

A Strategic Step in Fort Worth Water's Asset Management Journey

Wendy Chi-Babulal, P.E., Fort Worth Water Department
Mazen Kawasmi, P.E., CFM, GISP, Freese and Nichols, Inc.
Jessica Brown, P.E., Freese and Nichols, Inc.

ABSTRACT

Fort Worth Water (FWW) has been traveling the asset management journey for many years. Recently, FWW made a strategic step toward its asset management journey by moving toward an overarching asset management governance for its program using the Institute of Asset Management (IAM) Six Subject Areas. The first step was completing an Asset Management Maturity Assessment (AMMA) on their overall asset management program.

The goal of this assessment was to perform a strategic review of their FWW asset management program through a plan-do-check-act (PDCA) business process. The benefits achieved through the AMMA for FWW were numerous including identification of asset management gaps both strategic and tactical as well as providing a process to capture the various asset management activities already occurring within the organization and a forum to allow staff at all levels to align their perception of asset management to the new asset management governance structure.

This presentation discusses the process used by a large water utility such as Fort Worth to perform an AMMA including identifying targeted interview groups, using focused interview questions from the IAM, tracking documented activities, capturing identified gaps, and recommending initiatives to enhance FWW's asset management program. The AMMA was performed by interviewing multiple focus groups within FWW to capture the status of vertical and horizontal assets and supporting systems for both water and wastewater infrastructure. The AMMA evaluated all aspects of a recommended asset management model including: a) organization and people, b) strategy and planning, c) asset information, d) decision-making process, e) lifecycle project delivery, and f) risk management. These aspects align with the Asset Management Landscape Methodology for best appropriate practices to establish and sustain an asset management program.

KEYWORDS

Asset Management, Asset Management Plan, Institute of Asset Management, Geographic Information System, Strategic Asset Management Plan, Asset Management Landscape Methodology

INTRODUCTION

FWW provides water and wastewater services to customers within Fort Worth, Texas and 36 wholesale customers in the surrounding counties and serves a population of approximately 1,265,000 people. FWW's mission statement is to enable their community to thrive with clean water done right every time. FWW's vision statement is to be the premier water utility focused on exceeding customer expectations through value-driven, innovative services. In keeping with

this mission and vision, FWW assessed and compared their ongoing asset management activities with high performing benchmark water utilities and industry leading asset management guidelines. Gaps with industry standards were identified, and short and long term recommendations were developed to move toward a more comprehensive asset management program for FWW.

METHODOLOGY

Purpose

FWW has been engaged in asset management activities for over a decade with active programs in both the water and wastewater systems for linear and vertical assets. These various programs have yielded significant benefits for FWW in enhanced asset inventory and proactive identification of assets nearing the end of their remaining useful life. FWW recognizes that there are a number of gaps with the current asset management activities. It also recognizes that the existing asset management applications are not well linked across the organization into a comprehensive asset management program with clear comprehensive strategy, objectives and outcomes.

Performing an AMMA provides FWW with a baseline for an action plan to address key asset management gaps. The maturity assessment will help FWW identify strengths and improvement areas for their asset management program. Overall, the maturity assessment builds awareness of good practices in asset management and the content of FWW’s asset management program. The assessment will also help identify areas for cross-group/department coordination. A summary of the primary elements and linkage of an effective asset management program is shown on **Figure 1**.

