



Government of the
Cook Islands

ASSET MANAGEMENT DEVELOPMENT PLAN

(FINAL v1.0)

November 2019

FOREWORD

Why is “asset management” important

Assets deliver important services to our communities and comprise the major investment undertaken by the Government of the Cook Islands on behalf of the community. Upon their acquisition they also create a huge responsibility for future governments to fund the ongoing maintenance, operation and renewal of these assets.

A key issue facing governments throughout the Pacific is the management of ageing infrastructure assets in need of renewal and replacement to ensure that the assets are maintained and developed to meet the ever-changing needs of our communities while also delivering such services in a cost-effective manner under a constrained funding environment.

Asset management is based on a set of fundamentals.

1. **Value:** Assets exist to provide value to the organisation and its stakeholders.
2. **Alignment:** Asset management translates the organisational objectives into technical and financial decisions, plans and activities.
3. **Leadership:** Leadership and workplace culture are determinants of realisation of value.
4. **Assurance:** Asset management gives assurance that assets will fulfil their required purpose.

Ineffective asset management has a significant impact on the cost of maintaining assets as well as the quality of services delivered to our community. Through improved asset management we will be able to provide great quality services while doing so in a more cost effective and sustainable way.

Infrastructure assets such as roads, drains, water and wastewater assets, bridges and public buildings present challenges as their condition and longevity can be difficult to determine, and the increasing demands in terms of quality and standards. Funding the creation of new infrastructure is a known challenge however, ensuring the Government of the Cook Islands adequately considers and accounts for the ongoing operation and maintenance of this infrastructure is a key objective of asset management.

The development of the Asset Management Development Plan (AMDP) supports improved asset management across all Cook Island infrastructure agencies.



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Asset Management Development Plan

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KEY DEFINITIONS

Asset: Item, thing or entity that has potential or actual value to an organisation. They may be tangible or intangible, financial or non-financial, and include consideration of risks and liabilities. They may provide positive or negative impacts at different stages of the asset life. Physical assets usually refer to land, buildings, infrastructure and equipment. Intangible assets are non-physical assets such as leases, brands, digital assets, use rights, licences, intellectual property rights, reputation or agreements.

Infrastructure Assets: Physical assets typically forming a network or a portfolio of assets serving communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components (e.g. transport, water, wastewater, freight etc)

Asset Management (AM): The international ISO:55000 Asset Management Guideline defines asset management broadly as “*coordinated activity of an organization to realize value from assets*”. Whereas the International Infrastructure Management Manual (IIMM) defines it as “*The systematic and coordinated activities and practices of an organisation to optimally and sustainably deliver on its objectives through the cost-effective lifecycle management of assets.*” Effective asset management is a shift in focus toward the long-term life cycle of an asset, its sustained performance and service delivery, rather than the short-term, day-to-day aspects of the asset.

Asset Management Policy: A document that broadly outlines the principles and mandated roles and requirements for undertaking asset management in a systematic and coordinated way, consistent with the agency's strategic plan. It provides the mandate for good asset management practices across government.

Asset Management Plan (AMP): Documented information that specifies the activities, resources and timescales required for an individual asset, or a grouping of assets, to achieve the organization's asset management objectives. They are long-term plans (usually 10-20 years or more for infrastructure assets) that outline the asset activities and programmes for each service area and resources applied to provide a defined level of service in the most cost-effective way.

Level of Service (LoS): Parameters, or combination of parameters, which reflect social, political, environmental and economic outcomes that the organization delivers. Level of service statements describe the outputs or objectives an organisation or activity intends to deliver to customers. They are customer outcome centric (e.g. provide safe drinking water) rather than the more asset centric “performance measures” (e.g. Litres of water pumped per day).

Maintenance: All actions necessary for retaining an asset as near as practicable to its original condition but excluding rehabilitation or renewal. Maintenance does not increase the service potential of the asset or keep it in its original condition, it slows down deterioration and delays when rehabilitation or replacement is necessary.

Rehabilitation (refurbishment): Remedial work to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally, it involves repairing the asset to deliver its original level of service (i.e. heavy patching of roads, slip lining of sewer mains, etc.) without resorting to significant upgrading or renewal.

Renewal (replacement): To replace existing assets or facilities with assets or facilities of equivalent capacity or performance capability. For example, replacing a 500 HP pump motor with the same make/model or a new 500 HP energy efficient motor would be considered as “asset renewal” – both options provide the same capacity/performance in terms of function. The energy efficiency is a secondary benefit of the renewal.

Unfunded Liability: This is the “funding gap” that can arise within an organisation managing long-life assets. It is the difference between historic capital expenditure on maintenance, rehabilitation and renewals and what is now required to sustain the required levels of service. Asset management principles help assess the magnitude of an agency's unfunded liability.

INTRODUCTION

Scope of this Development Plan

Being a national level **Asset Management Development Plan**, the purpose of this document is to explore the current state of asset management across the Government of the Cook Islands, understand the issues and challenges faced to improve the current state and to produce a 2-year **roadmap** of improvement activities aligned to the knowledge areas described in the International Infrastructure Asset Management manual (IIMM).

This implementation strategy covers macro items and business improvement initiatives (people, process and technology). To develop the strategy, the project team investigated:

1. The status of current asset management systems, practices and funding.
2. The main challenges and barriers to implementing improved AM practices.
3. The required improvements to asset management procedures, systems and staffing.

This implementation plan is focused on using good asset management practices to improve current infrastructure management processes.

Navigating this Document

- 1 SCOPE OF ASSET MANAGEMENT**
Defines what good asset management practices aim to achieve, which assets are covered under the strategy the key government agencies responsible.
- 2 CURRENT STATE OF ASSET MANAGEMENT**
Reports the results of a maturity assessment of current asset management practices against International Infrastructure Management framework.
- 3 REVIEW OF SUPPORT SYSTEMS**
Presents a view of foundational AM software systems currently in use and makes recommendations on enhancements.
- 4 IMPROVEMENT PROGRAMME**
Presents the challenges faced, guiding principles behind the implementation plan (roadmap) for improving business processes supported by good asset management practices.

SECTION 1

SCOPE OF ASSET MANAGEMENT

This section of the strategy defines what asset management aims to achieve, which assets are covered under the strategy and the key government agencies responsible for applying good asset management practices.

1.1 Definition of Asset Management

There are many definitions of asset management. The key components of these definitions state:

- a) Assets exist to deliver customers a service (e.g. water, power, shelter);
- b) Budgets must consider the whole-of-life costs of operating, maintaining, and renewing these assets; and
- c) Asset management aims to deliver sustainable levels of service in a cost-effective manner.

One of the more widely accepted 'textbook' definitions of asset management is provided by the Institute of Asset Management (UK):

“ systematic and coordinated activities and practices through which an organisation optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditures over their life cycles for the purpose of achieving its organisational strategic plan. ”

1.2 Goal of Asset Management

At a foundational level, the goal of asset management is to enable infrastructure managers to answer five core management questions:

- 1) What is the current state of the system and assets we own and maintain?
- 2) What levels of service are required by our customers and stakeholders?
- 3) Which assets are critical to providing those levels of service?
- 4) What is the optimum investment strategy for sustaining those assets?
- 5) How do we meet and sustain these long-term funding commitments?

To achieve these foundational goals, the government and its key stakeholders will commit to:

- Ensuring AM principles are integrated into government planning frameworks.
- Using asset registers, condition, risk and performance data to make quantitative, transparent and defensible capital investment decisions.

- Providing a whole-of-life cost analysis when making those investment decisions.
- Ensuring that the asset base is not increased without considering the impact on governments ability to fund the future maintenance and renewal of those assets.
- Ensuring revenue streams are enough to sustain assets in a condition which optimises both agency costs and those of the end user.
- Utilising technology advances and innovative solutions that assist and are relevant to asset preservation, maintenance and reducing whole-of-life costs.
- Building resilience to climate change and environmental challenges.
- Establishing clear lines of responsibility and accountability.

1.3 Benefits of Asset Management

The benefits of asset management can include, but are not limited to the following¹:

- a) **Improved financial performance:** improving the return on investments and reducing costs can be achieved, while preserving asset value and without sacrificing the short or long-term realisation of organisational objectives;
- b) **Informed asset investment decisions:** enabling the organisation to improve its decision making and effectively balance costs, risks, opportunities and performance;
- c) **Managed risk:** reducing financial losses, improving health and safety, good will and reputation, minimizing environmental and social impact, can result in reduced liabilities such as insurance premiums, fines and penalties;
- d) **Improved services and outputs:** assuring the performance of assets can lead to improved services or products that consistently meet or exceed the expectations of customers and stakeholders;
- e) **Demonstrated social responsibility:** improving the organisation's ability to, for example, reduce emissions, conserve resources and adapt to climate change, enables it to demonstrate socially responsible and ethical business practices and stewardship;
- f) **Demonstrated compliance:** transparently conforming with legal, statutory and regulatory requirements, as well as adhering to asset management standards, policies and processes, can enable demonstration of compliance;
- g) **Enhanced reputation:** through improved customer satisfaction, stakeholder awareness and confidence;
- h) **Improved organisational sustainability:** effectively managing short and long-term effects, expenditures and performance, can improve the sustainability of operations and the organisation;
- i) **Improved efficiency and effectiveness:** reviewing and improving processes, procedures and asset performance can improve efficiency and effectiveness, and the achievement of organisational objectives.

¹ *International Standard ISO55000: Asset management*

1.4 AM Knowledge Base

The following three documents contain the knowledge base for asset management development in the Cook Islands. These two foundational documents contain the key AM themes replicated throughout many of the other published reports and manuals on asset management.



ISO Standards for Asset Management (ISO55001/55002)

ISO 55000 provides an overview of the subject of asset management and the standard terms and definitions. ISO 55001 is the requirements specification for an integrated, effective management system for asset management. ISO 55002 provides guidance for the implementation of such a management system. The development of these standards was achieved by ISO Committee TC251, with 31 countries participating. The standards were published in February 2014 and are available from national standards bodies such as BSI.



International Infrastructure Management Manual (IIMM)

Now in its 5th Edition (2015) the International Infrastructure Management Manual (IIMM) provides a multidisciplinary set of guidelines for determining lifecycle investment strategies for public infrastructure assets. Recognising that the ISO55000 Asset Management Standards are very much the “What to do”, the IIMM provides the “How to do it” in terms of applying the standards for infrastructure asset management by way of case examples, templates and guidelines.

1.5 Cook Island Context for Asset Management

Distribution of the Population

The infrastructure is spread across the 12 inhabited islands, with Table 1 providing a basic summary of each island. With the low populations on many of the islands, the provision of economically sustainable infrastructure and maintaining the associated technical support for that infrastructure on each island will be an ongoing challenge. Any AM initiatives relating to the management of infrastructure on the outer islands will need to recognise these challenges.

Table 1: Summary of Island Statistics

Island	Land Area Km ² (%)	Populat'n (% of total)	Characteristics (source: NIIP (2015))
Rarotonga	67.1 (28.3%)	13,007 (74.6%)	Rarotonga – the most populated island and seat of government in the Cook Islands is a dominant rugged volcanic up thrust, with an outlying reef system and varying width lagoons. The population is generally spread around the lowlands and lower slopes of the island. The main township Avarua is the capital of the Cooks and its main commercial centre. Tourism is the predominant industry, followed by offshore banking agriculture and fishing.
Southern Islands		3,326 (19.1%)	Comprises the 6 islands listed below.
Aitutaki	18.3 (7.7)	1,941 (11.1%)	Aitutaki is 140 nautical miles from Rarotonga. The island is of atoll makeup with the population concentrated on the major land mass in its north-western corner. The land here reaches to 260 metres above sea level. A large lagoon makes up approx 70% of its area.

Island	Land Area Km ² (%)	Populat'n (% of total)	Characteristics (source: NIIP (2015))
			The island is serviced daily by a regular air service and usually receives two overseas cargo ships a month. Second most popular tourism island, many years ago Aitutaki was a major exporter of bananas.
Mauke	18.4 (7.8)	297 (1.7%)	Mauke is 150 nautical miles from Rarotonga. A small island mass made up of makatea (coral reef) with the community generally spread along the south western coast. It has an airfield and recently (2012) its harbour was upgraded. Maire eis (flower garlands) are its main export (to Hawaii).
Mitiaro	22.3 (9.4)	155 (0.9%)	Mitiaro is 142 nautical miles from Rarotonga. A small island mass made up of makatea with the community located generally in the one village known as Atai. It has an airfield and recently (2012) its harbour was upgraded.
Manaue	6.2 (2.6)	Nil	Manaue is 124 nautical miles from Rarotonga, located between Atiu and Aitutaki (24 nautical miles). This island is made up of two separate land masses and a fringing coral reef with no easy passage to its lagoon. Once a thriving copra industry and a small airstrip operated on Manaue.
Atiu	26.9 (11.4)	434 (2.5%)	Atiu is 116 nautical miles from Rarotonga. A small harbour and airfield are located on the north-western low lands while the interior rises up to 80 metres above sea level. The majority of the population and commercial activity operates on this higher land about the village of Areora in the centre of the island. Coffee is the main crop of Atiu grown in the valleys. Third most popular tourism island by visitor numbers.
Takutea			Bird sanctuary off the coast of Atiu
Mangaia	51.8 (21.9)	499 (2.9%)	Mangaia is 110 nautical miles from Rarotonga. This island is the most southern of the Cooks group located to the south east of Rarotonga, also the oldest island in the Pacific being an upraised coral mass. Oneroa the main village is located on the western side of the island close to the small harbour (presently being upgraded) and airfield. The interior sits up to 70 metres above sea level and offers good agriculture land.
Northern Islands		1,101 (6.3%)	Comprises the 7 islands listed below.
Palmerston	2.1 (0.9)	58 (0.3%)	Palmerston is 270 nautical miles from Rarotonga. A large coral atoll with fringing land scattered about its outer reef system. Its small population is located on one of the land masses on the south western corner. Access is by irregular shipping service from Aitutaki or Rarotonga. Subsistence living and fish exports to Rarotonga.
Pukapuka	1.3 (0.6)	444 (2.5%)	Pukapuka is 715 nautical miles from Rarotonga. An atoll with a number of separate land masses and a deep lagoon. The majority of the population resides on the northern land mass. A passage from the open sea to the lagoon enables supplies to be landed on the island. At the southern end of the island some 8 N miles, is a small airstrip. An open boat and barge operates to facilitate passengers to the main northern island. This island is the most western of the group.
Nassau	1.3 (0.6)	78 (0.4%)	Nassau is 673 nautical miles from Rarotonga. A small island mass with the community located generally in one village area on the south western corner. The closest island is Pukapuka a distance of 48 nautical miles away.
Manihiki	5.4 (2.3)	212 (1.2%)	Manihiki is 650 nautical miles from Rarotonga. An atoll with two separate land masses and a very deep lagoon. Each land mass has its own Village with the population being split equally between the two. The Village of Tukao on the north side supports a small airstrip and both Villages have their own respective harbours (recent contract for upgrading has been let). This island is the central of black pearl production for the Cook Islands.

Island	Land Area Km ² (%)	Populat'n (% of total)	Characteristics (source: NIIP (2015))
Rakahanga	4.1 (1.7)	83 (0.5%)	Rakahanga is 674 nautical miles from Rarotonga. A small island with the population centralised in one area. This island's access is by way of motor launch from Manihiki - a distance of 24 nautical miles. Some time ago the airport was destroyed by a cyclone and has never been rebuilt due to the need to re-site it to a more secure location.
Penrhyn	9.8 (4.1)	226 (1.3%)	Penrhyn is 737 nautical miles from Rarotonga. A large coral atoll with fringing land scattered about its outer reef system. The main village of Omoka is situated on the southern side and supports the majority of the population. The airfield and a deep water port within the lagoon are located in the Omoka village area. The deep water port is often used by fishing vessels that call to refuel.
Suvarrow	0.4 (0.1)	NIL	Suvarrow is 513 nautical miles from Rarotonga. This island is a pure atoll with entry to its lagoon available through a large opening in the reef. The island is registered as a World Heritage Park. Many visiting international yachts stop here on their south Pacific ventures between April and October at which time two caretakers are positioned on the island.
Total	236.7	17,434	

Source: The populations are from the 2016 National Census. Land area and island characteristics are from the NIIP (2015)

Infrastructure Agencies

The following tables identifies those agencies that are major infrastructure owners; those that are minor asset owners; and those agencies that while not necessarily having a significant asset ownership role have a key role to play in asset management in the Cook Islands. By exception, an agency not listed in the table below is deemed to have a limited role to play in this current AM initiative, although they may be actively brought into the programme at some later date.

