Republic of Nauru

Nauru Integrated Infrastructure Strategic Plan

November 2019

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The Nauru Integrated Infrastructure Strategic Plan was endorsed and adopted by the Nauruan Cabinet on 27 November 2019 as a guide to public infrastructure investment planning and budgeting.

The report was prepared by the Ministry of Infrastructure in collaboration with the Ministry of Finance, with the support of the PRIF Coordination Office.

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This report has been developed through a collaborative effort between PMF and a team of individual consultants and the staff of the Government of Nauru. The authors wish to thank the Government of Nauru's staff for their valuable inputs and cooperation during the preparation of this report.

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List of Acronyms and Abbreviations

ADB	Asian Development Bank
AMP	Asset Management Policy
AOP	Annual Operating Plan
AUD	Australian Dollar
AUS-DFAT	Australian Department of Foreign Affairs and Trade
BSRP	Building Safety and Resilience in the Pacific Project
CBA	Cost–Benefit Analysis
CCA	Climate Change Adaptation
CEI	Ministry for Commerce, Industry & Environment
DCA	Department of Civil Aviation
DOE	Department of Education
DOH	Department of Health
DOS	Department of Science
DOT	Department of Transport
DRR	Disaster Risk Management
EU	European Union
GON	Government of Nauru
GRC	Gross Replacement Cost
ICT	Information and Communication Technology (Department of)
IFI	International Financial Institution
IWRM	Integrated Water Resources Management
JICA	Japan International Cooperation Agency
KPIs	Key Performance Indicators
NEISIP	Nauru Economic Infrastructure Strategy and Investment Plan
NDC	Nationally Determined Contribution
NES	Nauru National Emergency Service
NFMRA	Nauru Fisheries and Marine Resources Authority
NIAMF	Nauru Infrastructure Asset Management Framework
NIANGO	Nauru Island Association of NGOs
NIC	Nauru Island Councils
NIISP	Nauru Integrated Infrastructure Strategic Plan
NPC	Nauru Phosphate Corporation
NPP	New Project Proposal

NRC	Nauru Rehabilitation Corporation
NPBSO	Nauru Private Business Sector Organization
NSDS	National Sustainable Development Strategy
NUC	Nauru Utilities Corporation
NWSHIP	National Water, Sanitation, and Hygiene Implementation Plan
NZMFAT	New Zealand Ministry for Foreign Affairs and Trade
PAD	Planning and Aid Division
PAN	Port of Nauru
PEC	Pacific Environment Community Fund
PIANGO	Pacific Island Association of NGOs
PIPI	Pacific Infrastructure Performance Indicators
PRIF	Pacific Region Infrastructure Facility
RO	Reverse Osmosis
RON	Republic of Nauru
RONPHOS	Republic of Nauru Phosphate Corporation
RPC	Nauru Regional Processing Centre
RSP	Remaining Service Potential
SOE	State Owned Enterprise
SOPAC	Pacific Islands Applied Geoscience Commission
SPREP	Secretariat of the Pacific Regional Environment Programme
TA	Technical Assistance
TVET	Technical and Vocational Education and Training
VEI	Vital Energy Inc.

Executive Summary

The need for infrastructure investment

Nauru is one of the smallest countries in the world, located in a remote region in the South Pacific, with population of approximately 10,000 and land area of 21 square km. Its nearest neighbour is Banaba Island in Kiribati, located 300 kilometres away. Goods to Nauru are generally transported on freight ships through Fiji, located approximately 2250 km from Nauru or through Brisbane, at about 3350 km from Nauru.

The exceptionally small size of the country does not allow the benefit of economies of scale for procuring of goods and services. Due to relatively small size of procurement volume, unit costs for asset procurement are extremely high. Its remote and isolated location in the South Pacific further increases procurement costs.

Approximately 80% of Nauru's total land is non-habitable. However, the land has been mined for phosphates over the past 100 years and has been left as barren, worked-out land with residual pinnacles. The land cannot be used for agriculture, forestry or habitation, without costly rehabilitation.

Due to the depletion of the land, Nauru is highly susceptible to resource constraints and the island is totally dependent on external supplies with rising prices, including for fuel, food, clothing, and building materials.

Nauru is also highly susceptible to the effects of climate change, including drought, flooding, coastal erosion and heat stress. These adverse effects are expected to increase in magnitude and frequency with the change in climate. Infrastructure assets are subject to harsh corrosive operating environment, which in the absence of ongoing preventative maintenance, results in significant reduction in life of assets.

Nauru Integrated Infrastructure Strategic Plan

Given changes in the Government of Nauru and the recent endorsement of the updated National Sustainable Development Strategy 2019–2030, the Nauru Integrated Infrastructure Strategic Plan (NIISP) has been prepared by the government to update the Nauru Economic Infrastructure Strategy and Investment Plan (NEISIP) 2011. The NEISIP contained
10 high-priority economic infrastructure investment projects to be implemented between 2011 and 2018. As of July 2019, 60% of the projects were implemented with the remainder either still seeking funding or disregarded.

The NIISP provides an investment plan based on the current condition and capacity of existing infrastructure assets, the need for services in Nauru.

The NIISP sets the direction for infrastructure investments and management for the next five to 10 years. It integrates capital planning into a broader asset management framework to ensure that existing infrastructure is restored and adequately maintained, and that new infrastructure is built to service the infrastructure demands and development needs and objectives of Nauru.

Prioritising investment

Considering the high cost of providing public services and declining national revenue and household incomes, the Government of Nauru requires increased development partner support to provide basic services to its residents. Increased development partner support requires demonstrated improvement in efficiency in provision of such public services, as well as objective and transparent criteria to demonstrate that the planned investments in infrastructure repair, renewal, and replacement are urgently needed.

Lack of adequate funding for asset maintenance, repairs, and renewal is one of the main reasons for premature infrastructure failures in most Pacific island countries.

To provide public services effectively and cost efficiently requires ongoing investment in infrastructure asset maintenance, repairs and renewal in a timely way. In the absence of such investments, infrastructure assets suffer premature degradation and failure, disrupting public services and significantly reducing the service life of assets.

The process to develop the NIISP was initiated with the Cabinet's endorsement of the Asset Management Policy in 2017 to ensure that investment levels are correctly prioritized to achieve required service levels and that assets are well managed to meet the financial, social, cultural and environmental needs of Nauru in a sustainable manner.

A detailed review of Nauru's infrastructure service delivery was conducted in 2018/2019 to map out the infrastructure services that the government is providing to the communities in each infrastructure sector. The Nauru Integrated Infrastructure Sector Strategy (NIISS) was assessed the infrastructure sector strategies in place and identified key performance indicators for infrastructure services. At the same time, a central asset register was developed, which contains information of all major assets on the island, including a condition assessment.

Based on the assessments and the data collected, the NIISP details the infrastructure investment required in Nauru to match demand in the next 5 to 10 years. The NIISP identifies and prioritises rehabilitation works, upgrades, and new infrastructure, and estimates an annual maintenance budget required to maintain current assets as well as implement priority infrastructure projects.

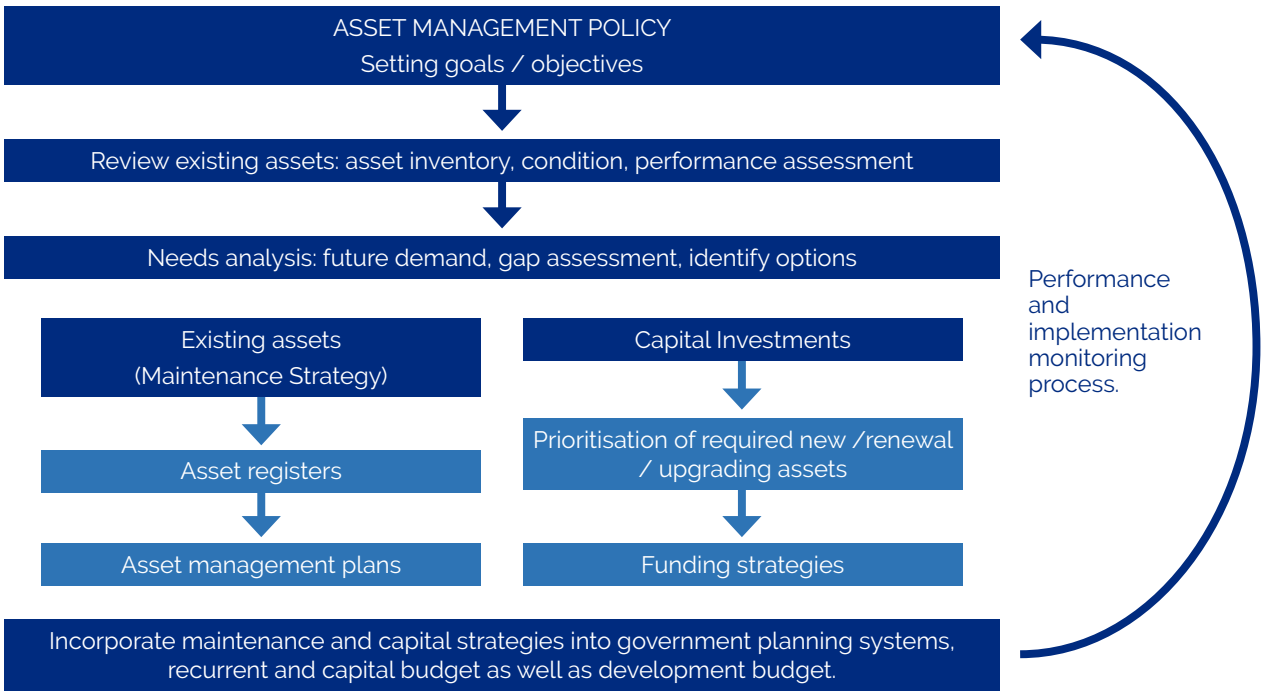


Figure 1: Process to develop the Nauru Integrated Infrastructure Strategic Plan

Development of the NIISP was led by the Ministry of Infrastructure, in close collaboration with the Ministry of Finance. A steering committee guided and directed the overall process as shown in Figure 1.

The proposed infrastructure investments have been prioritized using a multi-sectoral, multi-criteria quantitative assessment, applicable to all infrastructure sectors:

1. Each project was documented in a one page excel sheet, which provides key characteristics in several categories.
2. These characteristics were then scored, weighted and ranked using a common assessment and quantification grid.

Prioritized projects

Table 1 lists the prioritized projects in the investment plan. All per-unit costs provided in this document are in Australian Dollars (AUD) and are based on estimated costs in 2019.

Table 2 is an overview of the proposed investment plan for all projects listed in the infrastructure pipeline, including those already under implementation until the year 2030. Table 3 shows the funding sources for the proposed investments.

To provide guidance to Government of Nauru staff in carrying out asset management tasks and investment planning in the future, the following documents have been prepared and are included as appendices to this report:

- Infrastructure Asset Management Procedures
- Infrastructure Asset Maintenance Guide
- Infrastructure Condition and Capacity Assessment Guide
- Asset Replacement and Renewal Cost Estimating Guide
- Infrastructure Asset Management Plan
- Infrastructure Project Prioritization Criteria.

Top 10 prioritized projects

1. Renovate old building as maternity ward
2. Renovate two classrooms for NPS
3. Renovate old building as isolation ward
4. Relining of 4 C tanks
5. Construction of nursing home
6. Redevelopment of old ward for paediatrics.
7. Improvements to landfill site
8. 6.5 MW PV & 5 MW battery storage
9. Relocate medical waste incinerator to landfill site
10. Renovate two additional classrooms NPS

Table 1: Prioritized project list

Priority Serial #	Project Name	Total Scores	Investment value (1,000 AUD)
1	Renovate old building as maternity ward	82.69	320
2	Renovate two classrooms for NPS	77.88	120
3	Renovate old building as isolation ward	77.88	350
4	Relining of 4 C tanks	77.88	160
5	Construction of nursing home	76.92	4,500
6	Redevelopment of old ward for paediatrics.	76.92	480
7	Improvements to landfill site	75.96	1400
8	6.5 MW PV & 5 MW battery storage	75.96	36,660
9	Relocate medical waste incinerator to landfill site	72.12	20
10	Renovate two additional classrooms NPS	72.12	120
11	One new classroom for Kaiser College	72.12	75
12	Addition of two sets of traffic lights on Simpson Rd	72.12	77
13	Sanitary facility, 5 community centres, and storage room	72.12	17.5
14	Rehabilitate draining sumps & soak pits	71.15	300
15	Purchase of 2 large and 2 smaller buses	71.15	222
16	Phase 3 renovations hospital improvements	70.19	4,000
17	Pipeline from AIWO to RON hospital	70.19	500
18	Government Admin Building renovation	68.27	500
19	Resealing and repair of existing roads	68.27	14,000
20	Septage new treatment plant for country	68.27	6000
21	Install recyclables sorting system	68.27	60
22	New media building	67.31	300
23	Replace heavy duty equipment for solid waste	67.31	342
24	Renovation to nav-aid equipment building	67.31	60
25	Resealing and repair of runway & taxiway	67.31	15,000
26	Replacement VHF air–ground radio	67.31	225
27	Vaisala meteorological system	67.31	490
28	Replace fire trucks	66.35	150
29	Rehab of G1 Generator Ruston, 2.4 MW	66.35	1,000
30	Rehab of G5 Generator Ruston, 1.0 MW	66.35	500
31	Repairs to existing rip raps	64.42	300