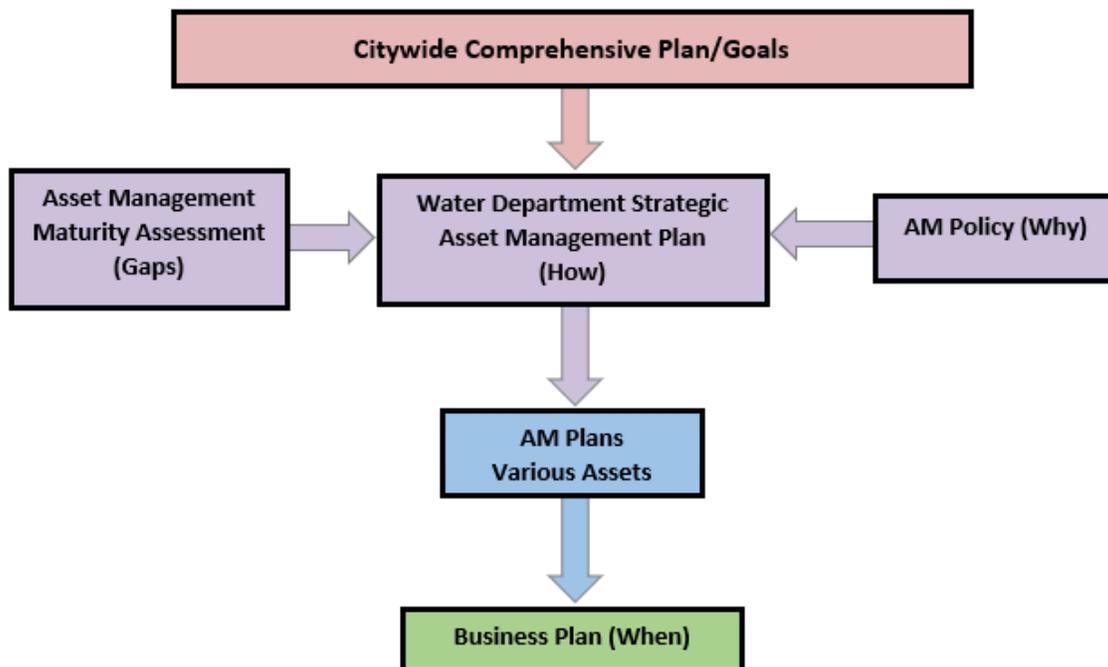


Figure 1: Asset Management Primary Elements and Linkage

Process

The assessment approach utilized for the maturity assessment followed the 39 subjects of the Asset Management Landscape Methodology for best appropriate practices to establish and sustain an asset management program. The maturity assessment performed included the following steps.

1. Select an AMMA methodology which aligns with FWW reorganization.
 - Three methodology alternatives were identified for performing the AMMA: British Standards Institution's Publicly Available Specification 55, ISO 55001, and the IAM Landscape Methodology. The IAM Landscape Methodology was chosen because it was the most applicable to FWW due to the asset management activities already underway within the organization.
2. Provide supporting documentation for questions and identify targeted interviewees.
 - Questions were developed utilizing the 39 subject areas of the Asset Management Landscape Methodology. Interview groups were established with FWW staff to provide an accurate and wholistic assessment of FWW's asset management program. Interviewees were grouped either by their current group in FWW or by position (i.e., senior management).
3. Provide background and overview of AMMA.
 - A presentation was developed to provide FWW staff with an overview of the purpose and process of the AMMA and the Asset Management Landscape Methodology.
4. Schedule and conduct interviews.
 - Eight sessions of interviews were scheduled from November 5 through December 12, 2018. Several groups were asked the same set of questions, but only the top management group provided answers for all 39 questions. The questions in Step 2 and the presentation in Step 3 were sent to all interviewees in advance. During each interview session, consensus on a score for each question was achieved.
5. Request evidence to justify scoring results.
 - For any score that was a three or higher, evidence was requested to justify the scoring results. FWW staff uploaded the relevant documentation to a Microsoft SharePoint site.

