



ASSET MANAGEMENT COUNCIL

Asset Life Cycle Management

Case Studies on Asset Life Cycle Cost Modelling



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Contents

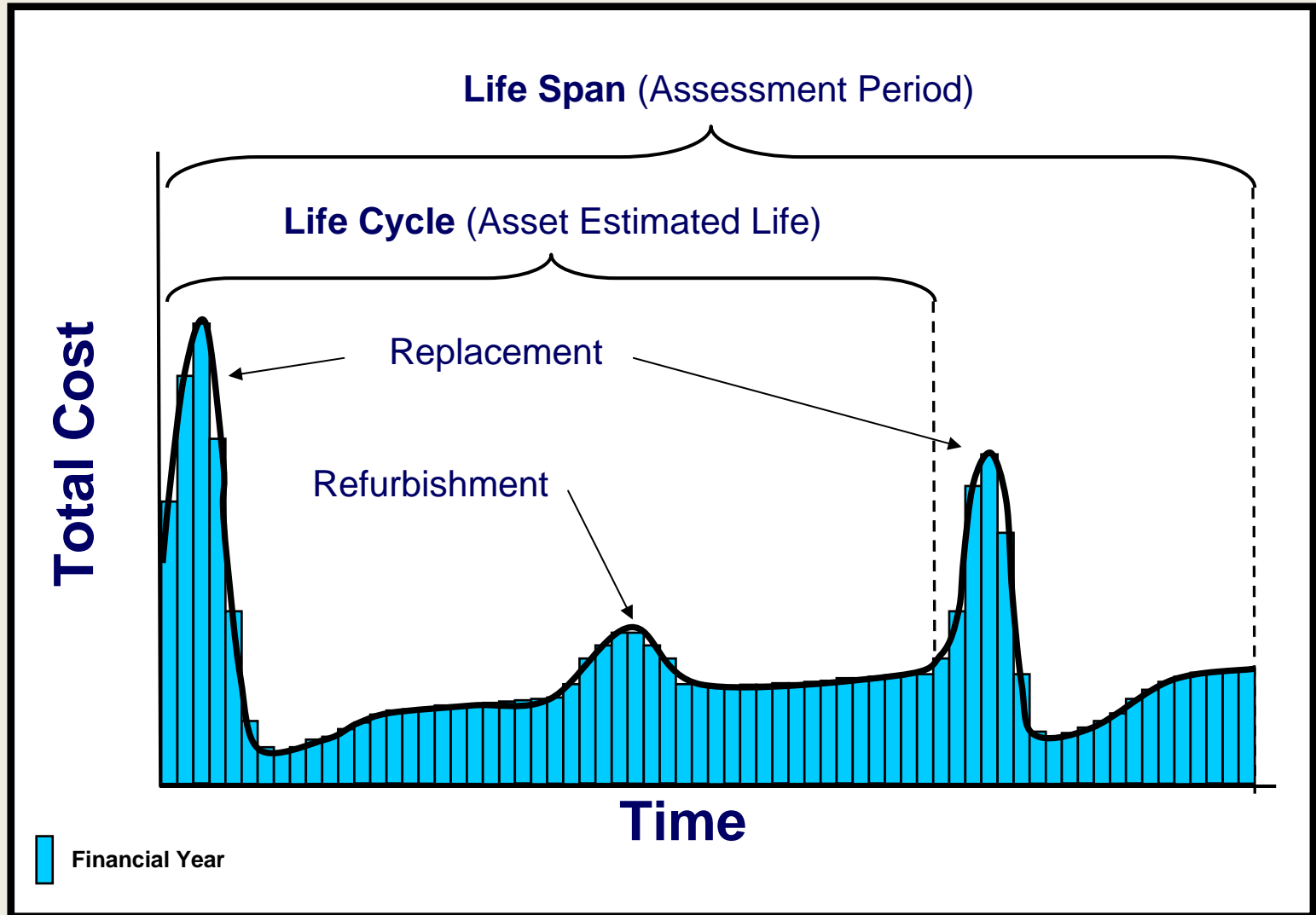
- The Basics
- The Process
- Different Models
- Examples / Case Studies



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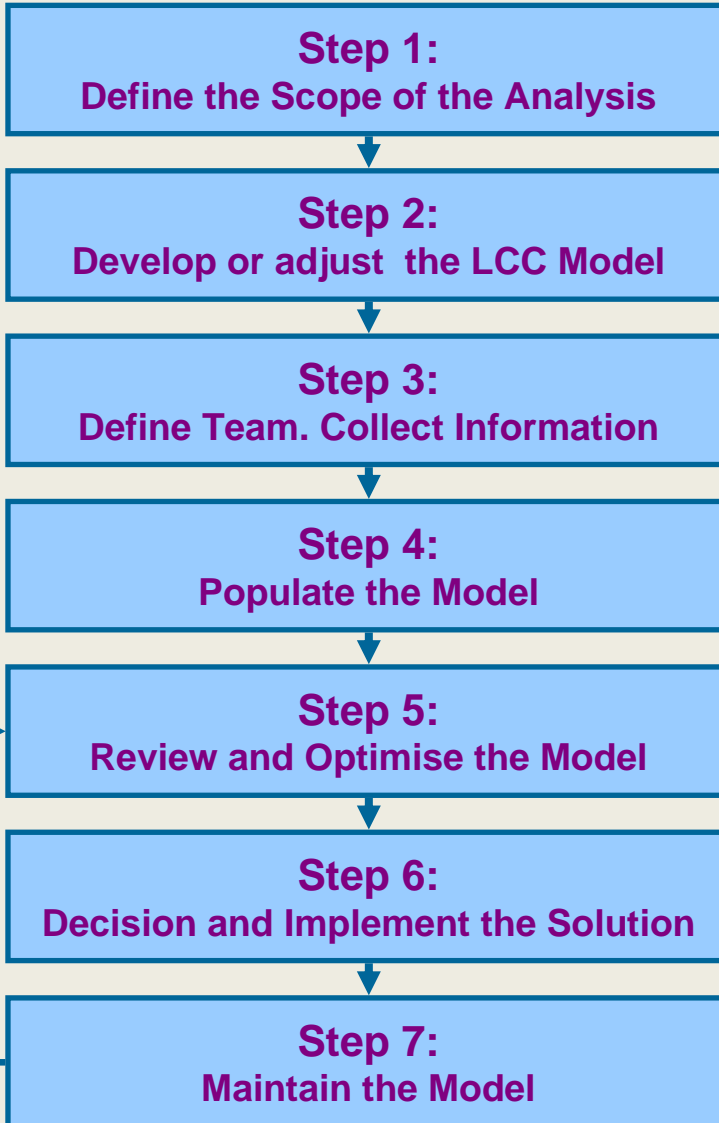


Asset Life Cycle Cost Basics





Life Cycle Cost Modelling Process



- Stakeholder involvement
- Project plan review
- Scope of analysis
- Data requirements analysis

- Model selection
- Depreciation policies and rates
- Governing accounting practices
- Categorisation of cost contributors
- Validation of the model by Accounting

- Team identification
- Responsibility allocation
- Data collection and configuration

- Data verification
- Audit trail for data entries
- Consensus discussion
- Base results demonstration

- Reality checks
- Sensitivity analysis
- Variations

- Presentation to Stakeholders
- Consensus
- Budget alignment and Project Team appointment
- Implementation project definition and activation

