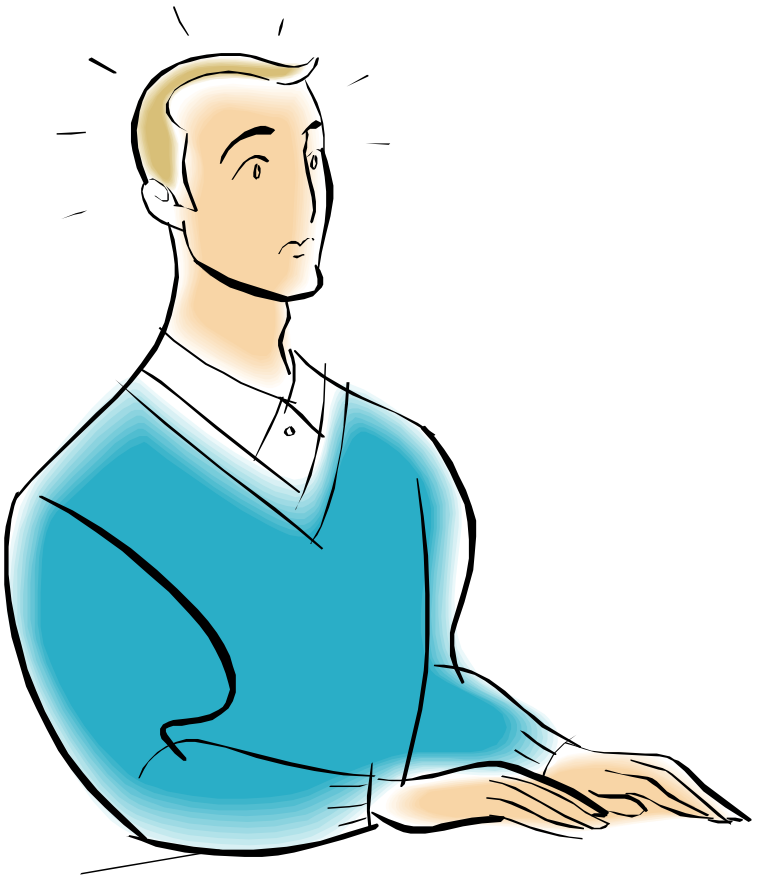
Fundamentals of Asset Management

Step 4. Determine Life Cycle & Replacement Costs

A Hands-On Approach

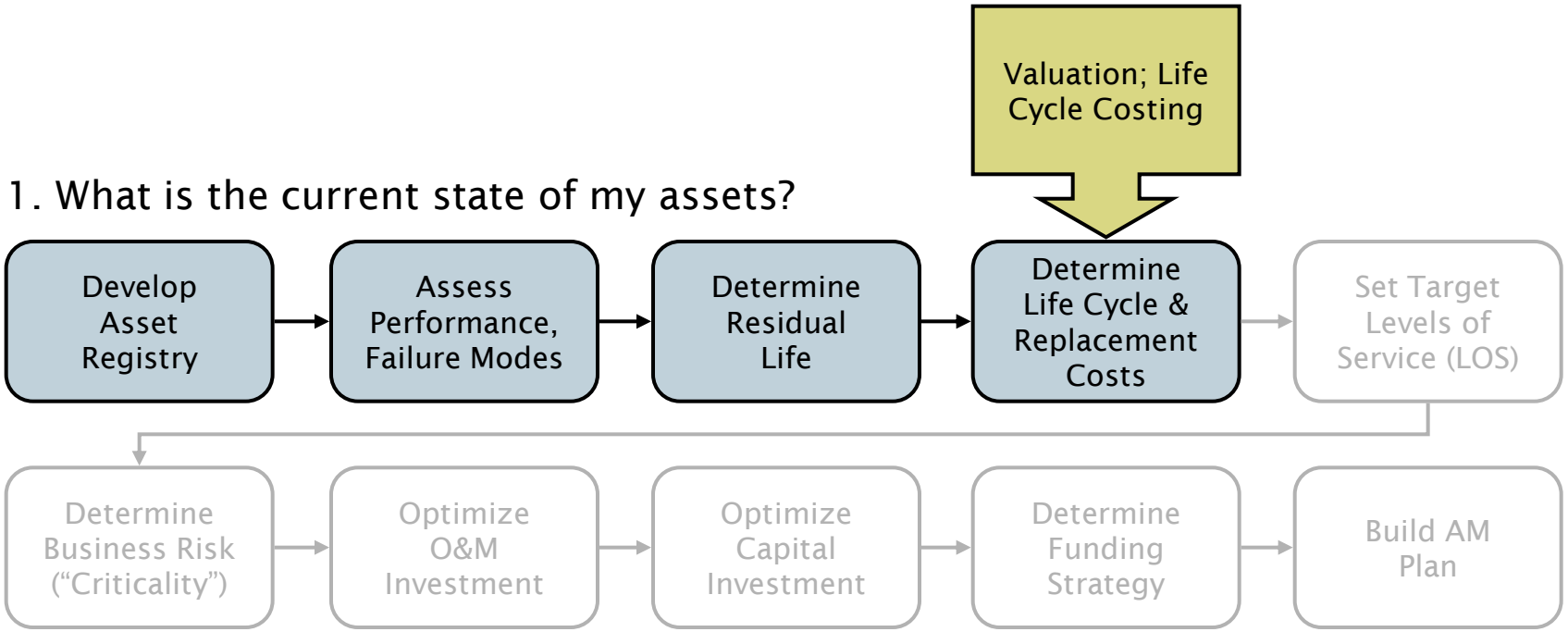
Tom’s bad day…



First of 5 core questions, continued

1. What is the *value* of my assets?
   - *Why* are cost and value important?
   - *How* is value determined?
   - *How* to determine replacement cost?

AM plan 10-step process



Concepts of *cost* particularly useful to AM

- *Current replacement cost* - The full cost to replace an asset in its current operating environment
