From Assets to Action: A Framework for Operational Readiness

Guiding effective preparation for successful operations

betterAIM
Better Asset & Information Management

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Agenda

- **Walkthrough Operational Readiness**
- **Share 3 Industry Case Studies**

Operational Readiness Defined

An asset is fully ready and available, and all ‘systems’ are in place to enable it to perform its intended function safely, reliably and efficiently.

The key elements are:

Functional capability
- The asset performs to its design specifications
- All systems, components, and integrations are working correctly

Reliability & maintainability
- Failure risks are understood and minimized
- Maintenance plans, spare parts, and support systems are in place

Safety & compliance
- Meets regulatory, environmental, and safety requirements
- Hazards are identified and controlled

Documentation & information
- Operating procedures, manuals, and asset data are complete and accurate
- Asset registers and maintenance systems are populated

People & training
- Operators and maintainers are trained and competent
- Roles and responsibilities are clearly defined

Support systems
- Tools, spare parts, logistics, and supply chains are ready
- Monitoring and control systems are operational

Testing & validation
- Commissioning, inspections, and performance tests are completed
- The asset has demonstrated it can operate under expected conditions

Covered today

From Assets to Action

Framing the Operational Readiness Challenge

Incomplete Asset Handover

Provision of Asset Information can often be overlooked during delivery and becomes an afterthought at project end.

Requirements aren’t always clear

Clearly defined Maintenance Strategy, Data Standards and Specifications aren’t readily available for the supply chain to deliver against.

Easier to adopt existing PMs for similar assets

A good plan, sometimes. The genesis of existing PMs can be unknown. Lack of maintenance effectiveness measures inhibits continuous improvement processes.

Focus is on Asset Delivery

Regardless of good intent, asset delivery partners aren’t typically skilled to produce effective maintenance plans ready for deployment to your CMMS.

Why This Matters

Symptoms of Poor Operational Readiness Processes

Incomplete Asset Data

Asset is in operation but isn't yet in the CMMS – No Asset Register, PMs, Parts, etc:

Work not captured/ Warranty dates lost/ Parts not on hand

Wrong Maintenance Strategies

PMs from existing assets applied to new asset to get something in the system:

PMs for wrong assets or assets that don't exist/ Low confidence leads to optionality/ disengagement

Incorrect Budget

Lack of clarity leads to poor understanding of lifecycle costs and incorrect maintenance budgets:

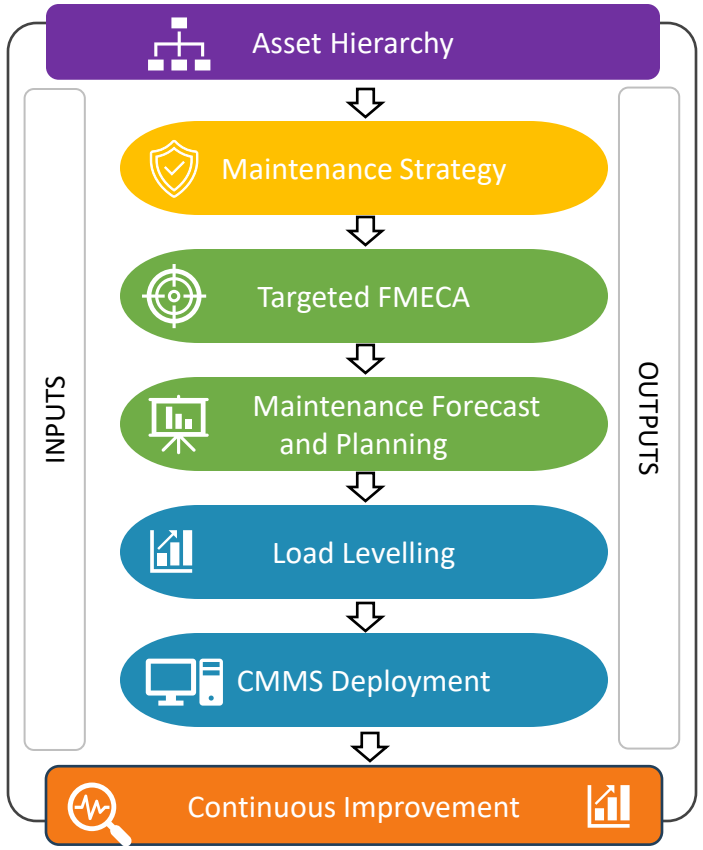
Insufficient budgets/ Absorb into existing budget/ Required resources not available

