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ASSET MANAGEMENT COUNCIL

VALUE OF USING ASSET MANAGEMENT MODELS

Developing & embedding a lifecycle model within an operational business

Asset Lifecycle Accountability Framework

Enhanced Framework to Balance Cost, Risk and Performance in Railways using ISO 55000 based Key Performance Indicators

From Reflection to Foresight: GenAI's Role in Infrastructure Asset Management

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ERNST KRAUSS

EDITOR IN CHIEF

When we started talking now nearly 30 years ago about Asset Management (that is the lifecycle management of Assets) as a method to optimise Asset usage, risk and cost management and how to deliver better production systems, we all had ideas that we tried to articulate. We drew many maps that originated at brainstorming sessions and realised that we all had similar but still different ideas. But ideas alone cannot provide a valid roadmap to success. Eventually models emerged that allowed the decisive identification of what Asset Management could and should look like or at least show what is involved.

Over the years, a range of asset management models have been developed by many, each intending to give a comprehensive view on the complexities of Asset Management Systems and to identify their essential components. Whether through the interconnected models of the Asset Management Council, the Institute of Asset Management's framework comprising six core elements, the Institute of Public Works Asset Management models, or various other contemporary methodologies found in the digital domain, the primary and common aim is to deliver clarity and structured insight. These models enable us to visualise the entirety of an asset system, thereby facilitating the identification of critical elements necessary for robust and effective asset management.

From these base models, we can systematically identify critical parts required for an effective Asset Management System. From there we develop appropriate process maps, responsibility allocation and develop the detailed procedures that enable the effective operation of the Asset Management System. My own experience is that the more rigorously defined the selected model is, the easier it becomes to create the transition plans from the current state to the desired future state and create the change management strategies and plans.

Guiding clients through the complexities of an Asset Management System and its constituent components can be a significant challenge. When I used models that not only showed the building blocks but identified how strategic plans, tactical plans and enabling systems come together to provide a complete system, the understanding of the scale of the changes required often accelerated and created additional and specific ideas how to tailor the System to an Organisation's strategic intent.

I would therefore summarise the value of Asset Management models as critical communication tools, enabling accelerated understanding of complex systems and interdependencies, providing clarity on requirements and enable effective planning. My experience tells me that without such Asset Management models, we cannot effectively engage with Stakeholders and across an organisation to achieve the objectives of Asset Management. What is your experience?

We value your feedback and hope that you find inspiration in this volume of "The Asset" where there is more to be found about Asset Management models and their value.



FROM MY DESK: NATIONAL CHAIR'S LETTER

NATIONAL CHAIR, TOBY HORSTEAD

This edition of The Asset Journal is set to focus on the value of using asset management models. For me asset management models are a metaphor for asset management as a practice. It makes sense to use them and the concept is seemingly simple, but if it becomes too detailed the value is lost.

This leads me to recall a famous quote "All models are wrong". The aphorism is generally attributed to George E. P. Box - British Statistician

When I hear "asset management model" I usually think of an asset management framework. But as a model is a representation of a concept then this could take on many forms. Like a risk matrix is a model used to support risk assessments, and an image showing the balance of cost risk and performance is a model for outcomes from asset management.

I would confidently say that an accepted and understood asset management framework model is critical to the success of the implementation of an asset management approach within an organisation. That model must be representative of an organisation, in their image, and not just the application of a theoretical model.

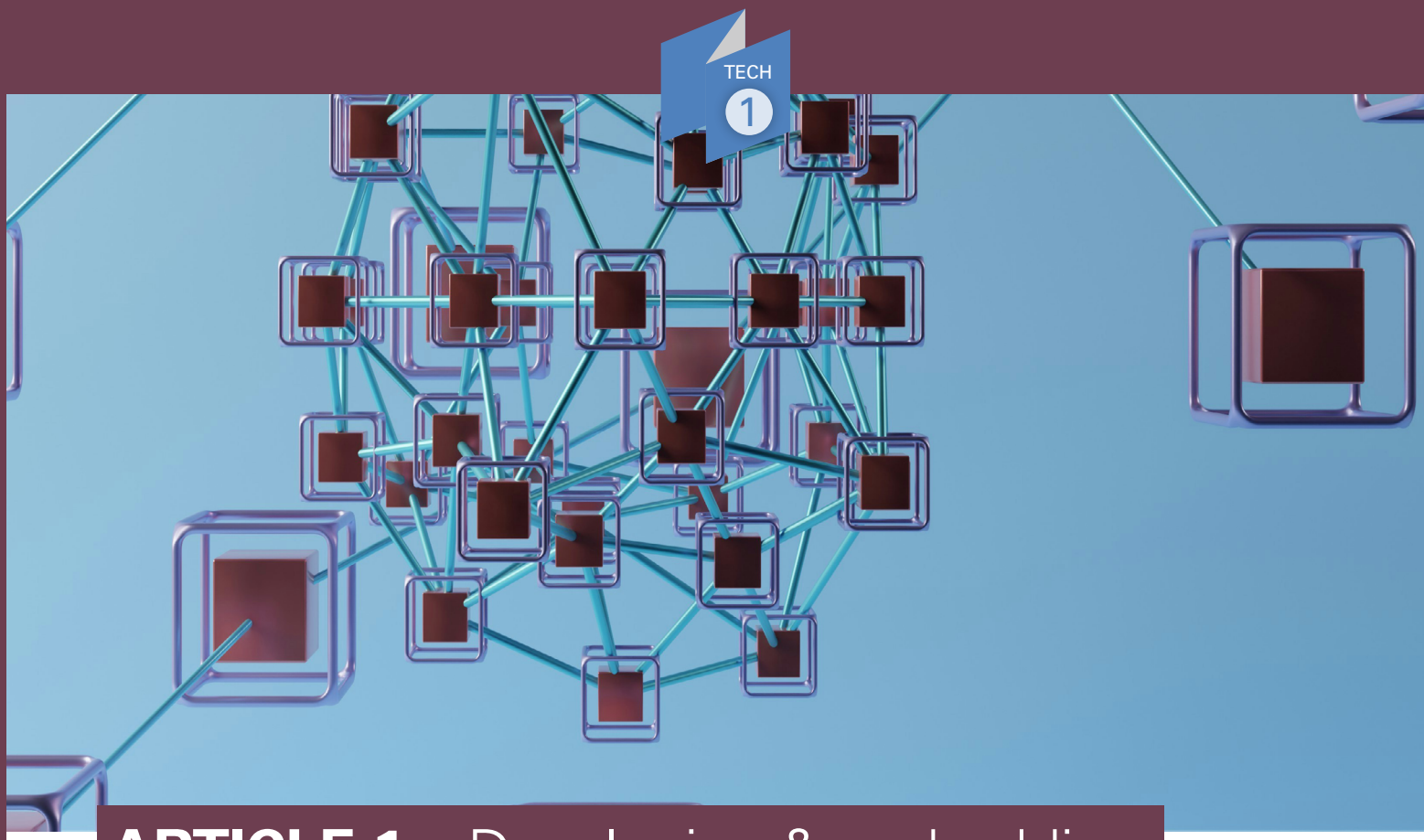
There is a challenge though; how to simply represent all the elements of an asset management system that interact together vertically and horizontally, that shows a life cycle approach, and expresses this at the strategic, tactical and operational levels? Well to assist our members in thinking about this frame this is exactly what the three AM Council AMBoK models do. The strategic level concept model, the tactical level systems model and the operational level capability model.

The challenge still comes back to creating an asset management model that resonates and integrates within an organisation. It must be a good communication tool that is simple enough but still shows enough detail to be useful.

When at Transport for NSW back in the 2010's I championed the development of the Asset Management Framework model and accompanying Life Cycle models. The models used the corporate colours of the transport modes and language that resonated with Transport for NSW.

Evidence of the acceptance and success of the models is that evolutions of the models are still in use today. Perhaps the greater evidence of the success of the Transport for NSW models, and Asset Management permeating contemporary culture is their appearance in Series 5 Episode 8 of Utopia "Wide Awoke". Check out the walls of the conference room between minutes 5 to 8 and between 19 to 23.

I am confident that this issue of The Asset Journal will be valuable in assisting members think about how models can support the expressing and operationalising asset management.



ARTICLE 1 – Developing & embedding a lifecycle model within an operational business

Hudson Dowell, Downer

SUMMARY

The following paper describes the approach Downer applied to develop, deploy and maintain an asset lifecycle modelling tool as part of a pilot project at the one of Downer's Public Private Partnership (PPP) contracts. Within the context of the pilot project, the model had to bring together disparate groups of information to produce a robust and transparent forecast cost at completion, while also providing the contract team the ability to maintain the forecasting tool. This paper will discuss the model processes applied, critical steps and key lessons learnt.

Keywords: Lifecycle, ISO55001, Asset Management Fundamentals, Change Management, Process Change, Lifecycle Modelling

1 THE PROJECT

A strategic projects team was tasked with validating lifecycle modelling processes, increasing business capability in asset management and embedding core lifecycle forecasting principles within the pilot project contract.

One of the pilot project outcomes produced a lifecycle modelling tool built from the core Downer Group asset management standards & processes that provides robust lifecycle forecasts that are measurable against delivery, financial and governance functions alike. This tool formed part of a capability review and devel- opment piece of the project, embedding asset management processes into the operational business to enable data driven & governable lifecycle management decision making going forward for all PPPs within Downer.

2 THE MODELS

The lifecycle models produced have asset information from all equipment and systems supporting the de- livery of the contract and guides have been written to assist the team through a series of asset management decisions to produce a validated and common format lifecycle forecast that can be reported to various stakeholders.

With the inputs driving the lifecycle model existing across multiple asset information systems, often with marginally different (but digitally significant) ways of categorising the information against the assets, a consolidation exercise was required in the front end to be able to bring together and provide traceability between these vital pieces of data in and in a common language format.

Figure 1 describes the overarching process that was developed for the lifecycle model and how the core process areas interrelate. These fundamental processes formed the building blocks and allowed for data gap analysis to be conducted, with an established data structure to measure against for information quality re- quirements. As shown in the figure, bringing together the maintenance and renewal & replacement costs to be considered holistically is essential in achieving lifecycle results for an asset; both financially and oper- ationally. Structuring the model with this concept in mind supported that cultural change in how assets are viewed in a whole of life context.

Some of the key requirements was the ability to challenge the data through the transparency of the models; allowing the site team to review and use the tool, while providing the necessary financial and governance outputs, such as Work Breakdown Structure and Cost Coding. This led to the project team utilising acces- sible platforms and developing customised reporting functions to the relevant business levels.

A key part of developing the model was creating those linkages between those differing functions and classifying assets. Figure 2 demonstrates the connections of competing hierarchies and how they can be attributed, ultimately providing greater flexibility in reporting and transparency of the data.