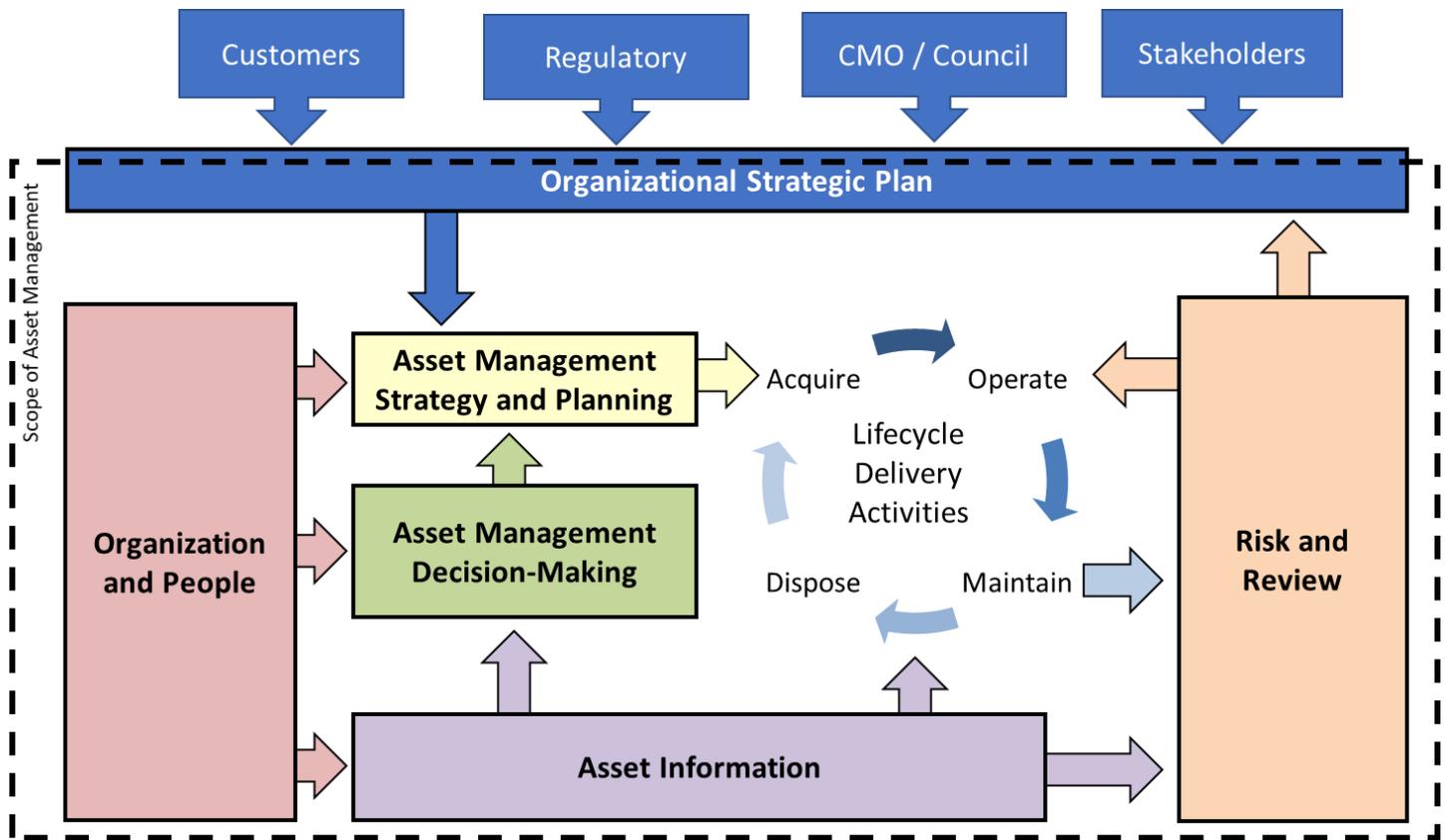
6. Tabulate scores.
 - The scores from each interview group were tabulated for linear assets and vertical assets, separating water and wastewater, and several visual representations of the results were created for review.
7. Develop results summary.
 - The results were reviewed and strengths and areas of improvement in the FWW asset management program were identified. Short and long term recommendations were also developed to move FWW toward a more comprehensive asset management program.
8. Review with leadership to determine path forward.
 - The results and recommendations were presented to FWW leadership and a path forward was discussed.
9. Finalize path forward recommendations.

Asset Management Maturity Assessment Subject Areas

The IAM Landscape model was selected for performing the maturity assessment of FWW's asset management program. The IAM conceptual model for the Asset Management Landscape Methodology is summarized in **Figure 2**. The approach breaks down an asset management program into six subject areas, as detailed in the IAM Asset Management – An Anatomy (Version 3, December 2015), portions of which are included here.

- Asset Management Strategy and Planning – Strategy and planning aligns an organization's asset management activities, and the outputs from its assets, with its overall organizational objectives. This alignment or line of sight enables the individuals carrying out their day-to-day asset management activities to trace the rationale for what they are doing through the asset management plan and asset management objectives to the organizational objectives. These activities include planning to improve an organization's asset management capabilities and the management system for asset management.
- Asset Management Decision-Making – Effective asset management decision-making is essential for an organization to maximize the value realized over the lives of its assets. This subject area considers the challenges faced and the approaches to decision-making for the three main stages of an asset's life: acquisition/creation, operation and maintenance, and end of life.

