Asset Management Webinar Series

Developing Financial Strategy with Whole Lifecycle Costing

This initiative is delivered through the Municipal Asset Management Program, which is delivered by the Federation of Canadian Municipalities and funded by the Government of Canada.

Contact ccbf@amo.on.ca for more information

Asset Management Webinar Series

1) Leadership and Governance in Asset Management

2) Establishing Asset Hierarchy & Conducting Data Gap Analysis

3) Understanding Service Levels

4) Using Risk Assessments to Identify Local Priorities

5) Developing a Financial Strategy Using Whole Lifecycle Costs

AMO Association of Municipalities Ontario

AGENDA

- Panel Discussion
  - Brad Brookman, Director of Finance/Treasurer, Municipality of North Grenville
  - Donna White, Director of Finance, Township of North Huron
- Overview of Financial Model
  - Troy Mander, Asset Management Ontario
  - Mayuri Bharkhada, Asset Management Ontario
- Q&A

AMO Association of Municipalities Ontario

Panel Discussion

- **Long Term Financial Implications of New Assets**
  - When acquiring new infrastructure asset, how can municipalities estimate future operations, maintenance and capital costs associated with the new asset?

- **Identifying and Tracking Asset Lifecycle Costs**
  - How can staff from finance effectively collaborate with other departments to identify typical annual operations and maintenance activities and track relevant costs?

- **Budget Policy and Asset Management (AM) Policy**
  - How important it is for a municipality's budget policy to be aligned with its AM policy to ensure capital and operating projects proposed in the budget are also highlighted in the AM plan?

AMO Association of Municipalities Ontario

Developing Financial Strategy Using Asset Whole Lifecycle Costs

Troy Mander & Mayuri Bharkhada

November 5, 2021

Connection to O.Reg. 588/17

- The 10-year AMP must include a forecast of the municipality's annual capital & operating expenditures to sustain current & desired LOS

- The AMP must also include:
  - What works/activities the municipality can afford to undertake
  - What works/activities cannot be undertaken & how will the risks be managed

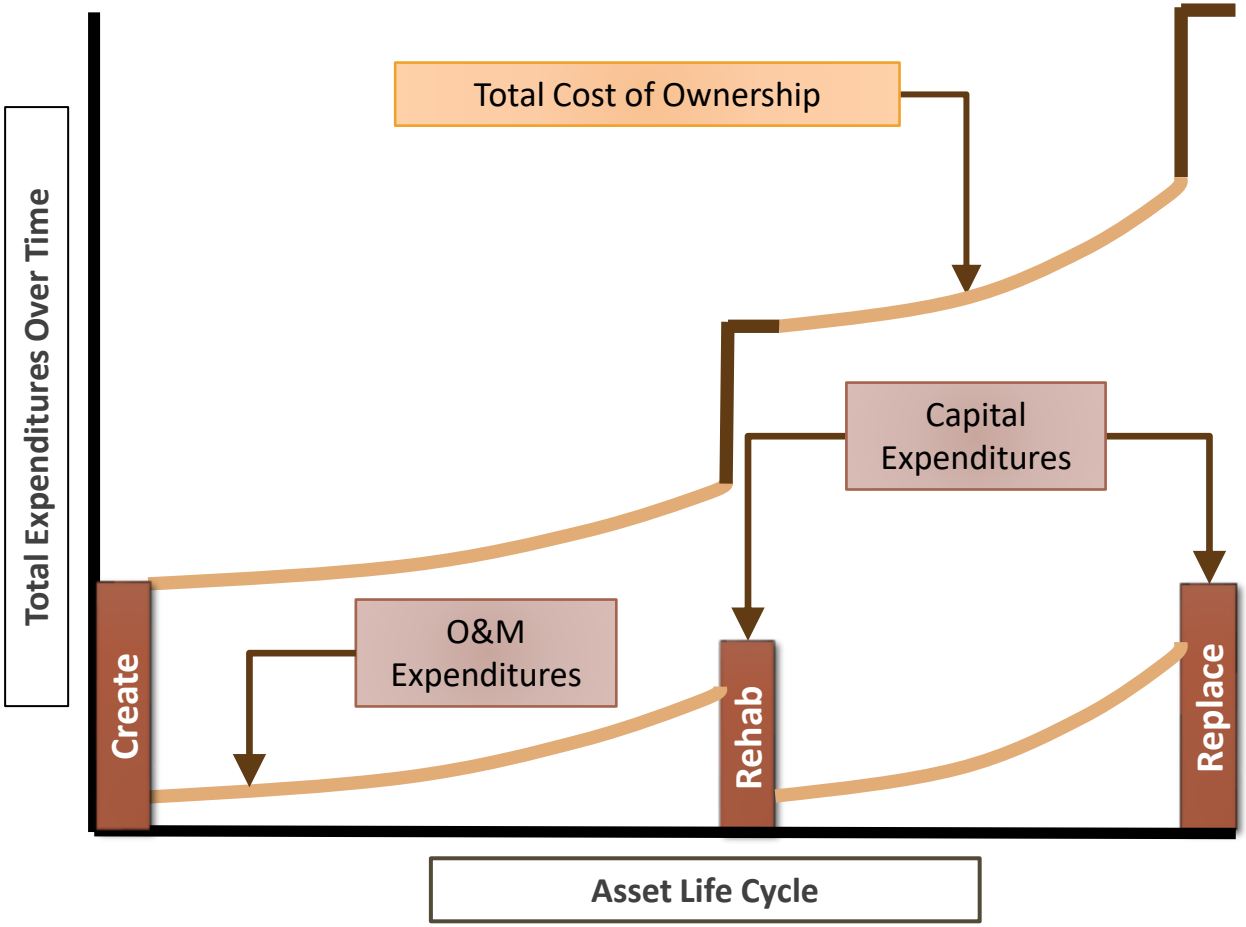
- An objective of O.Reg 588/17 is to encourage municipalities to determine their infrastructure funding gap & how it will be managed

Infrastructure Funding Gap

- A measure of financial sustainability
  - i.e. larger funding gap = less sustainable AMP

- Relative to the municipality's
  - Levels of service & risk targets
  - Whole life cycle strategies & costs
  - Risk tolerances
  - Reserves & revenues
  - The calculation period

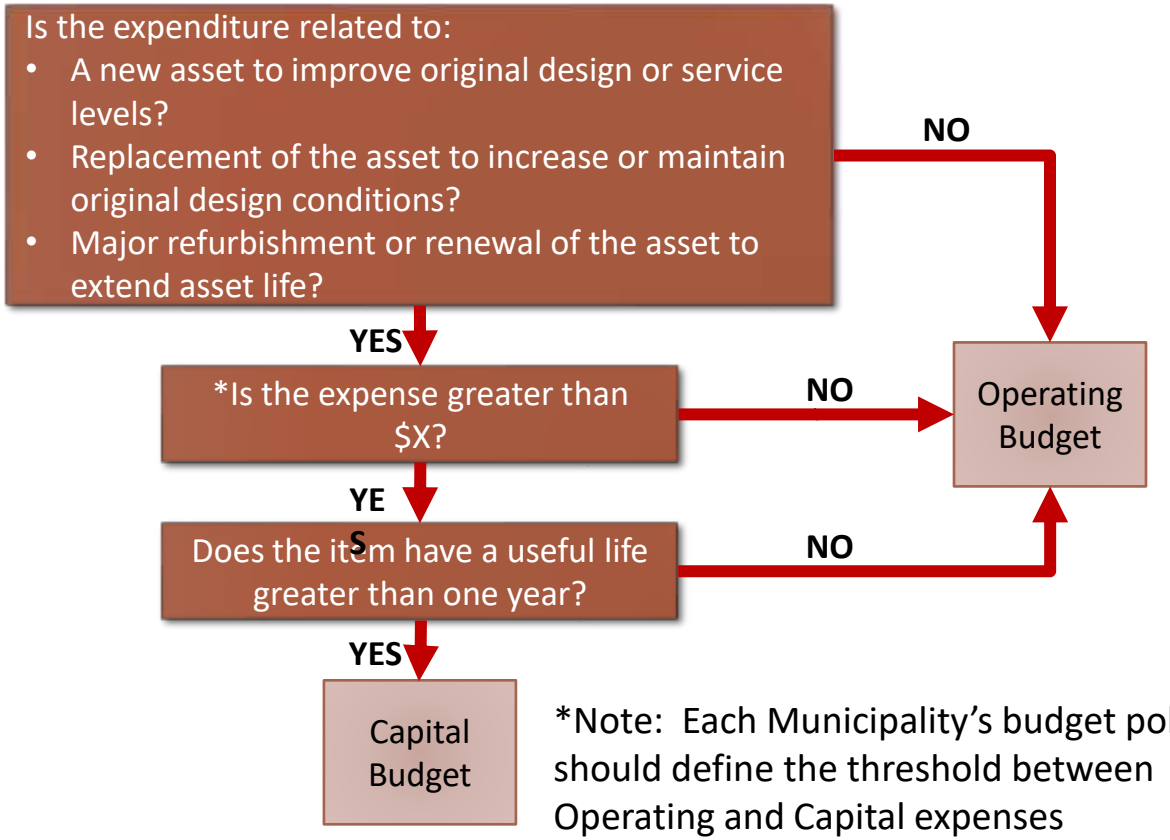
Whole Life Cycle Costs & Total Cost of Ownership