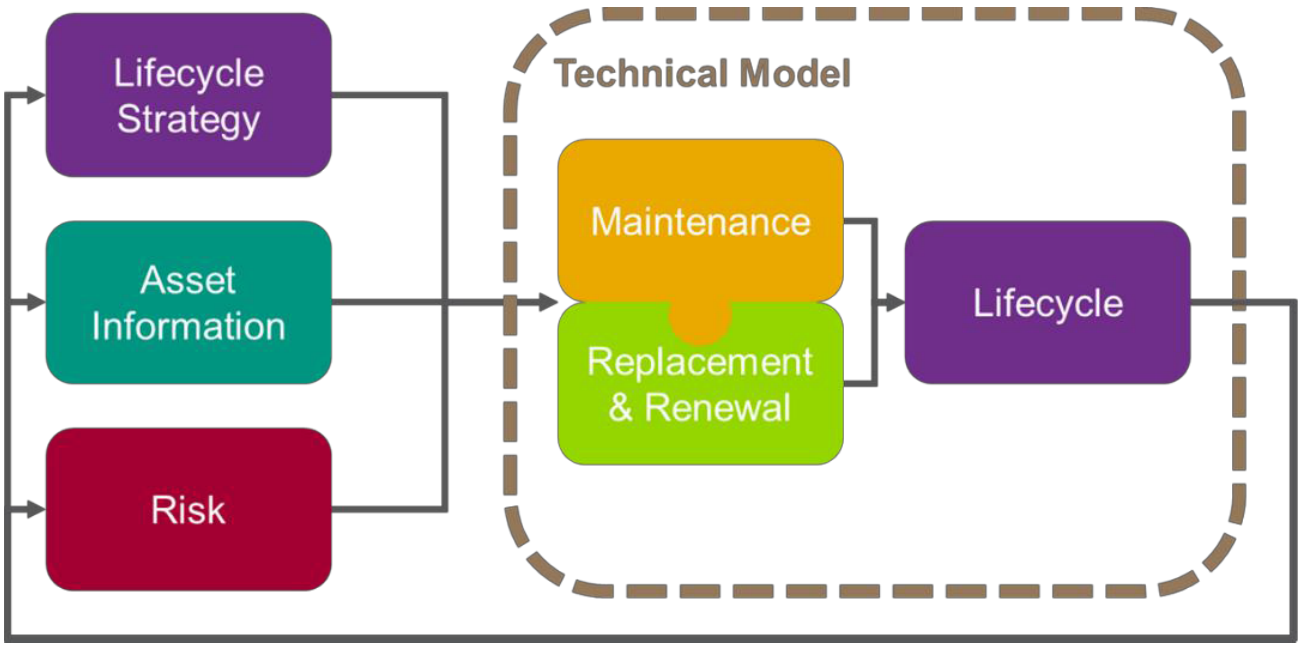


Figure 1: Overview of the lifecycle model process

When ap- proaching this type of work, selecting what level of detail to create those linkages is critical; whilst many- to-one and one-to-many relationships may be unavoidable due to legacy systems, working at the finest level of detail does allow for more accurate linkages to be developed.

The functionality and calculations of the model itself were re-evaluated from the ground up, drawing from asset management fundamentals to establish a transparent yet robust forecasting capability and empower the team to make informed lifecycle decisions for the assets. Stripping back the processes and evaluating exactly what asset information was available, the integrity of the data, and the capacities of our teams to maintain the information lead to a number of decisions around what a sustainable forecast looked like, and what the roadmap is to refine and improve the accuracy.

Figure 3 shows a a simple input / output diagram that was used in development of the lifecycle model, for testing and training purposes. When utilising fundamental asset management principles in forecasting, the accuracy of the forecast ultimately comes down to two key factors; the quality of the data, and the capability of the model operator. Therefore, it was essential to ensure our teams were conversant in using the model, and to have an awareness of our data quality and the potential impact those factors may have on the fore- casting accuracy. The approach was a series of training packages, awareness sessions and handover sessions to ensure our teams were left with the capability and confidence to operate the model.

3 THE LESSONS LEARNT & NEXT STEPS

With the models being used operationally for more than a year now, there has been a series of improvements undertaken, lessons learnt, and plans developed for the next phase.

The first year of operation brought about changes to formats & structures, additional information require- ments to better suit the business and how they operate. Downer has also expanded on how the anonymised data can be used internally to better inform other business decisions and functions to foster smarter asset spending. This is supported

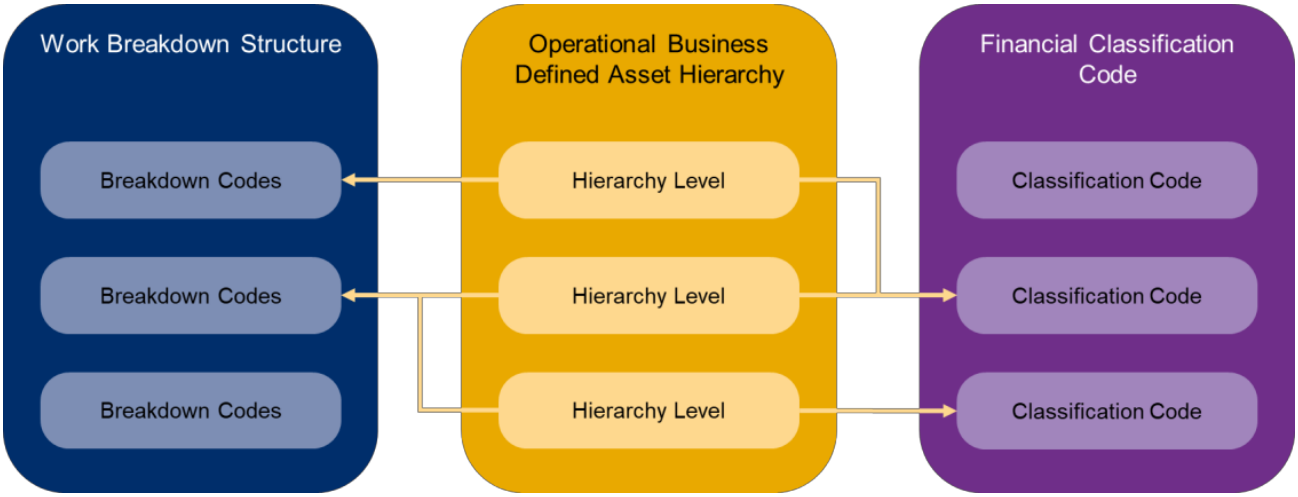


Figure 2: Connections formed between classification methods

by standardised asset information structures and processes that enable mean- ingful data to be developed and shared within the business. All these advances could not be achieved with- out the capability of the operational team, and as such the ongoing training, support and business ownership is essential for successful outcomes.

4 CONCLUSION

The pilot project that Downer undertook was deemed successful, with a robust and transparent forecast being produced, and more importantly, embedded with the business to allow the operational team to con- tinue producing comparable forecasts going forward. Looking to the future, planning is underway to pro- gress these models to improve connection speeds, reduce system maintenance and refine forecasting accu- racies across the portfolio of contracts. These are all areas that users of the models, from all functions of the business, have expressed interest in and believe will provide increased efficiencies for our teams. Ulti- mately, the users will have the most experience-based knowledge on how these systems perform, and it is the responsibility of those managing the development to utilise the operator knowledge for the valuable resource that it is.

		Outputs				
		Maintenance Costs	Replacement & Renewal Costs	Lifecycle Costs	Risk	Customer Experience
Inputs	Decrease acceptable condition thresholds		-	-	+	-
	Increase maintenance spend on assets	+		+	-	+
	Change the asset lifecycle strategy	↕	↕	↕	↕	↕
	...					

Figure 3: Simplified Input / Output table of the lifecycle model

TECH 2



ARTICLE 2 – Asset Lifecyle Accountability Framework

Charmaine Quick, Goulburn Murray Water
Dr Frédéric Blin, Quang Ly & Elise Wright, AECOM

SUMMARY

Goulburn Murray Water (GMW) collaborated with AECOM to develop an Asset Lifecycle Accountability Framework. This initiative aimed to optimize the delivery of asset management activities, ensuring reliable service through enhanced efficiency, improved maintenance strategies, and clear accountability. The project introduced swim lane flowcharts to delineate accountability amongst each General Manager and Senior Leadership Team member. Key outcomes include improved maintenance processes, consistent terminology, and a formalized maintenance strategy. The framework supports a culture of productivity and risk mitigation and has contributed to the efficient management of GMW's assets. This streamlined approach ensures the continued provision of high-quality water services for the Northern Victorian community.

Keywords: Asset Management, Asset Lifecycle Accountability Framework (ALAF), Strategic Asset Management Plans, Corporate Strategy, Productivity and Maintenance Optimisation, Swim Lane Flowchart

SUMMARY

Goulburn Murray Water (GMW) collaborated with AECOM to develop an Asset Lifecycle Accountability Framework. This initiative aimed to optimize the delivery of asset management activities, ensuring reliable service through enhanced efficiency, improved maintenance strategies, and clear accountability. The project introduced swim lane flowcharts to delineate accountability amongst each General Manager and Senior Leadership Team member. Key outcomes include improved maintenance processes, consistent terminology, and a formalized maintenance strategy. The framework supports a culture of productivity and risk mitigation and has contributed to the efficient management of GMW's assets. This streamlined approach ensures the continued provision of high-quality water services for the Northern Victorian community.

Keywords: Asset Management, Asset Lifecycle Accountability Framework (ALAF), Strategic Asset Management Plans, Corporate Strategy, Productivity and Maintenance Optimisation, Swim Lane Flowchart

1 INTRODUCTION

Goulburn Murray Water is Australia's largest rural water corporation, servicing more than 25,000 customers in Northern Victoria (Figure 1) (Anon., 2025). GMW services support a range of agricultural industries including dairy, cropping and horticulture, which are key to continued prosperity in the Northern Victorian community. To continue providing a strong and reliable service, GMW identified an opportunity to review its RACI (responsibility, accountability, consult and inform) matrix and develop an accountability framework in the form of swim lane flowcharts to identify which roles are accountable for key processes and functions.

Effective Asset Management is an organizational effort, where the accountability and responsibility of all members of the corporation should be clearly defined and delineated. A study of water infrastructure management in Canada suggested that 'there is a clear need for formalizing the assessment of organizational performance and its competency to manage assets' effectively (Esmaili & El-Diraby, 2017). ISO 55001:2024 echo and supports the idea that a formal review of asset management practices at an organizational level is key to effectively planning and delivering the level of service and desired outcomes to GMW's stakeholders and customers.

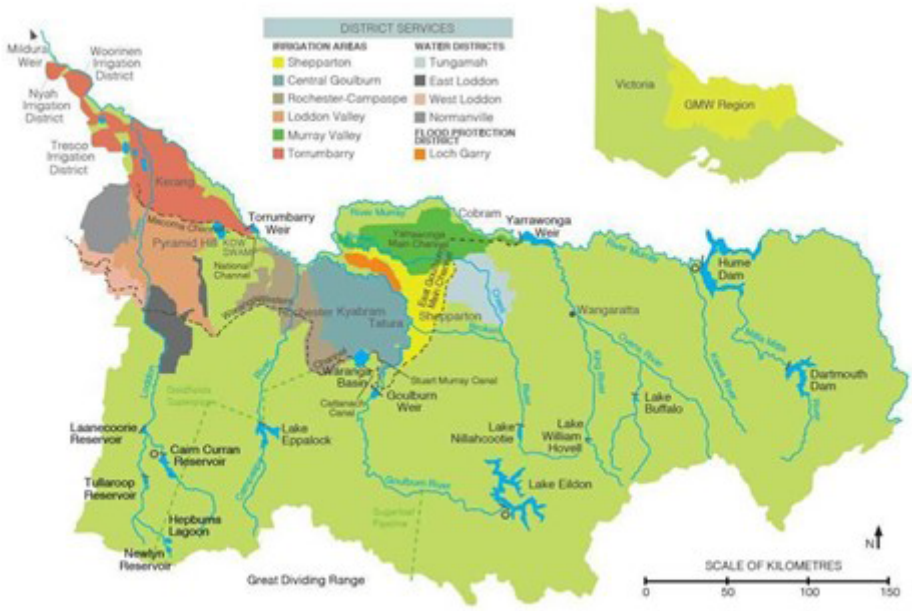


Figure 1: Goulburn Murray Water Service Map (Anon., 2025)

GMW collaborated with AECOM to develop an Asset Lifecycle Accountability Framework to establish well-defined accountability, endorsed by General Managers (GMs) and the Senior Leadership Team (SLT). Leadership commitment, through the endorsement of the framework, is critical for sustainable organisational change (Lafraia & Hardwick, 2013).