Priority Serial #	Project Name	Total Scores	Investment value (1,000 AUD)
32	Provide roof on play area at Nauru College	64.42	40
33	Disability access to learning village and disabled school	64.42	32
34	Develop new road for waterfront area near the port	64.42	1,200
35	Capital repair to footpaths	64.42	300
36	Conversion to synchronous generators	63.46	100
37	Provide roof on play area at BIS	62.50	40
38	Cafeteria building at Nauru Secondary School	62.50	150
39	Repairs to roadside curbs and gutters	62.50	250
40	120-ton crane to unload containers	62.50	1,200
41	Reach stacker for 20-ft containers	62.50	500
42	Water remineralization plant	62.50	150
43	Nauru Sport Complex — Phase 2	59.62	2,883
44	Land Records building renovation	56.73	100
45	Development of new cemetery	55.77	95
46	Replacement 8" pipe cantilever to farm	55.77	1,500
47	Building of Ijuw community sport courts	54.81	63
48	Construction of new rip rap in Boe district	53.85	400
49	Replace mooring equipment at end of life	53.85	7,595
50	Decompression chamber rehabilitation	51.92	36
51	Hospital security fence and parking area	50.96	60
52	Rehabilitate 4 small boats	50.00	80
53	Home Affairs—renovate 4 buildings	44.23	150
		TOTAL	**105,172.5**

Table 2: Overall NIIP 2019 investment plan 2020–2030

Nauru Department/ Operator	Project #	2020–21 projects 1–14	2021–22 projects 15–24	2022–23 projects 25–35	2023–24 projects 36–51	2024–25 projects 52–53
Overall infrastructure Investment Pipeline 2019–2030		**85,420,948**	**94,910,372**	**89,090,333**	**24,267,467**	**1,771,500**
Infrastructure rehabilitation (Project Type R)		**2,750,000**	**21,100,000**	**15,600,000**	**410,000**	**150,000**
Infrastructure upgrading (Project Type U)		**2,539,500**	**4,310,000**	**3,272,000**	**2,189,500**	**1,441,500**
Infrastructural equipment & vehicles replacement		**10,098,115**	**563,705**	**865,000**	**9,331,300**	**80,000**
Department of Civil Aviation	DCA-R-36			225,000		
	DCA-R-37			490,000		
Nauru Fisheries and Marine Resources Authority	NFMRA-R-38				36,000	
	NFMRA-R-39					80,000
	NFMRA-R-A					
Nauru Rehabilitation Corporation	NRC-R-A	10,098,115				
	NRC-R-B					
	NRC-R-40		341,705			
	NRC-R-C					
Nauru National Emergency Service	NES-R-41			150,000		
	NES-R-A					
Department of Transport	DOT-R-42		222,000			
	DOT-R-A					
	DOT-R-B					
	DOT-R-C					
Port of Nauru	PAN-R-43				1,200,000	
	PAN-R-44				500,000	
	PAN-R-45				7,595,300	
	PAN-R-A					
	PAN-R-B					
PSA	PSA-R-A					
	PSA-R-B					
	PSA-R-C					
	PSA-R-D					
Large already committed projects (Project type N)		**63,640,000**	**67,086,667**	**67,086,667**	**10,486,667**	
Port of Nauru	PAN-N	37,666,667	37,666,667	37,666,667		
ICT	ICT-N	18,933,333	18,933,333	18,933,333		
Nauru National Emergency Service	NES-N	1,540,000				
Nauru Utilities Corporation	NUC-N-46	5,200,000	10,486,667	10,486,667	10,486,667	
Department of Education	DOH-N	300,000				
Vital Energy Inc & Nauru Utilities Corporation infrastructure		**6,393,333**	**1,850,000**	**2,266,667**	**1,850,000**	**100,000**
Vital Energy Inc	VEI-U-47				1,500,000	
	VEI-U-A	100,000	100,000	100,000		
	VEI-U-B	666,667	666,667	666,667		
Nauru Utilities Corporation	NUC-R-A	500,000				
	NUC-R-B	333,333				
	NUC-R-48			1,000,000		
	NUC-R-49			250,000	250,000	
	NUC-R-C	700,000				
	NUC-N-D	2,000,000				
	NUC-R-E	**750,000**	**750,000**			
	Project #	**2020–21 projects 1–14**	**2021–22 projects 15–24**	**2022–23 projects 25–35**	**2023–24 projects 36–51**	**2024–25 projects 52–53**
	NUC-U-50				**25,000**	**25,000**
Nauru Utilities Corporation	NUC-R-F	**750,000**				
	NUC-N-51		**250,000**	**250,000**		
	NUC-R-G	**350,000**				
	NUC-N-52				**75,000**	**75,000**
	NUC-N-53	**160,000**				
	NUC-N-H	**83,333**	**83,333**			

Table 2: (continued)

Nauru Department/ Operator	Project #	2025–26	2026–27	2027–28	2028–29	2029–30	Total Investment (2020–2030) (AUD)
Overall infrastructure Investment Pipeline 2019–2030		**3,471,768**	**2,255,018**	**2,230,018**	**2,230,018**	**2,230,018**	**307,877,460**
Infrastructure rehabilitation (Project Type R)		**-**	**-**	**-**	**-**	**-**	**40,010,000**
Infrastructure upgrading (Project Type U)		**-**	**-**	**-**	**-**	**-**	**13,752,500**
Infrastructural equipment & vehicles replacement		**3,446,768**	**2,230,018**	**2,230,018**	**2,230,018**	**2,230,018**	**33,304,960**
Department of Civil Aviation	DCA-R-36						225,000
	DCA-R-37						490,000
Nauru Fisheries and Marine Resources Authority	NFMRA-R-38						36,000
	NFMRA-R-39						80,000
	NFMRA-R-A	40,000	40,000	40,000	40,000	40,000	200,000
Nauru Rehabilitation Corporation	NRC-R-A						10,098,115
	NRC-R-B	943,253	943,253	943,253	943,253	943,253	4,716,265
	NRC-R-40						341,705
	NRC-R-C	40,137	40,137	40,137	40,137	40,137	200,685
Nauru National Emergency Service	NES-R-41						150,000
	NES-R-A	162,000	162,000	162,000	162,000	162,000	810,000
Department of Transport	DOT-R-42						222,000
	DOT-R-A	260,000					260,000
	DOT-R-B		32,500	32,500	32,500	32,500	130,000
	DOT-R-C	102,000	102,000	102,000	102,000	102,000	510,000
Port of Nauru	PAN-R-43						1,200,000
	PAN-R-44						500,000
	PAN-R-45						7,595,300
	PAN-R-A	123,000					123,000
	PAN-R-B	129,378	129,378	129,378	129,378	129,378	646,890
PSA	PSA-R-A	920,000					920,000
	PSA-R-B		333,750	333,750	333,750	333,750	1,335,000
	PSA-R-C	447,000	447,000	447,000	447,000	447,000	2,235,000
	PSA-R-D	280,000					280,000
Large already committed projects (Project type N)							**208,300,000**
Port of Nauru	PAN-N						113,000,000
ICT	ICT-N						56,800,000
Nauru National Emergency Service	NES-N						1,540,000
Nauru Utilities Corporation	NUC-N-46						36,660,000
Department of Education	DOH-N						300,000
Vital Energy Inc & Nauru Utilities Corporation infrastructure		**25,000**	**25,000**	**-**	**-**	**-**	**12,510,000**
Vital Energy Inc	VEI-U-47						1,500,000
	VEI-U-A						300,000
	VEI-U-B						2,000,000
Nauru Utilities Corporation	NUC-R-A						500,000
	NUC-R-B						333,333
	NUC-R-48						1,000,000
	NUC-R-49						500,000
	NUC-R-C						700,000
	NUC-N-D						2,000,000
	NUC-R-E						**1,500,000**
	Project #	**2025–26**	**2026–27**	**2027–28**	**2028–29**	**2029–30**	**Total Investment (2020–2030) (AUD)**
	NUC-U-50	**25,000**	**25,000**				**100,000**
Nauru Utilities Corporation	NUC-R-F						**750,000**
	NUC-N-51						**500,000**
	NUC-R-G						**350,000**
	NUC-N-52						**150,000**
	NUC-N-53						**160,000**
	NUC-N-H						**166,667**

Table 3: Sources of funding for the NIIP 2019 investment plan by groups of projects

Group of projects / funding sources	2020 - 21 projects 1-14	2021-22 projects 15-24	2022-23 projects 25-35	2023-24 projects 36-51	2023-24 projects 52-53
Overall Infrastructure investment pipeline 2019–2030	**85,420,948**	**94,910,372**	**89,090,333**	**24,267,467**	**1,771,500**
Approved projects 2019–2029 (large development partners & NUC)	64,673,333	58,200,000	57,366,667	-	-
Prioritized infrastructure investment pipeline 2019–2030	10,649,500	36,710,372	31,723,667	24,267,467	1,771,500
Non-prioritized projects (Vehicles)	10,098,115	-	-	-	-
Total large already committed projects	**63,640,000**	**67,086,667**	**67,086,667**	**10,486,667**	**-**
Development partners funding (large development partners projects) (83.54%)	53,162,467	56,041,683	56,041,683	8,760,168	-
GoN funding (large development partners projects) (16.5%)	10,477,533	11,044,984	11,044,984	1,726,499	-
Total SOEs prioritized projects (VEI, NUC, NRC Rehab.)	**160,000**	**591,705**	**1,500,000**	**1,850,000**	**100,000**
Total approved SOEs projects	**6,233,333**	**1,600,000**	**766,667**	**-**	**-**
Total not prioritized projects (vehicles)	**10,098,115**	**-**	**-**	**-**	**-**
Estimated GoN funding SOEs all projects (100%)	16,491,448	2,191,705	2,266,667	1,850,000	100,000
Total prioritized rehabilitation projects	**2,750,000**	**21,100,000**	**15,600,000**	**410,000**	**150,000**
Total prioritized upgrading projects	**2,539,500**	**4,310,000**	**3,272,000**	**2,189,500**	**1,441,500**
Total prioritized equipment projects	**-**	**222,000**	**865,000**	**9,331,300**	**80,000**
Estimated development partners funding (Type R, Type U and equipment projects)	**3,049,073**	**20,257,540**	**15,203,597**	**8,551,438**	**1,204,175**
Estimated GoN funding (Type R, Type U and equipment projects)	**2,240,427**	**5,374,460**	**4,533,403**	**3,379,362**	**467,325**
Total development partners funding	**56,211,540**	**76,299,222**	**71,245,280**	**17,311,606**	**1,204,175**
Total GON funding	**29,209,408**	**18,611,150**	**17,845,054**	**6,955,861**	**567,325**

Table 3: (continued)

Group of projects / funding sources	2025-26	2026-27	2027-28	2028-29	2029-30	Total investment (2020–2030) (AUD)
Overall Infrastructure investment pipeline 2019–2030	**3,471,768**	**2,255,018**	**2,230,018**	**2,230,018**	**2,230,018**	**307,877,460**
Approved projects 2019–2029 (large development partners & NUC)	-	-	-	-	-	180,240,000
Prioritized infrastructure investment pipeline 2019–2030	25,000	25,000	-	-	-	105,172,505
Non-prioritized projects (Vehicles)	3,446,768	2,230,018	2,230,018	2,230,018	2,230,018	22,464,955
Total large already committed projects	**-**	**-**	**-**	**-**	**-**	208,300,000
Development partners funding (large development partners projects) (83.54%)	-	-	-	-	-	174,006,000
GoN funding (large development partners projects) (16.5%)	-	-	-	-	-	34,294,000
Total SOEs prioritized projects (VEI, NUC, NRC Rehab.)	**25,000**	**25,000**	**-**	**-**	**-**	**4,251,705**
Total approved SOEs projects	**-**	**-**	**-**	**-**	**-**	**8,600,000**
Total not prioritized projects (vehicles)	**3,446,768**	**2,230,018**	**2,230,018**	**2,230,018**	**2,230,018**	**22,464,955**
Estimated GoN funding SOEs all projects (100%)	3,471,768	2,255,018	2,230,018	2,230,018	2,230,018	35,316,660
Total prioritized rehabilitation projects	-	-	-	-	-	40,010,000
Total prioritized upgrading projects	-	-	-	-	-	13,752,500
Total prioritized equipment projects	-	-	-	-	-	10,498,300
Estimated development partners funding (Type R, Type U and equipment projects)	**-**	**-**	**-**	**-**	**-**	**48,265,823**
Estimated GoN funding (Type R, Type U and equipment projects)	**-**	**-**	**-**	**-**	**-**	**15,994,977**
Total development partners funding	**-**	**-**	**-**	**-**	**-**	**222,271,823**
Total GON funding	**3,471,768**	**2,255,018**	**2,230,018**	**2,230,018**	**2,230,018**	**85,605,637**

1 Introduction

The Government of Nauru is charged with the stewardship and management of a range of important infrastructure assets, such as roads, airports and seaports, buildings, and plant and equipment. The government is facing mounting financial challenges in sustaining public services at desired levels due to the ageing and degrading infrastructure, increasing demand and expectations for public services, adverse impacts of climate change on infrastructure assets, and inadequate funding for asset replacement, renewal, and maintenance budgets.