Table 2: Key Asset Management Agencies

Agency	Major Asset Owner	Minor Asset Owner	Key AM Function
Infrastructure Cook Islands (ICI)	✓		
Ministry of Education (MOE)	✓		
Ministry of Finance and Economic Management (MFEM)			✓
Ministry of Health (MOH)	✓		
Ministry of Justice (MOJ)		✓	✓
Ministry of Police (MOP)		✓	
Ministry of Transport (MOT)		✓	
Office of the Public Expenditure Review Committee and Audit			✓
To Totau Vai (TTV) - Water	✓		
Te Aponga Uira (TAU) - Power	✓		
Office of the Prime Minister (OPM) ¹			✓
Emergency Management Cook Islands (EMCI)			✓
Outer Island Government administrations ²	✓		
Aitutaki Power Supply	✓		
Cook Islands Investment Corporation (CIIC) - Property	✓		

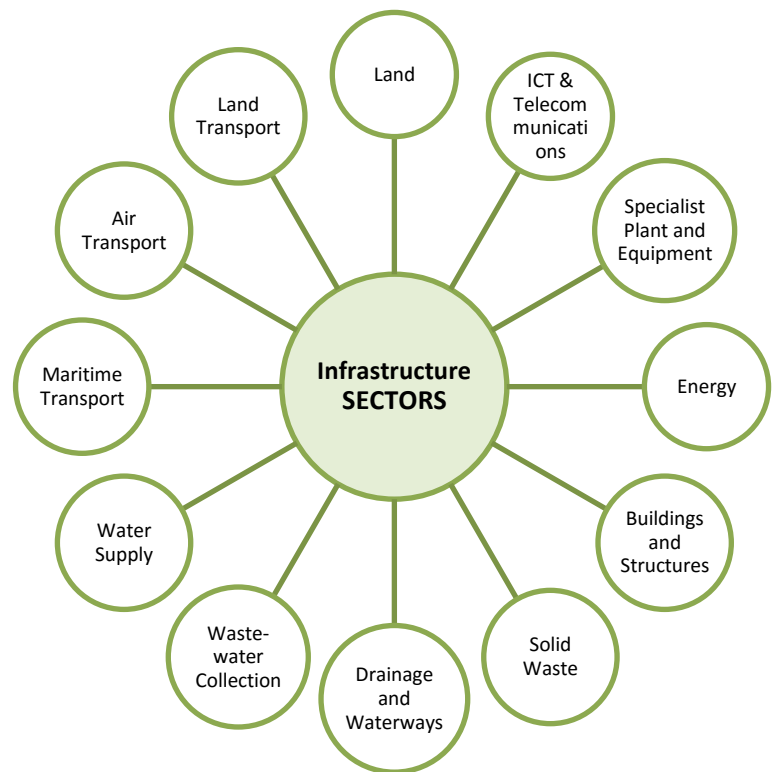
Agency	Major Asset Owner	Minor Asset Owner	Key AM Function
Cook Islands Ports Authority (CIPA)	✓		
Airport Authority Cook Islands (AACI)	✓		
Cook Islands Government Property Corporation (CIGPC) - Land			✓
Avaroa Cable Limited (ACL)	✓		

Notes: 1. Director of Renewable Energy; Director of Outer Island; Director ICT
 2. Outer island administrations on Atiu, Aitutaki, Mangaia, Manihiki, Mauke, Mitiaro, Palmerston, Penrhyn, Pukapuka, Rakahanga.

1.6 Infrastructure Covered by this Strategy

The infrastructure assets included under this Strategy can be grouped into twelve main “infrastructure sectors”:

- **Land Transport** (e.g. roads, bridges, culverts, street lighting and roadside drainage)
- **Air Transport** (e.g. runways, navigational aids and lighting)
- **Maritime Transport** (e.g. jetties, navigational aids and vessels)
- **Water Supply** (e.g. desal, pumps, pipes, treatment plants and intakes)
- **Wastewater Collection** (e.g. desal, pumps, pipes, treatment plants and intakes)
- **Drainage and Waterways** (e.g. seawalls, river protection, canals and flood gates)
- **Solid Waste** (e.g. landfill; dump sites; transfer station)
- **Buildings and Structures** (e.g. schools, hospitals, administration, quarters)
- **Energy** (e.g. power generation and distribution)
- **Specialist Plant and Equipment** (e.g. medical equipment, hydro/solar plant)
- **ICT and Telecommunications** (e.g. undersea cable, data networks)
- **Land** (e.g. road corridor, reserves, commercial, residential and industrial)



Many of the government departments and state-owned enterprises managing the Cook Island’s infrastructure assets would be considered ‘capital-intensive’ based on the ratio of the capital expenditure required to the amount of labour that is required. Capital-intensive organisations typically own a high proportion of long-life, high-value assets such as transmission lines, bridges,

wharves, pipelines, buildings and roads. As these assets age, maintenance costs increase along with a decrease in their reliability and performance. This is an important distinction to make as a small deferral of these capital investments can significantly improve the short-term financial performance of the organisation but result in longer-term unfunded liabilities.

Table 3 identifies the main infrastructure agencies responsible for asset management across the Cook Islands. Table 4 summarises the assets they are responsible for.

Table 3: Summary of Infrastructure Asset Owners

Asset Group	Agencies
Land Transport	Ownership resides with CIIC with ICI and Outer Island Governments delegated maintenance and operational responsibilities
Air Transport	AACI for Rarotonga and Aitutaki, Other islands under Outer Island Governments with support ICI & AACI
Maritime Transport	CIPA for Rarotonga and Aitutaki; Outer island ports under Outer Island Governments with support ICI & CIPA; MoT, Police for patrol vessels
Water Supply	TTV for Rarotonga, ICI, Outer island systems under Outer Island Governments
Wastewater Collection	CIIC for Tepuka, ICI
Solid Waste (Landfill & Sanitation)	ICI, MoAg, Outer Island Governments
Buildings	ICI, CIIC, MoH, DOE, MoLG, MoEd, MoP, Pa Enea, CIGPC
Energy	Te Aponga Uira (TAU), CIIC (Aitutaki Power Supply), Outer Island Governments, ICI supports generator maintenance
Specialist Equipment	MoH for health equip, OPM/ICT
Drainage and Waterways	ICI
ICT & Telecommunications	ACL, CIIC for Matavera AM Mast, ICT/OPM
Land	ICI – Roads, NES – Reserves & Coastal

Table 4: Summary of Infrastructure Assets

Sector Summary	Major Infrastructure Assets
<p>LAND TRANSPORT</p> <ul style="list-style-type: none"> ❖ Rarotonga <ul style="list-style-type: none"> ❖ 201km Roads, 10.2km Footpaths ❖ 211 Drains, 5.4km Culverts, 82 Bridges ❖ (\$73 million RC Dec 2012) ❖ Outer islands – limited road network 	Earthworks; Sealed Roads; Unsealed Roads; Agricultural Roads; Service Roads; Footpaths; Streetlight Poles and Assemblies; Guardrails; Kerb and Channel; Roadside Drains; Bridges; Fords; Culverts; Retaining Walls; Sea Walls; Rock revetment.
<p>AIR TRANSPORT</p> <ul style="list-style-type: none"> ❖ 2 international airport (Rarotonga, Aitutaki) ❖ 7 domestic airports (Mangaia, Atiu, Mitiaro, Mauke, Manihiki, Pukapuka, Tongareva) 	Terminal buildings; Carparks; Runways; Taxiway; Aprons; Navigation Aids (VASI, PAPI, REIL etc); Runway Lighting; Weather Stations; Control Systems; Fire Trucks; Fuelling Systems at Rarotonga.
<p>MARITIME TRANSPORT</p> <ul style="list-style-type: none"> ❖ 1 international port (Rarotonga) ❖ Container ports at Rarotonga & Aitutaki ❖ Wharves, anchorages and jetties on outer islands ❖ Navigation markers, Vessels & heavy equipment 	Container ports; Wharf; Jetties; Forklifts; Beacons; Cargo Ships; Passenger Ships; Tugs; Barges; Navy Vessels; Patrol Boats.
<p>WATER SUPPLY</p> <ul style="list-style-type: none"> ❖ Rarotonga <ul style="list-style-type: none"> ❖ 12 intakes (metered), 8 Storage reservoirs ❖ 251 km Water mains, 2 Pumps, 7 meters ❖ 5400 connections ❖ (\$39 million RC Dec 2012) ❖ Small distribution on outer islands 	Reservoirs; Intakes; Water mains; Laterals; Valves; Hydrants; Boreholes; Dams; Storage Tanks; Water Pumps; Dosing Pumps/Tanks; Generators; Control Panels; Telemetry; Sensors; Flowmeters; Aerator; Actuators; Compressors; Cranes; Feeders/Hoppers; Motors; UV Treatment; Civil Works.
<p>WASTEWATER COLLECTION</p> <ul style="list-style-type: none"> ❖ Rarotonga services 59 private properties, college and indoor arena <ul style="list-style-type: none"> ❖ 1 pump station, 1 small treatment plant ❖ 2km of sewer pipes ❖ Installed in 2009 and 2010 ❖ (\$630,000 RC Dec 2012) 	Gravity main; Rising main; Manholes; Connections; Valves; Pumps; Generators; Control Panels; Telemetry; Sensors; Flowmeters; Actuators; Compressors; Cranes; Feeders/Hoppers; Motors; UV Treatment; Grinders; Blowers; Aerator; Dewatering; Diffuser; Ponds; Odour Control; Screens; Mixers; Scrubbers; Incinerators; Septic Tankers; Civil Works.
<p>SOLID WASTE (LANDFILL & SANITATION)</p> <ul style="list-style-type: none"> ❖ Rarotonga <ul style="list-style-type: none"> ❖ Rarotonga Waste Facility landfill ❖ 1 septage treatment pond ❖ (\$4.5 million RC Dec 2012) ❖ Aitutaki – 1 managed landfill ❖ Sludge ponds to receive septic tank deposits on Rarotonga & Aitutaki ❖ Dump sites on Outer Islands 	Leachate Collection/Liner; Weigh Bridges; Solid Waste Recycling Centre
<p>BUILDINGS</p> <ul style="list-style-type: none"> ❖ 184 Government Buildings ❖ 40% over 50yrs old ❖ (\$148m RC 2012) ❖ Carparks on public land 	Schools; Hospital and medical facilities; Offices; Residential housing; Sports arenas; Prison and courtrooms; Commercial property; Cyclone Shelters (outer islands); In NZ CI High Commission & Consulate Office; Carparks; Public toilets
<p>ENERGY</p> <ul style="list-style-type: none"> ❖ Rarotonga (Privatised – Not Included) ❖ Outer islands – generators & small distribution on some islands ❖ Solar PV on Outer Islands (8 PV Northern Group; 5 PV Southern Group) 	Diesel engines; Generators; Transformer stations; Solar panels; Battery Storage Facilities; Fuel stations; Scada equipment; Switching equipment; Cranes; Power lines; Buildings.
<p>SPECIALIST EQUIPMENT</p> <ul style="list-style-type: none"> ❖ High Value Medical Equipment ❖ Specialist ICT 	Ultrasound Equipment; Ventilators; Endoscopes; Ambulance; Mammography machine; Cystoscope/Hysteroscope; Boiler; Incinerators; X-ray equipment; Oxygen Plant.
<p>DRAINAGE AND WATERWAYS</p> <ul style="list-style-type: none"> ❖ Stormwater drains ❖ Culverts 	Rivers; Creeks; River/Coastal Protection; Seawall Embankments; Breakwaters/Groins; Waterways; Piped Stormwater.
<p>ICT & TELECOMMUNICATIONS</p> <ul style="list-style-type: none"> ❖ Marine cable under construction ❖ 1 x AM Mast ❖ Data Centre & network 	Cable landing stations (Rarotonga & Aitutaki); Terrestrial Cable; Manholes; Ductlines; BMH; HHs; Matavera AM Mast; ICT Servers; Host building; Masts, cabling, antennas; Independent Power Producers (IPP)
<p>LAND</p>	Road Corridor; Reserves; Commercial; Residential; Industrial.

SECTION 2

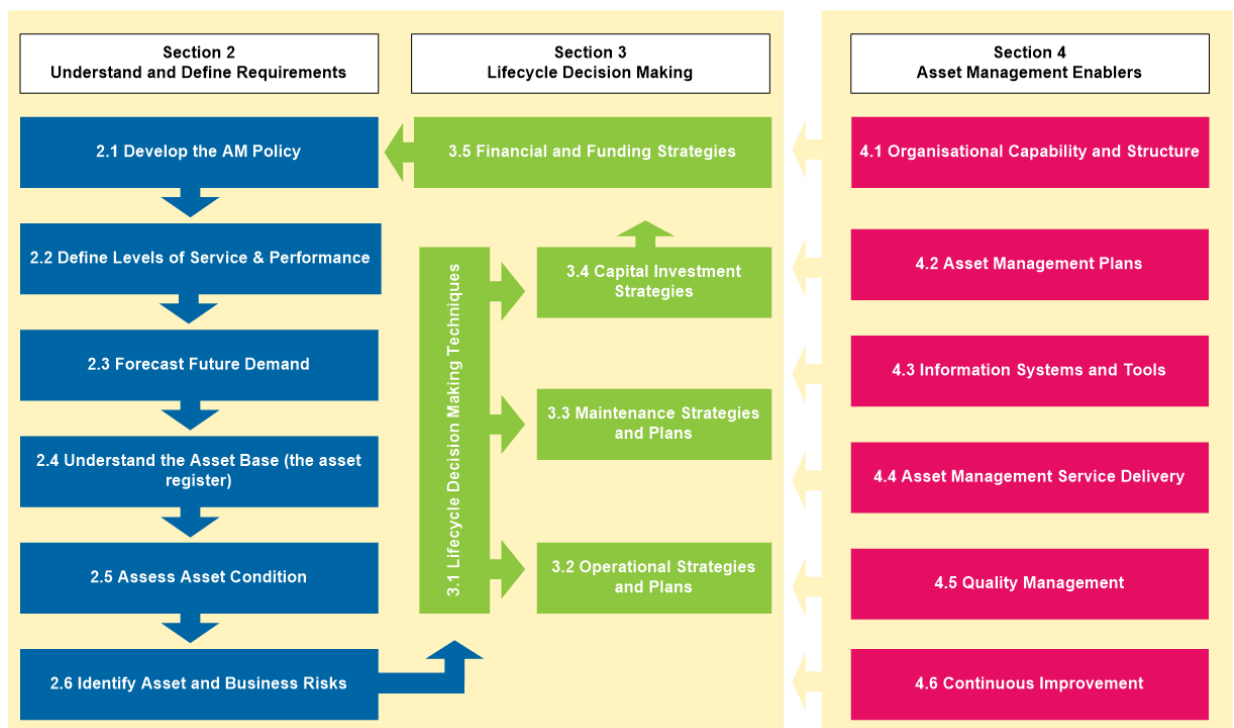
CURRENT STATE OF ASSET MANAGEMENT

This section of the strategy presents a useful framework for asset management as defined in the International Infrastructure Management Manual (IIMM) and assesses the current maturity of key agencies asset management practices against this framework.

2.1 Asset Management Framework

The basis of the analysis and reporting for this project has been the International Infrastructure Management Manual's (IIMM) Asset Management Framework (AMF) which has been developed over many years in New Zealand and Australia. The AMF has been shown to have an alignment with the ISO55000 Series Asset Management Standard requirements. The framework provides a foundation upon which asset management, in its holistic sense can be assessed and improved across organisations and across the Cook Islands as a whole. It covers 17 aspects of asset management summarised into 3 core pillars (knowledge areas):

1. Understanding and Defining Requirements;
2. Lifecycle Decision Making; and
3. Asset Management Enablers.



Source: International Infrastructure Management Manual (IIMM)

Figure 1: Adopted Asset Management Framework

The AMF provides a structured framework that guides the decision-making process for the long-term management of government-owned assets and infrastructure. The AMF has been adopted for this project to apply to all ministries, departments and delivery bodies for the ongoing management of infrastructure and assets owned and operated by the Government of the Cook Islands.

The AMF diagram (Figure 1 above) highlights that for all organisations there are aspects of the services and outcomes delivered by the organisation that are dependent on assets and others that are not dependent on assets. Below is a description of each of the three pillars of the AMF.

1. Section 2: Understanding and Defining Requirements

Commencing with the AM Policy and Strategy, this 1st pillar of the AMF sets out to answer the basic questions of *what are we trying to achieve? how are we doing? and with what assets?* The AM Policy for a given asset owner will need to be consistent with overarching government wide strategies and policies.

The definition of service levels and performance management also fits within this 1st pillar of the AMF, along with demand forecasting. While these first aspects are not asset based, the next three aspects move directly into assets with a focus on the asset register, asset condition and risk management.

