7,749,871
2035	$ 7,749,871	$ 174,372	$ -	$ 7,924,243
2036	$ 7,924,243	$ 178,295	$ (4,000,000)	$ 4,102,538
2037	$ 4,102,538	$ 92,307	$ (4,000,000)	$ 194,845
2038	$ 194,845	$ 4,384	$ -	$ 199,229
2039	$ 199,229	$ 4,483	$ -	$ 203,712
2040	$ 203,712	$ 4,584	$ -	$ 208,296
2041	$ 208,296	$ 4,687	$ -	$ 212,983

There will some impacts to the County levy as a result of increased capital funding being raised through the annual budget process, as well funding for the annual repayment (principal and interest). The annual levy is required to be increased by approximately 2.16% annually through to 2041 in order to finance the required asset management expenditures. Given that

the plan does not include small culverts, it would be expected that this requirement will increase. These estimates will be updated as our asset management plan evolves.

All other operating budget increases or funding cuts excluded, it is estimated that the County levy will be required to increase to $68.8 million by 2041 in order to finance our infrastructure.

County Levy Impact					
Year	**Annual Capital Funding Increase**	**Annual Repayment Increase**	**County Levy Increase**	**County Levy**	**Annual Levy % Increase**
2022	$ -	$ 359,000	$ 359,000	$46,013,750	
2023	$ 730,000	$ 334,800	$ 1,064,800	$47,078,550	2.31%
2024	$ 803,000	$ 186,737	$ 989,737	$48,068,287	2.10%
2025	$ 883,000	$ (21,000)	$ 862,000	$48,930,287	1.79%
2026	$ 972,000	$ 104,235	$ 1,076,235	$50,006,522	2.20%
2027	$ 1,069,000	$ 130,548	$ 1,199,548	$51,206,070	2.40%
2028	$ 1,176,000	$ 54,907	$ 1,230,907	$52,436,977	2.40%
2029	$ 1,293,000	$ (30,000)	$ 1,263,000	$53,699,977	2.41%
2030	$ 711,000	$ 324,352	$ 1,035,352	$54,735,329	1.93%
2031	$ 747,000	$ 484,105	$ 1,231,105	$55,966,434	2.25%
2032	$ 784,000	$ 567,386	$ 1,351,386	$57,317,820	2.41%
2033	$ 823,000	$ 223,331	$ 1,046,331	$58,364,150	1.83%
2034	$ 865,000	$ 564,282	$ 1,429,282	$59,793,432	2.45%
2035	$ 908,000	$ 424,548	$ 1,332,548	$61,125,980	2.23%
2036	$ 953,000	$ 520,836	$ 1,473,836	$62,599,816	2.41%
2037	$ 1,001,000	$ 180,751	$ 1,181,751	$63,781,567	1.89%
2038	$ 1,051,000	$ 366,324	$ 1,417,324	$65,198,891	2.22%
2039	$ 1,103,000	$ 321,612	$ 1,424,612	$66,623,504	2.19%
2040	$ 1,159,000	$ 66,005	$ 1,225,005	$67,848,509	1.84%
2041	$ 1,217,000	$ 40,039	$ 1,257,039	$69,105,547	1.85%
Average increase to 2041					2.16%

APPENDIX A – Public Works Expenditures (2021 – 2029)

APPENDIX B – Public Works Pavement Management Strategy

(note, this will be updated in the future for Council approval)

APPENDIX C – Asset Levels of Service – Risk Analysis

APPENDIX A

2022 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$2,557,500		
RB0011:County Rd 15 (Londesborough Road) - 15-06.9 (Westerhout Bridge)	1960	65	$757,000	**MajorMtce** Barrier/Parapet Replacement	$200,000	100%	**$200,000**	Recommended	Central Huron AUBURN
				MajorMtce Patch, Waterproof, Pave	$110,000	100%	**$110,000**	Recommended	
RB0028:County Rd 15 (Londesborough Road) - 15-03.6 (Bob Edgar Bridge)	1989	74	$5,195,000	**ENGdesign** Engineering Design Work	$30,000	100%	**$30,000**	Recommended	ACW AUBURN
RB0030:County Rd 15 (Londesborough Road) - 15-14.6 (Wallace Bridge)	1956	58	$1,169,000	**MajorMtce** Barrier/Parapet Replacement	$200,000	100%	**$200,000**	Recommended	Central Huron AUBURN
				MajorMtce Patch, Waterproof, Pave	$110,000	100%	**$110,000**	Recommended	
RB0043:County Rd 16 (Newry Road) - 16-20.0 (Cunningham Bridge)	1993	73	$3,947,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	Huron East WROXETER
RB0052:County Rd 13 (Bayfield Road) - 13-09.7 (Tricks Creek Bridge)	1964	70	$702,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	Central Huron ZURICH
RB0060:County Rd 22 (Donnybrook Line) - 22-06.4 (Donnybrook Bridge)	1965	69	$4,633,000	**ENGdesign** Engineering Design Work	$100,000	100%	**$100,000**	Recommended	ACW AUBURN
RB0065:County Rd 31 (Sharpes Creek Line) - 31-26.6 (Foresters Bridge)	1984	70	$5,946,000	**RSP** Patch girder ends.	$0	100%	**$0**	Recommended	ACW AUBURN
				EIR Replace slope protection at south abutment	$0	100%	**$0**	Recommended	
				PWP Patch, Waterproof and Pave	$375,000	100%	**$375,000**	Recommended	
				TJR Transverse Exp Joint Replacement	$125,000	100%	**$125,000**	Recommended	
RB0069:County Rd 86 (Amberley Road) - 86-32.8 (Zetland Bridge)	1965	70	$3,987,000	**CSS** Coat Structural Steel	$550,000	100%	**$550,000**	Approved	North Huron AUBURN
				PWP Patch, waterproof, and pave.	$200,000	100%	**$200,000**	Approved	
				RRH Replace curb and barrier	$400,000	100%	**$400,000**	Approved	
				RSB Rehabilitate Substructure	$100,000	100%	**$100,000**	Approved	
RB0091:Line 17 - Boundary Bridge #24	1979	68	$345,500	**IAG** Install Approach Guiderail	$35,000	50%	**$17,500**	Recommended	South Huron ZURICH

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2022 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$985,000		
RB0131:County Rd 84 (Zurich Main Street) - 84-06.9	1955	60	$225,000	**cRSL** Replace Culvert - Same Location	$250,000	100%	**$250,000**	Approved	Bluewater ZURICH
RB0150:County Rd 17 (Winthrop Road) - 17-06.1	1970	35	$350,000	**cRSL** Replace Culvert - Same Location	$400,000	100%	**$400,000**	Approved	Huron East AUBURN
RB0163:County Rd 8 (Base Line/Maitland Terrace) - 08-14.0	1970	45	$225,000	**cRSL** Replace Culvert - Same Location	$200,000	100%	**$200,000**	Approved	Central Huron AUBURN
RB0186:County Rd 86 (Amberley Road) - 86-02.4	1930	41	$410,000	**cENGdesign** Engineering Design Work	$120,000	50%	**$60,000**	Approved	ACW AUBURN
RB0261:County Rd 15 (Kinburn Line) - 15-22.1	1975	37	$488,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	Central Huron AUBURN
RB0400:County Rd 81 (Grand Bend Line) - 81-07.7	1955	51	$732,000	**cRSB** Rehabilitate Substructure	$25,000	100%	**$25,000**	Recommended	South Huron ZURICH

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2022	PW Buildings	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
								$34,500		
BB001:County Rd 84 (Zurich-Hensall Road) - Zurich Main Shop and Bulk Storage Shed		2013	80	$8,100,000	**bADS** Air Duct Systems	$7,500	100%	**$7,500**	Recommended	ZURICH
BB004:County Rd 22 (Donnybrook Line) - Auburn Main Shop		1981	70	$4,500,000	**bACF** Automated Ceiling Fans	$12,000	100%	**$12,000**	Recommended	AUBURN
BB007:County Rd 87 (Harriston Road) - Wroxeter Main Shop		1981	75	$3,300,000	**bHGS** Heat Generating Systems	$10,000	100%	**$10,000**	Recommended	WROXETER
					bHGS Heat Generating Systems	$5,000	100%	**$5,000**	Recommended	

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2022 PW Weather Stations	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$20,000		
BW02:County Rd 86 (Amberley Road) - 42658 AMBERLEY RD		0	$120,000	**wRS** Replace Camera	$5,000	100%	**$5,000**	Recommended	
				wRI Replace Instruments	$15,000	100%	**$15,000**	Recommended	

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2022 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$7,647,162		
RD0504-00:County Rd 5 (Mt. Carmel Drive) - (to) Airport Line-to-Highway 4	1989	74	$750,000	**DMS** Double Micro-Surfacing	$105,626	50%	**$52,813**	Recommended	South Huron
RD2101-00:County Rd 21 (Airport Line) - (to) Huron Park Rd-to-CountyRoad 10 (Crediton Road)	1998	72	$696,000	**DMS** Double Micro-Surfacing	$80,090	100%	**$80,090**	Recommended	South Huron
RD3004-00:County Rd 30 (Fordwich Line) - (to) CountyRoad 87 (Harrison Road) -to-CountyRoad 7 (Howick-Turnberry Road)	1984	60	$4,500,000	**CIR** Cold-In-Place Recycling	$1,137,406	100%	**$1,137,406**	Recommended	Howick
RD3005-00:County Rd 30 (Fordwich Line) - (to) CountyRoad 7 (Howick-Turnberry Road)-to-Howick-Minto Line (Wellington Boundary)	1988	60	$5,900,000	**CIR** Cold-In-Place Recycling	$1,373,051	100%	**$1,373,051**	Recommended	Howick
RD3101-00:County Rd 31 (Parr Line) - (to) CountyRoad 84 (Zurich-Hensall Road) -to-Kippen Road	2000	75	$1,636,000	**DMS** Double Micro-Surfacing	$188,259	100%	**$188,259**	Recommended	Bluewater
RD8402-00:County Rd 84 (Zurich Main Street) - (to) 162m West of Walnut St. (W. Limit Zurich)-to-150m East of East St. (E. Limit Zurich)	2000	49	$3,216,000	**U-REC** Urban Reconstruction	$2,808,000	100%	**$2,808,000**	Pending	Bluewater
RD8403-01:County Rd 84 (Zurich-Hensall Road) - (to) 150m East of East St. (E. Limit Zurich)-to-CountyRoad 31 (Parr Line)	2000	67	$2,750,000	**CIR** Cold-In-Place Recycling	$926,558	100%	**$926,558**	Recommended	Bluewater
RD8403-02:County Rd 84 (Zurich-Hensall Road) - (to) CountyRoad 31 (Parr Line) -to-190m West of Elizabeth St. (W. Limit Hensall)	2000	74	$4,000,000	**CIR** Cold-In-Place Recycling	$1,080,985	100%	**$1,080,985**	Recommended	Bluewater

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2022 Rural Ditches	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$180,000		
RT00-EST: - Estimated Rural Ditches		0	$0	**dDC** Estimated 35km each year	$150,000	100%	**$150,000**	Recommended	
				dBC Brushing	$30,000	100%	**$30,000**	Recommended	

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2023 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$2,460,000		
RB0003:Nile Road - Boundary Bridge #11	1970	71	$1,160,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	ACW AUBURN
RB0028:County Rd 15 (Londesborough Road) - 15-03.6 (Bob Edgar Bridge)	1989	74	$5,195,000	**RCS** Remove construction joints	$150,000	100%	**$150,000**	Recommended	ACW AUBURN
				TJR Transverse Exp Joint Seal Replacement	$80,000	100%	**$80,000**	Recommended	
				PWP Patch, Waterproof, Pave	$350,000	100%	**$350,000**	Recommended	
RB0040:County Rd 7 (Howick-Turnberry Road) - 07-00.9 (Lower Maitland)	1963	70	$2,714,000	**ENGdesign** Engineering Design Work	$40,000	100%	**$40,000**	Recommended	Morris Turnberry WINGHAM
RB0041:County Rd 7 (Howick-Turnberry Road) - 07-04.8 (Fitchs Bridge)	1957	69	$3,767,000	**ENGdesign** Engineering Design Work	$35,000	100%	**$35,000**	Recommended	Morris Turnberry WROXETER
RB0043:County Rd 16 (Newry Road) - 16-20.0 (Cunningham Bridge)	1993	73	$3,947,000	**MajorMtce** Patch, Waterproof, Pave	$145,000	100%	**$145,000**	Recommended	Huron East WROXETER
				MajorMtce Transverse Exp Joint Replacement	$80,000	100%	**$80,000**	Recommended	
RB0052:County Rd 13 (Bayfield Road) - 13-09.7 (Tricks Creek Bridge)	1964	70	$702,000	**MajorMtce** Barrier/Parapet Replacement	$200,000	100%	**$200,000**	Recommended	Central Huron ZURICH
				MajorMtce Patch, Waterproof, Pave	$125,000	100%	**$125,000**	Recommended	
RB0060:County Rd 22 (Donnybrook Line) - 22-06.4 (Donnybrook Bridge)	1965	69	$4,633,000	**TJR** Transverse Exp Joint Replacement	$100,000	100%	**$100,000**	Recommended	ACW AUBURN
				RSP Rehabilitate Superstructure	$50,000	100%	**$50,000**	Recommended	
				RSB Rehabilitate Substructure	$75,000	100%	**$75,000**	Recommended	
				PWP Patch, Waterproof, Pave	$275,000	100%	**$275,000**	Recommended	
				RRH Replace barrier walls	$350,000	100%	**$350,000**	Recommended	
RB0083:Bannockburn Line - Boundary Bridge #14	1973	74	$1,737,000	**ENGdesign** Engineering Design Work	$35,000	100%	**$35,000**	Recommended	Bluewater ZURICH
RB0090:Line 183 - Boundary Bridge #23	1961	44	$325,000	**RSL** Replace Bridge - Same Location	$700,000	50%	**$350,000**	Recommended	Huron East ZURICH