These challenges are placing pressure on the government to improve the effectiveness of infrastructure asset management by adopting sustainable, efficient, and proactive strategies aimed at improving public services while lowering the cost of service provision.

In 2017, the Government of Nauru approved an infrastructure asset management policy to develop an integrated infrastructure strategic plan aimed at achieving the following objectives:

- to ensure that the performance of infrastructure assets is aligned with the goals and objective of the National Sustainable Development Strategy (NSDS) of Nauru
- to ensure that the investment levels in National Economic Infrastructure Strategy and Investment Plan (NEISIP) are correctly prioritized and aligned to achieve the required service levels from infrastructure assets
- to ensure that infrastructure assets are managed to fully meet the financial, social, cultural, and environmental needs of Republic of Nauru in a sustainable manner
- to proactively manage infrastructure assets so they continue to provide the required levels of service throughout their life cycle, allowing the value provided by national resources to be maximized
- to ensure the public is consulted and public opinions are considered in designing asset management processes so the needs and expectations of Nauru residents are understood and considered in making asset investment decisions
- to ensure that disciplined project management processes are adopted to guide the initiation, approval, and implementation of asset management projects to ensure the best outcomes and highest value for the public
- to ensure that assets are managed in compliance of the legislative and regulatory requirements
- to ensure that the Nauru public sector is employing innovative and the best-in-class work practices to manage national assets for continuous improvement in service delivery and asset management.

An integrated infrastructure plan involves a uniform set of processes, shared data repositories, and objective criteria to measure infrastructure performance and operating condition, assesses assets' remaining service potential, and prioritize investments into asset repair, renewal, or replacement, based on assets' real needs.

Bridging the gaps and eliminating inefficiencies caused by fragmentation, coordinating decision-making processes, and efficiently sharing and managing asset data will improve the quality of investment decisions, resulting in operating efficiencies for assets.

The Nauru Infrastructure Asset Management Framework (NIAMF) and the Nauru Integrated Infrastructure Strategic Plan (NIISP) have been developed through a collaborative effort between a team of consultants funded through technical assistance (TA) by the Pacific Region Infrastructure Facility (PRIF) and staff from the Government of Nauru.

The NIISP provides an investment plan based on the current condition and capacity of existing infrastructure assets, the need for services in Nauru.

Together, the NIAMF and the NIISP are expected to:

- remove barriers that have prevented achieving NSDS goals
- align asset performance with the goals and objectives in the NSDS
- allocate an adequate level of investments into preventative maintenance, repair, rehabilitation, and renewal, prioritized based on the risk of failure
- improve service quality, leading to enhanced public satisfaction
- reduce asset failures, leading to improved public health and safety and minimizing the risk of adverse environmental impacts
- reduce asset life cycle costs through optimizing operations and improving economic and financial returns on investment
- help decision makers make rational and objective investment decisions, demonstrating that investments produce the best value for money
- ensure assets perform sustainably by building resilience to climate change
- align the NEISP with the condition of the infrastructure.

Bridging the gaps and eliminating inefficiencies caused by fragmentation, coordinating decision-making processes, and efficiently sharing and managing asset data will improve the quality of investment decisions, resulting in operating efficiencies for assets.

2 Drivers for an integrated approach to infrastructure investment management

Decision making for managing public infrastructure requires data and processes to be assimilated. Adopting integrated, multidisciplinary approaches is a key requirement for efficient and sustainable asset management programs.

The integrated strategic planning is a systematic process for important issues to be prioritized by taking into account the value and the availability of resources.

The following drivers support an integrated approach to infrastructure investment management in Nauru.

2.1 High infrastructure costs

Nauru is one of the smallest countries in the world, located in a remote region in the South Pacific, with population of approximately 10,000 and land area of 21 square kilometres. Its nearest neighbour is Banaba Island in Kiribati, 300 kilometres away. Goods are generally transported to Nauru on freight ships through Fiji, approximately 2,250 kilometres away or through Brisbane, 3,350 kilometres away.

The size of the country does not allow economies of scale for procuring goods and services—the relatively small size of volume of goods means that unit costs are extremely high. Nauru's remote and isolated location further increases the cost of procuring assets, due to high transportation costs.

In the absence of an integrated approach, inefficient processes for infrastructure investment planning may lead to even a higher costs and poor quality of public services.

The size of the country does not allow economies of scale for procuring goods and services—the relatively small size of volume of goods means that unit costs are extremely high.

2.2 Harsh climate, non-habitable, and non-arable land

Approximately 80% of Nauru's total land is non-habitable. This land, of more than 40 metres above sea level is in the central plateau of Nauru, and would in usual circumstance be valuable as shelter from rising in sea levels due to climate change. However, the land has been mined for phosphates over the past 100 years[1] and has been left as barren, worked-out land with residual pinnacles. The land cannot be used for agriculture, forestry or habitation, without costly rehabilitation. As a result, most of the population lives on a narrow strip of land that fronts the ocean, less than five metres above sea level.

Due to the depletion of the land, Nauru is highly resource constrained and the island is totally dependent on external supplies with rising prices, including for fuel, food, clothing, and building materials.

Nauru is also highly susceptible to the effects of climate change, including drought, flooding, coastal erosion, and heat stress. These effects are expected to increase in magnitude and frequency with the change in climate. Infrastructure assets are subject to a harsh and corrosive operating environment, which in the absence of ongoing preventative maintenance, results in significant reduction in life of assets.

In view of the harsh environmental and operating conditions, which effectively decrease the typical useful life of infrastructure assets and increase the cost of public services, combined with the higher cost of living in Nauru, an integrated asset management strategy is needed to extend assets' service life through proactive asset management.

2.3 Declining revenue sources

Phosphate mining has played a critical role in the shaping Nauru's economic and social development over the past 100 years. Phosphate mining has been a steady and stable source of revenue for Nauru, both at the government and household level, and it has helped support relatively high living standards and public service levels.

With depletion of the phosphate, however, this revenue source has declined dramatically, with an expected end-life of less than 10 years. The potential of dolomite quarrying has been considered; however dolomite quarrying processes are expensive and coupled with Nauru's remote location from potential markets, dolomite mining is not expected to be economically viable. Revenue from regional detention processing centres has provided temporary relief from revenue shortfall during the past few years, but this revenue stream is not expected to last in the long term.

1 Williams, M. 1985. Phosphateers — ***A History of the British Phosphate Commissioners.***

Nauru is also highly susceptible to the effects of climate change, including drought, flooding, coastal erosion, and heat stress.

Considering the high cost of providing public services and declining national revenue and household incomes, the Government of Nauru requires increased development partner support to provide basic services to its residents. Increased development partner support would require demonstrated improvement in efficiency in provision of such public services, as well as objective and transparent criteria to demonstrate that the planned investments in infrastructure repair, renewal, and replacement are urgently needed. Adoption and successful implementation of the NIISP and the NIAMF are expected to provide the development partners with the required assurances.

Considering the high cost of providing public services and declining national revenue and household incomes, the Government of Nauru requires increased development partner support to provide basic services to its residents.

2.4 Current asset management practices

Before the NIISP, a unified national strategy for managing infrastructure assets was lacking in Nauru. Most public sectors assessed the performance of assets based on whether an asset had completely broken down or if it was still in service. No mechanism was in place to engage the public for feedback about whether the infrastructure assets were meeting their needs.

The NIISP uses well-defined performance indicators and service levels to measure and benchmark assets' functional performance and outlines formal procedures for planning new assets to meet the increasing demand for services. The asset register, created during development of the NIISP, contains complete and accurate information to support asset management decisions and, with the exception of Nauru Utilities Corporation (NUC), this information was previously not available within public sector agencies.

Most departments were not familiar with the concept of risk assessment in determining the likelihood of an infrastructure asset failing or how to prioritize investments into risk mitigation initiatives, through asset repair, refurbishment, and renewal. Asset investment decisions were made subjectively, resulting in economic inefficiencies.

Development of the NIISP addresses these deficiencies, which can lead to increased investment efficiency.

...technical skills, knowledge, tools, and equipment for maintaining infrastructure assets are lacking in Nauru.

2.5 Lack of technical skills, knowledge, tools, and equipment for maintaining assets

Within the departments responsible for providing public services, technical skills, knowledge, tools, and equipment for maintaining infrastructure assets are lacking in Nauru.

The Ministry of Works was dissolved under the 2008 government reform to reduce the number of public servants. This ministry was responsible for developing infrastructure policy and coordinating activities for infrastructure management. Subsequently, infrastructure planning and implementation has become the responsibility of different service sector ministries that do not have staff with the technical skills or knowledge required for effectively managing infrastructure assets. Nauru's local government system, the Nauru Island Councils (NIC), were also dissolved in 1999 and any technical or administrative resources the municipalities had for provision of services have also been lost.

The Government of Nauru's departments and ministries rely on private contractors for advice to determine the scope and scheduling of infrastructure rehabilitation projects and project management decisions. However, some have conflicting interests and are therefore unable to provide fair and objective advice. Infrastructure maintenance is carried out on an ad hoc basis. Repairs of buildings, heavy equipment, and vehicles poses a problem since expertise and spare parts need to come from outside the country.

Most infrastructure assets are constructed by foreign contractors under supervision of development partner-financed consultants. When the assets are handed over, knowledge transfer for asset maintenance and condition assessment is not always complete and this has an adverse impact on asset performance.

For example, Canstruct Pty Ltd, an Australian civil engineering and building company, was commissioned by the Australian Government as managing contractor to undertake construction works at the Regional Processing Centre. They have also recently constructed other infrastructure assets in Nauru, such as schools and hospitals, using standard portable-type building designs and imported materials. However, it does not appear the buildings' designs and construction materials have not considered the local environmental conditions in Nauru.

Nauru's small size justifies a lean government structure, but the absence of technically competent staff for asset management and contract administration is an impediment to efficient infrastructure investment planning. The integrated infrastructure investment plan has specific provisions for capacity building and organizational strengthening to mitigate these weaknesses.

2.6 Land tenure and land use planning

The land tenure laws in Nauru are different from most other countries. Much of the land in Nauru is owned not by individuals, but by large family groups. With few exceptions, the Government of Nauru or corporate entities do not own land and cannot acquire land and they must enter into lease arrangement with landowners to obtain rights for land use to provide public infrastructure and services. Any lease transactions for land require consensus among owners, which is often difficult to achieve.

Infrastructure development and building arrangements largely depend on negotiations between land owners and developers. In the past this constraint has resulted in ad-hoc planning with congested plots and random clustering of functions.

Under these existing constraints, the integrated infrastructure investment plan is expected to result in improved land use to provide public services.

2.7 Nauru Infrastructure Asset Management Policy

In 2017, the Government of Nauru approved the implementation of the NIAMP, which requires development and implementation of the NIISP and NIAMF, incorporating the best-in-class asset management practices and decision-support systems.

3 Stakeholders' roles and responsibilities

A number of stakeholders are responsible for implementing the NIISP and NIAMF.

3.1 Government of Nauru Cabinet

Government of Nauru Cabinet members serve as the custodians and stewards of public assets in Nauru and, as elected members, are responsible for ensuring public needs are well served by the infrastructure assets in the most cost-efficient manner. Therefore, Cabinet members are key stakeholders, who want to oversee the successful development and implementation of the NIISP and the NIAMF.

The main role of Government of Nauru Cabinet in this process is to review and approve the Asset Management Policy and to review and approve Infrastructure Investment Plans, and ensure appropriate level of resources are available for asset management.

3.2 Ministry secretaries and chief executives of public sector enterprises

The secretaries for each of the Government of Nauru ministries and the Chief Executive Officers of public sector enterprises have the primary responsibility for ensuring that the departments and corporations under them are effectively managed to provide public services that meet public satisfaction and in most cost-efficient way. Therefore, they are important stakeholders with an interest in ensuring that the NIISP and the NIAMF are successfully developed and implemented.

The roles of ministry secretaries and public sector enterprise CEOs are to collectively review the Asset Management Policy and advise the Cabinet of any recommended changes, and to ensure accurate and reliable information is presented to the Cabinet for decision making. They are also responsible for allocating adequate resources and funding, monitor performance, and take corrective actions when required.

3.3 Infrastructure asset managers and directors

The infrastructure asset managers and directors within government departments and state-owned enterprises are responsible for managing public sector infrastructure assets. They are responsible for all aspects of asset operations from when an asset is commissioned to when it is retired. More specifically, infrastructure asset managers and directors are accountable for the day-to-day asset management tasks, including maintaining asset records (including entries in the asset register), undertaking preventive maintenance, condition assessment, performance evaluations and preparing business cases for renewal and replacement, based on the criteria provided in the Asset Management Framework. Asset managers and directors obtain approval from the Secretary Infrastructure before submitting business cases to the Infrastructure Investment Planner in the Ministry of Finance for inclusion in the project pipeline.