- *Life cycle cost* - The total cost of an item throughout its life, including the costs of planning, design, acquisition, operations, maintenance, and disposal, less any residual value, or the total cost of providing, owning, and maintaining a building or component over a predetermined evaluation period

AM's two major cost perspectives

Direct life cycle costs

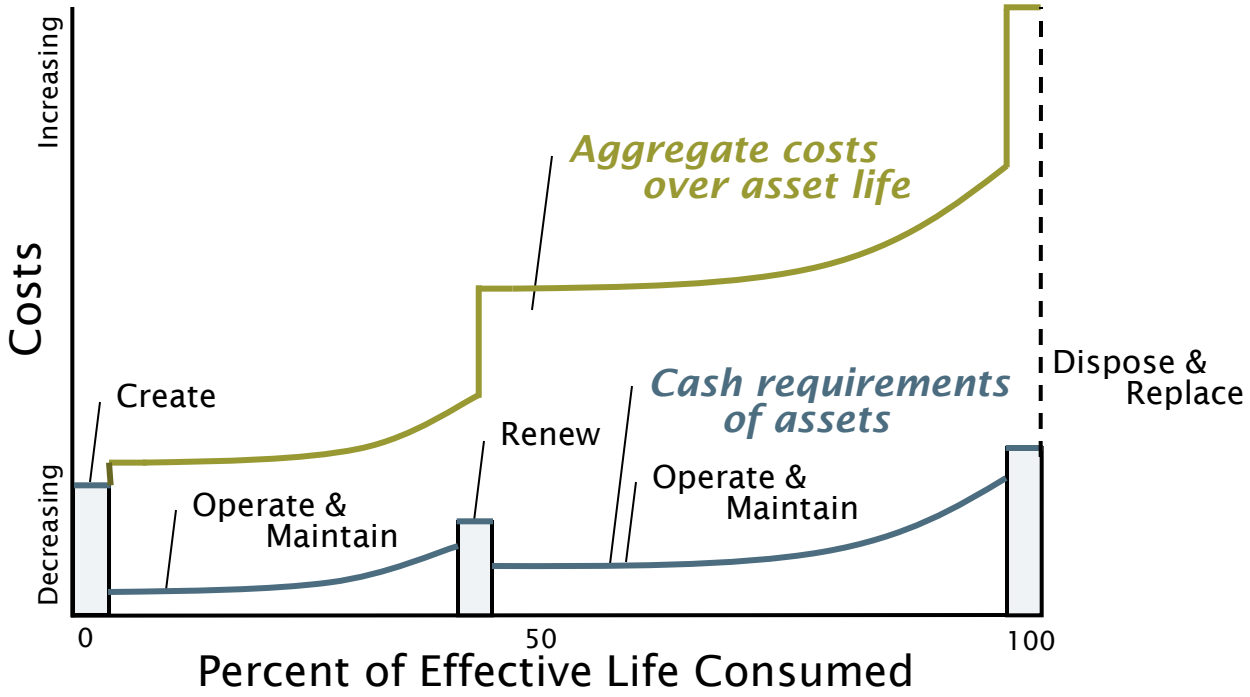
- Acquisition
- Operation
- Maintenance
- Renewal
  - Reparation
  - Rehabilitation
  - Replacement
- Disposal and decommissioning