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2023 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$1,035,000		
RB0186:County Rd 86 (Amberley Road) - 86-02.4	1930	41	$410,000	**RSL** Replace Culvert	$900,000	50%	**$450,000**	Recommended	ACW AUBURN
RB0227:County Rd 8 (Base Line) - 08-04.6	1970	75	$275,000	**cSPI** Scour Protection Improvements	$20,000	100%	**$20,000**	Recommended	Central Huron AUBURN
RB0261:County Rd 15 (Kinburn Line) - 15-22.1	1975	37	$488,000	**cRSL** Replace Culvert - Same Location	$400,000	100%	**$400,000**	Recommended	Central Huron AUBURN
RB0332:County Rd 19(Ethel Line/Brandon Rd/Molesworth) - 19-19.9	1965	45	$125,000	**cENGdesign** Engineering Design Work	$40,000	100%	**$40,000**	Recommended	Huron East WROXETER
RB0355:County Rd 19(Ethel Line/Brandon Rd/Molesworth) - 19-15.8	1965	45	$125,000	**cENGdesign** Engineering Design Work	$35,000	100%	**$35,000**	Recommended	Huron East WROXETER
RB0358:County Rd 31 (Parr Line) - 31-06.3	1965	45	$225,000	**cENGdesign** Engineering Design Work	$40,000	100%	**$40,000**	Recommended	Bluewater ZURICH
RB0443:County Rd 87 (Harriston Road) - 87-12.0	1960	52	$312,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	Howick WROXETER

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2023 Driveway Entrances	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$5,500,000		
2390: - Estimated Residential Rural Entrances (916)		60	$8,000,000	**rRGE**	$1,000,000	100%	**$1,000,000**	Recommended	
2396: - Estimated Farm Entrances (5,092)		60	$15,300,000	**rRFE** Expect about 1500 needed in next 5 years	$4,500,000	100%	**$4,500,000**	Recommended	

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2023	PW Buildings	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
								$3,736,000		
BB001:County Rd 84 (Zurich-Hensall Road) - Zurich Main Shop and Bulk Storage Shed		2013	80	$8,100,000	**bCFR** Concrete Flooring Repair	$1,000	100%	**$1,000**	Recommended	ZURICH
					bWRR Window Replacement and Repair	$1,300	100%	**$1,300**	Recommended	
					bHGS Heat Generating Systems	$12,000	100%	**$12,000**	Recommended	
					bELS Emergency Light Systems	$4,500	100%	**$4,500**	Recommended	
BB003:County Rd 22 (Donnybrook Line) - Auburn Long Storage Shed		1986	75	$1,500,000	**bCFR** Concrete Flooring Repair	$5,000	100%	**$5,000**	Recommended	
					bSCI Special Construction Items	$5,000	100%	**$5,000**	Recommended	
BB004:County Rd 22 (Donnybrook Line) - Auburn Main Shop		1981	70	$4,500,000	**bELS** Emergency Light Systems	$4,500	100%	**$4,500**	Recommended	AUBURN
					bCFR Concrete Flooring Repair	$1,000	100%	**$1,000**	Recommended	
					bCFR Concrete Flooring Repair	$1,000	100%	**$1,000**	Recommended	
					bWRR Window Replacement and Repair	$700	100%	**$700**	Recommended	
BB009:County Rd 4 (London Road) - Wingham Salt Shed			10	$20,000	**bRPL** Building to be demolished and incorporate into new building	$600,000	100%	**$600,000**	Recommended	
BB010:County Rd 4 (London Road) - Wingham Sand Shed			20	$900,000	**bRPL** Both domes need replacement	$600,000	100%	**$600,000**	Recommended	
BB011:County Rd 4 (London Road) - Wingham Main Shop			10	$1,500,000	**bRPL** Building needs to be replaced	$2,500,000	100%	**$2,500,000**	Recommended	

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2023 PW Weather Stations	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$20,000		
BW03:County Rd 22 (Donnybrook Line) - 83091 DONNYBROOK LINE		0	$120,000	**wRS** Camera replacement	$5,000	100%	**$5,000**	Recommended	
				wRI Instrumentation replacement	$15,000	100%	**$15,000**	Recommended	

2023 PW Yards	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost $50,000	Project Status *	Municipality - Patrol
BY03:County Rd 22 (Donnybrook Line) - Auburn		0	$0	**bFDS** Fuel Distribution System	$50,000	100%	**$50,000**	Recommended	ACW

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2023 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$8,427,000		
RD0303-00:County Rd 3 (Mill Road) - (to) 330m East of CountyRoad 31 (E. Limit Varna)-to-0.5km W. of Bannockburn Bridge	2000	72	$1,200,000	**CIR** Cold-In-Place Recycling	$320,000	100%	**$320,000**	Pending	Bluewater
RD0304-00:County Rd 3 (Mill Road) - (to) 0.5km W. of Bannockburn Bridge-to-E. End of Bannockburn Bridge	2000	70	$550,000	**CIR** Cold-In-Place Recycling	$108,000	100%	**$108,000**	Pending	Bluewater
RD0305-00:County Rd 3 (Mill Road) - (to) E. End of Bannockburn Bridge-to-205m West of Taylor Line (W. Limit Brucefield)	2000	70	$2,450,000	**CIR** Cold-In-Place Recycling	$694,000	100%	**$694,000**	Pending	Bluewater
RD0701-00:County Rd 7 (Howick-Turnberry Road) - (to) CountyRoad 4 (London Road) -to-CountyRoad 12 (Belmore Line)	1991	69	$7,960,000	**CIR** Cold-In-Place Recycling	$1,862,000	100%	**$1,862,000**	Pending	Morris Turnberry
RD0702-00:County Rd 7 (Howick-Turnberry Road) - (to) CountyRoad 12 (Belmore Line) -to-Gorrie Line	1995	65	$3,200,000	**CIR** Cold-In-Place Recycling	$838,000	100%	**$838,000**	Pending	Howick
RD0703-00:County Rd 7 (Howick-Turnberry Road) - (to) Gorrie Line-to-CountyRoad 30 (Fordwich Line)	1996	65	$4,800,000	**CIR** Cold-In-Place Recycling	$1,230,000	100%	**$1,230,000**	Pending	Howick
RD8302-01:County Rd 83 (Dashwood Road) - (to) 174m west of Elma St. (W. Limit Dashwood)-to-180m East of Lane St. (E. Limit Dashwood)		80	$3,000,000	**U-REC** Urban Reconstruction	$3,375,000	100%	**$3,375,000**	Pending	Bluewater

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2023 Rural Ditches	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$1,400,000		
RT00-EST: - Estimated Rural Ditches		0	$0	**dBC** Brushing - 80 km / yr on 5 year cycle	$150,000	100%	**$150,000**	Recommended	
				dDC Estimated 35km each year	$1,250,000	100%	**$1,250,000**	Recommended	

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2024 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$1,387,500		
RB0003:Nile Road - Boundary Bridge #11	1970	71	$1,160,000	**RSP** Rehabilitate Superstructure	$40,000	100%	**$40,000**	Recommended	ACW AUBURN
				RRH Barrier/Parapet Replacement	$120,000	100%	**$120,000**	Recommended	
RB0005:County Rd 4 (London Road) - 04-08.4 (Londesborough Bridge)	1933	45	$4,500,000	**DCS** Deck Condition Survey	$40,000	100%	**$40,000**	Recommended	Central Huron AUBURN
RB0008:County Rd 3 (Mill Road) - 03-10.4 (Bannockburn Bridge)	1962	61	$2,707,000	**ENGdesign** Engineering Design Work	$110,000	100%	**$110,000**	Recommended	Bluewater ZURICH
RB0018:County Rd 28 (McIntosh Line) - 28-10.1 (Farrish Bridge)	1966	73	$894,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	Howick WROXETER
RB0026:County Rd 3 (Mill Road) - 03-18.1 (Brucefield Bridge)	2000	75	$579,000	**ENGdesign** Engineering Design Work	$25,000	100%	**$25,000**	Recommended	Huron East ZURICH
RB0040:County Rd 7 (Howick-Turnberry Road) - 07-00.9 (Lower Maitland)	1963	70	$2,714,000	**MajorMtce** Patch, Waterproof, Pave	$180,000	100%	**$180,000**	Recommended	Morris Turnberry WINGHAM
RB0041:County Rd 7 (Howick-Turnberry Road) - 07-04.8 (Fitchs Bridge)	1957	69	$3,767,000	**MajorMtce** Rehabilitate Substructure	$50,000	100%	**$50,000**	Recommended	Morris Turnberry WROXETER
				MajorMtce Rehabilitate Superstructure	$100,000	100%	**$100,000**	Recommended	
				MajorMtce Patch, Waterproof, Pave	$200,000	100%	**$200,000**	Recommended	
RB0042:County Rd 16 (Morris Road) - 16-06.3 (Hoggs Bridge)	1957	70	$2,693,000	**ENGdesign** Engineering Design Work	$30,000	100%	**$30,000**	Recommended	Morris Turnberry WROXETER
RB0053:County Rd 16 (Morris Road) - 16-02.8 (Cleggs Bridge)	1961	69	$3,270,000	**ENGdesign** Engineering Design Work	$15,000	100%	**$15,000**	Recommended	Morris Turnberry WROXETER
RB0062:County Rd 25 (Blyth Road) - 25-12.6 (Patterson/Auburn Bridge)	1954	53	$6,350,000	**DCS** Deck Condition Survey	$35,000	100%	**$35,000**	Recommended	ACW AUBURN
RB0073:County Rd 87 (Harriston Road) - 87-07.4 (Wroxeter Bridge)	1953	65	$3,338,000	**MinorMtce** Rehabilitate Substructure	$75,000	100%	**$75,000**	Recommended	Howick WROXETER
				MinorMtce Rehabilitate Superstructure	$75,000	100%	**$75,000**	Recommended	
RB0083:Bannockburn Line - Boundary Bridge #14	1973	74	$1,737,000	**RSP** Rehabilitate Superstructure	$80,000	100%	**$80,000**	Recommended	Bluewater ZURICH
				TJS Transverse Exp Joint Seal Replacement	$125,000	100%	**$125,000**	Recommended	
				WSR Wearing Surface Rehabilitation	$50,000	100%	**$50,000**	Recommended	
RB0088:Line 183 - Boundary Bridge #20	1971	72	$424,500	**ENGdesign** Engineering Design Work	$35,000	50%	**$17,500**	Recommended	Huron East ZURICH

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2024 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$1,147,500		
RB0103:County Rd 31 (Sharpes Creek Line) - 31-32.1	1975	58	$658,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	ACW AUBURN
RB0158:County Rd 14 (Perth Road 180) - 14-14.3	1975	48	$225,000	**cENGdesign** Engineering Design Work	$50,000	50%	**$25,000**	Recommended	Huron East AUBURN
RB0225:County Rd 7 (Howick-Turnberry Road) - 07-18.4	1960	68	$594,000	**cRSB** Rehabilitate Substructure	$0	100%	**$0**	Recommended	Howick WROXETER
RB0329:County Rd 14 (Perth Road 180) - 14-11.7	1970	65	$75,000	**cENGdesign** Engineering Design Work	$45,000	50%	**$22,500**	Recommended	Huron East WROXETER
RB0332:County Rd 19(Ethel Line/Brandon Rd/Molesworth) - 19-19.9	1965	45	$125,000	**cRSL** Replace Culvert - Same Location	$150,000	100%	**$150,000**	Recommended	Huron East WROXETER
RB0355:County Rd 19(Ethel Line/Brandon Rd/Molesworth) - 19-15.8	1965	45	$125,000	**cRSL** Replace Culvert - Same Location	$150,000	100%	**$150,000**	Recommended	Huron East WROXETER
RB0358:County Rd 31 (Parr Line) - 31-06.3	1965	45	$225,000	**cRSL** Replace Culvert - Same Location	$250,000	100%	**$250,000**	Recommended	Bluewater ZURICH
RB0379:County Rd 25 (Blyth Road) - 25-10.8	1960	45	$350,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	ACW AUBURN
RB0443:County Rd 87 (Harriston Road) - 87-12.0	1960	52	$312,000	**cRSL** Replace Culvert - Same Location	$450,000	100%	**$450,000**	Recommended	Howick WROXETER

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2024 PW Buildings	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$93,000		
BB002:County Rd 22 (Donnybrook Line) - Auburn Bulk Sand and Salt Shed	2014	80	$10,500,000	**bELS** Emergency Light Systems	$4,500	100%	**$4,500**	Recommended	AUBURN
BB004:County Rd 22 (Donnybrook Line) - Auburn Main Shop	1981	70	$4,500,000	**bDWH** Domestic Water Heaters	$2,000	100%	**$2,000**	Recommended	AUBURN
				bHGS Heat Generating Systems	$15,000	100%	**$15,000**	Recommended	
				bHGS Heat Generating Systems	$2,000	100%	**$2,000**	Recommended	
				bPFR Plumbing Fixtures and Repairs	$2,500	100%	**$2,500**	Recommended	
				bSCI Special Construction Items	$10,000	100%	**$10,000**	Recommended	
				bEVS Exhaust Ventilation Systems	$5,000	100%	**$5,000**	Recommended	
				bEVS Exhaust Ventilation Systems	$5,000	100%	**$5,000**	Recommended	
				bEVS Exhaust Ventilation Systems	$4,000	100%	**$4,000**	Recommended	
				bEVS Exhaust Ventilation Systems	$6,000	100%	**$6,000**	Recommended	
				bEVS Exhaust Ventilation Systems	$2,000	100%	**$2,000**	Recommended	
				bESD Electrical Service and Distribution	$15,000	100%	**$15,000**	Recommended	
BB005:County Rd 87 (Harriston Road) - Wroxeter Bulk Sand and Salt Shed	2007	80	$3,312,500	**bPFR** Plumbing Fixtures and Repairs	$2,000	100%	**$2,000**	Recommended	WROXETER
BB007:County Rd 87 (Harriston Road) - Wroxeter Main Shop	1981	75	$3,300,000	**bEVS** Exhaust Ventilation Systems	$2,000	100%	**$2,000**	Recommended	
				bELS Emergency Light Systems	$4,500	100%	**$4,500**	Recommended	
				bEDR Exterior Door Replacement and Repair	$7,500	100%	**$7,500**	Recommended	
				bACF Automated Ceiling Fans	$4,000	100%	**$4,000**	Recommended	

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2024 PW Yards	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$350,000		
BY04:County Rd 84 (Zurich-Hensall Road) - Zurich		0	$0	**bPLA** Parking Lot Area	$300,000	100%	**$300,000**	Recommended	Bluewater
				bSWC Storm Water Collection	$50,000	100%	**$50,000**	Recommended	

