2021 Biennial Bridge Inspections
Presentation to Council
November 15th, 2021
United Counties SDG

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Quick Facts

- 188 Structures
  - 72 Bridges
  - 116 Large Culverts (> 3.0m)
- $235 Million Asset Replacement Value
- $38 Million in Capital Needs 2022 to 2031
- 3 Bridges & 29 Culverts should be replaced by 2031
- 26 Bridges require Rehabilitation
- Culvert renewal continues to be the focus.

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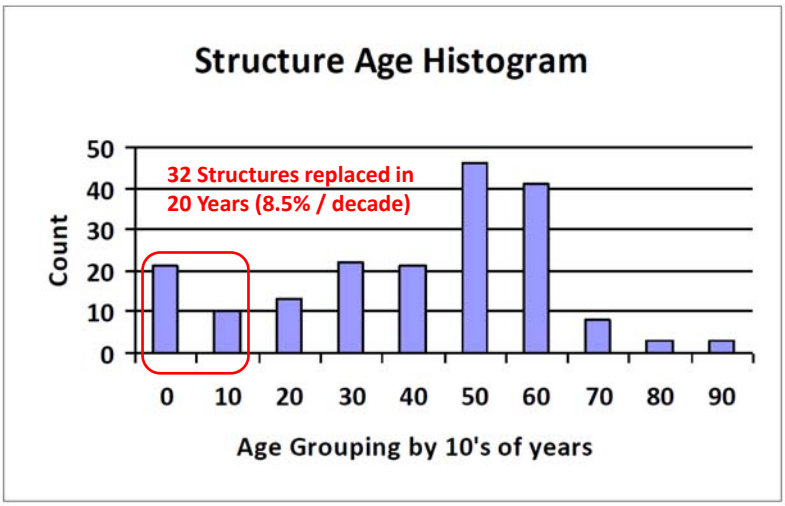
188 Structures Aged 1 to 96



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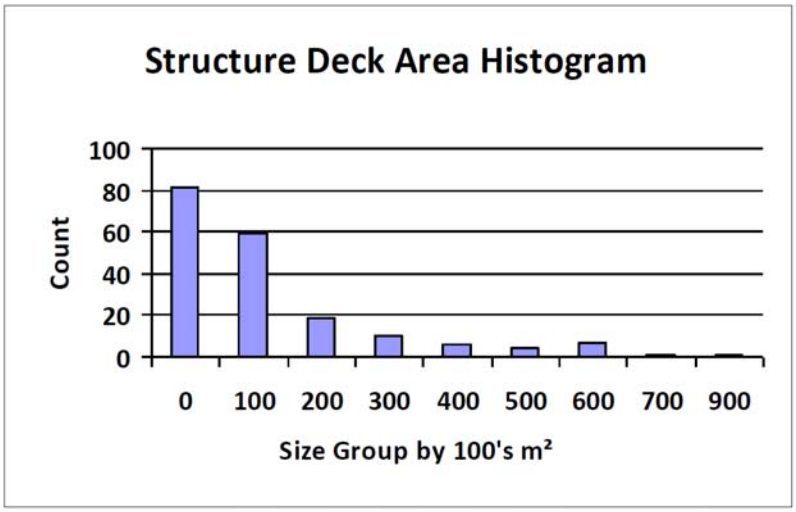
33,160 m^2 Ranging 36 – 967 m^2



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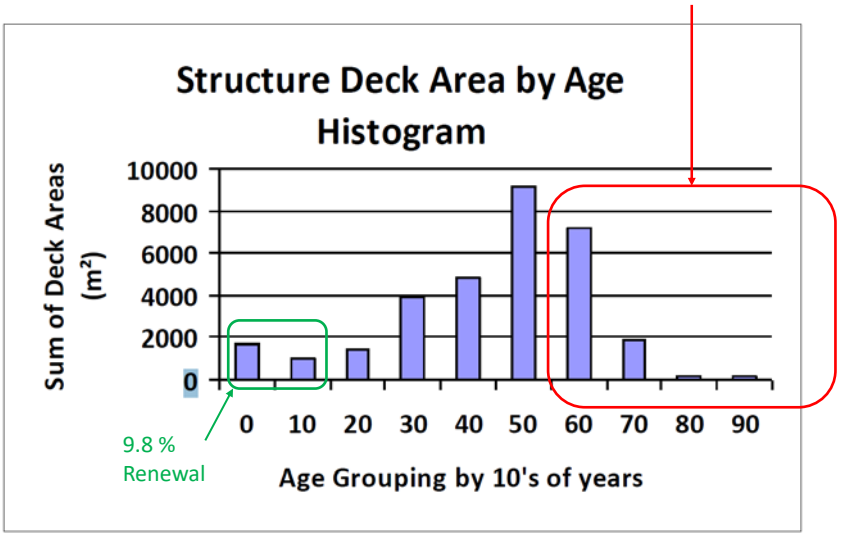
57% of Surface Area > 50 Years Old