- Lifecycle Delivery Activities – This subject area implements the asset management plan developed in the Strategy and Planning subject area. Good control of the activities, and associated risks, to acquire, operate, maintain, and dispose of assets is essential for the successful delivery of the asset management plan.
- Asset Information – Organizations involved in the management of assets rely on asset data and information as key enablers across the breadth of asset management activities. Asset information is typically an input to asset management processes, may be modified or created by a process, and will be an output of a process. Data and information requirements, including quality requirements, need to be identified and defined. Typically, organizations do not have perfect, or even adequate, asset information in either the quality or quantity they require. As a result, assessing and prioritizing activities to focus on areas that will provide the most benefit is a required step in the asset management process.
- Organization and People – Implementing an asset management approach is a change that leads organizations to question traditional ways of thinking and working. This can include reviews of organizational structures, roles and responsibilities, and contractual relationships. This can make the introduction of asset management thinking and practices a challenging experience for people, be they in senior management roles, staff delivering asset management activities, or working in the supply chain. Effective leadership is therefore crucial for building an organization, with the appropriate culture, which supports the delivery of good asset management.
- Risk and Review – This subject area contains core activities associated with the identification, understanding and management of risk; the establishment of effective feedback and review mechanisms to provide assurance that objectives are being achieved; and the continual improvement of asset management activities.



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Figure 2: IAM Conceptual Model for the Asset Management Landscape

Questions pertaining to FWW’s asset management program were developed utilizing the 39 subjects of the Asset Management Landscape Methodology. The 39 questions each fall under an Asset Management Landscape Methodology subject area, as shown in **Figure 3**, which also shows the subject matter for each question. **Figure 4** provides a list of all 39 questions that were used to conduct FWW’s maturity assessment.