Strategy-Execution Gap

Assuming strategy is implemented leads to poor top-down decisions and frustration in the execution layer:

Budget cut with unknown impacts/ Unknown risk exposure

Framework at a Glance



Robust Asset Foundation
Establishing a detailed asset register and component hierarchy ensures reliable analysis and planning.

High Level Maintenance Strategy
Definition of strategy designed to achieve objectives and required Levels of Service.

Targeted FMECA Analysis
Failure Modes and Effects Analysis focused on critical assets - identifies failure behaviours and mitigation strategies.

Maintenance Forecast and Planning
Outputs translate into a XX-year forecast with resource planning and practical implementation strategies.

Load Levelling
Ensure maintenance deliverability through resource allocation constraints.

CMMS structuring and deployment
Structured interaction with asset, maintenance and operational teams to ensure maintenance is structured how work is done.

Continuous Improvement
Framework is structured to enable analysis and feedback to relevant framework element

3 Case Studies

Recent Real-Life experiences of where our simple framework delivered

Case Study 1 – New Asset being delivered

Case Study 2 – New CMMS to Standardise across multiple locations

Case Study 3 – Going to market for Maintenance Contractor

Case Study 1

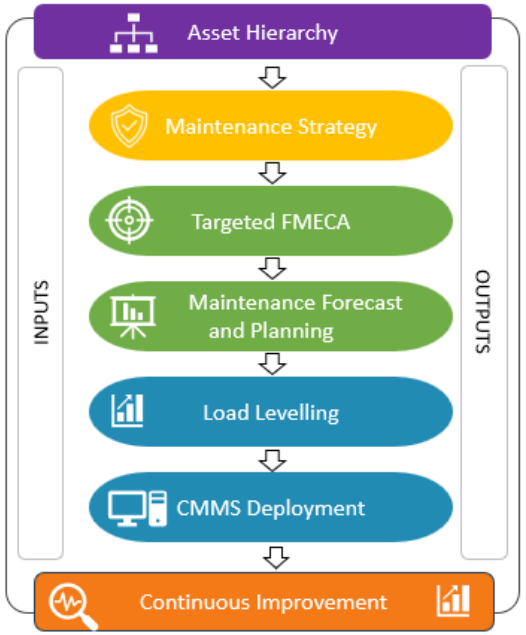
Maintenance Strategy for New Asset Delivery

Problem

A major rail infrastructure asset was being delivered without:

- a defined maintenance strategy,
- asset register, or
- understanding of lifecycle requirements.

This created significant risk that the asset would be commissioned without adequate maintenance planning, resourcing, or spares strategy leading to potential reliability and cost issues from day one.



Actions

- Build the asset hierarchy and register
- Develop maintenance strategy
- Translate strategy into executable maintenance plans
- Undertake load levelling and long-term forecasting
- Deploy to CMMS (IBM Maximo)

Case Study 1

Maintenance Strategy for New Asset Delivery

Outcomes

- Asset commissioned with a complete asset register and maintenance strategy
- Clear visibility of lifecycle costs, risks, and resource requirements
- Ability to revise application of strategy based on available workforce and budget
- Reduced risk of early-life asset failure and reactive maintenance
- Fully deployable maintenance plans integrated into Maximo