Whole Life Cycle Expenditures

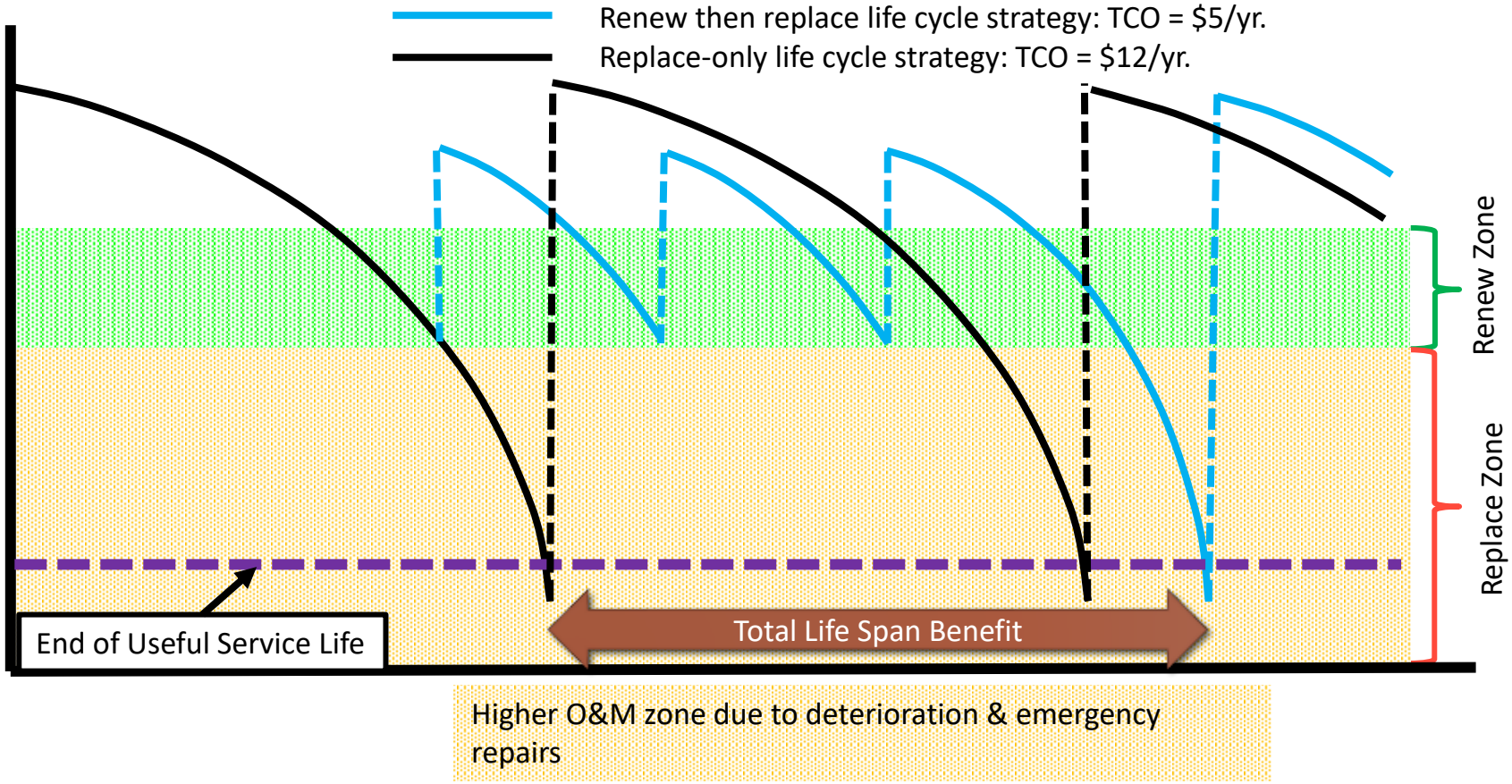
Type	Description	Examples	Budget
New/Create or Upgrade	New asset or an asset upgrade/expansion to improve performance beyond the original design conditions.	• Assets upsized for additional capacity • New assets for back-up or emergency capacity • Upgrades to provide service resiliency • New assets to service growth or new services	Capital
Replace or Rehabilitate	Significant asset renewal work or full replacement toward achieving original design conditions and extending asset life.	• 'Like-for-like' asset replacements • Relining, resurfacing, reconditioning of assets • Significant periodic mid-life refurbishments (can also be major maintenance)	Capital
Operations	Activities that have no affect on preserving asset condition but are required for, or are part of asset utilization.	• Daily monitoring & operation activities • Various charges & daily overhead costs • Consumables such as electricity, fuel, water, chemicals, salt, calcium chloride	Operating
Maintenance	The ongoing day-to-day activities to keep assets operating at original design conditions & maximize service life.	• Scheduled asset servicing & adjustments • Reactive repairs to correct asset faults • Modest alterations or reconfigurations	Operating

Capital or Operating Expense?



*Note: Each Municipality's budget policy should define the threshold between Operating and Capital expenses

Rehabilitative Life Cycle Strategies Save Costs & Maintain Better Services



Life Cycle Strategy & Cost Information

- Previously completed projects
- Municipal AMPs
- Communities of Practice
- Staff expertise: Engineering, Finance, Infrastructure Planning & Operations
- Asset replacement & maintenance history
- Value Engineering, Environmental Assessments & other engineering studies
- Condition Assessments
- Consultants
- Materials suppliers
- Contractors

Life cycle strategies & costs differ between municipalities:

- Community & asset levels of service targets
- Risk tolerances
- Operations & maintenance practices
- Demands
- Climate
- Geography
- Soil conditions
- Local building codes
- Approved materials specifications
- Construction practices

Conclusions

1. Consider ALOS & life cycle strategies in combination to maximize renewal options & asset value

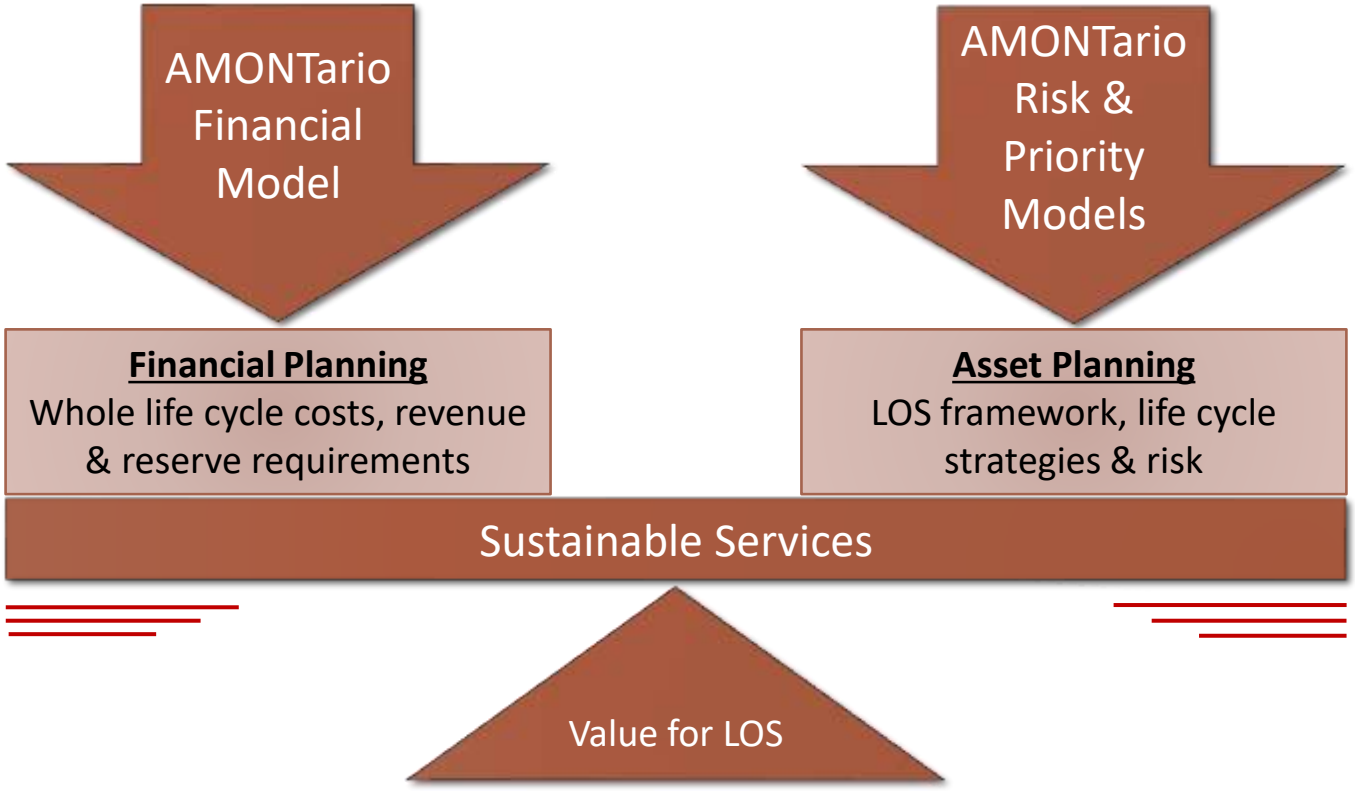
2. Consider Total Cost of Ownership implications when creating new assets
   - i.e. can we afford to maintain a new facility over the long term