- Populate actual data
- Adjust and review

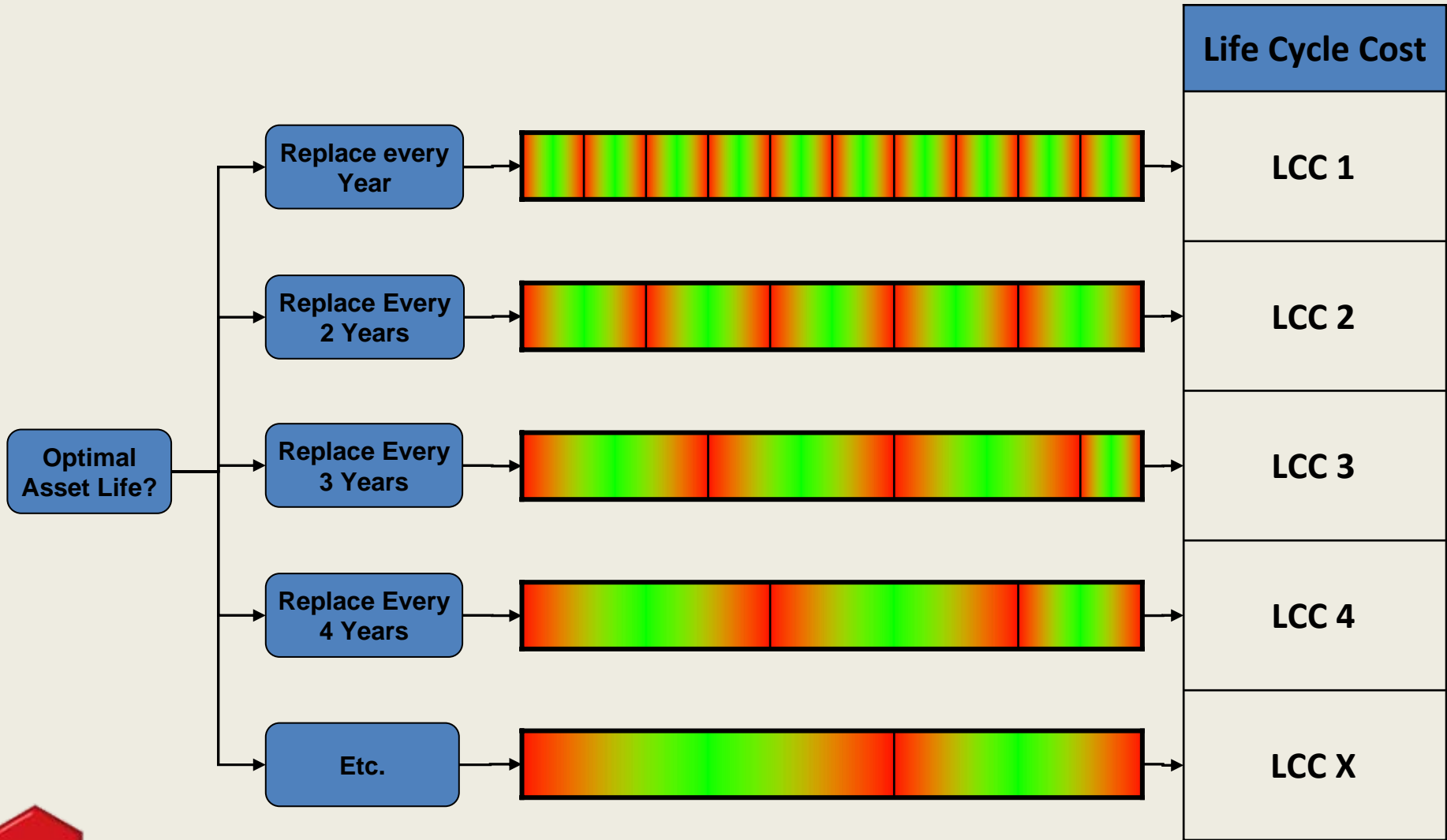


Different Models

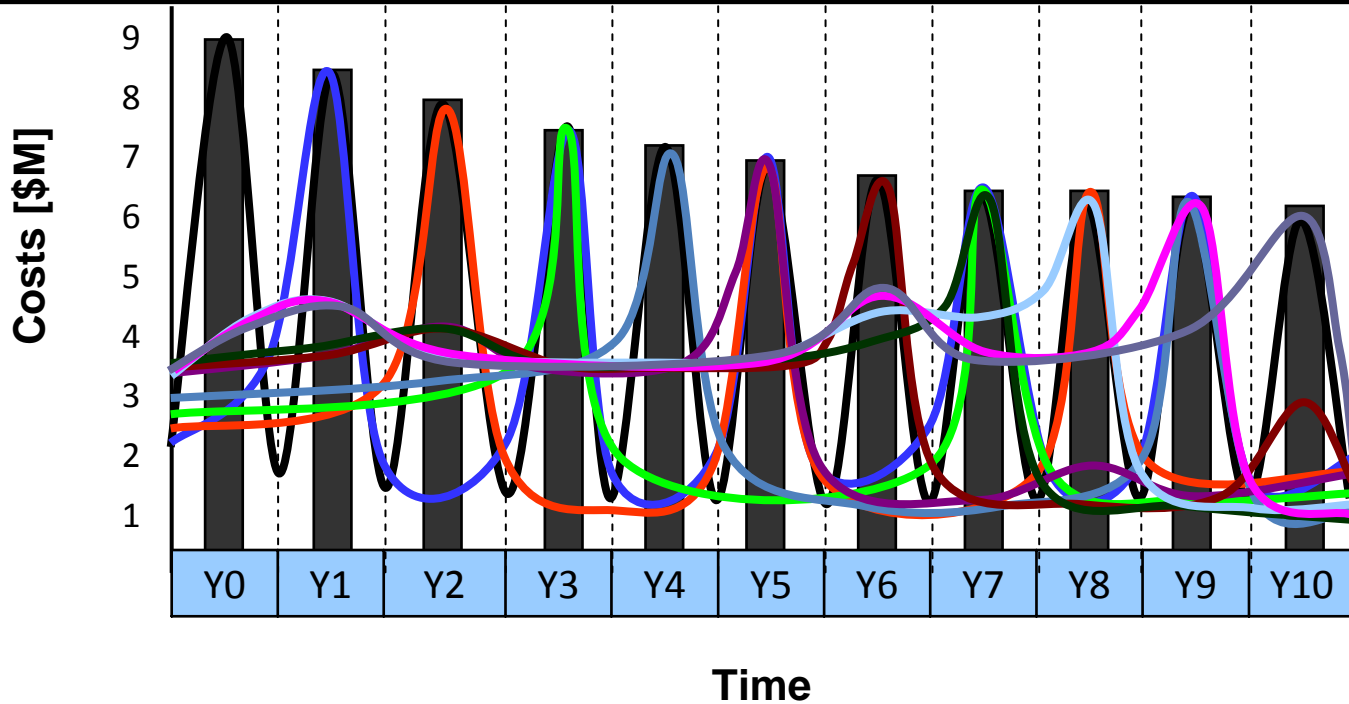
- Optimum Replacement Age
- Repair / Replacement
- Alternative Decision Making
- Maintenance Strategy Selection
- Other Uses



Optimum Replacement Age Models



Replacement Interval	Cost Summations across Life Span (Example)											
	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	LCC
Every Year												\$77.95M
Every 2 Years												\$47.95M
Every 3 Years												\$37.5M
Every 2 Years												\$34.45M
Every 4 Years												\$33.65M
Every 5 Years												\$32.55M
Every 6 Years												\$32.5M
Every 7 Years												\$35.2M
Every 8 Years												\$38.9M
Every 9 Years												\$41.7M
Every 10 Years												\$45.05M





Excel based Model Representation

Replacement Age

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
3278714	3233212	3188453	3144419	4476641	3058468	3016521	2975240	2934609	2365560	2326188	2229906	2156184	3777579	4751568	4907412	5203684	5626928	5626928	5626928	5626928	5626928	5626928	5626928	5626928	5626928	5626928
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Asset Life Determination

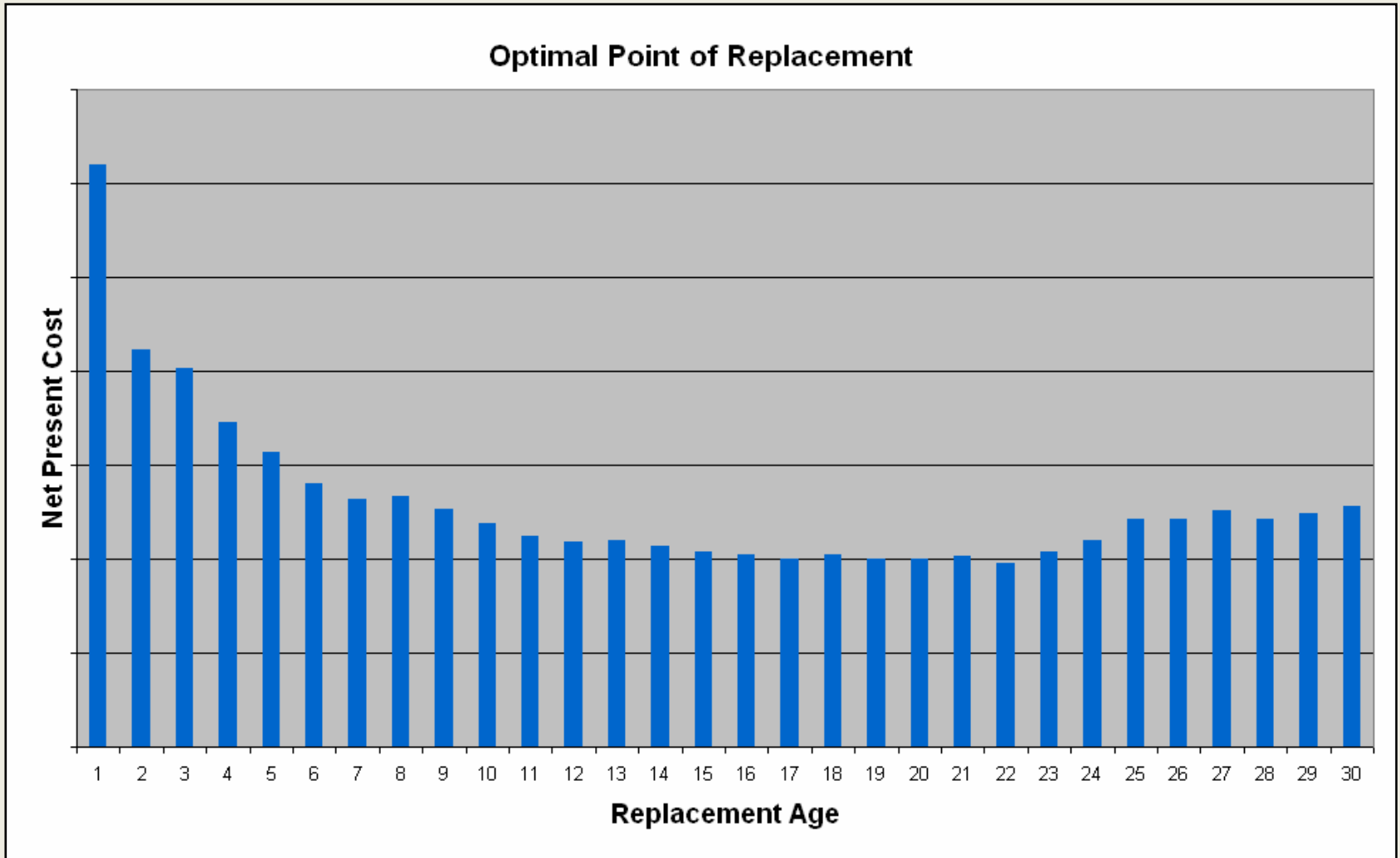


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Asset Life Determination

Optimal Point of Replacement





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Repair or Replace?

Old Truck?



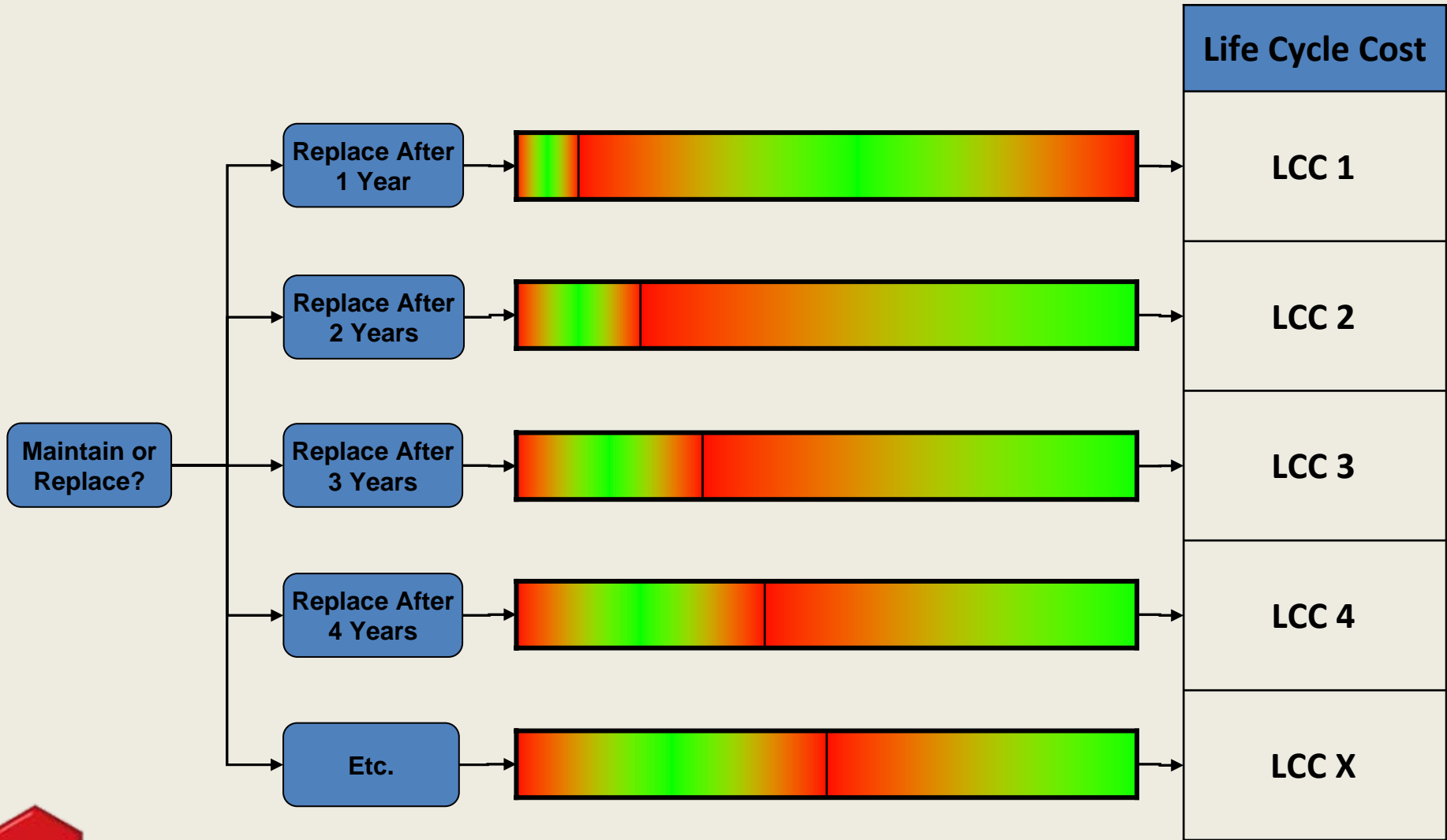
New Truck?