Key Lessons

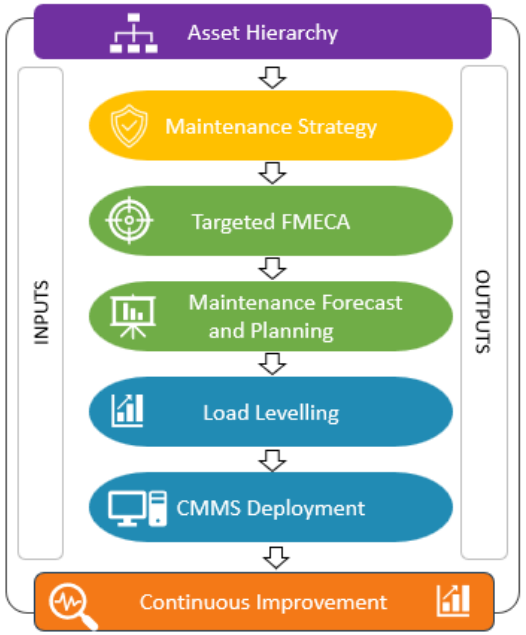
- Understand your maintenance delivery approach for new capital is incredibly important prior to engaging in construction contracts
- Skills to develop maintenance tactics are not always present in design and construction engineers
- Integrate your operations teams early to build effective PMs – consider practicality and deliverability
- Engage with your suppliers that will support your maintenance delivery SO1
- Ensure your master data has your outcome in mind. i.e. your classifications, hierarchy and level of componentisation support operational management

Case Study 2

Asset Data Capture & Maintenance Build for New CMMS

Problem

- A multi-port operation had inconsistent and incomplete maintenance practices across key asset classes, with gaps in planned maintenance for critical assets such as shiploaders, conveyors, sheds and berth infrastructure.
- A new CMMS was being deployed across sites to unify systems and processes.
- Existing maintenance data lacked standardisation.
- Limited alignment between strategies, FMEA, and execution systems.



Actions

- Standardise the asset data.
- Develop FMEA-driven maintenance tactics.
- Optimise maintenance plans through bundling, frequency optimisation, and operational constraints.
- Perform load levelling
- Deployment to new CMMS (MS D365)

Case Study 2

Asset Data Capture & Maintenance Build

Outcomes

- Consistent, standardised maintenance tactics across multiple port locations
- Enhanced visibility of maintenance workload and resource requirements
- Alignment between asset data, FMEA, and execution systems
- Fully integrated maintenance plans deployed into D365
- Improved reliability and reduced reactive maintenance across critical assets

Key Lessons

- Starting with the end in mind, know what you want to achieve by deploying consistency
- Start with asset data
- Focus on your critical equipment, remove noise
- FMEA doesn’t have to be an academic process. Start with the practical failure modes you can manage

Case Study 3

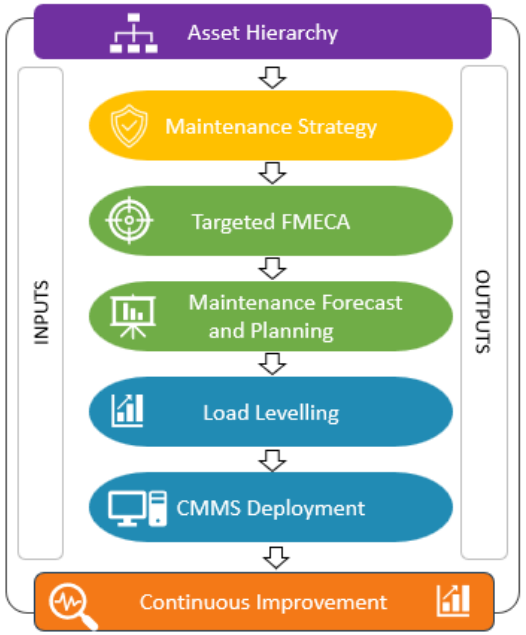
Maintenance Contract & Budget Strategy

Problem

A government corrections portfolio faced repeated challenges in procuring a long-term maintenance contract, with market bid variability that significantly exceeding available budgets.

