

ADVANCED ASSET MANAGEMENT

From Assets to Decisions

Practical Implementation Guide and Workbook

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*Companion volume to
Advanced Asset Management: From Assets to Decisions
A Practical Guide to Managing Equipment and Facilities*

Whites Elm

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Advanced Asset Management: From Assets to Decisions
Practical Implementation Guide and Workbook

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Foreword: Why This Workbook Exists

Most asset management initiatives fail in the same predictable way. Someone reads a textbook, gets fired up, calls a meeting, draws a roadmap, and then runs straight into the wall of *what do we actually do on Monday morning?*

I've watched it happen in utilities, government agencies, manufacturing plants, military bases, and one memorable session involving a utility, three angry maintenance supervisors, and a whiteboard. The textbook had been read. The slide deck had been built. The frameworks were on the wall. And nobody knew where to start.

So this workbook exists for one reason: to keep you out of that meeting.

The textbook (the nearly 500-page volume this thing is companion to) explains *what* advanced asset management is and *why* it works. It's the philosophy, the standards, the field examples, the pitfalls, and the receipts. It's a real book, with real chapter summaries, and a Chapter 21 that I'm a little proud of. Read it. Refer back to it. Underline things in it. But the textbook does not, by itself, get you to a finished asset register, a calibrated criticality model, a defensible capital case, and a leadership team that doesn't change the subject when you bring up deferred maintenance.

This workbook does. Or rather: this workbook is the scaffolding that gets *you* to do that. Every module produces an artifact. Every artifact gets used in the next module. By the end of Module 8 you have a practice: not a presentation, not a plan, not a maturity score, but an actual operating practice that survives the next leadership transition and the next budget cycle and the rate case that lands in your inbox the day before Thanksgiving.

A few honest disclosures.

This is *not* a plug-and-play template pack. The worksheets here are designed to make you think, not to absolve you of thinking. If you are looking for a turnkey deliverable to slide under your vice president's (VP) door and call it asset management, this isn't that. (And honestly, that VP would see right through it anyway.)

This is *not* certification prep. International Organization for Standardization (ISO) 55001 certification is a fine thing, and the disciplines in here will get you most of the way there, but I'm not going to walk you through clause 4.4. If you want clause 4.4, the standard is sitting on someone's shelf gathering dust; go find it.

This is *not* a tools manual. We talk about enterprise asset management (EAM) and computerized maintenance management system (CMMS) platforms extensively, but I'm not going to teach you how to configure Maximo or fix a broken integration with your enterprise resource planning (ERP) system. Your trusted advisor or system integrator's professional-services team are more than capable of guiding you through that.

What this *is* is a set of facilitated workshops, fillable forms, decision frameworks, and "how to run this module" playbooks that you can use literally on Monday morning. Run a half-day session with the Module 1 worksheets and you will know more about your program's

actual maturity than you did on Friday. Run all eight modules across 90 days (the *Getting Started: Your First 90 Days* section tells you how) and you will have a working practice with documented artifacts, signed authorities, and a governance routine on the calendar.

Two more things.

First, a word about Riverside Water. Riverside is a fictional regional water utility I built into the textbook to show what a decade of advanced asset management actually looks like as a story rather than as a checklist. Riverside is fictional but composite. Every move it makes, every mistake it survives, every bit of leadership patience and political weather it endures, comes from a real place. If you find yourself rolling your eyes at how exactly Riverside resembles your last three jobs combined, that's not a coincidence. The textbook's Chapter 21 is the full story; the workbook references Riverside throughout because the story is the most legible map of the practice in motion.

Second, a word about the tone. This is a serious discipline and I take it seriously. But I have also sat through too many asset management workshops that had all the warmth and immediacy of a tax audit, and I refuse to write another one. So if a sentence in here makes you laugh, that's intentional. If a sentence in here makes you think, "wait, that's actually exactly what happens to us," that's also intentional. The two reactions are not in tension. The work is hard; the language doesn't have to be.

Build the practice. Use the artifacts. Keep going through the boring middle. Save your organization a few hundred million dollars over the next decade. Then take a long weekend.

— Scott Stukel

How to Use This Workbook

This is a *how-to*. Every module, every worksheet, every appendix is structured around a question of the form “how do we actually do this thing?” The Implementation Guide & Workbook accompanies the textbook *Advanced Asset Management: From Assets to Decisions*. The textbook explains *what* advanced asset management is and *why* the practices matter; this workbook is where the practice gets *built*. The book is the Compass. This is the Field Guide.

The workbook is organized into eight modules that map to the textbook’s progression:

Module	Topic	Maps to textbook chapters
1	Where Do We Stand?	Chapters 1, 4, 21
2	Strategy and the Roadmap	Chapters 5, 6
3	Asset Identification and the Register	Chapters 9, 10, 11
4	Hierarchy and Asset Strategy	Chapters 12, 13
5	Condition Assessment	Chapters 14, 15
6	Criticality, Risk, and Treatment	Chapters 16, 17
7	Needs, Backlog, and Capital	Chapters 18, 19, 20
8	Sustaining the Practice	Chapters 5, 20, 21

Each module contains:

- **Learning objectives:** what the module is designed to produce
- **Pre-work:** questions to surface where the organization actually stands before the workshop or exercise
- **Worksheets:** fillable exercises that produce the artifacts the practice needs
- **Templates:** ready-to-adapt forms and registers
- **Facilitator notes:** guidance for running the module as a workshop
- **Output:** the deliverable the module is designed to produce

Three ways to use this workbook

As a self-paced implementation guide. Work through modules sequentially. Each module produces an artifact that the next module references. The output of Module 8 is a sustained practice; the path through Modules 1–7 is the build sequence.

As a workshop curriculum. Each module is sized for a half-day to full-day facilitated workshop with key program staff. The workbook provides the structure; the facilitator provides the judgment.

As a reference for specific tasks. When you need to produce a criticality scoring sheet, a risk acceptance form, a needs register entry, or a capital project justification, navigate directly to the relevant module and use the templates there. The textbook explains the practice; the workbook provides the forms.

The Companion Excel Workbook

This Implementation Guide & Workbook is paired with a companion Excel file: **Advanced Asset Management, Workbook Companion (Excel)**. The Excel file implements every scoring, list, and tracking exercise from this Implementation Guide & Workbook in a usable, calculable, and durable form. Together they are designed to be used as one toolkit:

- The **Implementation Guide & Workbook** explains the *concepts*, walks through the *practice*, and provides *prose-form* worksheets and templates that adapt easily to organizational context.
- The **Excel companion** provides *fillable*, *calculable* versions of the same exercises, with auto-computed scores, dropdowns and validations, conditional formatting, charts, cross-tab references, and a live program dashboard.

Recommended workflow

For each module, work through the concepts and prose in this Implementation Guide & Workbook first to build the program's understanding of the practice. Then move to the corresponding Excel tab to capture the actual scoring, register entries, or tracking artifacts the program will use and re-use over time. The Excel file becomes the program's living artifact; the Implementation Guide & Workbook remains the reference that explains why the artifact is structured the way it is.

Word-to-Excel cross-reference

Word Worksheet	Excel Tab	What the Excel tab adds
Worksheet 1A — Three Foundational Questions	1A Three Questions	Score 15 capabilities; auto-composite tier per question
Worksheet 1B — Phase Self-Assessment	1B Phase Assessment	Yes/No/Partial dropdowns; auto-counts and pass-tests
Worksheet 1C — Heroics Dependencies	1C Heroics	Fillable inventory with risk/action columns
Worksheet 1D — Dimensional Self-Assessment	(separate.xlsx: Radar Tool)	Radar visualization of 25 capabilities
Worksheet 2A — GSOT (Goals-Strategy-Objectives-Tactics) Build	2A GSOT	Cascading Goals/Strategy/Objectives/Tactics tables

Word Worksheet	Excel Tab	What the Excel tab adds
Worksheet 2B — Risk Tolerance Statement	2B Risk Tolerance	Categorical limits, tiered authority, mitigation, triggers
Worksheet 3A — Five-Lens Test	3A Five-Lens	Auto-counts $\geq$ Moderate; auto-decision (Include/Review/Exclude)
Worksheet 3C — Register Template	3C Asset Register	24-column register with dropdowns, frozen panes, conditional formatting
Worksheet 4A — Hierarchy Design Tests	4A Hierarchy Tests	Pass/Partial/Fail dropdowns
Worksheet 4B — Strategy Document by Asset Class	4B Asset Strategies	Strategy tracker by class with population, tiers, failure modes
Worksheet 5A — Anchor a 1-5 Rating Scale	5A Rating Anchors	Class-by-rating definition matrix
Worksheet 5B — Method Selection by Criticality	5B Method by Tier	Method-by-tier matrix with dropdowns
Worksheet 6A — Criticality Scoring Sheet	6A Criticality	Weighted-dimensional scoring; auto-composite; auto-tier; tier distribution chart
Worksheet 6B — Risk Matrix Calibration	6B Risk Matrix	Per-asset likelihood $\times$ consequence lookup; auto-tier; risk distribution chart
Worksheet 6C — Risk Treatment Selection	6B Risk Matrix (combined)	Treatment dropdown alongside risk tier
Worksheet 6D — Risk Acceptance Form	6D Risk Acceptance	Risk acceptance log with treatment dropdown
Worksheet 7A — Deficiency-to-Need Translation	7A Deficiency-Need	Translation form dropdown; status tracking; auto-feeds 7C
Worksheet 7B — Backlog Segmentation	7B Backlog Segmentation	4-segment $\times$ 3-tier grid with auto-totals and stacked bar chart
Worksheet 7C — Deferred Maintenance Backlog Tracking	7C DMB FCI Tracker	Auto-DMB sum (incl. pull from 7A); auto-FCI; year-over-year trend
Worksheet 7D — Capital Project Justification	7D Capital Cases	Capital project tracker (15 columns) with status dropdown
Worksheet 8A — Governance Routines Inventory	8A Governance Routines	7 routines pre-populated; fillable schedule and ownership columns

Word Worksheet	Excel Tab	What the Excel tab adds
Worksheet 8B — Audit Cycle Schedule	8B Audit Schedule	6 audits pre-populated; fillable currency tracking
Worksheet 8C — Multi-Year Trajectory Model	8C Trajectory	10-year baseline-plus-3-scenario grid with line chart
Worksheet 8D — Succession Planning	8D Succession	Critical-role tracker with risk and documentation status
Implementation Tracker (Workbook Appendix C)	Implementation Tracker	Status board with auto-progress %; status doughnut chart
Year-over-year tracking	Maturity History • Annual Refresh	Snapshot capture for trend reporting
(Cross-cutting program view)	Dashboard	Live key performance indicators (KPIs) from all tabs with explanations

How to find your way around the Excel file

The Excel file's first tab, *1. Read Me*, contains a clickable navigation table linking to every other tab. The second tab, *Dashboard*, presents live KPIs drawn from the rest of the file with explanations of what each metric means and what good looks like. Color conventions are consistent throughout: yellow fill = input, blue header = locked/header, grey fill = computed/read-only.

Where to download the Excel files

The Excel companion and the Self-Assessment Radar Tool are free to download at whiteselm.com/book/workbook. Type the address into a browser or scan the code below. The same page carries the current PDF of this workbook.



whiteselm.com/book/workbook

Access code: **TEACH-TO-FISH**

The files open in Protected View when first downloaded. Click *Enable Editing* to use the dropdowns and charts. They contain no macros. Both files are updated from time to time; compare the version note on the *1. Read Me* tab with the version shown on the download page to confirm you are working from the latest.

The Implementation Roadmap

The textbook's Chapter 21 follows the fictional Riverside Water Utility through a decade of advanced asset management practice across five phases. The five phases are the implementation roadmap this workbook supports.

Phase	Years	What gets built	Workbook modules
1 — Foundation Building	Years 1–2	Honest self-assessment, leadership commitment, asset identification, register baseline	1, 2, 3
2 — Building the Discipline	Years 3–4	Hierarchy, asset strategies, condition assessment program	3, 4, 5
3 — Visible Outcomes	Years 5–6	Criticality, risk, needs translation, capital justification	6, 7
4 — Stewardship and the Long View	Years 7–8	Multi-year trajectory, deferred maintenance discipline, governance maturity	7, 8
5 — Compounding Maturity	Years 9–10+	Practice that survives leadership change; sustained adaptation	8

Meet Riverside Water Utility (Our Recurring Friend)

Throughout this workbook you will encounter references to *Riverside Water Utility*, a regional water and wastewater utility serving 280,000 people across a metro area that, in my mental cartography, is somewhere in the Mountain West but could be anywhere in North America. Riverside is the case study at the heart of textbook Chapter 21. Riverside is also the story we keep coming back to in this workbook, because abstractions don't teach a practice. Stories do.

A few things to know about Riverside before you meet them in the modules.

Riverside is fictional. Riverside is also entirely real. Every event in the Riverside arc (the transformer failure that triggered a nine-month public utility commission inquiry, the incoming general manager who arrived convinced the program had gone rigid and needed a reset, the Year 6 rate case that was approved at the requested level for the first time in the utility's history, the committee that declined to recommend a politically visible renovation project because the criteria said no, the transmission main with three breaks in eighteen months that broke twice more during design and held service anyway because the response capability had been planned) happened to someone, somewhere, often in the last decade. Riverside is the composite. The composite is more useful than any single real example because the composite covers the full range of what the practice has to handle.

Riverside starts in Phase 1 (Foundation Building), which is to say that Riverside starts where most organizations actually start: an asset register roughly 70% complete and inconsistently maintained, capital decisions made through annual political negotiation

rather than risk analysis, maintenance 60% reactive, a computerized maintenance management system (CMMS) used by perhaps 40% of technicians, and no documented policy, no governance forum, no risk acceptance process, and no criticality model. Chapter 4 puts it plainly: most maturity indicators were Partial or No, and heroics were the de facto operating model. The decade of work that follows is what turns Partial and No into Yes, one indicator at a time, and that is what survives a regulatory audit, a rate case, a board chair who wants to know exactly where their ratepayers' money is going, two general managers, multiple operations and engineering executives, and the retirement of several senior staff.

Riverside fails plenty along the way. There's a stretch in Phase 2 where the register build is declared complete, the team is redeployed, and within six months attribute completeness on new assets starts drifting, until leadership recognizes the early signs and reinstates a half-time data steward. The drift is arrested. The lesson is that data quality is a permanent function, not a project deliverable. There are roughly six months where a new general manager's reset threatens to unwind substantial portions of the discipline, and the asset-management committee has to find ways to keep the practice alive without openly defying him. There's a Tuesday where a board member asks why Riverside has so much deferred maintenance and the program manager spends the next four months building the answer. The point of the Riverside story is not that everything goes right. The point is that the practice survives the things that go wrong.