2. Section 3: Lifecycle Decision Making

This 2nd pillar of the AMF focuses on the questions of *what needs to be done? and how will we pay for it?* The agreed decision-making techniques are documented and the resultant operational, maintenance and capital investment plans are developed, and optimised against the available funds. It is this 2nd pillar of the AMF that many people relate to the outputs of asset management, in that all the processes and practices are brought together to create tangible physical work programmes.

While the AMF, brings into scope the investment in new assets, the current focus of this asset management project is on the existing infrastructure assets – such that capital investment plans pertain to the renewal or rehabilitation of existing assets, rather than asset base expansion.

3. Section 4: Asset Management Enablers

The 3rd pillar of the AMF relates to the asset management enablers. It is the enablers (people, systems, service delivery models) and associated outputs of AM Plans, Quality Assurance and Improvement Plans, that are often the biggest hurdle to overcome when seeking to improve asset management practices. While addressing the enablers in themselves is not the same as delivering asset management, experience shows that it is difficult to get asset management to be a sustainable business practice without these enablers being understood and appropriately funded.

While many people see information systems and tools as being the core of asset management, these are in fact just enablers of good asset management. Information systems and tools comprises the software and hardware to store the asset register, the analysis of this data in the form of information which informs decision making. Furthermore, information management includes policies and procedures for the connection of these factors and the interaction with people.

Knowledge management is much broader and helps an agency to improve decision-making, increase work productivity and innovations. It is based on the underlying notion that *'good decision-making is based on good data'*.

The final aspect of this 3rd pillar of the AMF is that of continuous improvement. It should be noted that improvement is not the same as complexity – a fully sustainable simple AM process is preferable over a complex AM process that is not sustainable within the agency it is applied to. Moreover, the application of the AMF should reflect the nature of the assets being managed and the level of complexity will reasonable vary by asset type (e.g. roads vs water) and by location (e.g. Rarotonga vs one of the smaller outer islands).

2.2 Current State Maturity Assessment

An assessment of the current state of asset management across seven infrastructure agencies was conducted as part of this project. The purpose of the assessment was two-fold:

1. To allow our consultants to rapidly gain a feel for the status of asset management practices within the Cook Islands to help inform the development plan.
2. Introduce participants to the wide domain of asset management and give them insight into where they might look to improve on current practices.

The assessment benchmarks where each agency falls against the 17 components of the AMF, rating each response on a scale of 0-100. Specific guidance is given to what would warrant ratings in the range of:

- 0-20: Awareness
- 25-40: Minimum
- 45-60: Core
- 65-80: Intermediate
- 85-100: Advanced

The 17 individual responses to the maturity assessment are then combined into three summary ratings as per the table below.

Table 5: Current State Maturity Assessment Areas (IPWEA IIMM Asset Management Framework)

Summary Level	Aspect	Context of Assessment
Pillar 1: Understanding and Defining Requirements	1. AM Policy and Strategy	Does the agency have an AM Policy and AM Strategy? Has it been widely communicated? Is it aligned with wider government policies and strategies?
	2. Levels of Service and Performance Management	Does the agency have in place levels of service relating to the customer and asset provision? How have these been set?
	3. Demand Forecasting	What is the status of demand forecasting for asset provision?
	4. Asset Register Data	What sort of asset-related information is held and what is the quality of that information?

	5. Asset Condition Assessment	How does the agency measure the condition of its assets?
	6. Risk Management	What practices are in place to identify and manage risks to both assets and customer service?
Pillar 2: Lifecycle Decision Making	7. Decision Making	How are investment decisions made and balancing demands between operations, maintenance, renewal and expansion investments?
	8. Operational Planning	What practices are in place to make the most cost-effective use of the assets?
	9. Maintenance Planning	How does the agency plan and manage its maintenance activities?
	10. Capital Investment Strategies	How does the agency plan capital investments – both renewals and asset expansion?
	11. Financial and Funding Strategies	How does the agency plan and manage funding needs?
Pillar 3: Asset Management Enablers	12. Asset Management Teams	What is the AM capability within the agency? Is the AM team appropriately linked into the wider organisational structure?
	13. AM Plans	Does the agency produce an AM Plan and is it appropriate?
	14. Information Systems	What IT systems are used to manage the assets?
	15. Service Delivery Models	What service delivery models (force account, private sector, single or multiyear) are used to deliver the services?
	16. Quality Management	How does the agency ensure that it's asset management processes and practices are appropriate and effective?
	17. Improvement Planning	How does the agency identify and deliver improvement actions to its AM practices?

It needs to be noted that the state of AM does not necessarily reflect the state of the assets themselves. It is possible to have good assets and yet rate low on the AM maturity scale, and conversely it is possible to have poor assets (e.g. if underfunded) yet have a mature AM rating. Just because an agency has an asset management plan for example, does not mean they follow the plan or have good asset management practices.

The pilot agencies surveyed were:

- Cook Islands Port authority (CIPA)
- Office of the Prime Minister (OPM) – divisions related to renewable energy, ICT and outer islands
- Infrastructure Cook Islands (ICI)
- Ministry of Education (MoEd)
- Ministry of Health (MoH)
- Cook Islands Investment Corporation (CIIC) – buildings division
- Airport Authority Cook Islands (AACI)

In the charts that follow the lines represent:

- Red: The lowest score on the attribute from across the seven agencies assessed
- Blue: The average score on the attribute from across the seven agencies assessed
- Green: The highest score on the attribute from across the seven agencies assessed



Figure 2: Current State of Asset Management (by Agency)

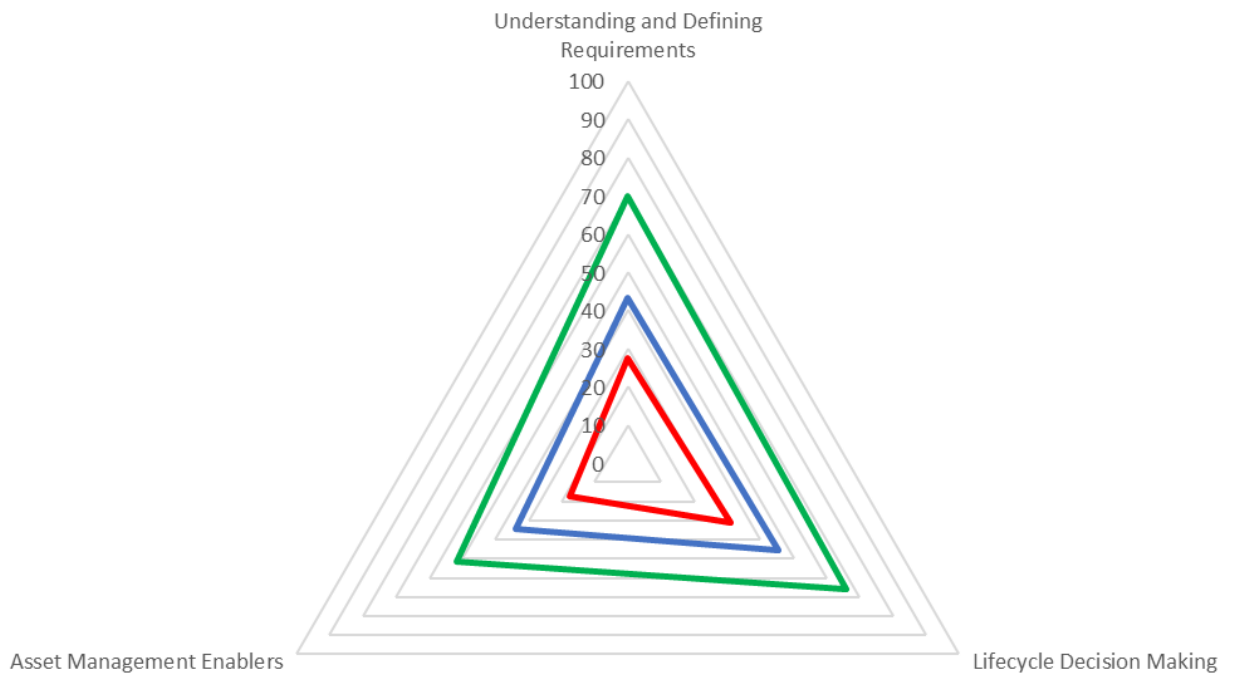


Figure 3: Current State of Asset Management (by AMF Knowledge Area)

The figures above illustrate that there is a high degree of variation in the application of asset management practices across the seven agencies assessed. For most of the 17 attributes, within the Cook Islands can be found both good to very good practice, and relatively poor practice. There is also a much stronger level of maturity on those aspects of asset management that relate to the more common 'doing' parts of asset management (funding, maintenance, capital investments etc.) and a correspondingly weaker application of the softer aspects of asset management (policies, strategies, improvement plans etc.).

As expected, the best practices were found in those agencies who were set up as state owned enterprises and who maintained highly critical assets (airport and power sectors). If these commercial entities can practice and derive benefits from good asset management, then it is almost certain that other parts of government can benefit from improving their asset management practices.

2.3 Future State (3-Year Target)

A future state for the whole of Cook Islands is not appropriate, as each asset owner is starting from different states of maturity and have different challenges to deal with. For some agencies a stronger focus on risk management and resilience may be required, whereas for others it is more around long term planning. Furthermore, just chasing a target can lead to disjointed improvement initiatives that while raising the score obtained, don't overall deliver better outcomes.

The asset management improvement initiatives developed under this review (refer to Section 4) have been identified that will deliver meaningful outcomes, while concurrently improving the AM maturity outcomes.

For each of the seven agencies assessed, an estimate of where their maturity level could reasonably be at in 3-years' time has been made. This 3-year target reflects a blend of completion of the improvement strategies developed in this review, along with simple 'within agency' type initiatives. For example, the following figure indicates the current level of maturity and assessed 3-year target for the Cook Islands Port Authority (CIPA). As is obvious from the figure, the targets neither reflect the achievement of a 100 rating, nor do they indicate a consistent level of improvement across all the aspects of asset management. Similar charts exist for all seven agencies assessed and are included in **Appendix C**.

It is recommended that the AM Maturity Assessment be repeated on an annual basis to monitor the level of progress being made.

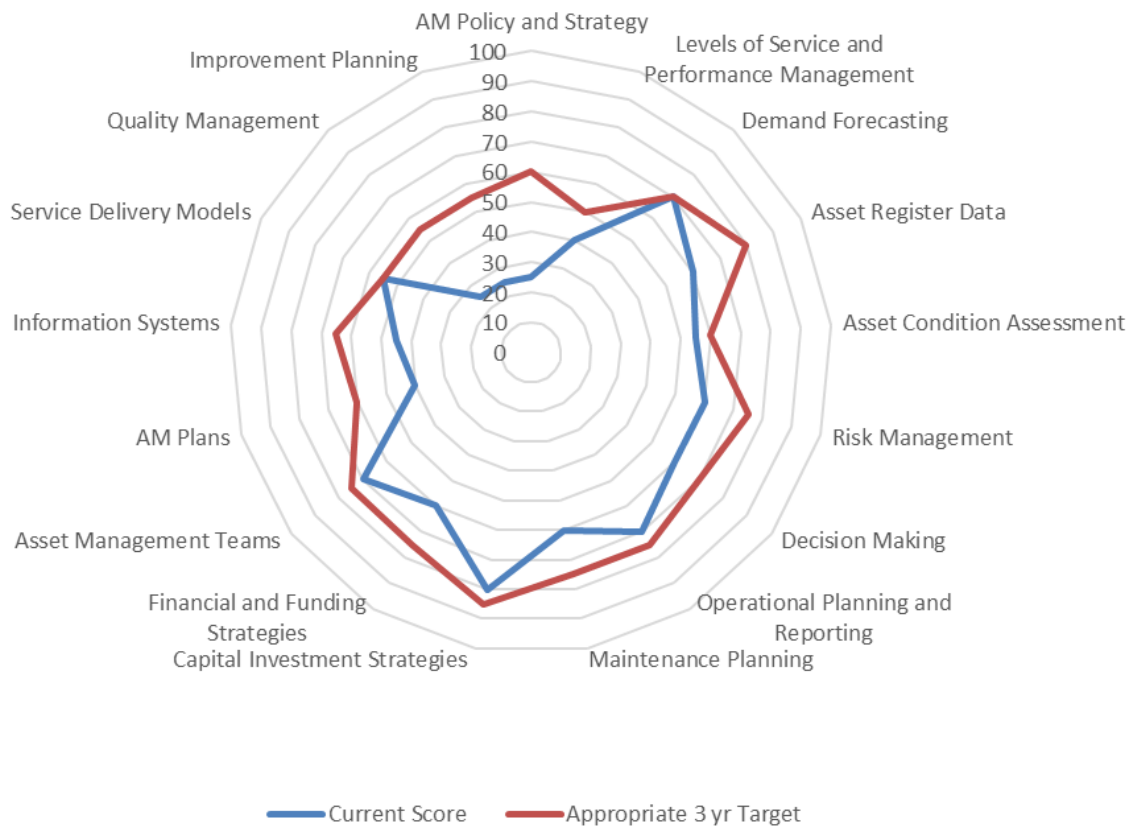


Figure 4: Current and Target State of Asset Management (Cook Island Port Authority)

SECTION 3

SUPPORT SYSTEMS REVIEW

This section of the strategy presents a view of foundational AM software systems currently in use and makes recommendations on enhancements which are incorporated into the implementation strategy in Section 4.

3.1 Geographic Information Systems (GIS)

A Geographic Information System (GIS) helps infrastructure agencies manage infrastructure assets which can be represented spatially as:

- points (buildings, towers),
- lines (roads, powerlines, pipelines, rivers) or
- polygons (facilities, land parcels).

Most assets have a spatial context and a GIS allows these to be mapped and analysed against information in different layers. While using the same GIS software solution across agencies is an advantage, it is more important that the data within the GIS is maintained to certain standards and the sharing of information between agencies is encouraged (e.g. aerial imagery and contour/terrain models).

During development of the AMDP we encountered three main GIS systems in use by infrastructure agencies to aid in the management and mapping of their assets:

QGIS (Open Source Product)

QGIS (previously also known as Quantum GIS) is a free open source GIS application enabling the user to visualise, manage, edit and analyse spatial map data. It is regularly updated (currently at v3.8) and can be downloaded from an online site free of charge and run on most computers running Windows and Android OS – although like any GIS it performs best on computers with higher spec graphics cards, RAM and CPU speeds.

There are estimated to be 10-15 individuals using QGIS across government including MOH, ICI, CIIC, EMCI and MOJ. While CIIC maintain a link between QGIS and data tables in AssetFinda most others using QGIS maintain their own data tables (typically in shape files) and in some instances maintain duplicate data to that captured and entered in AssetFinda. This is typical of GIS users as they would prefer to work with tables they have full control over to add attributes, edit table structures and the likes. When these tables are also used by, or are native to, other software solutions such as AssetFinda, there is a reluctance to change table structures for fear of disrupting the parent system. As a result, tables are copied and maintained outside the parent system and data subsequently becomes out of sync.

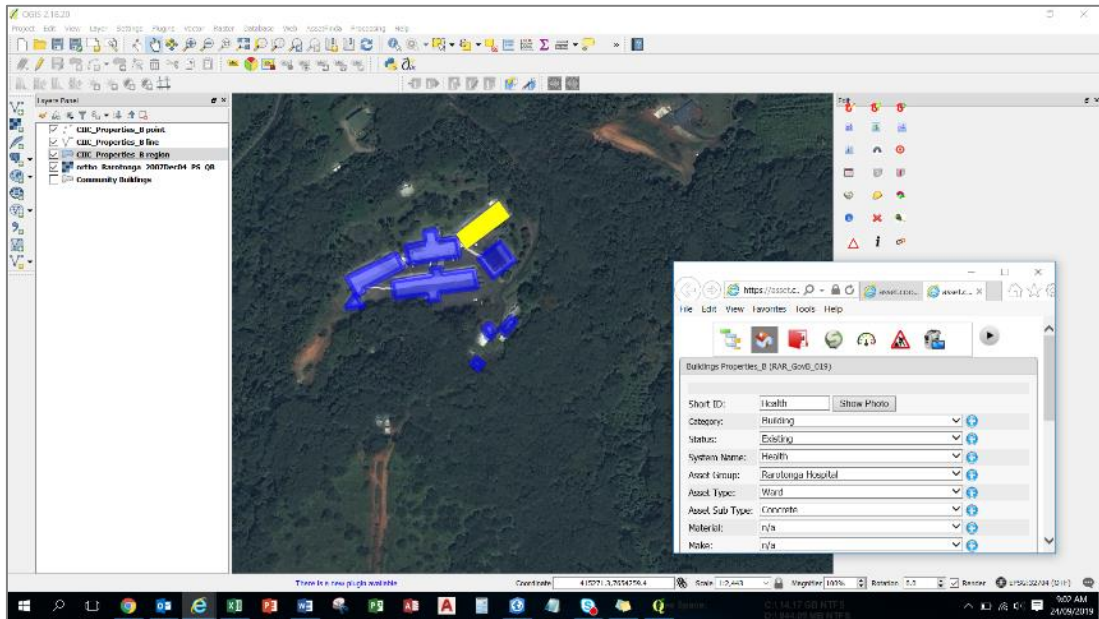


Figure 5: QGIS linked to AssetFinda property assets (query from with QGIS)

ArcMap (by ESRI)

ArcMap is the main component of Esri's ArcGIS suite of geospatial processing programs. The ArcGIS suite is available at four license levels: Basic, Standard, or Advanced (formerly ArcView, ArcEditor, or ArcInfo), and Pro. Each step up in the license provides the user with more extensions that allow a variety of querying to be performed on a data set.