The key objectives for the Asset Lifecycle Accountability Framework were to:

- Develop a clear delineation of accountability for GMW's General Managers and Senior Leadership Team against the asset management lifecycle processes.
- Enable roles to be accountable for their actions, decisions and performance.
- Deliver performance improvements and realignment of the accountabilities and reporting lines to ensure the asset value chain is being managed as efficiently as possible.
- Introduce visual representation of the process to clearly communicate accountability to all personnel.

2 METHODOLOGY

Figure 2 outlines a flowchart of the methodology undertaken to address the objectives of the project

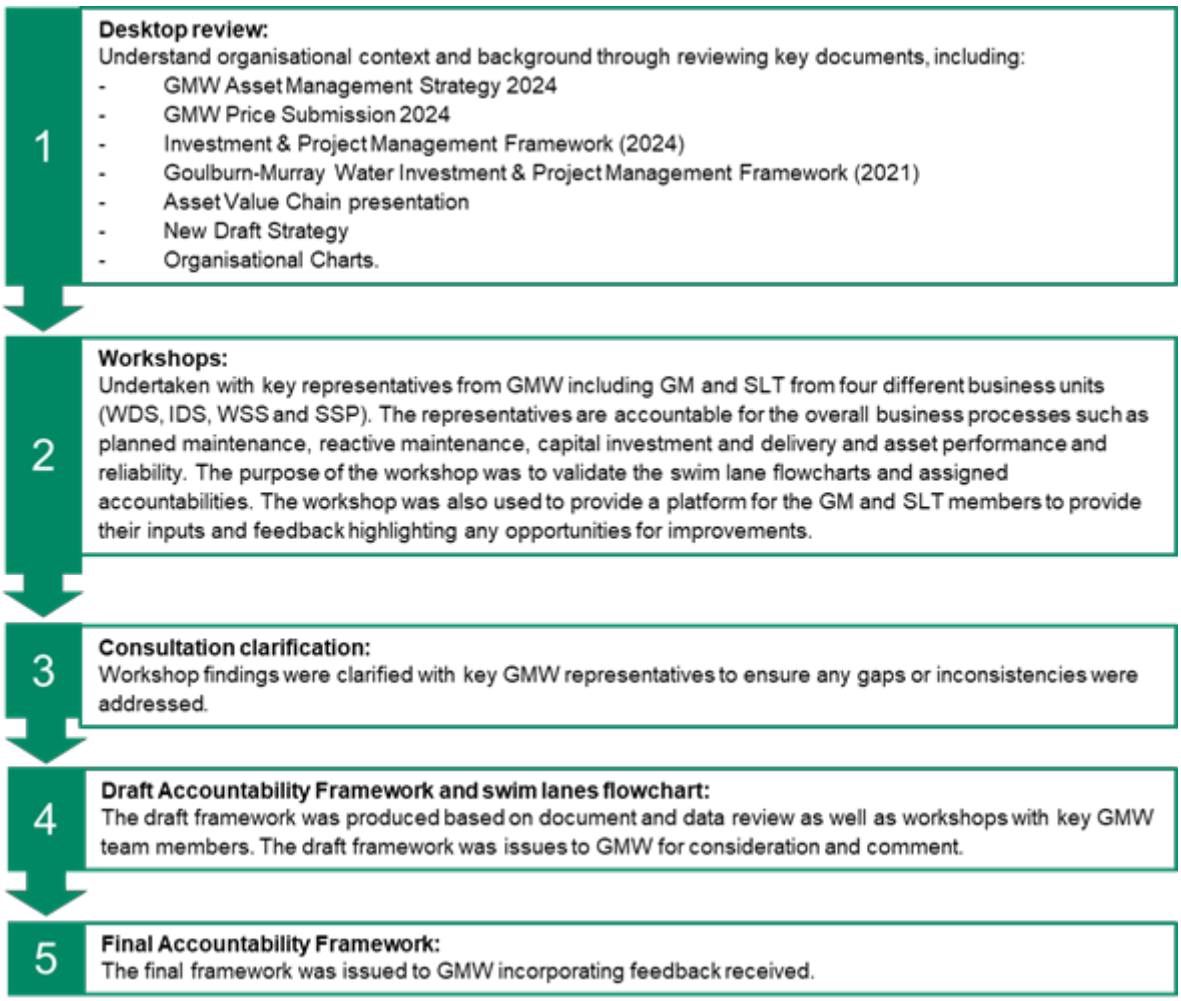


Figure 2: ALAF Methodology

and produce the final deliverables of an accountability framework in the form of swim lane flowcharts.

A desktop review of GMW organisational context and background was undertaken to provide insights into the current asset management lifecycle processes, gaps and opportunities for improvement. The former RACI matrix was mapped against the Institute of Asset Management and Global Forum for Maintenance and Asset Management's 39 subjects. This led to spread of accountability across four business units, blurring the accountability areas amongst the leadership team. Four key areas were identified where improvement could be implemented:

- Maintenance strategy development,
- Preventative Maintenance and Work Order details,
- Work Order scheduling, planning, and prioritisation
- Capital delivery

For each of the key areas, a swim lane flowchart was developed to capture the decision-making process. This was followed by workshops with all General Managers and the Senior Leadership Team to work collaboratively to provide input, refine and an agreement was obtained for the swim lane flowcharts.

The final framework and swim lanes were implemented by GMW in the following months to become 'business as usual' which include continue monitoring to ensure successful implementation, recognise results and reward team members.

3 DISCUSSION

The swim lane flowcharts were developed to visually communicate and obtain agreement on the areas of accountability for each GM and SLT with the aim to deliver measurable improvements across key areas of asset management lifecycle. The swim lane flowchart helped support a culture of productivity and accountability, while removing ambiguity and mitigating risks (e.g. unclear accountability areas). Some of the noteworthy benefits the implementation of swim lane flowcharts provided were:

- Reduced the backlog of maintenance activities by critically assessing whether the priority is correctly assigned.
- Increased efficient use of maintenance staff (e.g. grouping work orders based on location and proximity).
- Increased in planned maintenance delivery productivity, resulted in a reduction in maintenance cost, kept the price of the service low, benefited the irrigators in the region.
- Increased in asset reliability, resulted in meeting the customers' demand and need for irrigation water with increased asset availability.

A sample swim lane flowchart is shown in Figure 3, illustrating the key processes or tasks considered in its development. Note that this example has been modified from the final GMW Asset Lifecycle Accountability Framework.

Further opportunities for improvements were identified through the workshop sessions with GMW's leadership. These opportunities were consolidated into four key areas for improvement to effectively address the current gaps:

- Consistent Terminology – To ensure clarity and uniformity in the approach of all activities undertaken. Consistent terminologies were applied in all documents and processes. Definitions and terminology in line with standard practice from International Infrastructure Management Manual (IIMM) were implemented.
- Maintenance strategy – A formalised process and procedure was required to ensure the maintenance strategy process was consistently applied and considers Failure Mode(s), Effects and Criticality.
- Work order scheduling and planning – There needs to be a dedicated resource tasked to schedule and plan maintenance activities.

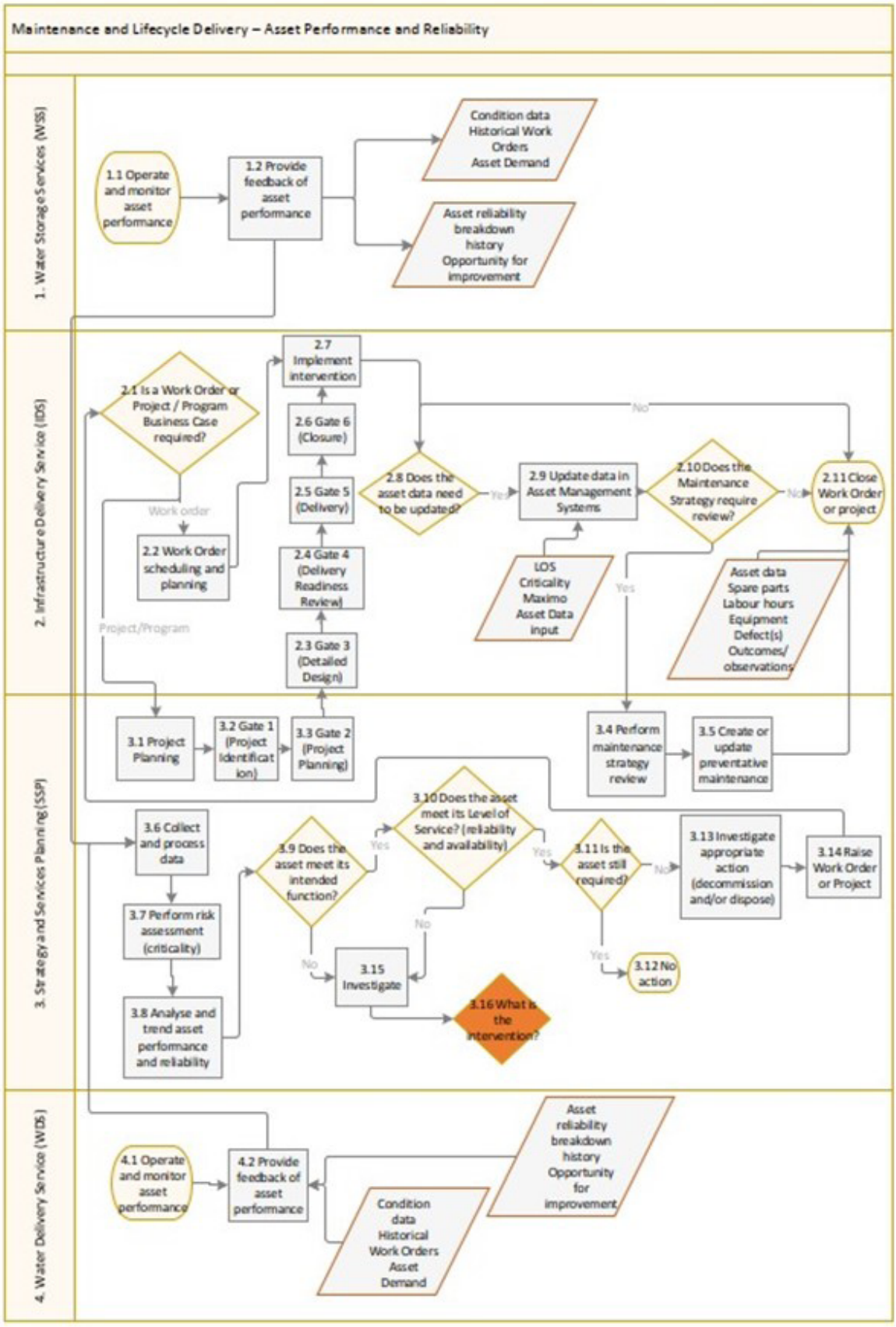


Figure 3: Sample Swim Lanes (note this has been modified from GMW Asset Lifecycle Accountability Framework)

- Work order prioritisation - A standard procedure for work order prioritisation to define different priorities to assist with the maintenance (in particularly for reactive maintenance, such as breakdown work orders) planning and scheduling.

Another key outcome from this project was the ongoing endorsement and support from senior leadership in the business. The GMs and SLT were heavily involved in the development of the accountability framework and provided feedback and review of current processes, as well as approved and championed the new framework. Senior leadership support is critical for the ongoing success of Asset Management processes, as change management and culture development should be driven from the top down. A review of a Melbourne Council's Asset Management practices suggested that the beneficial asset management outcomes "was achieved … because the transition was championed and supported by both the previous and current CEOs" (Godau, 2008).