There was limited clarity on:

- the true cost of maintaining assets,
- risk exposure, and
- minimum service requirements making it difficult to define a viable contract scope.



Actions

- Consolidated a unified asset and maintenance data environment
- Defined maintenance strategy and service requirements
- Prioritise maintenance based on risk and compliance
- Support contract specification and market engagement

Case Study 3

Maintenance Contract & Budget Strategy

Outcomes

- Clear understanding of minimum viable maintenance spend vs risk exposure
- Ability to align contract scope with available budget
- Improved market engagement through well-defined requirements
- Reduced risk of over-scoped or unaffordable contracts
- Establishment of a defensible, risk-based maintenance strategy for long-term planning

Key Lessons

- Contracting services for maintenance without a focus on overall maintenance strategy allows for variability in outcomes.
- A clear, simple decision-making framework helps to prioritise maintenance needs and risk.
- Understanding the trade-off to service provision, for maintenance expenditure is imperative to continue to delivery lifecycle value.

Key Takeaways

1. Start with Execution in Mind

- Strategies must be deployable into CMMS and operations
- If it can’t be executed, it has no value

2. Asset Data is the Foundation

- Non-standard hierarchies and incomplete registers drive poor outcomes
- Engineering data ≠ maintenance-ready data

3. Keep FMEA Practical

- Focus on actionable failure modes
- Link directly to maintenance tasks and decisions

4. Implement It

- The organisation will make high-level decisions assuming it is in place
- If you don't, you know the symptoms…..

Thank you for Listening.

Any Questions?

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From Assets to Action: A Framework for Operational Readiness

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Abstract This paper presents a series of applied case studies demonstrating a proven approach to achieving operational readiness and establishing sustainable, long-term asset management practices across multiple organisations and industries. Drawing on deployments undertaken in several Australian states, the work illustrates how a structured, data-driven methodology can transform fragmented maintenance activities into coherent, strategy-aligned asset management programs.

At the core of the approach is the systematic development of a robust asset register and component hierarchy, providing the foundation for consistent asset identification and analysis. A criticality assessment is then applied across the register to prioritise assets based on consequence, likelihood, and operational impact. This forms the basis for developing a high-level maintenance strategy that defines what should be maintained, how, and at what intervention points, culminating in targeted Failure Modes and Effects Analysis (FMEA) for critical assets.

Insights from the FMEA process are translated into actionable maintenance forecasts, including long-term programs allocating resources, materials, and consumables. The forecasting process integrates labour modelling, contractor benchmarking, and spares optimisation, supported by decision frameworks that guide what to hold, where to store it, and what to outsource.

The outcome is an operationally ready maintenance program aligned to organisational strategy, costed for budget planning, and fully supported by the necessary people, materials, and systems. By focusing on practical delivery and repeatable digital processes, this approach provides a scalable pathway for organisations to move from reactive maintenance toward predictive, sustainable asset management maturity.

Keywords Operational readiness, asset management, maintenance strategy, FMEA, CMMS, forecasting, asset hierarchy

1 Introduction

Across asset-intensive organisations, significant effort has been invested in developing asset management strategies aligned with recognised standards such as ISO 55001. These strategies typically articulate clear objectives around safety, reliability, service levels, and cost optimisation. However, despite this strategic maturity, many organisations continue to struggle at the operational layer.

Maintenance activities are often fragmented, reactive, and influenced by short-term pressures rather than long-term intent. Asset data exists but is not structured in a way that supports decision-making. Planning processes lack consistency, and resource allocation is frequently contested. This disconnect between strategy and execution represents one of the most persistent challenges in asset management.

Operational readiness addresses this challenge. It is not about developing more strategy, collecting more data, or introducing additional tools. It is about ensuring that asset intent is translated into executable, funded, and resourced work that can be delivered through existing systems.

This paper presents a practical framework for achieving operational readiness, supported by applied case studies across ports, rail, and government infrastructure. The focus is on delivery. The framework demonstrates how organisations can move from fragmented asset practices to structured, repeatable maintenance programs that align strategy with execution.