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2024 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$5,294,450		
RD8303-01:County Rd 83 (Dashwood Road) - (to) 180m East of Lane St. (E. Limit Dashwood)-to-CountyRoad 2 (Goshen Line)		73	$980,000	**CIR** Cold-In-Place Recycling	$266,000	100%	**$266,000**	Pending	Bluewater
RD8303-02:County Rd 83 (Dashwood Road) - (to) CountyRoad 2 (Goshen Line) -to-462m West of Francis St. (W. Limit Exeter)		73	$5,820,000	**CIR** Cold-In-Place Recycling	$1,772,700	100%	**$1,772,700**	Pending	Bluewater
RD8304-00:County Rd 83 (Thames Road West) - (to) 462m West of Francis St. (W. Limit Exeter)-to-Highway 4	199	64	$2,472,000	**U-REC** Urban Reconstruction	$1,917,000	100%	**$1,917,000**	Pending	South Huron
RD8602-01:County Rd 86 (Amberley Road) - (to) 125m East of Walter St. (E. Limit Lucknow)-to-CountyRoad 22 (Donnybrook Line)	1995	67	$1,650,000	**CIR** Cold-In-Place Recycling	$1,567,500	50%	**$783,750**	Pending	ACW
RD8602-02:County Rd 86 (Amberley Road) - (to) CountyRoad 22 (Donnybrook Line) -to-Beecroft Line	1995	46	$370,000	**CIR** Cold-In-Place Recycling	$370,000	50%	**$185,000**	Pending	North Huron
RD8602-03:County Rd 86 (Amberley Road) - (to) Beecroft Line-to-Norman Line	1995	45	$740,000	**CIR** Cold-In-Place Recycling	$370,000	100%	**$370,000**	Pending	North Huron

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2025 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$3,097,500		
RB0001:County Rd 83 (Thames Road) - 83-25.0 (Ausable River East Bridge)	1948	59	$1,297,000	**ENGdesign** Engineering Design Work	$150,000	100%	**$150,000**	Recommended	South Huron ZURICH
RB0008:County Rd 3 (Mill Road) - 03-10.4 (Bannockburn Bridge)	1962	61	$2,707,000	**CDR** Complete Superstructure Replacement	$2,000,000	100%	**$2,000,000**	Recommended	Bluewater ZURICH
RB0009:County Rd 17 (Winthrop Road) - 17-06.4 (Winthrop Bridge)	1945	65	$1,269,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	Huron East AUBURN
RB0012:County Rd 8 (Base Line) - 08-09.2 (Sheppards Bridge)	1950	64	$687,000	**MinorMtce** Concrete Deck Soffit Repairs	$85,000	100%	**$85,000**	Recommended	Central Huron AUBURN
RB0018:County Rd 28 (McIntosh Line) - 28-10.1 (Farrish Bridge)	1966	73	$894,000	**MajorMtce** Barrier/Parapet Replacement	$110,000	100%	**$110,000**	Recommended	Howick WROXETER
				MajorMtce Patch, Waterproof, Pave	$105,000	100%	**$105,000**	Recommended	
RB0026:County Rd 3 (Mill Road) - 03-18.1 (Brucefield Bridge)	2000	75	$579,000	**MajorMtce** Patch, Waterproof, Pave	$105,000	100%	**$105,000**	Recommended	Huron East ZURICH
RB0033:County Rd 1 (Lucknow Line) - 01-29.6 (Beckers Bridge)	1960	66	$1,123,000	**ENGdesign** Engineering Design Work	$25,000	100%	**$25,000**	Recommended	ACW AUBURN
RB0042:County Rd 16 (Morris Road) - 16-06.3 (Hoggs Bridge)	1957	70	$2,693,000	**PWP** Patch, Waterproof, Pave	$250,000	100%	**$250,000**	Recommended	Morris Turnberry WROXETER
RB0048:County Rd 12 (Belmore Line) - 12-57.3 (Salem Creek Bridge)	1997	78	$718,000	**ENGdesign** Engineering Design Work	$15,000	100%	**$15,000**	Recommended	Howick WROXETER
RB0053:County Rd 16 (Morris Road) - 16-02.8 (Cleggs Bridge)	1961	69	$3,270,000	**PWP** Patch, Waterproof, Pave	$215,000	100%	**$215,000**	Recommended	Morris Turnberry WROXETER
RB0089:Line 183 - Boundary Bridge #22	1960	63	$320,500	**ENGdesign** Engineering Design Work	$35,000	50%	**$17,500**	Recommended	Huron East ZURICH

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2025 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$1,325,000		
RB0103:County Rd 31 (Sharpes Creek Line) - 31-32.1	1975	58	$658,000	**cRSL** Replace Culvert - Same Location	$400,000	100%	**$400,000**	Recommended	ACW AUBURN
RB0143:County Rd 20 (Belgrave Road) - 20-28.0	1975	55	$250,000	**cENGdesign** Engineering Design Work	$40,000	100%	**$40,000**	Recommended	North Huron AUBURN
RB0158:County Rd 14 (Perth Road 180) - 14-14.3	1975	48	$225,000	**cRSL** Replace Culvert - Same Location	$450,000	50%	**$225,000**	Recommended	Huron East AUBURN
RB0182:County Rd 84 (Zurich-Hensall Road) - 84-09.0	1950	34	$525,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	Bluewater ZURICH
RB0329:County Rd 14 (Perth Road 180) - 14-11.7	1970	65	$75,000	**cRSL** Replace Culvert - Same Location	$150,000	50%	**$75,000**	Recommended	Huron East WROXETER
RB0341:County Rd 13 (Bayfield Road) - 13-08.7	1970	55	$150,000	**cENGdesign** Engineering Design Work	$35,000	100%	**$35,000**	Recommended	Bluewater AUBURN
RB0379:County Rd 25 (Blyth Road) - 25-10.8	1960	45	$350,000	**cRSL** Replace Culvert - Same Location	$500,000	100%	**$500,000**	Recommended	ACW AUBURN

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2025 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$5,784,100		
RD0203-02:County Rd 2 (Goshen Street South) - (to) 120m South of South St. (S. Limit Zurich)-to-CountyRoad 84 (Zurich-Hensall Road)	1981	62	$1,008,000	**U-REC** Urban Reconstruction	$1,008,000	100%	**$1,008,000**	Pending	Bluewater
RD1303-00:County Rd 13 (Bayfield Road) - (to) 200m W. of Telephone Rd-to-Devon Street (S. Limit Clinton)	1984	61	$696,000	**M&P1L** Mill 50 mm - Pave 50 mm	$63,800	100%	**$63,800**	Pending	Central Huron
RD8404-00:County Rd 84 (King Street) - (to) 190m West of Elizabeth St. (W. Limit Hensall)-to-Highway 4	2000	69	$2,640,000	**U-REC** Urban Reconstruction	$2,970,000	100%	**$2,970,000**	Pending	Bluewater
RD8601-00:County Rd 86 (Amberley Road) - (to) Highway 21-to-310m West of Ross St. (W. Limit Lucknow)	1995	69	$3,668,000	**CIR** Cold-In-Place Recycling	$3,484,600	50%	**$1,742,300**	Pending	ACW

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2026 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$1,390,000		
RB0009:County Rd 17 (Winthrop Road) - 17-06.4 (Winthrop Bridge)	1945	65	$1,269,000	**RCS** Rehabilitation / Replacement of Safety Curbs / Sidewalks	$75,000	100%	**$75,000**	Recommended	Huron East AUBURN
				PWP Patch, Waterproof, Pave	$150,000	100%	**$150,000**	Recommended	
				RSP Patch soffit	$0	100%	**$0**	Recommended	
RB0033:County Rd 1 (Lucknow Line) - 01-29.6 (Beckers Bridge)	1960	66	$1,123,000	**PWP** Patch, Waterproof, Pave	$250,000	100%	**$250,000**	Recommended	ACW AUBURN
RB0035:County Rd 4 (London Road) - 04-32.9	1960	60	$3,490,000	**ENGdesign** Engineering Design Work	$275,000	100%	**$275,000**	Recommended	North Huron AUBURN
RB0036:County Rd 4 (London Road) - 04-33.2	1960	62	$2,190,000	**ENGdesign** Engineering Design Work	$250,000	100%	**$250,000**	Recommended	North Huron AUBURN
RB0048:County Rd 12 (Belmore Line) - 12-57.3 (Salem Creek Bridge)	1997	78	$718,000	**PWP** Patch, Waterproof, Pave	$150,000	100%	**$150,000**	Recommended	Howick WROXETER
RB0059:County Rd 20 (Belgrave Road) - 20-24.6 (Marnoch Bridge)	1966	71	$4,633,000	**ENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	North Huron AUBURN
RB0088:Line 183 - Boundary Bridge #20	1971	72	$424,500	**RRH** Barrier/Parapet Replacement	$125,000	50%	**$62,500**	Recommended	Huron East ZURICH
				RSP Rehabilitate Superstructure	$50,000	50%	**$25,000**	Recommended	
				IAG Install Approach Guiderail	$25,000	50%	**$12,500**	Recommended	
RB0089:Line 183 - Boundary Bridge #22	1960	63	$320,500	**RRH** Barrier/Parapet Replacement	$100,000	50%	**$50,000**	Recommended	Huron East ZURICH
				RSP Rehabilitate Superstructure	$25,000	50%	**$12,500**	Recommended	
				IAG Install Approach Guiderail	$25,000	50%	**$12,500**	Recommended	
RB0091:Line 17 - Boundary Bridge #24	1979	68	$345,500	**ENGdesign** Engineering Design Work	$30,000	50%	**$15,000**	Recommended	South Huron ZURICH

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2026 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$975,000		
RB0143:County Rd 20 (Belgrave Road) - 20-28.0	1975	55	$250,000	**cRSL** Replace Culvert - Same Location	$250,000	100%	**$250,000**	Recommended	North Huron AUBURN
RB0182:County Rd 84 (Zurich-Hensall Road) - 84-09.0	1950	34	$525,000	**cRSL** Replace Culvert - Same Location	$525,000	100%	**$525,000**	Recommended	Bluewater ZURICH
RB0341:County Rd 13 (Bayfield Road) - 13-08.7	1970	55	$150,000	**cRSL** Replace Culvert - Same Location	$150,000	100%	**$150,000**	Recommended	Bluewater AUBURN
RB0398:County Rd 81 (Grand Bend Line) - 81-03.5	1970	66	$787,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	South Huron ZURICH

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2026 PW Yards	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$125,000		
BY02:County Rd 87 (Harriston Road) - Wroxeter		0	$0	**bPLA** Parking Lot Area	$62,500	100%	**$62,500**	Recommended	Howick
BY03:County Rd 22 (Donnybrook Line) - Auburn		0	$0	**bPLA** Parking Lot Area	$62,500	100%	**$62,500**	Recommended	ACW

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2026 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$6,192,000		
RD0302-00:County Rd 3 (Mill Road) - (to) 155m west of CountyRoad 31 (W. Limit Varna)-to-330m East of CountyRoad 31 (E. Limit Varna)	1988	78	$1,200,000	**U-REC** Urban Reconstruction	$1,350,000	100%	**$1,350,000**	Pending	Bluewater
RD0402-00:County Rd 4 (London Road) - (to) CountyRoad 8 (Base Line)-to-216m S of CountyRoad 15 (S. Limit Londesborough)	1984	73	$7,000,000	**CIR** Cold-In-Place Recycling	$1,794,000	100%	**$1,794,000**	Pending	Central Huron
RD0403-00:County Rd 4 (Londesboro Main St) - (to) 216m S of CountyRoad 15 (S. Limit Londesborough)-to-37m Nof Anthonys Line (N. Limit Londesborough)	1984	70	$2,160,000	**CIR** Cold-In-Place Recycling	$180,000	100%	**$180,000**	Pending	Central Huron
RD0404-00:County Rd 4 (London Road) - (to) 37m N of Anthonys Line (N. Limit Londesborough)-to-CountyRoad 25 (Blyth Road)	1984	63	$3,860,000	**CIR** Cold-In-Place Recycling	$996,000	100%	**$996,000**	Pending	Central Huron
RD1206-00:County Rd 12 (Brussels Line) - (to) CountyRoad 25 (Blyth Road)-to-Walton Road (N. Limit Walton)	1989	86	$1,872,000	**U-REC** Urban Reconstruction	$1,872,000	100%	**$1,872,000**	Pending	Morris Turnberry

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2027 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$3,250,000		
RB0001:County Rd 83 (Thames Road) - 83-25.0 (Ausable River East Bridge)	1948	59	$1,297,000	**RSL** Replace Bridge - Same Location	$2,000,000	100%	**$2,000,000**	Recommended	South Huron ZURICH
RB0034:County Rd 4 (London Road) - 04-25.6 (Belgrave Bridge)	1932	62	$499,200	**ENGdesign** Engineering Design Work	$0	100%	**$0**	Recommended	North Huron AUBURN
RB0059:County Rd 20 (Belgrave Road) - 20-24.6 (Marnoch Bridge)	1966	71	$4,633,000	**PWP** Patch, Waterproof, Pave	$350,000	100%	**$350,000**	Recommended	North Huron AUBURN
				RRH Replace bridge barriers	$750,000	100%	**$750,000**	Recommended	
RB0091:Line 17 - Boundary Bridge #24	1979	68	$345,500	**RSP** Rehabilitate Superstructure	$60,000	50%	**$30,000**	Recommended	South Huron ZURICH
				PWP Patch, Waterproof, Pave	$150,000	50%	**$75,000**	Recommended	
RB0093:County Road 5 - 05-20.2 (Smith's Bridge)	1959	67	$1,280,000	**ENGdesign** Engineering Design Work	$50,000	50%	**$25,000**	Recommended	South Huron ZURICH
RB0095:County Road 5 - 05-14.8 (Mud Creek Bridge)	1960	66	$315,500	**ENGdesign** Engineering Design Work	$40,000	50%	**$20,000**	Recommended	South Huron ZURICH

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2027 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$835,000		
RB0130:County Rd 84 (Zurich-Hensall Road) - 84-04.9	1955	55	$200,000	**cENGdesign** Engineering Design Work	$40,000	100%	**$40,000**	Recommended	Bluewater ZURICH
RB0133:County Rd 4 (London Road) - 04-10.5	1965	34	$450,000	**cRSB** Rehabilitate Substructure	$50,000	100%	**$50,000**	Recommended	Central Huron AUBURN
RB0203:County Rd 86 (Amberley Road) - 86-09.7	1950	50	$100,000	**cENGdesign** Engineering Design Work	$30,000	50%	**$15,000**	Recommended	ACW AUBURN
RB0316:County Rd 12 (Brussels Line) - 12-31.9	1950	60	$225,000	**cENGdesign** Engineering Design Work	$45,000	100%	**$45,000**	Recommended	Huron East WROXETER
RB0323:County Rd 12 (Belmore Line) - 12-55.1	1970	60	$150,000	**cENGdesign** Engineering Design Work	$35,000	100%	**$35,000**	Recommended	Howick WROXETER
RB0398:County Rd 81 (Grand Bend Line) - 81-03.5	1970	66	$787,000	**cRSL** Replace Culvert - Same Location	$650,000	100%	**$650,000**	Recommended	South Huron ZURICH