3. Ensure clear organizational guidance on what are capital, operating & maintenance activities & expenses

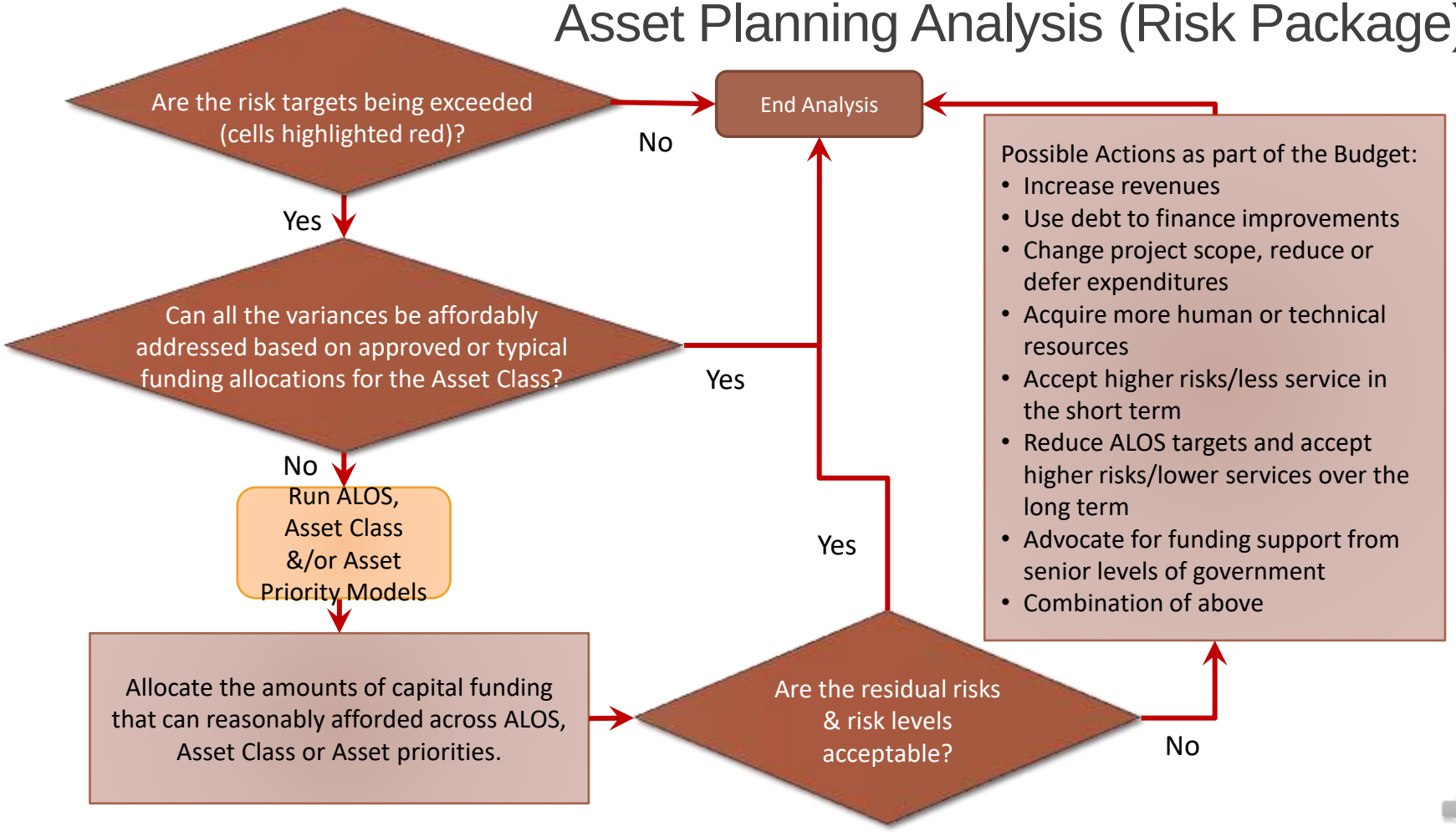
4. Develop & maintain life cycle unit costs for repeatable budget estimates & developing financing strategies

AMONTario Modelling for Sustainability

Achieving a Sustainable Balance



Asset Planning Analysis (Risk Package)



Completed Risk Analysis

Step 2. Adjust asset distributions and Likelihood of Failure based on affordable 10-year capital investments

Current state of assets and risks

Asset Level of Service Information		Consequences						Risk Targets		Current State Risk & Financial Analysis							Financial Plan Analysis						
Road Risk Analysis		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	Estimated Costs to Meet ALOS Targets (Risk Mitigation Costs) ($,000's)	Risk-Cost Benefit ($,000's per Risk Point Reduced)	Proposed 10-year Capital Plan Investments ($,000's)	ALOS Distribution within the Asset Class (%)	Post-Financing Likelihood of Failure (After Proposed Investments)	Estimated Post 10-year Capital Plan Risk (After Proposed Investments)	Risk Reduced by Capital Plan	Net Variance from Residual (Target) Risk
HCB Collector Roads	**Condition ALOS #1**	**4**	**3**	**4**	**2**	**2**	**15**	**2**	**30**														
	PCI = 70									PCI >69	40%	2	**30**	0.0%				65%	2	**30**	0%	0.0%
	PCI = 70									PCI = 69 to 56	30%	3	**45**	**-33.3%**	$ 1,000	$ 66.67	$ 500	15%	3	**45**	0%	**-33.3%**
	PCI = 70									PCI = 55 to 45	20%	4	**60**	**-50.0%**	$ 2,000	$ 67	$ 1,000	10%	4	**60**	0%	**-50.0%**
	PCI = 70									PCI<45	10%	5	**75**	**-60.0%**	$ 1,000	$ 22	$ 1,000	10%	2	**30**	150%	0.0%
	PCI = 70												**0**			$ -				**0**		
Average Condition ALOS #1 Risks and							**Average Condition ALOS #1 Risks and Total Costs**				**100%**		**45**	**-33.3%**	**$ 4,000**	$ 267	**$ 2,500**	**100%**		**35.25**	**28%**	**-14.9%**
HCB Collector Roads	**Performance ALOS #1**	**4**	**4**	**3**	**1**	**3**	**15**	**2**	**30**														
	Operational Functionality = Good									Very Good	1%	1	**15**	100.0%		$ -		1%	1	**15**	0%	100.0%
	Operational Functionality = Good									Good	59%	2	**30**	0.0%				78%	2	**30**	0%	0.0%
	Operational Functionality = Good									Fair	29%	3	**45**	**-33.3%**	$ 1,500	$ 100	$ 500	10%	3	**45**	0%	**-33.3%**
	Operational Functionality = Good									Poor	11%	4	**60**	**-50.0%**	$ 200	$ 7	$ 200	11%	2	**30**	100%	0.0%
	Operational Functionality = Good									Very Poor			**0**			$ -				**0**		
ALOS #1 Average Performance Risks a							**ALOS #1 Average Performance Risks and Total Costs**				**100%**		**38**	**-20.0%**	**$ 1,700**	$ 227	**$ 700**	**100%**		**31.35**	**20%**	**-4.3%**