2 Framing the Operational Readiness Challenge

The gap between strategy and execution is not unique to any single industry. It is a systemic issue observed across sectors. Organisations often have well-developed asset strategies, risk frameworks, and policies, yet struggle to translate these into day-to-day operational decisions.

This gap manifests in several ways. Maintenance becomes reactive, driven by failures rather than planning. Critical assets compete with non-critical assets for attention due to a lack of prioritisation. Resource allocation is influenced by historical practice rather than risk-informed decision-making. As a result, organisations are unable to clearly demonstrate why work is being undertaken, how it aligns with strategy, or whether it represents optimal use of resources.

The consequences are significant. Reactive maintenance consumes disproportionate effort, long-term planning is undermined, and asset performance is compromised. In regulated environments, this also creates challenges in demonstrating compliance and justifying investment decisions.

Operational readiness reframes this problem. It shifts the focus from compliance and documentation to delivery and execution. It asks a simple but critical question: are we ready to deliver our strategy in practice?

3 Framework for Operational Readiness

The framework presented in this paper provides a structured, end-to-end pathway for translating asset knowledge into executable work. It links a series of interdependent steps that progressively build from foundational asset data through to system-ready maintenance programs.

The starting point is the establishment of a robust asset register and component hierarchy. This provides the foundation for all subsequent analysis. Without a consistent and maintainable asset structure, downstream processes such as criticality assessment and maintenance planning lack reliability.

Once the asset foundation is established, a criticality assessment is applied across the asset base. This step ensures that effort is prioritised based on operational risk, considering consequence, likelihood, and impact. Criticality provides a clear basis for decision-making and ensures that resources are directed where they deliver the greatest value.

A high-level maintenance strategy is then developed. This defines what should be maintained, how it should be maintained, and at what intervention points. The strategy sets direction without becoming overly detailed, allowing for focused analysis where it matters most.

Targeted Failure Modes and Effects Analysis (FMEA) is then applied to critical assets. The approach is deliberately practical. Rather than attempting exhaustive analysis, the focus is on identifying failure modes that can be actively managed. This ensures that outputs are directly linked to actionable maintenance tasks.

Outputs from the FMEA process are translated into long-term maintenance forecasts. These forecasts define workload, resource requirements, and cost implications over a defined planning horizon. They incorporate labour modelling, contractor benchmarking, and spares optimisation, ensuring that plans are both realistic and deliverable.

Load levelling is then applied to ensure that maintenance demand aligns with available resources. This step is critical in moving from theoretical plans to executable programs. Finally, maintenance plans are structured and deployed into CMMS platforms, enabling scheduling, execution, and ongoing management.