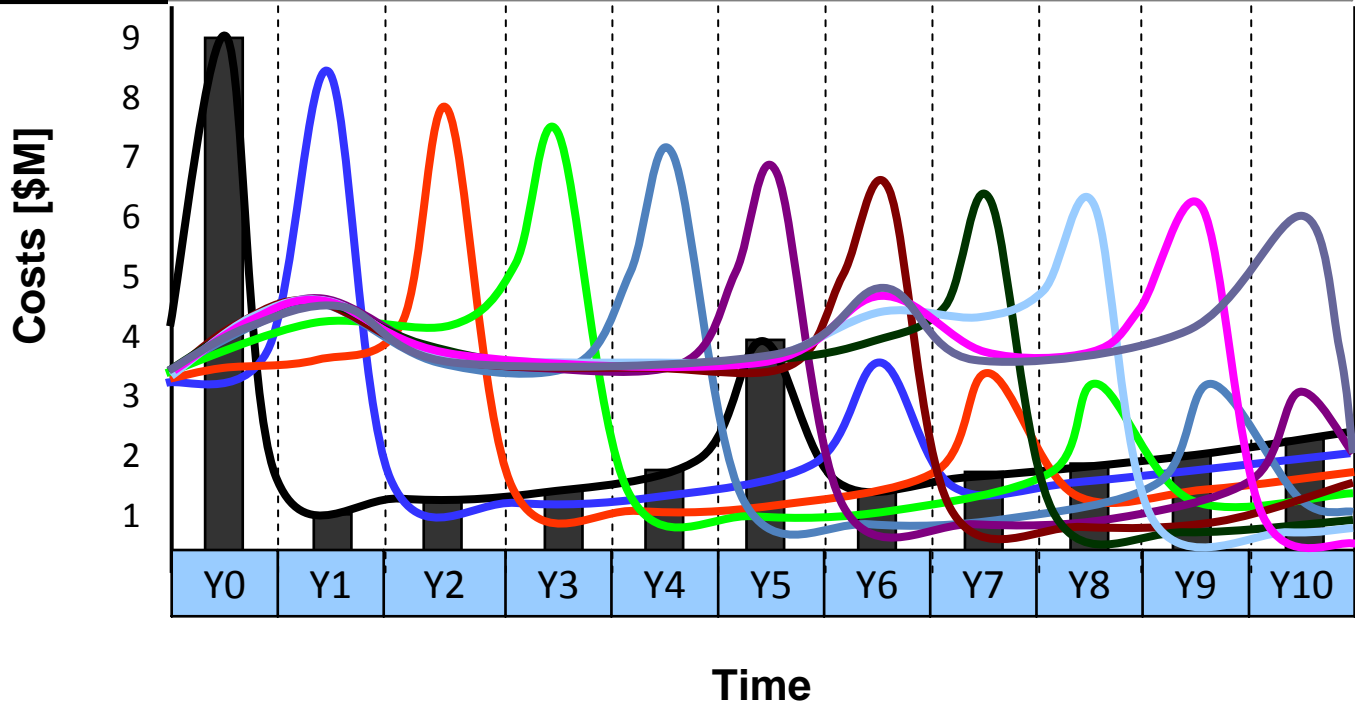
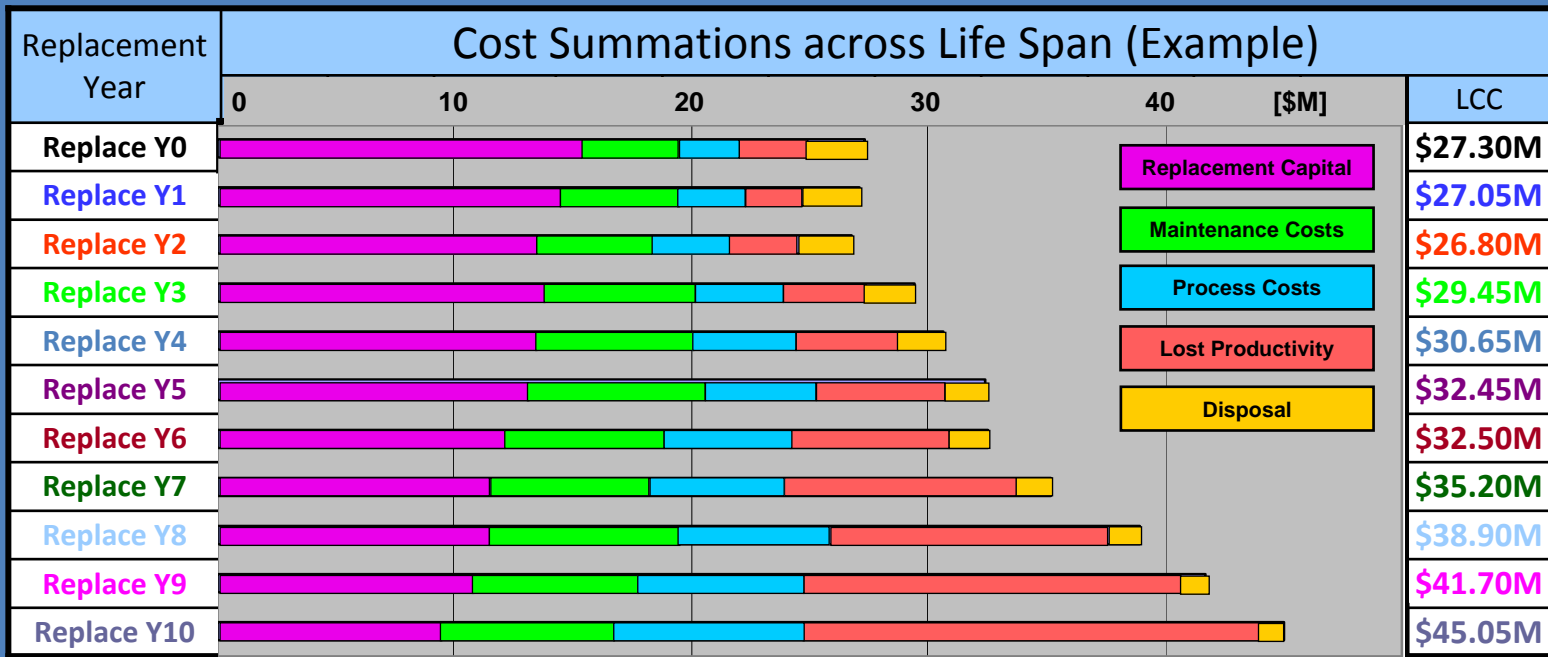


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Repair / Replacement Models







Excel based Model Representation

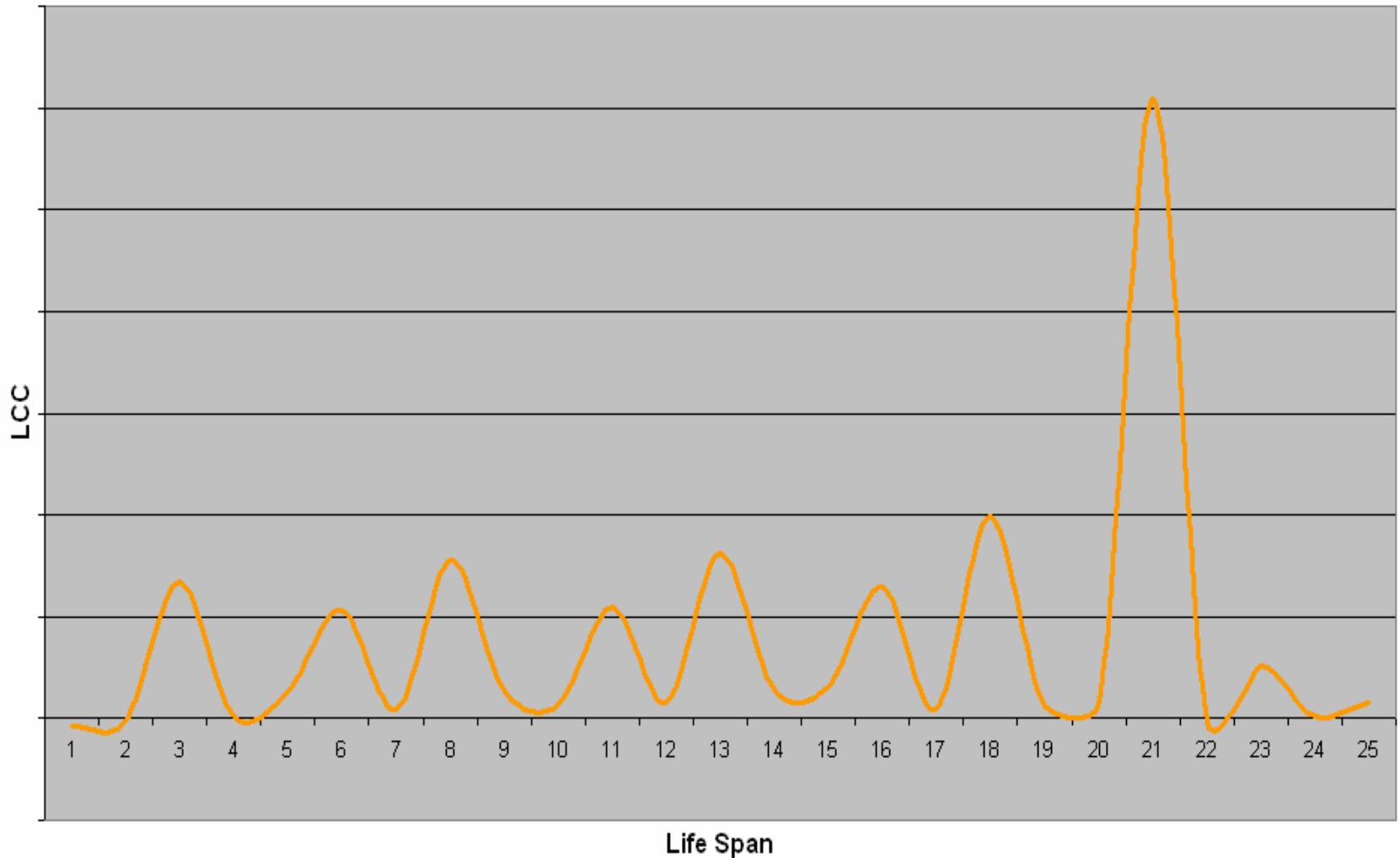
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Repair/Replace Model