3.4 Infrastructure investment planner

The Infrastructure Investment Planner within the Ministry of Finance is responsible for screening business cases prepared by the asset managers and directors to develop a project pipeline and prioritize investment projects, based on prioritization criteria in the NIISP and submitting long-term investment plans and short-term annual budgets to the Secretary of Finance and Cabinet for approval.

3.5 Residents of Nauru

The residents of Nauru, who are beneficiaries of the services provided by various public sector departments and corporations, are important stakeholders. This group includes homeowners, business owners, students, parents of school-aged children, patients using services at the hospital and clinics, motor vehicles owner and drivers, air passengers, port users, as well as customers of electricity, water, sewage and waste disposal services.

It is expected residents will voluntarily participate in satisfaction surveys about public services. While conducting public surveys, it is important that ensure any biases are removed from the sample.

3.6 Private sector enterprises and non-government organizations

The private sector enterprises in Nauru, including the businesses that use the public services and the businesses that provide public services to government entities are a key stakeholder group. Private sector enterprises are represented by the Nauru Private Business Sector Organization (NPBSO), formerly the Nauru Chamber of Commerce.

Non-government organizations (NGOs) represent interests of special groups and are also stakeholders in infrastructure development. The Nauru Island Association of NGOs (NIANGO) was formed in 1992 to facilitate NGO operations in Nauru and are a member of the Pacific Island Association of NGOs (PIANGO).

During implementation of the NIISP and NIAMF, these groups should be consulted to seek their input.

3.7 Government administrative staff

A significantly large portion of the infrastructure assets in Nauru consist of public sector office and administrative buildings and motor vehicles. Employees of Government of Nauru departments and state-owned enterprises who work in these buildings or drive these vehicles are stakeholders. This group of stakeholders is expected to participate in formal surveys to indicate their level of satisfaction with and the condition of office buildings and the safety of motor vehicles. Surveys must be free of biases.

3.8 International development partner organizations

Many international development partner organizations financially support public sector infrastructure investments in Nauru. They are interested in ensuring that public benefits from aid are maximized and sustained through prudent asset management practices. The Pacific Region Infrastructure Facility (PRIF) is overseeing the development and implementation of the NIISP and the NIAMF on behalf of a group of development partner organizations.

4 Infrastructure Service Review

4.1 Infrastructure developed since NEISIP 2011

The NEISIP 2011 was the last major public infrastructure programming document developed in Nauru. The report documented projects in a variety of sectors. Table 4-1 summarizes these infrastructure projects and their implementation status.

Table 4-1: List of planned infrastructure projects under NEISIP 2011

Sector and project name	Status of project*	Investment value (1000 AUD)	Funding sources	Starting year	Completion year
Transport — aviation					
PAPI System	IC	100	Air Services AUS	2015	2015
Runway resurfacing and fencing	IC; SF	800	Gov. funding	2017	2017
Nav-aids Distance Measuring Equipment (DME)	IC	400	Gov. funding	2015	2015
Nav-aids VHF Omnidirectional Range (VOR)	IC	400	Gov. funding	2015	2015
Transport — land					
Solar street lighting	IC; D	300	ROC	2014	2014
Fleet augmentation	IC	150	AZB	2015	2015
Road rehabilitation	IC	400	Gov. funding	2017	2017
Transport — maritime					
Omega 65 tons crane	D	500	U		
New quay wall and Anibare mooring	D	14,400	U		
Utilities — electricity					
None					
Utilities — fuel tank farm					
Jet A1 fuel supply	IC	400	Gov. funding	2015	2015
Bulk saltwater emergency response	D	1,000	U		
Utilities — water supply					
Risk reduction and 1 water tanker (1@10m3)	IC	760	EU	2015	2017
Solar powered RO unit	IC	3,000	PEC	2012	2013
300 m3/ day RO unit	IC	600	AUS-DFAT	2012	2013
3 water tankers (1@10 m3 & 3@4m3	D	500	U		
NUA (NUC) O&M workshop & spare parts	IC	3,000	U		
Repair and upgrade water storage tanks	UI	400	NUC	2018	2019
Runway rain water harvesting	SF	8,000	U		
Additional community water tanks 15@100 m3	SF	800	U		
Rehabilitation bulk water tanks at gold course	SF	400	U		
Utilities — Wastewater					
Sludge Study "Alternative disposal options"	D	500	U		
Utilities — Solid Waste					

Sector and project name	Status of project*	Investment value (1000 AUD)	Funding sources	Starting year	Completion year
New lined landfill & compactor truck	SF	1,400	U		
Hospital hazardous waste incinerator	IC	300	Gov. funding	2017	2017
Economic sectors — ICT					
New telecom tower	D	350	U		
Economic sectors — fisheries					
None					
Social sectors — education					
School annual refurbishment programme	IC	600	AUS-DFAT		
Aiwo school rebuilding and disability access	D	14,100	U		
Learning village project	IC	3,600	AUS-DFAT	2016	2018
Social sectors — health & sport					
Annual refurbishment to hospital	IC	1,100	AUS-DFAT		
New hospital	IC		AUS-DFAT	2014	2016
Social sectors — sport					
National indoor stadium and playing field	SF	600	AUS-DFAT	2017	2018
Environment — land Rehabilitation					
None					
Environment — coastal protection					
None					
Other — government administration					
None					
Other — national emergency services					
None					
Other — police					
Police Headquarters	IC	5,500	AUS-DFAT	2011	2012
Police Youth Club	D	200	U		
Other — government administration					
None					

* U=unfunded; D= discarded, IC= implemented & completed, SF= seeking funding, UI= under implementation

From the 32 infrastructure projects recommended under the NEISIP 2011, 18 (56%) were implemented and completed, in some cases with five or more years' delay; 14 (44%) were either discarded or are still seeking funding from the development partner's community.

Table 4-2 lists the infrastructure projects that were started between NEISIP 2011 and 2018. Of the 80 projects, 48 projects (61%) have been completed and 32 are either under implementation or not yet commissioned. Only a few of these projects were outlined in the NEISIP.

The large discrepancy between the projects outlined in the NEISIP 2011 and the projects actually implemented signals an inefficient project development pipeline, funding mobilization and prioritization process. Causes are multiple: projects from large development partners do not follow the same channels of review and approval as projects submitted in the form of New Project Proposals (NPP) to Treasury. Projects funded by development partners are directly agreed by Cabinet and the President. NPP submissions also include operational expenditure requests. This makes infrastructure selection difficult as operational expenditure decided by political decision makers often take precedence over longer-term infrastructure requirements.

Table 4-2: List of other infrastructure projects started between 2011 and 2018

Sector and project name	Status of project*	Investment value (1000 AUD)	Funding source	Starting year	Completion year
Transport — aviation					
VIP room at airport building	CC	150	Gov. funding	2018	2018
Transport — land					
Buses (small) 6 units (one every year)	CC	720	Gov. funding	2011 - 2017	2011 - 2017
Buses (large) 6 units (one every year)	CC	900	Gov. funding	2012 - 2017	2011 - 2017
Transport — maritime					
Mooring equipment	CC	7,000	Gov. funding	2016-2017	2016-2017
Forklift 16 tons	CC	350	JICA	2018	2018
2 Sea mules	CC	1,500	JICA	2017	2017
1 Vehicle (Nissan)	CC	44	JICA	2018	2018
2 Sea mules	CC	1,500	Gov. funding	2015	2015
Side lifter 20 ft container	CC	160	Gov. funding	2018	2018
Forklift 7 tons	CC	75	Gov. funding	2014	2014
Pilot boat	CC	40	Gov. funding	2014	2014
Forklift 2 tons	CC	20	Gov. funding	2016	2016
Sustainable and climate-resilient connectivity (new harbour)	UC	105,996	ADB/gov. funding	2018	2020
Utilities — electricity					
Relocate high-speed gensets/ Bauda Junc. Sta.	UC	750	NUC	2017	2019
Replace P/Sta. overhead crane	UC	125	NUC	2017	2019
Generator office upgrading	CC	30	NUC	2017	2017
New Ruston 3MW generator	UC	800	NUC	2017	2019
G1 repairs & refurbishment	UC	350	NUC/AUS-DFAT	2017	2019
G6 repairs & refurbishment	UC	450	NUC/AUS-DFAT	2017	2019
P/St. roof replacement (ADB)	CC	1,300	EU/ADB/DON/ NUC	2014	2017
2 New 3 MW generators & 11KV bus (ADB)	CC	10,000	EU/ADB/GON/ AUS-DFAT/NUC	2014	2018
Power station lighting	CC	40	NUC	2017	2017
Power station fencing upgrade	CC	50	NUC	2017	2017
Airport standby generator	CC	50	NUC	2017	2017
SCADA PLC Stage 1,2,3	UC	150	NUC	2017	2019
Field feeder 11kV (EU)	UC	800	EU	2017	2019
Cantilever & shoreline substation	UC	40	NUC	2016	2019
Ronphos drier substation	UC	30	NUC	2016	2017
Menen Terrace substation	CC	20	NUC	2017	2018
RON Hospital 11 KV feeder	CC	40	NUC	2017	2017
RMN feeder upgrade p/sta. to Anabar	UC	750	EU	2017	2019

Sector and project name	Status of project*	Investment value (1000 AUD)	Funding source	Starting year	Completion year
RMS feeder upgrade p/sta. to Buada	UC	750	EU	2017	2019
Odin Aiwo substation	CC	50	NUC	2017	2017
Distribution office	UC	80	NUC	2018	2018
11kV cable Civic Centre to Wind Sock	UC	50	NUC	2017	2018
Civic Centre RMU 4-way	CC	30	NUC	2018	2018
Location L1 substation upgrading	UC	50	NUC	2018	2018
1.1MW MFAT/EU solar	UC	3,200	NZMFAT/EU	2017	2019
Street light installation	CC	50	NUC	2015	2018
Scratch card top up	CC	130	NUC	2017	2018
Customer Service office refurbishment	CC	80	NUC	2017	2017
PS-ports-location 11KV reticulation	UC	165	NUC	2018	2019
Installation review project	UC	375	NUC	2016	2019
Utilities — fuel tank farm					
No documented project					
Utilities — water supply					
Brakish water supply — high ground community Meneng (300 people)	CC	150	EU-USP	2016	2016
Community water tanks 14@ 6 m3	CC		Japan	2013	2013
Pilot Catholic School project solar drinking system	CC			2016	2016
Construction of Water Office & Lab. (AUS-DFAT)	UC	150	AUS-DFAT	2016	2018
B13 Assessment (AUS-DFAT)	CC	65	AUS-DFAT	2017	2017
Water quality lab. equipment	UC		AUS-DFAT	2016	2018
Water bottling plant	UC	1,140	NUC	2018	2019
Water pipe reticulation to RON Hospital	UC	425	NUC	2018	2019
B13 water treatment tank and equipment	UC	80	NUC	2018	2019
Meneng water treatment tank and equipment	UC	80	NUC	2018	2019
3ML bulk water storage tank-B13 site	UC	240	NUC	2018	2019
Installation & commissioning of 480KL RO plant — Meneng	UC	145	NUC	2018	2019
5KL & 10KL water trucks cab & chassis	UC	338	NUC	2018	2019
Utilities — wastewater					
No project documented					
Utilities — solid waste					
Pilot waste sorting facilities	UC	60	Japan	2017	2018

Sector and project name	Status of project*	Investment value (1000 AUD)	Funding source	Starting year	Completion year
Economic sectors — ICT					
New servers	CC	30	Gov. funding	2016	2016
Glass fiber gov.	UC	80	Gov. funding	2016	2018
Communication tower at ITC	CC	60	Gov. funding	2018	2018
New media building	UC	73	Gov. funding	2018	2018
East Micronesian Cable Project	UC	21,600	ADB/ gov. funding	2018	2020
Economic sectors — fisheries					
Renovation of AIWO ramp for fishing boats	CC	15	Gov. funding	2016	2016
Fishery building & aquaculture hatching equipment	CC	2,870	NZ-MFAT/AUS-DFAT	2016	2016
2 small boats	CC		JICA	2017	2017
Management system for fishing license oversight	CC				
2 excavators	CC		JICA	2017	2017
Fish market	CC			2016	2016
Emergency power generator	CC				
Social sectors — education					
Learning village development	CC	11.700	AUS-DFAT	2016	2018
Social sectors — health & sport					
Hospital Phase 1	CC	28,400	AUS-DFAT	2014	2016
Hospital Phase 2	CC	included	AUS-DFAT	2016	2017
Hospital waste incinerator	CC	300	SPREP	2017	2017
Sport complex — Phase 1	CC	5,900	AUS-DFAT	2017	2018
Environment — land rehabilitation					
No project documented					
Environment — coastal protection					
No project documented					
Other — National Emergency Services					
New NES Headquarter & meteorology equipment	UC	3,080	BSRP — EU; Gov. funding	2015	2019
2 Jetski	CC	40	Gov. funding	2013	2013
2 Jetski	CC	40	Gov. funding	2016	2016
1 large ambulance	CC	50	AUS-DFAT	2016	2016
1 small ambulance	CC	40	Gov. funding	2013	2013
Other — police					
8 Police vehicles	CC	320	Gov. funding	2016	2016
Other — government administration					
Court of Justice	CC				

*UC=under construction; CC=commissioned & completed

4.2 Public services delivered by public infrastructure

Table 4-3 summarizes the key public services delivered by the operators of the public infrastructure and assets, with their capacity to generate revenue for cost recovery.