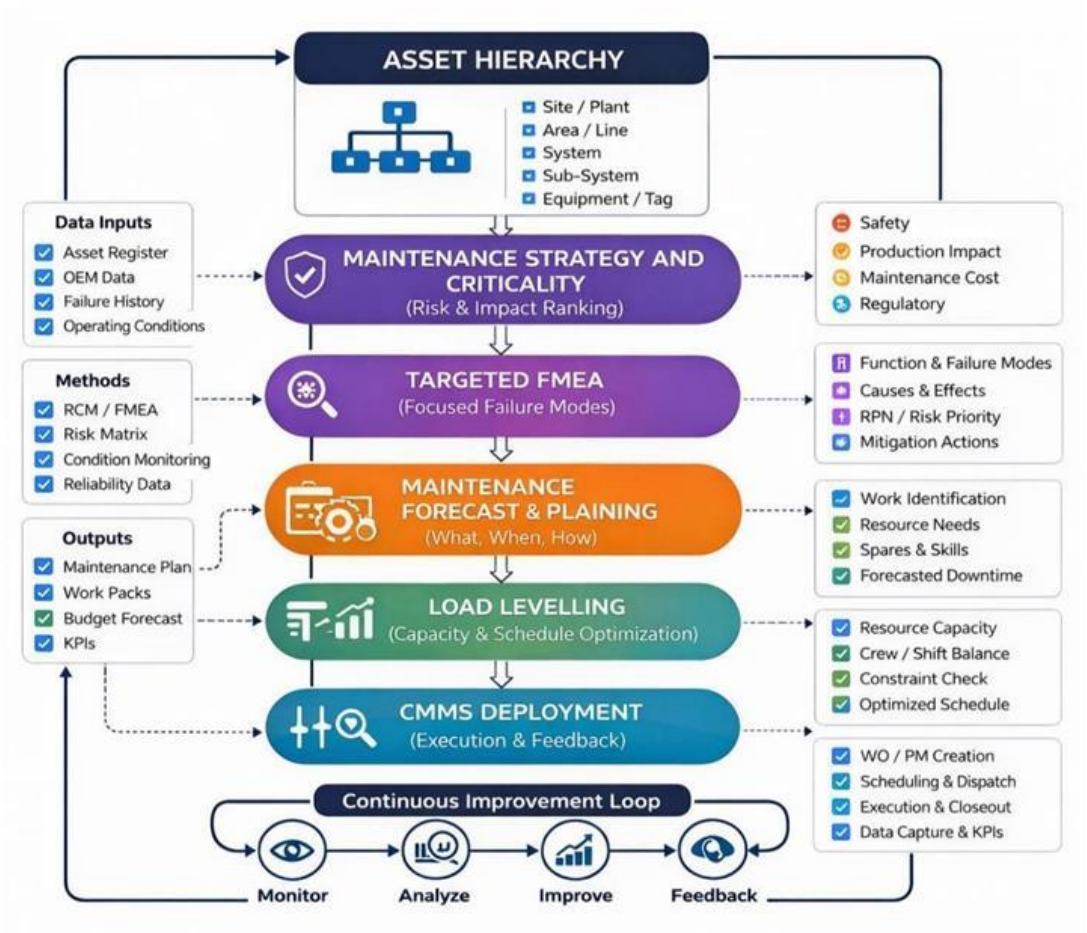

Figure 1 BetterAIM Framework for Operational Readiness

3.1 From Strategy to Execution

A defining characteristic of the framework is its focus on execution. Each step is designed with the end state in mind: the creation of work that can be delivered through operational systems.

This requires a shift in how asset management activities are approached. Asset registers must be structured for maintenance, not just engineering representation. FMEA must be practical and directly linked to tasks. Maintenance strategies must consider workforce and budget constraints. Forecasts must be aligned to how work is actually delivered.

The framework ensures that there is a clear line of sight from asset data through to work orders. This alignment is what enables organisations to move from intent to action.

The framework demonstrates how regional collaboration can be used to address common challenges and accelerate capability development. It provides a practical example of how knowledge can be shared across organisations in a way that is structured, sustainable, and aligned with asset management principles.

At a sector level, the Playbook highlights the importance of moving beyond static guidance towards dynamic, system-based approaches. This is particularly relevant as utilities continue to adopt digital technologies and generate increasing volumes of data.

4 Case Study 1: Ports – Asset Data Capture and Maintenance Build

A multi-port operation was managing a diverse portfolio of critical assets, including shiploaders, conveyors, and berth infrastructure, across multiple sites. Despite the scale and importance of these assets, maintenance practices were inconsistent and largely reactive. Planned maintenance coverage was incomplete, and where it existed, it lacked standardisation across sites. This created variability in reliability outcomes and limited confidence in maintenance planning.

At the same time, the organisation was deploying a new CMMS platform (D365) to unify systems across sites. However, the underlying asset and maintenance data environment was not aligned to support this transition. Asset hierarchies were inconsistent, classification structures varied, and there was limited linkage between asset strategies, FMEA outputs, and executable maintenance plans.