There are estimated to be 7-8 individuals using ArcMap across government including CIIC, EMCI and TTV. There is no link between ArcMap and AssetFinda records, users of ArcMap maintain their own data tables for the applications they use the software to support.

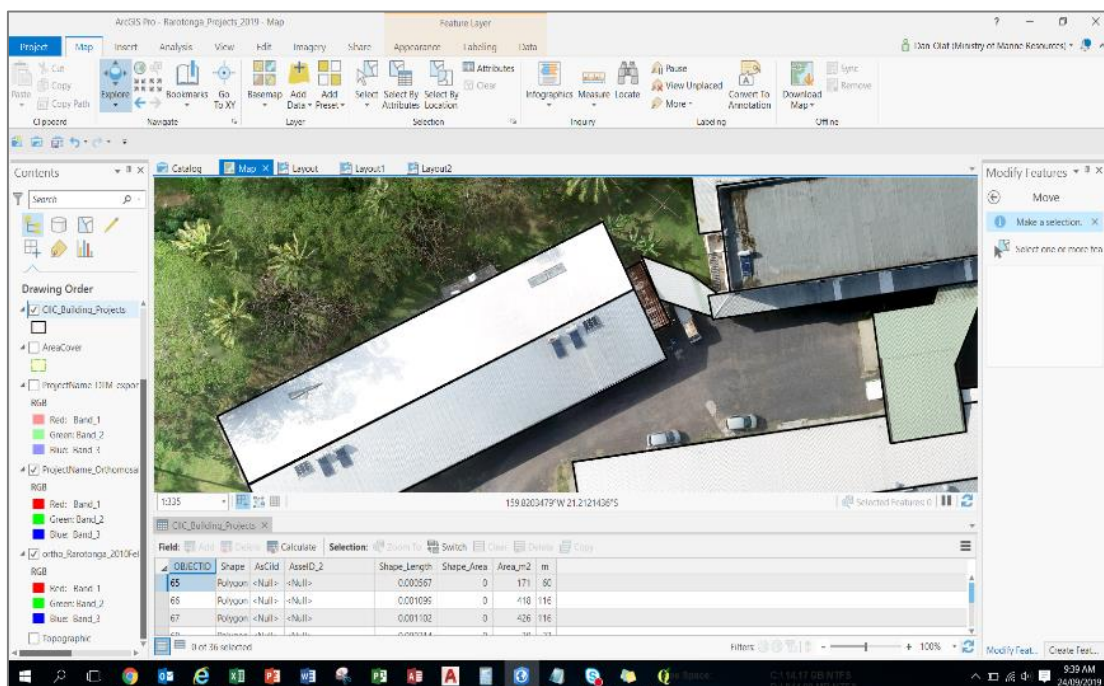


Figure 6: ArcMap being used with drone imagery to determine roof areas at the hospital

MapInfo Pro (by PBS)

MapInfo Pro is a desktop geographic information system produced by Pitney Bowes Software (formerly MapInfo Corporation). MapInfo was the first spatial mapping solution released in 1986. It has historically been a popular product across the Pacific because of its ease of use and lower entry cost. However, QGIS is taking some of the entry level market due to its 'low' cost and ESRI have improved the user friendliness of ArcMap to eat further into MapInfo's market space.

ICI has 1-2 MapInfo users who maintain the road network in MapInfo tables (again in parallel to the data originally captured and entered in AssetFinda).

AutoCAD

AutoCAD is a desktop drafting package produced by Autodesk. It is used by the Ministry of Justice (MOJ) Survey Division to store and maintain land parcel boundaries (property cadastre). While attempts have been made in the past to set up a geospatial mapping division within MOJ they have not been successful, and AutoCAD remains the core mapping solution. There are no topographic datasets or maps maintained by MOJ.

GIS Recommendations:

1. Review how GIS is being used by infrastructure agencies and determine the best structure and format to maintain core asset data.
2. Consolidate information to remove duplication and improve the integrity of this data. This includes gathering information from past projects and the private sector (e.g. Bluesky)
3. Improve the format of base layer data (roads, imagery, rivers, landmarks, coastline, cadastre, contours etc) and promote greater sharing of this data across infrastructure agencies.
4. Where applicable, maintain the links with AssetFinda where broader functions of AssetFinda are being utilised (e.g. Work order management, Asset valuation etc).

3.2 Asset Management Systems (AMS)

There are many different types of Asset Management Systems (AMS) supporting a broad range of business support function including:

- Procurement (Parts and Services)
- Asset Register / Inventory Management
- Work Management (Job Plans, Work Orders, Maintenance Schedules etc)
- Revenue and Billing
- Resource Management (Fleet, Personnel, Specialist Equipment and Plant etc)
- Mobile workforce (Work allocation, Dispatching, Field mobility etc)

The deployment and return on investment in AMS is generally greater for agencies with a significant volume of 'active' (mechanical and electrical) assets such as oil rigs, treatment facilities and power plants. However, they can also be beneficial for agencies who do a significant amount of maintenance.

ASSET MANAGEMENT	WORK MANAGEMENT	INVENTORY MANAGEMENT	PROCUREMENT MANAGEMENT	CONTRACT MANAGEMENT	SERVICE MANAGEMENT
Locations Asset Failure Codes Meters Meter Groups	Work Order Tracking Quick Reporting Labor Reporting Assignment Manager Activities & Tasks Service Requests Job Plans Preventive Maintenance Master PM	Items Master Storerooms Inventory Issues & Transfers Condition Codes Stoked Tools Tools Service Items	Request for Quotation Receiving Purchase Requisitions Invoices Companies Purchase Orders Terms & Conditions	Purchase Contracts Master Contracts Warranty Contracts Lease/Rental Contracts Labor Rate Contracts Terms & Conditions	Service Request Self-Service - Create Request - View Request Ticket Templates Activities & Tasks

Figure 7: Example of functions available in IBM Maximo's AMS/EAM

AssetFinda

AssetFinda is a browser-based asset management system with multiple GIS interfaces (ArcMap, MapInfo and QGIS) and a mobile app for field users. It has been implemented by a good number of small and medium sized local government authorities in New Zealand and Australia.










<p>Comprehensive Accounting </p> <p>Access a comprehensive range of financial reports, including valuations and operational costs.</p>	<p>Comprehensive Accounting </p> <p>Access a comprehensive range of financial reports, including valuations and operational costs.</p>	
<p>Scheduled Maintenance </p> <p>Allows you to plan the most efficient and cost-effective way to perform scheduled or reactive maintenance.</p>	<p>Scheduled Maintenance </p> <p>Allows you to plan the most efficient and cost-effective way to perform scheduled or reactive maintenance.</p>	
<p>Mobile Application </p> <p>Our mobility solutions give your field crews unprecedented live access to data over 3G, 4G or WiFi networks.</p>	<p>Mobile Application </p> <p>Our mobility solutions give your field crews unprecedented live access to data over 3G, 4G or WiFi networks.</p>	
<p>Integration </p> <p>Seamlessly connect your existing CRM's and systems to simplify your asset management processes.</p>	<p>Integration </p> <p>Seamlessly connect your existing CRM's and systems to simplify your asset management processes.</p>	

Figure 8: Functionality available in AssetFinda

AssetFinda 3.8.x was implemented by CIIC in 2016 to house and maintain asset data collected by AECOM and to provide support to asset valuations and service order management however, these latter two functions require additional support and training to ensure they are implemented and used.

AssetFinda has been installed on local servers housed at MFEM and performance is sluggish and limited in some areas due primarily to network issues and firewall restrictions. AssetFinda use seems to be limited to CIIC with its responsibility to manage governments property portfolio.

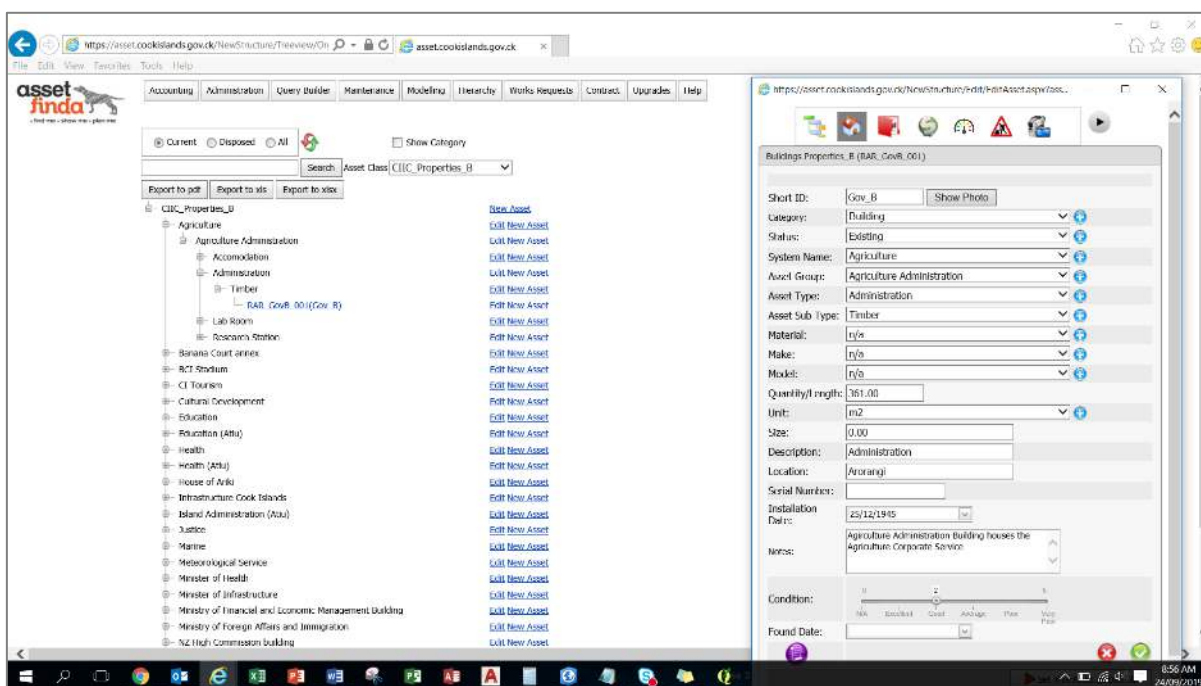


Figure 9: AssetFinda (4.x) system used by Cook Islands Government (2016)

Unit4 Business World (UBW)

Unit4 Business World is classed as an Enterprise Resource Planning (ERP) software solution which typically focus on service-focussed organisations and the people and finance side of their business including payroll, invoicing, customer management. ERP's generally provide less functionality supporting management of the physical assets (i.e. warehousing, inventory, work management, spares etc). UBW is no exception, however, it has implemented some bespoke functionality to support basic asset management functions.

Unit4 has been in business since the early 1980's and employs over 3,000 staff worldwide. Their ERP is central to the Cook Island power authority's (TAU) business for billing customers and managing service tickets and work orders. With a move by the water authority (TTV) to implement water metering, the use of Unit4 within the Cook Islands may grow further.

AMS Recommendations:

1. Review the relationship between asset data maintained using AssetFinda and those data held in GIS systems and being maintained outside of AssetFinda. Rationalise the information collected to better support asset management and remove duplication of records.
2. Investigate upgrading AssetFinda to take advantage of better mapping integration and newer functions. Consider the costs and advantages of cloud-hosting options to improve system performance.
3. Find the 1-2 areas where functionality available within AssetFinda can support improved business practices (e.g. asset valuation and service request management) and provide additional training and support to ensure they are fully implemented.
4. Investigate the relative merits and common functionality of AssetFinda and Unit4 for TAU and TTV. Specifically, around work order management, meter reading and billing, customer service management and determine the right system to support TTV as they implement improvements to support their new infrastructure.

3.3 Financial Management Information Systems (FMIS)

The Ministry of Finance and Economic Management (MFEM) are currently implementing a new Financial Management Information System (FMIS) which is based on the Unit4 Business World software product.

Objectives of a new FMIS system are to improve:

1. Timeliness of Consolidated Financial Accounts and Reporting
2. Financial support across government
3. Control of Government Commitments to ensure spending complies with statutory requirements and approved procedures
4. Improved quality, timeliness and access for HOMs, Crown and Government generally
5. Training in one system as it becomes relevant across all of Government.
6. Transparency and access to expenditure documentation
7. Reduce reliance on MS Excel and consequential duplication of data entry
8. Control and transparency of Government funds
9. Transparency of capability & centralised training to build capability
10. Better access to management information, customised to need.
11. Audit timeliness and outcomes.
12. Improved system security and internal audit capability.

The project began with a rollout and pilot of the Unit4 product in July 2019 within MFEM. Broader rollout to all government departments will commence in February 2020 and is expected to take 2-3 years to fully embed new processes.

Cook Islands have been on accrual accounting (IPSAS/IFRS) since legislation was enacted in 1996. However, there is still considerable work to be done to improve the robustness of its Financial Statements when it comes to the value and annual depreciation of infrastructure. An Audit Office review in September 2018 of governments complete 2014 Financial Statements received the following Qualified Opinions:

1. Property, plant and equipment, infrastructure assets and depreciation expense

Due to the lack of effective internal controls and insufficient reliable financial records, we were unable to confirm, or verify by alternate means, the valuation, existence and completeness of property, plant and equipment and infrastructure assets reported by the Cook Islands Government at \$128.1m and \$102.9m respectively. Any misstatement of these carrying values will have a consequential effect on the related depreciation expense of \$10.9m.

2. Inventory

Due to the lack of effective internal controls and insufficient reliable inventory records held by Infrastructure Cook Islands, Ministry of Health and Cook Islands Pearl Authority, we were unable to verify the valuation and existence of inventory with a carry value of \$1.9m out of total recorded inventory of \$8.4m .

These are serious qualifications and a key driver for a number of the AMDP improvement initiatives focussed on improving asset registers and updates to CIIC's building and ICI's road network valuations and associated financial statements. There is an external consultant currently assisting MFEM and ICI improve financial housekeeping, but this does not extend to a full revaluation.

Ministry	Replacement cost (\$,000)	Optimised replacement cost (\$,000)	Optimised depreciated cost (\$,000)	Accumulated depreciation (\$,000)	Annual depreciation (\$,000)
Agriculture	1,504	1,504	64	1,439	21
Audit Office	477	477	262	215	8
Business Trade Investment Board	139	139	88	51	2
CI Investment Corp	142	142	78	64	2
CI Tourism	670	670	25	645	8
Commercial property	1,628	1,628	914	714	27
Crown Law Office	427	427	36	391	7
Cultural Development	10,781	10,781	7,393	3,387	180
Deputy Prime Minister	493	493	18	474	6
Education	56,397	56,397	11,345	45,052	905
Finance	3,456	3,456	1,901	1,555	58
Foreign Affairs	1,077	1,077	592	485	18
Health	13,775	13,775	5,947	7,828	220
House of Ariki	482	482	265	217	8
HRD	560	560	24	536	8
Infrastructure & Planning	12,549	12,549	530	12,019	177
Justice	4,904	4,904	3,187	1,716	82
Marine	869	869	35	834	12
Meteorological Service	750	750	225	525	12
Minister of Finance	685	685	320	366	11
Minister of Health	672	672	25	647	8
Minister of Infrastructure	726	726	29	697	10
Minister of Marine	327	327	14	312	5
Opposition Office	403	403	121	282	7
Parliamentary Services	1,964	1,964	589	1,375	33
Police	4,866	4,866	4,379	487	81
Pacific Legislatures for Population & Prime Minister	188	188	138	50	3
Prime Minister	1,944	1,944	90	1,855	30
Public Service Comm	482	482	265	217	8
Government Residentials	9,586	9,586	2,586	7,000	160
Public Toilets	264	264	180	84	4
Telecom Sports Arena	10,403	10,403	9,883	520	173
BCI Stadium	4,522	4,522	2,524	1,999	75
	148,111	148,111	54,074	94,037	2,370

Figure 10: Extract of AECOM Valuation of Government Buildings (2012)

30 June 2012	Cost / Valuation \$000	Accum Depn \$000	Net Book Value \$000
Group			
Other freehold land	428	-	428
Airport freehold land	10,985	-	10,985
Leased land	1,081	73	1,008
Specialised buildings	15,715	841	14,874
Other buildings	59,446	17,267	42,179
Leasehold improvements	91	54	37
Specialised Motor vehicles	4,324	2,953	1,371
Other Motor vehicles	200	181	19
Specialised Furniture and office equipment	255	157	98
Other Furniture and office equipment	3,161	2,783	378
Specialised Plant and equipment	17,195	5,308	11,887
Other Plant and equipment	2,108	504	1,604
Marine equipment	18	18	-
Infrastructure			
- Power network	9,699	1,074	8,625
- Airport facilities	51,789	1,542	50,247
- Port facilities	6,034	723	5,311
- Capital work in progress	23,886	-	23,886
Tools	1	-	1
	206,416	33,458	172,958

Figure 11: Extract from CIIC Financial Statement (2013)

There is a great opportunity to align the upgrade of governments FIMS with the benefits of improving asset registers and valuation processes tackled under this AM development programme.