Riverside is also the program that, by Year 10, gets cited by peer utilities as a benchmark. Other water utilities ask Riverside to host them for site visits. Riverside's GM gets invited to industry keynotes. Riverside's asset-management lead publishes a paper. The lesson is not that Riverside became special. The lesson is that the practice, sustained for a decade through ordinary management discipline, *becomes* the differentiator. Most organizations cannot sustain the discipline that long. Riverside did. The workbook is here to help your organization do the same.

You will encounter Riverside throughout the modules: sometimes as an example of what to do, sometimes as a cautionary tale, sometimes both at the same time (the most honest examples). When the textbook reference says "see Chapter 21, Year 4," that's where to go for the longer version. When this workbook says "Riverside spent eight months on this exact step," it means that's a realistic bracket. Your mileage may vary, but if you're trying to do the same step in three weeks, the workbook is suggesting you slow down.

Where to Begin

Most organizations begin at Phase 1 even when they have years of asset management activity behind them, because *advanced* asset management is a different posture, not an additive layer on existing practice. Module 1's self-assessment is where the honest starting point gets established.

The five-phase arc is not a competition or a race. It is a description of how the practice tends to mature when sustained. Some programs move faster through certain phases (a program with strong existing data may sprint through Phase 1 and 2); some programs spend longer in some phases (a program recovering from a previous failed initiative may need extra time in Phase 1 to rebuild credibility). The arc is the description, not the prescription.

Whatever phase you're starting in, the next move is the same: run Module 1 honestly, find out where you actually are, and start the next module.

Getting Started: Your First 90 Days

This workbook is designed to be useful from day one, not after a long preparation phase. The 90-day plan below is the recommended on-ramp for a program team that has decided to build (or rebuild) an advanced asset management practice. Every step references the workbook module that supports it.

Days 1–14: Honest baseline

The first two weeks are about establishing the truth of where the program stands today, not where it would prefer to stand. Resist the temptation to start solving problems before you have agreed what they are.

What to do, in order:

1. Identify the program sponsor (typically the asset-owning executive: utility GM, public works director, plant manager, facilities VP). The sponsor does not need to lead this work, but does need to authorize it and stand behind its findings.
2. Convene a small core team (3 to 6 people) that includes operations, maintenance, engineering, and finance. This is your assessment team for Module 1, and your build team for Modules 2 onward.
3. Run the Module 1 self-assessment in a single half-day working session. Use Worksheets 1A, 1B, 1C, and 1D in sequence. Capture the scores, the supporting evidence, and the disagreements within the team.
4. Capture the heroics list (Worksheet 1C). The list is uncomfortable; capture it anyway.
5. Produce the Module 1 output (a 2-page baseline brief) and circulate to the sponsor and the broader leadership team for confirmation that the baseline is accurate. Do not skip this step. The remaining work depends on the baseline being shared.

What to avoid in the first two weeks:

- Do not commit to a specific maturity target before establishing the baseline.
- Do not begin tool selection (EAM/CMMS, asset register platform, condition-monitoring software) before establishing the practice the tool would serve.
- Do not promise a date for the asset register, the criticality model, or the risk register. The right question first is *what shape is the practice in*, not *what is the delivery date for the next artifact*.

Days 15–45: Strategy and structure

With the baseline confirmed, the next four weeks are about establishing direction and the structural foundation.

What to do, in order:

1. Module 2: build the GSOT (Goals → Strategy → Objectives → Tactics) chain over two facilitated sessions. The first session aligns leadership on the top-level goals; the second drives those goals down to specific tactics with owners and timelines.
2. Module 2: draft a one-page Risk Tolerance Statement and circulate it to leadership for sign-off. This single page will anchor every risk decision the program makes for the next decade.
3. Module 2: produce the Roadmap Charter, a 4 to 6 page document that names what the program will build, the order it will be built in, the resources required, and the success criteria. This is the program's authorizing document.
4. Module 3: agree the inclusion criteria (Worksheet 3B) for the asset register. Decide what counts as an asset before counting them. Most asset register problems originate at the inclusion-criteria step.
5. Module 3: design the register schema (Worksheet 3C) and identify the existing data sources that will populate it. Most organizations already have most of what they need; the work is consolidation and validation, not de novo collection.

What to avoid in days 15–45:

- Do not write the strategy in a way that requires every other team to change to support it. The strategy that requires no change from anyone is also worthless; the goal is the middle.
- Do not let the asset register schema become a perfectionist exercise. You want a usable register at 90% completeness, not a beautiful register at 50%.
- Do not announce the program externally yet. Announcement should follow the production of artifacts that demonstrate the program is real, not precede it.

Days 46–90: The first cycle

The final 45 days complete a first end-to-end cycle of the practice. The cycle will be small in scope (perhaps one asset class or one facility) but will exercise every link in the chain: register → hierarchy → strategy → condition → criticality → risk → needs → backlog → capital. Completing one full cycle, even a narrow one, is more valuable than completing four partial cycles that never reach the funded-decision stage.

What to do, in order:

1. Module 4: design the hierarchy for the chosen asset class (Worksheet 4A) and document the strategy for that class (Worksheet 4B). Two days of disciplined work, not two months.
2. Module 5: anchor the 1–5 condition rating scale (Worksheet 5A) and apply it to the chosen asset class using the method appropriate to the criticality (Worksheet 5B). For the first cycle, accept lower confidence ratings (Worksheet 5C); the goal is to exercise the method, not to achieve perfect accuracy.
3. Module 6: complete a criticality scoring sheet (Worksheet 6A) for the chosen asset class. Apply the calibrated risk matrix (Worksheet 6B) to the highest-criticality assets.

Document at least one risk acceptance decision (Worksheet 6D); this proves the practice is real.

4. Module 7: translate at least three deficiencies into formal needs (Worksheet 7A), classify them in the backlog (Worksheet 7B), and run one of them through the capital-project justification template (Worksheet 7D). End-to-end, even narrow, beats best-in-class on any single step.
5. Module 8: hold the first program governance meeting (Worksheet 8A's recommended cadence) and document the routine. The meeting itself proves the governance routine exists; what it produces in the first sitting is less important than that it sat.

At the end of 90 days the program has: a baseline, an authorizing strategy, a register, a working hierarchy, a strategy document for at least one asset class, condition data on that class, a criticality model, a risk register entry, an end-to-end traced deficiency, and an active governance routine. That is the foundation. Everything that follows is depth, scope expansion, and embedding.

What if the organization is not starting from zero?

Most teams will not be starting from a blank page. Some have a partial register, an old criticality scoring exercise, a dormant policy, an EAM/CMMS system in disrepair, or a previous unsuccessful asset-management initiative. Use the Module 1 assessment to identify what exists, and then use the **Quick-Start Decision Tree** in Workbook Appendix E to determine which module to begin with. The decision tree handles five common starting situations explicitly:

- The organization has an asset register but no strategy.
- The organization has a strategy but no register.
- The organization has both but no risk practice.
- The organization has activity in every area but cannot defend any of it externally.
- The organization has a previous failed initiative and needs to recover credibility before launching a new one.

In each case the right starting module is different, and starting in the wrong place will reproduce the previous failure. The decision tree is not optional reading.

Module 1 — Where Do We Stand?

Excel companion: Worksheets 1A, 1B, and 1C have implementations in the *Workbook Companion (Excel).xlsx* on tabs *1A Three Questions*, *1B Phase Assessment*, and *1C Heroics*. Use the Excel tabs to score, store, and revisit the assessments year over year; use the prose below to understand what each instrument is doing and how to interpret the results. Download the Excel files at whiteselm.com/book/workbook.

Learning Objectives

After completing this module, the program will be able to:

- Identify which phase of maturity best describes the organization's current state.
- Articulate the foundational gaps that constrain progress to the next phase.
- Establish a baseline against which future progress can be measured.
- Identify the heroics dependencies that would not survive personnel change.

How to Run This Module

Time commitment: Half a day for the assessment session, plus 1 to 2 hours of pre-work for the lead, plus 2 hours to write the baseline brief afterward.

Who needs to be in the room: Program sponsor or their delegate, the asset-management lead, an operations representative, a maintenance representative, an engineering or planning representative, and a finance representative. Six to eight people total. Larger groups produce hedged answers.

Sequence:

1. Open with the textbook's three foundational questions and the Riverside Phase descriptions. Twenty minutes of orientation reading + discussion before scoring begins.
2. Score Worksheet 1A (the three questions) individually, then compare. Where the scores diverge, discuss; do not average.
3. Score Worksheet 1B (the phase indicators) as a group. Read each indicator aloud; the group answers Yes / Partial / No together. Record the supporting evidence next to each Yes.
4. List heroics (Worksheet 1C) as a group brainstorm. Capture every dependency on a single person; do not edit yet.
5. Run Worksheet 1D (the radar self-assessment) in the Excel companion. The radar produces the most legible artifact for sharing the baseline.
6. Close by drafting the three-bullet baseline finding the team will deliver to leadership. Do not let the session end without a written baseline finding.

What good looks like at the end: A two-page baseline brief that names (a) the phase the program is currently operating in, (b) the three most consequential gaps that constrain

progress to the next phase, (c) the top heroics dependencies, and (d) the recommended next two modules to run. The brief is signed by the sponsor.

Common traps in this module:

- Optimism bias on Worksheet 1B. The remedy is to require a piece of supporting evidence for every Yes; “we do that informally” is a No.
- Defensive scoring on Worksheet 1C. The remedy is to frame heroics as the unmanaged risk the program inherits, not as criticism of any individual.
- Skipping the sponsor sign-off. The remedy is to make the sign-off a calendar event before the session, not a hopeful follow-up after.

Pre-Work

Before the assessment, gather the following from the asset management organization:

- ☐ The current asset management policy or charter (if one exists)
- ☐ The current asset register (or registers) with record counts by asset class
- ☐ The current capital plan
- ☐ The current backlog and deferred-work register (if separate)
- ☐ The most recent condition assessment findings*

*** Check the direction (1 best-5 worst vs 1 worst-5 best) of each assessment rating scale.** If any of this material is a facility or property condition assessment performed to ASTM E2018, for example, its scores run 1 as best and 5 as worst, the inverse of the scale Module 5 anchors. Note the direction on each source before the assessment session; converting later, after scores are in the register, is far more expensive than converting on the way in.

- ☐ The most recent rate case, capital case, or budget request
- ☐ Audit findings, regulatory inspection results, accreditation surveys from the last three years

Worksheet 1A — The Three Foundational Questions

Score the organization on each of the three foundational questions of advanced asset management. *The questions come from textbook Chapter 1; the tier names come from Chapter 4, "The Five Maturity Tiers." Note that Chapter 4's tiers and the Chapter 21 phases are two different constructs: tiers describe stable capability, phases describe the multi-year arc. Worksheet 1A scores tiers; Worksheet 1B places the program on the phase arc. Chapter 4 also warns against averaging away unevenness: a utility may run its treatment plants at Tier 4 and its distribution network at Tier 2, and honest assessment names that rather than splitting the difference.*

How to score: For each capability, read across the row and find the tier description that matches what the organization can show evidence for today, then write that tier number (1

to 5) in the Score column. Score what is in place and documented, not what is planned or done informally. If the organization sits between two descriptions, record the lower tier. Where practice differs sharply across the portfolio, score the parts separately rather than averaging them, as Chapter 4 advises. Have each participant score individually first, then compare; where scores diverge, discuss the evidence rather than averaging the numbers.

Question 1: What do we have, and how is it performing?

Capability	Tier 1 (Asset Identification and Organization)	Tier 2 (Work Control)	Tier 3 (Work Optimization)	Tier 4 (Proactive)	Tier 5 (Cognitive / Strategic)	Score
Asset register completeness against capital ledger	<50%	50-75%	75-90%	90-95%	≥95% reconciled annually	
Documented inclusion criteria	None	Informal	Documented	Governed	Reviewed every 3 years	
Hierarchy organized to support decisions	Ad-hoc	Single hierarchy	Vertical + horizontal	Standard across enterprise	Reviewed when systems change	
Templates by asset class	None	Some classes	Major classes	All classes	Annual template review	
Single source of truth designated	No	In some systems	Documented	Enforced	Reconciled to source systems	

Composite tier, Question 1 (the lowest score in the table above): ____

Question 2: What condition are our assets in, what could go wrong, and how much does it matter?

Capability	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Score
Condition assessed for critical assets	<50%	50-75%	75-90%	≥90%	≥95% with assessment currency and confidence captured; Tier A refreshed annually or on trend	
Anchored 1-5 rating scale used consistently	No scale	Inconsistent	Documented	Inter-rater calibrated	Calibrated annually	
Likelihood estimates linked to failure modes	No	Some assets	Critical assets	Most asset classes	All Tier A and B	
Criticality model documented and applied	None	Informal	Documented	Governed	Reviewed every 3-5 years	
Risk register maintained and governed	None	Spreadsheet	EAM-tracked	Quarterly refresh	Tiered reporting	

Composite tier, Question 2 (the lowest score in the table above): ____

Question 3: What should we do, when, and with what investment?

Capability	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Score
Needs register separate from deficiency register	None	Conflated	Distinct	Governed	Closed-loop with assessment	
1-, 2-, 5-year work plans integrated	Annual only	1+5	1+2+5 separate	1+2+5 integrated	+ 10-year forward look	
Deferred maintenance backlog tracked separately	No	Informal	Documented	Deferred maintenance backlog (DMB) and facility condition index (FCI) reported	Board-level routine	
Capital plan justified by risk reduction	No	Some projects	Most projects	All Tier A/B projects	Defensible to regulators	
Execution governance closes the loop	No	Project-by-project	Standard process	All capital	All capital + operations and maintenance (O&M)	

Composite tier, Question 3 (the lowest score in the table above): ____

Composite tier: the lowest scoring capability sets the tier of the organization on each question. *Reaching Tier 4 or 5 on a single capability while sitting at Tier 1 on another does not produce defensible practice; it produces uneven exposure.*

Worksheet 1B — Phase Self-Assessment

For each of the five phases, score the program against the indicators. *The indicator set below is textbook Appendix J — Maturity Self-Assessment Checklist, reproduced as published. Indicators the workbook adds are listed separately under each phase so the crosswalk to the book stays clean.*

How to score: Answer Yes, Partial, or No for each indicator: tick the box for Yes, write P beside it for Partial, and leave it blank for No. A Yes needs evidence you could show an outsider; “we do that informally” is a No. The score for each phase is the number of Yes answers among the textbook Appendix J indicators. Partial answers do not count toward the score, but note them, because they show where the next work is. The workbook-added indicators are diagnostics and are not counted.

Reading the result: the program is operating in the highest phase for which it answers Yes to most of the indicators, meaning more than half. Most programs show elements of

adjacent phases at once; that is normal. The answers identify which moves have been completed and which remain.