Moreover, it was imperative that where improvements are made, the implementation of any changes were communicated and monitored (International Infrastructure Management Manual, 2020). Outcomes achieved were recorded for GMW to recognise results and monitor progress. The swim lane flowcharts formed the corpus of the GMW asset management system and became 'business as usual'.

4 CONCLUSION

Following the completion of this project, the team successfully developed an Asset Lifecycle Accountability Framework in the form of swim lane flowcharts. This has streamlined and clearly delineated accountability for GMW's asset management lifecycle processes.

The following steps were taken to ensure the successfully implementation of the Asset Lifecyle Accountability Framework:

- Adoption of the new Asset Lifecycle Accountability Framework swim lanes into 'business as usual,'
- Adoption of consistent terminology for maintenance activities
- Development of a process and procedure for maintenance strategy development, implementation, and review
- Dedication of a resource for scheduling and planning
- Development of a work order creation procedure including a work order prioritisation process.

Overall, the development of this framework has contributed to increased clarity surrounding accountability amongst the leadership team. The delivery of this streamlined Asset Lifecycle Accountability Framework resulted in improved efficiency and increased utilisation of resources, to better serve the community of Northern Victoria and realising the value chain in its full capacity.

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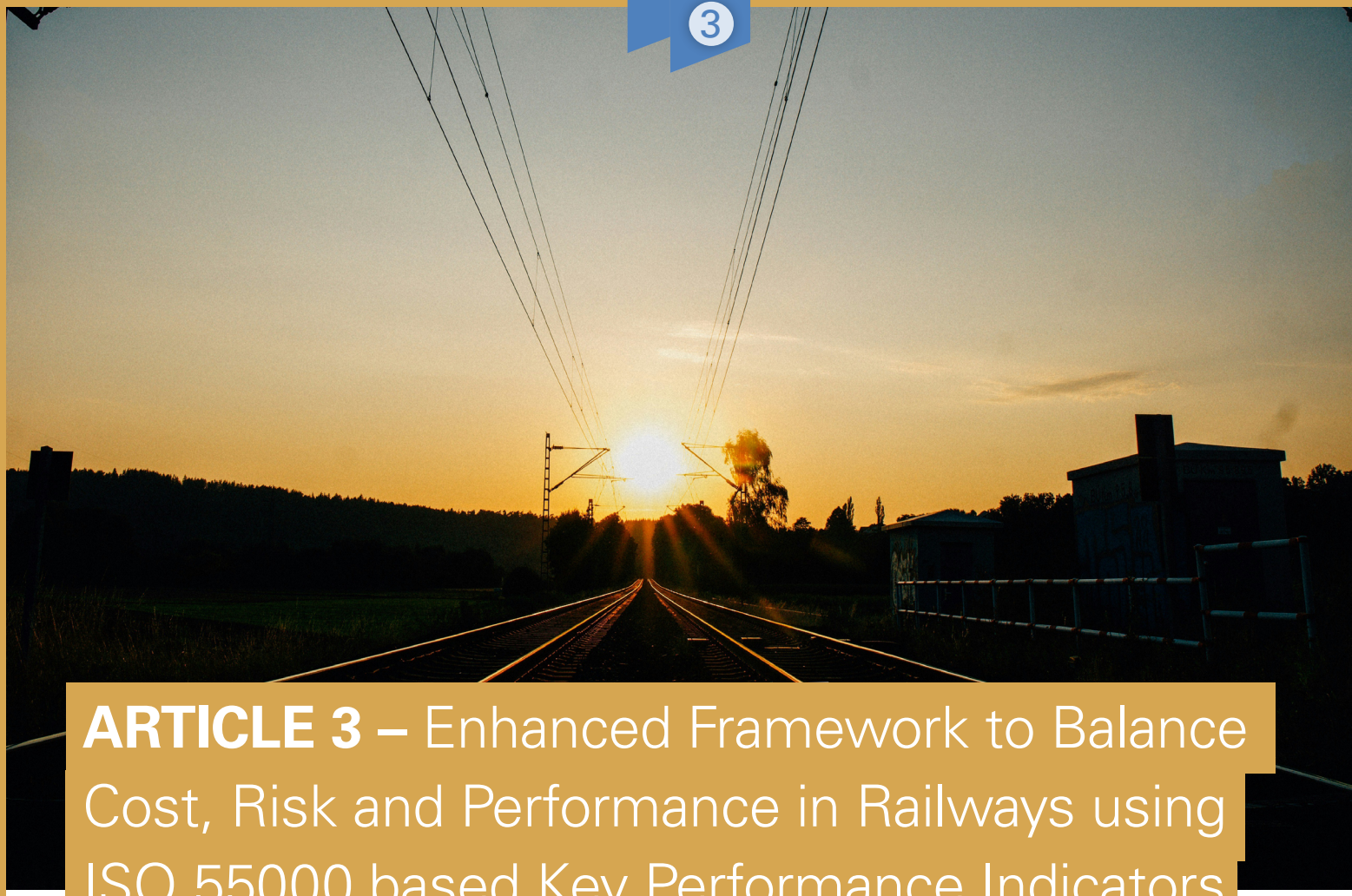
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TECH 3



ARTICLE 3 – Enhanced Framework to Balance Cost, Risk and Performance in Railways using ISO 55000 based Key Performance Indicators

Dennis Noble, Gopi Chattopadhyay, and Truong Phung,
Federation University

SUMMARY

The increasing demands on railway infrastructure and expectations from stakeholders including regulatory bodies have been putting more pressure on sustainable and resilient rail assets. To address this rail infrastructure owners and operators are using asset management best practices. Overall Railway Infrastructure Effectiveness (ORIE) is a metric proposed by various rail companies in the world including the Swedish Transport Administration. It is considered useful for assessing infrastructure performance. However, its traditional focus on availability, performance, and quality at an elevated level cannot fully capture and analyse the complexities of and dynamic situations of modern railway systems. The ISO 55000:2024 standards highlight the need to incorporate sustainability, resilience, operational risk, and financial viability into asset management decision-making. This paper proposes further enhancements of ORIE approaches to include critical dimensions, enabling a more holistic evaluation of railway infrastructure capital investments and maintenance strategies.

Keywords: Asset Management, Maintenance Performance Measurement, Overall Railway Infrastructure Effectiveness (ORIE), Sustainability, Whole-of-life Cost Modelling

1 INTRODUCTION

Modern railway networks face mounting pressures to meet the demands of a growing population and a changing world. While rail offers a sustainable and efficient mode of transport, infrastructure owners and operators increasingly grapple with a range of challenges that hinder effective investment planning [9]. Chief among these challenges is the need for rail organisations to balance costs, risks and performance targets. Over the years, numerous methods and frameworks have been developed with a traditional focus on minimising cost and risk. However, modern rail networks face complex challenges, which include meeting the performance expectations of customers like turn-up and go services or degraded mode operations, during maintenance and upgrades. Traditional methods often fall short in addressing these complex challenges, necessitating new approaches to prioritisation and performance measurement [8]. Moreover, there is an emerging requirement to consider and include sustainable practices in railway operations and maintenance planning and activities [16].

2. CURRENT CHALLENGES IN RAILWAY INFRASTRUCTURE

Railway infrastructure, in general, is facing challenges such as aging infrastructure where railway networks contend with aging assets nearing the end of their design life, leading to increased maintenance needs, higher failure rates, and potential safety risks [1]. The climate change impacts on rail infrastructures such as extreme weather events, e.g., heavy floods, severe heatwaves, and storms, are increasing in frequency and intensity, disrupting operations and causing significant damage to rail infrastructure [2].

Capacity constraint is another major obstacle; the growing urbanisation and demand for rail services strain existing network capacity, leading to congestion, delays, and reduced service quality [3]. Funding limitations such as limited budgets and competing priorities, which require strategic allocation of resources to maximise the impact of infrastructure investment, are also the major factors that railway companies must face [4].

Adding to those challenges above are data deficiencies. The incompleteness or inconsistency of data on asset condition, performance, and risk hinders informed investment decisions which can adversely impact network performance and capacity [5].

3. LITERATURE REVIEW

3.1 Infrastructure Renewal Prioritisation Frameworks

Effective infrastructure renewal is essential for ensuring the functionality, safety, and economic viability of transportation networks. With challenges such as ageing infrastructure, limited resources, and growing maintenance backlogs, the development of robust prioritisation frameworks has become a critical area of focus. These frameworks aim to provide structured, data-driven approaches to allocate resources efficiently and address the most pressing needs within infrastructure systems. This review explores several frameworks, evaluating their methodologies, strengths, and limitations, while identifying common themes and gaps in the current body of knowledge.

One notable framework is the Comprehensive Decision-Making Framework for Maintenance and Modernisation proposed by Dowd, Franz, and Wasek [6]. This approach employs a system thinking perspective, using complex network analysis (CNA) to assess the criticality of components within an infrastructure network. It incorporates a Bayesian network model to quantify urgency levels and calculates a Maintenance and Modernisation Index (M&M Index) to guide resource allocation. The framework is praised for its holistic view, considering interdependencies between components and enabling trade-off analysis. However, its reliance on extensive data collection and processing makes it computationally intensive, and its effectiveness is contingent on the availability and quality of real-world data.

Another approach is the Renewals Prioritisation Tool (RPT), developed by Michael Hetherington [8]. The RPT is designed to optimise infrastructure investment by ranking assets requiring renewal over a 3–5-year planning horizon. It uses criteria such as asset performance, condition, location, customer experience, and environmental risk to

provide a balanced, evidence-based ranking. While practical and aligned with operational needs, the RPT may suffer from subjectivity due to the weighting of criteria and lacks complex modelling to account for interdependencies between assets. Additionally, it primarily focuses on risk and condition, with limited consideration of broader factors influencing renewals.

For railway bridges, a Life Cycle Cost (LCC) framework has been developed, specifically targeting concrete and steel structures [9]. This framework consists of three modules: bridge assessment, maintenance optimisation, and network-level prioritisation. It incorporates deterioration models to predict future conditions and prioritise defects, while also considering maintenance costs. The LCC framework's strength lies in its specificity and long-term perspective, but it is limited to certain infrastructure types and does not fully account for network-level effects.

The Analytic Network Process (ANP) is another multi-criteria decision-making approach used for ranking railway infrastructure projects [10]. It evaluates economic, financial, and technological indicators to determine project feasibility, providing a broad overview of prioritisation. However, the ANP method can be subjective due to the weighting of criteria and computationally intensive, especially in systems with numerous elements. Similarly, the Return on Maintenance Investment (ROMI) framework [11] focuses on financial and non-financial returns from maintenance investments, emphasising reduced delays and increased asset availability. While economically efficient, it may overemphasise financial aspects, potentially neglecting safety, social, and environmental considerations.

A prototype decision support framework [12] evaluates trade-offs among competing infrastructures, considering parameters such as strategic importance, socioeconomic contribution, and physical condition. This structured approach helps manage limited funding but remains in the prototype stage, with scope for incorporating additional factors like life cycle costs and political considerations. Asset management frameworks with a life cycle approach [12, 13] also provide a long-term perspective, covering asset planning, creation, and operation. These frameworks are comprehensive but require significant organisational and data integration to be effective. Finally, the Overall Railway Infrastructure Effectiveness (ORIE) framework [14, 15] assesses system performance through measures like availability, performance, and quality. While holistic, it does not directly consider cost-effectiveness or interdependencies and needs to incorporate sustainability and resilience metrics.

In summary, these frameworks highlight the importance of systems thinking, data-driven decision-making, multi-criteria analysis, life cycle perspectives, and trade-off analysis in infrastructure renewal prioritisation.