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2027 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$8,952,850		
RD0104-00:County Rd 1 (Lucknow Line) - Hawkins Road-to-92m South of James St. (S. Dungannon)		99	$1,765,000	**FDR** Full-Depth Reclamation	$858,750	100%	**$858,750**	Pending	ACW
RD0106-01:County Rd 1 (Lucknow Line) - 50m North of Proudfoot Ave (N. Dungannon) -to-CountyRoad 20 (Belgrave Road)	1990	99	$3,974,000	**FDR** Full-Depth Reclamation	$1,912,500	100%	**$1,912,500**	Pending	ACW
RD3115-00:County Rd 31 (Saltford Road) - (to) 770 m E of Hwy 21-to-Highway 21		82	$1,848,000	**U-REC** Urban Reconstruction	$1,848,000	100%	**$1,848,000**	Pending	ACW
RD8301-00:County Rd 83 (Dashwood Road) - (to) Highway 21-to-174m West of Elma St. (W. Limit Dashwood)	1998	76	$5,750,000	**CIR** Cold-In-Place Recycling	$1,572,000	100%	**$1,572,000**	Pending	Bluewater
RD8606-01:County Rd 86 (Amberley Road) - (to) 0.3 km W. of CR 12-to-CountyRoad 34 (PerthRoad 178)	1999	70	$6,150,000	**CIR** Cold-In-Place Recycling	$1,603,600	100%	**$1,603,600**	Pending	Howick
RD8606-02:County Rd 86 (Amberley Road) - (to) CountyRoad 34 (PerthRoad 178) -to-CountyRoad 19 (Molesworth Line)	1999	70	$1,500,000	**CIR** Cold-In-Place Recycling	$408,000	100%	**$408,000**	Pending	Huron East
RD8606-03:County Rd 86 (Amberley Road) - (to) CountyRoad 19 (Molesworth Line) -to-123m West of Road 175 (Perth Boundary)	1999	70	$2,900,000	**CIR** Cold-In-Place Recycling	$750,000	100%	**$750,000**	Pending	Huron East

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2028 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$5,995,000		
RB0035:County Rd 4 (London Road) - 04-32.9	1960	60	$3,490,000	**RSL** Replace bridge	$3,500,000	100%	**$3,500,000**	Recommended	North Huron AUBURN
RB0036:County Rd 4 (London Road) - 04-33.2	1960	62	$2,190,000	**RSL** Replace bridge	$2,200,000	100%	**$2,200,000**	Recommended	North Huron AUBURN
RB0037:County Rd 4 (Josephine Street) - 04-35.2 (Hanna Bridge)	1966	70	$5,361,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	Howick WROXETER
RB0093:County Road 5 - 05-20.2 (Smith's Bridge)	1959	67	$1,280,000	**WAP** Waterproof and Pave	$250,000	50%	**$125,000**	Recommended	South Huron ZURICH
RB0095:County Road 5 - 05-14.8 (Mud Creek Bridge)	1960	66	$315,500	**PWP** Patch, Waterproof, Pave	$300,000	50%	**$150,000**	Recommended	South Huron ZURICH

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2028 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost $850,000	Project Status *	Municipality - Patrol
RB0130:County Rd 84 (Zurich-Hensall Road) - 84-04.9	1955	55	$200,000	**cRSL** Replace Culvert - Same Location	$200,000	100%	**$200,000**	Recommended	Bluewater ZURICH
RB0203:County Rd 86 (Amberley Road) - 86-09.7	1950	50	$100,000	**cRSL** Replace Culvert - Same Location	$200,000	50%	**$100,000**	Recommended	ACW AUBURN
RB0207:County Rd 86 (Amberley Road) - 86-25.5	1940	51	$457,750	**cENGdesign** Engineering Design Work	$60,000	50%	**$30,000**	Recommended	ACW AUBURN
RB0308:County Rd 12 (North Line) - 12-21.7	1975	70	$150,000	**cENGdesign** Engineering Design Work	$30,000	100%	**$30,000**	Recommended	Huron East AUBURN
RB0311:County Rd 12 (North Line) - 12-23.7	1963	66	$772,000	**cRSP** Rehabilitate Superstructure	$20,000	100%	**$20,000**	Recommended	Huron East AUBURN
RB0312:County Rd 12 (North Line) - 12-24.4	1963	67	$780,000	**cRSP** Rehabilitate Superstructure	$20,000	100%	**$20,000**	Recommended	Huron East AUBURN
RB0316:County Rd 12 (Brussels Line) - 12-31.9	1950	60	$225,000	**cRSL** Replace Culvert - Same Location	$225,000	100%	**$225,000**	Recommended	Huron East WROXETER
RB0323:County Rd 12 (Belmore Line) - 12-55.1	1970	60	$150,000	**cRSL** Replace Culvert - Same Location	$150,000	100%	**$150,000**	Recommended	Howick WROXETER
RB0325:County Rd 12 (Belmore Line) - 12-64.3	1962	71	$433,000	**cRSP** Rehabilitate Superstructure	$40,000	100%	**$40,000**	Recommended	Howick WROXETER
RB0390:County Rd 28 (Gorrie Road) - 28-00.4	1965	55	$125,000	**cENGdesign** Engineering Design Work	$35,000	100%	**$35,000**	Recommended	Howick WROXETER

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2028 Driveway Entrances	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$6,500,000		
2390: - Estimated Residential Rural Entrances (916)		60	$8,000,000	**rRPE**	$2,000,000	100%	**$2,000,000**	Recommended	
2396: - Estimated Farm Entrances (5,092)		60	$15,300,000	**rRFE** Expect to replace about 1500 in next 10 years	$4,500,000	100%	**$4,500,000**	Recommended	

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2028 PW Buildings	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$86,500		
BB004:County Rd 22 (Donnybrook Line) - Auburn Main Shop	1981	70	$4,500,000	**bVEG** Vehicle Equipment Garage	$5,000	100%	**$5,000**	Recommended	AUBURN
BB007:County Rd 87 (Harriston Road) - Wroxeter Main Shop	1981	75	$3,300,000	**bVEG** Vehicle Equipment Garage	$5,000	100%	**$5,000**	Recommended	WROXETER
				bEVS Exhaust Ventilation Systems	$10,000	100%	**$10,000**	Recommended	
				bEVS Exhaust Ventilation Systems	$4,000	100%	**$4,000**	Recommended	
				bHGS Heat Generating Systems	$10,000	100%	**$10,000**	Recommended	
				bHGS Heat Generating Systems	$45,000	100%	**$45,000**	Recommended	
				bHGS Heat Generating Systems	$7,500	100%	**$7,500**	Recommended	

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2028 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$8,715,100		
RD0301-00:County Rd 3 (Mill Road) - (to) Highway 21-to-155m West of CountyRoad 31 (W. Limit Varna)	1987	97	$5,900,000	**CIR** Cold-In-Place Recycling	$1,578,000	100%	**$1,578,000**	Pending	Bluewater
RD0408-00:County Rd 4 (London Road) - (to) Belgrave Bridge 4-25.6 (N. Limit Belgrave)-to-CountyRoad 86 (Amberley Road)	1993	94	$6,140,000	**CIR** Cold-In-Place Recycling	$1,586,000	100%	**$1,586,000**	Pending	North Huron
RD1504-00:County Rd 15 (Kings Road) - (to) CountyRoad 4 (London Road)-to-640m E of Cty Rd 4	2002	66	$1,536,000	**CIR** Cold-In-Place Recycling	$128,000	100%	**$128,000**	Pending	Central Huron
RD1505-00:County Rd 15 (Londesborough Road) - (to) 640m E of Cty Rd 4-to-CountyRoad 17 (Winthrop Road)	2002	88	$3,824,000	**CIR** Cold-In-Place Recycling	$1,816,400	100%	**$1,816,400**	Pending	Central Huron
RD1701-02:County Rd 17 (Winthrop Road) - (to) CountyRoad 12 (North Line) -to-CountyRoad 14 (Perth Boundary)	1999	74	$4,132,000	**CIR** Cold-In-Place Recycling	$1,962,700	100%	**$1,962,700**	Pending	Huron East
RD2202-02:County Rd 22 (Donnybrook Line) - (to) CountyRoad 20 (Belgrave Road) -to-CountyRoad 86 (Amberley Road)	1986	89	$3,288,000	**CIR** Cold-In-Place Recycling	$1,644,000	100%	**$1,644,000**	Pending	ACW

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2029 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$1,430,000		
RB0019:County Rd 30 (Patrick Street) - 30-05.9 (Fordwich Bridge)	1954	64	$2,491,000	**ENGdesign** Engineering Design Work	$150,000	100%	**$150,000**	Recommended	Howick WROXETER
RB0020:County Rd 30 (Fordwich Line) - 30-08.7	1958	73	$941,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	Howick WROXETER
RB0021:County Rd 30 (Fordwich Line) - 30-09.3	1958	73	$1,304,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	Howick WROXETER
RB0034:County Rd 4 (London Road) - 04-25.6 (Belgrave Bridge)	1932	62	$499,200	**RSL** Replace Bridge - Same Location	$700,000	100%	**$700,000**	Recommended	North Huron AUBURN
RB0037:County Rd 4 (Josephine Street) - 04-35.2 (Hanna Bridge)	1966	70	$5,361,000	**PWP** Patch, waterproof, and pave	$375,000	100%	**$375,000**	Recommended	Howick WROXETER
RB0056:County Rd 31 (Parr Line) - 31-13.7 (Varna Bridge)	1964	73	$2,915,000	**ENGdesign** Engineering Design Work	$15,000	100%	**$15,000**	Recommended	Central Huron ZURICH
RB0063:County Rd 25 (Blyth Road) - 25-17.1 (Dyers Bridge)	1950	62	$1,019,000	**ENGdesign** Engineering Design Work	$150,000	100%	**$150,000**	Recommended	North Huron AUBURN

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2029 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$920,000		
RB0109:County Rd 83 (Thames Road) - 83-23.4	1955	50	$225,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	South Huron ZURICH
RB0125:County Rd 2 (Bronson Line) - 02-14.7	1957	55	$250,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	South Huron ZURICH
RB0157:County Rd 13 (Bayfield Road) - 13-06.4	1960	50	$250,000	**cENGdesign** Engineering Design Work	$40,000	100%	**$40,000**	Recommended	Bluewater AUBURN
RB0202:County Rd 86 (Amberley Road) - 86-08.5	1950	46	$261,000	**cENGdesign** Engineering Design Work	$50,000	50%	**$25,000**	Recommended	ACW AUBURN
RB0207:County Rd 86 (Amberley Road) - 86-25.5	1940	51	$457,750	**cRSL** Replace Culvert - Same Location	$800,000	50%	**$400,000**	Recommended	ACW AUBURN
RB0245:County Rd 83 (Thames Road) - 83-28.1	1955	55	$200,000	**cENGdesign** Engineering Design Work	$40,000	100%	**$40,000**	Recommended	South Huron ZURICH
RB0253:County Rd 83 (Thames Road) - 83-33.0	1955	55	$225,000	**cENGdesign** Engineering Design Work	$40,000	100%	**$40,000**	Recommended	South Huron ZURICH
RB0263:County Rd 15 (Kinburn Line) - 15-24.6	1960	60	$577,000	**cRSP** Rehabilitate Superstructure	$0	100%	**$0**	Recommended	Central Huron AUBURN
RB0308:County Rd 12 (North Line) - 12-21.7	1975	70	$150,000	**cRSL** Replace Culvert - Same Location	$150,000	100%	**$150,000**	Recommended	Huron East AUBURN
RB0367:County Rd 20 (Belgrave Road) - 20-15.1	1990	73	$481,000	**cRSP** Rehabilitate Superstructure	$0	100%	**$0**	Recommended	ACW AUBURN
RB0390:County Rd 28 (Gorrie Road) - 28-00.4	1965	55	$125,000	**cRSL** Replace Culvert - Same Location	$125,000	100%	**$125,000**	Recommended	Howick WROXETER
RB0438:County Rd 86 (Amberley Road) - 86-59.5	1965	71	$336,500	**cRSB** Rehabilitate Substructure	$0	50%	**$0**	Recommended	Huron East WROXETER

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2029 PW Buildings	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$90,000		
BB004:County Rd 22 (Donnybrook Line) - Auburn Main Shop	1981	70	$4,500,000	**bESD** Electrical Service and Distribution	$75,000	100%	**$75,000**	Recommended	AUBURN
				bLEF Lighting Equipment and Fixtures	$15,000	100%	**$15,000**	Recommended	

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2029 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$20,030,000		
RD0308-00:County Rd 3 (Mill Road) - (to) 370m East of Highway 4 (E. Limit Brucefield) -to-142m West of CountyRoad 12 (W. Limit Egmondville)	2001	72	$2,624,000	**CIR** Cold-In-Place Recycling	$1,578,000	100%	**$1,578,000**	Pending	Huron East
RD0405-00:County Rd 4 (Queen Street) - (to) CountyRoad 25 (Blyth Road)-to-285m North of North St. (N. Limit Blyth)	1994	99	$3,984,000	**U-REC** Urban Reconstruction	$3,984,000	100%	**$3,984,000**	Pending	North Huron
RD0407-00:County Rd 4 (London Road) - (to) Parker Drive (S. Limit Belgrave) -to-Belgrave Bridge 4-25.6 (N. Limit Belgrave)	1993	99	$1,920,000	**U-REC** Urban Reconstruction	$1,920,000	100%	**$1,920,000**	Pending	North Huron
RD1201-01:County Rd 12 (Kippen Road) - (to) Highway 4-to-CountyRoad 32 (Staffa Road)	1983	75	$4,050,000	**CIR** Cold-In-Place Recycling	$1,140,000	100%	**$1,140,000**	Pending	Huron East
RD1201-02:County Rd 12 (Kippen Road) - (to) CountyRoad 32 (Staffa Road)-to-350m S. of Egmondville Bridge	1983	79	$4,600,000	**CIR** Cold-In-Place Recycling	$1,166,000	100%	**$1,166,000**	Pending	Huron East
RD1208-00:County Rd 12 (Brussels Line/Turnberry Street) - (to) Raymond Ct. (S. Limit Brussels)-to-520m North of George St. (N. Limit Brussels)	1984	99	$7,344,000	**U-REC** Urban Reconstruction	$7,344,000	100%	**$7,344,000**	Pending	Morris Turnberry
RD1304-01:County Rd 13 (Bayfield Road/ Railway Street) - (to) Devon Street (S. Limit Clinton)-to-King Street	1990	80	$544,000	**U-REC** Last Rehab Strategy was Mill/Pave in 1990	$891,000	100%	**$891,000**	Pending	
RD1304-02:County Rd 13 (Bayfield Road/ Railway Street) - (to) King Street-to-Highway 4	1990	80	$544,000	**U-REC** Last Rehab Strategy was Mill/Pave in 1990	$891,000	100%	**$891,000**	Pending	
RD1502-00:County Rd 15 (Londesborough Road) - (to) CountyRoad 8 (Base Line) -to-167m West of CountyRoad 4 (W. Limit Londesborough)	1992	80	$2,164,000	**CIR** Cold-In-Place Recycling	$1,082,000	100%	**$1,082,000**	Pending	Central Huron
RD1503-00:County Rd 15 (Kings Road) - (to) 167m West of CountyRoad 4 (W. Limit Londesborough)-to-CountyRoad 4 (London Road)	1992	40	$260,000	**CIR** Cold-In-Place Recycling	$34,000	100%	**$34,000**	Pending	Central Huron