Phase 1 — Foundation Building

- ☐ Documented asset management policy approved at the executive or board level
- ☐ Documented asset management strategy linked to organizational objectives
- ☐ Asset register that the operating organization trusts as authoritative ($\geq 90\%$ completeness on critical assets)
- ☐ Criticality model documented and applied to major asset classes
- ☐ Cross-functional asset management committee established with documented charter
- ☐ Data steward roles assigned with documented accountability

Score (textbook Appendix J indicators): ___ of 6

Workbook-added indicators (useful diagnostics, not part of the textbook checklist):

- ☐ Inclusion criteria for the register documented
- ☐ Asset register reconciles annually to the financial system within 2% variance
- ☐ Honest baseline assessment of current state shared with leadership

Phase 2 — Building the Discipline

- ☐ Sustainment strategies documented per asset class with criticality differentiation
- ☐ EAM/CMMS is used as the system of record by $\geq 80\%$ of technicians
- ☐ Standardized failure coding and work classification in use
- ☐ Condition assessment producing data that informs decisions
- ☐ Operational metrics moving in the intended direction (proactive ratio rising, schedule compliance improving, emergency spending declining)
- ☐ First risk acceptance decisions formally documented

Score (textbook Appendix J indicators): ___ of 6

Workbook-added indicators (useful diagnostics, not part of the textbook checklist):

- ☐ Asset hierarchy designed and applied across major asset classes
- ☐ Anchored 1-5 condition rating scale calibrated across assessors

- ☐ Asset management committee or steering forum operating with documented charter

Phase 3 — Visible Outcomes

- ☐ Capital plan justified by documented risk reduction with explicit risk acceptance for deferred items
- ☐ Funding case has prevailed in at least one significant external test (rate case, board review, regulatory filing)
- ☐ Board engaged with the program's outcomes rather than its activities
- ☐ Outcome-based metrics reported on the executive scorecard
- ☐ Capital decisions traceable to documented data and analysis

Score (textbook Appendix J indicators): __ of 5

Workbook-added indicators (useful diagnostics, not part of the textbook checklist):

- ☐ Risk-based prioritization driving capital decisions
- ☐ Risk register maintained and reviewed quarterly
- ☐ Backlog managed separately from deferred maintenance

Phase 4 — Stewardship and the Long View

- ☐ Multi-year capital trajectory model maintained and referenced in funding conversations
- ☐ Deferred-risk register operational with defined review cycles and aggregate reporting
- ☐ Sustainment baseline documented and protected through formal funding commitment
- ☐ Program has survived at least one major leadership transition without measurable regression
- ☐ Workforce succession planning documented for the top 5 critical roles

Score (textbook Appendix J indicators): __ of 5

Workbook-added indicators (useful diagnostics, not part of the textbook checklist):

- ☐ Multi-year capital trajectory presented to executive committee or board
- ☐ Deferred maintenance backlog and FCI reported regularly
- ☐ Risk acceptance documented for all qualifying deferrals

- ☐ Audit cycle for asset register and risk register operating
- ☐ Documented governance routines surviving leadership transitions

Phase 5 — Compounding Maturity

- ☐ Program's outcomes referenced as benchmarks by peer organizations
- ☐ Program asks strategic questions about the next decade's challenges
- ☐ Asset management is embedded in organizational practice rather than experienced as a separate program
- ☐ Continuous-improvement routines (post-implementation reviews, strategy refreshes, annual retrospectives) operational
- ☐ Program adapts deliberately to emerging conditions (climate, workforce, regulation, technology)

Score (textbook Appendix J indicators): __ of 5

Workbook-added indicators (useful diagnostics, not part of the textbook checklist):

- ☐ Practice serves as reference for peer organizations
- ☐ Continuous improvement routines surface and adopt sector developments
- ☐ Decision quality metrics tracked and reported

Phase the program is currently in: the highest phase for which the program answers Yes to most of the textbook Appendix J indicators. Answer Yes / Partial / No for each indicator. Most programs exhibit elements of multiple adjacent phases simultaneously; that is normal, and the assessment identifies which moves have been completed and which remain, not a grade. Where an earlier phase has significant gaps, record them as constraining gaps rather than re-labelling the program's phase.

Interpreting the result (textbook Appendix J). Mostly Yes in Phase 1 with No or Partial beyond means foundation work is the priority: policy, register, criticality, governance. Mostly Yes through Phase 2 means discipline-building is the priority: sustainment strategies, EAM/CMMS use, outcome metrics. Mostly Yes through Phase 3 means outcomes are visible and the next moves are stewardship-oriented: long view, deferred risk, succession. Mostly Yes through Phase 4 means the program is mature and the next moves are about adaptation and the next horizon. The self-assessment is not a competition or a grade. It is a diagnostic that focuses on the next set of moves.

Worksheet 1C — Heroics Dependencies

For each of the following capabilities, identify whether the practice depends on a small number of named individuals such that their departure would degrade the practice. *Chapter 4 defines maturity as the answer to a single question: what would still work if the people who hold it together were not here? A practice that depends on named individuals is*

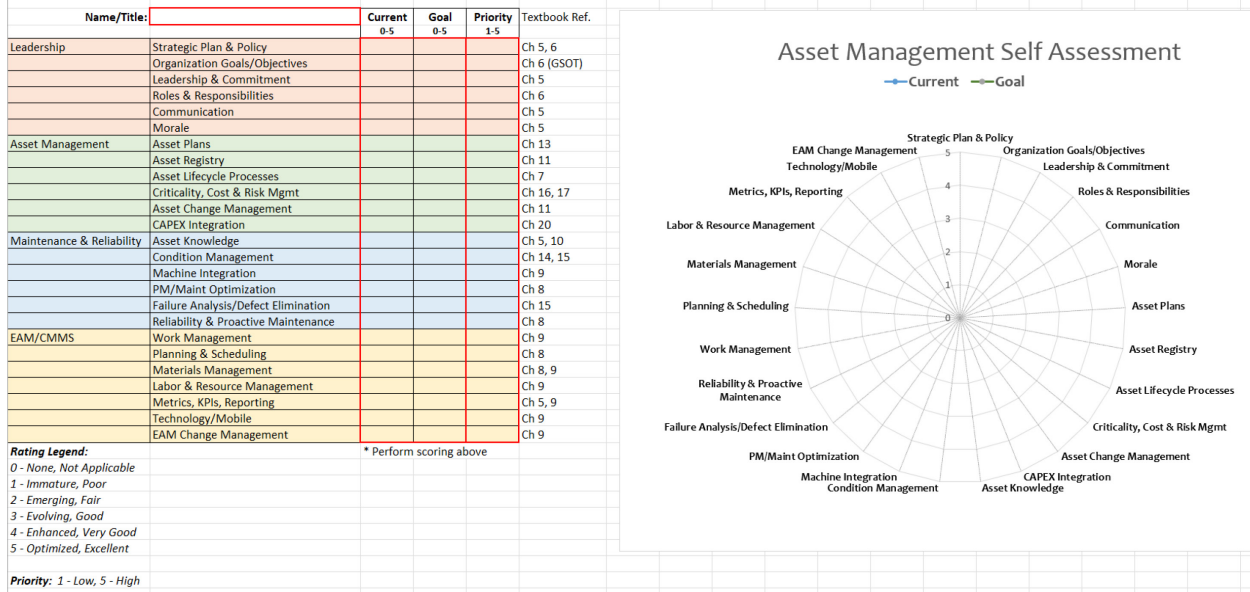
not stable at any tier, and Chapter 4 is explicit that an organization is only at Tier 4 when the practice "would survive the loss of any one engineer."

Capability	Depends on whom?	Risk if they leave	Action to institutionalize
Capital plan rationale and prioritization			
Criticality scoring			
Condition assessment interpretation			
Deferred-risk register maintenance			
Governance forum facilitation			
EAM/CMMS data quality oversight			
Regulatory engagement / rate case material			

Worksheet 1D — Dimensional Self-Assessment (Radar Tool)

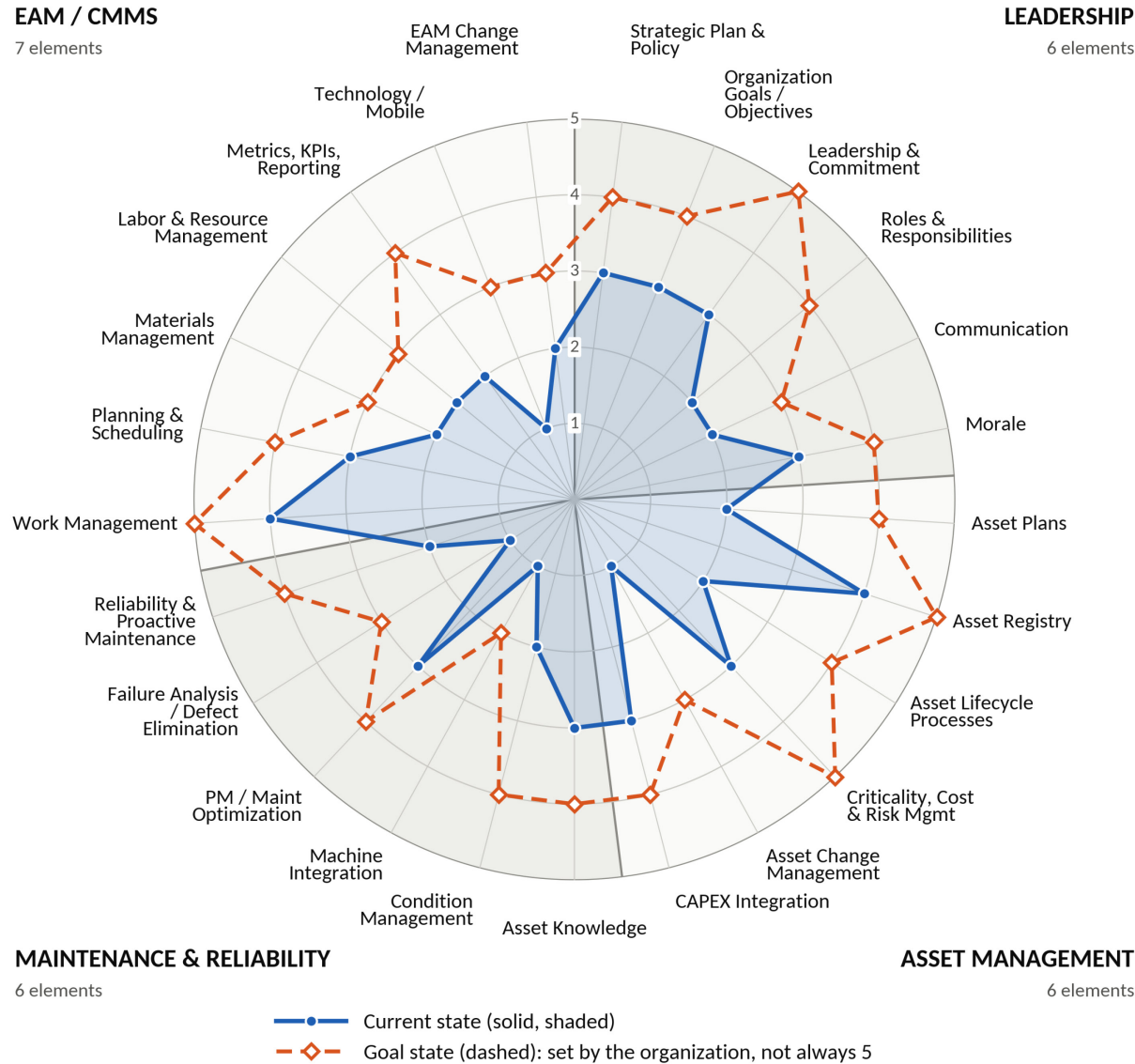
A separate companion artifact, *Advanced Asset Management, Self-Assessment Radar Tool (Excel)*, accompanies this workbook. It scores 25 specific capabilities across four categories and produces a radar chart showing where the program is balanced or lopsided.

Advanced Asset Management, Self-Assessment Radar Tool — Dimensional Self-Assessment



Self-Assessment Radar: 25 Elements in Four Categories

Illustrative example. Scale 0 (none) to 5 (optimized).



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The radar chart shows an illustrative program's current state (solid line, shaded) against its goal state (dashed line) across 25 elements in four categories. Goals are set by the organization and differ by element. Lopsided patterns, and the widest gaps between the two lines, show where the next round of investment should land.

Use the radar tool alongside the phase-based assessment in Worksheet 1B; the two views answer different questions:

- **Phase-based assessment (1B)** answers *where is the program in its multi-year arc?*
- **Dimensional assessment (radar tool)** answers *where is the program balanced and where is it uneven?*

A program at Phase 3 on the arc may still be lopsided on the radar, for instance scoring strong on Asset Management dimensions while scoring weak on Maintenance & Reliability or EAM/CMMS dimensions. That imbalance shows up immediately in the radar visualization and points to where the next round of investment should land.

The Four Categories and 25 Elements

Category	Elements
Leadership (6)	Strategic Plan & Policy, Organization Goals/Objectives, Leadership & Commitment, Roles & Responsibilities, Communication, Morale
Asset Management (6)	Asset Plans, Asset Registry, Asset Lifecycle Processes, Criticality/Cost & Risk Mgmt, Asset Change Management, CAPEX (capital expenditure) Integration
Maintenance & Reliability (6)	Asset Knowledge, Condition Management, Machine Integration, PM/Maint Optimization, Failure Analysis/Defect Elimination, Reliability & Proactive Maintenance
EAM/CMMS (7)	Work Management, Planning & Scheduling, Materials Management, Labor & Resource Management, Metrics/KPIs/Reporting, Technology/Mobile, EAM Change Management

Scoring Convention

Score	Definition
0	None / Not applicable
1	Immature, Poor
2	Emerging, Fair
3	Evolving, Good
4	Enhanced, Very Good
5	Optimized, Excellent

Columns to Fill In

- **Current:** current state score (0–5) for each element
- **Phase 1:** interim target for the next 12-month cycle
- **Goal:** the target end state for the program on each element. The goal is not automatically 5; see “Setting goals” below.
- **Priority:** relative urgency for closing the gap (1 = low, 5 = high)

Setting goals: best practice for you. Set each goal at the level the organization’s mission, risk tolerance, and resources justify. A 5 on every element is neither necessary nor affordable for most programs; for many elements a 3 or a 4 is the right long-term target, and a small number of elements may deserve a 5. The textbook makes the same point throughout: improvement should be right-sized, because a practice that is appropriate and sustainable in one organization may overwhelm another. Read the radar as the gap between the current line and the organization’s own goal line, not as the distance from the outer ring.