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Of Significance

- 9.8% of Inventory Area renewed in past 20 years
- Ideally renewal should be at least 10% per decade
- Long-term outlook: Increasing capital expenditures
- Significant investment in Preservation Capital may forestall some replacements

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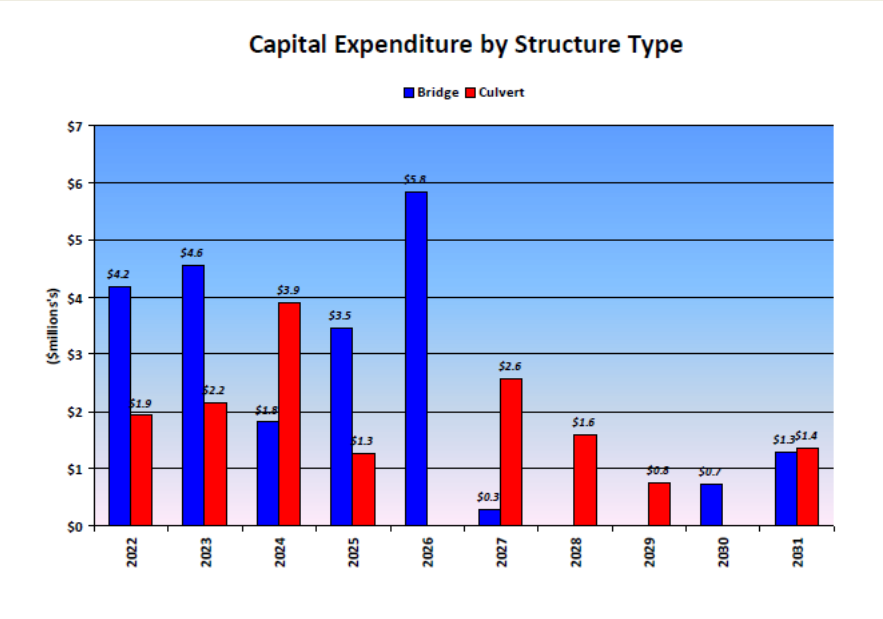

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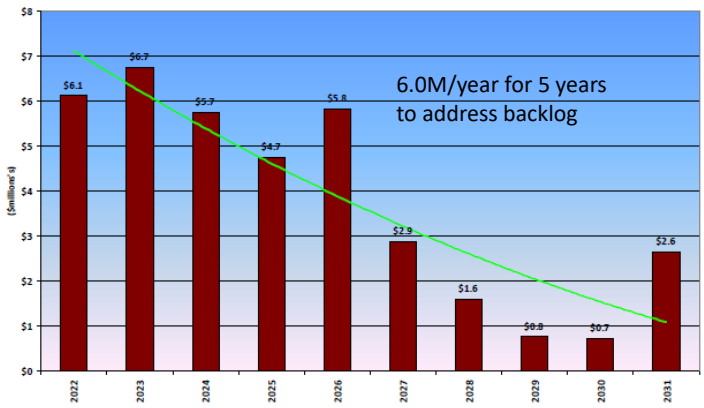
$37,714,000 2022 - 2031



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Estimated Remaining Service Life (ERSL) & Replacement Value

Bridge ID	Name	Estimated Remaining Service Life	Program Year	Estimated Replacement Cost
01-158	Ferguson MD	3	2024	$495,000
03-124	Inkerman Bridge	3	2023	$2,060,000
03-276	Black Creek MD	3	2024	$543,000
08-090	Nash Creek Twin Culvert	3	2024	$636,000
15-163	Wert MD	3	2024	$335,000
43-035	Wylie Creek Culvert	3	2024	$426,000
43-641	Morrow-Munro MD	3	2024	$386,000
09-984	Kittle Creek Culvert	2	2023	$345,000
12-093	Dixon Creek Culvert	2	2023	$564,000
27-030	Fraser Creek Culvert	2	2028	$342,000
31-197	CSP	2	2023	$354,000
31-198	Hollister Rd. Equalizer Battery	2	2023	$799,000
02-093	Doran's Bay Culvert	1	2022	$501,000
20-196	Cardinal MD	1	2022	$440,000
42-003	Eastman Creek Culvert	0	2022	$500,000