There is a gap in the industry of a framework that can take into account multiple scenarios over a long planning horizon while considering more novel and specialist performance measure impacts along with traditional performance measures. There exists a gap in the current body of knowledge and future research opportunities exist focusing on developing more comprehensive frameworks that are computationally efficient, consider more complex interdependencies, and incorporate sustainability and resilience metrics. By combining the strengths of these different approaches, a robust decision-making framework can be created to ensure effective and efficient infrastructure renewal.

3.2 Rail Performance Measures

Traditionally, the industry has been concerned about customer satisfaction, on-time performance, and service reliability. However, with the release of ISO55000:2024 industries are being encouraged to measure, report, and in turn improve their Asset condition, maintenance performance, and financial performance. And now considering climate change concerns society expects these organisations (big emitters of CO2) to practice their business sustainability making environmental indicators more relevant.

And with ever-increasing demand and budgetary pressures financial viability is also garnering more attention in the board rooms of railway organisations. However, when examining the available body of knowledge there is a stark disconnect between industry demand for KPIs and methodologies and the existence of relevant KPIs to cater to the above interests.

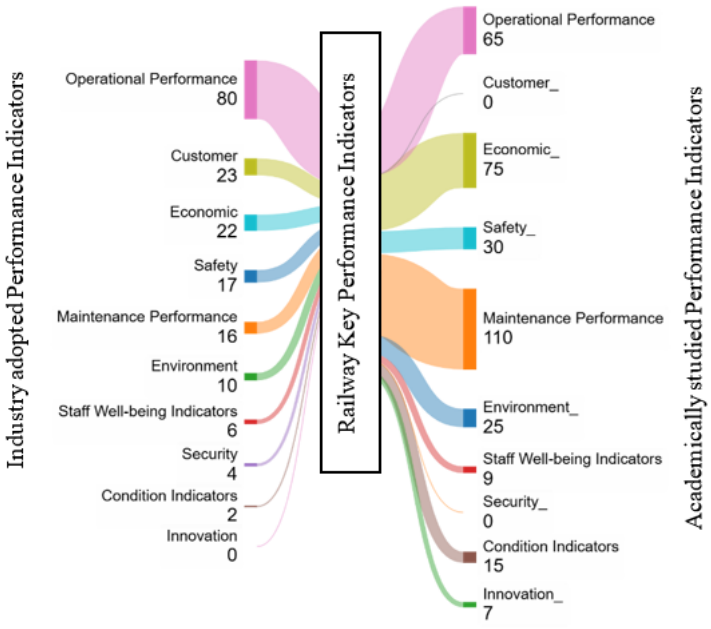


Figure 1: Number of performance measures in each category referenced in Industry and Academic sources

Figure 1 shows a representation of research emphasis on the rail industry's Key Performance Indicators (KPIs), revealing a distinct divergence between academic focus and industry priorities. Industry focuses on operational performance KPIs, a pragmatic orientation likely driven by the exigencies of efficiency maximisation, cost minimisation, and service reliability. Conversely, academic research demonstrates a more diversified approach, encompassing a wider spectrum of KPIs, including those pertaining to safety, security, maintenance performance and environmental sustainability. This broader scope suggests a greater emphasis on long-term challenges and the societal implications of rail transport.

The literature reveals a divergence in focus between academic research and industry practices regarding performance indicators in the railway sector. Academics often emphasise infrastructure-specific metrics such as Mean Time to Repair (MTTR) and other maintenance-related KPIs, while industry priorities centre on service delivery, quality, costs, and risk. Although infrastructure performance measures contribute to overall railway performance, they are not always directly linked to service outcomes. Despite these differences, both domains converge on the importance of customer satisfaction and financial performance KPIs, reflecting their shared recognition of these factors in a competitive transportation landscape [17, 18].

However, significant disparities exist, particularly in the emphasis on safety, security, and environmental sustainability. Academic research places a strong focus on safety and security, often exploring novel and intricate monitoring methods, whereas industry practices, while acknowledging the cardinal importance of safety, may not prioritise it to the same extent. This gap highlights the need for improved knowledge transfer and collaboration to translate academic advancements into practical industry applications. An even more pronounced gap is observed in environmental sustainability, where industry attention lags behind academic interest. Given the growing focus on climate action, this disparity underscores the urgent need for research and innovation in sustainable rail technologies and practices [17, 18].

The analysis acknowledges potential limitations, such as the influence of KPI selection and categorisation on observed trends, and the overrepresentation of academic priorities due to publication prevalence. Industry data, on the other hand, may be constrained by commercial sensitivities. Despite these

limitations, the findings emphasise the necessity for stronger collaboration between academia and industry. Cognitive Fit Theory suggests that the complexity of academic frameworks and KPIs often hinders their adoption by industry, as they may not align with organisational needs or data capabilities. Simplifying these solutions and ensuring they are adaptable to industry requirements could bridge this gap [17, 18].

The top 20 KPIs studied academically and adopted by the industry include metrics such as punctuality, maintenance costs, capacity utilisation, track quality, availability, and safety-related indicators like accidents at level crossings and injury ratios. By leveraging these KPIs and understanding their nuances, rail asset managers can gain a comprehensive view of railway performance. This knowledge enables risk-informed decisions on investments, maintenance strategies, and operational improvements, ultimately fostering a more efficient, reliable, sustainable, safe, and customer-focused railway system [17, 18].

Figure 2 shows how often performance measures have been studied in the surveyed literature and how prevalent these performance measures are in the railway industry use. The primary source of industry usage is from Australian and New Zealand rail industry operators and infrastructure managers. Academic sources are from studies based on railway infrastructure performance measures and optimisation frameworks.

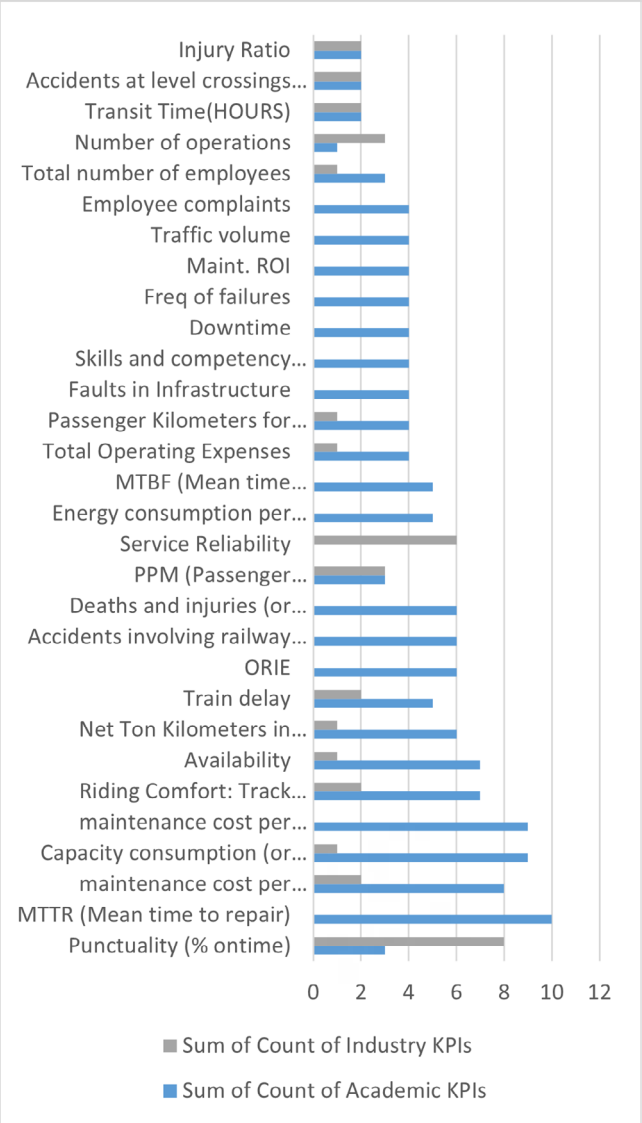


Figure 2: A comparison of key performance indicators and their relative prevalence in the Academic and Industrial domains

4. PROPOSED ENHANCED FRAMEWORK

Traditional methods for infrastructure investment prioritisation often fail to adequately account for wider economic benefits, social impacts, and environmental considerations [20].

To address these challenges, new methods for infrastructure investment prioritisation and performance measurement are needed. Integrating sustainability, risk, and resilience into the existing frameworks enhances their relevance in today's context. A conceptual framework incorporating additional factors to assess the environmental impact of railway maintenance is presented in Table 1 below. The authors are working on this for a comprehensive framework that can be a best practice for application in the industry. The following are some of the proposed measures being considered for incorporation into the existing ORIE framework to create an enhanced performance metric framework based on ISO 55000.

Table 1: High Level Performance Indicators for inclusion in the enhanced framework based on ISO 55000

ISO 55000 Requirement	Suggested KPI
Understanding the organisational context	Number of identified stakeholders and their engagement levels (e.g., survey score).
Leadership and commitment	Percentage of senior management participating in asset management training or reviews.
Asset management policy	Frequency of policy reviews and updates (e.g., reviewed annually).
Asset management objectives	Percentage of asset management objectives aligned with organisational strategic goals.
Risk management	Number of identified asset-related risks mitigated within a defined period.
Asset management planning	Percentage of assets covered by an up-to-date asset management plan.
Support and resources	Percentage of budget allocated to asset management activities versus actual spending.
Competence and Awareness	Percentage of asset management staff trained and certified in relevant competencies.

5. CONCLUSION

Railway infrastructure owners and operators have been facing severe pressures to do more with less and further enhancing performance including reducing costs and risks along with improving safety. Proposed framework incorporates a more holistic approach to investment prioritisation. The proposed method addresses the limitations of current industry standard methods of investment prioritisation which only considers the costs, risk and very limited benefit factors, such as environment or financial sustainability. There is a need for a comprehensive consideration of all relevant factors including financial viability of the project, sustainability considerations, resilience of the infrastructure, environment and society covering human impacts and many more. To address these a more comprehensive framework is proposed for CAPEX decisions.

6. ACKNOWLEDGEMENTS

This work is supported by the Australian Government through the Research Training Program.

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REFLECTIVE ARTICLE – From Reflection to Foresight: GenAI's Role in Infrastructure Asset Management

Dr Steven McCann & A/Prof. Guillermo Aranda-Mena,
School of Property, Construction and Project Management,
RMIT University

With $213 bn in public infrastructure projects planned over the next five years, GenAI is already transforming how Australia manages its infrastructure. In their article, Dr. Steven McCann and A/Prof. Guillermo Aranda-Mena examine the current and predicted impacts of GenAI on team collaboration, operating models and workplace practices, whilst identifying areas where human expertise remains essential. It considers governance and quality controls to validate GenAI outputs, the risks emerging in workplace integration and longer-term implications for the built environment and asset management profession.

The recent emergence of Generative Artificial Intelligence (GenAI) and Large Language Models deep learning technology such as ChatGPT is transformational. My first use of asking a complex question and seeing the answer appear almost immediately, with such a high-quality response, was met with a sharp intake of breath. It was like seeing the moon through a telescope on a clear night for the first time. As someone that has both an asset-intensive and professional research background, I understood intuitively that this technology would have a major impact not just on my work but on the wider environment in which I work. It's so easy to use and the results can be extraordinary, whether that be for identification of hard-to-find information from obscure sources, sense-checking, effective writing or almost instantaneously processing complex requests such as identifying patterns in information and data.

Take GenAI's ability to analyse and write effectively for example. Developing policy, procedures and reports are my professional raison d'être. I consider myself to be a capable writer and have spent many years honing this skill. It's easy however, after using GenAI for a few minutes, to understand that even someone without a high school certificate or much

asset management experience, who might not speak English fluently, can produce an impressively accurate and well-articulated response to a wide array of technical or other issues within seconds – which may be better than what I can craft.