Economic costs

- Financial costs
  - Direct costs to the governmental organization
  - Direct customer costs
  - Community costs
- Triple bottom line
  - Financial and economic
  - Social
  - Environmental

Nature of life cycle costs

Cash requirements and cumulative costs over asset life



Defining life cycle cost

Life cycle cost = *original* cost
– *salvage* value
+ *operating* costs
+ *maintenance* costs
+ *renewal* costs
+ *decommissioning* costs

Determining life cycle cost

Requires that an organization conduct

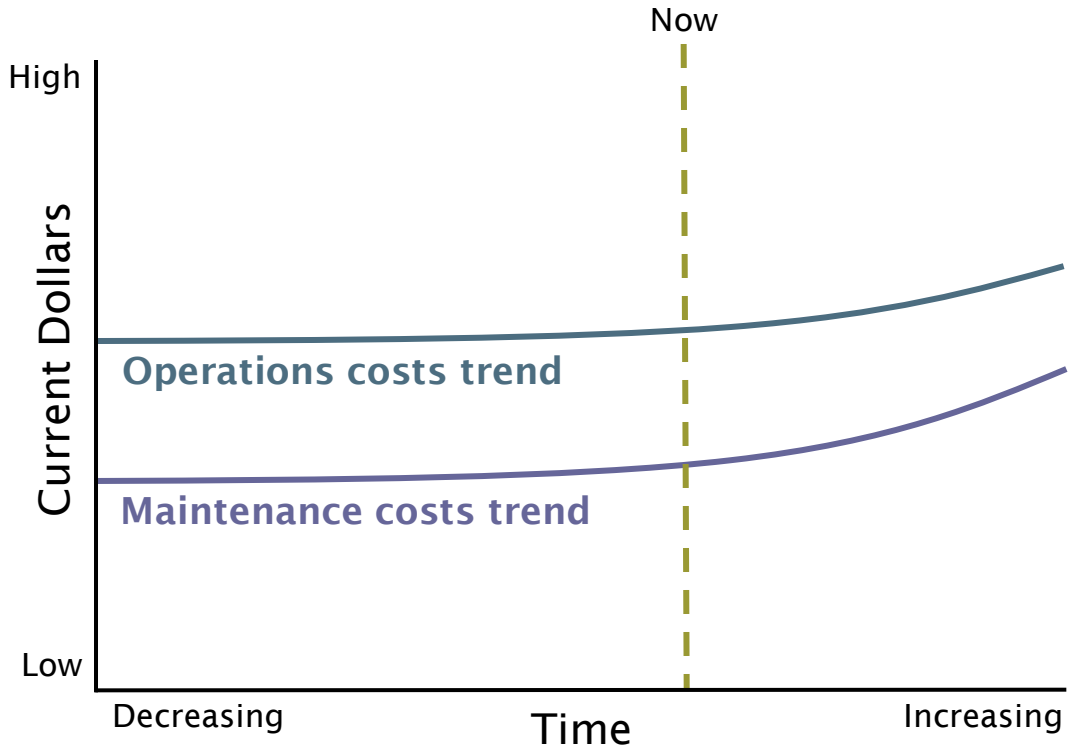
1. Either cost tracking
   - Integrating CMMS to financial system
   - Setting up activity-based accounting
   - Storing data over time
2. Or cost allocation