32 Structures (mostly culverts) have less than 10 years ERSL

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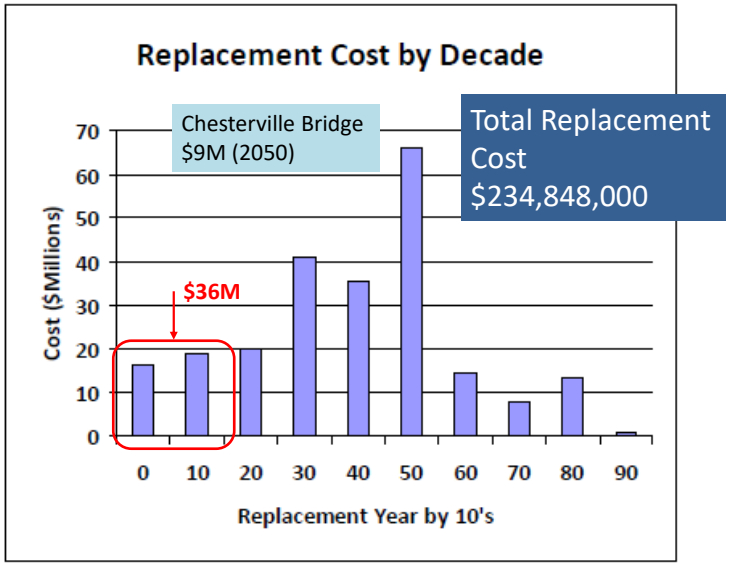

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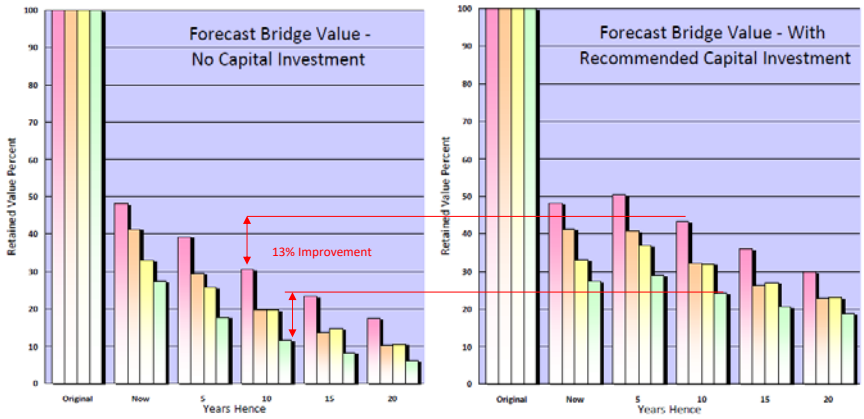
Side-by-Side Comparison showing Improved Retained Value



Need to continually spend $170K / year / percent improvement on bridges ($22.1M over 10 years yields 13% improvement in retained value)

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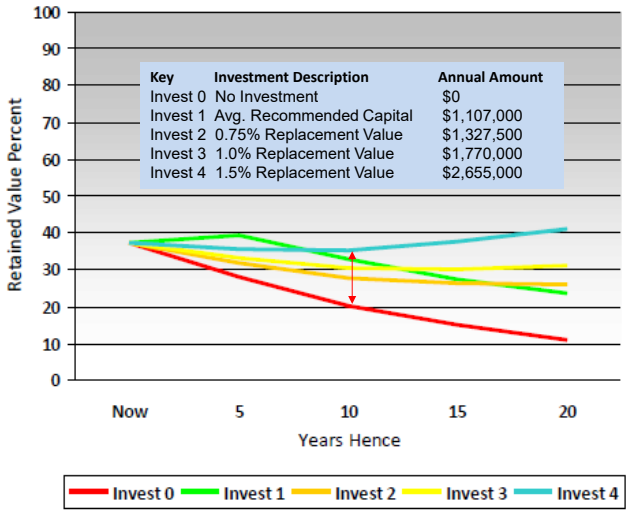
Level of Depreciation with 5 Investment Alternatives