GenAI offers other advantages. For example, it has the potential to reduce some of the grind and intellectual weight when undertaking conceptual development and analytical work, which means it is possible to make contributions to business area planning more effectively and deliver organisational outputs more quickly. Where appropriate, I have used GenAI in my own day-to-day work in program development to assist with summarising documents, planning, and developing early draft scenarios, harnessing the technology's astonishing predictive capability.

Having experimented with GenAI, and in considering the bigger picture, I can see the technology flattening business structures and teams, where less people will be required to perform the same functions when delivering similar – or even greater – volumes of work. For those less skilled or experienced team members, the use of GenAI will result in the biggest uptick in learning, organisational performance and productivity for them. It will probably squeeze middle-management resulting in reductions but will make executive decision-making easier through consistent development and application of assessment criteria, through producing useful summaries for complex reports that can easily be obtained using additional GenAI questions, and greater ability to test and validate data findings and patterns through running queries, amongst other things. This also speaks to the advantage of senior decision-makers engaging more effectively with staff who are actually producing the work in real time without having to enter into lengthy information exchanges with multiple management layers.

GenAI can also be used to create and support many potential efficiencies within the sector such as developing better continuity between project finalisation and integration of project outputs into program management, creating and maintaining repositories for technical documentation, developing and maintaining procedures that reflect changes to commercial strategies or service performance trends, triggers that flag abatements for under-performance without being drawn into costly disputes, and succession planning. Although perhaps not always obvious or seen as priority, these should be part of strategic considerations and re-visited regularly.

I expect that GenAI in conjunction with other AI technologies will soon create reliable processes where performance data and predictive impacts of under-performance can be viewed in real-time, thus creating potential to quickly reduce inefficiencies, correct performance and create cost savings. To an extent, this is already happening in various industries, including the utility industry, but is not used widely across government, for instance, to manage and monitor plethora of contracted service delivery obligations. And just think about this in terms of Australia's top 10 transport infrastructure projects, for example. It is estimated that the combined cost is more than $200 billion. A ten percent efficiency dividend would be enormous at this scale.

It's difficult to see how GenAI will develop over the longer term as a Large Language Model or the pace at which change will continue to occur but if progress does taper off, I take some assurance that the nature of work will become different rather than there being mass redundancy, despite the fear of some of my colleagues. One thing that I have observed, and where the returns are accurate, is that GenAI is excellent at responding to singular information requests – you ask the question and get a very well-considered answer. That's fine on a per-task basis but GenAI in its current form cannot yet effectively deal with the complexity or dynamics of dealing with multiple tasks simultaneously in the same way that a human does in their day-to-day work. And understanding the context for decision-making is so important – just ask any organisational risk manager. This is quite a big limitation.

So, I think at least for now, GenAI will certainly become part of the fabric of what we do and how we make decisions, but not independently from us as humans. Put differently, it's a useful aid – or as some people call it – a co-intelligence. This is probably a reasonable assumption to make until the technology starts to join the dots for us more effectively. GenAI still lacks depth, and for now, this keeps us in control.

Over the last few years, we have commonly heard about the over-collection of data in some organisations, where sometimes we know that data is being collected but without any real intent behind it, the inability to use that data for effective decision-making, or trying to use data collected for one purpose for another reason that is not fit-for-purpose. Although GenAI might help with rationalisation and streamlining over time, there is a real danger of coasting using this technology that may result in the creation of new risks and realisation of unforeseen

issues. Over time, as we as humans may become more accepting of and less critical of GenAI returns, we may find staff relying on findings without adhering to established governance requirements and applying quality control measures.

Clearly, it is easy to generate lots of nice, well-formulated content almost at a click of a button. But we may also begin to drown in this content when there is so much of it, and where we don't have the capacity to absorb and process it all, prioritise it or properly integrate it into our business workflows. Ignorance of this will likely create false confidence in staff that generate content through GenAI, in senior organisational decision-makers who are responsible for providing validation of that content, as well as end-users who should benefit as intended from use of that content. Coasting will give rise to a whole raft of new risks and issues which could have catastrophic consequences. At this point in time, it is difficult to assess the magnitude of financial and other costs of inaccurate predictions being generated by GenAI but some of these may be considerable.

Although the context and specifics may be different, look at what happened with Robodebt, the Australian government's debt collection scheme. Automated notices were sent to welfare recipients that did not have debts and resulted in almost $2 billion in payments from over 400,000 people. This fiasco has shaken the public sector to its core and resulted in mistrust by the public as well as cautious uptake of AI for other government initiatives. This is a reason why human oversight and ethical decision-making is and will remain important.

Allied to this, the ability to interrogate findings – not least because GenAI typically offers a singular answer to a question posed – will remain crucial. In previous iterations, the technology has been known to exhibit unacceptable levels of embedded bias and answers returned using the latest version may still produce errors or even hallucinations. Returns can result in unknown information gaps which may for instance lead to regulatory non-compliance, safety hazardous, harm and thus, a basis for lawsuits.

I also envisage in some circumstances – but hope that I'm wrong – that sub-sets of skilled professionals in some occupation groups, including for asset management may, as a worst-case scenario, become little more that document formatters or proof-readers for automatically generated reports or equivalent in their current roles. Despite huge productivity gains that are being realised through AI flowing from the rationalisation of operating models, the diminishing need to perform routine administrative and other tasks, and the level of raw digital processing power now available, intellectual inertia may become a very real problem for human-centred productivity in highly structured occupations and teams where organisational information and datasets can be leveraged effectively by GenAI that involve relatively low levels prediction or small uncertainty gaps. That's not to say that the potential or expertise that these employees have will necessarily become lost or surplus to demand.

The nature of work within asset management will change. This is inevitable. As such, there is a very good possibility that due to wide-scale adoption of GenAI, responsibilities will be re-configured. In some instances, new roles will be created. Some of these could be for functions that we haven't even yet considered or perceive more fully that we need. To realise the full potential of GenAI, it requires enthusiasm to not only to embrace the upside of the technology and its limitations, but a willingness to understand and share the learnings, adjust workflows and trial new approaches, including partnering more effectively across disciplines to generate better collective outcomes. This includes bringing better practices that can be adapted from other disciplines into asset management.

There is well-founded hope which is backed up by a swathe of philosophical AI thinkers and practitioners. Consider the shift from heavy industry and the advent of digital technology, including the scale of change that took place – some jobs within asset management disappeared, others were created. Yes, the future involves embracing uncertainty, but it's not doom and gloom.

If you, the reader, are an experienced industry practitioner and wish to participate in future GenAI asset management research with RMIT University, please contact A/Prof. Guillermo Aranda-Mena: guillermo.aranda-mena@rmit.edu.au for details.

Disclaimer: GenAI was not used to generate any aspect of these reflections and predictions.

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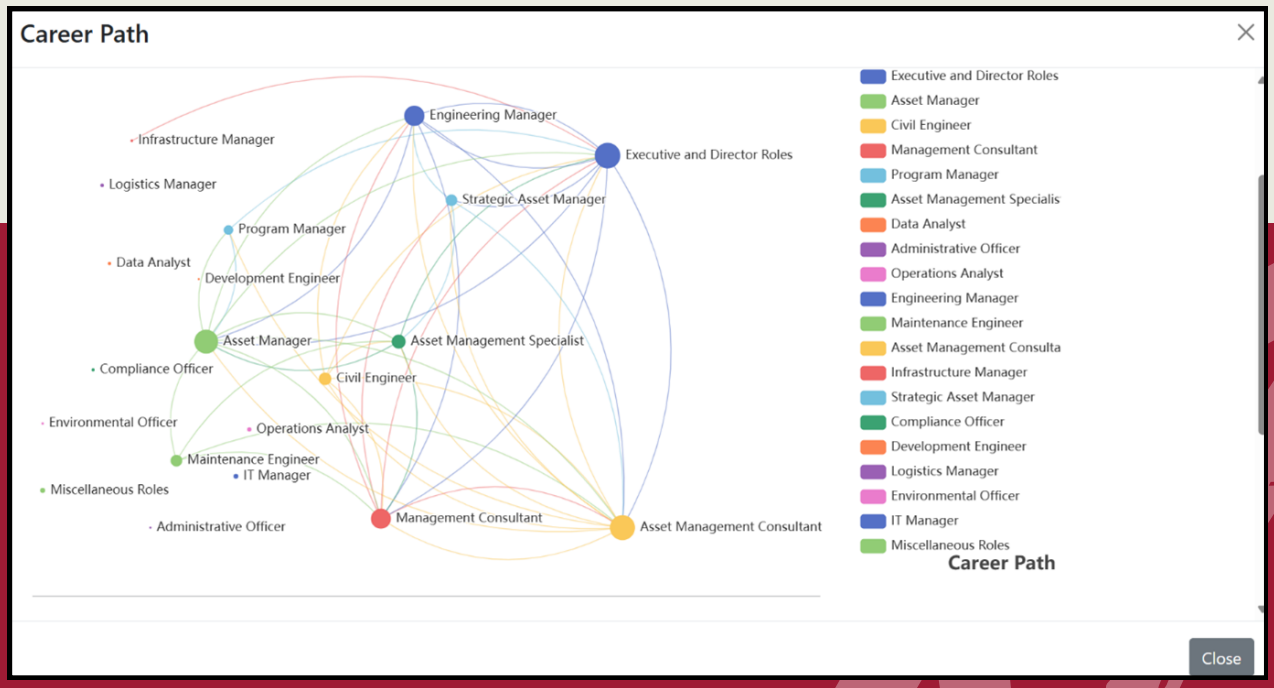
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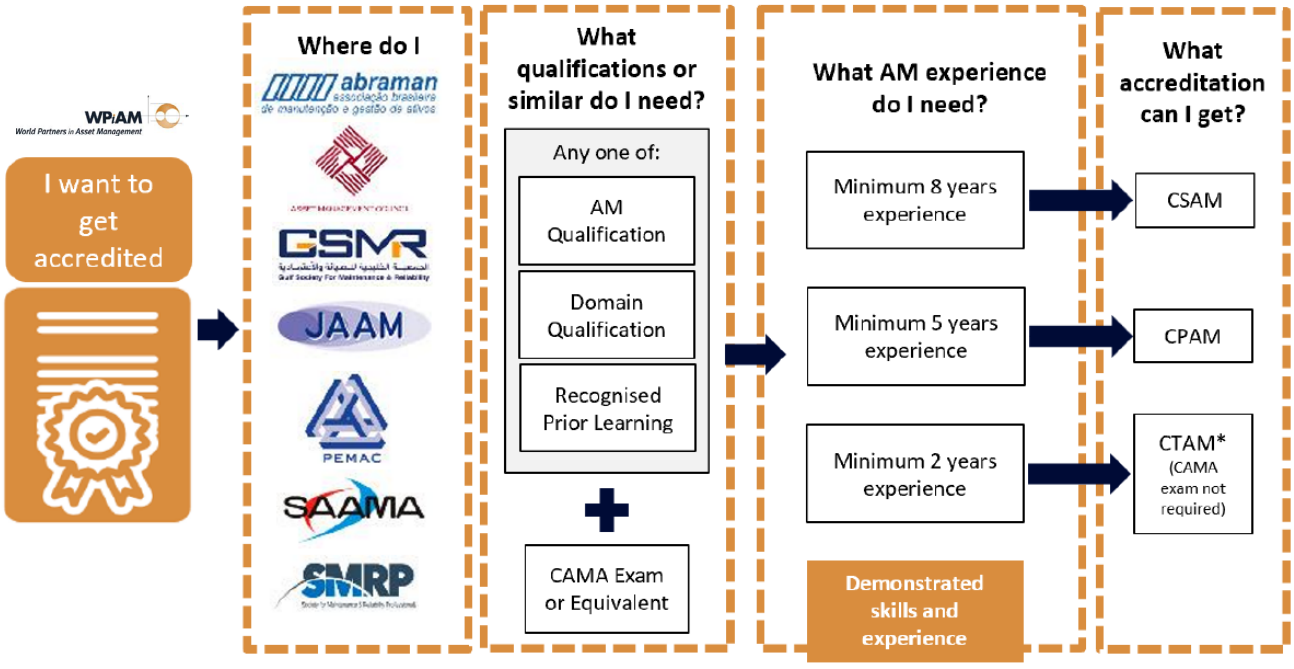
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STAR PROFILE – Ritesh Kumar CPAM



Why Asset Management?