How to Use

1. Open the radar tool spreadsheet alongside the workbook.
2. Score each of the 25 elements in the *Current* column based on the program’s actual current state, not its aspirational state.
3. Use the *Textbook Ref.* column to navigate to the chapter that develops each capability if scoring is uncertain.
4. Set *Phase 1* targets that are realistic for the next 12 months, *Goal* values for the multi-year target, and *Priority* values that reflect where leverage is greatest given the program’s current phase.
5. The spreadsheet produces a radar chart visualization automatically; interpret it together with the phase-based and three-questions assessments.

Reading the Radar

Three patterns are diagnostic:

- **Balanced and small:** program is consistent across dimensions but at low maturity. Foundational work in Modules 1–3 is the right next move.
- **Balanced and large:** program is mature across dimensions. Module 8 (sustaining) is the priority.
- **Lopsided:** strong on some dimensions, weak on others. The weak dimension is the next investment target, regardless of how strong the others look. Lopsided programs are at risk of cumulative failure modes that the strong dimensions cannot compensate for.

The radar tool was developed in 2015 and refined for inclusion in this workbook. Adopt it as a permanent feature of the program’s annual self-assessment; year-over-year radar comparisons are one of the most legible ways to show leadership how the program is progressing.

Module 1 Output

By the end of Module 1, the program has:

1. A documented composite tier on each of the three foundational questions
2. A documented phase placement on the maturity arc
3. A documented list of heroics dependencies and the actions required to institutionalize each

4. A completed dimensional self-assessment (radar) with Current, Phase 1, Goal, and Priority columns populated
5. A baseline against which future progress can be measured

This is the input to Module 2, where the strategy and roadmap are built against this honest baseline.

Module 2 — Strategy and the Roadmap

Excel companion: GSOT and Risk Tolerance worksheets have fillable implementations on Excel tabs *2A GSOT* and *2B Risk Tolerance*. The Excel versions provide cascading Goals/Strategies/Objectives/Tactics tables and structured risk tolerance entry with dropdowns.

Learning Objectives

After completing this module, the program will be able to:

- Articulate goals, strategy, objectives, and tactics (GSOT) that connect organizational purpose to asset decisions.
- Document a risk tolerance statement that bounds what the program will and will not address.
- Establish a roadmap charter that the executive sponsor can defend to leadership and the board.
- Draft the asset management policy, the foundational governance document approved at the executive or board level, and distinguish it from the roadmap charter.

How to Run This Module

Time commitment: Two facilitated half-day sessions, separated by two to three weeks of drafting, plus an hour of leadership time for the sign-offs.

Who needs to be in the room: The executive sponsor in person, not a delegate, for the goals and the risk tolerance discussion; the asset-management lead; operations and maintenance leadership; an engineering or planning lead; a finance representative; and a regulatory or compliance representative. Six to eight people.

Sequence:

1. Open with the Module 1 baseline brief and the pre-work documents. The goals come from the organization's mission and strategic plan, not from the preferences of whoever is in the room.
2. Build Worksheet 2A from the top down: goals first, then a strategy for each goal, then objectives, then tactics. Count the objectives before moving on. Chapter 6's benchmark is 5 to 10 across the whole program, each with a documented baseline and target.
3. Draft Worksheet 2B with the sponsor present. Start with the categorical limits, then the tiered acceptance authority, then the mitigation requirements and review triggers. Test the draft against the recent risk events gathered in pre-work: would this statement have produced a decision the organization could defend?
4. Between sessions, the asset-management lead drafts the roadmap charter (Worksheet 2C) and the asset management policy (Worksheet 2D). Keep them as two documents. The charter says how the program will operate; the policy is the governance commitment approved at the executive or board level.

5. In the second session, review both drafts against the GSOT and the risk tolerance statement. Where they disagree, fix the disagreement in the room.
6. Close by putting the sign-offs on the calendar: the sponsor for the charter and the risk tolerance statement, the executive team or board for the policy.

What good looks like at the end: A documented GSOT with 5 to 10 objectives, each carrying a baseline and a target; a one-page risk tolerance statement circulated to leadership for sign-off; a one- to two-page roadmap charter approved or formally proposed; and an asset management policy drafted against the eight sections with an approval date named.

Common traps in this module: Objectives that are too vague or too many, which Chapter 6 names directly; tactics written before goals, because tactics are what the room already does every day; a risk tolerance statement drafted without the sponsor, which leaves the tiered acceptance authority unenforceable the first time it is tested; folding the charter and the policy into one document; treating sign-off as a hopeful follow-up rather than a calendar event.

Pre-Work

- ☐ Current organizational mission and strategic plan
- ☐ Most recent rate case, capital plan, or budget request rationale
- ☐ Documented service-level commitments (regulatory, contractual, internal)
- ☐ Recent risk events and their financial, regulatory, or service consequences

Worksheet 2A — GSOT (Goals-Strategy-Objectives-Tactics) Build

Build the four-level GSOT for the asset management program. *Pattern from textbook Chapter 6.*

Goals (a small number of outcomes the assets are managed to deliver)

What is the organization trying to achieve through its assets?

Strategies (the approach to pursuing each goal)

For each goal, what strategy will the program follow?

Goal	Strategy

Objectives (measurable targets that operationalize each strategy)

For each strategy, what measurable objectives will you commit to? Chapter 6's benchmark is 5 to 10 asset management objectives in active management across the whole program (the book's recommended practice), each with a documented baseline and target. Count the total across all strategies before finalizing: Chapter 6 names "objectives that are too vague or too many" as a specific failure.

Strategy	Objective	Metric	Target	Timeline

Tactics (the day-to-day actions that move objectives forward)

For each objective, what specific actions does the operating organization take?

Objective	Tactic	Owner	Frequency

Worksheet 2B — Risk Tolerance Statement

The risk tolerance statement is the organization's documented position on what risk it will and will not accept in each consequence dimension. *Pattern from textbook Chapter 17.*

Categorical Limits (consequences not acceptable at any level)

Consequence dimension	Categorical limit
Life safety	(e.g., No risk to staff, public, or occupants accepted)
Regulatory compliance	(e.g., No deferral that would cause non-compliance with permit conditions)
Environmental	(e.g., No risk of release into receiving water above defined threshold)
Service continuity	(Specify the service-failure modes that cannot be accepted)

Tiered Acceptance Authority

Magnitude of accepted risk	Approval authority	Documentation required
Routine deferral (low consequence, defined duration)	Line management	Standard form
Significant deferral (moderate consequence)	Asset management committee or VP	Form + risk analysis
Major deferral (high consequence or strategic)	Executive sponsor	Full risk acceptance package
Categorical limit cases	Cannot be accepted	N/A

Mitigation Requirements

For each level of accepted risk, what compensating actions are required?

Acceptance level	Required mitigation
Routine	(e.g., Quarterly monitoring; documented in deferred-work register)
Significant	(e.g., Enhanced inspection cadence; defined response capability)
Major	(e.g., Specific stakeholder communication; board reporting)

Review Triggers

What events automatically trigger reassessment of an accepted risk?

- ☐ Defined time interval (annual minimum)
- ☐ Condition change beyond threshold
- ☐ Near-miss event
- ☐ Regulatory or code change
- ☐ Funding cycle
- ☐ Planned outage that creates access opportunity
- ☐ Other: _____

Worksheet 2C — Roadmap Charter

Use this template to draft a one- to two-page roadmap charter for executive sponsor approval.

ASSET MANAGEMENT ROADMAP CHARTER

Sponsor: _____

Effective: _____

Review cycle: every ____ years

1. Purpose

The organization will manage its physical assets through a documented, risk-informed asset management practice that produces defensible decisions about sustainment, capital investment, and risk acceptance.

2. Scope

This charter governs management of [ASSET CLASSES] across [LOCATIONS].

3. Goals (from Worksheet 2A)

- [Goal 1]
- [Goal 2]

- [Goal 3]
- 4. Risk tolerance summary (from Worksheet 2B)
The organization will not accept [CATEGORICAL LIMITS]. Risk acceptance authority is tiered according to the documented schedule, with the asset management committee accountable for review.
- 5. Governance
 - Asset Management Steering Committee membership: [LIST ROLES]
 - Meeting cadence: [QUARTERLY/MONTHLY]
 - Decision authority: [DEFINED THRESHOLDS]
 - Escalation path: [DEFINED]
- 6. Reporting
 - Operational dashboard: [WEEKLY/MONTHLY]
 - Management report: [QUARTERLY]
 - Board / executive report: [SEMI-ANNUAL/ANNUAL]
- 7. Pacing
The program will follow the maturity arc described in the textbook, with current phase identified as [PHASE FROM MODULE 1] and target for next [TIMEFRAME] of [TARGET PHASE].
- 8. Re-approval
This charter is reviewed and re-approved by the sponsor every [3] years or upon significant organizational, regulatory, or scope change.

Approved: _____
(Executive Sponsor)

Worksheet 2D — Asset Management Policy

The policy is a distinct artifact from the roadmap charter. The charter documents how the program will operate; the policy is the foundational governance document approved at the executive or board level. Chapter 5 requires it as a separate codification step, and Chapter 11 assumes it when it establishes the register as the authoritative source. Pattern from textbook Appendix H.

Draft the policy against these eight sections:

ASSET MANAGEMENT POLICY

1. Purpose

The organization's commitment to managing its asset base in support of mission delivery, long-term service, responsible risk management, and accountable stewardship.

2. Scope

Which assets and which functions the policy governs.

3. Principles (adopt or adapt the six)

- Risk-based prioritization
- Lifecycle thinking
- Documented decision-making
- Intentional risk acceptance
- Integrated decision-making
- Continuous improvement

4. Roles and Responsibilities

Board / executive leadership; asset management sponsor; asset management committee; asset management lead; asset owners; data stewards.

5. Governance and Decision Authority

Committee cadence, decision thresholds, and the tiered risk acceptance authority from Worksheet 2B.

6. Performance Measurement and Reporting

A small set of outcome-based metrics, reviewed quarterly by leadership and reported annually to the board.

7. Standards Alignment

ISO 55000 family; International Infrastructure Management Manual (IIMM); sector-specific standards.

8. Review

Reviewed by the committee at least every three years, re-approved at the executive or board level, with documented change history.

Approved: _____
(Executive Sponsor / Board)

Benchmark (textbook Chapter 5): documented asset management policy approved at executive or board level; reviewed at least every three years (ISO 55001:2024, Clause 5.2; the three-year interval is the book's recommended practice).

Module 2 Output

By the end of Module 2, the program has:

1. A documented GSOT
2. A documented risk tolerance statement
3. An approved or proposed roadmap charter, and a drafted or adopted asset management policy
4. The artifacts the rest of the workbook builds against

Module 3 — Asset Identification and the Register

Excel companion: The Five-Lens test and the asset register live on Excel tabs *3A Five-Lens* and *3C Asset Register*. The Excel five-lens auto-decides Include/Review/Exclude based on lens scores; the register has 24 columns with dropdowns for tier, condition score, confidence, sustainment strategy, and status, plus conditional formatting that highlights Tier-A-with-low-confidence rows automatically.

Learning Objectives

- Apply the five-lens framework to determine what belongs in the asset register.
- Distinguish the deficiency register (the assessor's raw observation log) from the asset register (the governed system of record).
- Build or refine a register at appropriate granularity for decision-making.
- Establish the register as the authoritative system of record.
- Apply data sufficiency thinking to set required, conditional, and optional register attributes, avoiding both perfectionism and under-investment in data.

How to Run This Module

Time commitment: Two facilitated half-day sessions, separated by several weeks of register reconciliation. The reconciliation between sessions is where the time goes; scale it to the number of source lists the organization is carrying.

Who needs to be in the room: The asset-management lead, the EAM/CMMS administrator or data steward, the finance fixed-asset accountant, operations and maintenance representatives who know what is physically in the field, and an engineering or planning representative. Five to seven people.

Sequence:

1. Lay the source lists side by side: the existing register or registers, the finance fixed-asset list, the EAM/CMMS asset structure, and the recent condition assessment reports. Record the counts and the gaps between them before debating anything.
2. Run Worksheet 3A on candidate asset classes rather than individual items, starting with functional role. Answer each lens Yes / Partial / No; the lenses are diagnostic questions, not graded scores.
3. Write the inclusion criteria (Worksheet 3B) from the 3A results while the reasoning is fresh.
4. Run Worksheet 3D before finalizing the template. Walk backward from the decisions the program must support to the attributes each decision needs, and let that set the R / C / O designations.
5. Adopt the register template (Worksheet 3C) and build class-specific versions from it. When FCA data is loaded, apply the scale direction check from pre-work: convert ASTM E2018 scores to the organization's own scale and record the source scale.

6. Between sessions, reconcile the source lists against the inclusion criteria. In the second session, review the result, assign an accountable owner and a data steward to the register attributes, and declare the register the authoritative system of record under change control.

What good looks like at the end: Documented inclusion criteria; a reconciled asset register, or a documented plan to reconcile with dates and owners; a standard register template adopted for the organization's asset classes with R / C / O designations that trace to decisions; and a named ownership and stewardship model for the register's attributes.

Common traps in this module: The perfectionist register, delayed for years pending complete records; template overload, where creating a new asset record becomes a burden nobody accepts; treating the finance fixed-asset list or the assessor's deficiency log as if it were the asset register; loading FCA condition scores without converting the scale direction; a register that nobody is accountable for, which stops being authoritative the first time two systems disagree.

Pre-Work

- ☐ Existing asset register (or registers, if multiple)
- ☐ Capitalized fixed-asset list from finance
- ☐ Recent facility condition assessment (FCA), condition assessment, or audit reports

Scale direction check. FCA and property condition assessment reports produced to ASTM E2018 score 1 as best and 5 as worst. The register schema in Worksheet 3C stores condition on the organization's own anchored scale, where 5 is Excellent. Convert on load and record the source scale alongside the score.

- ☐ EAM/CMMS asset count and structure

Worksheet 3A — The Five-Lens Test

For each candidate asset class or item, score on the five lenses. *Pattern from textbook Chapter 10.*

Asset / Class	Functional role	Value	Risk	Maintainability	Ownership	Include?

For each lens, answer against the lens questions in Chapter 10; the book poses each lens as a diagnostic question, not a graded score. Answer **Yes / Partial / No**.

Decision rule: Items that pass all five lenses belong in the register (textbook Chapter 10); items that fail two or more rarely justify the overhead of formal management. Functional role is the first test, because if it cannot be answered the remaining tests rarely matter. Ownership is not a disqualifier: a high-value asset with no clear owner is a governance problem worth solving rather than a reason to exclude it. Flag ownerless candidates for the orphan-asset resolution list instead of excluding them. Items that pass on some dimensions but not others are evaluated in context and referred to [COMMITTEE] with documented disposition.