Life Cycle Costs for Replacement Scenarios





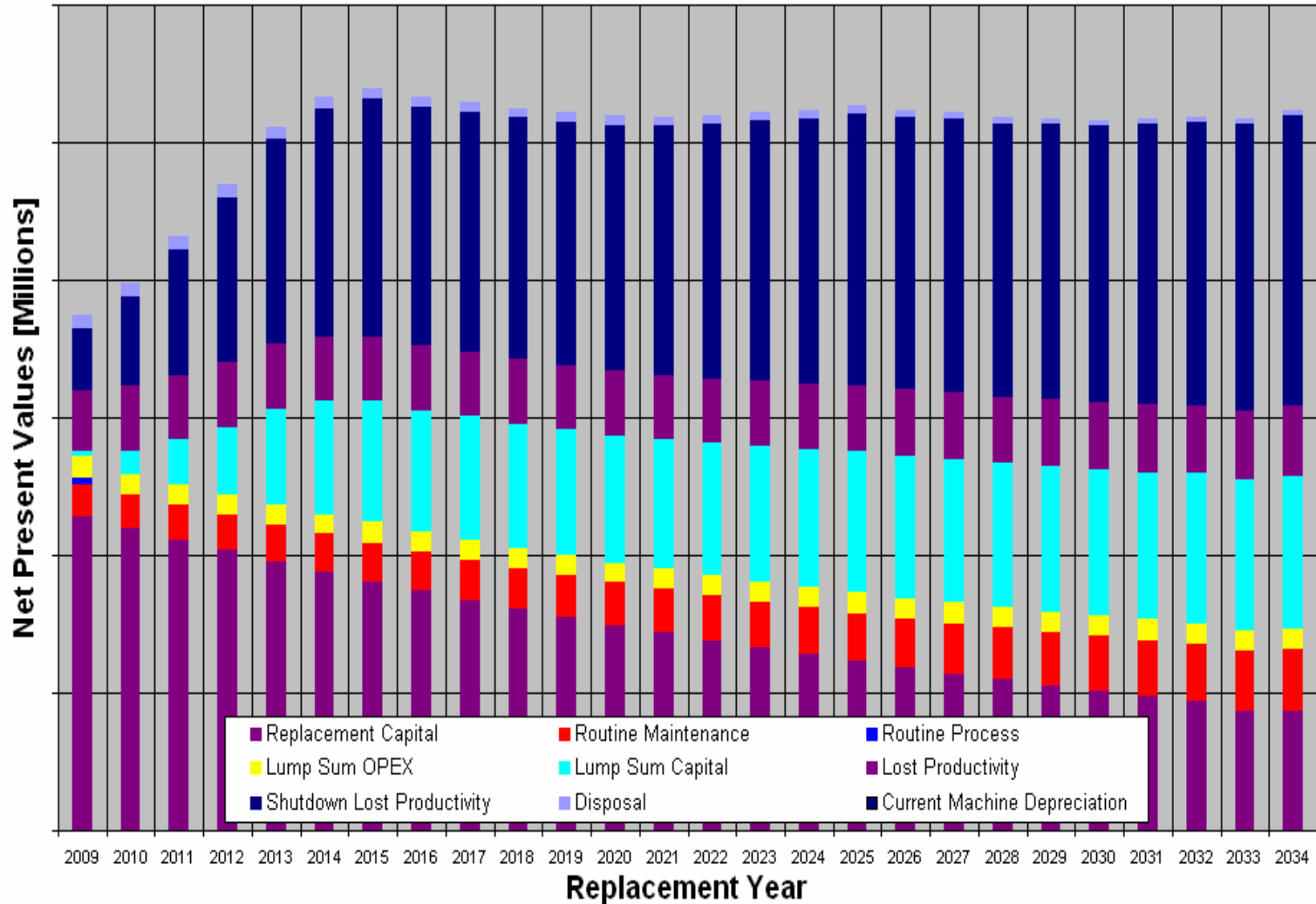
Coal Terminal Assets





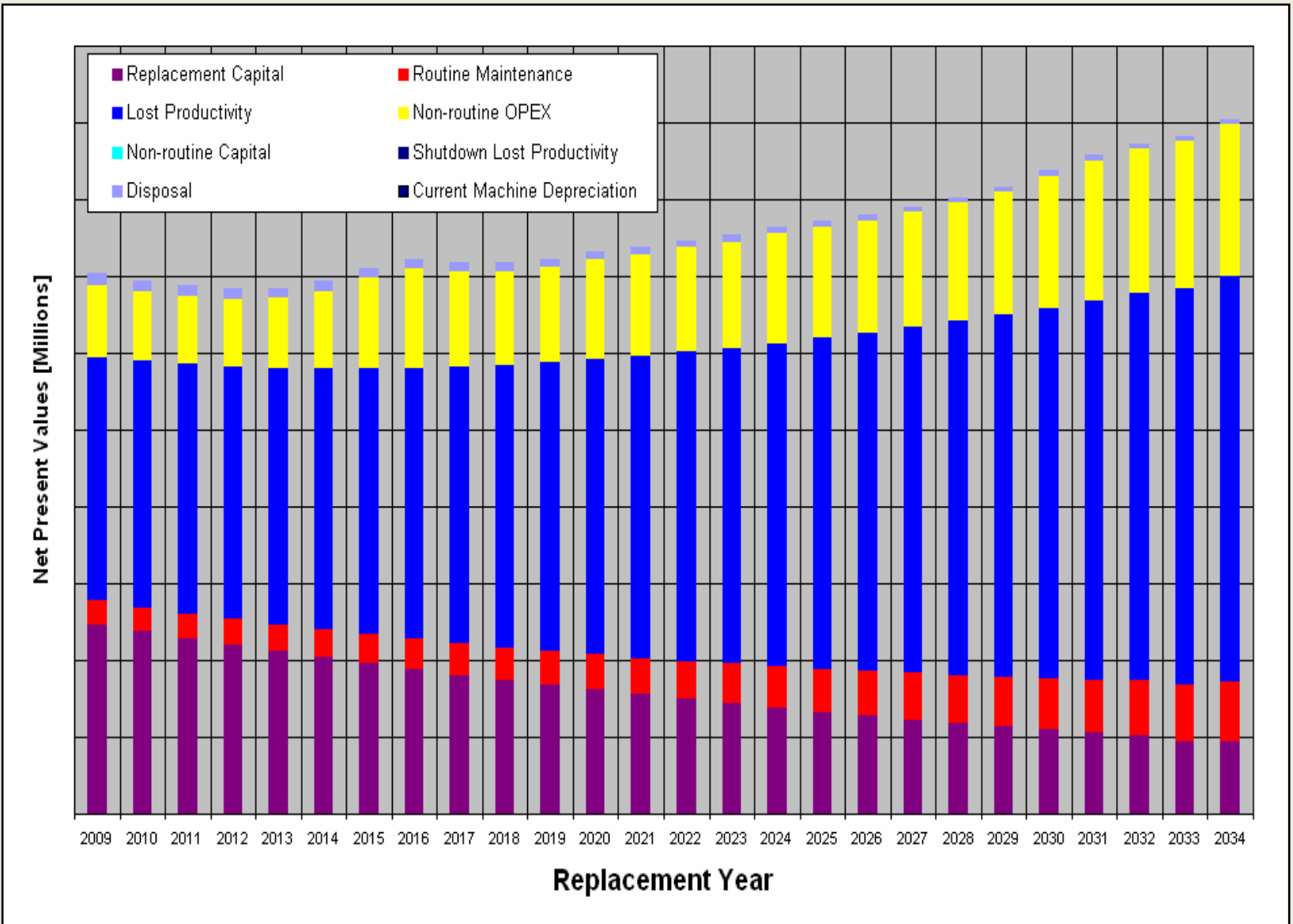
Stacker Repair / Replace Model

Total Life Cycle Cost Breakdown

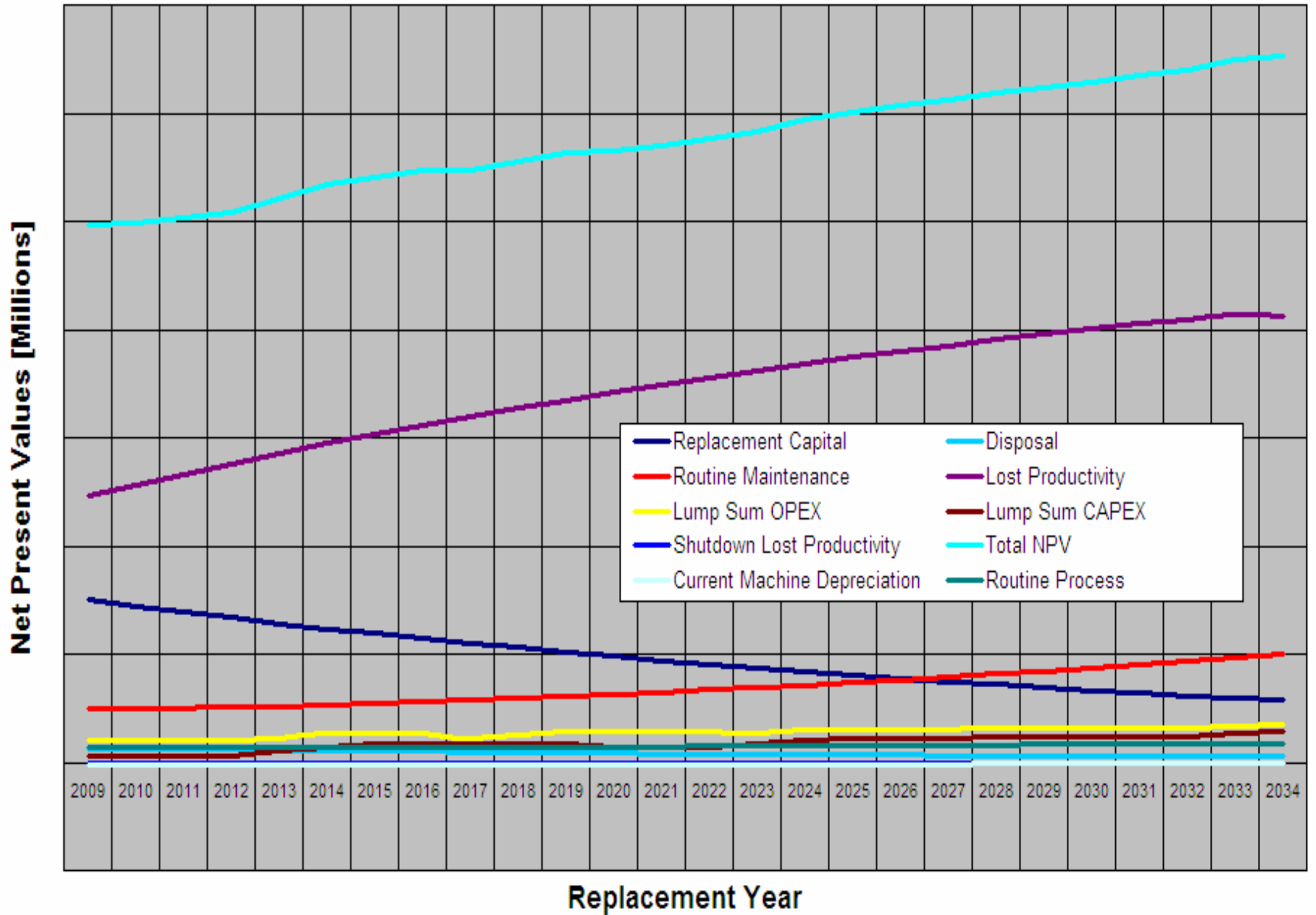