Total costs of asset needs

Step 1. Enter affordable 10-year capital investments

Step 3. ALOS risk reductions per affordable 10-year capital investments

AMONTario' s Financial Model

November 5th, 2021

Mayuri Bharkhada

AMONTario
ASSET MANAGEMENT ONTARIO

TAB 1: Calculating Annual Operations and Maintenance Costs by Asset Class

Cost Categories	Pavement					Pavement					Pavement				
	Daily Road Patrols				Operations_System	Snow Plowing				Operations_System	Patching				Mair
	Description	Cost Centre (If available)	$/Hour	Annual Hours	Total Costs	Description	Cost Centre (If available)	$/Hour	Annual Hours	Total Costs	Description	Cost Centre (If available)	$/Hour	Annual Hours	
Labour	Supervisor		36	1250	$ 45,000	Driver		27	18432	$ 497,664	Worker		30	1920	$
					$ -					$ -					$
					$ -					$ -					$
					$ -					$ -					$
					$ -					$ -					$
Subtotal Labour					$ 45,000					$ 497,664					$
	Description	Cost Centre (If available)	$/Unit (If available)	Amount Used	Total Costs	Description	Cost Centre (If available)	$/Unit (If available)	Amount Used	Total Costs	Description	Cost Centre (If available)	$/Unit (If available)	Amount Used	
Parts and materials					$ -					$ -	Asphalt				$
					$ -					$ -					$
					$ -					$ -					$
					$ -					$ -					$
					$ -					$ -					$
Subtotal Parts & Materials					$ -					$ -					$
	Description	Cost Centre (If available)	$/Unit (If available)	Amount Used	Total Costs	Description	Cost Centre (If available)	$/Unit (If available)	Amount Used	Total Costs	Description	Cost Centre (If available)	$/Unit (If available)	Amount Used	
Consumables (electricity, fuel, chemicals, etc.)	Fuel		1.3	3750	$ 4,875	Fuel		1.35	12442	$ 16,797	Fuel		1.35	7680	$
					$ -					$ -					$
					$ -					$ -					$
					$ -					$ -					$
					$ -					$ -					$
Subtotal Consumables					$ 4,875					$ 16,797					$
	Description	Cost Centre (If available)	$/Hour	Hours/Year	Total Costs	Description	Cost Centre (If available)	$/Hour	Hours/Year	Total Costs	Description	Cost Centre (If available)	$/Hour	Hours/Year	
Equipment	Pick up Truck		15	1250	$ 18,750	Plow Truck		65	9216	$ 599,040	Truck / Hot Box		25	980	$
					$ -					$ -					$
					$ -					$ -					$
					$ -					$ -					$
					$ -					$ -					$
Subtotal Equipment					$ 18,750					$ 599,040					$
Activity Subtotal					$ 68,625					$ 1,113,501					$
Asset Class as a Percentage of the Service Division	Note: The units used to calculate the Asset Class as a percentage of the overall Service Division (a major group of related Asset Classes) must be consistent with the asset units of measure in the asset register or data base; e.g., km, metres, m²				26%	Note: The units used to calculate the Asset Class as a percentage of the overall Service Division (a major group of related Asset Classes) must be consistent with the asset units of measure in the asset register or data base; e.g., km, metres, m²				26%	Note: The units used to calculate the Asset Class as a percentage of the overall Service Division (a major group of related Asset Classes) must be consistent with the asset units of measure in the asset register or data base; e.g., km, metres, m²					

1. O&M (System & Facilities) | 2.Capital Costs (System) | 3.Input & Summary (System) | 3.Input & Summary (Facilities) | 4. Facilities Investment Model | 5. Life Cycle (Sys ...

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ASSET MANAGEMENT ONTARIO

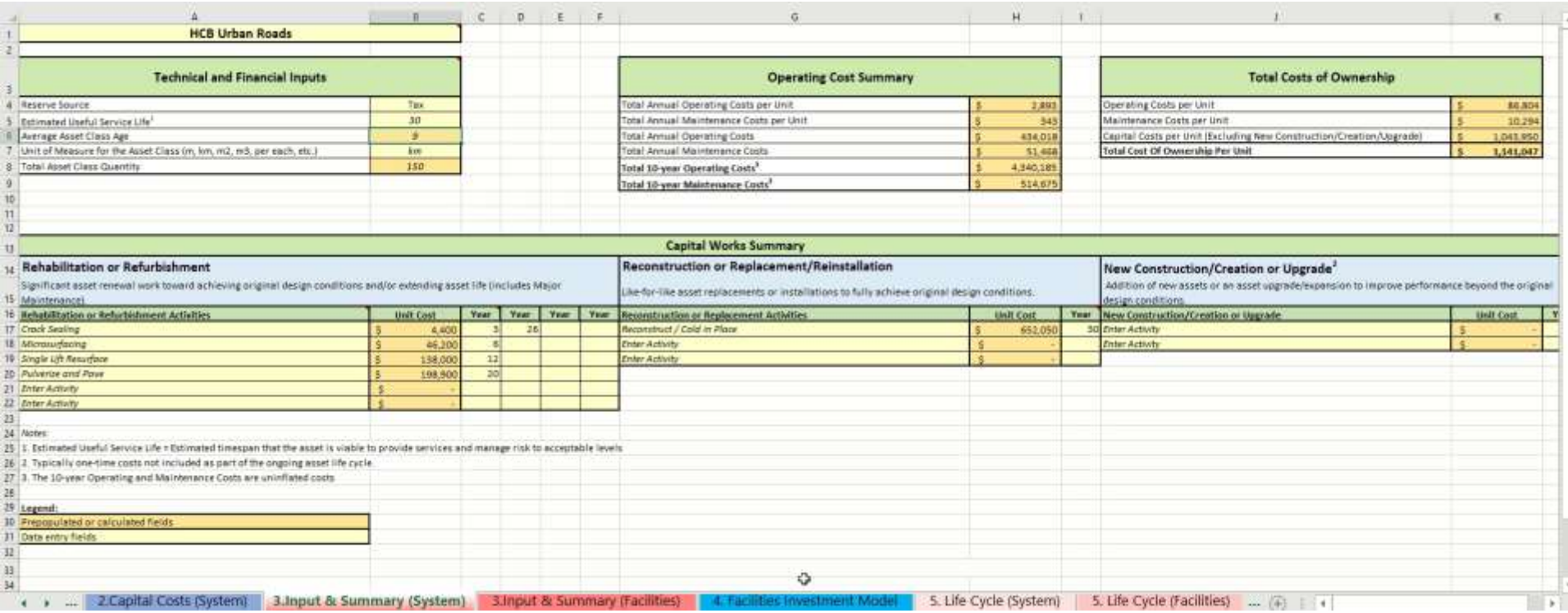
TAB 2: Calculating Capital Costs by Asset Class for System Assets only