Primary Cost Unit	Minor code	Number of Units	$/Unit	Allocated Cost
Direct Labor				
	Direct Pay	2.5 hours	$42.00	$105.00
	Overhead	.5 hours	$6.00	$3.00
	Benefit Burden	1	$8.20	$8.20
	FICA, etc	1	$2.20	$2.20
Materials				
	Vehicle	1.5 hours	$47.15	$70.73
	Pipe	160 feet 8” PVC	$1.20/foot	$ 192.00

CMMS means computerized maintenance management system

Life cycle costing

It’s about understanding trends and drivers



Measuring “consequence of failure”: three elements of full economic costs

1. *Direct costs to the local government*
   - Repair and return to service costs
   - Service outage mitigation costs
   - Utility emergency response costs
   - Public safety costs
   - Administrative and legal costs of damage settlements
   - Lost product costs

Three elements of full economic costs, cont.

2. *Direct customer costs*
   - Property damage costs, including restoration of business
   - Service outage costs
   - Service outage mitigation and substitution costs
   - Access impairment and travel delay costs
   - Health damages

Three elements of full economic costs, cont.

3. *Community costs*
   - Emotional strain and welfare
   - Environmental pollution, erosion, sedimentation
   - Destruction of habitat or damage to it
   - Attractiveness (economic, tourists)

Concepts of *value* particularly useful to AM

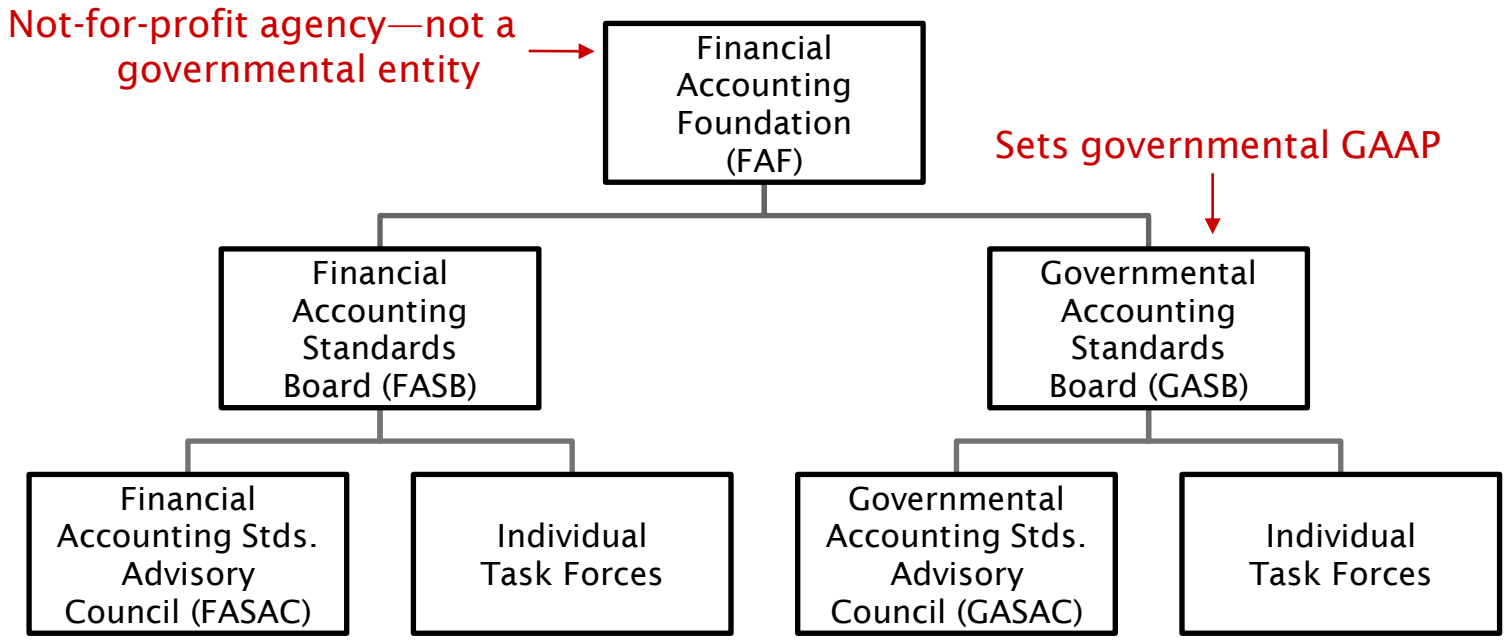
- *Depreciated value (book value)*—Value of an asset as determined using generally accepted accounting principles and as reflected on the balance sheet
- *Replacement value*—The current cost to substitute an entire asset with a new or equivalent asset without enhancement of capabilities