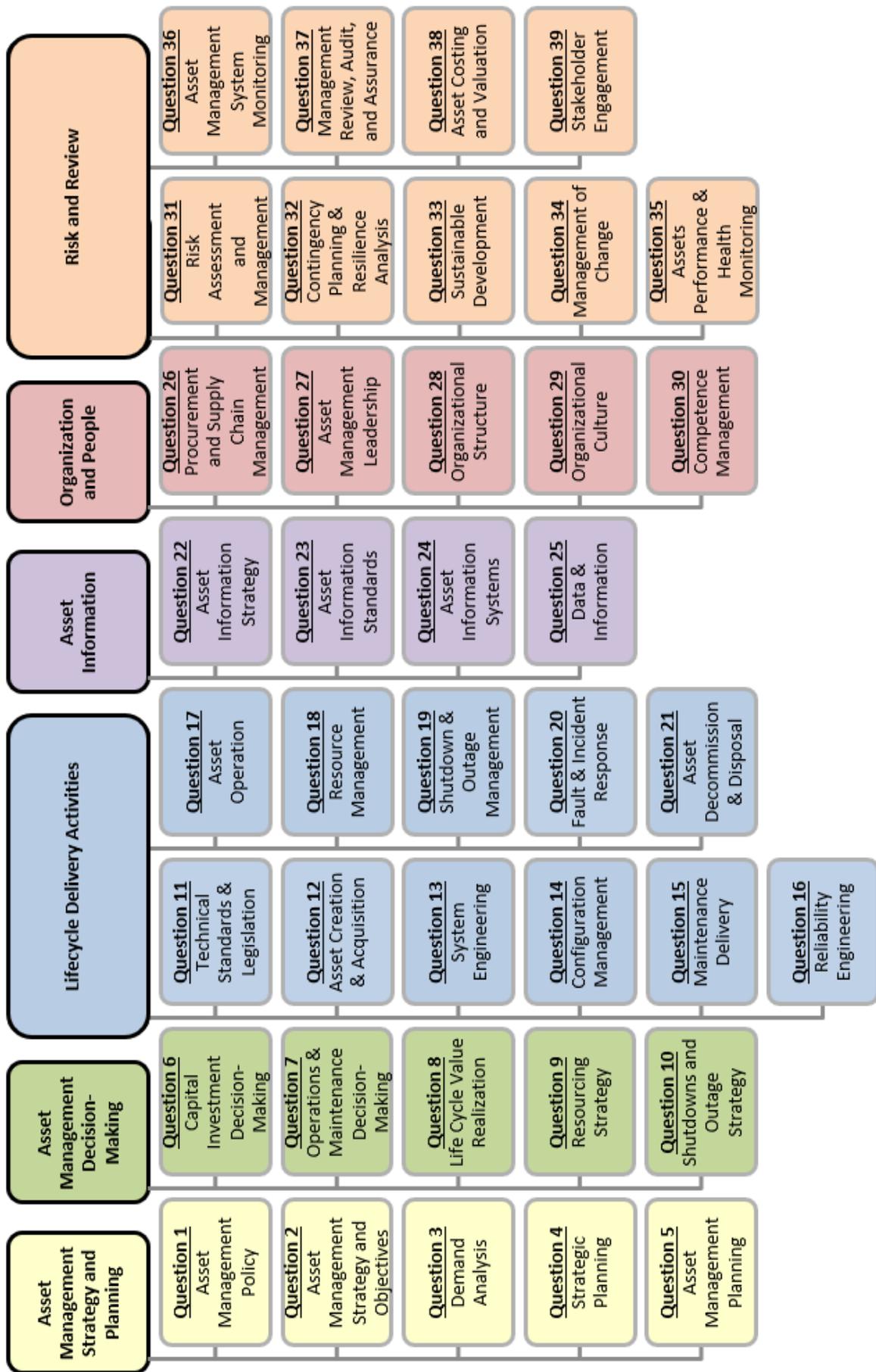


Figure 3: Asset Management Maturity Assessment Subject Areas

Subject Area	Question	Subject	Question
Asset Management Strategy and Planning	1	Asset Management Policy	Does your organization have an Asset Management Policy?
	2	Asset Management Strategy and Objectives	Does your organization have an Asset Management Strategic Plan with strategic objectives?
	3	Demand Analysis	Does the organization regularly perform a demand analysis of its major assets?
	4	Strategic Planning	Does the organization have a process to undertake strategic planning?
	5	Asset Management Planning	Does the organization have a process to develop and execute Asset Management Plans for its various asset deliverables and is it being implemented?
Asset Management Decision-Making	6	Capital Investment Decision-Making	Does the organization have a process and deliverable for Capital Investment Decision-Making?
	7	Operations & Maintenance Decision-Making	Does the organization have a process and deliverable for Operations and Maintenance (O&M) Decision-Making?
	8	Life Cycle Value Realization	Does the organization have activities in place to maximize Asset Life Cycle Value?
	9	Resourcing Strategy	Does the organization develop Resourcing Plans to evaluate people, equipment, and tools needed to deliver Asset Management Plans?
	10	Shutdowns and Outage Strategy	Does the organization have strategy plans for shutdowns and outages?
Lifecycle Delivery Activities	11	Technical Standards & Legislation	Does your organization have processes to ensure Asset Management Activities are completed with relevant technical standards?
	12	Asset Creation & Acquisition	Does your organization have processes for the Acquisition, Installation and Commissioning of Assets?
	13	System Engineering	Does your organization have an interdisciplinary systems engineering process to drive/balance life cycle solutions?
	14	Configuration Management	Does your organization have process and deliverables to record and monitor asset's functional and physical status?
	15	Maintenance Delivery	Does the organization have processes to ensure maintenance specifications, standards, and schedules are executed and integrated with engineering, operations and IT etc.?
	16	Reliability Engineering	Does the organization have processes to ensure that assets operate to a defined standard for a defined time in a defined environment?
	17	Asset Operation	Does the organization have processes and documentation to its assets to achieve the desired business objectives?
	18	Resource Management	Does the organization effectively manage resources required to execute Asset Management Activities?
	19	Shutdown & Outage Management	Does the organization effectively manage the implementation of shutdowns and outage plans?
	20	Fault & Incident Response	Does the organization have a fault and incident response plan including incident detection, fault analysis, use of standard response, repairs, etc.?
	21	Asset Decommissioning & Disposal	Does the organization have an asset decommissioning and disposal process and documentation?