The intervention began with the establishment of a standardised asset maintenance data environment. This involved designing and implementing a centralised data model aligned to the CMMS, integrating asset hierarchies, classifications, and failure mode structures. The focus was not on replicating engineering data, but on creating a maintainable asset structure that could support planning and execution.

With this foundation in place, a targeted FMEA process was applied across critical asset classes. Historical work orders and failure data were reviewed to identify practical failure modes, rather than theoretical ones. Maintenance tactics were then developed and standardised through class-based libraries, ensuring consistency across similar assets and sites.

Maintenance plans were subsequently optimised by considering operational constraints. Tasks were bundled where appropriate, frequencies were adjusted to balance risk and effort, and alignment with CMMS capabilities was ensured. This step was critical in avoiding over-engineered plans that could not be executed in practice.

Load levelling was then applied to balance maintenance demand with available resources across sites. This provided visibility of workload over time and enabled realistic scheduling. The final step involved structuring and deploying the maintenance plans into D365, ensuring that all outputs were fully executable within the system.

The outcomes were immediate and measurable. The organisation achieved consistent maintenance tactics across all ports, improving reliability and reducing reactive maintenance on critical assets. Visibility of workload and resource requirements improved significantly, enabling better planning and decision-making. Most importantly, alignment was achieved between asset data, analysis, and execution systems, creating a sustainable foundation for ongoing improvement.

A key lesson from this case is the importance of starting with the end in mind. The design of asset data, FMEA, and maintenance plans must be driven by how work will ultimately be executed. Without this alignment, even well-developed strategies fail to deliver value in practice.

5 Case Study 2: Rail – Maintenance Strategy for New Asset Delivery

A major rail infrastructure asset was approaching commissioning without a defined maintenance strategy, asset register, or understanding of lifecycle requirements. This presented a significant risk. Without structured maintenance planning, the asset would enter operation with no clear approach to managing reliability, resourcing, or spares, effectively locking in inefficiency from day one.

This situation is not uncommon in capital delivery environments, where the focus is often on design and construction, with maintenance introduced too late in the process. As a result, engineering data is available, but it is not structured in a way that supports operational management.

The intervention focused on establishing operational readiness prior to commissioning. The first step was to build a fit-for-purpose asset hierarchy and register, leveraging existing engineering documentation but translating it into a structure aligned to maintainable components. This ensured that the asset base could support maintenance planning and execution.

A high-level maintenance strategy and decision framework were then developed. This defined the philosophy for how the asset would be maintained, including intervention approaches, inspection regimes, and risk-based prioritisation. This step provided clarity and direction, ensuring that subsequent analysis was aligned to organisational objectives.

FMEA was then applied across the asset register to identify failure modes and determine required maintenance tactics. The approach was deliberately practical, focusing on failure behaviours that could be actively managed. Outputs were directly linked to maintenance tasks, ensuring traceability between analysis and execution.

These insights were translated into executable maintenance plans. Tasks were grouped by asset class and operational requirements, and detailed resource needs were defined, including labour, skills, and spares. A long-term maintenance forecast was developed, enabling scenario testing of strategy against resource constraints and risk tolerance.

Load levelling ensured that the maintenance program was achievable within available resources. The final step involved structuring all data and plans for deployment into IBM Maximo, ensuring seamless integration with operational systems.

The asset was commissioned with a complete, structured maintenance strategy, providing immediate operational readiness. The organisation gained clear visibility of lifecycle costs, risks, and resource requirements, enabling informed decision-making from the outset. The risk of early-life failure and reactive maintenance was significantly reduced.

A critical lesson from this case is the importance of integrating maintenance into capital delivery. Maintenance strategy, asset structure, and operational planning must be developed alongside design and construction, not after. This ensures that assets are delivered not just as physical infrastructure, but as operationally ready systems.

6 Case Study 3: Corrections – Maintenance Contract and Budget Strategy

A government corrections portfolio faced ongoing challenges in procuring a long-term maintenance contract. Market bids consistently exceeded available budgets, and there was limited confidence in the organisation's ability to define a viable contract scope. The underlying issue was a lack of clarity around maintenance requirements, risk exposure, and service expectations.