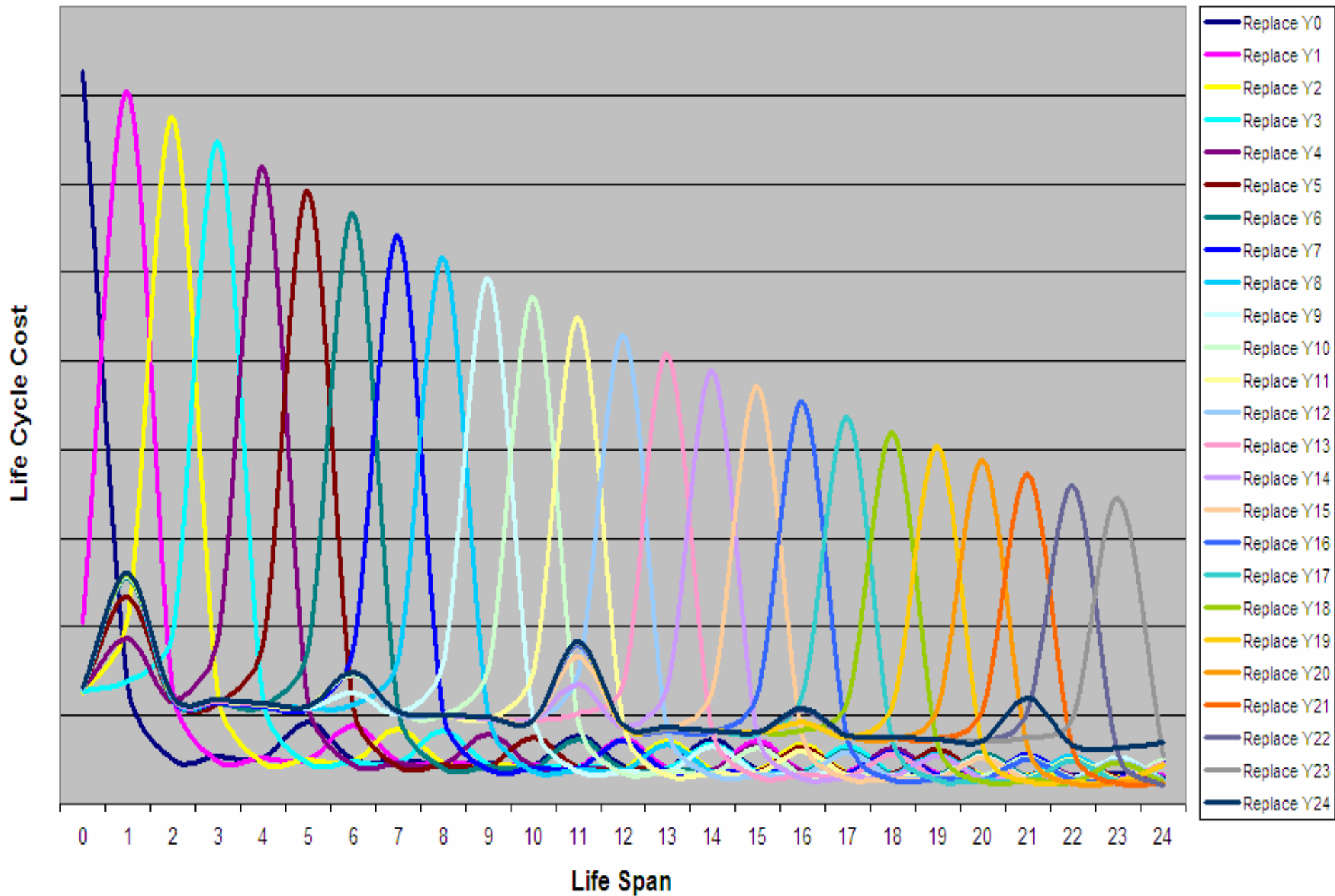
Reclaimer Repair / Replace Model



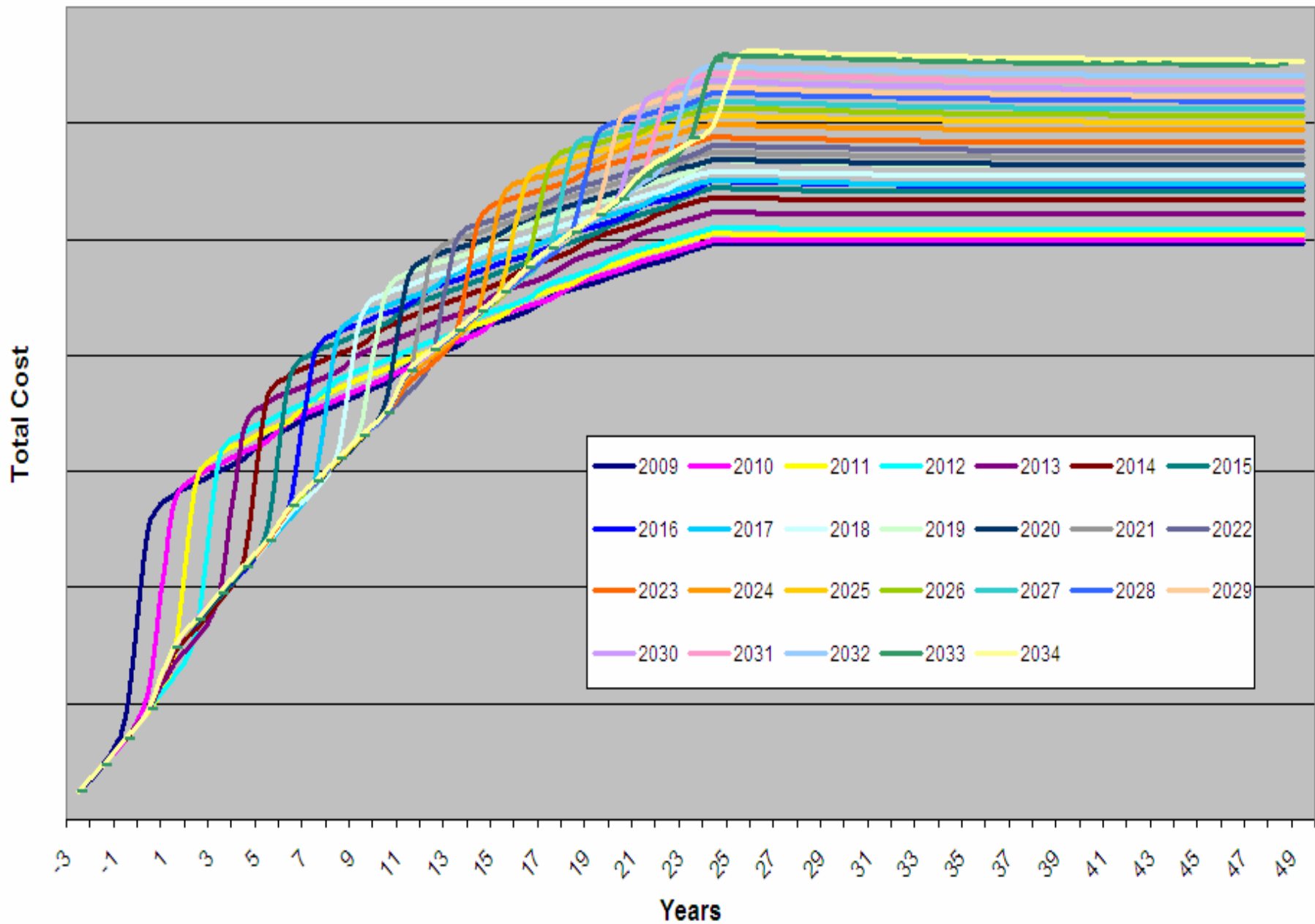
Life Cycle Cost Elements



Life Cycle Costs for Replacement Scenarios

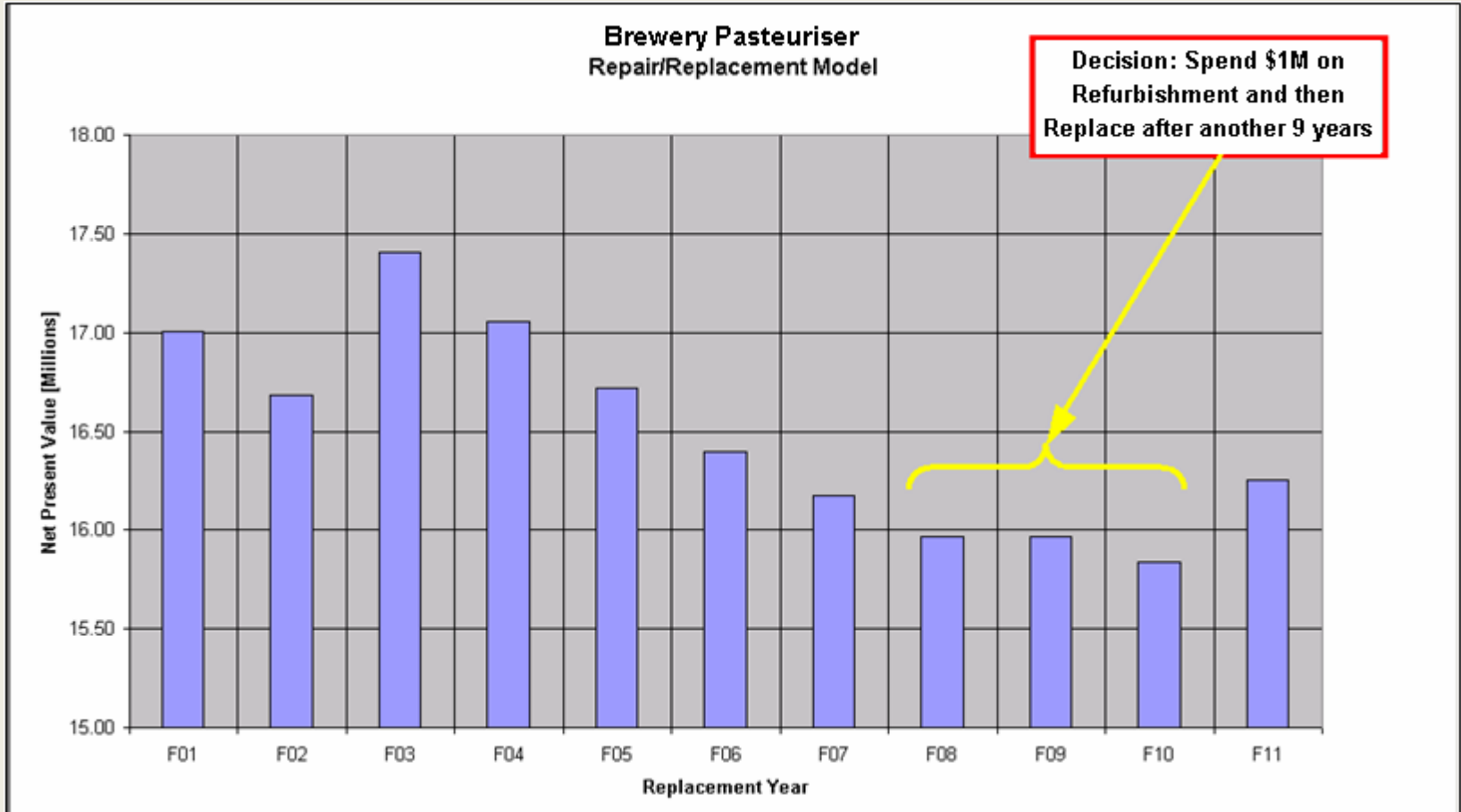


Accumulative Total Cost over Life Span