I chose asset management because it offers a dynamic and engaging environment. There is always something to improve—whether it's physical assets, systems, data, standards, or processes. As industries and technologies continue to evolve rapidly, effective asset management becomes essential to keep pace with change. In today's competitive landscape, customers expect reliable services, and strong asset management is key to ensuring customer satisfaction and maintaining business continuity.

How long have you been working in the asset management sector?

IWith over twelve years of experience in the power industry, I began my career as an electrician, where I developed strong technical skills in diagnosing and repairing electrical infrastructure to support operational continuity. I later transitioned into the power distribution industry, joining the design and planning team as an electrical technician. In this role, I was responsible for maintaining distribution and transmission assets and designing new infrastructure to support network expansion.

Over the years, I have built deep expertise in asset design and planning, which led to my current leadership role in asset management. Today, I manage the full lifecycle of distribution assets, including inspections, maintenance, defect remediation, asset renewal, and long-term planning and budgeting. My focus is on ensuring asset reliability, optimizing performance, and supporting sustainable growth for the business."

What is your speciality?

I am a qualified Electrical Engineer and a PMP-certified Project Manager with a strong focus on electrical design and project management. My expertise lies in building and maintaining electrical infrastructure—whether it's replacing aging assets or delivering new installations. I thrive on managing the full project lifecycle, from initiation through planning, execution, and closeout. What excites me most about asset management is the opportunity to combine strategic planning with hands-on problem-solving to ensure infrastructure reliability, efficiency, and long-term value.

What drew you to explore more about this?

A key component of asset management is the ongoing maintenance and replacement of assets, systems, data, and processes—all of which must be executed with minimal disruption to business operations. This is where project management becomes essential. With effective project management, asset management objectives can be achieved efficiently and strategically. I view every element within asset management as a project, each with its own lifecycle, challenges, and opportunities. This perspective allows me to apply structured methodologies to deliver outcomes that support operational continuity and long-term asset performance

What's the best career advice you've ever received and who gave it to you?

Early in my career, a former manager at a power distribution company shared advice that has stayed with me: 'Unless you do it yourself, you won't truly understand what the task entails. If you want to grow, first learn by doing—then guide others.' This principle has shaped my approach to leadership and asset management. I believe hands-on experience is essential for building credibility, making informed decisions, and effectively mentoring others. It's this mindset that continues to influence how I lead projects and support my team

What makes a great asset manager?

A great asset manager is someone who not only understands but has experienced the full asset management lifecycle. This hands-on knowledge enables informed decision-making and effective leadership. To be truly effective, an asset manager must align with the organization's asset management objectives while maintaining a careful balance between budget constraints, process efficiency, and resource management. It's this strategic and operational harmony that drives long-term asset performance and business success.

What is the most exciting trend that you've noticed in asset management today?

Industries are rapidly embracing environmentally sustainable solutions and leveraging emerging technologies to enhance asset and data management. Modern approaches offer greater efficiency and reliability compared to traditional methods, ultimately benefiting end users. As asset management evolves, integrating smart systems, data analytics, and sustainable practices is becoming essential for delivering long-term value and aligning with broader environmental and operational goals.

What is the biggest challenge facing up-and-coming asset managers today?

Staying current with emerging technologies is essential in modern asset management. Innovations like artificial intelligence are reshaping traditional maintenance and analytics practices, offering smarter, data-driven solutions. To remain effective and competitive, it's crucial to integrate these advancements into existing asset management frameworks. Embracing such technologies not only enhances operational efficiency but also ensures alignment with the evolving expectations of end users and industry standards

What is the biggest challenge facing the asset management sector today?

There is a noticeable shortage of skilled professionals entering the asset management sector, particularly among electrical engineers. It's rare to find individuals who are equally passionate about both engineering and asset management. This gap presents a challenge for the industry, as effective asset management requires a unique blend of technical expertise, strategic thinking, and operational insight. Encouraging more engineers to explore asset management as a career path is essential to building resilient infrastructure and driving innovation.

What's next for you?

My next milestone is to complete my Master's degree, which will further strengthen my foundation and expertise in asset management. I am committed to deepening my knowledge and continuing to grow within the sector, with the goal of becoming a well-rounded asset management professional. This journey will enable me to contribute more strategically to the industry, integrating advanced practices and insights to drive sustainable and efficient asset performance.

When you're not busy at work, what do you enjoying doing?

Outside of work, I enjoy spending quality time with my young family and exploring new places through travel. These experiences help me stay grounded and inspired. When I have time to myself, I find joy in playing musical instruments and listening to classical music—it's my way of unwinding and reconnecting with creativity.

STAR PROFILE – Cliff Cheung CSAM



Why Asset Management?

I believe asset management is a vital discipline that can be applied to any industry, anywhere in the world. For any business to operate successfully and efficiently, it must adopt a strong asset management mindset and approach. The fundamental definition in ISO 55001:2024 explains it in a very simple yet effective way: The goal of asset management is to maximise the value realised from assets throughout their lifecycle, delivering benefits to both the organisation and its stakeholders..

How long have you been working in the asset management sector?

I have worked in the asset management sector for my entire career, spanning 15 years. After graduating from UNSW with a degree in Aeronautical Engineering and Arts, I began my career in the aviation sector in Newcastle with Aeropelican (now FlyPelican) as a Maintenance Planner. I later joined QantasLink as a Maintenance Planner for the Bombardier Dash 8 series, before transitioning into the A380 Fleet Management team as a Senior Mechanical Systems and Reliability Engineer.

From there, I moved into the Defence sector, working on naval vessels (Landing Helicopter Docks) as a Senior Reliability Engineer, followed by a role as Principal Reliability Engineer on the M6 Stage 1 Tunnels and Road project. I am now the Principal Reliability and Asset Management Lead for Sener, currently assigned as the RAM and Asset Manager for Webuild on the Sydney Metro – SSTOM project.

What is your speciality?

My core expertise lies in RAM—Reliability, Availability, and Maintainability. This field fascinates me because it focuses on understanding how reliably a system performs, ensuring it is available when required, and determining how efficiently it can be maintained to continue operating at optimal performance.

What drew you to explore more about this?

I have always been intrigued by how different industries approach RAM. While the methodologies and processes vary, the goal remains the same—balancing risk, performance, and cost through effective RAM studies.

In aviation, the focus is on dispatch reliability—ensuring the aircraft is safe and ready to fly. In the naval and road/tunnel sectors, availability takes precedence, ensuring critical assets remain operational, even in degraded modes (for example, ships remaining afloat or tunnels and roads staying structurally safe). This work involves understanding the asset's functions, operational context, potential failure modes, and identifying effective control measures to mitigate risks.

What's the best career advice you've ever received and who gave it to you?

The most valuable advice I have received—shared by many mentors—is to step outside of your comfort zone. Explore different industries, pursue your passions, and embrace new challenges. This mindset can take you further than you might imagine.

What is the biggest challenge facing the asset management sector today?

Artificial Intelligence (AI) presents both a challenge and an opportunity. In asset management, we must develop a solid understanding of how to harness AI to benefit our AM communities, while avoiding over-reliance on it. The key will be using AI as an enabler, not a replacement, for sound asset management principles.

What is your proudest career achievement?

I am grateful to have had a rewarding career (Thank God!) so far, supported by exceptional mentors and peers (like to use this opportunity to thank Jono Blowes, Simon Nailer, Janan Andermanizadeh in particular) who entrusted me with significant responsibilities and team work. I take pride in knowing that I've contributed to projects I can share with my children and future grandchildren—working on aircraft from the smallest Dash 8 to the largest A380 with Qantas, supporting Australia's largest naval assets (Landing Helicopter Docks), contributing to major infrastructure like the M6 motorway, and playing a role in delivering the Sydney Metro to the Western Sydney Airport.

When you're not busy at work, what do you enjoying?

I enjoy spending quality time with my family, whether it's short getaways or longer trips. We love discovering new cafes and parks. I also have a passion for music and enjoy playing instruments and singing in my spare time.



STAR PROFILE – Tony Blefari CFAM



Why Asset Management?

I didn't grow up dreaming of becoming an asset manager. In fact, when I started in the mid-90s, I hadn't even heard of the term. My timing, though, was uncanny: AAS 27 (Australian Accounting Standard: Financial Reporting by Local Governments) had just been introduced, which required councils to prepare general purpose financial reports and account for all their assets. Suddenly, there was a huge demand for councils to collect data on their infrastructure assets, as many were still recorded in hard copy format in a big red ledger or found on 'as-con' plans.

So, I started out capturing that data without fully understanding what it was being used for, until I later joined local government. That's where you learn to sink or swim quickly, and it turned out to be a great training ground. Over time, I had the chance to try many roles, from design, supervision and construction to development approvals, depot operations, and fleet management. But no matter where I went, I always gravitated back to asset management.

When the Road Management Act was introduced in Victoria and councils had to prepare road management plans, I was fortunate to cross paths with an asset management guru who became a major influence on my professional journey. That encounter cemented my path.

What has kept me in the field and what still drives me today, is the impact and generational benefit we create as asset custodians. Asset management isn't just about data or systems; it's about making smarter decisions that shape communities, ensuring the infrastructure people rely on every day is safe, sustainable, and delivering value long into the future. That sense of purpose has made it a career that's been a wonderful ride ever since..

How long have you been working in the asset management sector?

Just over 30 years, though it feels like it's flown by in the blink of an eye.

I started out in the industry when spreadsheets and manual inspections were the norm, travelling all over the country in a vehicle with no air-conditioning to perform visual road condition inspections with my trusty copy of ROCON90. Back then, we had to get out of the vehicle to inspect cracking in a representative 50-metre section of road. To assess oxidation and binder ageing, we'd pluck a stone from the surface using a flat head screwdriver. If it came loose easily, it meant the binder was brittle or oxidised; if it was sticky and/or had a long tail, the binder was relatively new and considered to be in good condition.

And all of this was done with nothing more than a flashing orange light on the car roof, no lane closures, no traffic management, just a lot of trust in my orange high viz vest!

Fast forward to today, and the transformation is extraordinary. Sophisticated and expensive vehicles with laser profilometers and high-resolution cameras now capture the same data in minutes; faster, safer, and with far more accuracy. Best of all, the data is consistent and unbiased, which means decisions are not only better informed, but also defensible, validated, and capable of delivering real value to the communities we serve.

What is your speciality?

My speciality is translating complexity into clarity,

taking the technical side of asset management and turning it into a story that people can understand, act on, and believe in. Whether it's councillors, executives, finance teams, field staff, or the community, I see my role as equal parts technical specialist and communicator. For me, it's not just about providing answers but ensuring knowledge transfer, making sure the expertise doesn't sit with me alone, but is embedded across an organisation. The best outcomes happen when people are empowered with the knowledge to make confident, informed decisions.