	A	B	C	D	E	F	G	H	I	J
1	**Crack Sealing**			**Microsurfacing**			**Single Lift Resurface**			**Pulverize and Pave**
2	**Applicable Works (includes all labour, materials & equipment)**	**Unit of Measure**	**$/Unit**	**Applicable Works (includes all labour, materials & equipment)**	**Unit of Measure**	**$/Unit**	**Applicable Works (includes all labour, materials & equipment)**	**Unit of Measure**	**$/Unit**	**Applicable Works (includes all labour, materials & equi**
3	Rehabilitation/Refurbishment Unit Costs	km	$ 4,000	Rehabilitation/Refurbishment Unit Costs	km	$ 42,000	Rehabilitation/Refurbishment Unit Costs	km	$ 100,000	Rehabilitation/Refurbishment Unit C
4	Optional Additional Allowances (Name)			Optional Additional Allowances (Name)			Curb Repairs		$ 10,000	Optional Additional Allowances (Nan
5	Optional Additional Allowances (Name)			Optional Additional Allowances (Name)			Base Spot Repairs		$ 10,000	Optional Additional Allowances (Nan
6	Optional Additional Allowances (Name)			Optional Additional Allowances (Name)			Optional Additional Allowances (Name)			Optional Additional Allowances (Nan
7	Optional Additional Allowances (Name)			Optional Additional Allowances (Name)			Optional Additional Allowances (Name)			Optional Additional Allowances (Nan
8	**Sub Total Construction Costs**		**$ 4,000**	**Sub Total Construction Costs**		**$ 42,000**	**Sub Total Construction Costs**		**$ 120,000**	**Sub Total Construction Costs**
9	**Overhead & Contingency Costs (as applicable)**	**Allowances (% of Line 8)**	**$/Unit**	**Overhead & Contingency Costs (as applicable)**	**Allowances (% of Line 8)**	**$/Unit**	**Overhead & Contingency Costs (as applicable)**	**Allowances (% of Line 8)**	**$/Unit**	**Overhead & Contingency Costs (as applicable)**
10	Pre-Design/Study		$ -	Pre-Design/Study		$ -	Pre-Design/Study		$ -	Pre-Design/Study
11	Design		$ -	Design		$ -	Design		$ -	Design
12	Contract Administration	10	$ 400	Contract Administration	5	$ 2,100	Contract Administration	5	$ 6,000	Contract Administration
13	Survey		$ -	Survey	5	$ 2,100	Survey	5	$ 6,000	Survey
14	Contingency/Provisional Allowance		$ -	Contingency/Provisional Allowance		$ -	Contingency/Provisional Allowance	5	$ 6,000	Contingency/Provisional Allowance
15	Other		$ -	Other		$ -	Other		$ -	Other
16	**Sub Total Overhead & Contingency Costs**		**$ 400**	**Sub Total Overhead & Contingency Costs**		**$ 4,200**	**Sub Total Overhead & Contingency Costs**		**$ 18,000**	**Sub Total Overhead & Contingency C**
17	**Total Unit Costs**		**$ 4,400**	**Total Unit Costs**		**$ 46,200**	**Total Unit Costs**		**$ 138,000**	**Total Unit Costs**
18										
19	Notes:									
20	**Rehabilitation or Refurbishment** Significant asset renewal work toward achieving original design conditions and/or extending asset life (includes Major Maintenance).									
21	**Reconstruction or Replacement/Reinstallation** Like-for-like asset replacements or installations to fully achieve original design conditions.									
22	**New Construction/Creation or Upgrade** Addition of new assets or an asset upgrade/expansion to improve performance beyond the original design conditions.									
23										
24	**Legend:**									

1. O&M (System & Facilities) | 2.Capital Costs (System) | 3.Input & Summary (System) | 3.Input & Summary (Facilities) | 4. Facilities Investment Model | 5. Life Cycle (Sys ...

AMONTario
ASSET MANAGEMENT ONTARIO

TAB 3: Summary and Total Cost of Ownership for Systems Assets



HCB Urban Roads

Technical and Financial Inputs	
Reserve Source	Tax
Estimated Useful Service Life[1]	30
Average Asset Class Age	9
Unit of Measure for the Asset Class (m, km, m2, m3, per each, etc.)	km
Total Asset Class Quantity	150

Operating Cost Summary	
Total Annual Operating Costs per Unit	$ 2,893
Total Annual Maintenance Costs per Unit	$ 345
Total Annual Operating Costs	$ 434,018
Total Annual Maintenance Costs	$ 51,468
Total 10-year Operating Costs[3]	$ 4,340,189
Total 10-year Maintenance Costs[3]	$ 514,675

Total Costs of Ownership	
Operating Costs per Unit	$ 88,804
Maintenance Costs per Unit	$ 10,294
Capital Costs per Unit (Excluding New Construction/Creation/Upgrade)	$ 1,043,950
Total Cost Of Ownership Per Unit	$ 1,141,047

Capital Works Summary

Rehabilitation or Refurbishment
Significant asset renewal work toward achieving original design conditions and/or extending asset life (includes Major Maintenance)

Rehabilitation or Refurbishment Activities	Unit Cost	Year	Year	Year	Year
Crack Sealing	$ 4,400	3	26		
Microsurfacing	$ 46,200	6			
Single Lift Resurface	$ 138,000	12			
Pulverize and Pave	$ 198,900	20			
Enter Activity	$ -				
Enter Activity	$ -				

Reconstruction or Replacement/Reinstallation
Like-for-like asset replacements or installations to fully achieve original design conditions.

Reconstruction or Replacement Activities	Unit Cost	Year
Reconstruct / Cold In Place	$ 652,050	30
Enter Activity	$ -	
Enter Activity	$ -	

New Construction/Creation or Upgrade[2]
Addition of new assets or an asset upgrade/expansion to improve performance beyond the original design conditions

New Construction/Creation or Upgrade	Unit Cost	Y
Enter Activity	$ -	
Enter Activity	$ -	

Notes:
1. Estimated Useful Service Life = Estimated timespan that the asset is viable to provide services and manage risk to acceptable levels
2. Typically one-time costs not included as part of the ongoing asset life cycle
3. The 10-year Operating and Maintenance Costs are uninflated costs

Legend:
Prepopulated or calculated fields
Data entry fields

2.Capital Costs (System) | 3.Input & Summary (System) | 3.Input & Summary (Facilities) | 4. Facilities Investment Model | 5. Life Cycle (System) | 5. Life Cycle (Facilities)

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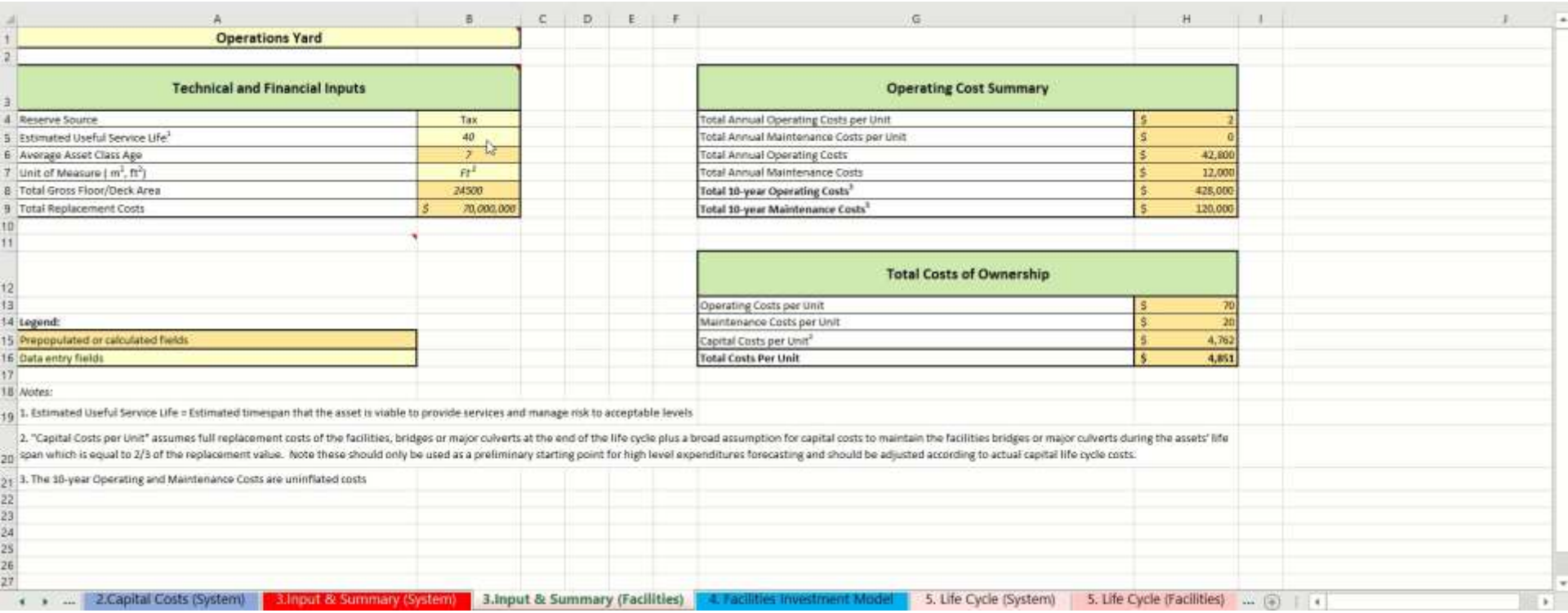
ASSET MANAGEMENT ONTARIO

TAB 3: Summary and Total Cost of Ownership for Facilities, Bridges & Major Culverts Assets



Operations Yard

Technical and Financial Inputs	
Reserve Source	Tax
Estimated Useful Service Life[1]	40
Average Asset Class Age	7
Unit of Measure (m^2, ft^2)	Ft^2
Total Gross Floor/Deck Area	24500
Total Replacement Costs	$ 70,000,000

Operating Cost Summary		
Total Annual Operating Costs per Unit	$	2
Total Annual Maintenance Costs per Unit	$	0
Total Annual Operating Costs	$	42,800
Total Annual Maintenance Costs	$	12,000
Total 10-year Operating Costs[3]	$	428,000
Total 10-year Maintenance Costs[3]	$	120,000

Total Costs of Ownership		
Operating Costs per Unit	$	70
Maintenance Costs per Unit	$	20
Capital Costs per Unit[2]	$	4,762
Total Costs Per Unit	$	4,851

Legend:

Prepopulated or calculated fields	
Data entry fields	

Notes:

1. Estimated Useful Service Life = Estimated timespan that the asset is viable to provide services and manage risk to acceptable levels

2. "Capital Costs per Unit" assumes full replacement costs of the facilities, bridges or major culverts at the end of the life cycle plus a broad assumption for capital costs to maintain the facilities bridges or major culverts during the assets' life span which is equal to 2/3 of the replacement value. Note these should only be used as a preliminary starting point for high level expenditures forecasting and should be adjusted according to actual capital life cycle costs.