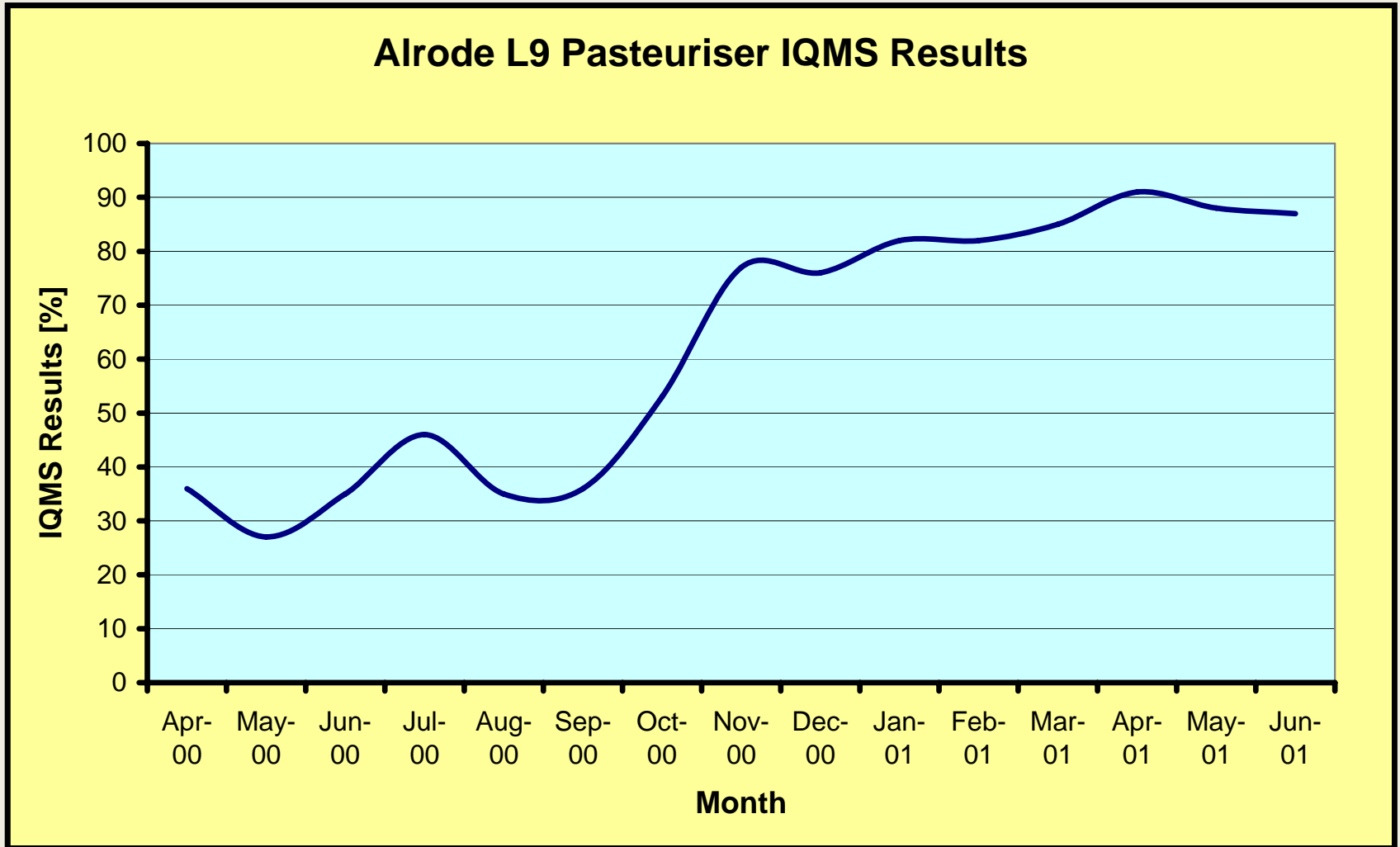


Repair/Replacement Model Example 1



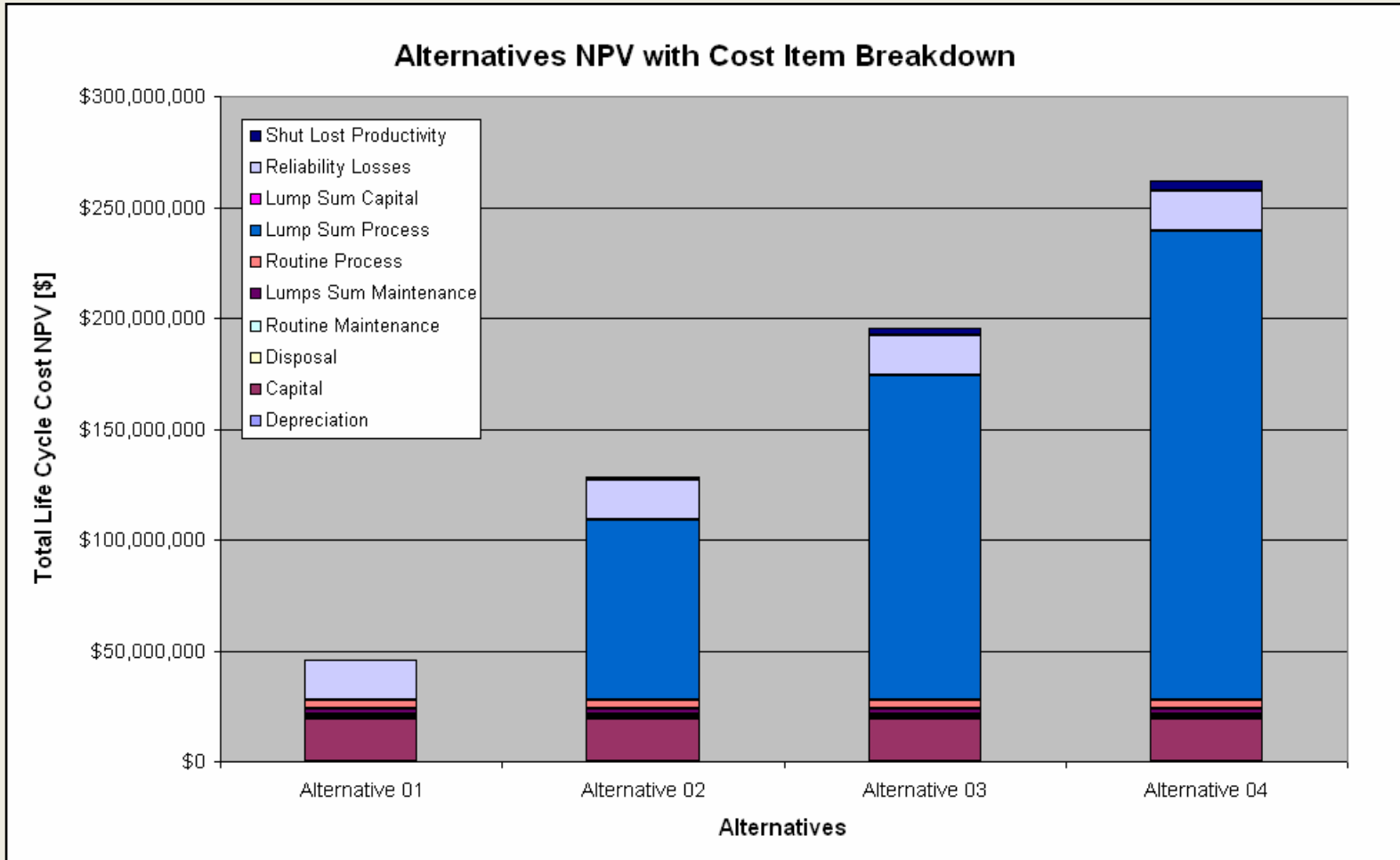


Pasteuriser Performance Improvement





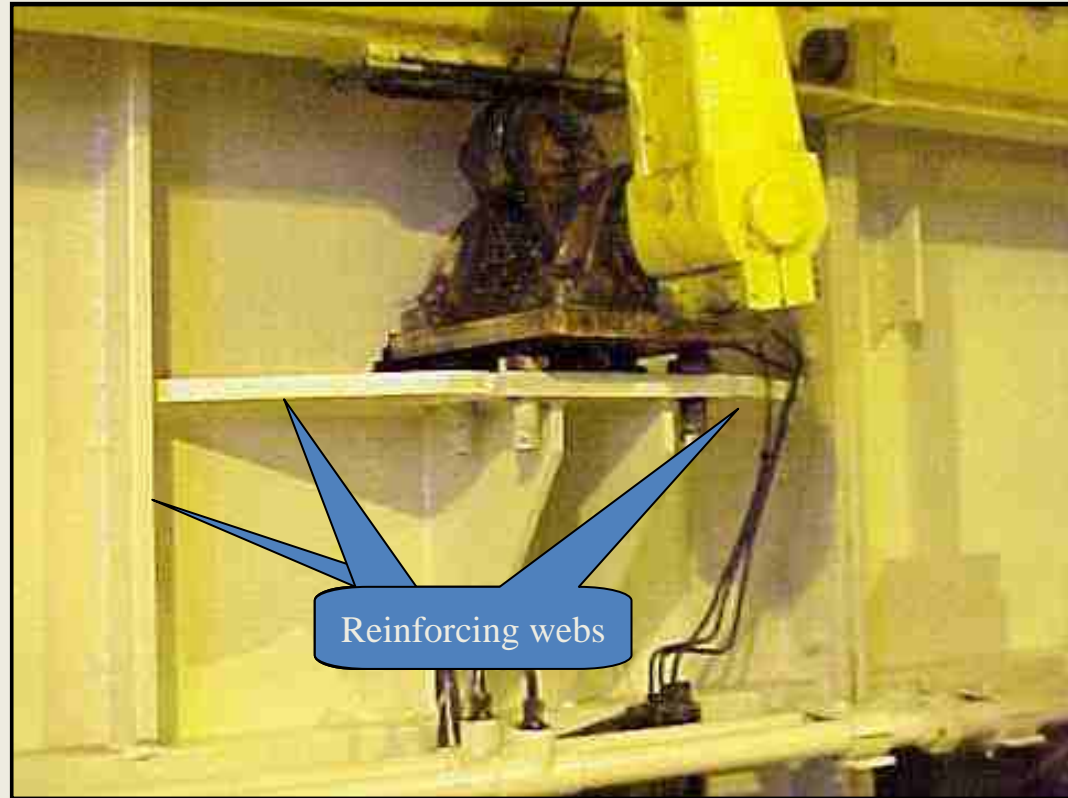
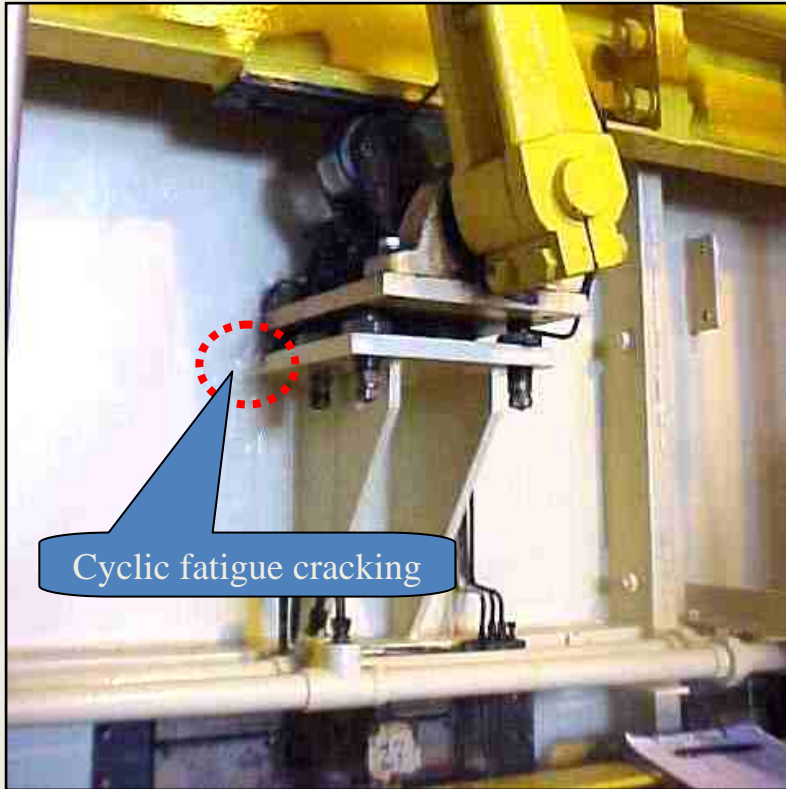
Alternative Decision Making