Table 4-3: Main public services delivered by infrastructure assets

	Sector and sub-sector	Authority oversight	Operator	Services delivered	Cost recovery potential
	Transport — aviation	Civil Aviation Authority	Directorate of Civil Aviation	Runway, taxiway, Nav-aids Baggage handling Border control Central and transfer security	User charges Passenger levy Departure tax Landing fees Air navigation fees Airport space rental
			Air Nauru	International personal travel, International freight Passenger staircase	User charges
	Transport — land	Minister for Transport & Telecommunications	Department of Transport	Registration of vehicles Road network development & maintenance Public buses transport system	User charges Car registration fees Motorcycle registration fees
	Transport — maritime	Port Authority of Nauru	Port Authority of Nauru	Vessel mooring Cargo handling (bulk & breakbulk, container, fuel) Cargo storage	User charges
	Utilities — Electricity	Nauru Utilities Corporation	Nauru Utilities Corporation	Production and delivery of electricity through a power grid system to domestic, commercial, industrial and governmental customers	Users charges Rates for domestic, commercial, industrial and governmental users Rates for ABF/RPC
	Utilities — fuel Tank farm	Ministry of Finance	Vital Energy Incorporated as Concessionaire	Fuel (fuel oil and jet fuel) cargo handling, storage and delivery by trucks to commercial, industrial and governmental customers.	Users charges Special tax on sale of fuel dedicated to the rehabilitation of the fuel tank farm

	Sector and sub-sector	Authority oversight	Operator	Services delivered	Cost recovery potential
	Utilities — water supply	Nauru Utilities Corporation	Nauru Utilities Corporation	Production and delivery of drinking water (RO desalination) via water trucks to domestic, commercial, industrial and governmental customers	Users charges Rates for domestic, commercial, industrial and governmental users Rates for ABF/RPC
	Utilities — wastewater	Department of Commerce, Industry and Environment — Environmental Resources Centre	Egidu Transport System	Collection and disposal of septic sludge from individual sceptic tanks	Users charges Septic tanks emptying charge
	Utilities — solid waste	Department of Commerce, Industry and Environment —Environmental Resources Centre	Nauru Rehabilitation Corporation Private Waste Collectors	Collection and disposal of urban solid waste through bins and containers collected and discharged at landfill site	User Charges Solid waste collection charge for commercial users Tipping fees at landfill for community, commercial and industrial users
	Economic sectors — ICT	Telecom Authority	Information, Communication Technology Department. DIGICEL, Acclink, and Bendigo Bank as internet service provider	Management of national and international communication for domestic, commercial and governmental customer, Data storage and communication for government services	User charges Rental of communication towers Communication service fees Cable access fees
	Economic sectors — fisheries	Nauru Fisheries & Marine Resources Authority	Nauru Fisheries & Marine Resources Authority	Management of fishing licenses in Nauru waters, Management of Fish resources Promotion of inland aquaculture	User charges Fishing license fees Fishing days fees Court fines and fees
	Social sectors — education	Department of Education	Department of Education	Transportation of teachers to schools. Primary, secondary and TVET education for the Nauru population	Government budget Free for Nauru citizens

	Sector and sub-sector	Authority oversight	Operator	Services delivered	Cost recovery potential
	Social — health & sport	Department of Health (DOH)	Department of Health	Health centers and hospital services in a multiplicity of clinical fields	Government budget Free for Nauru citizens User charges for selective foreigners
			Directorate of Sport	Promotion of healthy lifestyle across the population	Government budget Free services
	Environment — land rehabilitation	President Office	Nauru Rehabilitation Corporation	Rehabilitation of phosphate mined sites for safe alternative use of the land	Initial endowment fund at creation of the NRC corporation
	Environment — coastal Protection	President Office	Nauru Rehabilitation Corporation	Seashore protection against climate change and natural disaster risks	Government budget President special project
	Other — National Emergency Services	Nauru Emergency Services	Rescue & Fire Services Nauru Life Guards Ambulance Emergency Services	Firefighting and rescue services Sea rescue services Ambulance services	Government budget
	Other — police	Nauru Police Force	Nauru Police Force	Police safety and security services	Government budget
	Other — Government Administration	Ministry for Public Services (MPS)	Public Services Administration	Management of Governmental buildings Management of fleets of vehicles for government departments and units	Government budget

4.3 Strategic and sectoral documents for infrastructure planning and programming

Several documents provide insight into the future demand for public infrastructure and services: the Nauru Sustainable Development Strategy (NSDS), a road map on energy, and sectoral elaborated strategies and plans in water and sanitation, solid waste, education, and health. In Appendix A, these document are briefly summarized from the perspective of future public infrastructure and related public services needs from the perspective of the GON, ministries and agencies overseeing the sectors, and the general public.

Another source of information for guidance on public infrastructure and service demand and gaps are sectoral strategies. Appendix A also summarizes recent sectoral strategies and other studies developed for Nauru; however, some of these studies are old and outdated.

4.4 Infrastructure services performance indicators

Service performance indicators quantify the quality delivered by infrastructure assets. These indicators are useful tools for documenting how services are performing and to guide future opportunities for improvement and productivity gains, as well as future needs for investment.

A systematic review of the performance of the various public sectors was undertaken in 2018 to understand which indicators are important for each sector, recent performance of each indicator, and an assessment of readily available information that can be generated without excessive burden on operators so that monitoring becomes systematic and compulsory in Annual Operational Plans submitted to the sector ministries and to Treasury.

To compare sub-sectors of public infrastructure, which is important for prioritization, performance indicators should fall into categories that are common to all public infrastructure assets and services:

Accessibility and availability	Availability and coverage of the infrastructure to deliver its mission to the public
Usage and capacity	Capacity of the infrastructure to meet current and future demand for services while minimizing under-utilization
Reliability and security	Ability of the infrastructure to meet effectively and continuously normal or current demand
Health and safety	Safeness of the infrastructure for those who use it and the wider national community at large
Vulnerability and resilience	Ability of the infrastructure to cope or respond in the event of unusual demand (disaster response, climate change)
Affordability	Capacity of the users or the country to pay for the services provided by the infrastructure
Sustainability	Ability of the operator to sustain quality services over the life of the infrastructure asset
Output and process	Quantity of products or services produced by the infrastructure or processes enabled by the infrastructure
Productivity and effectiveness	Capacity to improve or accelerate the advancement of the outcome of the services delivered by the infrastructure assets

A survey undertaken in 2018 and discussions with all operators of public infrastructure between 2018 and 2019 suggest that indicators for future infrastructure planning should:

1. be simple and easy to document without significant additional burden and effort to operator staff
2. use embedded data that is already collected and documented by infrastructure operators
3. provide insight on the assets' operating performance
4. be aligned with local needs and affordability of users and Nauru
5. be easily, accurately, objectively and cost-effectively measured and documented for objectives and targets
6. allow assets and service performance benchmarking and comparison with other Pacific island countries.

The service performance indicators and targets were reviewed and endorsed by the Infrastructure Steering Committee in 2019. It was recommended that the indicators should be an annex to the recently approved NSDS 2019 and reported in the sectoral Annual Operating Plans produced by the operators under a new infrastructure summary chapter to be added to the official format of the Annual Operating Plans.

Two types of Key Performance Indicators (KPIs) are proposed:

1. technical KPIs on delivery performance and status (Table 4-7)
2. financial KPIs on expenditures and cost recovery status (Table 4-8).

Data in the two tables include achievement in two financial years (2016/17 and 2017/18) as well as proposed targets for the milestone year 2025.

Table 4-7: Technical KPIs of public infrastructure services

	Sector and sub-sector	Operator	Key Performance Indicators	Achievement Year 2016/17	Achievement Year 2017/18	Targets 2025
	Transport — aviation	Directorate of Civil Aviation	Number of aircraft movement / week	10	9	12 to 15
			Number of incoming passengers / months	1730	1900	> 2500
			Number of recorded incident at airport (debris & intrusion) / year	12	5	< 5
	Transport — land	Department of Transport	% of maintenance works awarded to private contractor	80	80	> 80
			Number of intersections / road segments with potholes or cracks hampering smooth traffic or damaging vehicles	N/A	3	< 2
			Number of lane wide flooded road segments after heavy rain	N/A	6	<2
			Number of operating public buses on the island	10	8	16
	Transport — maritime	Port Authority of Nauru	Ship turn-around time (days) for a 300 TEUs vessel.	10	10	5
			Storage capacity at ground level (TEUs)	150	300	600
			Number of container discharged/ back-loaded/year (TEUs)	4204	2804	> 4500
	Utilities — electricity	Nauru Utilities Corporation	System Average Interruption Duration Index (SAIDI) (hours/ month)	41.6	28.8	< 15
			System Average Interruption Frequency Index (SAIFI) (interruption/ month)	26.1	20.5	< 10
			Renewable energy percentage (%) in the electricity power supply mix	3 %	3 %	>50 %
			Electricity losses in the grid (%)	36%	26%	< 15%

	Sector and sub-sector	Operator	Key Performance Indicators	Achievement Year 2016/17	Achievement Year 2017/18	Targets 2025
	Utilities — fuel tank farm	Vital company as Concessionaire	% of vehicle fuel sale/year for "non-RPC" related activities	Not known	Not known	constant
			Air fuel sale/year	Not known	Not known	20 % increase
			Number of significant asset deficiencies recorded at inspection	Not known	Not known	<10
	Utilities — water supply	Nauru Utilities Corporation	Ratio of RO plant operational availability against capacity (2300 KL/ day)	95 %	95 %	> 95 %
			Water losses or non-accounted for water (production versus billed amount) in %	11 %	7 %	< 5 %
			Average domestic RO consumption per population (litre/capita, day)	6	15	> 20
	Utilities — wastewater	Egidu Transport System	Number of 4 m^3 sceptic sludge load collected/month	100	100	100
			Water borne illness incidence recorded at hospital/ year	Not known	Not known	20% reduction against 2019
	Utilities — solid waste	Nauru Rehabilitation Corporation	Average skip bin ($6m^3$) collection frequency (days/ week)	3	3	3
		Private Waste Collectors	Quantity collected (L/ inhabitant, day)	Not known	Not known	20 % reduction against 2019
			Quantity sorted and sent for recycling (L/ inhabitant, day)	Not known	Not known	15%
	Economic sectors — ICT	Information, Communication Technology Department, DIGICEL, Acclink, and Bendigo Bank as internet service provider	% population with mobile phone access	75%	80%	90%
			% population with access to computer device(s)	60%	65%	80%
			Number of service providers	2	2	3
			Population real access to 4G broadband services	3%	5%	20%
	Economic sectors — fisheries	Nauru Fisheries & Marine Resources Authority	Illegal unreported unregulated fishing event/ year	3	2	< 2
			Local sea fish production per year (metric tons)	270	200	> 300
			Aquaculture production on the island (tons/ year)	1.5	1.5	> 3

	Sector and sub-sector	Operator	Key Performance Indicators	Achievement Year 2016/17	Achievement Year 2017/18	Targets 2025
	Social sectors — education	Department of Education	% of children population attending school	43.6%	43.5%	60%
			Average students per classroom (primary)	33	33	25
			% of Classrooms in country with IT computer	Not known	21 %	50 %
			No of students registered at TVET school	200	289	> 400
			No of students at the Naoero Disable Centre	43	44	> 40
	Social sectors — health & sport	Department of Health	Number of hospital beds available	60	63	63
			Average hospital occupancy ratio of hospital beds	40 %	30 %	> 40 %
			Number of dialysis machines operational	4	4	10
			Average number of outpatients treated at hospital/ day	80	82	> 100
			Number of waterborne diseases recorded at hospital or wellness community centres	Not known	Not known	20% reduction against 2019
		Directorate of Sport	Reduction of number of person with recorded NCD (% of country population)	Not known	Not known	20% reduction against 2019
			% of the population practicing actively sport at sport facilities	20 %	23 %	30%
	Environment — land rehabilitation	Nauru Rehabilitation Corporation	Mining area rehabilitated in a year (ha)	0	0	> 2
			Cumulated surface of rehabilitated mining areas so far (ha)	4	4	> 14
			Crushed pinnacles material re-used (tons/year)	Not known	Not known	30 % increase against 2019
	Environment — coastal protection	Nauru Rehabilitation Corporation	Coastal protection wall construction (km/year)	1.14	0.01	0.2
			Cumulated sea protection wall constructed so far (m)	1140	1150	100 % increase against 2019
	Other — national emergency services	Rescue & Fire Services Nauru Life Guards Ambulance Emergency Services	Fire fighting readiness functionality (RFS modality)	90%	90%	> 90%
			% of fire addressed (bush, building, etc.)/year	Not known	Not known	100%
			% of patient requesting transport actually transported	Not known	Not known	100%

	Sector and sub-sector	Operator	Key Performance Indicators	Achievement Year 2016/17	Achievement Year 2017/18	Targets 2025
	Other — police	Nauru Police Force	Average response time to request for intervention (minutes)	6–12	6–2	< 10
			Incidence of serious road accident handled by police per year	Not known	Not known	20 % reduction against 2019
			% of number of requests for police intervention answered by police average/month	Not known	Not known	> 95%
	Other — government administration	Public Services Administration	% building passing inspection/ satisfying GON building standards	Not known	Not known	> 80%
			% of governmental vehicles fleet operational	Not known	59.7%	> 80%

For financial KPIs, three types of data are proposed:

1. The adequacy of maintenance expenditure expressed as the annual expenditure over the gross replacement value of the underlying assets managed by the services operator.
2. The cost recovery of services for revenue-generating economic services expressed as the overall annual revenue generated by the operator over the direct annual cost of operating and maintaining the underlying assets.
3. The specific cost of services for non-revenue generating social services expressed as the overall cost of delivering the services per year divided by the population of the country for the health, NES and police services and the number of pupils and student at school for the education services.