Remaining Value of all Bridges



Key	Investment Description	Annual Amount
Invest 0	No Investment	$0
Invest 1	Avg. Recommended Capital	$1,107,000
Invest 2	0.75% Replacement Value	$1,327,500
Invest 3	1.0% Replacement Value	$1,770,000
Invest 4	1.5% Replacement Value	$2,655,000

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Grays Creek Bridge Rehab – 02-513

Year	BCI	ERSL	PD	SLD	Damage
2019	71.5	47	28.4	14.1	16.3
2021	76.1	55	51.8	37.1	1.5
Difference	+4.6	+8 years	+23.4 %	+23.0 %	-14.8 %

Rehab Cost $930,000
($1,700 / m^2)
($209 / m^2 / year
life extension)

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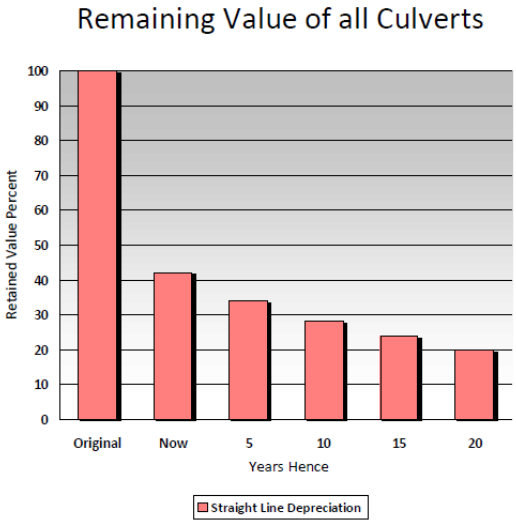
Culvert Depreciation Outlook

Present & Forecast Culvert Depreciation w/o Investment



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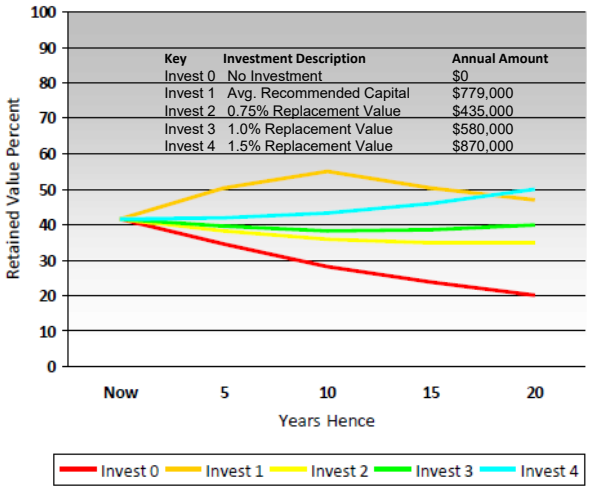
5 Culvert Investment Scenarios

Remaining Value of all Culverts



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02-093 Doran's Bay Culvert Severe Corrosion (2022)
$582K

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20-196 Cardinal MD (2022) $498K

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18-548 Ferguson Creek Bridge (2022) $776K

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Bridge Condition Index (BCI)

BCI Range	Count 2021 (2019)	Percent 2021 (2019)	Change Count & (%)
70 - 100	97 (105)	51.6 (55.9)	-8 (-4.3%)
60 - 70	73 (68)	38.8 (36.2)	+5 (+2.6%)
50 - 60	17 (14)	9.0 (7.4)	+3 (+1.6%)
< 50	1 (1)	0.5 (.5)	0 (0%)

Ideally, 80% of structures should have BCI > 70
28.4% behind MTO goal

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Summary

Catch-up Capital	Long-Term Replacement Capital	Preservation Capital
Need to spend $6.0M / Year on Capital for structures for next 5 years (Catch-up Phase)	Need to spend ~ $1.8M / Year on Structure Replacement alone for next 20 years	Preservation Capital will help defer Structure Replacements by extending the life of bridges

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Summary Financial Information

ITEM	Structure Replacement Value $M	Nominal Annual Depreciat'n Rate %	Nominal Annual Depreciat'n Value $K	Ideal Annual Capital Investment 20 Year Outlook $K	Recom'd Annual Average Capital Next 10 Years $K
Bridges	176.8	1.30	2,300	3,000	2,200
Culverts	58.2	1.15	630	870	1,560
Total	**235**	**1.30**	**2,930**	**3,870**	**3,760**

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