# Life Cycle Planning for Civil Assets Course

19 – 23 April 2027
Rome (Italy)



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## Introduction:

Life cycle planning for civil assets is the practice of deciding, from creation to disposal, when roads, bridges, buildings, pipe networks, tunnels and dams should be inspected, maintained, renewed or replaced, and at what whole-life cost. This 1-week course is for engineers, asset management professionals, maintenance and capital planners, and the managers they report to, and its final deliverable is a 10-20-year asset life cycle plan. It is taught at intermediate practitioner level as a spreadsheet modelling build, with ISO 55000, the international standard for asset management, as the reference framework.

## Course Objectives:

- Define the stages of a civil asset life cycle and distinguish useful life from economic life when setting renewal timing
- Interpret inspection data to build a condition-rating register and a deterioration curve for an asset class
- Compare preventive maintenance, rehabilitation and replacement options using life cycle cost analysis and net present value
- Apply likelihood and consequence of failure scores to rank renewal candidates in a risk-based prioritised plan
- Distinguish constrained from unconstrained funding scenarios and interpret their effect on backlog and levels of service
- Justify a 10-20-year maintenance and capital renewal plan aligned with ISO 55000 principles to decision makers

## Target Audience:

- Civil and infrastructure engineers who inspect structures, pavements and networks, judging which condition grade and treatment each asset needs
- Asset management professionals who keep registers and asset plans, deciding which data and models support life cycle decisions
- Maintenance planners who schedule routine and preventive works, choosing when an intervention costs less than waiting
- Project and capital planning staff who prepare multi-year budgets, deciding which renewals enter the capital plan and when
- Professionals who lead civil asset portfolios, judging which funding scenario balances risk, cost and service



## Course Outline:

### Day 1: Foundations of Civil Asset Life Cycles and Current-State Assessment

- Asset Life Cycle Stages: Planning, Creation, Operation, Maintenance, Renewal and Disposal
- Useful Life vs Economic Life: Defining When a Civil Asset Should End
- Asset Hierarchy and Inventory Register: Classifying Roads, Bridges, Networks and Buildings
- Condition Rating Scales: Visual Inspection Grades for Pavements, Structures and Pipes
- Condition-Rating Register Exercise: Building a Current-State Baseline From Inspection Data

### Day 2: Asset Management Standards and Deterioration Models Compared

- ISO 55000 and ISO 55001: Asset Management Principles and System Requirements
- Strategic Asset Management Plan vs Asset Management Plan: Purpose and Content
- Levels of Service: Customer and Technical Measures as Described in the IIMM
- Deterministic vs Probabilistic Deterioration Models: Regression Curves and Markov Chains
- Deterioration Curve Build: Estimating Remaining Useful Life From Condition History

### Day 3: Intervention Strategies and Whole-Life Cost Analysis

- Preventive Maintenance vs Rehabilitation vs Replacement: Intervention Options Along the Curve
- Intervention Trigger Points: Condition Thresholds That Prompt Treatment on Each Asset Class
- ISO 15686-5 Life Cycle Costing: Cost Categories for Buildings and Constructed Assets
- Net Present Value and Discount Rates: Comparing Costs Spread Over Decades
- Life Cycle Cost Comparison Exercise: Ranking Intervention Options for a Bridge Deck

### Day 4: Risk-Based Prioritisation, Funding Scenarios and What Goes Wrong

- Likelihood vs Consequence of Failure: Building a Criticality and Risk Matrix
- Risk-Based Prioritisation: Ranking Renewal Candidates by Risk Reduced per Unit Cost
- Funding Scenario Analysis: Comparing Constrained and Unconstrained Budgets Against Backlog
- Asset Performance Indicators: Condition Index, Backlog Ratio and Renewal Gap Tracking
- Common Planning Failures: Missing Data, Deferred Maintenance Backlogs and Optimistic Asset Lives

### Day 5: Modelling Build: Producing a Risk-Based 10-20-Year Asset Life Cycle Plan

- Case Portfolio Data Review: Applying Condition Registers to a Mixed Civil Portfolio
- Prioritised Renewal Plan Build: Applying Risk Scores and Life Cycle Costs Together
- Ten-Year vs Twenty-Year Planning Horizons: Testing Sensitivity of Funding Needs
- Plan Presentation to Decision Makers: Defending Scenarios, Risks and Service Trade-Offs
- Asset Life Cycle Plan Completion: Finalising the Long-Term Maintenance and Renewal Plan



## Skills You Will Gain:

- Condition Rating Assessment
- Deterioration Curve Modelling
- Remaining Useful Life Estimation
- Life Cycle Cost Analysis
- Net Present Value Comparison
- Criticality and Risk Scoring
- Funding Scenario Modelling
- Capital Renewal Planning

## Why Attend This Course:

- From replacing assets when they fail to timing interventions on a modelled deterioration curve
- From comparing options on purchase price alone to ranking them on discounted whole-life cost
- From funding the most urgent-sounding request to prioritising renewals by risk reduced per unit of spend
- From annual budget lists to a 10-20-year asset life cycle plan tested against funding scenarios

## Conclusion:

Planning the life cycle of civil assets means choosing the right treatment at the right time so that a road, bridge or pipe network delivers its required service at the lowest whole-life cost and an acceptable level of risk. The course makes three distinctions clear: useful life versus economic life, purchase cost versus discounted life cycle cost, and condition-based versus risk-based prioritisation. It suits engineers, planners and asset management professionals at intermediate level who already work with civil assets and now need working models, not policy statements, to support long-term maintenance and renewal decisions.

## Frequently Asked Questions FAQ:

### What should a delegate know before a life cycle planning for civil assets course?

Working experience with civil assets in design, inspection, maintenance or budgeting, plus basic spreadsheet skills, is enough. Discounting, deterioration modelling and risk scoring are explained step by step before delegates use them in the exercises.

### How does a life cycle planning for civil assets course differ from a general asset management systems course?

It concentrates on the numbers behind decisions: condition data, deterioration curves, life cycle costs, risk scores and funding scenarios for civil assets. Asset management system courses focus on policy, organisation and audit of the management system, which this course covers only as context.



## Why does life cycle planning for civil assets use discounted costs rather than purchase price?

Most of a civil asset's cost arises after construction. Discounting maintenance, rehabilitation and replacement costs to present value lets options with different timings be compared fairly, often showing that earlier, cheaper treatment costs less than later reconstruction.

## What does a delegate take back to work from a life cycle planning for civil assets course?

A 10-20-year asset life cycle plan built during the course, with its condition-rating register, deterioration curve, life cycle cost comparison and risk-based prioritised renewal list, ready to adapt to the delegate's own asset portfolio.