Table 4-8: Financial KPIs of public infrastructure services

	Sector and sub-sector	Operator	Key Performance Indicators	Achievement year 2016/17	Achievement year 2017/18	Target 2025
	Transport — aviation	Directorate of Civil Aviation	Maintenance expenditure ratio	0.87%	0.72%	2%
			Cost recovery ratio (DOC)	128.57%	103.82%	120%
	Transport — land	Department of Transport	Maintenance expenditure ratio	Not known	Not known	2%
	Transport — maritime	Port Authority of Nauru	Maintenance expenditure ratio	0.94%	2.50%	3%
			Cost recovery ratio (DOC)	27.57%	57.32%	120%
	Utilities — electricity	Nauru Utilities Corporation	Maintenance expenditure ratio	Not known	Not known	3%
			Cost recovery ratio (DOC)	89.42%	113.59%	120%
			Specific cost of services			
	Utilities — fuel tank farm	Vital company as Concessionaire	Maintenance expenditure ratio	Not known	Not known	3%
			Cost recovery ratio (DOC)	Not known	Not known	100%
	Utilities — water supply	Nauru Utilities Corporation	Maintenance expenditure ratio	Not known	Not known	2%
			Cost recovery ratio (DOC)	89.42%	113.59%	120%

	Utilities — wastewater	Egidu Transport System	Maintenance expenditure ratio	Not known	Not known	2%
			Cost recovery ratio (DOC)	Not known	Not known	100%
	Utilities — solid waste	Nauru Rehabilitation Corporation	Maintenance expenditure ratio	Not known	Not known	2%
			Cost recovery ratio (DOC)	Not known	Not known	40%
	Economic sectors — ICT	Information, Com. Tech. Dep.	Maintenance expenditure ratio	4.46%	7.22%	4%
			Cost recovery ratio (DOC)	Not known	Not known	120%
	Economic sectors — fisheries	Nauru Fisheries & Marine Resources Authority	Maintenance expenditure ratio	0.72%	0.76%	2%
	Social sectors — education	Department of Education	Maintenance expenditure ratio	1.95%	0.70%	2%
			Specific cost of services	2,822	2,253	< 2500
	Social sectors — health & sport	Department of Health (DOH) & (DOS)	Maintenance expenditure ratio	0.46%	0.72%	2%
			Specific cost of services	1,091	946	<1000
	Environment — land rehabilitation	Nauru Rehabilitation Corporation	Maintenance expenditure ratio	12.1%	6.54%	4%
	Other — national emergency services	NES composed of RFS, NLG & AES services	Maintenance expenditure ratio	16.2%	47.9%	3%
			Specific cost of services	120	157	<160
	Other — police	Nauru Police Force	Maintenance expenditure ratio	6.04%	3.92%	3%
			Specific cost of services	206	171	<200
	Other — government administration	Public Services Administration	Maintenance expenditure ratio (building)	Not known	Not known	1%
			Maintenance expenditure ratio (vehicles)	Not known	Not known	3%

5 Asset Information and Current Operating Condition

5.1 Asset register

The following list shows various categories of infrastructure assets managed by GON departments and GON owned corporations for providing public services:

buildings

roads

airstrip and navigation aids

wharfs and boat ramps

electricity generation and distribution assets

fuel storage plant and distribution vehicles

telecommunication plant

water desalination plant and distribution vehicles

waste water treatment plant

solid waste management assets

coast protection assets

heavy duty and light duty motor vehicles

motor boats.

There are no departmental asset registers with adequate information on existing infrastructure assets for decision making, except for Nauru Utilities Corporation (NUC) and Vital Energy Inc. (VEI). Therefore, field surveys gathered the required information to support asset management decisions and financial controls. This information is recorded in an asset register for all the departments and corporations that previously did not have sufficiently detailed asset registers.

The asset register contains the following sets of information for all infrastructure assets, above the materiality threshold of $25,000 (replacement cost):

Asset hierarchy: The asset register uses a five-level hierarchy, which provides enough information to make informed asset management decisions, without unduly burdening the relatively weak capacities available for managing information.

Asset construction details: Detailed information about asset design and construction is captured, including type and subtype of asset components and their dimensional details, allowing accurate determination of asset repair, renewal, and replacement costs.

Asset information for prudent asset management decisions: Asset location, typical useful life and current service age, asset replacement cost, required budget for maintenance and current operating condition, and remaining service potential of asset are recorded in the asset register.

Financial information: Initial book value, accumulated depreciation for previous years of service, current year deprecation and net book value are recorded in the asset register.

Table 5-1 summarizes information about infrastructure assets in Nauru as at May 2019.

Table 5-1: Government of Nauru asset register summary

Assets	Initial Book Value	Accum. Depreciation	Net Book Value	Gross Replacement Cost	Annual Maintenance Allowance
Buildings:					
Education Buildings	$24,696,024	$6,126,757	$18,569,268	$36,834,920	$184,175
Public Service Admin, Emergency, Police, Justice Buildings	$28,990,454	$4,243,135	$24,747,319	$44,118,930	$220,595
ICT Buildings	$388,777	$240,454	$148,323	$1,728,250	$8,641
Health Buildings	$5,817,227	$1,125,005	$4,692,222	$12,298,440	$61,492
Fisheries and Marine Resources Buildings	$1,765,814	$434,173	$1,331,640	$2,627,000	$13,135
Civil Aviation Buildings	$3,740,979	$2,189,016	$1,551,963	$10,536,840	$52,684
Port Authority Buildings	$-	$-	$-	$-	$-
CIE Buildings	$63,317	$29,989	$33,328	$102,600	$513
Total Buildings	$65,462,592	$14,388,529	$51,074,064	$108,246,980	$541,235
Coastal Protection:					
Total Seawalls & ripraps	$1,629,078	$1,059,041	$570,038	$6,600,000	$71,250
Department of Transport:					
Sealed Roads	$7,514,347	$5,653,944	$1,860,402	$27,755,644	$148,364
Footpaths	$490,807	$490,807	$-	$3,116,400	$31,164
Total Dept of Transport	$8,005,153	$6,144,751	$1,860,402	$30,872,044	$179,528
Civil Aviation Assets:					
Runway, Taxiways and Hard stop Areas	$9,502,331	$6,326,888	$3,175,444	$34,540,299	$128,030
Other navigation assets	$1,715,420	$136,029	$1,579,391	$1,995,000	$39,900
Total Civil Aviation Assets	$11,217,751	$6,462,916	$4,754,835	$36,535,299	$167,930
Port Authority Assets:					
Motor Vehicles:	$1,130,309	$599,031	$531,278	$1,535,000	$22,050
Boats, Mooring and Unloading Equipment	$9,206,123	$1,435,841	$7,770,281	$10,040,000	$261,600
Total Port Authority Assets	$10,336,431	$2,034,872	$8,301,559	$11,575,000	$283,650
Emergency Services Assets:					
Motor Vehicles:	$731,851	$378,890	$352,961	$960,000	$28,800
Motor boats	$86,250	$19,534	$66,716	$100,000	$4,000
Total Emergency Service Assets	$818,101	$398,423	$419,677	$1,060,000	$32,800
Fisheries and Natural Resources Assets:					
Heavy Duty Vehicles and boats	$257,223	$40,027	$217,196	$280,000	$10,400
Total Fisheries Assets	$257,223	$40,027	$217,196	$280,000	$10,400
NRC Assets:					
Unsealed Roads	$1,856,602	$541,724	$933,776	$5,896,000	$294,800
Motor vehicles	$12,377,858	$6,110,768	$6,267,090	$15,356,770	$460,703
Total NRC Assets	$14,234,460	$6,652,492	$7,200,866	$21,252,770	$755,503
ICT Assets:					
Antenna Towers & IT equipment	$483,587	$135,930	$347,657	$641,553	$12,831
Total ICT Assets	$483,587	$135,930	$347,657	$641,553	$12,831
Public Service Admin Assets:					
Light Duty Motor vehicles	$7,426,448	$2,789,831	$4,636,618	$9,160,000	$274,800
Heavy Duty Vehicles and Equipment	$1,059,289	$640,977	$418,311	$1,440,000	$43,200
Total Public Service Admin Motor Vehicles	$7,426,448	$2,789,831	$4,636,618	$9,160,000	$274,800
Fuel Storage Farm Assets	$19,000,000	$4,200,000	$14,800,000	$25,000,000	$500,000
Electricity Sector Assets	$31,407,196	$6,205,165	$25,202,031	$35,000,000	$700,000
Water Sector Assets	$3,544,140	$1,395,307	$2,148,833	$4,000,000	$80,000
Total GON Infrastructure Assets	**$173,822,163**	**$51,907,284**	**$121,533,777**	**$290,223,647**	**$3,609,927**

5.2 Interpreting condition assessment results

The results of asset condition assessment are shown in Table 5-2. Assets with a remaining service potential (RSP) score were grouped into five categories from Very Good to Very Poor. For assets in "Poor" or "Very Poor" condition, all options for rehabilitation of the asset condition were considered and cost estimates for the most cost-efficient way to restore the asset's performance to an acceptable level were included in the project pipeline of potential future investments.

Table 5-2: Asset remaining service potential interpretation and required action

Remaining Service Potential (RSP)	Interpretation	Required Action
0 - 25	Very Poor	Prepare a business case for asset replacement - (High Priority)
26 - 50	Poor	Prepare a business case for asset replacement
51 - 70	Fair	Continue with recommended maintenance
71 - 85	Good	Continue with recommended maintenance
85 - 100	Very Good	Continue with recommended maintenance

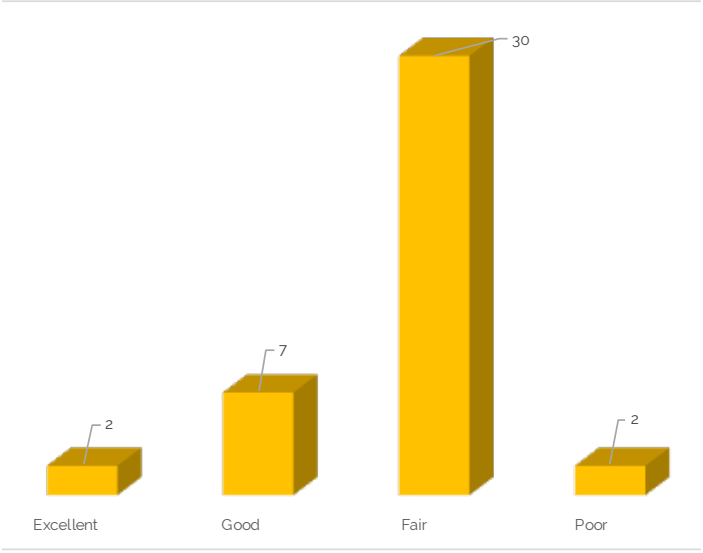
For complex assets, where assets are made of many components that can be individually renewed (e.g. roof of a building or road surface seal), the condition score of the individual components was used, as shown in Table 5-3.

Table 5-3: Asset component condition assessment and required action

Component Condition	Interpretation	Required Action
0	Asset Failed and Failure Presents Public Risks	Immediately proceed with component renewal - obtain emergency funding
1	Very Poor	Prepare a business case for component renewal - (High Priority)
2	Poor	Prepare a business case for component renewal
3	Fair	Continue with recommended maintenance
4	Good	Continue with recommended maintenance
5	Very Good	Continue with recommended maintenance

5.3 Results of asset condition assessment

The asset management plan in Appendix B describes the results of the asset condition assessment undertaken in February 2019. This section summarises the condition assessment results. This information was used to develop the list of proposed pipeline projects for investments during the next 10 years, which are outlined in Section 7 of this report.