Asset data was fragmented across facilities, and maintenance practices varied significantly. Without a structured understanding of what needed to be maintained and why, it was difficult to engage the market effectively or justify investment decisions.

The intervention began with the consolidation of a unified asset and maintenance data environment. Disparate asset registers were brought together into a common data model, providing a consistent foundation for analysis and planning. Maintenance requirements were structured across facilities, enabling comparison and standardisation.

A maintenance strategy was then defined through a series of workshops involving key stakeholders. This process aligned maintenance approaches with organisational risk appetite and budget constraints. Levels of service and performance measures were clearly articulated, providing a basis for contract specification.

A critical component of the approach was the differentiation between minimum viable maintenance and optimal maintenance. Minimum maintenance was defined as the level required to meet compliance and manage critical risks. Optimal maintenance extended beyond this to support lifecycle performance and asset longevity. This distinction provided clarity in decision-making and enabled transparent trade-offs between cost and service.

Maintenance activities were prioritised based on risk and compliance requirements. Legislative obligations and high-risk activities were clearly identified, ensuring that essential work was protected. This prioritisation framework provided a defensible basis for resource allocation.

The framework then supported the development of a clear contract scope and governance structure. This enabled more effective engagement with the market, reducing uncertainty and improving the quality of bids received.

The outcome was a risk-based, defensible maintenance strategy aligned to available funding. The organisation was able to align contract scope with budget constraints, improve market engagement, and reduce the risk of over-scoped or unaffordable contracts. Importantly, it established a sustainable approach to long-term maintenance planning.

A key lesson from this case is the importance of clearly defining the relationship between risk and expenditure. Without this clarity, organisations are unable to make informed trade-offs, and the market will price uncertainty accordingly.

7 Sustaining Value Through Continuous Improvement

Operational readiness is not a one-time achievement. It requires ongoing refinement as assets operate and new information becomes available.

The framework embeds a feedback loop that links operational performance back to maintenance strategies and FMEA insights. As work is executed, data on asset performance, failure behaviour, and task effectiveness is captured and analysed. This information is used to refine strategies, adjust maintenance intervals, and optimise resource allocation.

This process supports both technical and organisational learning. It enables continuous improvement in maintenance practices and strengthens confidence in data-driven decision-making. Over time, organisations can transition from reactive maintenance toward predictive and preventative approaches.

Governance plays a critical role in sustaining this value. Regular review cycles ensure that maintenance programs remain aligned with changing operating conditions, budgets, and risk profiles.

8 Key Insights for Practice

Across all case studies, several consistent themes emerge. Operational readiness must be designed with execution in mind. If strategies cannot be deployed into operational systems, they do not deliver value. Asset data must be structured to support maintenance, not just engineering representation. FMEA should focus on actionable insights rather than theoretical completeness.

Maintenance must be integrated early in capital delivery to avoid locking in inefficiencies. Standardisation provides the foundation for scalability, while optimisation can then be applied at a local level. Finally, there must be clear alignment between strategy, resources, and risk, ensuring that plans are both achievable and defensible.

9 Conclusion

Operational readiness represents the point at which asset management moves from intent to action. It is where strategy, data, and planning converge into executable work that delivers measurable outcomes.

The framework presented in this paper demonstrates that operational readiness is not dependent on new systems or complex methodologies. It can be achieved through disciplined, structured delivery that aligns asset data, risk, and execution.

By focusing on practical application, repeatability, and integration with existing systems, organisations can move beyond reactive maintenance toward proactive, sustainable asset management. The case studies illustrate that this approach is applicable across industries and asset types, providing a scalable pathway for improving performance and resilience.

Ultimately, the shift from assets to action is not a conceptual change, but an operational one. It requires organisations to focus on how work is defined, prioritised, and delivered. When this alignment is achieved, asset management becomes not just a framework for planning, but a system for delivering value in practice.