Figure 4: Asset Management Maturity Assessment Questions

Subject Area	Question	Subject	Question
Asset Information	22	Asset Information Strategy	Does the organization have an Asset Information Strategy including documentation of the approach and reporting?
	23	Asset Information Standards	Does the organization have defined Asset Information Standards with a consistent structure and format?
	24	Asset Information Systems	Does the organization have systems in place to support asset information activities and processes?
	25	Data & Information	Does the organization have a process for the management of the data and information within the asset information system?
	26	Procurement and Supply Chain Management	Do the organization's processes ensure that all outsourced Asset Management activities align with the Asset Management objectives and does the organization monitor the outcome versus the objectives?
Organization and People	27	Asset Management Leadership	Does the organization have the leadership required to promote the organizational Asset Management objectives of the organization?
	28	Organizational Structure	Does the organization's structure have the ability to deliver the organizational Asset Management objectives?
	29	Organizational Culture	Does the organization's culture have the ability to deliver the organizational and Asset Management objectives?
	30	Competence Management	Does the organization have processes in place to develop and maintain an adequate supply of competent and motivated staff to fulfill its Asset Management objectives?
Risk and Review	31	Risk Assessment and Management	Does the organization have processes and policies in place to assess and mitigate risk?
	32	Contingency Planning & Resilience Analysis	Does the organization have a Contingency Plan in place in the event of an adverse impact?
	33	Sustainable Development	Does the organization have processes in place to ensure Sustainable Development?
	34	Management of Change	Does the organization have processes in place to manage changes to people, processes, and assets?
	35	Assets Performance & Health Monitoring	Does the organization have processes and performance indicators in place to monitor the performance and health of its assets?
	36	Asset Management System Monitoring	Does the organization have processes and measures in place to monitor the performance and health of its Asset Management System?
	37	Management Review, Audit, and Assurance	Does the organization have processes in place for reviewing and auditing the effectiveness of its asset management processes and system?
	38	Asset Costing and Valuation	Does the organization have processes in place for the valuation and depreciation of its assets?
	39	Stakeholder Engagement	Does the organization have methods used to engage with stakeholders?

Figure 4: Asset Management Maturity Assessment Questions - Continued

Interviews and Scoring Methodology

Interview groups were established to provide an accurate and wholistic assessment of FWW's asset management program. Eight sessions of interviews were performed from November 5 through December 12, 2018. At each interview, FWW staff were given an overview of the purpose and process of the AMMA and the Asset Management Landscape Methodology. Not all 39 questions pertained to each group, so the questions asked at each session differed based on the expertise of the interviewees.

For each interview, FWW staff were provided with a handout of the 39 questions and additional context pertaining to each question. Each question was discussed among FWW staff, and a resulting score (from 0 to 4) was agreed upon through consensus. The scoring followed the criteria shown in **Figure 5**. A score of 0 implies that FWW has not recognized the subject or there is no current evidence of commitment to develop it. A score of 4 implies that FWW processes are excellent. Based on discussions in the first interview, FWW staff requested flexibility in scoring to recognize efforts that were between two scoring values, so scores in half point increments were recorded to more accurately reflect FWW's efforts in specific areas.

Each question was assigned four scores for each asset type category: water linear assets, water vertical assets, wastewater linear assets, and wastewater vertical assets. The discussions that occurred during each meeting were documented. During the interview process, information was gathered to better understand FWW's existing asset management activity goals and outcomes. The information was utilized to determine which specific programs and processes are mature and being used consistently to support asset management activities, including integration between multiple groups, tools, and implementation into future capital improvements, and which programs and processes are areas for improvement.

An important aspect of the AMMA is that there is documentation of the processes and procedures that support the asset management scoring. FWW staff uploaded relevant documentation to a Microsoft SharePoint site. The SharePoint site provides a centralized location that can be referenced for future asset management program needs.