3. The 10-year Operating and Maintenance Costs are uninflated costs

2.Capital Costs (System) | 3.Input & Summary (System) | 3.Input & Summary (Facilities) | 4. Facilities Investment Model | 5. Life Cycle (System) | 5. Life Cycle (Facilities)

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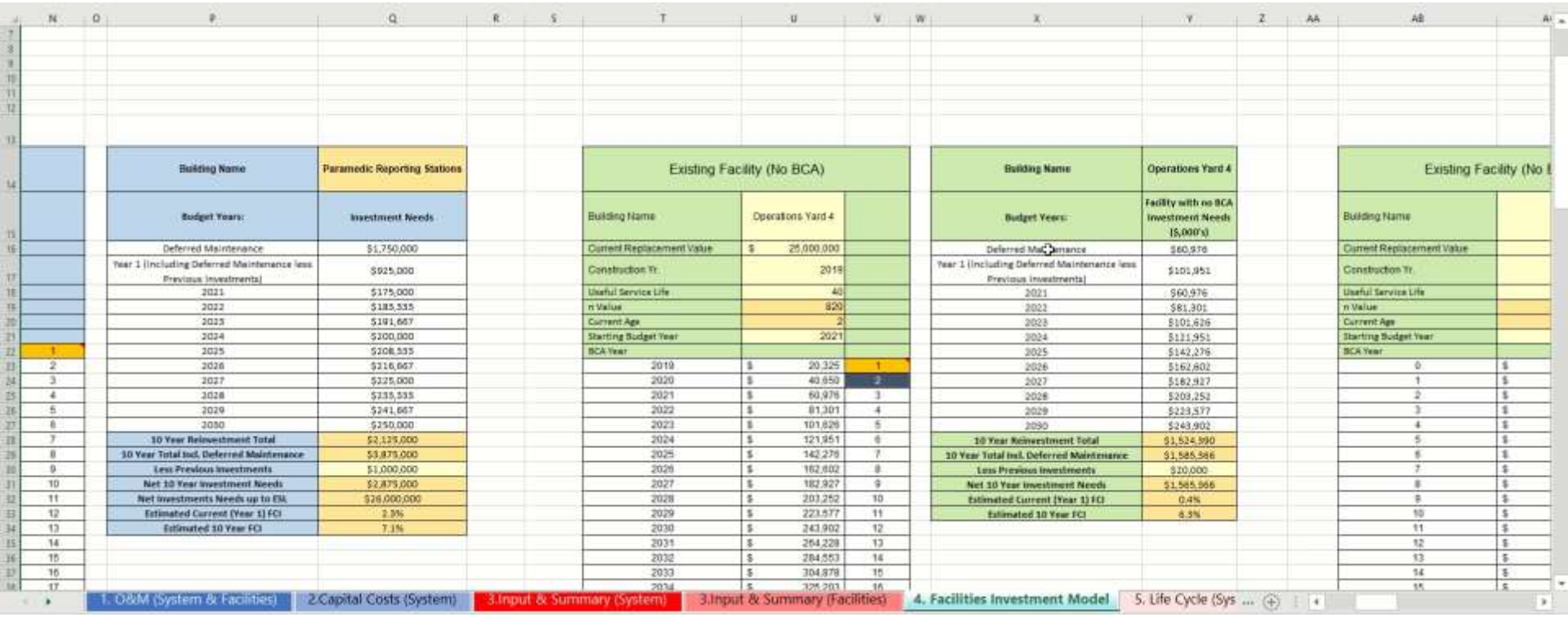
ASSET MANAGEMENT ONTARIO

TAB 4: Facilities Investment Model



Building Name	Paramedic Reporting Stations
Budget Years:	Investment Needs
Deferred Maintenance	$1,750,000
Year 1 (Including Deferred Maintenance less Previous Investments)	$925,000
2021	$175,000
2022	$183,335
2023	$191,667
2024	$200,000
2025	$208,333
2026	$216,667
2027	$225,000
2028	$233,333
2029	$241,667
2030	$250,000
10 Year Reinvestment Total	$2,125,000
10 Year Total Incl. Deferred Maintenance	$3,875,000
Less Previous Investments	$1,000,000
Net 10 Year Investment Needs	$2,875,000
Net Investments Needs up to EOL	$26,000,000
Estimated Current (Year 1) FCI	2.3%
Estimated 10 Year FCI	7.1%

Existing Facility (No BCA)		
Building Name	Operations Yard 4	
Current Replacement Value	$ 25,000,000	
Construction Yr.	2019	
Useful Service Life	40	
n Value	820	
Current Age	2	
Starting Budget Year	2021	
BCA Year		
2019	$ 20,325	1
2020	$ 40,650	2
2021	$ 60,976	3
2022	$ 81,301	4
2023	$ 101,626	5
2024	$ 121,951	6
2025	$ 142,276	7
2026	$ 162,602	8
2027	$ 182,927	9
2028	$ 203,252	10
2029	$ 223,577	11
2030	$ 243,902	12
2031	$ 264,228	13
2032	$ 284,553	14
2033	$ 304,878	15
2034	$ 325,203	16

Building Name	Operations Yard 4
Budget Years:	Facility with no BCA Investment Needs ($,000's)
Deferred Maintenance	$60,976
Year 1 (Including Deferred Maintenance less Previous Investments)	$101,951
2021	$60,976
2022	$81,301
2023	$101,626
2024	$121,951
2025	$142,276
2026	$162,602
2027	$182,927
2028	$203,252
2029	$223,577
2030	$243,902
10 Year Reinvestment Total	$1,524,390
10 Year Total Incl. Deferred Maintenance	$1,585,366
Less Previous Investments	$20,000
Net 10 Year Investment Needs	$1,565,366
Estimated Current (Year 1) FCI	0.4%
Estimated 10 Year FCI	6.3%

Existing Facility (No	
Building Name	
Current Replacement Value	
Construction Yr.	
Useful Service Life	
n Value	
Current Age	
Starting Budget Year	
BCA Year	
0	$
1	$
2	$
3	$
4	$
5	$
6	$
7	$
8	$
9	$
10	$
11	$
12	$
13	$
14	$
15	$

1. O&M (System & Facilities) | 2.Capital Costs (System) | 3.Input & Summary (System) | 3.Input & Summary (Facilities) | 4. Facilities Investment Model | 5. Life Cycle (Sys ...