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2030 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$910,000		
RB0020:County Rd 30 (Fordwich Line) - 30-08.7	1958	73	$941,000	**PWP** Patch, Waterproof, Pave	$250,000	100%	**$250,000**	Recommended	Howick WROXETER
RB0021:County Rd 30 (Fordwich Line) - 30-09.3	1958	73	$1,304,000	**WAP** Waterproof and Pave	$200,000	100%	**$200,000**	Recommended	Howick WROXETER
RB0044:County Rd 12 (Kippen Road) - 12-11.7 (Egmondville Bridge)	1937	69	$1,489,000	**ENGdesign** Engineering Design Work	$160,000	100%	**$160,000**	Recommended	Huron East ZURICH
RB0056:County Rd 31 (Parr Line) - 31-13.7 (Varna Bridge)	1964	73	$2,915,000	**PWP** Patch, Waterproof, Pave	$300,000	100%	**$300,000**	Recommended	Central Huron ZURICH

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2030 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$1,645,000		
RB0109:County Rd 83 (Thames Road) - 83-23.4	1955	50	$225,000	**cRSL** Replace Culvert - Same Location	$225,000	100%	**$225,000**	Recommended	South Huron ZURICH
RB0125:County Rd 2 (Bronson Line) - 02-14.7	1957	55	$250,000	**cRSL** Replace Culvert - Same Location	$350,000	100%	**$350,000**	Recommended	South Huron ZURICH
RB0157:County Rd 13 (Bayfield Road) - 13-06.4	1960	50	$250,000	**cRSL** Replace Culvert - Same Location	$250,000	100%	**$250,000**	Recommended	Bluewater AUBURN
RB0174:County Rd 11 (Hern Line) - 11-06.1	1960	61	$644,000	**cRSB** Rehabilitate Substructure	$0	100%	**$0**	Recommended	South Huron ZURICH
RB0202:County Rd 86 (Amberley Road) - 86-08.5	1950	46	$261,000	**cRSL** Replace Culvert - Same Location	$450,000	50%	**$225,000**	Recommended	ACW AUBURN
RB0245:County Rd 83 (Thames Road) - 83-28.1	1955	55	$200,000	**cRSL** Replace Culvert - Same Location	$200,000	100%	**$200,000**	Recommended	South Huron ZURICH
RB0253:County Rd 83 (Thames Road) - 83-33.0	1955	55	$225,000	**cRSL** Replace Culvert - Same Location	$225,000	100%	**$225,000**	Recommended	South Huron ZURICH
RB0265:County Rd 7 (Howick-Turnberry Road) - 07-12.5	1970	60	$150,000	**cENGdesign** Engineering Design Work	$25,000	100%	**$25,000**	Recommended	Howick WROXETER
RB0320:County Rd 12 (Brussels Line) - 12-42.6	1960	69	$672,000	**cRSP** Rehabilitate Superstructure	$20,000	100%	**$20,000**	Recommended	Huron East WROXETER
RB0371:County Rd 20 (Belgrave Road) - 20-25.3	1950	50	$774,000	**cRSB** Rehabilitate Substructure	$25,000	100%	**$25,000**	Recommended	North Huron AUBURN
RB0422:County Rd 86 (Amberley Road) - 86-44.1	1950	71	$861,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	Morris Turnberry WROXETER
RB0423:County Rd 86 (Amberley Road) - 86-46.1	1950	50	$293,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	Morris Turnberry WINGHAM

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2030 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$14,300,600		
RD0106-02:County Rd 1 (Lucknow Line) - CountyRoad 20 (Belgrave Road)-to-850 m S. of Cty Rd. 86	1990	99	$5,500,000	**CIR** Cold-In-Place Recycling	$1,456,000	100%	**$1,456,000**	Pending	ACW AUBURN
RD0307-00:County Rd 3 (Mill Road East) - (to) Highway 4-to-370m East of Highway 4 (E. Limit Brucefield)	2001	81	$1,968,000	**U-REC** Urban Reconstruction	$888,000	100%	**$888,000**	Pending	Huron East
RD0410-00:County Rd 4 (London Road) - (to) North St. West (N. Limit Wingham) -to-Huron Bruce Road	1993	97	$5,750,000	**CIR** Cold-In-Place Recycling	$1,406,000	100%	**$1,406,000**	Pending	Morris Turnberry
RD1204-00:County Rd 12 (Main Street North) - (to) Highway 8-to-Cherry Hill Road	1987	76	$2,184,000	**U-REC** Urban Reconstruction	$2,457,000	100%	**$2,457,000**	Pending	Huron East
RD1701-01:County Rd 17 (Winthrop Road) - (to) CountyRoad 15 (Londesborough Road)-to-CountyRoad 12 (North Line)	1999	77	$2,392,000	**CIR** Cold-In-Place Recycling	$1,196,000	100%	**$1,196,000**	Pending	Huron East
RD2201-00:County Rd 22 (Donnybrook Line) - (to) CountyRoad 25 (Blyth Road) -to-530m N of Cty Rd 25	1986	73	$505,000	**CIR** Cold-In-Place-Recycling	$106,000	100%	**$106,000**	Pending	ACW
RD2202-01:County Rd 22 (Donnybrook Line) - (to) 530m N of Cty Rd 25-to-CountyRoad 20 (Belgrave Road)	1986	93	$4,068,000	**CIR** Cold-In-Place Recycling	$1,932,300	100%	**$1,932,300**	Pending	ACW
RD2502-01:County Rd 25 (Blyth Road) - (to) CountyRoad 8 (Base Line)-to-CountyRoad 22 (Donnybrook Line)	1993	98	$1,152,000	**U-REC** Urban Reconstruction	$1,152,000	100%	**$1,152,000**	Pending	ACW
RD2802-00:County Rd 28 (Victoria Street) - (to) 192m South of James St. (S. Limit Gorrie)-to-CountyRoad 87 (Harrison Road)	2005	78	$2,448,000	**U-REC** Urban Reconstruction	$2,100,000	100%	**$2,100,000**	Pending	Howick
RD3111-02:County Rd 31 (Londesborough Road) - (to) CountyRoad 1 (S) (Benmiller Line)-to-83m W. of Cty Rd 1 (North)	1990	87	$1,416,000	**U-REC** Urban Reconstruction	$1,593,000	100%	**$1,593,000**	Pending	ACW
RD3112-00:County Rd 31 (Londesborough Road) - (to) 83m W. of Cty Rd 1 (North) -to-Falls Reserve Road	1986	75	$312,000	**M&P1L** M1P1 50mm HMA	$14,300	100%	**$14,300**	Pending	ACW

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2031 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$3,475,000		
RB0013:County Rd 8 (Base Line/Maitland Terrace) - 08-12.5 (Penfound - Hallums Bridge)	1961	62	$1,765,000	**ENGdesign** Engineering Design Work	$225,000	100%	**$225,000**	Recommended	Central Huron AUBURN
RB0017:County Rd 28 (Victoria Street) - 28-07.5 (Gorrie Bridge)	1945	60	$2,408,000	**ENGdesign** Engineering Design Work	$100,000	100%	**$100,000**	Recommended	Howick WROXETER
RB0019:County Rd 30 (Patrick Street) - 30-05.9 (Fordwich Bridge)	1954	64	$2,491,000	**RSL** Replace Bridge - Same Location	$2,165,000	100%	**$2,165,000**	Recommended	Howick WROXETER
RB0031:County Rd 1 (Benmiller Line) - 01-03.2 (Big Benmiller Bridge)	1969	73	$6,963,000	**ENGdesign** Engineering Design Work	$20,000	100%	**$20,000**	Recommended	ACW AUBURN
RB0063:County Rd 25 (Blyth Road) - 25-17.1 (Dyers Bridge)	1950	62	$1,019,000	**RSL** Replace Bridge - Same Location	$950,000	100%	**$950,000**	Recommended	North Huron AUBURN
RB0096:County Rd 1 (Benmiller Line) - 01-03.5 (Small Benmiller)	1970	74	$1,219,000	**ENGdesign** Engineering Design Work	$15,000	100%	**$15,000**	Recommended	ACW AUBURN

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2031 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$1,380,000		
RB0156:County Rd 12 (Brussels Line) - 12-35.1	1955	70	$568,000	**cRSP** Rehabilitate Superstructure	$20,000	100%	**$20,000**	Recommended	Huron East WROXETER
RB0175:County Rd 11 (Hern Line) - 11-07.8	1960	68	$619,000	**cRSP** Rehabilitate Superstructure	$0	100%	**$0**	Recommended	South Huron ZURICH
RB0176:County Rd 11 (Hern Line) - 11-09.5	1960	54	$653,000	**cRSB** Rehabilitate Substructure	$25,000	100%	**$25,000**	Recommended	South Huron ZURICH
RB0238:County Rd 83 (Dashwood Road) - 83-19.9	1955	63	$200,000	**cENGdesign** Engineering Design Work	$40,000	100%	**$40,000**	Recommended	South Huron ZURICH
RB0265:County Rd 7 (Howick-Turnberry Road) - 07-12.5	1970	60	$150,000	**cRSL** Replace Culvert - Same Location	$150,000	100%	**$150,000**	Recommended	Howick WROXETER
RB0277:County Rd 2 (Bronson Line) - 02-01.0	1965	60	$175,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	South Huron ZURICH
RB0384:County Rd 25 (Blyth Road) - 25-32.5	1937	70	$726,000	**cRSB** Rehabilitate Substructure	$0	100%	**$0**	Recommended	Morris Turnberry WROXETER
RB0392:County Rd 34 (Perth Road 179) - 34-02.3	1960	73	$254,500	**cRSP** Rehabilitate Superstructure	$0	50%	**$0**	Recommended	Howick WROXETER
RB0408:County Rd 83 (Dashwood Road) - 83-18.6	1955	60	$200,000	**cENGdesign** Engineering Design Work	$45,000	100%	**$45,000**	Recommended	South Huron ZURICH
RB0422:County Rd 86 (Amberley Road) - 86-44.1	1950	71	$861,000	**cRSL** Replace Culvert - Same Location	$775,000	100%	**$775,000**	Recommended	Morris Turnberry WROXETER
RB0423:County Rd 86 (Amberley Road) - 86-46.1	1950	50	$293,000	**cRSL** Replace Culvert - Same Location	$275,000	100%	**$275,000**	Recommended	Morris Turnberry WINGHAM

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2031	PW Buildings	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
								$12,000		
BB007:County Rd 87 (Harriston Road) - Wroxeter Main Shop		1981	75	$3,300,000	**bWRR** Window Replacement and Repair	$12,000	100%	**$12,000**	Recommended	WROXETER

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2031 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$11,675,000		
RD0502-00:County Rd 5 (Mt. Carmel Drive) - (to) Grand Bend Road-to-CountyRoad 2 (Bronson Line)	1996	91	$2,450,000	**CIR** Cold-In-Place Recycling	$1,292,000	50%	**$646,000**	Pending	South Huron
RD1202-00:County Rd 12 (Kippen Road) - (to) 350m S. of Egmondville Bridge-to-Egmondville Bridge	1992	41	$840,000	**U-REC** Urban Reconstruction	$945,000	100%	**$945,000**	Pending	Huron East
RD1203-00:County Rd 12 (Kippen Road) - (to) Egmondville Bridge-to-Lloyd Eisler Street	1999	68	$4,872,000	**U-REC** Urban Reconstruction	$2,754,000	100%	**$2,754,000**	Pending	Huron East
RD1501-00:County Rd 15 (Londesborough Road) - (to) CountyRoad 31 (Sharpes Creek)-to-CountyRoad 8 (Base Line)	1990	88	$2,036,000	**CIR** Cold-In-Place Recycling	$1,018,000	100%	**$1,018,000**	Pending	ACW
RD1601-00:County Rd 16 (Morris Road) - (to) CountyRoad 4 (London Road) -to-Orchard Line (W. Limit Brussels)	1982	95	$8,600,000	**CIR** Cold-In-Place Recycling	$2,160,300	100%	**$2,160,300**	Pending	Morris Turnberry
RD2004-01:County Rd 20 (Belgrave Road) - (to) 4.5km E of Cty Rd 1-to-CountyRoad 22 (Donnybrook Line)	1995	96	$1,844,000	**FDR** Full-Depth Reclamation	$697,500	100%	**$697,500**	Pending	ACW
RD2502-02:County Rd 25 (Blyth Road) - (to) CountyRoad 22 (Donnybrook Line) -to-CountyRoad 4 (London Road)	1993	100	$7,450,000	**CIR** Cold-In-Place Recycling	$1,848,000	100%	**$1,848,000**	Pending	North Huron
RD2801-00:County Rd 28 (Gorrie Road) - (to) CountyRoad 34 (PerthRoad 178) -to-192m South of James St. (S. Limit Gorrie)	1985	74	$5,670,000	**CIR** Cold-In-Place Recycling	$1,345,200	100%	**$1,345,200**	Pending	Howick
RD3114-00:County Rd 31 (Saltford Road) - (to) Westmount Line (E. Limit Saltford) -to-770 m E of Hwy 21	81	$680,000	**M&P1L** Mill 50 mm - Pave 50 mm		$62,000	100%	**$62,000**	Pending	ACW
RD3401-00:County Rd 34 (Perth Road 178) - (to) CountyRoad 86 (Amberley Road) -to-CountyRoad 28 (Gorrie Line)	82	$745,000	**CIR** Cold-In-Place Recycling		$398,000	50%	**$199,000**	Pending	Howick