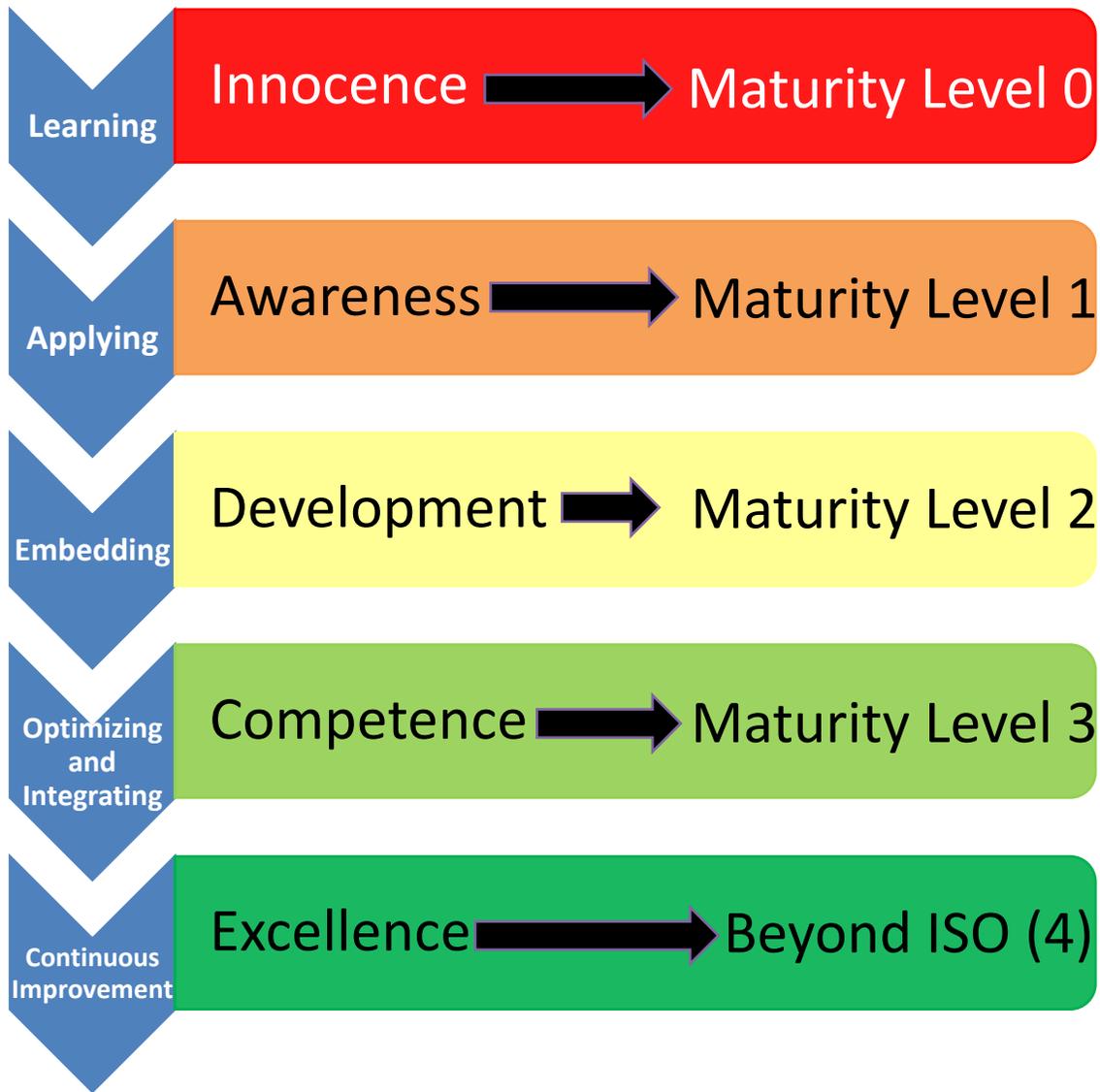


Figure 5: Asset Management Maturity Assessment Scale

RESULTS

The scores from each interview group were tabulated and the results for linear and vertical assets were aggregated. **Table 1** provides a breakdown of the overall average scores by subject area. FWW had the highest average score under Lifecycle Delivery Activities, and the lowest average score under Risk and Review. Asset Information had the biggest variance in scores, mostly due to the robustness in GIS for linear assets as opposed to vertical assets.

Table 1: Average Scores Summary by Subject Area

Subject Area	Questions	Average Score	Low Score	High Score
Asset Management Strategy and Planning	1 - 5	1.8	1.5	2.5
Asset Management Decision-Making	6 – 10	1.8	1.0	3.0
Lifecycle Delivery Activities	11 – 21	2.3	1.0	3.0
Asset Information	22 – 25	2.0	0.5	4.0
Organization and People	26 - 30	1.8	0.0	3.0
Risk and Review	31 – 39	1.7	0.0	3.0

LESSONS LEARNED

- Ensure the assessment methodology is used to match your organization’s objectives.
- Include a short presentation explaining asset management principles and framework before each focus group assessment for sharing the definition and concept to ensure everyone has the same understanding.
- Separate senior management and technical staff during the focus group interviews.

NEXT STEPS

- Asset Management Policy
- Asset Management Communication Plan
- Strategic Asset Management Plan
- Asset Management Plans

REFERENCES

Global Forum On Maintenance & Asset Management; 2014; *The Asset Management Landscape Second Addition*; ISBN 978-0-9871799-2-0.