Two valuation perspectives

- Macro view—aggregation of assets
  - Financials
  - GASB
- Micro view—the individual asset
  - Life cycle cost
  - Economic life
  - Optimal renewal decision making

GASB is Governmental Accounting Standards Board

GASB - how GAAP is set



GAAP is generally accepted accounting principles

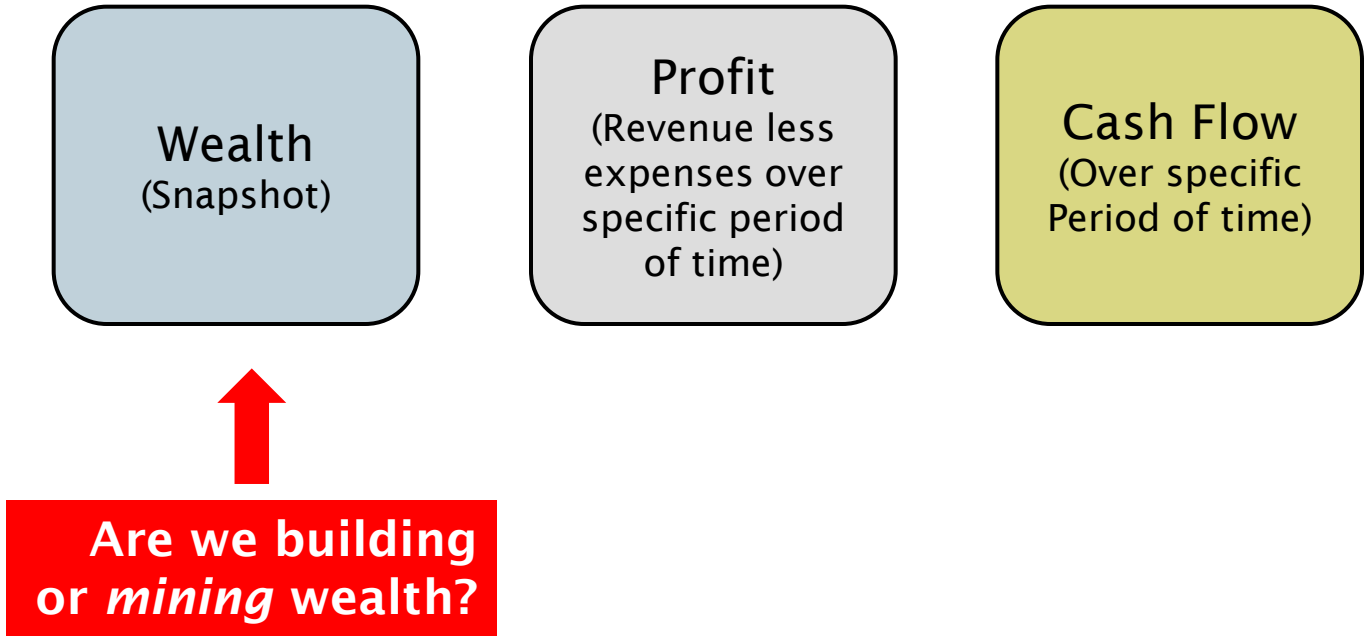
What GASB is all about

Practices and procedures by which governments…

- Using *source documents for such transactions as*
  - Tax receipts
  - Paychecks
  - Invoice payments
  - Debt payments
- *Record* financial transactions
  - In an accounts journal
  - And general ledger
- And *report* financial transactions
  - In consolidated annual financial reports

Focus of GASB's Statement 34

What it's all about – the financial reporting perspective



Two accounting views

1. Financial accounting — Based on historic cost
   - GAAP-driven
   - Financial statement reporting—external
   - Meets criterion of fairly presenting the result of operations on financial condition
   - Audit trail paradigm
2. Managerial accounting — Based on replacement cost
   - Not GAAP-driven
   - Instead, *business case*-driven—*decision*-focused
   - *Cost*-focused