FMIS Recommendations:

1. Codesign and establish a clear link between the Fixed Asset Register (FAR) in the new FIMS system and the physical infrastructure asset registers maintained by key Cook Island infrastructure agencies.
2. Seek to resolve the qualified opinion on the financial statements of CIIC and ICI (initially) by improving the robustness of asset registers and valuation.
3. Understand how additions and disposals are managed between the FAR and physical registers and ensure robust processes are put in place to report and reconcile the two registers in a manner that is endorsed by Audit Office.

SECTION 4

IMPROVEMENT PROGRAMME

This section of the development plan presents the challenges faced implementing asset management improvement programmes, the guiding principles followed by the project team, and the final list of improvement initiatives that form the 2020/21 and 2021/22 development plan.

4.1 Implementation Challenges

Any business improvement programme faces similar challenges when attempting to bring about change in government organisations. The tables below highlight the key challenges government faces if it is to successfully implement improved asset management practices. These challenges were developed and iterated during stakeholder workshops and are presented in the order of their assessed significance below.

Table 6: Key Challenges Implementing Asset Management Improvements

Challenge / Observation	Description
Geographical challenges	On the outer islands, the quantity of technical work is insufficient to maintain a permanent presence of skilled labour e.g. small solar electricity generation and distribution.
Increasing user expectations	From the quality of assets (e.g. asphalt versus chip sealed roads) to the reliability of service (e.g. water supply) and environmental sustainability (e.g. chlorine, solar etc) users are increasing their expectations of infrastructure, often without an appreciation of the cost impacts of such increases.
Lack of asset information	Many of the assets are still not in electronic registers (some not in any registers), such that the true scope of the infrastructure to be maintained and the associated risks to service provision are unknown.
Unclear ownership and responsibilities	Some assets are not clearly assigned to any agency or in some cases they are assigned to agencies that don't have the know how to manage them. This results in these assets being poorly funded and maintained.
Competing priorities	While resources are aware of the need to more proactively manage infrastructure, conflicting near-term priorities make the adoption of long-term process change difficult. 'Firefighting' takes precedence with regard to both people and budgets.
Asset resilience and natural disasters	Assets often fail early or don't have the resilience to survive natural disasters. Responding to 'unplanned' events and disruptions is taking up more time and is a key determinant in the life of an asset. We need to consider resilience as a key driver for AM.
Lack of expertise to deploy	There is a broad understanding of concepts but the technical expertise and understanding to execute improvements is missing. This is becoming more notable as infrastructure complexity is increasing e.g. solar power generation, water treatment.
Leadership support is more focussed on near-term impact	While people agree with the need for better AM it is hard to identify the near-term value when assessing conflicting priorities and limited resourcing and budgets. Political and executive leadership prioritises near-term emergencies over longer-term business improvements.

Service-based agencies managing large infrastructure	Some agencies only have a few large/critical infrastructure assets (e.g. buildings). These agencies are generally more service delivery orientated and not familiar with maintenance or lifecycle planning (e.g. Education). In these situations, it makes sense for another agency (e.g. CIIC) to be responsible for building maintenance and renewal with service level agreements (or similar) to ensure requirements are met. This also is the challenge faced by outer-island governments managing diverse infrastructure.
Taking on too much too soon	Prior (2012-13) AM initiatives identified a broad range of improvement actions but for many entities it is too big a leap from where they are today resulting in limited uptake.
Agencies at different levels	Not all agencies are at the same level of maturity when it comes to asset management, nor do they need to be. There needs to be consideration of where the greatest returns lie with AM. In particular, the degree of asset deterioration, its scale and its criticality

The table below shows the key infrastructure specific challenges identified during development of the National Infrastructure Investment Plan (NIIP) in 2015.

Table 7: Key Challenges Identified in the NIIP (2015)

Sub-sector	Issues
Air Transport	Limited maintenance of existing airstrips Land ownership issues Reducing populations in outer islands and economic viability of operations Very high cost of air fares particularly to Northern islands Fragmented institutional responsibilities
Marine Transport	Limited maintenance of existing wharves and jetties Vessels not able to travel to remote islands because it is uneconomical
Road Transport	Limited maintenance on existing unsealed and sealed roads Inadequate recurrent budget for government to maintain all roads and to build new ones Institutional capacity of Infrastructure Cook Islands (ICI) needs to be strengthened. Narrow road reserves (land issues are an obstacle to widening) Overweight vehicles with no controls or monitoring
Water Supply	Limited maintenance of existing infrastructure Old pipe network Poor or non-existent filtration Minimal storage Major network losses (estimated at between 20% and 70%)
Sanitation	Old septic tanks Low public awareness of environmental health risks Recent cases of contamination of lagoons
Solid Waste Management	Minimal coordination and regulation of solid waste collection and disposal Shortage of land and potentially adverse impacts for landfills on small islands Indiscriminate burning of (often toxic) rubbish by householders and others Difficulties and cost to ship recyclable materials off the islands Minimal means to handle hazardous waste Increasing volumes of waste generation
Energy	High cost of electricity to consumers High cost of diesel for generation Vulnerability of fuel storage facilities Overhead networks open to cyclone damage
ICT	Monopoly operation High consumer costs Uneconomic outer islands services
Education	High cost of decentralised provision of school facilities Inadequate maintenance of schools MOE feels constrained in planning for infrastructure as it does not own the schools Power costs and water security in schools
Health	Achieving adequate service provision in Pa Enua High cost of providing specialised services Inadequate maintenance of health centres and residence Emerging issues – aged care facilities, mental health facilities
Other Infrastructure	Lack of disability access in public buildings and business premises Road furniture including footpaths and other transport systems do not cater for people with disabilities Emerging issues – aged care facilities, mental health facilities Future of the government housing stock Some ministries occupying sub-standard office accommodation

4.2 Guiding Principles

Based on the observed challenges above, the following guiding principles underpin the implementation strategy (roadmap) for asset management in the Cook Islands.

- **Build internal capability**
Asset management is often referred to as a 'journey'. To provide greatest benefit for the Cook Islands the strategy has been based on developing internal capability with around 80% of the programme being delivered by internal staff (around 50% by the new Asset Management Unit) supported by specialist external consultants.
- **Centralise then decentralise**
Some activities such as data collection, valuations, system configuration, monitoring and evaluation are centralised initially to improve consistency, achieve more rapid delivery and demonstrate value. Then the functions can be decentralised.
- **Take incremental steps**
Building capability over time, monitoring the impact and recognising quick wins. The improvement initiatives don't try and bring all agencies to the same level of maturity, they restrict their scope to target the most value in the shortest time – this may be a subset of assets, geographic area or agency.
- **Encourage participation and buy-in as a priority**
The participation and commitment of agencies is a must and the selected initiatives ensure a engagement of most of the key infrastructure agencies.
- **IFRS/IPSAS is a catalyst**
The experience from other jurisdictions is that the adoption of accrual accounting combined with the need to undertake regular revaluations is the key catalyst towards improved asset management. Some of the initiatives directly support MFEM's move to accrual accounting and implementation of a new FMIS system.

4.3 AMDP Roadmap Improvement Initiatives

The table below contains a summary of the 18 improvement initiatives proposed to improve asset management across whole-of-government over the next 2 years. **Appendix A** provides a more detailed write-up of each of these 18 initiatives.

Table 8: Summary of AMDP Improvement Initiatives

ID	Name	Description
R	Establish governance for AM program	Develop and implement strong governance around the asset management programme and to raise awareness and support for the programme with key stakeholders and executive levels of government.
Z	Design Physical and Fixed Asset Register for all major infrastructure	Design physical asset register for all major assets and create geodatabase templates. Document the relationship between the financial Fixed Asset Register (FAR) hierarchy for major infrastructure (>\$50,000) and the physical asset register.
O	Improve knowledge of infrastructure extent on Raro and clarify maintenance responsibilities	Develop data validation/collection methodology for major infrastructure on Rarotonga and mobilise internal survey crews to collect the information. Load information into appropriate asset register.

ID	Name	Description
X	Improve knowledge of infrastructure extent for Pa Enea and clarify maintenance responsibilities	Develop data validation/collection methodology for major infrastructure on outer islands and mobilise internal survey crews to collect the information. Load information into appropriate asset register/spreadsheets.
S	Improve legislative framework supporting infrastructure management	Review and support the implementation of relevant infrastructure legislation and supporting policy and regulatory documents to ensure clarity of responsibilities for sustainably managing major infrastructure across the Cook Islands.
H	Improve base data, data sharing and spatial mapping capabilities	Assemble disparate spatial datasets, improve the quality of base spatial datasets for use by infrastructure agencies in their respective GIS systems and promote the importance of maintaining and sharing spatial datasets with political leadership.
J	Implement 3-Year Periodic Maintenance Contract for Roads	Determine periodic maintenance needs for roads on Rarotonga for next 5 years, package work and develop budget. Assess contracting industry capacity/capability and procure maintenance contract services on a 3+1+1 term.
M	Lifecycle cost and business case for CT Scanning	Develop a robust business plan and funding request which considers the whole-of-life cost of establishing and operating a CT Scanning centre in Rarotonga to cater for rising demand and improve the current situation of sending patients to NZ.
T	Develop 10-year Bridge Maintenance and Renewals Program	Assess capital (renewal and refurbishment) and maintenance requirements for bridges on Rarotonga. Determine criticality and prioritise work into 4-year maintenance and renewal contract(s) and secure budget for works.
D	Develop water pricing and revenue collection methodology for water	Determine the revenue needed to operate and maintain the new water infrastructure on Rarotonga and support the implementation of the preferred revenue collection option. This initiative excludes supporting the public consultation process.
I	Improve use of GIS for managing water infrastructure	Increase TTV's GIS mapping capability to ensure asset information is kept up to date, used to support maintenance management and shared between agencies.
C	Improve robustness of work order management for Power assets	Improve the use of TAU's enterprise management software (UBW) to support reactive and planned maintenance work orders for critical power infrastructure. Extend capability around mapping of this infrastructure.
F	Improve coordination of underground utility works	Establish ongoing cooperation between utility companies with underground services and the roads authority and improve the coordination of trenching works associated with the undergrounding of utility infrastructure (mostly power cabling).
Q	Pilot valuation methodology for road and bridge infrastructure	Configure ICI's AMS (AssetFinda) to support a systematic valuation of road and bridge infrastructure and manage the process for reconciling the output with ICI's financial statements under IFRS standards.
G	Determine critical infrastructure maintenance and renewal needs and capabilities for Pa Enea	Assess maintenance, renewal needs and resilience of infrastructure on outer islands and determine the funding, capacity and capabilities of on-island staff to sustain these infrastructure assets. Establish SLA's to support Pa Enea staff.
E	Establish general maintenance service agreement for Health & Education buildings	Establish clear accountability for inspecting and responding to maintenance needs across Rarotonga's school and public health buildings. Ensure systematic processes are put in place to lodge maintenance service requests and carry out maintenance repairs.

ID	Name	Description
B	Demonstrate robust business cases to support annual capital budget requests	Review and recommend enhancements to capital funding requests to streamline process for existing infrastructure, improve consistency of requests and ensure adequate consideration of whole-of-life costs when building new infrastructure.
N	Implement systematic planned maintenance program for critical Port/Water plant on Rarotonga	Develop a robust planned maintenance regime for critical mechanical and electrical equipment in use by the port and water authorities. Implement schedules, standard jobs plans and work orders to ensure the systematic completion of these works.

The implementation of asset management is often defined as a journey rather than task or process. A fundamental tenement of asset management is the requirement to be constantly striving for excellence through ongoing evaluation and continual improvement.

The tasks and timelines (*Figure 12:* Figure 12) are based on the currently available information and understanding of the existing environment. However, over time the underlying environment will change including changes in the context, drivers and enabling framework. Additionally, the needs and wants of stakeholders will evolve to reflect the issues that have greatest impact on their day-to-day lives. It is therefore critical that the specific tasks and timelines be reviewed regularly (at least 6-monthly) and adjusted to reflect the changing environment and enabling framework.

Asset Management Development Plan Implementation Schedule

	ID	Name	Dur.	Start	2020												2021												2022				
					May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May				
1	R	Establish governance for AM program	24	05/20	[Blue bar spanning all months from May 2020 to May 2022]																												
2	Z	Design Physical and Fixed Asset Register for all major infrastructure	3	06/20	[Blue bar from Jun 2020 to Aug 2020]																												
3	O	Improve knowledge of infrastructure extent on Raro and clarify maintenance responsibilities	12	07/20	[Blue bar from Jul 2020 to Jun 2021]																												
4	X	Improve knowledge of infrastructure extent for Pa Enuu and clarify maintenance responsibilities	6	11/20	[Blue bar from Nov 2020 to Apr 2021]																												
5	S	Improve legislative framework supporting infrastructure management	12	09/20	[Blue bar from Sep 2020 to Aug 2021]																												
6	H	Improve base data, data sharing and spatial mapping capabilities	3	08/20	[Blue bar from Aug 2020 to Oct 2020]																												
7	J	Implement 3-Year Periodic Maintenance Contract for Roads	3	10/20	[Blue bar from Oct 2020 to Dec 2020]																												
8	M	Lifecycle cost and business case for CT Scanning	3	01/21	[Blue bar from Jan 2021 to Feb 2021]																												
9	T	Develop 10-year Bridge Maintenance and Renewals Program	4	03/21	[Blue bar from Mar 2021 to Jun 2021]																												
10	D	Develop water pricing and revenue collection methodology for water	3	04/21	[Blue bar from Apr 2021 to May 2021]																												
11	I	Improve use of GIS for managing water infrastructure	6	07/21	[Blue bar from Jul 2021 to Dec 2021]																												
12	C	Improve robustness of work order management for Power assets	2	09/21	[Blue bar from Sep 2021 to Oct 2021]																												
13	F	Improve coordination of underground utility works	4	01/22	[Blue bar from Jan 2022 to Apr 2022]																												
14	Q	Pilot valuation methodology for road and bridge infrastructure	3	07/21	[Blue bar from Jul 2021 to Sep 2021]																												
15	G	Determine critical infrastructure maintenance and renewal needs and capabilities for Pa Enuu	6	11/21	[Blue bar from Nov 2021 to Apr 2022]																												
16	E	Establish general maintenance service agreement for Health & Education buildings	3	09/21	[Blue bar from Sep 2021 to Dec 2021]																												
17	B	Demonstrate robust business cases to support annual capital budget requests	2	12/21	[Blue bar from Dec 2021 to Jan 2022]																												
18	N	Implement systematic planned maintenance program for critical Port/Water plant on Rarotonga	6	11/21	[Blue bar from Nov 2021 to Apr 2022]																												

Figure 12: Implementation Schedule for AMDP

The indicative schedule above would be updated once the programme start date is set and become the basis of tracking and reporting progress to management executives over the course of the programme.

4.4 Key Roles in the Program

For the asset management improvement program (Appendix A) to be successful, good governance is crucial. The best processes and systems will not bring about change without the support of the end users, management and wider government stakeholders. Below is a summary of the key stakeholder in delivering the program and the role they are expected to fulfil.