ASSET MANAGEMENT COUNCIL

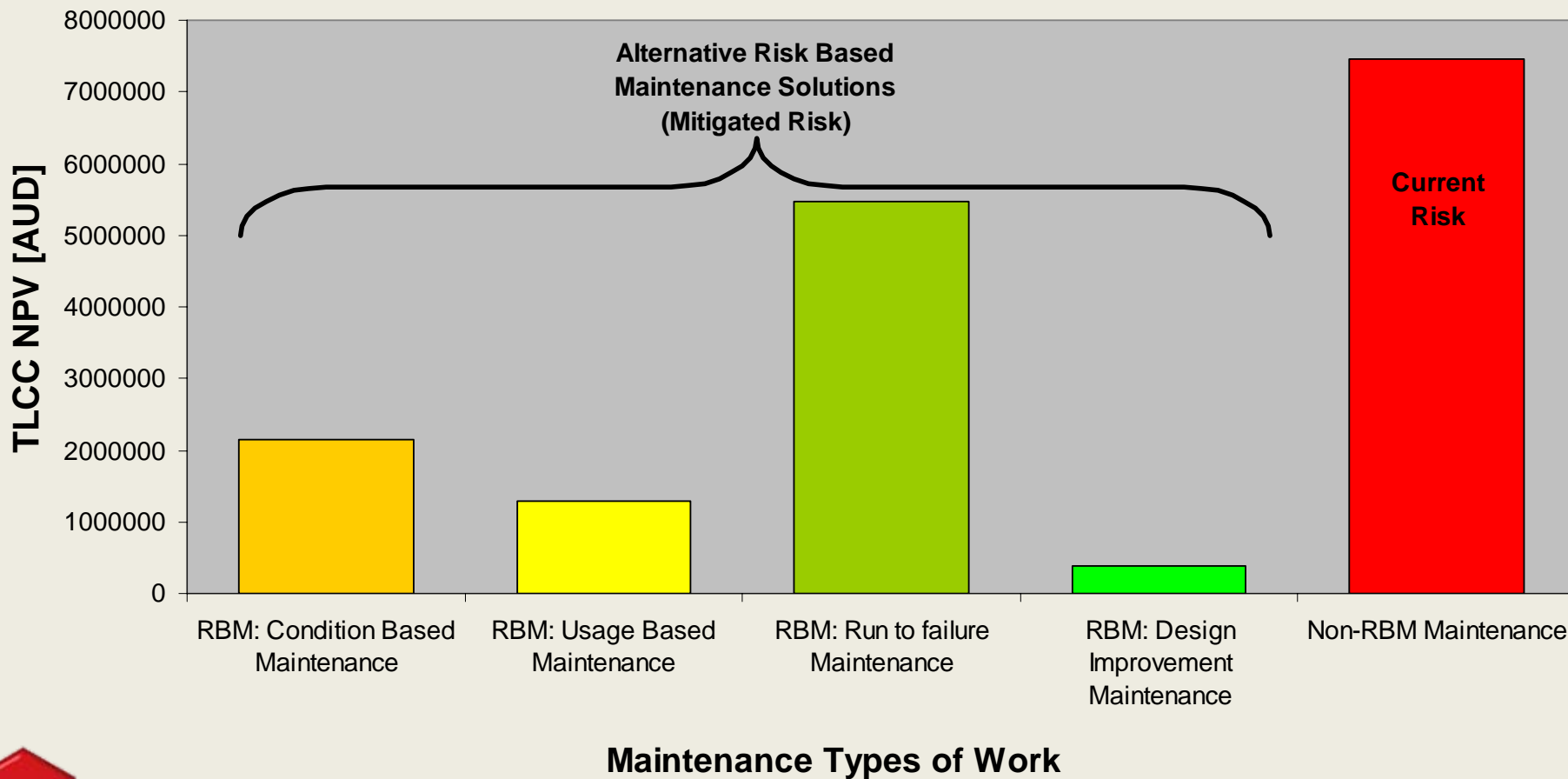
Maintenance Strategy Selection



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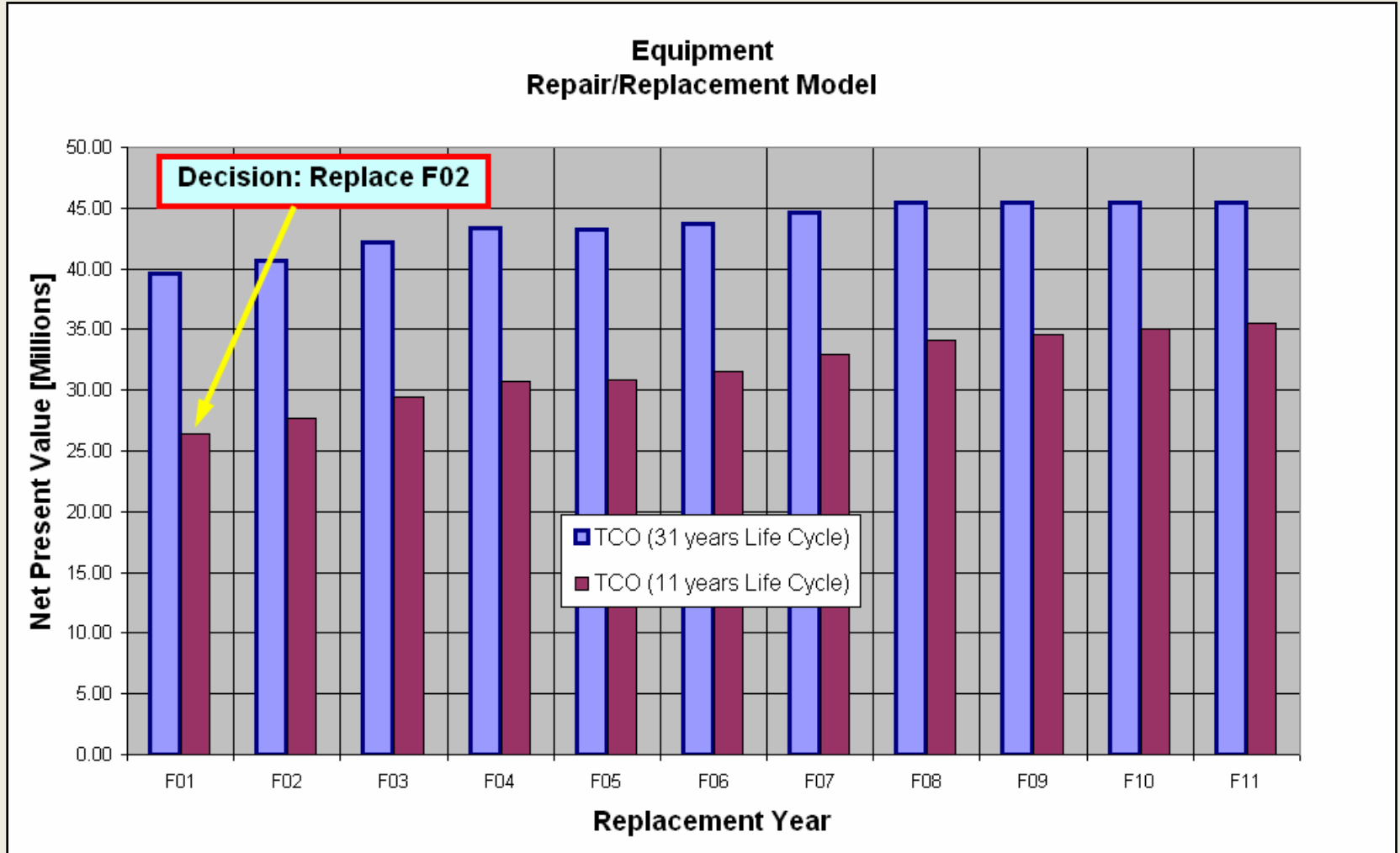
Maintenance Strategy Selection

Risk Based Maintenance Task LCC Comparison





Life Span Impact





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Life Cycle Cost Modelling

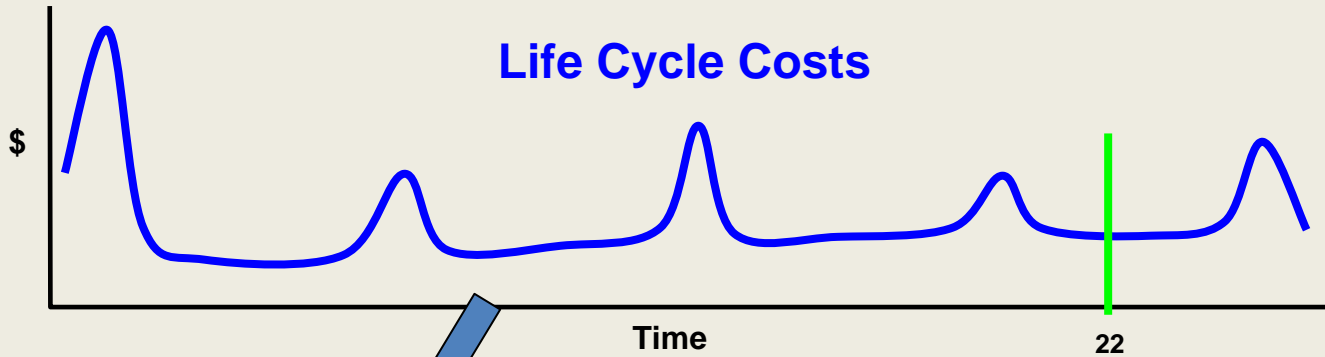
Other Uses



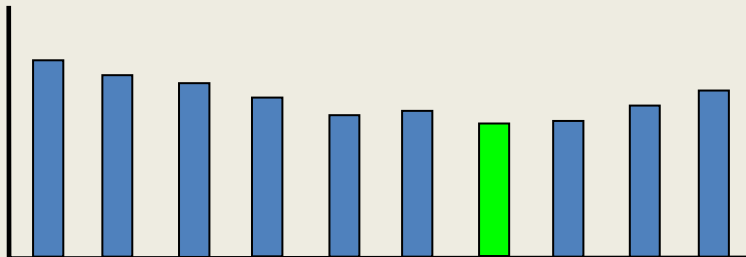
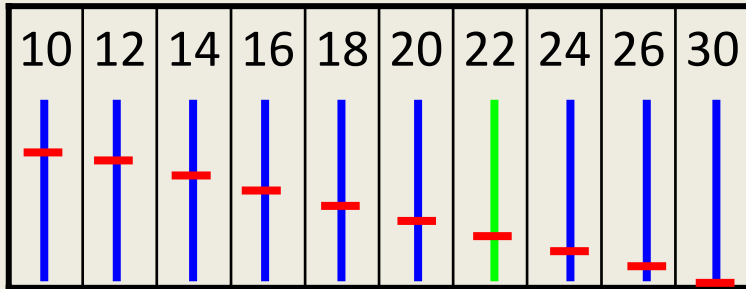
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Life Cycle Cost Management



Replacement Year Scenarios



Fleet Plan

Assets	Rolling Years X?)									
	0	4	8	12	16	20	24	28	32	36
1		→	→	→	→	→	→	→	→	→
2	→	→	→	→	→	→	→	→	→	→
3		→	→	→	→	→	→	→	→	→
4	→	→	→	→	→	→	→	→	→	→
5		→	→	→	→	→	→	→	→	→
6	→	→	→	→	→	→	→	→	→	→
7		→	→	→	→	→	→	→	→	→
Fleet Total LCC	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