Worksheet 3B — Inclusion Criteria Document

Draft the inclusion criteria the organization will adopt:

ASSET INCLUSION CRITERIA

An item belongs in the asset register if:

1. It performs a defined function that supports a service the organization provides; and
2. It passes the five-lens test (failing no more than one lens); and
3. A unique identifier can be assigned and maintained; and
4. An accountable owner role exists or can be established.

An item is excluded from the register if:

- It is a component or subassembly tracked under a parent asset that does not independently meet the criteria above
- It is a consumable or spare part tracked in inventory
- It is part of the building fabric (e.g., doors, ceilings) unless relevant to a condition assessment program
- It has low value, low risk, and is easy to replace (light bulbs, etc.)

Borderline cases are reviewed by [COMMITTEE] with documented disposition.

Worksheet 3C — Register Template

Use the template below for each asset class. *Pattern from textbook Appendix C (Sample Asset Register Template). Designations are R (required), C (conditional), and O (optional); apply the data sufficiency test in Worksheet 3D when setting your own. Build class-specific templates from this baseline: Chapter 11 is explicit that a template for a centrifugal pump is different from a template for a transformer, which is different from a template for a roof.*

Identification Attributes

- Asset ID (unique, persistent across lifecycle)
- Asset class
- Asset type
- Manufacturer / model / serial
- Year installed / commissioned
- Location (facility, building, room/grid reference)

Hierarchy and Relationship Attributes

- Parent asset (if applicable)
- Functional system / process line
- Upstream / downstream relationships

Lifecycle Attributes

- Expected service life
- Replacement cost (current)
- Capitalized value

- Last refurbishment date
- Planned replacement window

Operational and Maintenance Attributes

- Sustainment strategy (run-to-failure, time-based preventive maintenance (PM), condition-based, predictive, rehabilitation, or replacement)
- Inspection cadence
- Condition score (current, with date and assessor)
- Confidence indicator
- Failure history reference

Ownership and Governance Attributes

- Accountable owner role
- Data steward
- Change-control level

Worksheet 3D — Data Sufficiency Test

Chapter 11's test for whether a register attribute earns its place: if a piece of information will not change a decision, the cost of collecting and maintaining it is wasted. This worksheet is the chapter's walk-backward exercise, and it is how you set your own R / C / O designations in Worksheet 3C rather than inheriting someone else's.

For each decision the program is meant to support, name the minimum set of attributes required to make that decision defensible. The intersection of those minimum sets is the register's required content. Everything outside the union is optional at best.

Decision the program must support	Minimum attributes required to make it defensible	Already captured?
Prioritization of maintenance		
Capital reinvestment		
Risk acceptance		
Deferral		
Retirement / disposal		
(Other, specify)		

Two failure modes bracket this exercise. Chapter 11 names the first as the perfectionist register, delayed for years pending complete records. The second is template overload, in which templates require so many attributes that creating a new asset record becomes burdensome. Data sufficiency is the discipline that avoids both.

Module 3 Output

By the end of Module 3, the program has:

1. Documented inclusion criteria
2. A reconciled asset register (or a documented plan to reconcile)
3. A standard register template adopted for the organization's asset classes
4. A documented data ownership and stewardship model for register attributes

Module 4 — Hierarchy and Asset Strategy

Excel companion: Hierarchy design tests and per-class asset strategies have implementations on Excel tabs *4A Hierarchy Tests* and *4B Asset Strategies*.

Learning Objectives

- Design a vertical hierarchy that supports rollups and reporting.
- Use horizontal perspectives for cross-cutting analysis without breaking the hierarchy.
- Document asset strategies right-sized to criticality.

How to Run This Module

Time commitment: Two facilitated working sessions of half a day each, separated by one to two weeks of drafting.

Who needs to be in the room: Asset-management lead, planning lead, operations representatives by asset class, reliability engineer, and a finance representative. Five to seven people.

Sequence:

1. Test the existing hierarchy (or proposed hierarchy) against Worksheet 4A's design tests. The tests produce the necessary edits, not abstract design opinions.
2. For each top-level asset class, draft Worksheet 4B (the strategy document). One asset class per session works well; multiple classes in one sitting produce a generic template that fits no class.
3. Review draft strategies with operations and maintenance leadership. Their endorsement is the test of whether the strategy is operationally real.
4. Publish the strategies in the asset-management policy document or as appendices to it, then draft the asset management plan outline (Worksheet 4C) for at least one portfolio. A strategy is the why and the what; a plan is the how and the when, and mature programs maintain both.

What good looks like at the end: A hierarchy that survives the seven design tests, plus a documented strategy per asset class that names the dominant failure modes, the chosen sustainment posture (proactive, predictive or condition-based, interval-based planned, reactive, or run-to-failure), the levels of service it is managed to, the target reliability or condition, and the target lifecycle cost.

Common traps in this module: Strategies written at the level of asset *systems* but not at the level of individual asset *classes*; strategies that name the activity (we do PMs) rather than the posture (we operate this class proactively because of consequence and predictability of failure modes); strategies disconnected from the criticality model that arrives in Module 6 (forces rework).

Worksheet 4A — Hierarchy Design Tests

Apply these tests when designing or revising the asset hierarchy:

- ☐ Does each level represent a decision the organization actually makes at that level? (If not, the level is administrative overhead.)
- ☐ Is the hierarchy four to six levels deep (site → system → subsystem → asset), with deeper structure only for critical components? (Benchmark: 4 to 6 levels, Society for Maintenance and Reliability Professionals (SMRP) Best Practices.)
- ☐ Are similar assets at the same level across facilities? (Consistency is more valuable than perfection.)
- ☐ Are physical, functional, and organizational relationships separated rather than blended into one tree?
- ☐ Is the hierarchy anchored in physical or functional reality rather than organizational structure? (If reorganization breaks rollups, the hierarchy was built on the org chart, not on the assets.)
- ☐ Have you walked the hierarchy through the analytical queries it must actually support (capital prioritization, condition trending, work cost rollups, regulatory reporting, risk analysis) before locking it?
- ☐ Does the design plan for evolution: portfolio expansion, organizational restructuring, new asset classes, system integration?
- ☐ Is ownership unambiguous at every level, including where responsibility is split (owned by one group, maintained by another, funded by a third)? Benchmark: a documented owner or steward role on ≥95% of register entries. Review the hierarchy standard at least every three years.

Worksheet 4B — Strategy Document by Asset Class

For each major asset class, complete the strategy document below. *Pattern from textbook Chapter 13.*

ASSET STRATEGY — [CLASS NAME]

Owner: _____ Effective: _____

Asset Class Description

- What assets are included in this class?
- What functional role do they serve?
- Approximate population and replacement value

Criticality

- Tier distribution within this class (A / B / C counts)
- What drives the tier assignment

Sustainment Strategy by Tier

- Tier A: [strategy + monitoring + spares strategy]
- Tier B: [strategy + monitoring + spares strategy]
- Tier C: [strategy + monitoring + spares strategy]

Failure Modes

- Top 3-5 failure modes the strategy is designed to detect or prevent

Strategy Change Triggers

- Condition or trend thresholds
- Operating context changes (load, environment, redundancy)
- Lifecycle milestones
- Regulatory or code changes

Review Cycle

- Annual review minimum
- Triggered review on Tier A failure or major operating change

Approved by: _____

Worksheet 4C — Asset Management Plan (AMP) Outline

A strategy and a plan are different artifacts, and Chapter 13 says mature programs maintain both. A strategy is typically a few pages and addresses the why and the what. An asset management plan is the operational document that implements the strategy for a specific portfolio: the work, the timing, the resources, the budget, and the performance measures. The plan is the how and the when. Pattern from textbook Appendix I.

ASSET MANAGEMENT PLAN — [PORTFOLIO / ASSET CLASS]

1. Executive Summary
2. Asset Class Description and Boundaries
3. Levels of Service
 - Customer levels of service (reliability, availability, quality)
 - Technical levels of service (operating parameters, capacity)
 - Target and current performance
4. Current Demand and Future Demand
5. Asset Inventory and Condition
6. Lifecycle Management Strategy
7. Risk Management
8. Financial Summary
 - 10-year capital and operating expenditure forecast
 - Replacement asset value (RAV) and reinvestment rate
 - Funding sources and constraints
9. Improvement Plan
10. Plan Governance

Owner: _____ Effective: _____ Review: _____

Levels of service is the element most often left underdeveloped. Chapter 13: mature practice articulates targets in measurable terms, for example "no more than X main breaks per 100 miles per year" or "no more than Y minutes of unplanned outage per customer per year." Benchmark: levels of service documented and reported with target and actual performance (IIMM levels of service; ISO 55001:2024, Clause 6.2.2).

Refresh cadence: Chapter 13's general guidance is a major refresh every three to five years. Its municipal-utility case runs the strategic asset management plan (SAMP) on a five-year refresh with annual minor updates and asset management plans on a three-year refresh with annual updates aligned to budget cycles.

Module 4 Output

By the end of Module 4, the program has:

1. A documented vertical hierarchy with horizontal perspectives
2. Asset strategy documents for the top 5-10 asset classes by replacement value
3. A documented review cycle for each strategy, and an asset management plan outline for at least one portfolio

Module 5 — Condition Assessment

Excel companion: Rating-scale anchoring and method-by-criticality matrices live on Excel tabs *5A Rating Anchors* and *5B Method by Tier*.

Learning Objectives

- Anchor a 1-5 condition rating scale that produces consistent results across assessors.
- Match assessment method to asset criticality and decision relevance.
- Capture confidence alongside condition scores.
- Build assessment outputs that drive decisions rather than produce reports.

How to Run This Module

Time commitment: One half-day session to anchor the rating scale; the assessment fieldwork itself runs over weeks to months depending on portfolio size.

Who needs to be in the room (for the anchoring session): Asset-management lead, condition-assessment lead, two or three field practitioners (someone who has actually walked the assets), reliability engineer, and the data steward. The anchoring is what determines whether two assessors will produce comparable scores.

Sequence:

1. Anchor the 1–5 scale (Worksheet 5A) with concrete observable descriptions for each rating level. Use photos, prior assessment reports, or shared field experience to calibrate. Do not move forward until two assessors independently scoring the same 20-asset sample reach at least 80% exact agreement on the rating assigned.
2. Decide method by criticality (Worksheet 5B). High-criticality assets get instrumented or formal-method assessment; low-criticality assets get visual-only at lower frequency. The grid is the policy.
3. Train the field assessors on the anchored scale. Skip this step and the data is unusable.
4. Apply confidence ratings (Worksheet 5C) at the time of assessment, not later. Confidence is a property of the assessment, not the asset.
5. Work through the failure mechanisms for each asset class (Worksheet 5D) so the strategy documents in Module 4 have a real basis for their dominant failure modes, and capture condition trend alongside level (Worksheet 5E) so Modules 6 and 7 inherit trajectory rather than a single point. Then run a calibration audit at the 90-day mark: pull 20 assessed assets and re-score with a different assessor. The calibration is what keeps the scale meaningful over time.

What good looks like at the end: A documented 1–5 scale with anchors (5 best, 1 worst), a method-selection matrix tied to criticality, a failure-mechanism inventory per class, condition trend captured on the asset record rather than only the latest rating, condition data flowing into the EAM/CMMS at the asset-record level, and a confidence rating attached to every assessment.

Common traps in this module: Allowing the rating scale to drift between assessors (no calibration audit); applying the same method to all assets regardless of criticality (over-spends on low-criticality, under-invests on high); collecting condition without a defined refresh frequency (data ages out and decisions revert to gut).

Worksheet 5A — Anchor a 1-5 Rating Scale

For each asset class, document anchored definitions and photo examples for each rating level.

Asset class: _____

Scale direction: 5 is best and 1 is worst. A falling score means a degrading asset, and rating 2 is the action threshold (textbook Chapter 15; Chapter 14). Document anchored definitions and photo examples for each rating level, for each asset class.

Why 5 is best: a higher number reads as healthier to leadership, a falling score shows deterioration at a glance, and a low, falling score points directly to a higher likelihood of failure (Worksheet 5E). The direction is a convention; what matters is using one direction everywhere and converting outside reports on load (textbook Chapter 15).

Incoming FCA data runs the other way. Facility condition assessments and property condition assessments performed to ASTM E2018 score 1 as best and 5 as worst, the inverse of the scale anchored here. The textbook uses both: its own condition scale in Chapters 14 and 15 (5 is Excellent), and the ASTM E2018 scale in the Chapter 18 to 20 worked thread, where a worn-out chiller is "5 of 5 (worst)" and the same asset after replacement is "1 of 5." Convert FCA scores before they enter the register, the risk matrix, or the deferred-maintenance tracker: an ASTM score of 5 becomes a 1 on this scale, 4 becomes 2, 3 stays 3, 2 becomes 4, and 1 becomes 5. Record which scale each score came from on the asset record so the conversion is auditable.

Rating	Written definition	Indicators (specific, observable)	Photo example reference
5 — Excellent	New or like-new condition		
4 — Good	Sound and fully serviceable; normal wear only		
3 — Fair	Functional but showing moderate deterioration		
2 — Poor	Serviceable but degraded; at or approaching the action threshold		
1 — Failed	Asset cannot perform its intended function		

Calibration test: two trained assessors independently rate the same 20-asset sample. Target is at least 80% exact agreement on the rating assigned (the book's recommended

practice, Chapter 14). If agreement is below 80%, refine the anchors: rubrics that produce frequent disagreement need clearer anchors, not more complexity. Mature anchored programs reach 85% and above (Chapter 15).

Worksheet 5B — Method Selection by Criticality

Criticality tier	Visual inspection	Structured inspection	Operator observations	Work history analysis	NDT	Condition monitoring Performance / output monitoring	Engineering assessment
Tier A							
Tier B							
Tier C							

Mark each cell as **Required**, **As-needed**, or **Not used** for the asset population. Require at least two methods for Tier A: Chapter 14 names "overreliance on a single method" as a pitfall, and the recovery path requires complementary methods for critical assets. Performance and output monitoring infers condition from operating data, including energy efficiency degradation, reduced capacity or throughput, increased cycle times, and declining output quality. Where a building automation system, supervisory control and data acquisition (SCADA) system, or telematics feed already exists, treat that data as condition data, not just operational telemetry.

Worksheet 5C — Confidence Indicator

Each condition score should carry a confidence indicator. Adopt this convention:

Confidence	Definition
High	Assessment is current relative to the tier's refresh cadence (Tier A annual or trend-driven; Tier B every 3 to 5 years; Tier C every 5 to 7 years); method appropriate to the failure modes that drive this class; assessor trained against the anchored scale or a qualified specialist; based on direct measurement rather than inference.
Medium	Assessment is within one cadence interval of due; method appropriate to the asset class but not to every dominant failure mode; assessor experience adequate; some inference from indirect indicators.
Low	Assessment is overdue against the tier's cadence; method limited or unable to detect the dominant failure modes; assessor unfamiliar with the asset class; condition largely inferred from secondary indicators rather than directly measured.