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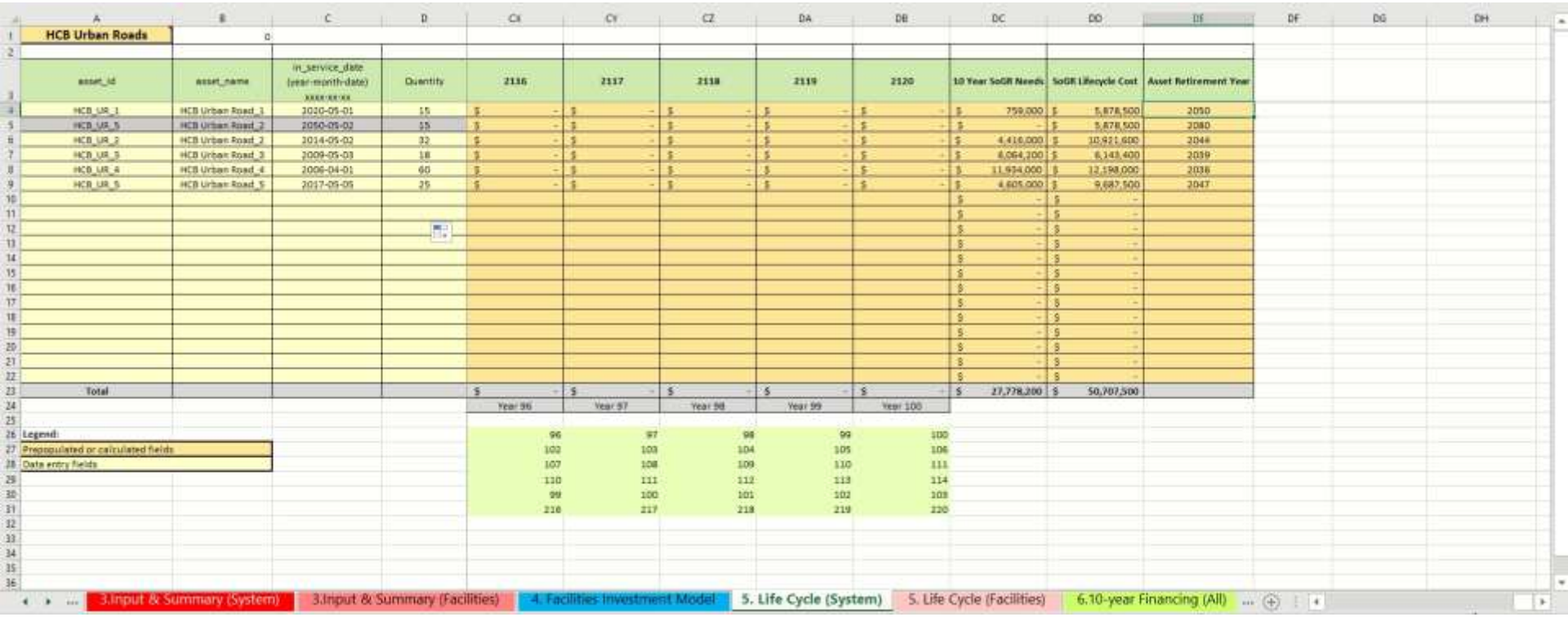
TAB 5: Capital Life Cycle Modelling for System Assets



HCB Urban Roads												
asset_id	asset_name	in_service_date (year-month-date) YYYY-MM-DD	Quantity	2116	2117	2118	2119	2120	10 Year SoGR Needs	SoGR Lifecycle Cost	Asset Retirement Year	
HCB_UR_1	HCB Urban Road_1	2020-05-01	15	$ -	$ -	$ -	$ -	$ -	$ 759,000	$ 5,878,500	2050	
HCB_UR_5	HCB Urban Road_2	2050-05-02	15	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,878,500	2080	
HCB_UR_2	HCB Urban Road_2	2014-05-02	32	$ -	$ -	$ -	$ -	$ -	$ 4,416,000	$ 10,921,600	2044	
HCB_UR_3	HCB Urban Road_3	2009-05-03	18	$ -	$ -	$ -	$ -	$ -	$ 8,064,200	$ 6,143,400	2039	
HCB_UR_4	HCB Urban Road_4	2006-04-01	60	$ -	$ -	$ -	$ -	$ -	$ 11,934,000	$ 12,198,000	2036	
HCB_UR_5	HCB Urban Road_5	2017-05-05	25	$ -	$ -	$ -	$ -	$ -	$ 4,605,000	$ 9,687,500	2047	
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
Total				$ -	$ -	$ -	$ -	$ -	$ 27,778,200	$ 50,707,500		
				Year 96	Year 97	Year 98	Year 99	Year 100				

Legend:					
Prepopulated or calculated fields	96	97	98	99	100
Data entry fields	102	103	104	105	106
	107	108	109	110	111
	110	111	112	113	114
	99	100	101	102	103
	216	217	218	219	220

3.Input & Summary (System) | 3.Input & Summary (Facilities) | 4. Facilities Investment Model | 5. Life Cycle (System) | 5. Life Cycle (Facilities) | 6.10-year Financing (All)

AMONTario
ASSET MANAGEMENT ONTARIO

TAB 5: Capital Life Cycle Modelling for Facilities, Bridges & Major Culverts Assets

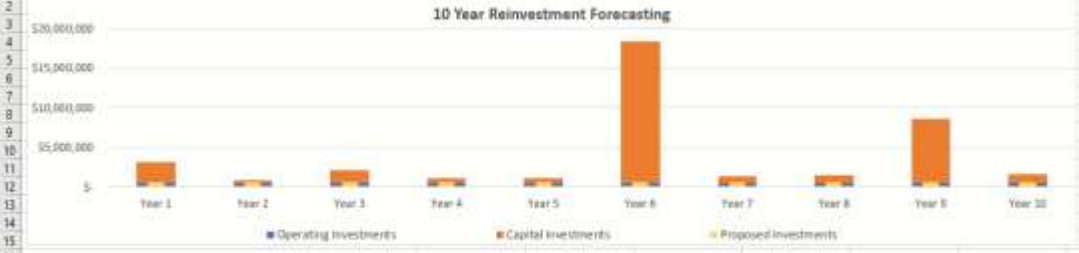
Operations Yards															
asset_name	Current Replacement Value	Gross Floor/Deck Area	asset_id	in_service_date (year-month-date) xxxx-xx-xx	Deferred Maintenance	Previous Investments	Current FCI/BCI[1,2]	Age	estimated_service_life	2021	2022	2023	2024	2025	2026
Facilities with BCAs and Bridges/Major Culverts with OSIM Inspections															
Operations Yard 1	$ 20,000,000	3000	Ops_1	2020-01-01			0.2%	1	40	$ 32,520.33	$ 48,780.49	$ 65,040.65	$ 81,300.81	$ 97,560.98	$ 115,821.1
Operations Yard 2	$ 15,000,000	2500	Ops_2	2005-01-01			0.1%	16	40	$ 12,195.12	$ 24,390.24	$ 36,585.37	$ 48,780.49	$ 60,975.61	$ 73,170.7
Operations Yard 3	$ 10,000,000	15000	Ops_3	2015-01-01			0.6%	6	40	$ 56,910.57	$ 65,040.65	$ 73,170.73	$ 81,300.81	$ 89,430.89	$ 97,560.9
Sub Total	$ 45,000,000	20500			$ -	$ -	0.2%	8.0		$ 101,626.02	$ 138,211.38	$ 174,796.75	$ 211,382.11	$ 247,967.48	$ 284,552.8
Facilities without BCAs															
Operations Yard 4	$ 25,000,000	4000	Ops_4	2019-01-01	$ 60,976	$ 20,000	0.4%	2	40	$ 60,975.61	$ 81,300.81	$ 101,626.02	$ 121,951.22	$ 142,276.42	$ 162,601.6
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
	$ -				$ -	$ -				$ -	$ -	$ -	$ -	$ -	$ -
Sub Total	$ 25,000,000	4000			$ 60,976	$ 20,000	0.4%	2.0		$ 60,976	$ 81,301	$ 101,626	$ 121,951	$ 142,276	$ 162,60
Totals	$ 70,000,000	24500			$ 60,976	$ 20,000	0.3%	7.0		$ 162,602	$ 357,724	$ 451,220	$ 544,715	$ 638,211	$ 731,70
										Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Legend:
Prepopulated or calculated fields

3.Input & Summary (System) | 3.Input & Summary (Facilities) | 4. Facilities Investment Model | 5. Life Cycle (System) | 5. Life Cycle (Facilities) | 6.10-year Financing (All)