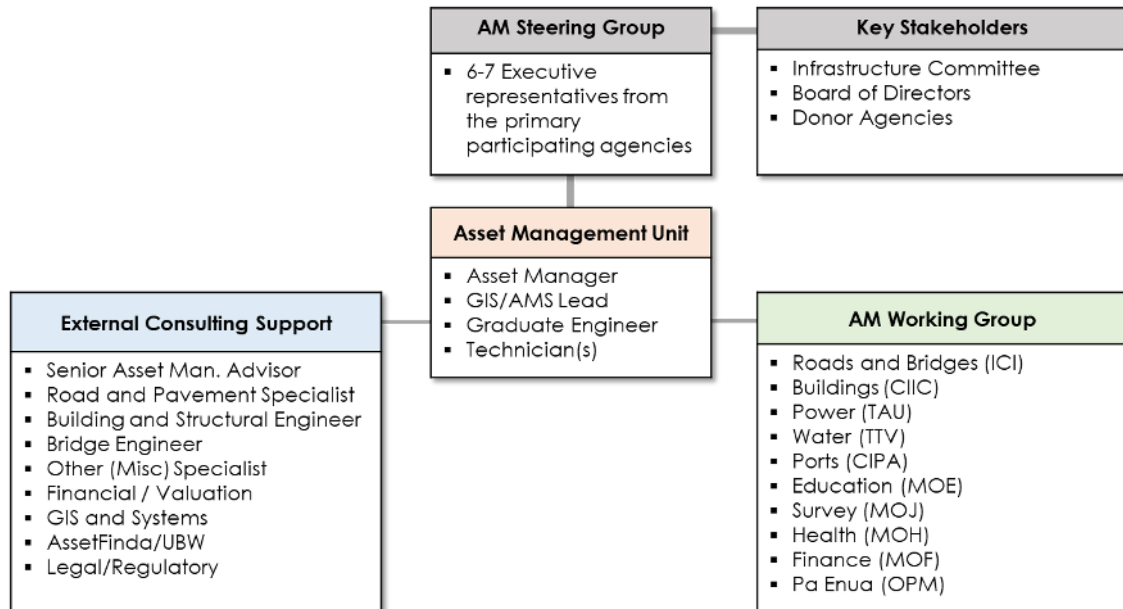


Figure 13: Governance and Delivery Structure for the AMDP

Asset Management Steering Group (AMSG) – <5% of AMDP Resourcing

The AM Steering Group (AMSG) will comprise a senior management official from each of the core agencies (CIIC, ICI, TAU, TTV, MFEM, CIPA, OPM). The group will be responsible for:

- Meeting 6-monthly
- Reviewing NAMF performance
- Identifying and removing roadblocks
- Being a champion for AM in their respective agencies
- Advocating budgets for agency level initiatives (e.g. data collection)
- Briefing their line management and ministries where applicable.

Asset Management Working Group (AMWG) – 30% of AMDP Resourcing

The AM Working Group (AMWG) will comprise the key AMDP initiative leads and any other key individuals keen to advance asset management within the Cook Islands. The AMWG would ideally have between 12-15 delegates. The groups will be responsible for:

- Meeting quarterly (moving to 6-monthly)
- Developing AM Policy and Strategy statements (with assistance from AMU)
- Identifying and tracking tactical and operational AM initiatives within their respective agencies
- Regular collaboration and cooperation with AMU to deliver the AM initiatives
- Being a champion for AM in their respective agencies
- Advocating budgets for agency level initiatives (e.g. data collection)

Asset Management Unit (AMU) – 45% of AMDP Resourcing

This central CIIC unit will be tasked with monitoring and review of progress and performance in relation to both asset management as well as the AMDP. This will include:

- Production of reports and recommendations for the AMSG and Government of Cook Islands
- High-level analysis of data to support whole-of-government infrastructure planning
- Project management and coordination of all external consultants supporting the AMDP
- Facilitation of all data collection and to ensure the cost-effective delivery of these services
- Identifying new AM initiatives over the course of the programme and adding them to the AMDP schedule
- Facilitation of collaboration across all agencies with a focus on the AMSG and AMWG
- Provision of technical advice and training to participating agencies

External Consulting Support – 20% of AMDP Resourcing

While there is a significant focus on recruiting a central AMU to deliver 45% of the AMDP, this unit and the participating agencies will require some additional specialist support if they are to deliver this programme successfully. The role of external consultants will be to:

- Provide direct support to the AMU
- Provide direct support to participating agencies to deliver their initiatives (e.g. valuation, bridge inspection, maintenance plans, term-contracting etc)
- Provide on-job training and knowledge transfer over the course of the programme

Critical to the success of the AMDP will be the ongoing training and development of staff as well as the strengthening of the underlying organisational culture and leadership. Agencies will be responsible for ensuring the appropriate skill levels and culture are developed within the agency. This will include technical skills relating to asset management and data analysis as well as leadership and interpersonal skills.

4.5 Staffing the Asset Management Unit

The AMDP proposes staffing a central AMU with 4-5 key staff with the following skills:

Asset Management Lead

100% of their available time on AMDP

It is likely this will be a contracted resource with the position advertised locally and in NZ and Australia. The applicant should have the following attributes:

- i. Professionally qualified engineer with tertiary qualifications from an internationally recognized tertiary institution in a relevant discipline, e.g. civil engineering.
- ii. Minimum of 8 years post graduate experience.
- iii. Minimum of 5 years of demonstrated previous experience in the management of municipal road, water or power infrastructure.
- iv. A working knowledge of the International Infrastructure Management Manual (IIMM) would be an advantage but not a requirement.
- v. Current knowledge in the concepts, principles and practices which govern the contracting of services, technical specifications in design, engineering and construction works, etc.
- vi. Demonstrated strong communication skills and persuasiveness in presenting, negotiating and resolving highly complex issues, both orally and in writing.

- vii. Ability to deal sensitively in multi-cultural environments and build effective working relations.
- viii. Experience in small island states and/or the Pacific region would be an advantage.
- ix. Fluency in written and verbal English is essential.

GIS/AMS Lead

~60% of their available time on AMDP

This would be a locally staffed position. The applicant should have the following skills:

- i. Practicing engineer or surveyor ideally with tertiary qualifications in a relevant discipline, e.g. geography, surveying or civil engineering.
- ii. Minimum of 5 years professional experience.
- iii. Minimum 3 years of demonstrated previous experience in the use of GIS, spatial survey methods, and/or surveys using GPS.
- iv. Demonstrated communication skills and willingness to transfer knowledge and train GIS resources.
- v. Minimum 3 years of experience in the Cook Islands and/or the Pacific region.
- vi. Fluency in written and verbal English and/or Rarotongan is essential.

Graduate Engineer

~75% of their available time on AMDP

This would be a locally staffed position. The applicant should have the following skills:

- i. Professionally qualified engineer with tertiary qualifications from an internationally recognized tertiary institution in a relevant discipline, e.g. civil engineering.
- ii. Demonstrated strong communication skills
- iii. Willingness to spend time in the field (including outer islands) and lead survey teams
- iv. Minimum 3 years in the Cook Islands and/or the Pacific region.
- v. Fluency in written and verbal English and Rarotongan is essential.

In addition to the above, 1-2 survey technicians will be needed during the first year of the programme to provide asset capture and data processing functions.

Appendix A

**Asset Management
Development
Initiatives**

R Establish governance for AM program

Scope Description / Tasks

Develop and implement strong governance around the asset management programme and to raise awareness and support for the programme with key stakeholders and executive levels of government.

- Establish and AM Steering Committee with executive level management from key infrastructure agencies
- Recruit key resources for Asset Management Unit (AMU) and mobilise international contract resources
- Brief and seek endorsement by cabinet for new AM governance structure, roles and responsibilities, 2020 programme overview – in conjunction with draft AM Policy (#S)
- Establish an AM Working Group with initiative leads from the AM Development Program
- Develop operating charters for above teams (their roles and responsibilities)
- Host 2-monthly meetings of AMWG and 6-monthly meetings of AMSC
- Review progress of AMDP and add new initiatives as they are identified
- Maintain rolling AM programme and budget for next wave (2022+)
- Prepare briefings to executive stakeholders (e.g. donors, ministers, CEO's) to raise awareness of programme and asset management.

Reason this Initiatives is Important (Drivers/Challenges)

AM had a boost in 2012-2013 due to the programme delivered by AECOM but that momentum has not been sustained. The aim of this programme is to broaden the engagement and involvement of a broader team to ensure the 2020-2023 programme will gain and maintain support. This needs to include the right balance of local and international support with active participation from all infrastructure agencies, the Ministry of Finance and government officials.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Tamarii Tutangata Vasie Ngatoko-Poila	<u>CIIC (AMU)</u> TAU, CIPA, TTV, MOE, OPM, ICI, MFEM	<u>2 years</u>	None

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
3.5		2.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
1									

Z Design physical and fixed asset registers for all major infrastructure

Scope Description / Tasks

Design physical asset register for all major assets and create geodatabase templates. Document the relationship between the financial Fixed Asset Register (FAR) hierarchy for major infrastructure (>\$50,000) and the physical asset register.

- Understand accrual accounting and valuation methodologies and FIMS requirements
- Design component level asset hierarchy for FAR
- Understand how the FAR is to be maintained (centralised/decentralised) and the flow of capitalisation
- Understand integration with physical asset registers held by TTV, TAU, ICI, CIPA, OPM (ICT), AACI and CIIC
- Develop master physical asset register
- Develop strategy for contracting data collection resources
- Present implementation/capture plan (→X, →O)

Reason this Initiatives is Important (Drivers/Challenges)

MFEM are procuring a new FMIS (UBW). The structure and quality of data in current agency AMS database systems (Assetfinda/UBW) will not allow population of the FAR. An audit of the 2014 Financial Statements was qualified due to their not being a clear link between GRC/DRC and infrastructure assets. Note CIPA have active valuation data (spreadsheets) for port assets on Rarotonga and Aitutaki.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Siva Grounder Dan-Olaf Rasmussen	MFEM CIIC (AMU), TAU, TTV, OPM (ICT), ICI, CIPA, MOH, AACI	<u>3 months</u>	None

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.25	0.5			0.25	0.25	0.25	0.25	0.25	0.25		0.25	0.25	0.25

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
1	0.25	0.25	0.25		0.5				



Improve knowledge of infrastructure extent on Rarotonga and clarify maintenance responsibilities

Scope Description / Tasks

Develop data validation/collection methodology for major infrastructure on Rarotonga and mobilise internal survey crews to collect the information. Load information into appropriate asset register.

- Determine critical asset list for survey (Water, Power, Roads, Ports) (Z→)
- Gather existing data from respective inventories and plan surveys and identify gaps
- Develop data collection methodology and any applicable condition assessment
- Pilot data collection methodology hardware/software and endorse by AMSC
- Train survey teams (internal AMU, Agency and external support)
- Conduct Rarotonga surveys and populate/verify physical asset register
- Provide recommendations on asset ownership and maintenance responsibilities to Steering Committee (→S)
- Load data into central AMS and provide to finance team for high level assessment of infrastructure value and population of FAR (→Q)
- Provide training in maintaining data in the AMS and ongoing monitoring of its completeness

Reason this Initiatives is Important (Drivers/Challenges)

Assetfinda was deployed in 2014 and while a reasonable amount of data was uploaded by the consultants at the time, data has only been maintained in a few areas (e.g. buildings). This activity will clean and update the data for all major infrastructure on Rarotonga and provide training to agencies to maintain the information.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Dan-Olaf Rasmussen	<u>CIIC (AMU)</u> CIPA, TAU, ICI, TTV, MOH, MOE, CIIC (Property), MFEM	<u>12 months</u>	Z

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.5	2	3	10	1	1	1	0.25	1	0.5			0.25	

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
0.5	0.5			2		0.5	0.25	0.25	

X Improve knowledge of infrastructure extent for Pa Enea and clarify maintenance responsibilities

Scope Description / Tasks

Develop data validation/collection methodology for major infrastructure on outer islands and mobilise internal survey crews to collect the information. Load information into appropriate asset register/spreadsheets.

- Determine critical asset list for survey (Water, Power, Airports, Roads, Telecommunications, Ports) (Z→)
- Gather existing data from respective inventories and plan surveys and identify gaps
- Develop data collection methodology and any applicable condition assessment
- Pilot data collection methodology hardware/software
- Train survey teams (internal AMU, Agency and external support)
- Conduct surveys and populate spreadsheets for Pa Enea to update going forward. This will include data techs visiting 5-6 islands with most infrastructure.
- Assess general condition (→G)
- Provide recommendations on asset ownership and maintenance responsibilities to Steering Committee (→S)

Reason this Initiatives is Important (Drivers/Challenges)

OPM does not have records on the extent of Pa Enea assets making it difficult to report their value/liability and determine support requirements. The remoteness makes capture and maintenance of data difficult. There is a general responsibility for ICI to support airports, wharfs, roads, bridges maintenance/repairs but don't own the assets.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Mia Teaurima Tangi Tereapii	<u>CIIC (AMU)</u> OPM, Pa Enea, CIPA, TAU, ICI, Private Sector, MFEM	<u>6 months</u>	Z, O

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.5	2	3	6	1	1	1	1	1			2		

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
0.5				1					



Improve legislative framework supporting infrastructure management

Scope Description / Tasks

Review and support the implementation of relevant infrastructure legislation and supporting policy and regulatory documents to ensure clarity of responsibilities for sustainably managing major infrastructure across the Cook Islands.

- Review ownership and responsibilities for infrastructure and review draft AM policy statement (X→) (O→)
- Review previous work and recommendations by AECOM with respect to regulatory framework and draft Asset Management Policy and Asset Management Plan regulations where applicable
- Review other relevant infrastructure Acts/Policies/Regulations for alignment and consistency with AM Policy and asset custodianship of all infrastructure
- Review policies and regulations pertaining to asset valuations (in particular infrastructure vs PPE)
- Assess mechanism to enable multi-year (e.g. 3+1+1) maintenance contracts
- Identify any amendments/inconsistencies with regulations and prepare briefing for AMSC
- Draft any new acts or amendment to acts required to improve the role of infrastructure agencies in managing their assets
- Assist AMSC in the consultation process to get the required regulatory environment enacted

Reason this Initiatives is Important (Drivers/Challenges)

There are a number of Policies, Regulations and Acts that have been drafted to support infrastructure governance and management. A coordinated effort is needed to ensure these legislative documents get enacted to provide the mandate to promote and drive better asset management. Responsibilities for renewing and maintaining infrastructure is unclear.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Vasie Ngatoko-Poila	CIIC (AMU) MFEM, OPM, OPSC, CLO, OAG [Implementing Agencies]	<u>12 months</u>	X, O

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
2		1		0.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
2									2



Determine maintenance and renewal needs and capacity of Pa Enea to deliver

Scope Description / Tasks

Assess maintenance, renewal needs and resilience of infrastructure on outer islands and determine the funding, capacity and capabilities of on-island staff to sustain these infrastructure assets. Establish SLA's to support Pa Enea staff.

- Review infrastructure register to identify high criticality assets (X→)
- Develop inspection programme and specialist resources to visit outer islands. Practicalities of mobilising government teams on outer islands will restrict this to the 5-6 islands with most infrastructure. Other islands will be assessed remotely.
- Conduct interviews and skills assessment when on island.
- Determine critical infrastructure operational, maintenance and rehabilitation needs for 3-5 years
- Identify vulnerable (at risk) assets prone to disruption during storm events and understand disaster response options
- Determine training and staffing (capacity building) needs for on island staff along with external support arrangements to deliver a sustainable AM program
- Define and establish Service Level Agreement (SLA) arrangements to fund and deliver the M&R programme and operational support
- Submit work and support programme to MFEM for budgeting
-

Reason this Initiatives is Important (Drivers/Challenges)

Isolated nature of Pa Enea makes it difficult to access specialist staff in the event of assets breaking down or being disrupted during natural disasters. Island Government staff are responsible for a diverse asset base with limited budget or country wide view of priorities.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Mia Teaurima Tangi Tereapii Otheniel Tangianau Ani Matenga	<u>OPM</u> Pa Enea, CIIC (AMU), MFEM ICI, APS, TAU, TTV CIPA, AACI, MOE	<u>6 months</u>	X

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.5	1	2.5		2.5	2.5	2.5	1.25	1.25			2.5		

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
0.75	0.25	0.25							

B Demonstrate robust business cases to support annual capital budget requests

Scope Description / Tasks

Review and recommend enhancements to capital funding requests to streamline process for existing infrastructure, improve consistency of requests and ensure adequate consideration of whole-of-life costs when building new infrastructure.

- Understand current processes for requesting capital funds (Feasibility, Design, Budgeting, Procurement)
- Review past projects and business case templates
- Review and look for improvement opportunities for current stages and outputs associated with capital funding requests for major infrastructure
- Develop enhancements to streamline different types of purchase (small vs >\$50,000, renewal vs new etc). Link to NSDP, NIIP etc (ranking system) and present findings to AMSC
- Develop business case for existing projects which considers O&M costs and impact of depreciation, interest payments on financial statements
- Support development of 2-3 exemplar business cases on actual projects (MOH and ICI) (→T) (→M)

Reason this Initiatives is Important (Drivers/Challenges)

Currently budget requests for new capital projects and 4-year forecasts need to present whole-of-life cost of operating and maintaining the asset. The PDD/Business case template needs to be more robust to improve the success of annual budget and donor funding requests.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Siva Grounder Natalie Cooke	<u>MFEM</u> CIIC (AMU), MOH, ICI	<u>2 months</u>	none

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.5		0.5											0.25

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
1				0.25	0.5				

M Lifecycle cost and business case for CT Scanning

Scope Description / Tasks

Develop a robust business plan and funding request which considers the whole-of-life cost of establishing and operating a CT Scanning centre in Rarotonga to cater for rising demand and improve the current situation of sending patients to NZ.