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2032 Bridge	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$2,400,000		
RB0031:County Rd 1 (Benmiller Line) - 01-03.2 (Big Benmiller Bridge)	1969	73	$6,963,000	**PWP** Patch, Waterproof, Pave	$350,000	100%	**$350,000**	Recommended	ACW AUBURN
RB0044:County Rd 12 (Kippen Road) - 12-11.7 (Egmondville Bridge)	1937	69	$1,489,000	**RSL** Replace Bridge - Same Location	$1,500,000	100%	**$1,500,000**	Recommended	Huron East ZURICH
RB0062:County Rd 25 (Blyth Road) - 25-12.6 (Patterson/Auburn Bridge)	1954	53	$6,350,000	**ENGdesign** Engineering Design Work	$250,000	100%	**$250,000**	Recommended	ACW AUBURN
RB0074:County Rd 87 (Harriston Road) - 87-13.2 (Maitland River Bridge)	1960	69	$1,113,000	**ENGdesign** Engineering Design Work	$150,000	100%	**$150,000**	Recommended	Howick WROXETER
RB0096:County Rd 1 (Benmiller Line) - 01-03.5 (Small Benmiller)	1970	74	$1,219,000	**PWP** Patch, Waterproof, Pave	$150,000	100%	**$150,000**	Recommended	ACW AUBURN

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2032 Culvert_Large	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost $905,000	Project Status *	Municipality - Patrol
RB0122:County Rd 2 (Bronson Line) - 02-06.2	1970	50	$325,000	**cENGdesign** Engineering Design Work	$50,000	100%	**$50,000**	Recommended	South Huron ZURICH
RB0201:County Rd 31 (Parr Line) - 31-20.8	1965	65	$513,000	**cRSP** Rehabilitate Superstructure	$0	100%	**$0**	Recommended	Central Huron ZURICH
RB0218:County Rd 86 (Amberley Road) - 86-11.1	1950	49	$300,000	**cENGdesign** Engineering Design Work	$50,000	50%	**$25,000**	Recommended	ACW AUBURN
RB0238:County Rd 83 (Dashwood Road) - 83-19.9	1955	63	$200,000	**cRSL** Replace Culvert - Same Location	$200,000	100%	**$200,000**	Recommended	South Huron ZURICH
RB0277:County Rd 2 (Bronson Line) - 02-01.0	1965	60	$175,000	**cRSL** Replace Culvert - Same Location	$375,000	100%	**$375,000**	Recommended	South Huron ZURICH
RB0292:County Rd 6 (Kirkton Road) - 06-10.6	1970	65	$150,000	**cENGdesign** Engineering Design Work	$30,000	100%	**$30,000**	Recommended	South Huron ZURICH
RB0350:County Rd 19 (McNaught Line) - 19-01.6	1950	72	$585,000	**cRSP** Rehabilitate Superstructure	$0	100%	**$0**	Recommended	Huron East WROXETER
RB0408:County Rd 83 (Dashwood Road) - 83-18.6	1955	60	$200,000	**cRSL** Replace Culvert - Same Location	$200,000	100%	**$200,000**	Recommended	South Huron ZURICH
RB0411:County Rd 86 (Amberley Road) - 86-17.2	1950	58	$140,500	**cENGdesign** Engineering Design Work	$50,000	50%	**$25,000**	Recommended	ACW AUBURN

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2032 Road	Year Built	Condition	Estimated Replacement Value	Recommended Work Summary	Estimated Total Cost	County Portion	County Cost	Project Status *	Municipality - Patrol
							$11,960,900		
RD0102-00:County Rd 1 (Lucknow Line) - CountyRoad 31 (Londesborough Road) to CountyRoad 25 (Blyth Road)	1991	98	$3,935,000	**CIR** Cold-In-Place Recycling	$1,142,000	100%	**$1,142,000**	Pending	ACW
RD0406-01:County Rd 4 (London Road) - (to) 285m North of North St. (N. Limit Blyth) -to-CountyRoad 16 (Morris Road)	1991	100	$5,400,000	**CIR** Cold-In-Place Recycling	$1,420,000	100%	**$1,420,000**	Pending	North Huron
RD0406-02:County Rd 4 (London Road) - (to) CountyRoad 16 (Morris Road)-to-Parker Drive (S. Limit Belgrave)	1991	100	$1,100,000	**CIR** Cold-In-Place Recycling	$304,000	100%	**$304,000**	Pending	
RD1801-00:County Rd 18 (Cut Line Road) - (to) Highway 21-to-CountyRoad 31 (Parr Line)	1989	80	$3,372,000	**CIR** Cold-In-Place Recycling	$1,686,000	100%	**$1,686,000**	Pending	Central Huron
RD2004-02:County Rd 20 (Belgrave Road) - (to) CountyRoad 22 (Donnybrook Line) -to-Curry Line	1995	95	$2,944,000	**CIR** Cold-In-Place Recycling	$1,398,400	100%	**$1,398,400**	Pending	North Huron
RD2005-00:County Rd 20 (Belgrave Road) - (to) Curry Line-to-CountyRoad 4 (London Road)	1995	100	$1,340,000	**FDR** Full Depth Recycling & Pave	$697,500	100%	**$697,500**	Pending	North Huron
RD2803-00:County Rd 28 (McIntosh Line) - (to) CountyRoad 87 (Harrison Road) -to-CountyRoad 7 (Howick-Turnberry Road)	2000	84	$2,452,000	**CIR** Cold-In-Place Recycling	$1,226,000	100%	**$1,226,000**	Pending	Howick
RD2804-00:County Rd 28 (McIntosh Line) - (to) CountyRoad 7 (Howick-Turnberry Road)-to-Bruce Boundary	1998	75	$1,628,000	**CIR** Cold-In-Place Recycling	$814,000	100%	**$814,000**	Pending	Howick
RD3108-00:County Rd 31 (Parr Line) - (to) Holmes Street Holmesville-to-Highway 8	1983	88	$80,000	**M&P1L** M1P1 50mm HMA	$11,000	100%	**$11,000**	Pending	Central Huron
RD8305-00:County Rd 83 (Thames Road East) - (to) Highway 4-to-Pickard Street (E. Limit Exeter)	1991	97	$2,448,000	**U-REC** Urban Reconstruction	$1,416,000	100%	**$1,416,000**	Pending	South Huron
RD8603-00:County Rd 86 (Amberley Road) - (to) Bridge 86-35.8 (W. Limit Wingham) -to-CountyRoad 4 (London Road)	1993	90	$552,000	**U-REC** Urban Reconstruction	$552,000	100%	**$552,000**	Pending	North Huron
RD8604-00:County Rd 86 (Amberley Road) - (to) CountyRoad 4 (London Road) -to-CountyRoad 87 (Harrison Road)	1999	81	$4,400,000	**CIR** Cold-In-Place Recycling	$1,294,000	100%	**$1,294,000**	Pending	Morris Turnberry

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APPENDIX B

HURON COUNTY

Public Works Department

Pavement Management Program 2020 Update

HURON COUNTY

Public Works Dept.

Background – Paving Program

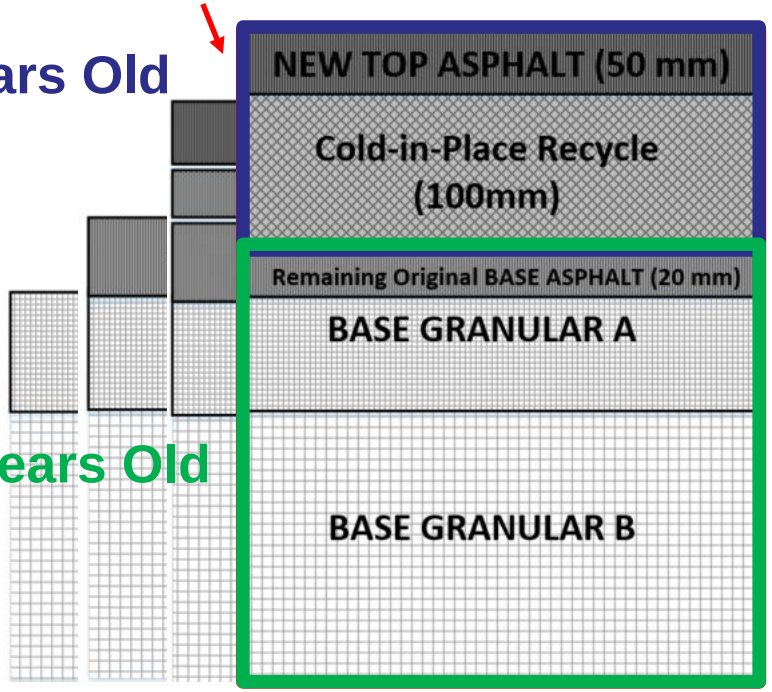
- When the County of Huron began paving roads they adopted a staged paving program.
- This type of paving program constructs a road over a period of decades vs. an un-staged program such as the Province of Ontario, which constructs its roads over a period of months.
- The staged program was felt to be more economical than the unstaged.

HURON COUNTY

This is what many of our roads are now

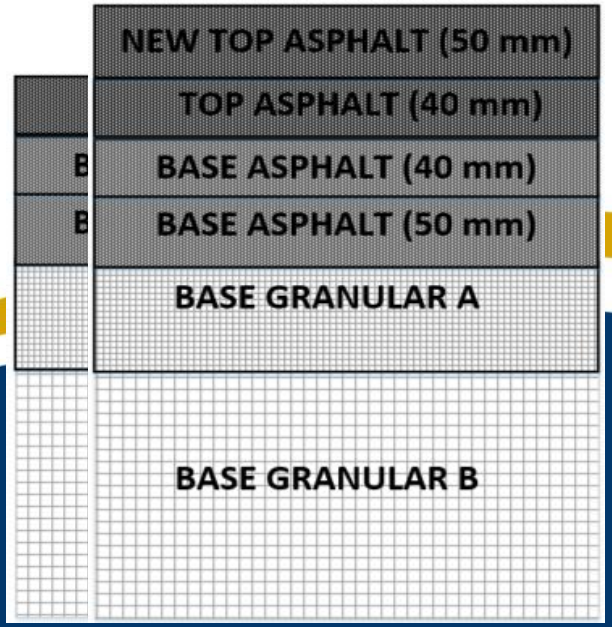
Staged Paving Program.

- Prepare a proper base including a waiting period for additional settlement over a year or two.
- Install the first asphalt base course - 50mm thickness.
- After a period of approximately 5 years, install the second asphalt base course 30mm thickness immediately followed by a 40mm asphalt surface course. Originally this was intended to last 15 years, but is normally stretched to 20 years.
- Recycle 100mm depth and surface with a 50mm of asphalt overlay.
- Total thickness 170mm of asphalt



Unstaged Paving Program

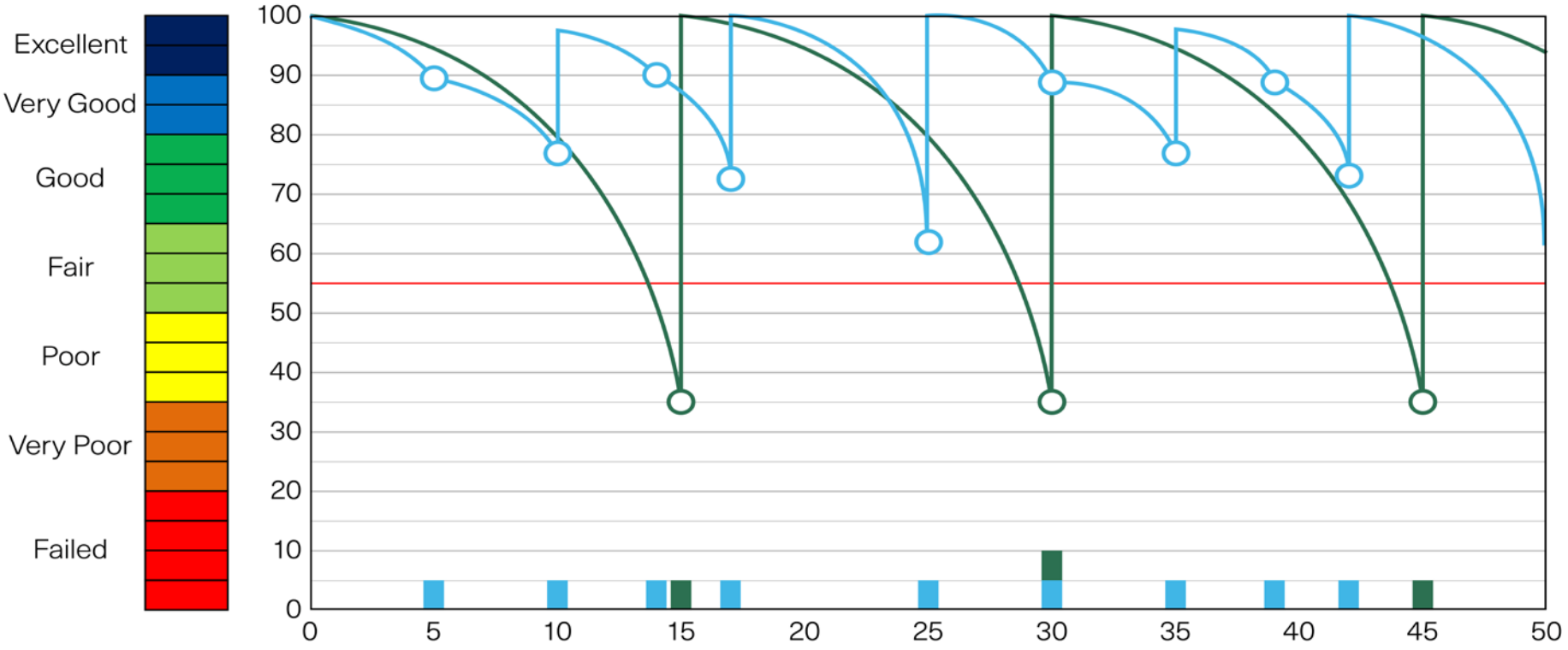
- Prepare a proper base prior to paving.
- Install the first asphalt base course 50mm thickness, followed by second 40mm base course, followed by 40mm surface course.
- Return in 20 years to install 50mm surface course.