Confidence reflects four things: data freshness, the assessment method, the assessor's experience, and the degree of inference versus direct measurement, including whether the method can detect the failure modes that actually drive this class. Decisions on Tier A

assets with Low confidence should trigger reassessment, not resignation. Where confidence is low and consequence is high, default to the more conservative estimate: an asset that has not been recently inspected is not necessarily in good condition, it is in unknown condition.

Worksheet 5D — Failure Mechanisms by Asset Class

Module 4's strategy document asks for the top three to five failure modes each asset class is managed against. This is where they come from. Chapter 15 names seven mechanisms; work through them for each class rather than starting from a blank page.

Mechanism	What it is	Present in this class?	Detectable by which method?
Wear	Gradual loss of material from contact between surfaces		
Fatigue	Accumulation of damage from cyclic loading		
Corrosion	Chemical or electrochemical degradation of materials		
Erosion	Loss of material from impingement of fluids or particles		
Thermal degradation	Affects insulation, lubricants, polymers, electronics		
Obsolescence	Loss of function because supporting infrastructure has disappeared, not because the asset degraded		
Operational drift	Gradual departure from the conditions the asset was designed for		

Degradation pattern. Chapter 15 uses the bathtub curve as a design generalization: failure rates elevated early (infant mortality from manufacturing or installation defects), low and stable through useful life, rising again at end of life as mechanisms compound. It does not apply to every asset (Nowlan and Heap identified six distinct failure-rate patterns, of which the bathtub is one), but it is common enough to design for: heightened attention at start-up, baseline monitoring during useful life, increasing scrutiny approaching expected end of life.

Obsolescence is the dimension most often missed. Chapter 14 treats condition as a composite of three dimensions: physical, functional, and obsolescence. Obsolescence does not appear during inspection, so it has to be asked about deliberately. Flag it on the asset record even when the physical rating is high.

Worksheet 5E — Condition Trend and Likelihood of Failure

Likelihood of failure is not the same thing as current condition. Chapter 15: an asset in poor condition with a stable trend may have lower near-term likelihood than an asset in fair condition with a rapidly worsening trend. Capture the trend, not just the level: the asset record holds the trend, not only the most recent rating.

Asset / class	Prior rating (date)	Current rating (date)	Trend	Rate of change	Likelihood tier

Trend values: Improving / Stable / Declining slowly / Declining rapidly.

Mapping condition and trend to a likelihood tier

Condition	Stable trend	Declining trend
5 — Excellent / 4 — Good	Very Low	Low
3 — Fair	Low to Moderate	High
2 — Poor	Moderate	Very High
1 — Failed	High	Very High

This is the tier-based estimation Chapter 15 recommends: "Good condition with stable trend = very low likelihood. Fair condition with deteriorating trend = high likelihood." Feed the resulting tier into Worksheet 6B rather than estimating likelihood independently there.

Conservative defaults. Where confidence is low and consequence is high, default to the more conservative likelihood estimate. Absence of evidence is not evidence of absence: an asset that has not been recently inspected is in unknown condition, not good condition.

Close the loop. Chapter 14's fifth practical principle is a quarterly review of the highest-priority condition findings, in which each finding is recorded as acted on, deferred with documented risk acceptance, or still open. Without it, assessment produces reports rather than decisions.

Module 5 Output

By the end of Module 5, the program has:

1. Anchored 1-5 rating scales by asset class
2. A method-by-tier matrix
3. A confidence-weighting convention
4. A documented assessment cadence by tier (Tier A annual or trend-driven; Tier B every 3 to 5 years; Tier C every 5 to 7 years or on trigger), a failure-mechanism inventory by class, and condition trend captured on the asset record

Module 6 — Criticality, Risk, and Treatment

Excel companion: This module has the most extensive Excel implementation. Tab *6A Criticality* provides weighted dimensional scoring with auto-composite, auto-tier, and a tier distribution chart. Tab *6B Risk Matrix* has the per-asset risk scoring table at the top with the likelihood and consequence anchors and visual heat map alongside; freeze panes keep the headers in place while you scroll through up to 100 risk entries. Tab *6D Risk Acceptance* is a 16-column risk acceptance log. Treatment selection (Worksheet 6C) is integrated into 6B as a dropdown column.

Learning Objectives

- Build a defensible criticality scoring model.
- Calibrate a 5x5 risk matrix against organizational outcomes.
- Select among the five risk treatment options for each entry above threshold.
- Document risk acceptance decisions in a form that survives audit.

How to Run This Module

Time commitment: Two facilitated full-day sessions, plus two to three weeks of scoring application across the portfolio.

Who needs to be in the room: The full asset-management committee plus operations, maintenance, engineering, finance, regulatory, and safety representation. Criticality is multidimensional and skipping a dimension produces unbalanced scores.

Sequence:

1. Calibrate the criticality scoring sheet (Worksheet 6A) on five to ten benchmark assets where the team agrees on the right tier. The benchmarks are the calibration; without them, scoring drifts.
2. Calibrate the risk matrix (Worksheet 6B). Define the impact thresholds for each impact category in dollar / outage / safety / regulatory terms. Define the likelihood bands.
3. Apply criticality scoring across the asset population. Tier A first, then Tier B, then Tier C; Tier C can be auto-assigned by asset class. Expect Tier A to land at roughly 5 to 10% of assets (Chapter 16 benchmark table, a common industry range). If your Tier A population lands materially outside that range, revisit the thresholds rather than the scores.
4. For Tier A assets with high condition concern, populate risk-register entries (Worksheet 6D). Treat the risk register as a working artifact, not a one-time inventory.
5. Document the first formal risk-acceptance decision. The first one establishes the routine; subsequent ones become normal practice.

What good looks like at the end: A criticality tier on every asset record, a calibrated 5x5 risk matrix in use, a risk register with at least one entry per Tier A asset of concern, and at least one signed risk-acceptance form.

Common traps in this module: Single-dimension criticality (consequence of failure only, ignoring service criticality, regulatory exposure, etc.); a risk matrix that is not calibrated to the organization's actual impact thresholds (everything ends up red); risk acceptance avoided rather than documented (the deferral happens; the decision does not).

Worksheet 6A — Criticality Scoring Sheet

Pattern from textbook Chapter 16 and Appendix D (Sample Criticality Scoring Sheet).

How to score: Score each dimension from 1 to 5 for the consequence of this asset failing, using the organization's anchored scoring criteria. Textbook Appendix D publishes criteria for scores of 1 (lowest), 3 (moderate), and 5 (highest) in each dimension; use 2 and 4 for assets that fall between them. Score consequence only. Condition and likelihood of failure are not part of criticality; they enter at the risk matrix in Worksheet 6B. Keep the scores consistent with the consequence tiers you calibrate in Worksheet 6B.

Scale direction: criticality runs the opposite way to condition. A criticality 5 is the most severe consequence; a condition 5 is an asset in excellent shape. Label both scales with their direction on every form and report.

Working the arithmetic: Weighted = Score × Weight. The Composite is the sum of the Weighted column and will fall between 1.0 and 5.0. For example, scores of 5 (safety), 4 (service), 3 (regulatory), 2 (environmental), 3 (financial), and 2 (reputational) give $1.50 + 1.00 + 0.45 + 0.30 + 0.30 + 0.10 = 3.65$, which is Tier B. The weights shown are the Appendix D defaults; adapt them to your context, but they must total 100%. The Excel tab *6A Criticality* does this arithmetic and assigns the tier automatically.

ASSET CRITICALITY SCORING SHEET

Asset: _____
 Asset Class: _____
 Criticality Owner: _____
 Date Scored: _____

Dimensional Scoring (1-5 scale; anchor each tier in the dictionary)

Dimension	Weight	Score	Weighted
Safety / life safety	30%		
Service / operational impact	25%		
Regulatory / compliance	15%		
Environmental	15%		
Financial	10%		
Reputational / stakeholder	5%		
Composite			

Tier Determination

Composite $\geq 4.0 \rightarrow$ Tier A

Composite 2.5 to 3.9 $\rightarrow$ Tier B

Composite < 2.5 → Tier C

Assigned Tier: _____

Justification (what drove the tier): _____

Trigger Events for Re-scoring

- ☐ Service requirements change
- ☐ Redundancy added or removed
- ☐ Regulatory or standard update
- ☐ Operating context change
- ☐ Major incident or near-miss

Approved by: _____

Worksheet 6B — Risk Matrix Calibration

Pattern from textbook Chapter 17.

Calibrate these locally. Textbook Chapter 17 does not publish a consequence-threshold table; it requires that you build one: "Anchor each likelihood and consequence tier to observable evidence... A high consequence rating should mean something specific." The values below start from textbook Appendix D's 1/3/5 criticality criteria, with tiers 2 and 4 interpolated. Replace them with your organization's thresholds before scoring, and keep them consistent with Worksheet 6A: an asset must not score 5 on one sheet and 3 on the other.

Anchor your 5x5 matrix tiers to observable thresholds. Document them in the table below.

Likelihood Tiers

Tier	Likelihood description	Evidence anchor (condition, trend, age, failure history)
Very Low	Extremely unlikely within planning horizon	Good condition, stable trend, well within expected life, no failure history in class
Low	Unlikely within planning horizon	Good to fair condition, stable trend, within expected life
Moderate	Possible within planning horizon	Fair condition, or a deteriorating trend from good; approaching expected life
High	Likely within planning horizon	Fair to poor condition with deteriorating trend, or beyond expected life; known failure mode active in class
Very High	Expected within planning horizon	Poor condition with deteriorating trend, or repeat failures in this asset or its class Textbook Chapter 15 is explicit that likelihood is expressed in tiers rather than precise percentages, "because the underlying data rarely supports false precision." If your organization chooses to attach probability ranges, document them as local calibration, make the bands non-overlapping, and record that they are not textbook-sourced.

Consequence Tiers

Tier	Service	Safety	Environmental	Regulatory	Financial	Reputational
Very Low	No service impact	No injury risk	No environmental impact	No regulatory implications	< \$25K	No external visibility
Low	< 4 hours, or < 1,000 customers	Minor injury	Contained on site, no reporting	Addressable within the standard reporting cycle	\$25K to \$100K	Local stakeholder inquiry
Moderate	4 to 24 hours	Recordable injury	Recoverable release within the site boundary	Notice of violation	\$100K to \$250K	Local stakeholder concern; local media
High	> 24 hours, or > 10,000 customers	Serious injury or hospitalization	Reportable release with offsite or waterway impact	Enforcement action with penalty exposure	> \$250K	Regional media; board attention
Very High	Multi-day outage across the service area	Loss of life or catastrophic harm	Major release with sustained ecological harm	Material violation with significant penalty exposure or shutdown risk	> \$250K with sustained revenue or penalty exposure	Sustained public, board, or political consequence

Calibration test: test the matrix against historical outcomes (textbook Chapter 17). Where failures have occurred, the matrix should have rated those assets as moderate to high risk in the period preceding failure. Where the matrix consistently under-rated assets that subsequently failed, the calibration is wrong; where it consistently over-rated assets that have been stable for years, the threshold may be too aggressive. Use every documented failure event from the last 24 to 36 months. Repeat the back-test annually.

Worksheet 6C — Risk Treatment Selection

For each Tier A or B risk register entry, select the treatment.

Risk score: enter the risk tier for the entry, from 1 (Very Low) to 5 (Very High). Find the entry's likelihood tier and consequence tier using the anchors you calibrated in Worksheet 6B, then read the risk tier where the two meet on the 5×5 matrix (the heat map on Excel tab *6B Risk Matrix*). Where the consequence differs by dimension, use the highest-rated dimension.

Entry	Risk score	Treatment selected	Rationale	Owner	Review date
		☐ Avoid ☐ Reduce ☐ Transfer ☐ Share ☐ Accept			
		☐ Avoid ☐ Reduce ☐ Transfer ☐ Share ☐ Accept			
		☐ Avoid ☐ Reduce ☐ Transfer ☐ Share ☐ Accept			
		☐ Avoid ☐ Reduce ☐ Transfer ☐ Share ☐ Accept			

Treatment definitions:

- **Avoid:** eliminate the source (decommission asset, change operating context)
- **Reduce:** lower likelihood or consequence (the standard sustainment toolkit)
- **Transfer:** shift consequence to a third party (insurance, vendor warranty, service contract)
- **Share:** pool consequence across multiple parties (mutual aid, joint operations)
- **Accept:** explicit, documented choice to live with the risk

Treatment is governed independently from the risk score. A high-risk entry with “accept” treatment is governed differently from a high-risk entry with “reduce” treatment.

Worksheet 6D — Risk Acceptance Form

Pattern from textbook Appendix E (Sample Risk Acceptance Form).

RISK ACCEPTANCE FORM

Asset / Risk Entry ID: _____
 Identified Risk: _____
 Likelihood tier: _____ Consequence tier: _____ Composite risk tier: _____

Consequence Profile

- Service impact: _____
- Safety exposure: _____
- Environmental: _____
- Regulatory: _____
- Financial: _____
- Reputational: _____

Treatment Selected: _____

Rationale: _____

Mitigation Actions While Accepted

1. _____
2. _____
3. _____

Duration of Acceptance: _____

Re-Evaluation Triggers:

☐ Time interval: _____☐ Condition change: _____☐ Operating change: _____☐ Near-miss event☐ Funding cycle☐ Other: _____

Approver: _____

(per tiered authority)

Date: _____

Module 6 Output

By the end of Module 6, the program has:

1. A documented criticality scoring model with dimensional weights
2. An anchored, calibrated 5x5 risk matrix
3. A treatment-selected risk register with named owners and review dates
4. A standard risk acceptance form integrated into the deferral workflow

Module 7 — Needs, Backlog, and Capital

Excel companion: This module has cross-tab automation that the Word version cannot replicate. Tab *7A Deficiency-Need* tracks deficiencies and their translation. Tab *7C DMB FCI Tracker* automatically pulls deferred items from 7A (where Status = “Deferred”) and computes both DMB and FCI, with conditional formatting against the industry FCI benchmarks. Tab *7B Backlog Segmentation* produces a stacked bar chart by criticality. Tab *7D Capital Cases* tracks the full capital pipeline with risk-dimension columns, alternatives, net present value (NPV), and approval status.

Learning Objectives

- Translate deficiencies into defensible needs, distinguishing a deficiency (what the assessment finds) from a need (what the program commits to do), and both from a symptom (what is wrong, with no defined action).
- Manage backlog through segmentation rather than aggregation.
- Track deferred maintenance separately from operational backlog.
- Build capital justifications that defend against cost-only challenge.