- Obtain business case template (B→)
- Identify current capacity (funding, facilities, staffing etc) to manage CT Scanning in Rarotonga. Identify gaps and areas requiring improvement
- Complete risk assessment plan for operating and maintaining facility
- Scope requirements for procurement and operation of CT Scanner.
- Populate business case with whole-of-life cost of CT Scanner operation, maintenance and replacement. Include purchase, installation, facilities, training, etc
- Compare with current costs of sending patients offshore
- Submit business case to MFEM as part of budget request

Reason this Initiatives is Important (Drivers/Challenges)

Currently rising numbers of accident, cancer, cardio, diabetes, respiratory patients are sent to offshore scanning facilities for diagnosis (even if terminal). This is a significant operational cost. It may be more effective to operate a facility based on Rarotonga.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Vaine Ngatokorua	<u>MOH</u> CIIC (AMU), MFEM	<u>3 month</u>	B

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.25												0.75	

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
				0.5					

H

Improve base data, data sharing and spatial mapping capabilities

Scope Description / Tasks

Assemble disparate spatial datasets, improve the quality of base spatial datasets for use by infrastructure agencies in their respective GIS systems and promote the importance of maintaining and sharing spatial datasets with political leadership.

- Establish MOU for spatial data sharing between MOJ and infrastructure agencies. This would cover the collaboration and sharing of core topographic data such as land cadastre, aerial imagery, contours, landmarks, features etc
- Improve GIS tools and workstation at CIIC AMU. Identify appropriate software (e.g. ArcMap) to align with core geospatial users
- Investigate basemap datasets in use across the country and scope any improvement requirements (including any control surveys or geodetic datums) to bring together a core set to produce a topographic base map
- Improve base topographic data (places, waterways, buildings etc)
- Process basemap into geodatabase for easy access
- Configure basemap topology and thematics for sharing in GIS systems (->C) (->F) (->I)
- Coordinate regular GIS User forums

Reason this Initiatives is Important (Drivers/Challenges)

There are many disparate spatial datasets that exist across the Cook Islands that have been collected for specific projects or studies and which are not maintained and have not been shared widely and made greatest use of. Property cadastre is maintained in AutoCAD and not available in infrastructure GIS systems. Data is not openly shared and geodetic datums vary. Satellite imagery (DigiGlobe v28) is held on cloud servers and is not used broadly. Drone footage is being stitched in for some areas. QGIS and ArcMap are the two primary GIS solutions.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Dan-Olaf Rasmussen	CIIC (AMU) TAU, TTV, ICI, MOJ	3 months	none

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.25	2							0.25		1			

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
0.25						1.25			

C

Improve robustness of work order management for Power assets

Scope Description / Tasks

Improve the use of TAU's enterprise management software (UBW) to support reactive and planned maintenance work orders for critical power infrastructure. Extend capability around mapping of this infrastructure.

- Review current ERP/EAM software (UBW) focussing on service order and work order management and procurement functions (i.e. excluding billing)
- Identify improvement needs with respect to people (training), data and process (job plans, warehousing, purchasing etc)
- Import spatial base maps into WMS (H→)
- Digitise and clean GIS data for current infrastructure
- Scope and budget UBW capability improvement requirements.
- Source specialist training in systems and process. Coordinate with other potential UBW activities (→I) (→N)
- Provide training of staff in new processes

Reason this Initiatives is Important (Drivers/Challenges)

Unit4 Business World (UBW) is a cloud-based ERP solution used by TAU to manage its asset register, procurement and track maintenance works (amongst other functions). Some enhancements to the system and training of staff are needed to better utilise and benefit for the full functionality this platform offers.

Lead Resources / Champions

Agencies (Lead)

Duration

Dependencies

Tama Heather	TAU CIIC (AMU)	<u>2 months</u>	H
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INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
	0.5	0.5				1							

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
0.25				0.5		0.25		0.75	

F Increase coordination of underground utility works

Scope Description / Tasks

Establish ongoing cooperation between utility companies with underground services and the roads authority and improve the coordination of trenching works associated with the undergrounding of utility infrastructure (mostly power cabling).

- Establish Service Level Agreement (SLA) and MOU with ICI/TTV/Bluesky to coordinate trenching and positioning of services in the road corridor
- Obtain work programme from utilities for upgrading areas (include completed work and work in progress)
- Improve use of maps/LiDAR in GIS and enhance asset location records (H→)
- Map all works in the programme and improve coordination of activities between parties and with ICI to minimise disruption to the road and traffic using the road.

Reason this Initiatives is Important (Drivers/Challenges)

Above ground power lines are disrupted during storm events. An undergrounding program is underway to improve resilience and service reliability. This includes upgrading aged underground and installation of new cabling. This initiative will improve the spatial coordination of works between stakeholder agencies.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Tama Heather	TAU CIIC (AMU), ICI, TTV, [Bluesky]	4 months	H

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
	1	0.25		0.25		2							

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
0.5						0.25			

Q Pilot valuation methodology for road and bridge infrastructure

Scope Description / Tasks

Configure ICI's AMS (AssetFinda) to support a systematic valuation of road and bridge infrastructure and manage the process for reconciling the output with ICI's financial statements under IFRS standards.

- Upgrade GIS at ICI and link to asset data in AMS and configure base data (H→)
- Build road hierarchy and referencing methodology including alignment with FAR (Z→)
- Load road and bridge network with linear referencing (O→) (X→)
- Determine unit rates and valuation methodology
- Assess Fair Value (depreciated replacement cost) and annual depreciation expense
- Configure valuation module and use AMS to generate data for export to FMIS.
- manage reconciliation into ICI's financial statements and previous work by AECOM and seek Audit Office feedback on methodology and auditability.

Reason this Initiatives is Important (Drivers/Challenges)

AssetFinda and QGIS are not currently well utilised and there needs to be a focus on increasing their use within ICI to justify ongoing investments. This initiative links to other more process-based improvements to ensure better uptake of the AMS is achieved.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Gareth Clayton	ICI CIIC (AMU), MOF	3 months	Z, X, O, H

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.25	1	1		1									0.25

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
0.75			0.25		0.75		0.5		

Improve use of GIS for managing water infrastructure

Scope Description / Tasks

Increase TTV's GIS mapping capability to ensure asset information is kept up to date, used to support maintenance management and shared between agencies.

- Assess inhouse GIS capabilities and determine best GIS platform (QGIS, ArcMap, MapInfo)
- Present findings, procure hardware/software and install
- Install GIS and link to asset data in GIS and configure with base data (H→)
- Ensure all water asset information is up to date (Z→) (O→)
- Provide training to staff in GIS and maintenance
- Produce base maps for publication with network summary report
- Link maps to AMS (AssetFinda/UBW)
- Provide summary data to MFEM for loading to FMIS
- Share data with other agencies and utilities (→F)

Reason this Initiatives is Important (Drivers/Challenges)

Under the Te Mato Vai project TTV are constructing a significant amount of new infrastructure. This initiative provides an opportunity to capture accurate records in the GIS before this information is lost.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Dan-Olaf Rasmussen	CIIC (AMU) TTV	6 months	Z, O, H

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.25	2		1					1					0.25

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
						0.25			

D Develop water pricing and revenue collection methodology for water

Scope Description / Tasks

Determine the revenue needed to operate and maintain the new water infrastructure on Rarotonga and support the implementation of the preferred revenue collection option. This initiative excludes supporting the public consultation process.

- Ensure all water asset information is up to date (Z→) (O→)
- Complete study into operation and maintenance costs and budgets noting that a project is underway to install household and commercial meters
- Develop revenue collection options/models for domestic, commercial, irrigation which promote sensible use and recover required revenue levels
- Present findings to TTV executives and AMSC
- Investigate synergies with TAU customer data and billing systems (UBW) to hold customer meter information
- Work with meter contractor to ensure processes in place to collect smartmeter data and load into customer billing solution (UBW) for analysis
- Determine business process, data and system needs to support read-to-revenue collection if being implemented
- Develop recommendations for board on implementation

Reason this Initiatives is Important (Drivers/Challenges)

TTV are responsible for managing the new intake facilities and ring main. A study is needed to determine appropriate revenue levels and charging mechanisms to ensure the sustainable management of this new and existing infrastructure on Rarotonga.

Lead Resources / Champions	Agencies (Lead)	Duration	Dependencies
Adrian Teotahi	TTV TAU	3 months	0

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.25	0.25	0.5						1					0.25

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
0.25				1	0.5			0.25	

T Develop 10-year bridge maintenance and renewals program

Scope Description / Tasks

Assess capital (renewal and refurbishment) and maintenance requirements for bridges on Rarotonga. Determine criticality and prioritise work into 4-year maintenance and renewal contract(s) and secure budget for works.

- Export validated asset register and review valuation outputs (O→) (Q→)
- Inspect all bridges and large culverts (~80) on Rarotonga to assess condition and determine maintenance and renewal requirements
- Develop forward work program and budgets (Capital and Maintenance)
- Investigate contracting options and develop package remedial maintenance works
- Develop business case for any work over first 4 years for submission to MFEM under annual budget request

Reason this Initiatives is Important (Drivers/Challenges)

Rarotonga has an aging bridge stock which has been under invested in and needs maintenance. A formal program is needed to determine work requirements to support a funding request. A professional services contract has been approved to access specialist bridge and structural engineering support for this initiative.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Gareth Clayton	ICI CIIC (AMU), MFEM	4 months	O, Q

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
		0.5	0.25	0.75									0.25

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
0.25			1						

J Implement 3-year periodic maintenance contract for roads

Scope Description / Tasks

Determine periodic maintenance needs for roads on Rarotonga for next 5 years, package work and develop budget. Assess contracting industry capacity/capability and procure maintenance contract services on a 3+1+1 term.

- Survey roads and identify resurfacing/rehab requirements and treatments (AC, Chip, Granular overlay) (O→)
- Develop 5-year forward work programme including priority, design parameters and budgets
- Liaise with industry to determine bidding capability and supervision requirements
- Develop a 3+1+1 periodic maintenance contract for roads on Rarotonga
- Establish budgets and liaise with MFEM to secure 3-5 year budget commitment
- Tender work and procure services
- Provide specialist pavement management advice over first year of the programme

Reason this Initiatives is Important (Drivers/Challenges)

The least lifecycle cost strategy to maintain roads involves periodic resurfacing and overlay treatments. Agencies need to intervene earlier with these treatments before roads become heavily potholed and need more expensive rehabilitation programmes.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Gareth Clayton	ICI MFEM	3 months	0

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.25	0.25	0.5	0.5	1									0.25

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
	1.5								

N Implement systematic planned maintenance program for critical port/water plant

Scope Description / Tasks

Develop a robust planned maintenance regime for critical mechanical and electrical equipment in use by the port and water authorities. Implement schedules, standard jobs plans and work orders to ensure the systematic completion of these works.

- Identify critical infrastructure and load and configure location hierarchy and equipment records and load into AMS (O→)
- Review AssetFinda and UBW functionality around planned maintenance
- Define scope of scheduled maintenance on critical infrastructure for Ports/Water
- Develop standard job plans and inspection frequencies to optimise works
- Develop cost estimates and ensure sufficient allocation in O&M budgets to complete periodic/planned maintenance tasks
- Load maintenance schedule and manage work orders within AMS
- Train staff and monitor work order management

Reason this Initiatives is Important (Drivers/Challenges)

AssetFinda like any AMS has the ability to aid the scheduling and management of cyclic (periodic / planned) maintenance. CIPA used this functionality initially but now use spreadsheets. TAU use a customised work order management module in UBW. TTV will have a need as they expand their water infrastructure and introduce 10 treatment facilities.

Lead Resources / Champions	Agencies (Lead)	Duration	Dependencies
Dan-Olaf Rasmussen Adrian Teotahi Andre Tuiravakai	CIIC (AMU) CIPA, TTV [TAU]	6 months	0

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.25	0.25	1					1	1					

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
1				3			0.25	0.25	



Establish general maintenance service agreement for health and education buildings

Scope Description / Tasks

Establish clear accountability for inspecting and responding to maintenance needs across Rarotonga's school and public health buildings. Ensure systematic processes are put in place to lodge maintenance service requests and carry out maintenance repairs.

- Obtain data from asset survey and link to property ownership/tenant information (O→)
- Assess building management and routine maintenance resources, current arrangements and performance and identify gaps
- Review contract and enhancements from Tereora College maintenance contract
- Assess on-island capacity, funding and insource/outsourced strategy for responding to maintenance needs
- Determine appropriate service standards and proforma for SLA (high level) e.g. qualified assessments, scheduling work, inspections, reactive work, accessibility etc
- Identify process improvements and support systems (e.g. service tickets, job cards etc)
- Prepare position paper for endorsement by AMSC
- Identify funding strategy and include in annual budget request

Reason this Initiative is Important (Drivers/Challenges)

Currently maintenance is very reactive and there are no clear standards for assessment of basic level of service standards for proactive assessments (including accessibility requirements). Budgets don't adequately cover capital for refurbishment and major repairs. Reactive maintenance needs are determined by each school and their respective attentiveness and there are insufficient resources to respond to the volume of requests.

Lead Resources / Champions	Agencies (<u>Lead</u>)	Duration	Dependencies
Vasie Ngatoko Rowena Newbigging	<u>CIIC (Property)</u> MOE, MOH CIIC (AMU)	<u>3 months</u>	O

INTERNAL Resource Inputs (months)

CIIC Asset Management				Government Agencies									
PM	GIS	AM	Tech	ICI	Bldg.	TAU	CIPA	TTV	MOE	Surv.	OPM	MOH	MFEM
0.25	0.5	0.5			0.5				0.5	0.25		0.5	

EXTERNAL Resource Inputs (months)

AM	Roads	Struct.	Bridge	Other	Finance	GIS	A.Finda	UBW	Legal
1		0.5					0.25		

Appendix B

Asset Management Maturity Questionnaire

AM QUESTIONNAIRE

The AM maturity model assists organisations in assessing their current asset management capabilities, identifying where they want to be in the future and implementing necessary improvements in a clear and structured way, with measurable results. There are 17 areas evaluated, with each rated across a scoring range of 0-100.

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
Understanding and Defining Requirements								
1	AM Policy and Strategy	Does the agency have an AM Policy and AM Strategy? Has it been widely communicated? Is it aligned with wider government policies and strategies?	The AM Policy supports an institution's strategic objectives. It articulates the principles, requirements and responsibilities for asset management (AM). It articulates the objectives, practices and action plans for AM improvement, audit and review processes. The AM Policy and Strategy may be incorporated into the AM Plan.	The Organisation is aware of the need to develop an AM Policy, but hasn't yet completed this work.	Corporate expectations are expressed informally and simply, e.g. "all departments must update AMPs every three years".	There are defined policy statements for all significant business activities. There is a clear linkage to corporate goals. AM Policy is supported by high level action plans with defined responsibilities for delivery.	Expectations of each business activity are supported by detailed action plans, resources, responsibilities and timeframes. AM Policy and Strategy is reviewed and adopted by Executive Team each year.	AM Policy and Strategy is fully integrated into the organisation's business processes and subject to defined audit, review and updating procedures.

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
2	Levels of Service and Performance Management	Does the agency have in place levels of service relating to the customer and asset provision? How have these been set?	Levels of service are the cornerstone of asset management and provide the platform for all lifecycle decision making. Levels of service are the outputs a customer receives from the organisation, and are supported by performance measures. One of the first steps in developing asset management plans or processes is to find out what levels of service customers are prepared to pay for, then understand asset performance and capability to deliver those requirements.	The organisation recognises the benefits of defining levels of service but has yet to implement guidelines for development of these.	Basic levels of service have been defined and agreed, along with the contribution of asset performance to the institution's objectives.	Customer Groups have been defined and requirements understood. Levels of service and performance measures are in place covering a range of service attributes. There is annual reporting against targets.	Customer Group needs have been analysed and costs of delivering alternate levels of service have been assessed. Customers are consulted on significant service levels and options.	There is formal consultation over levels of service. Customer levels of service and technical (ie asset performance) levels of service are an integral part of to decision making and business planning.
3	Demand Forecasting	What is the status of demand forecasting for asset provision?	This AM activity involves estimating demand for the service over the life of the AM plan or the life of the asset. Demand is a measure of how much customers consume the services provided by the assets. The ability to predict demand enables an institution to plan ahead and meet that demand, or manage risks of not meeting demand.	The organisation recognises the benefits of demand forecasting but has yet to implement processes to forecast demand.	Demand forecasts are derived by experienced staff (rather than data models), taking account of past demand trends and likely future growth patterns.	Demand Forecasts are based on robust projections of a single primary demand factor (e.g. population growth) and extrapolation of historic trends. Risk associated with changes in demand is broadly understood and documented.	Demand forecasts are based on mathematical analysis of past trends and primary demand factors. A range of demand scenarios is developed (e.g.: high/medium/low).	As for intermediate, plus there is an assessment of risks associated with different demand scenarios, and mitigation actions are identified.