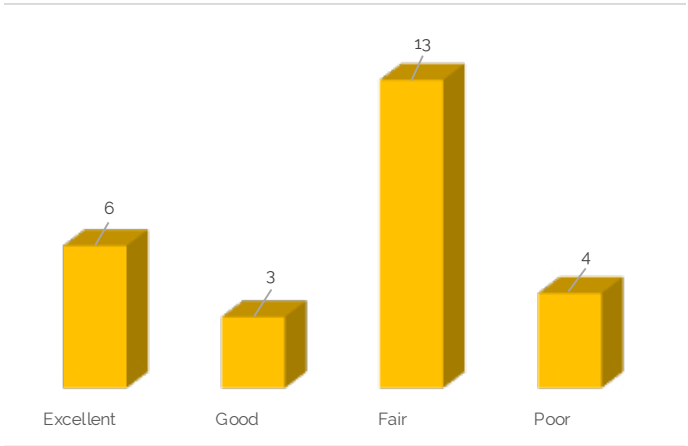


School buildings

Figure 5.1 is a snapshot of the condition of school buildings. Two of the existing buildings in the Nauru Primary School are in poor condition. Both buildings are pre-fabricated structures transferred from the old Regional Processing Centre. The sub-floor has degraded prematurely due to water damage. The buildings were originally air-conditioned. These air-conditioners were installed on concrete pillars and the sub-floor was exposed to moisture from condensation, which resulted in premature degradation. These buildings have low ceilings and are not suitable for ceiling fans.

Capacity assessments also show space constraints at both the Nauru Primary School and Kaiser College. Kaiser College requires one additional classroom immediately. Nauru Primary School requires two classrooms immediately and will require two additional classrooms within the next five years. Two schools, Bue Infant School and Yaren Primary School, require a roof over play area to provide shade and the secondary school requires a cafeteria.

Figure 5-1: School buildings condition assessment



Civic, emergency services and administration buildings

This group of 26 civic, emergency services and administration buildings includes the main government administrative office, the parliament, the conference center, the sports complex, the police and ICT department buildings, the courts and the jail buildings. As shown in Figure 5-2, four of the buildings are in poor condition, including two very old buildings used as the jail, the land records committee building, and the radio broadcast and media center building. There is a new jail, which was constructed on top of the hill in 2016, but is vacant. It is recommended that the jail operations are moved to the new building. The media center building should be demolished and a new building should be constructed for media operations near the ICT office. The land records committee building in Uboe district should be renovated, renewing the roof, fit-outs, flooring, and services.

Figure 5-2: Civic, administration, and emergency services buildings

Health sector buildings

The health sector buildings include the hospital complex buildings, which have been grouped into three buildings: the old hospital buildings that have not been yet renovated, the old hospital buildings that have been renovated during the past 10 years, and the newly constructed pre-fabricated hospital complex buildings. The health sector buildings also include two buildings at the public health center and four small buildings used as district clinics at four locations along the ring road.

Figure 5-3 shows the condition assessment of the health sector buildings. Four of the existing buildings are in poor condition, including the old, unrenovated buildings at the hospital site, both existing buildings at public health building site in Denig and one of the abandoned clinic buildings, which appears to have been vandalized in Meneng district.

Figure 5-3: Health sector buildings

To improve the health sector infrastructure, the old hospital buildings should be renovated on an as-required basis following the original Master Plan for Stage Redevelopment. There is an immediate need for a maternity ward and an isolation ward. At the public health building site, the masonry-walled building should be renovated, and the timber-framed building should be demolished. The capacity assessment identified the need for nursing residential quarters, which can be constructed at the site vacated by demolition of the timber-framed building at the public health site. The clinic in Meneng requires a new roof and new windows.

During the inspection of the health sector buildings, the poor quality of construction and use of inappropriate materials for the local environment was noted. The following defects were noted in the newly constructed hospital complex building:

- Early corrosion and a high corrosion rate on a large number of steel members.
- The railings and hardware attached to the walls with screws are falling off in several locations, inside the building. It appears in a number of locations, the hardware was attached to the wall covering without any structural support.
- Some of the doorframes have warped, which appears to be related to the sagging of the subfloor.
- In many locations, the vinyl floor tiles are lifting off the subfloor.
- The selected wall materials do not appear to be fireproof.

Aviation sector buildings

Four buildings service the aviation sector, including the airport building, the VIP lounge adjacent to the airport, and two small nav-aid equipment buildings on the hill. With the exception of the old masonry nav-aid equipment building, which requires a new roof, ceiling, and repairs to the standby generator, the rest of the buildings are in good condition.

Port authority buildings

All buildings at the Nauru Port have been demolished and will be rebuilt with development of the new wharf.

Fisheries sector buildings

All five buildings in the fisheries sector have been assessed to be in fair or good condition. Other than routine maintenance, no capital investments are required for this sector.

Commerce, industry and environment sector buildings

The Agriculture Training Center building in Buada is in poor condition and requires renovations.

Air strip — runway, taxiways and hard stop areas

The runway, taxiways and hard stop areas at the Nauru airstrip are currently in a fair operating condition. At the beginning of 2019, the surface pavement was 27 years. The typical service age of a superior-quality surface pavement is 25 years. The current condition of the runway surface layer is indicative of the excellent quality of the seal laid in 1992.

A visual inspection of the air strip revealed signs of surface degradation in the form of cracks in the surface layer and damage to the ridges in grooved section of the runway. The pavement was inspected in 2016 and based on the condition of the surface pavement, it was recommended that the surface pavement is resealed. While the sub-base of the air strip is in excellent condition, the surface pavement is approaching the end of its service life and will need to be resealed within the next five years.

The drainage sumps in the runaway apron are in good operating condition; however, the steel grills on two sumps have rusted away and they need to be replaced.

The traffic control radio equipment used by the airport control tower consists of a variety of equipment from various manufacturers and is up to 20 years old. The value of individual control tower assets is well below the asset register materiality threshold; therefore, these assets are not recorded in the asset register. However, considering the recent increase in traffic handled by Nauru Airport, the airport requires standardized VHF radio equipment for communications between the control tower and aircraft. To operate safely and efficiently, the airport also requires a standardized meteorological station.

All remaining components associated with aviation operations, including the security fence, the runway and taxiway edge lighting, PAPI, and navigation aid equipment are in fair or good condition and other than the routine maintenance, do not require any capital investment.

Sealed roads

Most sections of the sealed road are in a fair operating condition. Although there are visible signs of degradation on the surface layer of sealed roads, the underlying base is in good condition. Only those sections that have been exposed to ponding have experienced damage to the base.

The following sections of the road network are in poor condition:

- Section LTSR-019: Embassy/Hospital Hill Road
- Section LTSR-020: Hospital Hill Access Road
- Section LTSR-021: Embassy Hill Access Road.

These sections were not sealed in 1992 when the rest of the network was resealed and, as a result, have experienced degradation of the base pavement under the surface and are in urgent need of renewal.

Due to the large fixed-cost required to set up a temporary asphalt plant and relocating heavy machinery to Nauru, resealing roads should be undertaken at the same time as the runway.

The roadside concrete curb is generally in fair condition, but is damaged in some locations. Approximately 5% of the curb requires capital repairs. This work has already started and should be completed before the road reseal work begins.

One serious problem is the dysfunctional design of the road drainage system. To maintain groundwater, drain sumps with soak pits were installed along the entire length of the ring road. However, the size of the number of sump pumps and the size of existing soaks pits is insufficient for effective drainage during rain. Compounding the problem is that the drainage sumps are not equipped with screened grills and the drainage pipes get clogged with debris, resulting in serious ponding. To resolve this design deficiency, drainage sumps should be equipped with appropriately designed grills and the size of drainage pipes and soak pits should be increased. Alternatively, approximately 15 additional drainage sumps and soak pits should be installed along the ring road, in strategic locations that are subject to frequent ponding, and in locations where sufficient land is available for soak pits. This work should also be completed before the road seal is replaced.

The capacity assessment of the road network revealed there are approximately 90 dwelling sites, located between the Nauru Port and Nauru College and between the ring road and the seashore, that have very poor road access. Some of these dwellings are currently in an uninhabitable state, but many are occupied by migrant workers working for RONPHOS or NRC. Lack of roads in this area not only results in poor living conditions for residents, but poses a serious safety risk for rescue operations during potential fire, flood, or medical emergencies. Therefore, it is recommended to provide at least a 4 metre wide, single-lane road over a length of approximately 3 kilometres to provide access for these dwellings.

Footpaths

Most sealed roads in Nauru have 1.2 metre wide footpaths adjacent to the curb. In most locations, the footpath is provided on one side of the road, but in more densely populated districts, such as Baitsi, Uaboe and Nibok, a footpath is provided on both sides of the road. In sparsely populated districts, such as Ijuw and Anibare, there are sections of road with no footpath. The overall length of footpaths in Nauru is approximately 28.4 kilometres. All of the footpath sections are generally in fair condition, but some locations are damaged requiring repairs to prevent further degradation. Approximately 10% of the footpaths require capital repairs. Footpath repair work has already started and should continue until all of the damaged footpath sections have been renewed.

Unsealed roads

All of the unsealed roads in Nauru are in the mining area on Topside. These roads were initially developed as temporary access roads for phosphate mining operations. In recent years, a number of permanent facilities have been established on Topside, including the RPC centers, the landfill facility, and the jail, requiring access by non-mining motor vehicles. There are currently approximately 9 kilometres of unsealed roads on Nauru used for non-mining operations. Maintaining these roads in good working condition is very costly (approximately $50,000 per km per year) and it would be more economical to seal these roads. However, there may be still phosphate mining potential under the unsealed roads and, therefore, they cannot be sealed at this stage.

The condition of the unsealed roads is highly dependent on the re-grading frequency. For example, in February 2019, all the unsealed roads were in good condition because they had been recently re-graded.

Nauru commercial wharf and boat harbour

All existing harbour structures, including buildings, owned by the Port Authority of Nauru have reached the end of their service life and are currently undergoing re-construction with a budget of approximately AUD105 million.

The boat harbour in Anibare district, managed by the Fisheries Department is in good operating condition.

Coastal protection (sea walls and rip raps)

With some exceptions, the remaining sea walls and rip raps are assessed as being in fair condition.

The rip rap in Meneng district (near the Yaren boundary) and the rip rap in the Yaren district (behind Nauru Secondary School) are in poor condition. These rip raps have experienced repeated over-topping by waves, resulting in soil erosion under the rip rap, with the rocks falling off the top. These rip raps require capital repairs to prevent further degradation.

The existing sea walls protect the coastal areas reasonably well. There is a small section in Boe district near Yaren, where coastal protection can be improved through addition of approximately 400 metres of a new rip rap.

Solid waste management — landfill site

The existing landfill site in Nauru is considered in poor condition. Solid waste is dumped on the land surface without compaction and without the fill layers being covered by soil in between.

The landfill site does not have the provision for collection of leachate and vent pipes are used to dissipate odor. These deficiencies may create environmental issues if leachate overflows and contaminates the surrounding ground. This is a serious concern because the landfill site is located close to the Buada district pond, which is the main pond to capture and store groundwater in Nauru.

The medical waste incinerator is installed at the hospital, but it is not currently in use, due to its installation next to the oxygen production chamber. Medical waste is currently buried at the landfill site. It is recommended to relocate the medical waste incinerator to the landfill site and recommission it.

The recyclables are not sorted and are being dumped at the site mixed with waste, which means the landfill site is not being used economically. A small building has recently been constructed at the landfill site as a pilot project to demonstrate sorting recyclables. But this building is not being used because it is too small for the sorting functions and appears to have been designed without professional input.

Sewage treatment plant

The status of sewage treatment in Nauru is assessed as being in poor condition.

There are currently only two small-scale secondary sewage treatment plants functioning correctly: one installed at the hospital building and the second installed at RPC site. These plants are designed to treat sewage discharge at those two locations. NUC maintains the sewage treatment plant at the hospital and they have been asked to take over treatment of sewage from all the schools for which they are setting up a small size plant (donated by Israel) at the Nauru Public School site.

Iguigu Holdings currently pumps out the private household septic tanks and drains the waste into the small size sewage treatment plant behind the Nauru Public School, which is undersized for the task and is not operating correctly.

Nauru needs one or two secondary treatment plants of sufficient capacity to handle sewage waste from all private household septic tanks and the government needs to assign the responsibility for planning and designing this plant to either NUC or NRC.

Antenna towers

All of the antenna towers owned by the ICT and aviation sectors are assessed as being in fair condition and do not require any capital investment during the next 10 years. However, a new media or ICT tower will be required when the media building is relocated near the ICT building.

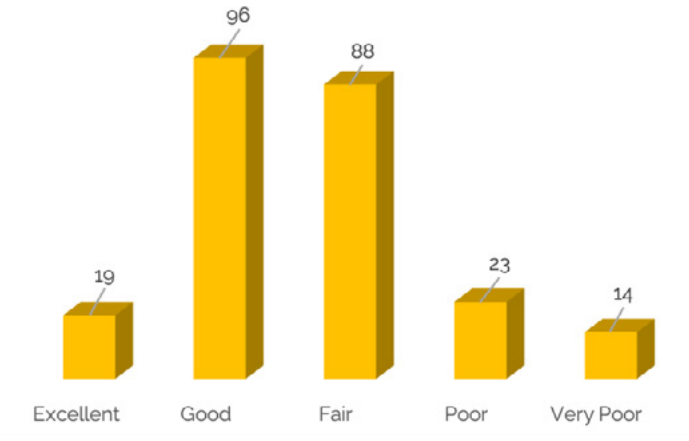


Figure 5-4: Condition of light-duty motor vehicles

Light-duty motor vehicles

All light duty vehicles in Nauru, except those owned by NUC and NRC, are managed by the Public Service Administration. There are a total of about 240 vehicles in this pool. Figure 5-4 summarizes the condition of light-duty vehicles as at May 2019. Vehicles in very poor condition require immediate replacement and vehicles in poor condition requiring replacement within two to five years.