GAAP is generally accepted accounting principles

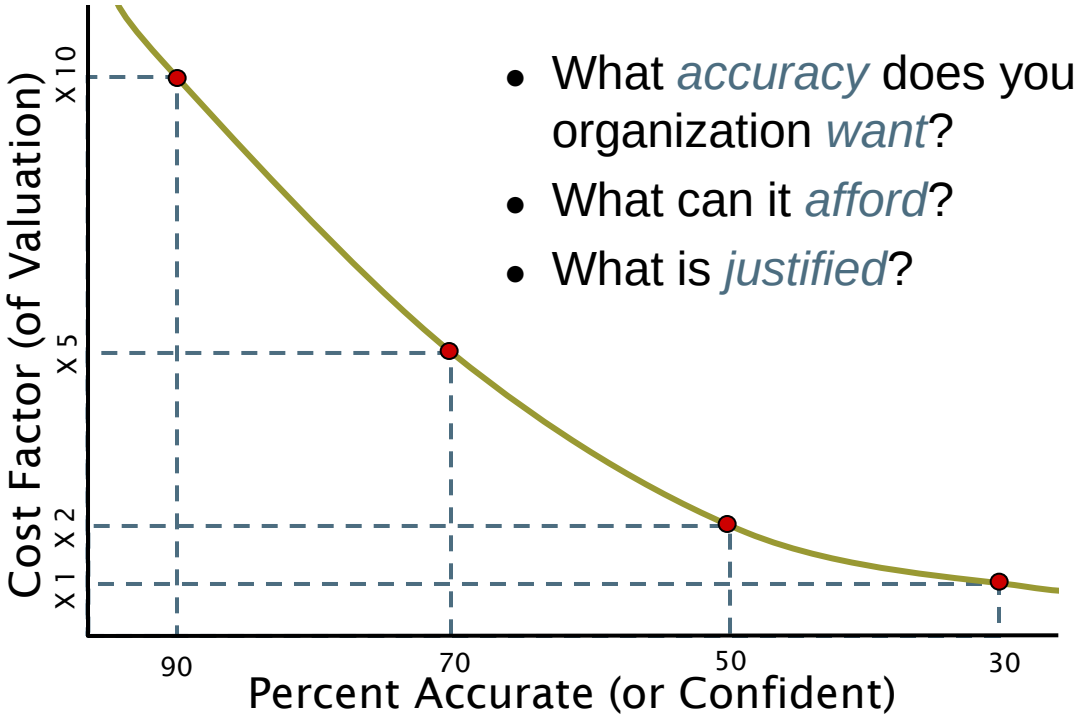
Determining replacement cost

- Level 1
  - Original cost x general cost index (e.g., CPI)
- Level 2
  - Original cost x sector-based cost index (e.g., ENR, Means, CCI)
  - Brownfields-to-Greenfields conversion costs
- Level 3
  - Modern Equivalent Engineered Replacement Asset (MEERA)
  - Detailed site-based cost analysis

CPI is Cost Performance Index, ENR is Engineering News-Record, Means is Means Building Construction Cost Data, CCI is Consumer Confidence Index

Cost vs. accuracy or confidence

Estimated *trade-off* in cost for accuracy or confidence



- What *accuracy* does your organization *want*?
- What can it *afford*?
- What is *justified*?

Which valuation technique?

- Financial accounting
  - Used for GASB reporting purposes
  - With choice of
    - *Historic* depreciation
    - Or *modified or preservation* approach
- Managerial accounting
  - Used for *renewal or replacement* analysis
  - And *long-term* funding strategies, including rate setting
  - With choice of
    - *Condition-based* renewal
    - Or *depreciated* replacement

GASB is Governmental Accounting Standards Board

Key points from this session

What is the value of my assets?

Key Points:

- Asset valuation is the "common benchmark" against which the decision to repair, refurbish or replace is made.
- Historic depreciation has little relevance to long lived assets where the management intent is to preserve the asset
- Far more relevant are the replacement value-based techniques

Associated Techniques:

- Valuation and costing
- Straight-line depreciation
- Condition-based depreciation
- Renewal/Replacement costing
- Depreciated replacement cost
- Deprival cost

Tom's spreadsheet