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
4	Asset Register Data	What sort of asset-related information is held and what is the quality of that information?	Asset data is the foundation for enabling most AM functions. Planning for asset renewal and maintenance activities cannot proceed until organisations know exactly what assets they own or operate and where they are located	The organisation recognises the benefits of capturing asset data but has yet to implement systems to capture the data.	Basic physical information recorded in a spread sheet or similar (e.g. location, size, type), but may be based on broad assumptions or not complete.	Sufficient information to complete asset valuation – as above plus replacement cost and asset age/ life. Asset hierarchy, asset identification and asset attribute systems documented.	A reliable register of physical and financial attributes recorded in an information system with data analysis and reporting functionality. Systematic and documented data collection process in place. High level of confidence in critical asset data.	Information on work history type and cost, condition, performance, etc. recorded at asset component level. Systematic and fully optimised data collection programme. Complete data-base for critical assets; minimal assumptions for noncritical assets.
5	Asset Condition Assessment	How does the agency measure the condition of its assets?	Timely and complete condition information supports risk management, lifecycle decision-making and financial / performance reporting.	The organisation recognises the need for monitoring asset condition but has not developed a coherent approach. Measures are incomplete, predominantly reactive. There is no linkage to asset management objectives.	Condition assessment at asset group level ('top-down'). Supports minimum requirements for managing critical assets and statutory requirements (e.g. safety).	Condition assessment programme in place for major asset types, prioritised based on asset risk. Data supports asset life assessment. Data management standards and processes documented. Programme for data improvement developed.	Condition assessment programme derived from benefit- cost analysis of options. A good range of condition data for all asset types (may be sampling- based). Data management processes fully integrated into business processes. Data validation process in place.	The quality and completeness of condition information supports risk management, lifecycle decision-making and financial / performance reporting. The institution conducts periodic reviews of the suitability of its condition assessment programme.

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
6	Risk Management	What practices are in place to identify and manage risks to both assets and customer service?	Risk management helps identify higher risks, and identify actions to mitigate those risks. This process reduces the organisation's exposure to asset related risk, especially around critical assets, and drives renewal and rehabilitation programmes and decision making.	The organisation recognises the benefits of risk management but has yet to implement processes for development of these.	Critical assets understood by staff involved in maintenance / renewal decisions.	Risk framework developed. Critical assets and high risks identified. Documented risk management strategies for critical assets and high risks.	Systematic risk analysis to assist key decision-making. Risk register regularly monitored and reported. Risk managed consistently across the organisation.	A formal risk management policy in place. Risk is quantified and risk mitigation options evaluated. Risk is integrated into all aspects of decision making.
Lifecycle Decision Making								
7	Decision Making	How are investment decisions made and balancing demands between operations, maintenance, renewal and expansion investments?	Decision techniques provide the best value for money form an organisation's expenditure programmes. These techniques reveal strategic choices, and balance the trade off between levels of service, cost and risk. ODM is a formal process to identify and prioritise all potential asset and non-asset solutions with consideration of financial viability, social and environmental responsibility and cultural outcomes.	The organisation recognises the benefits of optimised decision making but has yet to implement processes.	AM decisions are based largely on staff judgement and agreed corporate priorities.	Formal decision making techniques (eg using BCA) are applied to major projects and programmes.	Formal decision making and prioritisation techniques are applied to all operational and capital asset programmes within each main budget category/business unit. Formal decision making techniques (eg BCA) are applied to major projects and programmes. Critical assumptions and estimates are tested for sensitivity to results.	As for Intermediate, plus the decision making framework enables projects and programmes to be optimised across the whole business. Formal risk-based sensitivity analysis is carried out.

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
8	Operational Planning and Reporting	What practices are in place to make the most cost effective use of the assets?	Effective operational strategies can mitigate risk, defer the need for asset renewals and minimise service downtime following asset failures. Planning for business continuity and full utilisation of assets are key factors in good asset management processes.	The organisation recognises the benefits of operational planning and asset performance reporting but has yet to implement processes to implement these.	Operational responses are understood by key staff, but plans aren't well-documented, or are mainly reactive in nature. Asset performance is measured for some key assets but is not routinely analysed.	Emergency response plan is developed. Demand management is considered in major asset planning. Asset performance is measured for critical asset groups and is routinely analysed.	Emergency response plans and business continuity plans are routinely developed and tested. Demand management is a component of all operational decision making. Asset performance is measured and analysed for most asset groups.	Operational plans are routinely analysed, tested and improved. Formal debriefs occur after incidents. Asset performance is measured in real-time and cost-effectiveness is analysed across all asset groups. Operational programmes are optimised using benefit-cost and risk analysis.
9	Maintenance Planning	How does the agency plan and manage its maintenance activities?	Maintenance is "all actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal". Maintenance slows deterioration: it is mechanism to ensure assets continue to deliver performance associated with the required level of service. A major challenge for the asset manager is striking the appropriate balance between planned maintenance (inspections and scheduled maintenance etc.) and unplanned maintenance (arising from unexpected failures)	The organisation recognises the benefits of maintenance planning but has yet to implement such processes.	Managers and operators understand how asset functions support organisational objectives. Processes comply with legislation and regulations. Maintenance records are maintained. Critical assets have been identified.	Asset criticality considered in response, fault tracking and closure processes. There is a strategy for prescriptive vs. performance-based maintenance. Key maintenance objectives have been established, measured and reported on.	Contingency plans exist for all maintenance activities. Asset failure modes are understood. Timing and frequency of major preventative maintenance is optimised using benefit-cost analysis. Maintenance management software is being applied appropriately.	Forensic root cause analysis is conducted for major faults. All reactive and planned programmes are optimised with respect to renewal planning. Different procurement models have been fully explored. Maintenance operations represent value for money.

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
10	Capital Investment Strategies	How does the agency plan capital investments – both renewals and asset expansion?	Capital investment include the upgrade, creation or purchase of new assets, typically to address growth or changes in levels of service requirements, or for the periodic renewal of existing assets, to maintain service levels. institutions need to plan for the long term asset requirements relative to future levels of service. The decision on whether to create a new asset is typically the time when there is the most opportunity to impact on the potential cost and level of service. Cabinet expects all capital-intensive institutions to disclose 10 year capital intentions and make appropriate use of the better business cases methodology for programmes and individual investment proposals.	The organisation recognises the benefits of capital planning, but has yet to implement such processes.	There is a schedule of proposed capital projects and associated costs, based on staff judgement of future requirements.	Projects have been collated from a wide range of sources such as business unit planning processes and corporate risk processes. Capital projects for the next three years are fully scoped and estimated.	As for core, plus formal options analysis has been completed for major projects that need to be bought into service within the next 5 years. Capital intentions reports identify all major capital projects for the next 10 or more years with broad estimates of the costs and benefits of those projects or programmes.	Long -term capital investment programmes are developed using advanced decision techniques, such as predictive renewal modelling. The institution has a reliable and approved 10 year view of its future capital requirements and the strategic choices available to meet changing fiscal or level of service requirements.

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
11	Financial and Funding Strategies	How does the agency plan and manage funding needs?	Poor financial management can lead to higher long run life cycle costs, inequitable fees and charges, and financial "shocks". Good collaboration between financial and asset managers is important, especially in relation to long term financial forecasts and asset revaluations. Asset valuation is required by International Accounting Standards, and can be used in lifecycle decision making. Robust financial budgets are a key output of any asset management planning process.	The organisation recognises the benefits of developing medium to long term financial and funding strategies, but does yet have any in place. The organisational focus is on the operating statement rather than the balance sheet.	Financial forecasts are based on extrapolation of past trends and broad assumptions about the future. Assets are re-valued in accordance with NZ International Accounting Standards (NZ IFRS).	Ten year+ financial forecasts based on current AMP outputs. The quality of forecasts meets NZ IFRS requirements. Significant assumptions are specific and well reasoned. Expenditure captured at a level useful for AM analysis.	Ten year+ financial forecasts are based on current and comprehensive AMP's with detailed supporting assumptions / reliability factors. Asset expenditure information is linked with asset performance information.	The institution publishes reliable ten year+ financial forecasts based on comprehensive, advanced AMPs with detailed underlying assumptions and high confidence in accuracy. Advanced financial modelling provides sensitivity analysis, evidence-based whole of life costs and cost analysis for level of service options.
Asset Management Enablers								

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
12	Asset Management Teams	What is the AM capability within the agency? Is the AM team appropriately linked into the wider organisational structure?	Effective asset management requires a committed and co-ordinated effort across all sections of an organisation.	The organisation recognises the benefits of an asset management function within the organisation, but has yet to implement a structure to support it.	Asset Management functions are performed by a small number of people with AM experience.	An institution-wide Steering Group or Committee coordinates all capital asset management activity. There is relevant training for key AM staff. The Executive Team have considered options for AM functions and structures.	All staff in the organisation understand their role in relation to AM, it is defined in their job descriptions, and they receive training aligned to their roles. A person on the Executive Team has responsibility for delivering the AM policy and strategy.	There is strong leadership of the AM functions across the organisation. There is a formal AM capability management programme. The cost effectiveness of the AM structure has been formally reviewed.
13	AM Plans	Does the agency produce an AM Plan and is it appropriate?	An asset management plan is a written representation of intended capital and operational programmes for it's new and existing infrastructure, based on the organisations understanding of demand, customer requirements and it's own network of assets.	The organisation recognises the benefits of asset management plan(s), but has not yet developed any.	The AM Plan contains basic information on assets, service levels, planned works and financial forecasts up to 5 years, and future AM improvement actions.	As for minimum plus a description of services and key / critical assets, future demand forecasts, description of supporting AM processes, 10 year financial forecasts, 3 year AM improvement plan.	As for core, plus analysis of asset condition and performance trends (past / future), effective customer engagement in setting LoS, ODM / risk techniques applied to major programmes.	As for intermediate plus evidence of programmes driven by comprehensive ODM techniques, risk management programmes and level of service / cost trade-off analysis. Improvement programmes are largely complete. There is a focus on maintaining appropriate practices.

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
14	Information Systems	What IT systems are used to manage the assets?	AM systems have become an essential tool for the management of assets in order to effectively deal with the extent of analysis required.	The organisation recognises the benefits of using an asset management system, but does not have one in place.	Asset register records core asset attributes - size, location, age, etc. Asset information reports can be manually generated for AMP input.	Asset register enables hierarchal reporting (from component level to whole-of-facility level). There are systems for tracking customer service requests and for planning maintenance activity. System enables manual reports to be generated for valuation, renewal forecasting.	More automated asset performance reporting on a wider range of information. Key operations, unplanned maintenance and condition information held.	Financial, asset and customer service systems are integrated and enable advanced AM functions. There is optimised forecasting of renewal expenditure.
15	Service Delivery Models	What service delivery models (force account, private sector, single or multiyear) are used to deliver the services?	The effectiveness of asset management planning is proven in the efficient and effective delivery of services at an operational level.	The organisation recognises the benefits of defining services delivery mechanisms and functions, but has yet to define these.	Service delivery roles are clear. Allocation of roles (internal and external) generally follows past procurement preferences.	Core functions defined. Contracts in place for external service providers. Tendering / contracting policy in place. Competitive tendering practices applied.	As for core, plus internal service level agreements in place with internal service providers. Contracting approaches have been reviewed to identify best value delivery mechanism.	All potential service delivery mechanisms have been reviewed and formal analysis carried out. Risks, benefits and costs of various outsourcing options have been considered and the best value arrangement has been or is being implemented.

Question	Aspect	Questions	Why	Maturity Rating Guidance				
				Aware	Minimum	Core	Intermediate	Advanced
				0-20	25-40	45-60	65-80	85-100
16	Quality Management	How does the agency ensure that its asset management processes and practices are appropriate and effective?	When AM processes are part of a Quality Management system the institution is able to operate consistent and reliable processes,, provide evidence that what was planned was delivered, and ensure that knowledge is shared. In short, that processes are appropriate and consistently applied and understood.	The organisation recognises the benefits of quality assurance processes, but has yet to implement processes for these.	Simple process documentation in place for service-critical activities.	There is a clear quality policy and basic quality management system. All critical AM activity processes are documented.	Process documentation has been implemented in accordance with the Quality Management System plan. All processes documented to appropriate level detail.	Quality certification has been achieved. Surveillance audits demonstrate the quality management system is operating satisfactorily.
17	Improvement Planning	How does the agency identify and deliver improvement actions to its AM practices?	Well performing institutions give careful consideration of the value that can be obtained from improving AM information, processes, systems and capability. The focus is on ensuring AM practices are "appropriate" to the business objectives and government requirements.	The organisation recognises the benefits of improving asset management processes and practises, but has yet to develop an improvement plan.	Improvement actions have been identified and allocated to appropriate staff.	Current and future AM performance has been assessed and improvement actions identified to close the gaps. Improvement plans identify objectives, timeframes, deliverables, resource requirements and responsibilities.	There is formal monitoring and reporting on the improvement programme to the Executive Team. Project briefs have been developed for all key improvement actions. Resources have been allocated to the improvement actions.	There is evidence that agreed improvement plans have delivered the expected business benefits.

Appendix C

Asset Management Maturity Assessment by Agency



Cook Island Port Authority



Office of the Prime Minister (OPM)



Infrastructure Cook Islands (ICI)



Ministry of Education (MoEd)



Ministry of Health (MoH)



Cook Islands Investment Corporation (CIIC)



Airport Authority Cook Islands (AACI)

Appendix D

**Participants and
Attendees**

CONSULTATION GROUP

The following people were consulted with during the creation of the Asset Management Development Plan.

	Head of Ministry:	Ministry/ Organization:	Title/ Position:	Workshops		Follow-up
				18-Jul	19-Sep	
1	Sonny Williams	Infrastructure Cook Islands	Director of Planning and Project	x		x
2	Gareth Clayton	Infrastructure Cook Islands	Project Manager	x	x	x
3	Othenial Tangianau	Infrastructure Cook Islands	Director of Outer Island		x	
4	Desmond Wildin	MFEM - Audit	Audit Manager	x		
5	Micheal Ponga	MFEM - Audit	Audit Manager	x		
6	Ani Matenga	MFEM - Audit Office	Audit Manager		x	
7	Roberta Dashwood	MFEM - Audit Office	Audit Manager		x	
8	Teu Teulilo	MFEM - Tresurey	Tresury Manager	x		x
9	Siva Grounder	MFEM - Tresurey	Crown Accounts Manager	x	x	x
10	Kai Berlick	MFEM	Economic adviser		x	
11	Tangi Tereapii	OPM	Director of Renewable Energy Division	x		x
12	Mia Teaurima	OPM	Director of Pan Enea Division	x	x	x
13	Ben Ponia	OPM	Chief Of Staff		x	
14	Ngateina Rani	OPM (Redd)			x	x
15	Andre Tuiravakai	CIPA (Ports)	Asset & Operations Manager	x		x
16	Lucy Teokotai	CIPA (Ports)	Finance & Administration Manager	x		
17	Apii Timoti	TAU	Chief Executive Officer	x		
18	Alistair Newbigging	TAU		x	x	
19	Tama Heather	TAU		x		x
20	Brent Manning	TTV	Chief Executive Officer			x
21	Adrian Teotahi	TTV	Asset Engineer	x	x	x
22	Rowena Newbigging	MoE	Finance Director	x	x	x
23	Vaine Ngatokorua	MoH	Financial Officer		x	x
24	Edwin Utanga	ACL	Project Manager	x	x	
25	Annie Goodwin	CIIC - Properties	Project Officer	x		x
26	Elena Mataora	CIIC - Properties	Project Officer	x		x
27	Shona Kirikava	CIIC - Properties	Project Officer	x		
28	Anne Taoro	CIIC - Properties	Manager - Special Project Units	x	x	x
29	Tamarii Tutangata	CIIC - Properties	General Manager - AMCI	x	x	x
30	Vasie Ngatoko- Poila	CIIC - Properties	AMCI Properties Manager		x	x
31	Dan- Olaf Rasmussen	CIIC - Properties	Asset Management Officer (AMCI)	x	x	x
32	Sarah Short	MFAT	NZ Ministry of Foreign Affairs		x	x
33	Andreas Demmke	MFAT	NZ Ministry of Foreign Affairs		x	x