At the same time, my technical strength lies in strategic lifecycle modelling. I've built predictive, cross-asset models that balance cost, risk, and performance across portfolios worth more than $120 billion. These models integrate roads, stormwater, buildings, and other asset classes into unified, evidence-based plans. By combining that modelling capability with storytelling and education, I not only deliver robust analysis but also leave behind lasting capability, not just a one-off output.

Over my career, I've applied this speciality through frameworks aligned to ISO 55000, the IIMM, and IPWEA best practice guides; led complex revaluations under AASB standards; and designed training programs to lift asset management capability at all levels of an organisation.

What makes a great asset manager?

A great asset manager is a bridge-builder. Not in the literal sense of pouring concrete, but in connecting people, systems, and disciplines. They translate "asset management speak" into the language of an organisation's vision and strategy, and then turn those objectives into operational reality. They break down silos, securing buy-in by making the "why" just as clear as the "what."

Technical skill is vital, but it's no longer enough. In my experience, knowing the deterioration curve of an asset or the theoretical point it stops providing service is only half the story. The other half is bringing stakeholders such as councillors, executives, finance teams, depot crews, and the community, along on the journey. That way, they can make informed decisions with confidence and also understand why the decisions are being made.

Great asset managers are comfortable making decisions with imperfect information, balancing cost, risk, and performance to create lasting value. Above all, they never lose sight of the bigger picture: assets aren't just physical things, they're enablers of the services, opportunities, and experiences that help communities ensuring their way of life.

What is the most exciting trend that you've noticed in asset management today?

For me, the most exciting trend is how predictive analytics and integrated modelling are moving from niche to mainstream.

We're now seeing the latest software tools with AI-driven solutions designed to fit established frameworks like the IIMM and IPWEA guidelines and even generate fully formatted Asset Management Plans straight into Word or PowerPoint. That's a game-changer for efficiency, as it turns what used to be months of manual work into days.

Equally exciting is the shift to true cross-category infrastructure modelling. Instead of managing roads, footpaths, stormwater drains, and other asset classes in isolation, we can now model them together in a single system. This delivers a holistic view for decision-makers, streamlines capital works planning, eliminates duplication, and creates measurable cost savings.

The real power of these tools isn't just in producing plans faster or knowing which asset should be on a capital works program next year. It's in enabling asset managers to work on the system, not just inside it. By validating outcomes, tracking performance, and measuring delivery against objectives, we can continuously refine our strategies, to ensure that they remain current and aligned to the organisations strategic objectives. That's what turns asset management from a reporting function into a dynamic, evidence-based driver of community value.

What is the biggest challenge facing up-and-coming asset managers today?

The biggest challenge for emerging asset managers is balancing the "people side" of the role with the ever-expanding technical scope of the profession. It is easy to get caught up in asset data, modelling tools, or the latest technology, but the real value comes from getting the right information in front of decision-makers in a way they can understand and act on.

In my own career, the turning point came when I stopped leading with deterioration curves and started leading with stories about the services those assets enable. That is when the technical work began to connect with strategy and when decisions gained real traction.

For those entering the field, the key is recognising that asset management is not about presenting the one perfect answer. There is rarely a flawless decision, but if decision makers are equipped with clear, accurate information to make an informed choice, then you have done your job well. At its heart, asset management is about creating intergenerational benefit where decisions made today will stand the test of time and deliver value for communities today, tomorrow and long into the future.

What advice would you give to an up-and-coming manager today?

My advice would be to master the fundamentals, but don't get stuck in them. It is essential to understand the core principles such as data quality, levels of service, risk, and lifecycle costing because they are the building blocks of sound decision-making. But the real value of an asset manager lies in connecting those fundamentals to people, strategy, and outcomes. Your job is not to just manage assets, but connect people to better decisions.

So build your technical knowledge, but invest just as much in your ability to communicate. Learn how to translate a deterioration curve into a story that councillors, finance teams, or community members can understand and believe in. That is how you secure buy-in and turn analysis into action.

And never underestimate the wisdom of those on the ground. Spend time with depot staff, field crews, and engage with the residents who rely on these services every day. Their perspective will keep your decisions relevant.

What is the biggest challenge facing the asset management sector today?

The two biggest challenges are infrastructure resilience and environmental sustainability.

Resilience means preparing assets to withstand more frequent floods, bushfires, heatwaves, and storms. Communities expect assets to be reliable and to recover quickly when events occur. That requires foresight, redundancy, adaptive planning, and, increasingly, a sharper focus on identifying and protecting critical assets. These pressures are also driving a reassessment of useful lives, which are often shorter than previously assumed, directly impacting long-term planning and budgeting.

Sustainability recognises that every asset has an environmental footprint, from the materials we use, to the energy consumed, to how we renew or dispose of them at the end of life. While there have been advances in sustainable treatments, such as warm mix asphalt, recycled aggregates, and low-carbon concrete, their application in practice remains limited for a number of reasons. Until these treatments are supported by robust data and integrated into mainstream specifications, sustainability remains an evolving priority rather than a fully embedded practice in our asset management toolkit.

These are not "future" problems; they are already here. Both must be advanced if asset management is to remain credible, relevant, and able to deliver long-term value to the communities we serve.

What is your proudest career achievement?

My proudest achievement was contributing to the development of a world-class predictive modelling software platform. I had the privilege of working closely with the development team, feeding in ideas and shaping how the platform could be applied in practice. At the time, it was pioneering, giving hundreds of government organisations (not just in Australia, but internationally) the ability to build lifecycle models, integrate service levels, and present their story in a way that executives and councillors could clearly understand.

What I am most proud of is not the tool itself, but what it enabled. For the first time, asset managers could put clear options in front of decision-makers and demonstrate, with a degree of probability, what different levels of funding would mean for their portfolios. And they could do this without waiting decades to see those outcomes play out in real life. That ability to show the long-term consequences of today's choices fundamentally changed the conversation.

What makes this even more exciting is that the journey hasn't stopped. We have now broken through another major barrier: solving the nexus and cross-category modelling challenge. This new software, we can integrate roads, stormwater, buildings and other classes into a single, evidence-based picture. Being part of both stages has been one of the real highlights of my career.

What's next for you?

What's next for me? It's continuing to support asset custodians in managing their assets more effectively, with a strong focus on knowledge transfer and tools to help them tell their stories.

For me, it's about building capability as much as delivering outcomes. Whether through modelling, planning, or training, I want to keep helping governments and agencies, strengthen their long-term management of assets so that communities continue to benefit well into the future.

When you're not busy at work, what do you enjoying?

I love making my wine, there's something really grounding about the process, from crushing the grapes to fermentation to racking and finally sharing a bottle with family and friends. Cooking is another passion of mine, especially exploring the traditional Italian recipes taught to me by my mum. And when I want a completely different challenge, I pick up my acoustic guitar. I'm still very much learning, but it's a lot of fun and a great way to switch off, immersing myself in songs that have soundtracked my life so far.



ASSET MANAGEMENT COUNCIL

ASSET MANAGEMENT FUNDAMENTALS COURSE

Run online in a live interactive session over two consecutive mornings offers a thorough overview of asset management. The purpose of the Asset Management Fundamentals program is to understand the fundamentals of asset management and how they can provide benefits to the organisation. Please click here to register.
Course learning objectives:

- Define asset management within the context of ISO 5500x suite, the Asset Management Landscape and AMBoK
- Identify the principles that underpin asset management
- Identify available asset management tools and techniques that are applicable within organisational context
- Identify opportunities to apply these learnings to improve individual and organisational performance.

JULY 14 & 15

AUGUST 14 & 15

SEPTEMBER 15 & 16

OCTOBER 16 & 17

NOVEMBER 10 & 11

DECEMBER 8 & 9

Register at www.amcouncil.com.au

CHAPTER **NEWS**

BRISBANE

The Brisbane Chapter held a vibrant evening event on 16 July, combining professional development with a bit of fun through an engaging trivia session focused on asset management maturity. With panoramic views, great food, and a fantastic turnout, the event was a lively opportunity for members to learn, connect, and celebrate the asset management community spirit. Special thanks to our dedicated committee, event sponsors Rockfield Technologies Australia and Carousel Consulting, and congratulations to trivia winner Peri Albert!



MELBOURNE

The Melbourne Chapter has had a dynamic quarter, delivering two insightful technical events. On 30 July, members packed the room to hear from Tom Carpenter, a globally recognised contributor to ISO/TC 251, who provided expert updates on the evolving ISO 55000 family of standards. Attendees gained a clear view of upcoming changes and the importance of ongoing community input.



Then on 20 August, Fiona Beckley from V/Line took members on a thoughtful exploration of risk and opportunity through the lens of asset management. Sharing her work on the development of an Opportunity Framework, Fiona challenged traditional perceptions of risk and introduced tools to better capture and manage opportunities in practice.

Thank you to the Melbourne Chapter Committee, especially Chair Andrew Sarah, for facilitating another strong season of knowledge sharing and connection.



NEW ZEALAND

On 14 August, the New Zealand Chapter hosted its flagship event—the 2025 New Zealand Asset Management Symposium—at the Auckland University of Technology Conference Centre. Centred on the theme Delivering Value through Innovation, the one-day symposium brought together professionals from across the infrastructure and asset management sectors to explore cutting-edge ideas and practical applications.



Highlights included a compelling keynote by Andy Hagan from the New Zealand Infrastructure Commission, who discussed implementing the National Infrastructure Plan's 'Start-with-Maintenance' agenda.

CHAPTER **NEWS**

The program featured insightful presentations from leaders at Transpower, Auckland Transport, KiwiRail, GHD, Asset Dynamics, and AMCouncil, as well as a dynamic panel on lifting productivity through innovative infrastructure management.

Thank you to all who joined us for this successful day of knowledge sharing and collaboration.

PERTH

On 25 July, the Perth Chapter hosted an exclusive site visit to Wesfarmers' CSBP Chemical Plant, giving members a rare behind-the-scenes look at ammonia and ammonium nitrate production. The tour included a visit to the ANCCR control room, a walkthrough of key facilities, and a valuable discussion on maintenance and reliability strategies. Many thanks to the Wesfarmers CSBP team for their warm hospitality, and to committee member Freddie Mollentze for organising the event.



SYDNEY

It's been a big season for the Sydney Chapter, with two standout events this quarter. On 13 August, members gathered to explore the transformative role of digital twins in asset management. Ausgrid's Alex Watters and Stephanie Forsmann shared how the integration of digital replicas and data analytics is optimising performance, reducing risk, and delivering greater value across their $18 billion asset base.

Then on 22 August, Sydney played host to the AMCouncil's national Maintenance & Reliability in Asset Management Symposium—a one-day deep dive into how maintenance excellence underpins asset performance. With insights from international and local leaders across aviation, infrastructure, utilities, and manufacturing, the symposium sparked rich discussion on future skills, emerging technologies, and the strategic role of M&R. A highlight on the calendar, the event reinforced maintenance as a core enabler of asset management success.





ASSET MANAGEMENT COUNCIL

Indicators of Asset Management Maturity: A Snapshot

The **value the organisation wants from its assets** incorporated in planning processes and management reviews

Adoption of a complete **life cycle perspective** for all types of assets

Accurate information about the assets used for decision making

Integration of the **asset management system** into the overall organisation's management system

Management of **risks and opportunities** for services, assets, capabilities , process to achieve objectives

Continuity plans in place for uncertain external potential changes – disruption to the industry, political changes, extreme weather etc

Supportive **asset management culture**

Collaboration across the organisation

Continual improvement processes

How Much KNOWLEDGE & EXPERIENCE Protects Your Assets?



CFAM
Certified Fellow in Asset Management

CSAM
Certified Senior Practitioner in Asset Management

CPAM
Certified Practitioner in Asset Management

CAAM
Certified Associate in Asset Management

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☐ 6-10 $2,100.00 ☐ 0-5 $1,100.00

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