Public Works Department

Pavement Lifecycle (Deterioration) Curve

Preservation vs. Rehabilitation



Preservation Strategy:

Years 5, 14, 30 & 39:	Crack Sealing
Years 10 & 35:	Micro Surfacing (Double)
Years 17 & 42:	Chip Seal
Year 25:	Mill & Pave

Total Cost*/SY Over 50 Years = $37.20

Rehabilitation Strategy:

Year 15:	Unstabilized FDR plus 4" HMA Overlay
Year 30:	Unstabilized FDR plus 4" HMA Overlay
Year 45:	Unstabilized FDR plus 4" HMA Overlay

Total Cost*/SY Over 50 Years = $63.00

*present day costs

Road Deterioration Factors

- Construction
  - Supporting Soils
  - Quality of Granular Base Materials
  - Compaction of Granular Base
  - Quality of Asphalt Cement
  - Quality of Aggregate
  - Granular Proportions
  - Placing, rolling, temperature, moisture, humidity, etc…
  - Binding between layers
- Operationally
  - Traffic
    - Axle Loadings
    - Riding edge of pavement
    - Tire Pressure
  - Oxidation of AC
    - Loss of surface aggregates
  - Thermal Expansion/Contraction
  - Cracks
    - Water
    - freeze/thaw cycles
    - Vibration
  - Drainage

Pavement Management Options

Preservation

- Surface treatments/coatings
  - Reverse or reduce oxidation of AC
  - May provide hard wearing surface
  - Seal cracks reducing water penetration
- Many options available

Rehabilitation

- Removal or recycling all or some asphalt and/or base granular material.
- Improves structural support
- Many options available

What is the right option?

- **It depends on what the current state of the road and condition of layers and materials underneath.**

- Generally
  - keep the road as good as possible using suitable preservation options.
  - Rehabilitate to address the stresses the road is experiencing

Preservation Options

- Crack sealing, fog seal, reclamite, slurry seal, microsurfacing, cape seal.
- Each have varying costs and benefits. Ranges in annualized cost between $3,000 - $12,000 per km Life Cycle Cost.
- Some are good options for Huron County Roads.

Rehabilitation Options

- **Mill & Pave**
  - Cheapest option
    - $110k / km Capital
    - $9.2k / km / year Life Cycle Cost
  - Suitable when ALL layers underneath are still sound.
  - Generally this is **only** viable option for urban roads (with curb & gutter).
  - *Least environmentally friendly*

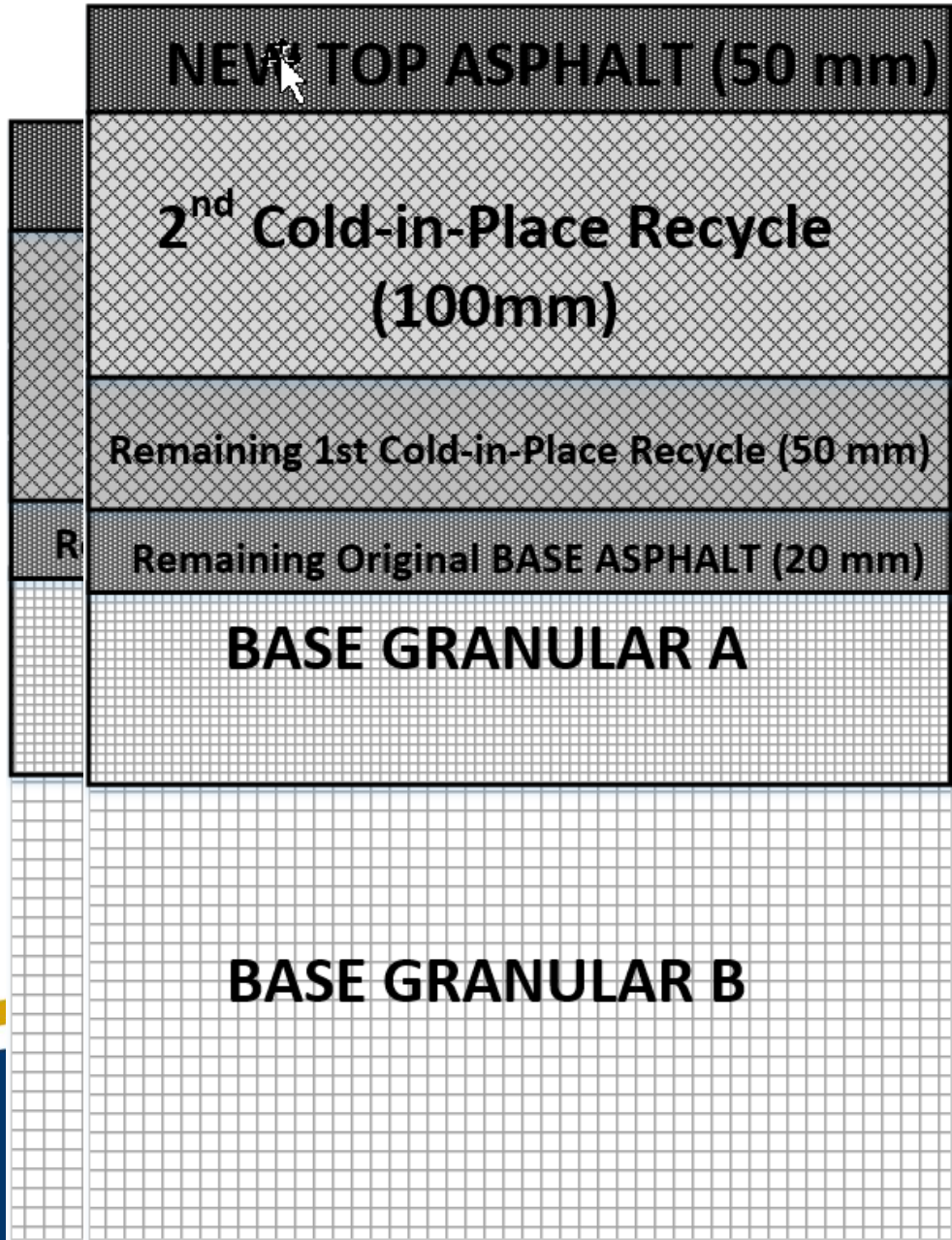
Haul Milled Asphalt (RAP) away and stockpile

Rehabilitation Options

- **Hot-in-Place Recycling**
  - Next cheapest option
    - $115k / km Capital
    - $9.6k / km / year Life Cycle Cost
  - Suitable when ALL layers underneath are still sound.
  - ***Becoming available in Ontario starting 2020.***

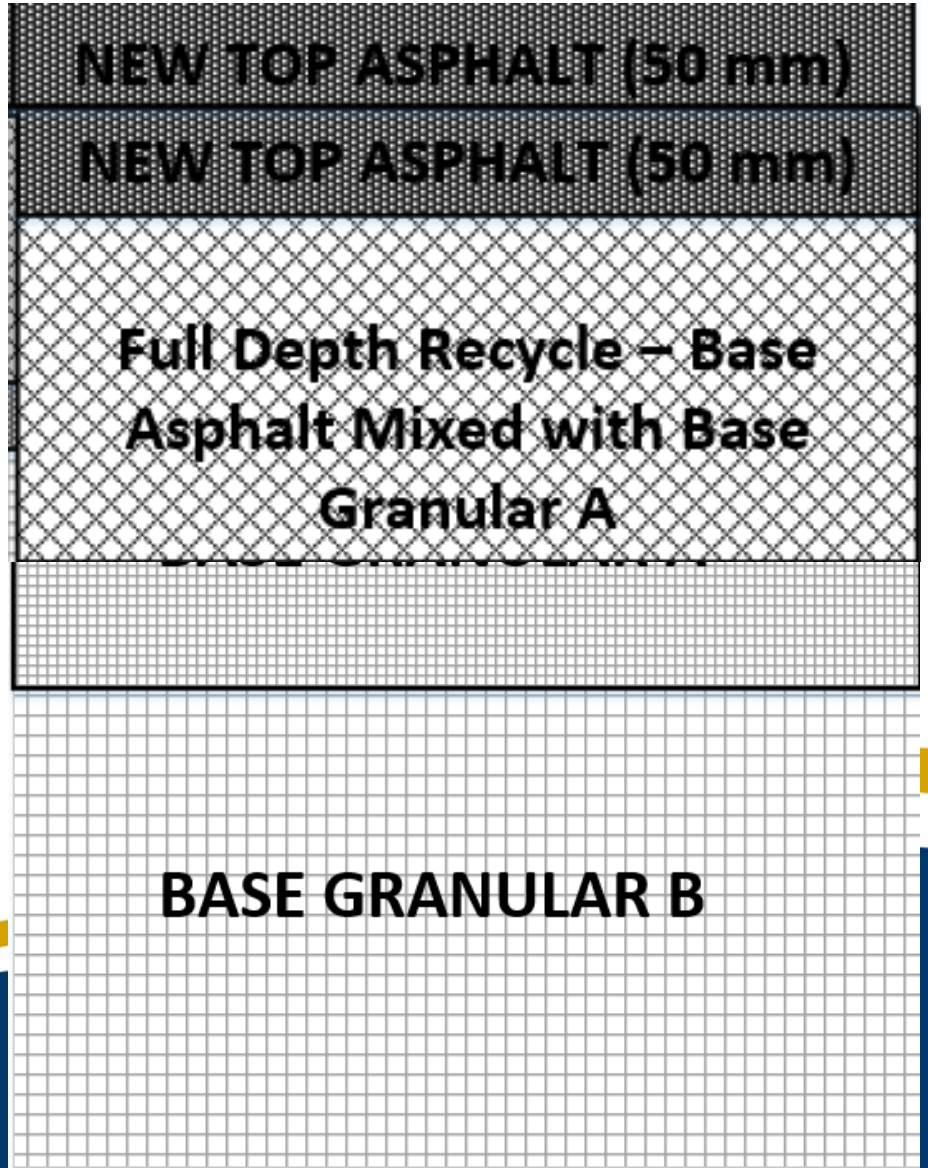
Rehabilitation Options

- **Cold-in-Place Recycling**
  - Moderate Cost
    - $167k / km Capital
    - $11.2k / km / year Life Cycle Cost *under ideal conditions.*
  - Suitable when base is in very good condition **AND** prior recycled materials can be re-mixed into a strong asphalt.
  - A second CIP is rarely done in the industry. If it is, it does not perform as well.



Rehabilitation Options

- **Full Depth Recycling**
  - Higher Capital Cost but SAME or better Life Cycle cost as CIP
    - $205k / km Capital
    - $11.3k / km / year Life Cycle Cost
  - Suitable when base has been compromised and significant pavement defects exist (rutting, potholes, deep cracks, etc..).



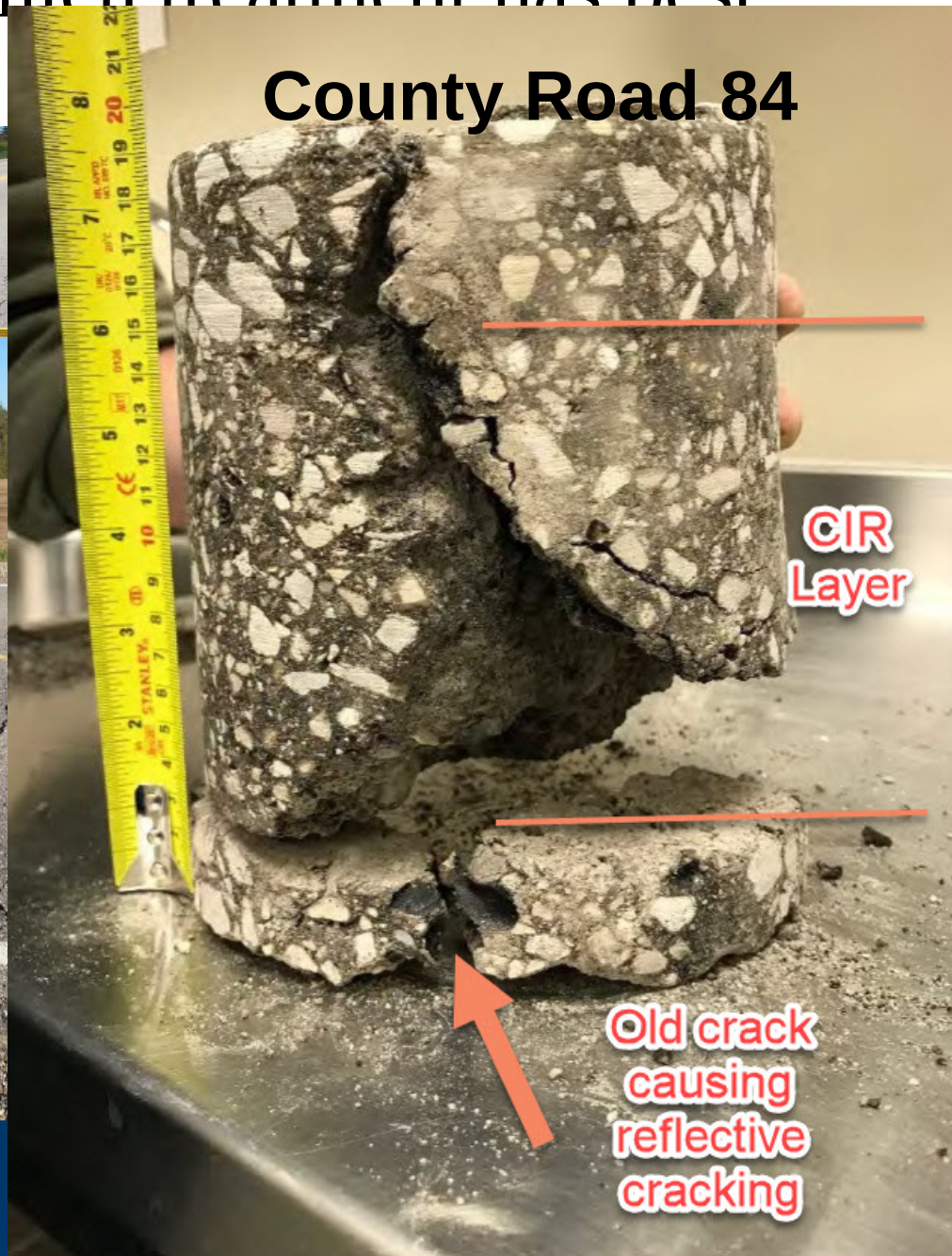
There is no one treatment solution to every road

County Road 30

- CIP in 2006
- After 7 years the road showed signs of stress.
- Road and base is progressively failing at 13 years (2019).
- An example of a County road that CIP is not a good choice and likely was not the best choice in 2006 having a life-cycle cost of over $16k/year

So how do we know which treatment has best value?