Replacement Scenario Costs

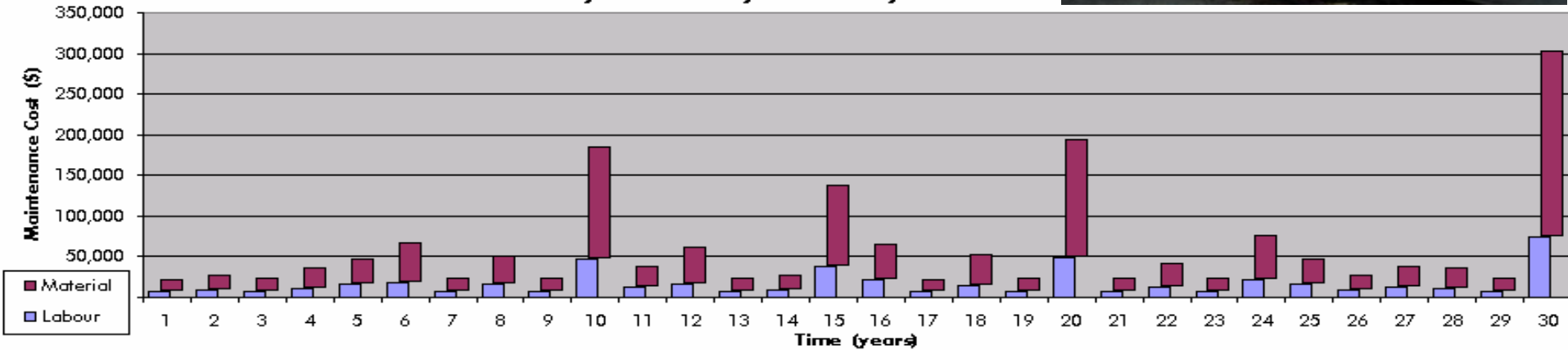




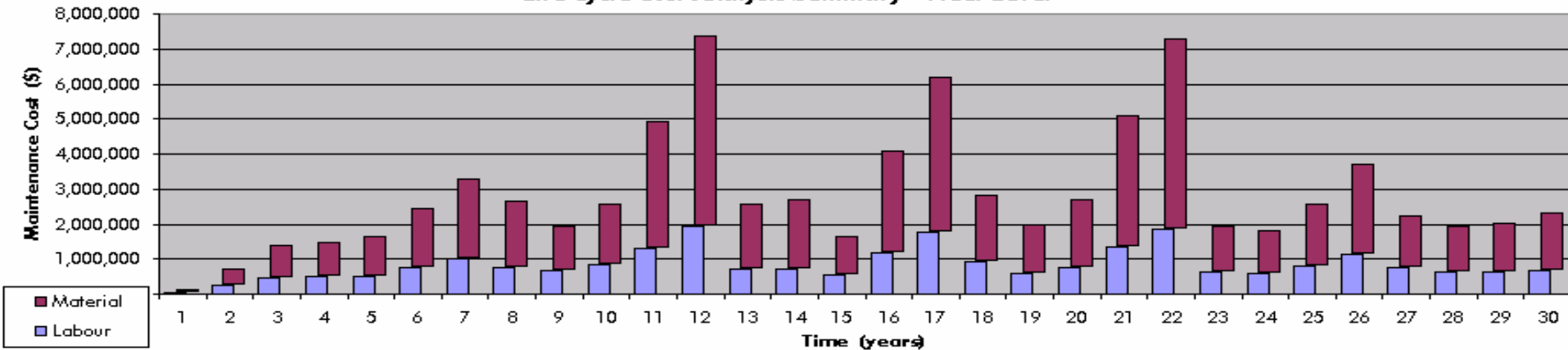
Life Cycle Cost



Life Cycle Cost Analysis Summary - Asset Level

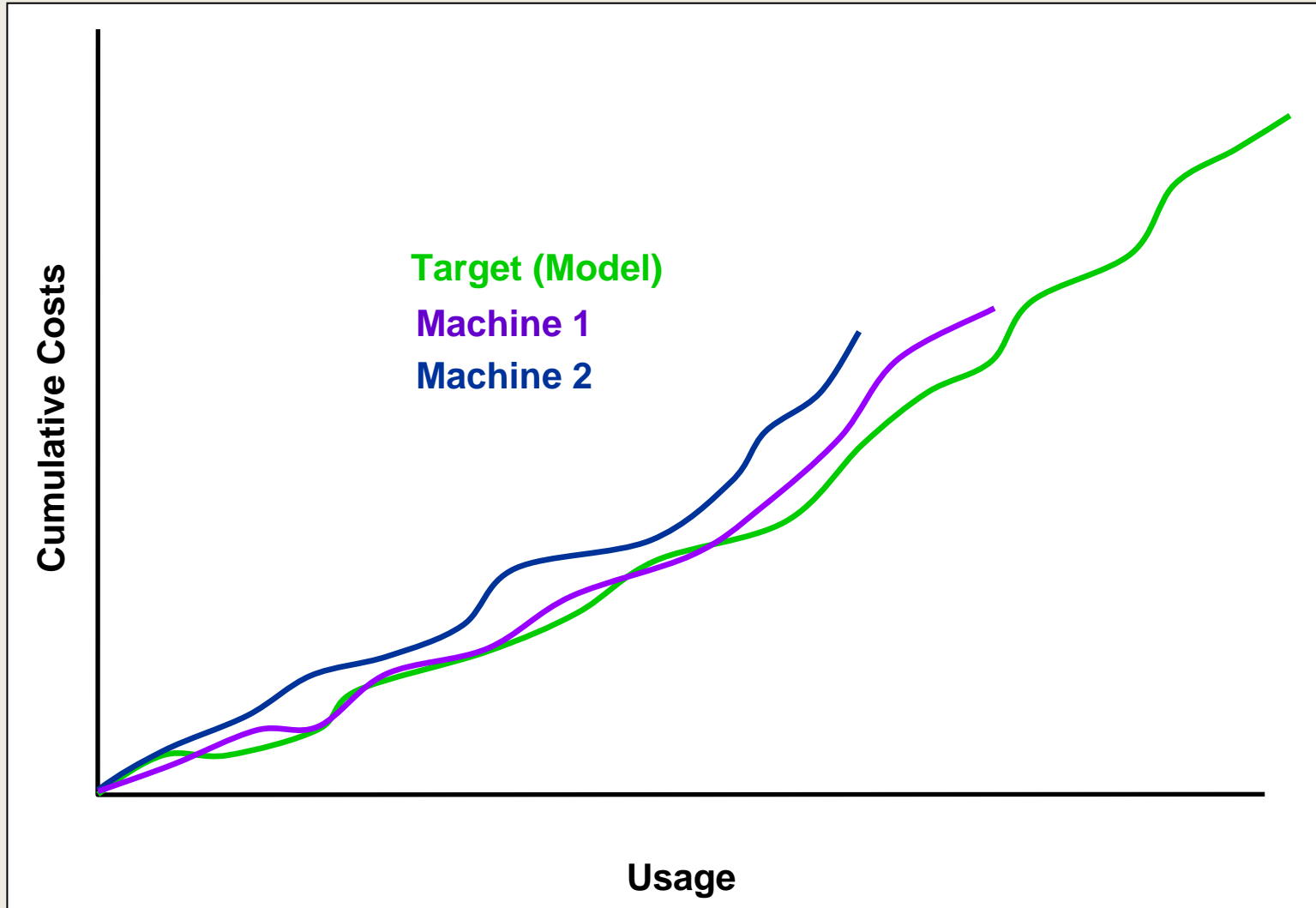


Life Cycle Cost Analysis Summary - Fleet Level





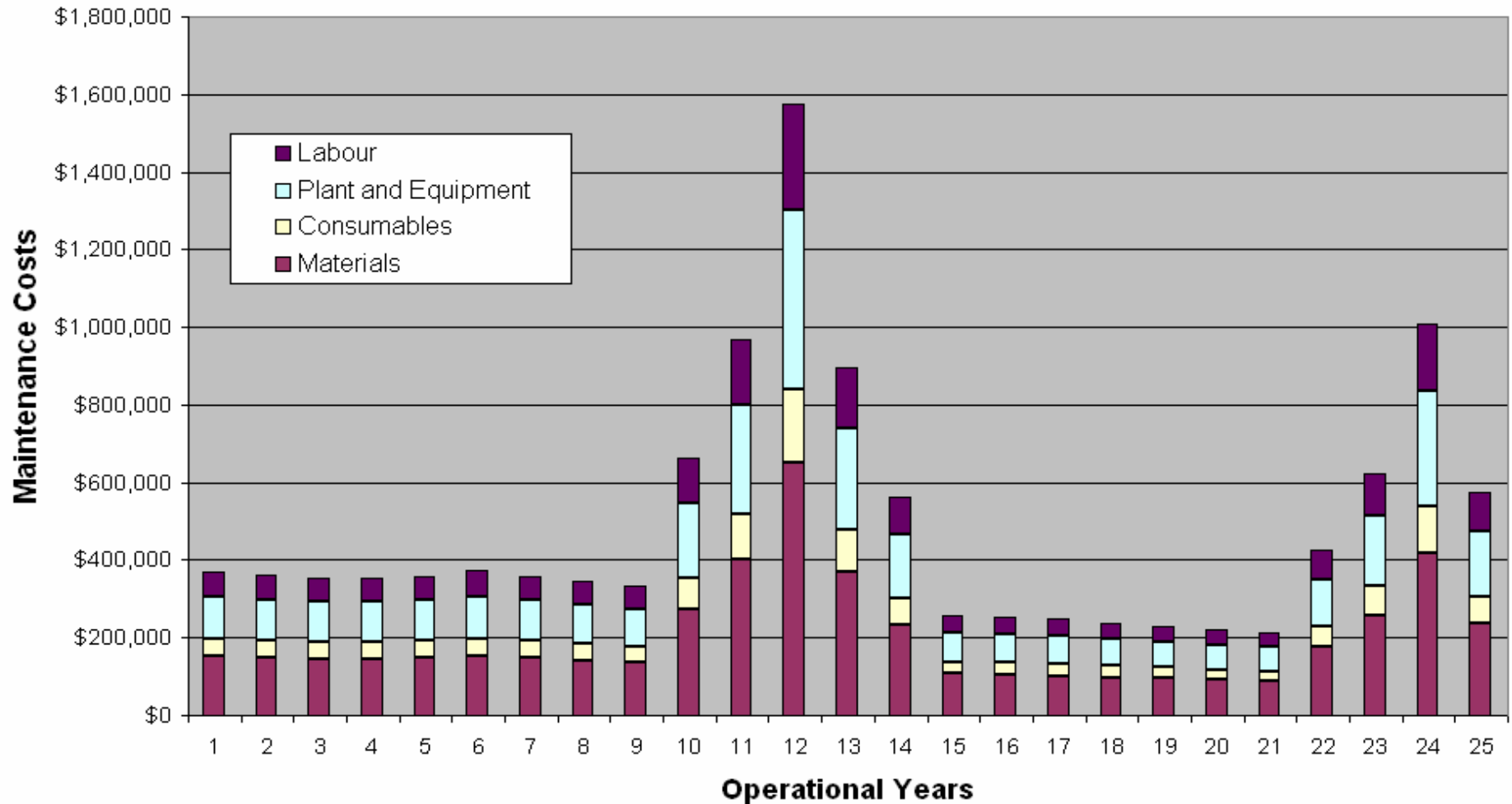
Machine Benchmarking





Dubai Festival City / Dubai Palm Jumeirah

Road Maintenance Costs





Modelling Software Tools

- Excel
- APT Lifespan (Woodhouse Partnership)
- AssetLife (Hansen Corporation)
- Meridium Reliability Solution Life Cycle Cost Module





References

Standards:

- Australian Federal Income Tax Legislation
- AS 15288: 2003 Systems Engineering – System Life Cycle Processes
- AS/NZS 4356: Life cycle costing - An application guide
- Australian Accounting Standard AAS 4 Depreciation
- Australian Accounting Standard AAS 116 Property, Plant and Equipment
- International Financial Reporting Standards (IFRS) IAS 16 and IAS 36 Standards
- Australian Government Depreciation Guidelines
- Australian Master Tax Guide
- TR 2009/4: Taxation Ruling - Income tax: effective life of depreciating assets
- GAAP (Generally Acceptable Accounting Practices)
- Life cycle costing Better Practice Guide – Australian National Audit Office

Books:

- Maintenance, Replacement and Reliability, A.K.S. Jardine
- Life-Cycle Cost and Economic Analysis, Prentice-Hall, Englewood Cliffs, NJ
- Life Cycle Cost, Reliability, Maintainability, and Supportability Guidebook, Warrendale, PA
- Life Cycle Costing: Techniques, Models and Applications, B. S. Dhillon
- Life-Cycle Cost and Economic Analysis, Benjamin S. Blanchard, Fabrycky, Wolter J

Websites:

- APT Lifespan: www.reliability.com.au
- LCC Ware 3: www.aptools.co.uk
- Barringer & Associates, Inc: <http://www.barringer1.com/>