How to Run This Module

Time commitment: Three weeks of focused work to build the deficiency-to-need translation routine; ongoing thereafter.

Who needs to be in the room: Asset-management lead, planning lead, finance lead, capital-program manager, and operations supervisors. The supervisors are the source of most deficiencies.

Sequence:

1. Set the deficiency-to-need translation discipline (Worksheet 7A): every deficiency from a condition assessment, an inspection, or a near-miss gets translated into a structured need before it can be acted on.
2. Establish the backlog segmentation (Worksheet 7B): maintenance backlog, capital backlog, compliance and safety backlog, deferred backlog. Chapter 19 is explicit that “four segments matter,” and they are different artifacts with different decision processes; conflating them is the root of most backlog dysfunction. Compliance and safety backlog carries disproportionate risk and should remain visible to leadership at all times.
3. Operationalize the deferred-maintenance tracker (Worksheet 7C). Aging matters; volume matters; risk-weighted exposure matters. Report all three, not just one.
4. Run one to three needs through the capital-project justification template (Worksheet 7D) end-to-end. End-to-end on a few beats partial on many.
5. Hold the first formal funding-decision meeting where capital decisions reference the worksheets. The meeting establishes the routine; the routine compounds.

What good looks like at the end: A deficiency-to-need translation routine that is followed (not bypassed); a backlog that is segmented into four buckets with different governance; a deferred-maintenance metric with aging and risk-weighted exposure tracked; capital decisions that cite the analysis rather than the urgency of the moment.

Common traps in this module: Treating the backlog as a single list (the four buckets get conflated and the wrong work gets prioritized); reporting deferred maintenance only as dollar volume (without aging and risk-weighting, the metric is misleading); capital justification reverting to descriptive narratives when the analysis becomes uncomfortable.

Worksheet 7A — Deficiency-to-Need Translation

For each deficiency from the latest condition assessment or inspection, translate to a need using the four translation forms. Chapter 18 defines the terms: a deficiency is an observed shortfall in an asset's condition, performance, compliance, or safety, and it is what the assessment finds; a need is the management commitment to act on it, and it is what the program decides to do about what was found. Deficiencies are observations; needs are commitments. Keep the deficiency register (exhaustive, rarely culled) separate from the needs register (curated, governed, explicitly cycled). Classify each need by urgency as Immediate, Short-term (one to two years), Medium-term (three to five years), or Long-term (beyond five years); those four categories map directly to the time-phased work plans in Chapter 19. *Pattern from textbook Chapter 18.*

Deficiencies sourced from an FCA carry the ASTM E2018 scale. Where the Source column is FCA, the condition score in the originating report runs 1 as best and 5 as worst. Invert it before comparing against register condition or feeding Worksheet 5E's likelihood mapping, and keep the original score in the notes so the translation can be traced back to what the assessment actually found.

Deficiency	Translation form	Need statement	Tier	Estimated cost	Cost confidence
	☐ Aggregation ☐ Filtering ☐ Reframing ☐ Bundling				
	☐ Aggregation ☐ Filtering ☐ Reframing ☐ Bundling				
	☐ Aggregation ☐ Filtering ☐ Reframing ☐ Bundling				
	☐ Aggregation ☐ Filtering ☐ Reframing ☐ Bundling				

Worksheet 7B — Backlog Segmentation

Segment the current backlog by the four types and by criticality.

Segment	Tier A	Tier B	Tier C	Total
Maintenance backlog	\$	\$	\$	\$
Capital backlog	\$	\$	\$	\$
Compliance and safety backlog	\$	\$	\$	\$
Deferred backlog	\$	\$	\$	\$
Total	\$	\$	\$	\$

Discussion questions:

1. Where is risk concentrated? Read the Tier A column, not the row totals. Chapter 19: "\$2 million in backlog concentrated in low-criticality assets may pose less risk than \$500,000 in backlog tied to life-safety systems." Pay particular attention to the compliance and safety row.
2. What is the age profile? (Older = higher risk in most cases; aging Tier A is a leading indicator of failure.)
3. What is the trajectory? (Growing, flat, or shrinking; and is the trajectory by criticality the same as the trajectory by total dollars?)

Worksheet 7C — Deferred Maintenance Backlog Tracking

Entry	Need ID	Asset	Criticality	Estimated cost	Approved deferral date	Risk acceptance reference	Re-evaluation date

Compute monthly. **DMB** is the dollar value of identified, unfunded asset needs, the subset of backlog the organization has deliberately chosen not to fund. Report it in absolute dollars, segmented by asset class, criticality tier, building, or system. **FCI** is DMB divided by the current replacement value (CRV) of the underlying asset portfolio. The DMB metric is meaningful only when the underlying needs register is defensible; a DMB built on a stale or

incomplete needs inventory understates real exposure. FCI benchmark bands (Chapter 19, industry rules of thumb): under 5% is “good” stewardship; 5 to 10% is “fair”; 10 to 30% is “poor”; above 30% indicates a portfolio in serious renewal trouble. Higher education in particular has well-developed FCI benchmarking through APPA (the association for higher-education facilities officers) and Sightlines (now Gordian).

Report DMB and FCI to executive committee at least quarterly with the trend line.

Worksheet 7D — Capital Project Justification Template

Pattern from textbook Appendix K (Sample Capital Project Justification Template). Appendix K notes that the format is brief by design, typically two pages, supported by referenced detail rather than embedded detail.

CAPITAL PROJECT JUSTIFICATION

Project: _____
 Estimated Cost: \$ _____
 Project Owner: _____

Need Statement

[Describe the underlying need in one paragraph.
 Reference the originating deficiency or risk register entry.]

Risk Reduction

- Current risk: [Tier A/B/C – describe consequence and likelihood]
- Risk after project: [describe the post-project state]
- Risk reduced: [quantify or describe]

Alternatives Considered

- Alternative 1: [option, cost, why not selected]
- Alternative 2: [option, cost, why not selected]
- Selected approach: [rationale]

Cost Analysis

- Direct project cost: \$
- Operating-cost impact (year 1): \$
- Lifecycle cost (10-year operating; state as net present value): \$
- Risk-adjusted benefit: \$

Schedule and Milestones

- Design start: _____
- Procurement complete: _____
- Construction start: _____
- Substantial completion: _____
- Closeout: _____

Performance Expectations

- What metric improves and by how much
- How performance will be measured post-project

If Deferred

- What risk is the organization accepting?
- For how long?
- What mitigation is required?
- When does the deferral get re-evaluated?

Approvals and Tracking

- Project sponsor: _____
- Funding source: _____
- Quarterly status review: _____
- Closeout review: _____

Module 7 Output

By the end of Module 7, the program has:

1. A defensible needs register translated from deficiencies
2. A segmented backlog with risk-tiered visibility
3. A separately tracked deferred maintenance backlog with DMB and FCI metrics
4. Capital project justifications that defend against cost-only challenge

Module 8 — Sustaining the Practice

Excel companion: Tabs *8A Governance Routines*, *8B Audit Schedule*, *8C Trajectory*, and *8D Succession* implement each worksheet. The 8C trajectory tab includes a baseline-plus-3-scenario line chart that visualizes the multi-year posture under different funding assumptions. The Implementation Tracker tab and the Annual Refresh tab support the year-over-year practice this module is about.

Learning Objectives

- Establish governance routines that survive personnel change.
- Document audit cycles for register, risk register, and deferred-maintenance backlog.
- Build the multi-year trajectory model for board-level engagement.
- Plan for succession on the practice's critical roles.

How to Run This Module

Time commitment: Two facilitated sessions of half a day each, then a quarterly cadence indefinitely.

Who needs to be in the room: The full asset-management committee. Sustaining is committee work, not individual work; if the committee does not exist, that is the first build.

Sequence:

1. Inventory the governance routines that already exist informally (Worksheet 8A). Most programs have more routine than they realize, just unnamed.
2. Document the routine cadence: monthly committee meeting, quarterly metrics review, annual program self-assessment, periodic third-party review.
3. Schedule the audit cycle (Worksheet 8B), setting cadence proportional to attribute volatility rather than to a single calendar: static attributes (identifiers, location, manufacturer, model) every three to five years; volatile attributes (condition, status, ownership) annually or on trigger; the asset management policy reviewed at least every three years and re-approved at the level it was originally adopted. Audits are sampling-based, not comprehensive; the goal is to detect drift early enough to correct it. Many programs also run an external benchmarking review every three years; that cadence is a workbook recommendation rather than a textbook benchmark.
4. Build the multi-year trajectory model (Worksheet 8C). The trajectory model is what carries the program through leadership transitions; without it the program becomes hostage to whoever is in the chair.
5. Document succession plans for the top five critical roles (Worksheet 8D). Ask: if this person left tomorrow, what would break, and how would we recover? Write the answer down.

What good looks like at the end: A documented governance cadence with calendared meetings, an audit schedule that is followed, a multi-year trajectory model on the wall, and

succession plans for the top five roles. The program survives the first leadership transition without measurable regression.

Common traps in this module: A committee that meets but does not decide; an audit schedule on paper that gets skipped; a trajectory model that nobody references; succession plans documented but never tested.

Worksheet 8A — Governance Routines Inventory

Routine	Frequency	Participants	Outputs	Charter / Documentation
Asset Management Steering Committee				
Backlog Review				
Risk Register Review				
Deferred-Risk Review				
Capital Cycle Workshop				
Annual Strategy Refresh				
Triggered Review (incident)	As needed			

For each routine, the documentation should include the standing agenda, decision authority, and the artifact produced.

Worksheet 8B — Audit Cycle Schedule

Audit	Frequency	Sampling approach	Owner	Last audit	Next due
Asset register completeness	Annual	Full reconciliation to fixed-asset list			
Asset register attribute accuracy	3 years	Sampling: 5% by criticality tier			
Risk register currency	Quarterly	All Tier A entries			
Deferred-risk re-evaluation	Per entry	Per documented re-eval date			
Condition assessment quality	3 years	Inter-assessor reliability test			
Capital case defensibility	Per cycle	Random sample of 20%			

Worksheet 8C — Multi-Year Trajectory Model

Pattern from textbook Chapter 20 (the multi-year capital trajectory and scenario planning).

Project the program's posture over a 10- or 20-year horizon. Chapter 20: "Mature programs maintain a multi-year capital trajectory: a 10- or 20-year projection of capital investment required to maintain current asset condition and risk profile." Model the current funding level as the baseline, then the three scenarios below, using the textbook's names. Minimum Sustainment is the funding required to prevent asset condition from declining further; Risk Reduction is the funding required to address the highest-risk needs; Target Performance is the funding required to achieve defined service-level objectives. A fourth, the Optimal Lifecycle Scenario, is available where lifecycle cost models are mature enough to support it.

Year	Baseline: current funding continued	Minimum Sustainment Scenario	Risk Reduction Scenario	Target Performance Scenario
Today	DMB \$, FCI %	(same starting point)	(same starting point)	(same starting point)
+1				
+3				
+5				
+10				

For each scenario, articulate:

- What the asset base looks like at year 10
- What service levels are sustained (or not)
- What risks are accepted (and at what cumulative magnitude)
- What capital and operating funding is required

Present the baseline and all three scenarios to the executive committee or board. The conversation that follows is the conversation the practice exists to enable.

Worksheet 8D — Succession Planning

For each critical role identified in Worksheet 1C, develop the succession plan.

Role	Current incumbent	Risk of departure	Knowledge to capture	Successor candidate	Cross-training plan	Documentation status

The test of embedding, in the textbook's words, is simple: if the asset management program disappeared tomorrow, would the discipline survive? Chapter 5's own case is honest about the cost of failing it, with 12 months of regression after a key departure and roughly two years to recover the pre-departure baseline.

Module 8 Output

By the end of Module 8, the program has:

1. Documented governance routines with charter, agenda, and decision authority
2. A defined audit cycle for each major artifact
3. A multi-year trajectory model with a current-funding baseline and three named funding scenarios
4. A succession plan for the practice's critical roles

Workbook Appendix A — Maturity Self-Assessment Checklist

Adapted from textbook Appendix J — Maturity Self-Assessment Checklist. Use this annually to track progress against the maturity arc.

(See Worksheet 1B for the assessment instrument.)

Scoring Convention

- **Phase the program is currently in** = the highest phase for which the program answers Yes to most of the textbook Appendix J indicators.
- **Track scores year-over-year.** Improvement is the goal; slippage is a leading indicator of program erosion.
- **Bring the assessment to the steering committee.** The conversation about the gaps is more valuable than the score itself.

Workbook Appendix B — Workshop Schedule Templates

Half-Day Workshop: Module 1 (Where Do We Stand?)

Time	Activity
0:00-0:30	Pre-work review; confirm participants have completed pre-work
0:30-1:30	Worksheet 1A: Three Foundational Questions
1:30-2:00	Break
2:00-3:00	Worksheet 1B: Phase Self-Assessment
3:00-3:30	Worksheet 1C: Heroics Dependencies
3:30-4:00	Synthesis and gap discussion; identify Module 2 priorities

Full-Day Workshop: Module 6 (Criticality, Risk, and Treatment)

Time	Activity
0:00-0:30	Recap of risk concepts (textbook Ch 16-17)
0:30-1:30	Worksheet 6A: Criticality Scoring Model build
1:30-2:30	Apply scoring to 20-asset sample (calibration)
2:30-3:30	Lunch
3:30-4:30	Worksheet 6B: Risk Matrix Calibration with historical events
4:30-5:30	Worksheet 6C: Treatment selection for top-quadrant entries
5:30-6:00	Worksheet 6D: Risk Acceptance Form workflow
6:00-7:00	Synthesis; identify register population priorities

Two-Day Workshop: Modules 7 + 8 (Needs to Action; Sustaining)

Day 1	
AM	Module 7: Deficiency-to-need translation; backlog segmentation
PM	Module 7 cont.: Capital project justifications; DMB / FCI dashboard
Day 2	
AM	Module 8: Governance routines; audit cycles
PM	Module 8 cont.: Multi-year trajectory model; succession planning

Workbook Appendix C — Implementation Tracker

Use this single-page tracker to monitor progress through the workbook.

Module	Output	Status (Not Started / In Progress / Complete)	Date Completed	Owner	Notes
1 — Where Do We Stand?	Phase placement; gap inventory				
2 — Strategy and Roadmap	GSOT; risk tolerance; charter				
3 — Asset ID and Register	Inclusion criteria; register				
4 — Hierarchy and Strategy	Hierarchy; class strategies				
5 — Condition Assessment	Rating scales; method matrix				
6 — Criticality and Risk	Scoring; matrix; acceptance form				
7 — Needs and Capital	Needs register; capital cases				
8 — Sustaining	Governance; audit; trajectory; succession				

Workbook Appendix D — Quick Reference: Key Forms and Templates

The forms below appear in this workbook and are also available in the textbook appendices for direct reference. Appendix letters are those of the published first edition.