- Regular Pavement condition Assessments.
- Tracking condition in our Asset Management System.
- Testing core samples of asphalt and base materials.
- Measuring actual thickness of asphalt layers.



County of Huron
Public Works Department

Questions?

HURON COUNTY

APPENDIX C

Asset Level of Service and Asset Class Risk Analysis

Asset Level of Service Information		Consequences						Risk Targets		Current State Risk & Financial Analysis				
Analysis Name		Health & Safety	Community Services	Financial	Environment	Reputation	Total Consequence	Target Likelihood of Failure (Based on ALOS Targets)	Residual (Target) Risk	Current Asset Level of Service	ALOS Distribution within the Asset Class (%)	Current Likelihood of Failure (Based on Current ALOS)	Current State Risk	Variance from Residual (Target) Risk
Roads	**Condition ALOS #1**	**3**	**4**	**4**	**2**	**2**	**15**							
	PCI = 80							**2**	**30**	PCI > 80	72%	1	**15**	100.0%
	PCI = 80									PCI: 79-70	16%	2	**30**	0.0%
	PCI = 80									PCI 69-60	10%	3	**45**	**-33.3%**
	PCI = 80									PCI 59-50			**0**	
	PCI = 80									PCI <50	2%	5	75	**-60.0%**
Average Condition ALOS #1 Risks and Total	**Average Condition ALOS #1 Risks and Total Costs**										**100%**		**22**	38.9%
Overall Average Condition ALOS Risks and T	**Overall Average Condition ALOS Risks and Total Costs**								**30**				**22**	38.9%
Roads	**Performance ALOS #1**	**5**	**3**	**2**	**1**	**2**	**13**							
	Operational Functionality = Good							**2**	**26**	Good	100%	2	**26**	0.0%
	Operational Functionality = Good												**0**	
	Operational Functionality = Good												**0**	
	Operational Functionality = Good												**0**	
ALOS #1 Average Performance Risks and To	**ALOS #1 Average Performance Risks and Total Costs**										**100%**		**26**	0.0%
Roads	**Performance ALOS #2**	**5**	**3**	**1**	**1**	**2**	**12**							
	Capacity - Good									Good	98%	2	**24**	0.0%
	Capacity - Good									Fair	2%	3	**36**	**-33.3%**
	Capacity - Good							**2**	**24**				**0**	
	Capacity - Good												**0**	
	Capacity - Good												**0**	
ALOS #2 Average Performance Risks and To	**ALOS #2 Average Performance Risks and Total Costs**										**100%**		**24**	**-1.0%**
Roads	**Performance ALOS #3**	**3**	**3**	**1**	**1**	**3**	**11**							
	Environmental Resiliency = Good									Good	100%	2	**22**	0.0%
	Environmental Resiliency = Good												**0**	
	Environmental Resiliency = Good							**2**	**22**				**0**	
	Environmental Resiliency = Good												**0**	
	Environmental Resiliency = Good												**0**	
ALOS #3 Average Performance Risks and To	**ALOS #3 Average Performance Risks and Total Costs**										**100%**		**22**	0.0%
Asset Class	**Performance ALOS #4**						**0**							
													0	
													0	
									0				**0**	

Asset Level of Service and Asset Class Risk Analysis

													0	
													0	
ALOS #4 Average Performance Risks and To	ALOS #4 Average Performance Risks and Total Costs											0%	0	
Overall Average Performance ALOS Risks a	Overall Average Performance ALOS Risks and Total Costs							24.0					24	-0.3%
Combined Average Condition & Performan	Combined Average Condition & Performance ALOS Risks and Total Costs							27.0					23	18.2%
Bridges	**Condition ALOS #1**	**5**	**5**	**5**	**2**	**4**	**21**							
	BCI = 70							2	42	BCI > 80	5%	1	21	100.0%
	BCI = 70									BCI: 79-70	47%	2	42	0.0%
	BCI = 70									BCI 69-60	40%	3	63	-33.3%
	BCI = 70									BCI 59-50	6%	4	84	-50.0%
	BCI = 70									BCI <50	2%	5	105	-60.0%
Average Condition ALOS #1 Risks and Total	Average Condition ALOS #1 Risks and Total Costs										100%		53	-20.9%
Average Condition #2 ALOS Risks and Total	Average Condition #2 ALOS Risks and Total Costs							0			0%		0	
Overall Average Condition ALOS Risks and T	Overall Average Condition ALOS Risks and Total Costs							42					53	-20.9%
Bridges	**Performance ALOS #1**	**5**	**5**	**5**	**2**	**3**	**20**							
	Operational Functionality = Good							2	40	Very Good	14%	1	20	100.0%
	Operational Functionality = Good									Good	76%	2	40	0.0%
	Operational Functionality = Good									Fair	10%	3	60	-33.3%
	Operational Functionality = Good												0	
	Operational Functionality = Good												0	
ALOS #1 Average Performance Risks and To	ALOS #1 Average Performance Risks and Total Costs										100%		39	2.0%
Bridges	**Performance ALOS #2**	**5**	**5**	**5**	**2**	**3**	**20**							
	Capacity - Good							2	40	Very Good	1%	1	20	100.0%
	Capacity - Good									Good	98%	2	40	0.0%
	Capacity - Good									Fair	1%	3	60	-33.3%
	Capacity - Good												0	
	Capacity - Good												0	
ALOS #2 Average Performance Risks and To	ALOS #2 Average Performance Risks and Total Costs										100%		40	0.0%
Bridges	**Performance ALOS #3**	**5**	**5**	**5**	**2**	**3**	**20**							
	Environmental Resiliency = Good							2	40	Very Good	2%	1	20	100.0%
	Environmental Resiliency = Good									Good	96%	2	40	0.0%
	Environmental Resiliency = Good									Fair	2%	3	60	-33.3%
	Environmental Resiliency = Good												0	
	Environmental Resiliency = Good												0	
ALOS #3 Average Performance Risks and To	ALOS #3 Average Performance Risks and Total Costs										100%		40	0.0%
Asset Class	**Performance ALOS #4**						**0**							
								0	0				0	
													0	
													0	
													0	
													0	
ALOS #4 Average Performance Risks and To	ALOS #4 Average Performance Risks and Total Costs										0%		0	
Overall Average Performance ALOS Risks a	Overall Average Performance ALOS Risks and Total Costs							40.0					40	0.7%
Combined Average Condition & Performan	Combined Average Condition & Performance ALOS Risks and Total Costs							41.0					46	-11.7%
Major Culvert >2.5 m	**Condition ALOS #1**	**4**	**5**	**5**	**2**	**4**	**20**							

Asset Level of Service and Asset Class Risk Analysis

	BCI = 70							2	40	BCI > 80	11%	1	20	100.0%
	BCI = 70									BCI: 79-70	30%	2	40	0.0%
	BCI = 70									BCI 69-60	36%	3	60	-33.3%
	BCI = 70									BCI 59-50	14%	4	80	-50.0%
	BCI = 70									BCI <50	9%	5	100	-60.0%
Average Condition ALOS #1 Risks and Total	**Average Condition ALOS #1 Risks and Total Costs**										**100%**		**56**	**-28.6%**
Average Condition #2 ALOS Risks and Total	**Average Condition #2 ALOS Risks and Total Costs**								**0**		**0%**		**0**	
Overall Average Condition ALOS Risks and	**Overall Average Condition ALOS Risks and Total Costs**								**40**				**56**	**-28.6%**
Major Culvert >2.5 m	**Performance ALOS #1**	**4**	**5**	**5**	**2**	**3**	**19**							
	Operational Functionality = Good							2	38	Good	100%	2	38	0.0%
	Operational Functionality = Good												0	
	Operational Functionality = Good												0	
	Operational Functionality = Good												0	
	Operational Functionality = Good												0	
ALOS #1 Average Performance Risks and To	**ALOS #1 Average Performance Risks and Total Costs**										**100%**		**38**	0.0%
Major Culvert >2.5 m	**Performance ALOS #2**	**4**	**5**	**5**	**2**	**3**	**19**							
	Capacity - Good							2	38	Good	100%	2	38	0.0%
	Capacity - Good												0	
	Capacity - Good												0	
	Capacity - Good												0	
	Capacity - Good												0	
ALOS #2 Average Performance Risks and To	**ALOS #2 Average Performance Risks and Total Costs**										**100%**		**38**	0.0%
Major Culvert >2.5 m	**Performance ALOS #3**	**4**	**5**	**5**	**2**	**3**	**19**							
	Environmental Resiliency = Good							2	38	Very Good	5%	1	19	100.0%
	Environmental Resiliency = Good									Good	95%	2	38	0.0%
	Environmental Resiliency = Good												0	
	Environmental Resiliency = Good												0	
	Environmental Resiliency = Good												0	
ALOS #3 Average Performance Risks and To	**ALOS #3 Average Performance Risks and Total Costs**										**100%**		**37**	2.6%
Asset Class	**Performance ALOS #4**						**0**							
									0				**0**	
													0	
													0	
													0	
													0	
ALOS #4 Average Performance Risks and To	**ALOS #4 Average Performance Risks and Total Costs**										**0%**		**0**	
Overall Average Performance ALOS Risks a	**Overall Average Performance ALOS Risks and Total Costs**								**38.0**				**38**	0.8%
Combined Average Condition & Performan	**Combined Average Condition & Performance ALOS Risks and Total Costs**								**39.0**				**47**	**-16.7%**
Minor Culvert <2.5 m	**Condition ALOS #1**	**3**	**5**	**4**	**2**	**3**	**17**							
	BCI = 70							3	51	BCI > 80	5%	1	17	200.0%
	BCI = 70									BCI: 79-70	33%	2	34	50.0%
	BCI = 70									BCI 69-60	38%	3	51	0.0%
	BCI = 70									BCI 59-50	21%	4	68	-25.0%
	BCI = 70									BCI <50	11%	5	85	-40.0%
Average Condition ALOS #1 Risks and Total	**Average Condition ALOS #1 Risks and Total Costs**										**108%**		**55**	**-7.4%**

Asset Level of Service and Asset Class Risk Analysis

Average Condition #2 ALOS Risks and Total								Average Condition #2 ALOS Risks and Total Costs		0			0%		0	
Overall Average Condition ALOS Risks and T								Overall Average Condition ALOS Risks and Total Costs		51					55	-7.4%
Minor Culvert <2.5 m	**Performance ALOS #1**	**3**	**5**	**4**	**2**	**3**	**17**									
	Operational Functionality = Good										Good	100%	2		**34**	0.0%
	Operational Functionality = Good														**0**	
	Operational Functionality = Good								**2**	**34**					**0**	
	Operational Functionality = Good														**0**	
	Operational Functionality = Good														**0**	
ALOS #1 Average Performance Risks and To								ALOS #1 Average Performance Risks and Total Costs					**100%**		**34**	0.0%
Minor Culvert <2.5 m	**Performance ALOS #2**	**3**	**5**	**3**	**2**	**3**	**16**									
	Capacity - Good										Good	100%	2		**32**	0.0%
	Capacity - Good														**0**	
	Capacity - Good								**2**	**32**					**0**	
	Capacity - Good														**0**	
	Capacity - Good														**0**	
ALOS #2 Average Performance Risks and To								ALOS #2 Average Performance Risks and Total Costs					**100%**		**32**	0.0%
Minor Culvert <2.5 m	**Performance ALOS #3**	**3**	**5**	**3**	**2**	**3**	**16**									
	Environmental Resiliency = Good										Good	98%	2		**32**	0.0%
	Environmental Resiliency = Good										Fair	2%	3		**48**	-33.3%
	Environmental Resiliency = Good								**2**	**32**					**0**	
	Environmental Resiliency = Good														**0**	
	Environmental Resiliency = Good														**0**	
ALOS #3 Average Performance Risks and To								ALOS #3 Average Performance Risks and Total Costs					**100%**		**32**	-1.0%
Minor Culvert <2.5 m	**Performance ALOS #4**						**0**									
															0	
															0	
									0						**0**	
															0	
															0	
ALOS #4 Average Performance Risks and To								ALOS #4 Average Performance Risks and Total Costs					**0%**		**0**	
Overall Average Performance ALOS Risks a								**Overall Average Performance ALOS Risks and Total Costs**		**32.7**					**33**	-0.3%
Combined Average Condition & Performan								**Combined Average Condition & Performance ALOS Risks and Total Costs**		**41.8**					**44**	-4.8%

Asset Level of Service Priority Matrix

Asset	ALOS Type	Asset Level of Service Statements & Targets	Current ALOS	Current State Risk	Current State Risk Ranking (Higher Risk = Higher Ranking #)	Variance from Residual (Target) Risk
Bridges	C	BCI = 70	BCI <50	105	15	-60.0%
Major Culvert >2.5 m	C	BCI = 70	BCI <50	100	14	-60.0%
Minor Culvert <2.5 m	C	BCI = 70	BCI <50	85	13	-40.0%
Bridges	C	BCI = 70	BCI 59-50	84	12	-50.0%
Major Culvert >2.5 m	C	BCI = 70	BCI 59-50	80	11	-50.0%
Roads	C	PCI = 80	PCI <50	75	10	-60.0%
Minor Culvert <2.5 m	C	BCI = 70	BCI 59-50	68	9	-25.0%
Bridges	C	BCI = 70	BCI 69-60	63	8	-33.3%
Bridges	P	Operational Functionality = Good	Fair	60	4	-33.3%
Bridges	P	Capacity - Good	Fair	60	4	-33.3%
Bridges	P	Environmental Resiliency = Good	Fair	60	4	-33.3%
Major Culvert >2.5 m	C	BCI = 70	BCI 69-60	60	4	-33.3%
Minor Culvert <2.5 m	P	Environmental Resiliency = Good	Fair	48	3	-33.3%
Roads	C	PCI = 80	PCI 69-60	45	2	-33.3%
Roads	P	Capacity - Good	Fair	36	1	-33.3%
0	0	0	0	0		0.0%

Asset Class Priority Matrix

Asset Information		Current State Risk	Current State Risk Ranking (Higher Risk = Higher #)	Variance from Residual (Target) Risk
Major Culvert >2.5 m	Combined Average Condition & Performance ALOS Risks and Total Costs	47	3	-16.7%
Bridges	Combined Average Condition & Performance ALOS Risks and Total Costs	46	2	-11.7%
Minor Culvert <2.5 m	Combined Average Condition & Performance ALOS Risks and Total Costs	44	1	-4.8%