AMONTario
ASSET MANAGEMENT ONTARIO

TAB 6: 10 Year Financing by Asset Class



Reinvestment Forecasting	Year 1			Year 2			Year 3			Year 4			Year 5		
Asset Classes	Operating Investments	Capital Investments	Total	Operating Investments	Capital Investments	Total	Operating Investments	Capital Investments	Total	Operating Investments	Capital Investments	Total	Operating Investments	Capital Investments	Total
System Assets															
HCB Urban Roads	$ 485,486	$ 2,484,000	$ 2,969,486	$ 485,486	$ -	$ 485,486	$ 485,486	$ 1,221,000	$ 1,706,486	$ 485,486	$ -	$ 485,486	$ 485,486	$ -	$ 4
			$ -			$ -			$ -			$ -			$
			$ -			$ -			$ -			$ -			$
			$ -			$ -			$ -			$ -			$
			$ -			$ -			$ -			$ -			$
Facilities/Bridges/Major Culverts															
Operations Yards	$ 54,800	$ 162,802	$ 217,602	$ 54,800	$ 357,724	$ 412,524	$ 54,800	$ 451,220	$ 506,020	$ 54,800	$ 544,715	$ 599,515	$ 54,800	$ 638,211	$ 6
			$ -			$ -			$ -			$ -			$
			$ -			$ -			$ -			$ -			$
			$ -			$ -			$ -			$ -			$
			$ -			$ -			$ -			$ -			$
Total Recommended Investments	$ 540,286	$ 2,646,802	$ 3,186,888	$ 540,286	$ 357,724	$ 898,010	$ 540,286	$ 1,672,220	$ 2,212,505	$ 540,286	$ 544,715	$ 1,085,001	$ 540,286	$ 638,211	$ 1,1
Proposed Investments	$ 500,000	$ 150,000	$ 650,000	$ 500,000	$ 150,000	$ 650,000	$ 500,000	$ 150,000	$ 650,000	$ 500,000	$ 150,000	$ 650,000	$ 500,000	$ 150,000	$ 6
Difference	$ 40,286	$ 2,496,802	$ 2,536,888	$ 40,286	$ 207,724	$ 248,010	$ 40,286	$ 1,522,220	$ 1,562,505	$ 40,286	$ 394,715	$ 435,001	$ 40,286	$ 488,211	$ 5

Legend:

3.Input & Summary (Facilities) | 4. Facilities Investment Model | 5. Life Cycle (System) | 5. Life Cycle (Facilities) | 6.10-year Financing (All) | 7. 10-year Reserve Financing

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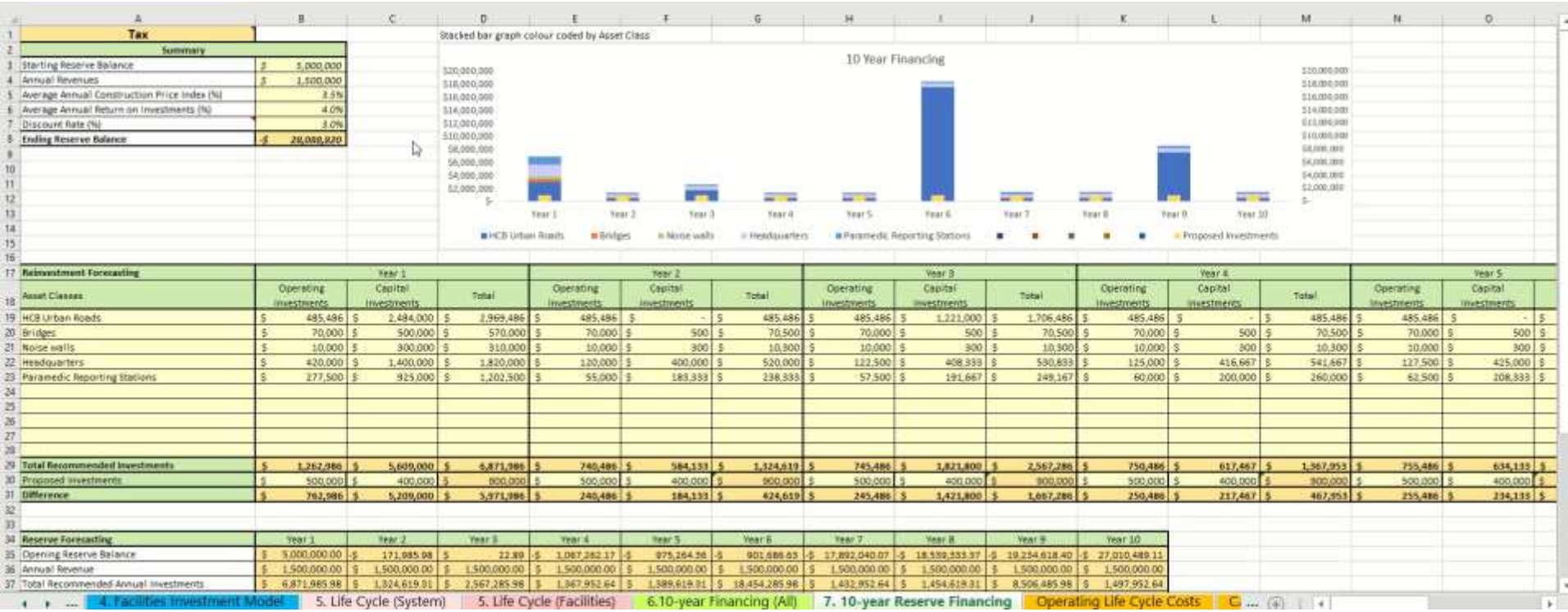
ASSET MANAGEMENT ONTARIO

TAB 7: 10 Year Reserve Financing for all Asset Classes



Tax

Summary

Starting Reserve Balance	$ 5,000,000
Annual Revenues	$ 1,500,000
Average Annual Construction Price Index (%)	3.5%
Average Annual Return on Investments (%)	4.0%
Discount Rate (%)	3.0%
Ending Reserve Balance	-$ 28,080,920

Stacked bar graph colour coded by Asset Class

10 Year Financing

HCB Urban Roads | Bridges | Noise walls | Headquarters | Paramedic Reporting Stations | Proposed Investments

Reinvestment Forecasting	Year 1			Year 2			Year 3			Year 4			Year 5		
Asset Classes	Operating Investments	Capital Investments	Total	Operating Investments	Capital Investments	Total	Operating Investments	Capital Investments	Total	Operating Investments	Capital Investments	Total	Operating Investments	Capital Investments	
HCB Urban Roads	$ 485,486	$ 2,484,000	$ 2,969,486	$ 485,486	$ -	$ 485,486	$ 485,486	$ 1,221,000	$ 1,706,486	$ 485,486	$ -	$ 485,486	$ 485,486	$ -	$
Bridges	$ 70,000	$ 500,000	$ 570,000	$ 70,000	$ 500	$ 70,500	$ 70,000	$ 500	$ 70,500	$ 70,000	$ 500	$ 70,500	$ 70,000	$ 500	$
Noise walls	$ 10,000	$ 300,000	$ 310,000	$ 10,000	$ 300	$ 10,300	$ 10,000	$ 300	$ 10,300	$ 10,000	$ 300	$ 10,300	$ 10,000	$ 300	$
Headquarters	$ 420,000	$ 1,400,000	$ 1,820,000	$ 120,000	$ 400,000	$ 520,000	$ 122,500	$ 408,333	$ 530,833	$ 125,000	$ 416,667	$ 541,667	$ 127,500	$ 425,000	$
Paramedic Reporting Stations	$ 277,500	$ 925,000	$ 1,202,500	$ 55,000	$ 183,333	$ 238,333	$ 57,500	$ 191,667	$ 249,167	$ 60,000	$ 200,000	$ 260,000	$ 62,500	$ 208,333	$
Total Recommended Investments	$ 1,262,986	$ 5,609,000	$ 6,871,986	$ 740,486	$ 584,133	$ 1,324,619	$ 745,486	$ 1,821,800	$ 2,567,286	$ 750,486	$ 617,467	$ 1,367,953	$ 755,486	$ 634,133	$
Proposed Investments	$ 500,000	$ 400,000	$ 900,000	$ 500,000	$ 400,000	$ 900,000	$ 500,000	$ 400,000	$ 900,000	$ 500,000	$ 400,000	$ 900,000	$ 500,000	$ 400,000	$
Difference	$ 762,986	$ 5,209,000	$ 5,971,986	$ 240,486	$ 184,133	$ 424,619	$ 245,486	$ 1,421,800	$ 1,667,286	$ 250,486	$ 217,467	$ 467,953	$ 255,486	$ 234,133	$

Reserve Forecasting	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Opening Reserve Balance	$ 5,000,000.00	-$ 171,985.98	$ 22.89	-$ 1,067,262.17	-$ 975,264.36	-$ 901,686.65	-$ 17,892,040.07	-$ 18,539,333.37	-$ 19,234,618.40	-$ 27,010,489.11
Annual Revenue	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00	$ 1,500,000.00
Total Recommended Annual Investments	$ 6,871,985.98	$ 1,324,619.91	$ 2,567,285.98	$ 1,367,952.64	$ 1,389,619.91	$ 18,454,285.98	$ 1,432,952.64	$ 1,454,619.91	$ 8,506,485.98	$ 1,497,952.64

4. Facilities Investment Model | 5. Life Cycle (System) | 5. Life Cycle (Facilities) | 6.10-year Financing (All) | 7. 10-year Reserve Financing | Operating Life Cycle Costs | C...

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