Form / Template	Workbook location	Textbook reference
Asset Inclusion Criteria	Module 3	Chapter 10
Asset Register Schema	Module 3	Appendix C
Asset Strategy Document	Module 4	Chapter 13
Condition Rating Scale (anchored)	Module 5	Chapter 14
Criticality Scoring Sheet	Module 6	Appendix D
Risk Acceptance Form	Module 6	Appendix E
Deferred-Risk Register	Module 7	Appendix F
Capital Project Justification	Module 7	Appendix K
Asset Management Policy	Module 2	Appendix H
Asset Management Plan Outline	Module 4	Appendix I
Maturity Self-Assessment	Module 1; Workbook Appendix A	Appendix J

Workbook Appendix E — Quick-Start Decision Tree

Where you start the workbook depends on what already exists, what is dormant, and where the program's credibility currently stands. The decision tree below addresses five common starting situations explicitly. Read the situation that fits and follow the recommended sequence.

Situation 1: We have a register, but no strategy

Starts at: **Module 2 (Strategy and the Roadmap)**, then **Module 6 (Criticality)**.

The register is the structural foundation, but without strategy the register cannot drive decisions. Build the GSOT, the Risk Tolerance Statement, and the Roadmap Charter first. Then layer the criticality model onto the existing register so the register tiers actually mean something.

Skip Module 3 unless the register is more than three years old or the inclusion criteria were never documented.

Situation 2: We have a strategy, but no register

Starts at: **Module 3 (Asset Identification and the Register)**, then **Module 4 (Hierarchy and Asset Strategy)**.

Strategy without an asset base is decoration. Build the inclusion criteria, the schema, and a usable register before adding any further analytical layer. Most teams in this situation discover that “strategy” was actually a vision document; treat Module 2's worksheets as ratification rather than first authorship.

Situation 3: We have both a register and a strategy, but no risk practice

Starts at: **Module 5 (Condition)** and **Module 6 (Criticality, Risk, and Treatment)** in parallel.

Condition data feeds risk; criticality feeds risk; together they enable risk-based prioritization. Run Modules 5 and 6 together rather than sequentially; the combined output is the risk register.

Situation 4: We have activity in every area, but cannot defend any of it externally

Starts at: **Module 1 (Where Do We Stand?)**, full assessment.

This situation is the most common and the most uncomfortable. The program is busy but not legible. The Module 1 self-assessment exposes which activities are real practice and which are theater. The honest baseline is the only foundation for credibility recovery; skipping it produces a credibility relapse within 6 to 12 months.

After Module 1, prioritize Module 7 (Needs and Capital); the worksheets there produce externally defensible artifacts (formal needs, segmented backlog, capital justifications). Activity becomes evidence.

Situation 5: A previous initiative failed and the program has lost credibility

Starts at: **Module 1**, then **Module 2** with explicit acknowledgment of the prior initiative.

A previous failure is not a barrier; it is a starting condition. The honest baseline must include “what we tried before, and what we learned.” The Roadmap Charter must explicitly address what is different this time, in language that the people who lived through the previous attempt will recognize as substantive. Without that recognition, the new initiative gets dismissed as “the same thing again.”

In this situation, the early wins matter more than usual. Prioritize work in Module 7 that produces visible, defensible artifacts within 90 days: a documented funding decision, a closed deficiency, a signed risk acceptance. Compounding maturity requires demonstrated competence first.

Workbook Appendix F — Common Mistakes and Recovery Paths

The mistakes below recur across organizations, sectors, and program maturity levels. Each is paired with the recovery path that has worked for the programs that have walked themselves back from the mistake. Most are tied to specific textbook pitfalls; see textbook Appendix A, Mapping Pitfalls to Corrective Actions.

The “perfectionist register”: the asset register is delayed for years pending a complete schema, complete records, and complete validation. The program has no register and therefore no foundation for any subsequent practice. *Recovery:* publish a 12-field register at 90% completeness on critical assets, name it the v1, and commit to scheduled extension passes (v2 at 6 months, v3 at 12). The published v1 unblocks every downstream practice; the perfect register that never publishes blocks everything indefinitely.

The “criticality everyone agrees with”: the criticality scoring exercise produces tiers that match what everyone already believed. Either the consensus reflects real shared understanding (rare) or the scoring was driven by anchoring to existing beliefs (typical). *Recovery:* re-score with a multi-dimensional sheet (consequence, service, regulatory, safety, environmental) and require evidence for each dimension’s score. Expect 10 to 25% of tiers to shift; that shift is the value of the exercise.

The “risk matrix that’s all red”: the calibrated risk matrix produces only high and very-high ratings, making prioritization impossible. The thresholds are too tight; either impact thresholds are set too low or likelihood bands are too compressed. *Recovery:* recalibrate using actual historical incidents and known dollar / outage thresholds. The matrix should distribute the population; if everything is red, the matrix is not yet calibrated.

The “backlog as a single list”: maintenance, capital, compliance and safety, and deferred backlog are all in one queue. Prioritization fails because the four segments have different decision rules. *Recovery:* segment using Worksheet 7B and report each segment separately to its appropriate audience. Operations cares about maintenance backlog; compliance and safety backlog stays visible to leadership at all times; finance and the board care about capital backlog and deferred backlog.

The “EAM/CMMS as the program”: the program treats EAM/CMMS implementation as advanced asset management. The system is the operating layer; the practice is the discipline that uses it. *Recovery:* build the practice (Modules 1 through 6) using whatever tooling is currently available; let the EAM/CMMS implementation follow rather than lead. Tools follow practice; practice does not follow tools.

The “one big workshop”: the program tries to complete the full workbook in a single multi-day workshop. The artifacts produced are shallow because the team has not yet absorbed the discipline. *Recovery:* run the modules in their natural cadence (90-day arc described in Getting Started), with operations and analysis between sessions. Workshops are convergence points; they cannot substitute for the work between them.

The “missing finance partner”: the program builds the practice without a finance representative on the asset-management committee. The capital-justification work in

Module 7 then reads as an attempt to dictate to finance rather than as a partnership. *Recovery*: recruit a named finance partner with explicit committee membership before Module 7 begins. The recovery often takes one to two years if the program has built without finance for a long time; do it before the trust deficit becomes structural.

The “vanity dashboard”: the program reports activity metrics (work orders closed, PMs completed, condition assessments delivered) rather than outcome metrics (risk reduction, reliability, sustainment ratio, deferred maintenance trend). Activity metrics rise even when outcomes are stagnant; the dashboard becomes evidence of work without evidence of progress. *Recovery*: migrate the dashboard to outcome-based metrics as defined in textbook Chapter 5 (“Demonstrating Value Through Outcomes”), five to seven metrics chosen from proactive-to-reactive maintenance ratio, schedule compliance, backlog by risk tier, condition-related failure rate on critical assets, capital plan execution against risk-documented basis, mean time between failures on Tier A assets, and ratio of emergency spending to planned spending. The textbook names this failure mode “outcome blindness.” Keep one or two activity metrics as throughput indicators, not as the primary measure.

The “policy without practice”: the asset-management policy is well-written, signed by leadership, and bears no relationship to how decisions are actually made. The policy is decoration. *Recovery*: identify the three to five decisions the program will demonstrably govern in the next quarter (capital prioritization, risk acceptance, sustainment-baseline funding, etc.). Practice those decisions per the policy. Policy compliance is built one decision at a time.

The “annual self-assessment with no follow-through”: the program runs Module 1 every year, identifies the same gaps, and never closes any of them. The assessment becomes ritual. *Recovery*: limit assessment cadence to every two to three years; use the years between for actual gap closure. Each assessment cycle should produce a small number of explicit improvement commitments; the next cycle reports against those commitments.

The “leadership change reset”: a new asset-owning executive arrives, surveys the program, and decides to reset. The practice built over years is partially dismantled. *Recovery (preventive)*: the multi-year trajectory model (Worksheet 8C) and the documented sustainment baseline (Module 8) are the primary defenses against leadership-driven resets. *Recovery (corrective)*: if the reset has already happened, treat it as a Phase 1 restart rather than a continuation; the credibility of the prior program does not transfer automatically.

The “audit-driven program”: the program scope is defined by the most recent audit findings rather than by the discipline. Each audit cycle drives a new set of disconnected activities. *Recovery*: use the audit findings as a calibration check on the discipline (where do they confirm the practice; where do they expose gaps the practice should already have caught) rather than as the source of program scope. Scope comes from Module 2; audits inform whether scope is being delivered.

The “consultant build-and-leave”: an external consultant builds the artifacts (register, criticality model, risk matrix, capital case) and departs. The artifacts decay because they were never operated by the organization. *Recovery*: require a shadow-build, in which the

consultant pairs with internal staff, the staff own the artifacts on completion, and the consultant's last deliverable is a knowledge-transfer audit confirming the staff can operate the artifacts independently.

Workbook Appendix G — Facilitator's Playbook

The workbook can be self-paced, but most organizations benefit from facilitated workshops at key transitions. This playbook describes how to run the workshops well.

Before the workshop

Confirm the sponsor. Workshops without sponsor authorization produce content that nobody is required to act on. The sponsor's name should be in the meeting invitation; if it is not, postpone.

Distribute pre-work. Everyone in the room should arrive with the relevant Module 1 baseline brief, the relevant prior worksheets, and any data they were asked to bring. Pre-work that arrives in the meeting is not pre-work.

Set expectations on time. Half-day means half a day with no other commitments. Full-day means the same for a full day. Sessions that try to fit around other meetings produce fragmented thinking.

Identify the recorder. A named person captures the worksheet outputs in real time. The room agrees on what was decided when the worksheet shows it; without a named recorder, decisions are forgotten between sessions.

During the workshop

Start with the why. Open every session with a five-minute restatement of where this module sits in the practice and why the artifact it produces matters. Resist the temptation to skip the framing; without it, participants treat the worksheets as paperwork.

Score individually, then converge. For any scoring exercise, have participants score individually for five minutes before sharing. Anchoring is the most common bias; individual scoring before discussion mitigates it.

Surface disagreement explicitly. When scores diverge, the divergence is the data. Spend time understanding why two informed people score the same item differently; do not average to make the discomfort go away.

Capture evidence, not just answers. For every Yes / No / Tier A / accept-the-risk decision, record the supporting evidence. Without evidence the artifact is opinion; with evidence it is decision.

Honor the worksheet sequence. The worksheet sequence in each module reflects the build sequence of the practice. Out-of-order completion produces inconsistent artifacts. If the room wants to skip ahead, ask why; sometimes the skip exposes a missing pre-work item.

End on a written output. Do not let the session close without a written artifact (filled worksheet, signed brief, action list). The written artifact is the test of whether the session converged; a session that ends in conversation only has not yet converged.

Common dynamics and how to handle them

Optimism bias. The room scores higher than the evidence supports. Counter by requiring an example or evidence for every Yes.

Defensive scoring on heroics. Worksheet 1C feels accusatory. Counter by reframing: the heroic is the program's competence, not the program's problem. The worksheet captures unmanaged risk so the program can convert competence into discipline.

Solution-jumping. A finding leads immediately to a solution proposal before the diagnosis is complete. Counter by parking the proposal explicitly: "captured for Module 2"; "captured for Module 7." Then return to the diagnostic worksheet.

Status-quo defense. A senior participant defends current practice in language that prevents honest scoring. Counter by privately acknowledging the work that produced the current practice, then asking the participant to score on the standard (the worksheet anchor) rather than on the trajectory. The standard is the test, not the participant's judgment.

Data-gap deferral. "We can't score this until we have the data." Counter by asking what would change if the data confirmed the worst case versus the best case. Often the answer is the same: the program would still proceed. The deferral is delay, not analysis.

The post-workshop fade. Two weeks after the workshop, the artifacts are stale and unsigned. Counter by closing the workshop with a calendared commitment: who signs by when, who circulates by when, when the next session is. Calendared commitments survive; intent does not.

After the workshop

Circulate within 48 hours. The artifact loses fidelity quickly; circulation captures it while the room's understanding is still fresh.

Confirm the next module. The Roadmap Charter (Worksheet 2C) names the sequence; honor it. Modules taken out of sequence produce rework.

Set the review point. Every artifact has a review cadence (annual at minimum for most). Schedule the review at the time the artifact is signed; otherwise the artifact ages without anyone noticing.

Closing Note

This workbook is a starting point, not a destination. The forms, worksheets, and modules will be adapted to the organization's specific context, sector, and constraints. The textbook explains the *why*; this workbook supports the *how*; the practice itself is built one cycle at a time, sustained over multiple years, and refined continuously against operating reality.

The complete toolkit consists of four artifacts that work together:

Artifact	Purpose
The textbook	Explains the <i>what</i> and the <i>why</i> of advanced asset management
This Implementation Guide & Workbook	Walks through the <i>how</i> : concepts, exercises, prose templates
The Excel Workbook Companion	The program's <i>operational artifact</i> : scoring, lists, tracking, dashboard
The Self-Assessment Radar Tool (Excel)	Annual dimensional check across 25 capabilities

Use the Implementation Guide & Workbook to understand what each module is doing; use the Excel companion to actually do it and store the result. Use the Implementation Tracker (in both Word and Excel) to keep track of where the program is in the build sequence. Use the Maturity Self-Assessment annually and the Annual Refresh tab in Excel to capture year-over-year progress. Use the textbook as the reference when the question that comes up isn't answered by the form in front of you.

The goal is not perfection. The goal is progress: measurable, deliberate, and durable.

About the Author

Scott Stukel is an asset management consultant, speaker, and author, and the founder of Whites Elm Consulting. For more than three decades he has helped organizations across education, utilities, manufacturing, government, and infrastructure improve asset performance, reduce risk, and make informed investment decisions. His experience spans asset management strategy, facilities management, enterprise asset management systems, capital planning, maintenance optimization, and organizational transformation.

He is the author of *Advanced Asset Management: From Assets to Decisions*, the book this workbook accompanies. The worksheets, templates, and facilitation notes in these pages come out of the same practice, including the self-assessment radar tool he first developed in 2015 and has refined since.

Workshops and assessments

Every module in this workbook is designed to be run as a facilitated working session. Whites Elm runs them with client teams as workshops, and also provides assessment and maturity reviews, roadmap and strategy consulting, training, and speaking and advisory support. To talk through where your program stands and which module to start with, book a conversation at whiteselm.com/contact.

Download the Excel tools

The Excel companion, the Self-Assessment Radar Tool, and the current PDF of this workbook are free to download at whiteselm.com/book/workbook.



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