Because the typical useful life of a light-duty vehicle in Nauru is 12 years, it is expected that all of the vehicles currently in fair condition will be in poor condition within the next 10 years.

Heavy-duty motor vehicles

Nauru Rehabilitation Corporation manages the majority of the heavy-duty vehicles owned by Government of Nauru. Most of these vehicles are used for land rehabilitation operations in the top-side mining areas. The average cost of a heavy-duty vehicle used in land rehabilitation operations is more than AUD400,000. A review the recent operating history of these vehicles indicates the need for improved accountability for asset management. Over the past five years, three of these vehicles were destroyed by fire and had to be prematurely retired from service prematurely.

Figure 5-5 summarizes the results of condition assessment of heavy-duty motor vehicles managed by NRC. Lack of vehicles in fair or good operating condition is hampering the ability of NRC to carry out its intended functions.

Figure 5-5: Condition of NRC heavy-duty vehicles

All assets in poor and very poor condition will need to be replaced within the next two years and the remaining assets will need to be replaced at least once during the 10-year investment plan.

The Port Authority of Nauru also owns capital-intensive heavy-duty vehicles used for unloading containers from ships and off-shore mooring equipment to hold ships waiting for a porting berth. Emergency Services is responsible for managing the fire trucks and ambulance fleet. The Department of Transportation manages public transit and school buses and Fisheries and Marine Resources Authority also owns mini excavators to excavate ponds to promote small-scale fish hatcheries at household level. All these vehicles have a typical useful life of eight years and will need to be replaced at least once during this 10-year investment plan.

Motorboats

The Port Authority of Nauru owns heavy-duty motorboats, referred to as sea mules, which are currently used to transport loaded containers from ship to dock. These boats are currently in fair operating condition and when the new port is commissioned and the ships can dock at the port, these boats will become redundant and will not need to be replaced.

The Fisheries and Marine Resources Authority manages a few small-sized motorboats, all of which are currently in fair condition. Emergency Services has four jet-skis that are currently in fair or good condition.

6 Asset maintenance

For safe, reliable and economically efficient operation of infrastructure, all infrastructure assets require a maintenance plan. While most of the infrastructure assets in Nauru are simple building structures, some assets, such as the wharf (currently under construction), involve engineered structures and complex equipment and require subject matter expertise to develop detailed maintenance plans. It is recommended that when new assets are acquired, a maintenance plan be developed as part of the engineering scope, during the procurement and construction phases of the infrastructure assets.

6.1 Typical maintenance infrastructure

Appendix C contains general maintenance guidelines for different types of infrastructure assets, which can be used for simple and standard assets or can be tailored to meet the specific needs of complex engineered assets. A summary of these maintenance needs for infrastructure assets follows.

Scheduled inspections and minor maintenance	Scheduled inspections and minor maintenance at regular intervals are required for minor repairs and replacement of degraded parts identified through inspections to avoid more serious damage and asset degradation. The scope and frequency of minor maintenance varies depending on the asset. The minor maintenance activities are funded through operations and maintenance budgets.
Reactive maintenance	Reactive maintenance involves repairing or replacing minor asset components when they fail in service to maintain asset functionality, meet the required service levels, and to prevent further asset degradation. The reactive maintenance is generally covered through operations and maintenance budgets but may occasionally involve capital expenditure, depending on the scope of required repairs.
Planned condition assessment	Planned condition assessment is carried out by subject matter experts and is undertaken less frequently than scheduled inspections. It involves comprehensive assessment of all assets and their components to determine their physical condition and to reveal any need for major repairs or refurbishment or replacement of components and their timing (i.e. determining the need for roof replacement of a building).
Planned major repairs and refurbishment	Planned major repair and refurbishment activities are performed in response to the repair/ refurbishment needs identified through planned condition assessment and these are generally covered through capital budgets. When repairs or refurbishment of an asset is not considered economically efficient, the asset is retired from service and replaced.

6.2 Funding maintenance

The optimal funding requirements for maintaining an asset is a function of the asset's design and construction as well as its operating environment and it can be calculated only through detailed analysis. A recent World Bank study estimates the minimum annual maintenance costs to be:

- 2% of replacement cost for electricity and road networks
- 3% of replacement cost for water and sanitation assets
- 8% of replacement cost for mobile assets.[2]

The scope of maintenance activities varies significantly for different asset types, to achieve the desired objectives of:

- preventing premature asset degradation
- reducing the risk of in-service asset failures
- providing economically efficient asset operations, throughout assets' life cycle.

The level of optimal maintenance required by an asset depends on several factors: assets that have a large number of moving parts and those have a higher degree of wear and tear. Similarly, those assets that are routinely exposed to a corrosive environment experience accelerated degradation of metal surfaces due to oxidation and therefore, require more extensive maintenance. The maintenance effort required for an asset also increases its age.

Based on the scope of maintenance activities required, annual maintenance budgets should be calculated as a percentage of gross replacement cost of the assets, as indicated Table 6-1. The indicated costs are for routine maintenance, inspections and minor emergency repairs and do not cover the cost of major component renewal.

2 Fay, M. and Yepes, T. 2003. Investing in Infrastructure — ***Policy Research Working Paper #3102*** , The World Bank.

Table 6-1: Asset maintenance budget as a percentage of gross replacement cost

Asset type	Average Annual maintenance cost as a percentage of gross replacement cost
Buildings	0.5%
Unsealed roads (base)*	5.0%
Sealed roads (surface, curb and gutter, sumps and soak pits)*	1.0%
Runway*	2.0%
Vehicles light duty	3.0%
Vehicles heavy duty	3.0%
Boats	4.0%
Telecom/electronics assets	2.0%
Rip raps	2.0%
Masonry sea walls/wharfs	0.5%
Concrete sea walls	0.5%
Footpaths	1.0%
Solid waste assets	2.0%
Sewage waste	2.0%
Miscellaneous	2.0%

* Does not include formation and base in replacement cost

7 Capital Investment Plan

7.1 Infrastructure projects pipeline

Based on the review of the public infrastructure and services delivery in Section 4, identified infrastructure gaps, development of the asset register, and review of asset condition in Section 5, a project pipeline of demand of infrastructure investment has been developed.

The following five infrastructure sub-groups were developed:

Type R	infrastructure rehabilitation, which aims to rehabilitate buildings and civil works infrastructure such as roads, runway, and sea protection walls to original design and functionality
Type U	infrastructure upgrading, which aims to improve similar types of civil infrastructure beyond its original design to adapt to evolving standards and include additional functionalities to avoid technical obsolescence
Type N	new infrastructure, which is greenfield, new public infrastructure, mostly large and development-partner driven
infrastructure equipment and vehicles	mostly, but not exclusively, equipment replacement or upgrading at the end of existing life of these assets
NUC and VEI	infrastructure and equipment renewal, upgrading, or new infrastructure and equipment developed by NUC (water and energy) and VEI (fuel tank farm)

The last category was created because NUC and VEI already have a functional asset register and they have completed a condition assessment of their infrastructure assets under a separate development-partner funded initiative. Therefore, the projects included in the investment pipeline for NUC and VEI, had been identified through the condition assessment initiative recently carried out by NUC and VEI.

Table 7-1 is the complete list of identified projects that collectively build the Nauru public infrastructure project pipeline for the year 2019. It includes projects already approved but not yet completed and commissioned, as well as projects under consideration based on assessments described in Section 4 and Section 6.

The total investment value of the five categories of infrastructure is AUD 315,267,460, which can be split into five infrastructure sub-groups:

Type R: Infrastructure rehabilitation	AUD 40,010,000
Type U: Infrastructure upgrading	AUD 13,752,500
Infrastructure equipment and vehicles replacement	AUD 33,304,960
Type N: Large, already committed projects	AUD 209,840,000
NUC & VEI infrastructure programme	AUD 18,360,000

The process for projects to be inserted in the project pipeline varies slightly depending on the type and owner of the project.

Projects in sectors under the responsibility of MID (transport, ICT, emergency services, fisheries as well as the social sectors (health and education)) need to be submitted to the Planning and Aid Division (PAD) in the form of a project proposal. Proposals are screened by PAD and Treasury. Some proposals may be rejected before being entered into the pipeline.

Projects in sectors under the responsibility of public utilities and the fuel tank farm, also submit project proposals, but these submissions are made directly to the Treasury and the government.

Finally, large projects driven by development partners are not required to have a specific proposal submission. They undergo detailed feasibility assessment, including financial and economic analysis, and are handled directly by the development partners and the government without being included in the project pipeline. No clear explanation for this was received from the Treasury or PAD, except to state that these projects are large, often supported jointly by several development partners and undergo detailed financial and economic appraisal according to the International Financial Institutions cost–benefit analysis guidelines before approval.

This diversity of pathways for infrastructure project approval a does not provide a level playing field across all the sectors and signals a lack of transparency.

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Table 7-1: Nauru Public Infrastructure Project Pipeline 2019

Nauru Department/ Operator	Project number (1)	Project Description	Project Driver	Project Trigger	Approval Status	Estimated Total Investment (AUD)
Infrastructure Investment Pipeline 2019–2030						**315,267,460**
Type R: Infrastructure rehabilitation						**40,010,000**
DOE	DOE-R-1	Renovate two classrooms for Nauru Primary School	Health & Safety	Condition Assessment	Under Consideration	**120,000**
ICT	ICT-R-2	New media building	Essential Public Services	Condition Assessment	Under Consideration	**300,000**
PSA	PSA-R-3	Land Records Committee building renovation	Essential Public Services	Condition Assessment	Under Consideration	**100,000**
	PSA-R-4	Government administration building renovation	Essential Public Services	Condition Assessment	Under Consideration	**500,000**
	PSA-R-5	Home Affairs — renovate four buildings	Essential Public Services	Condition Assessment	Under Consideration	**150,000**
DOH	DOH-R-6	Renovate old building to be used as maternity ward	Health & Safety	Condition Assessment	Under Consideration	**320,000**
	DOH-R-7	Renovate old building to be used as isolation ward	Health & Safety	Condition Assessment	Under Consideration	**350,000**
	DOH-R-8	Hospital security fence and improvement to parking area	Health & Safety	Condition Assessment	Under Consideration	**60,000**
	DOH-R-9	Redevelopment the old ward block for paediatrics.	Health & Safety	Condition Assessment	Under Consideration	**480,000**
DCA	DCA-R-10	Renovation to nav-aid equipment building	Essential Public Services	Condition Assessment	Under Consideration	**60,000**
	DCA-R-11	Resealing and repair of runway, taxiway and hardstops area	Essential Public Services	Condition Assessment	Under Consideration	**15,000,000**
DOT	DOT-R-12	Rehabilitate existing draining sumps and soak pits	Essential Public Services	Condition Assessment	Under Consideration	**300,000**
	DOT-R-13	Capital repairs to roadside curbs and gutters	Essential Public Services	Condition Assessment	Under Consideration	**250,000**
	DOT-R-14	Resealing and repair of existing roads	Essential Public Services	Condition Assessment	Under Consideration	**14,000,000**
	DOT-R-15	Capital repair to footpaths	Essential Public Services	Condition Assessment	Under Consideration	**300,000**
CIE	CIE-R-16	Repairs to existing rip raps	Essential Public Services	Condition Assessment	Under Consideration	**300,000**
NRC	NRC-R-17	Improvements to landfill site — install liner leachate collection system	Essential Public Services	Condition Assessment	Under Consideration	**1,400,000**
	NRC-R-18	Relocate medical waste incinerator to landfill site	Essential Public Services	Condition Assessment	Under Consideration	**20,000**
CIE	CIE-R-19	Septage new treatment plant for the country	Essential Public Services	Condition Assessment	Under Consideration	**6,000,000**

Nauru Department/ Operator	Project number (1)	Project Description	Project Driver	Project Trigger	Approval Status	Estimated Total Investment (AUD)
Type U: Infrastructure capacity upgrading						**13,752,500**
DOE	DOE-U-20	Renovate two additional classrooms for Nauru Primary School	Essential Public Services	Capacity Assessment	Under Consideration	**120,000**
	DOE-U-21	One new classroom for Kaiser College	Essential Public Services	Capacity Assessment	Under Consideration	**75,000**
	DOE-U-22	Provide roof on play area at Nauru College	Health & Safety	Capacity Assessment	Under Consideration	**40,000**
	DOE-U-23	Provide roof on play area at Boe Infant School	Health & Safety	Capacity Assessment	Under Consideration	**40,000**
	DOE-U-24	Cafeteria building at Nauru Secondary School	Essential Public Services	Capacity Assessment	Under Consideration	**150,000**
	DOE-U-25	Sanitary facility, 5 community centres and storage room	Essential Public Services	Capacity Assessment	Under Consideration	**17,500**
	DOE-U-26	Disability access to learning village and disabled school	Essential Public Services	Capacity Assessment	Under Consideration	**32,000**
DOH	DOH-U-27	Other Phase 3 renovations and hospital improvements	Health & Safety	Capacity Assessment	Under Consideration	**4,000,000**
	DOH-U-28	Construction of nursing home	Health & Safety	Capacity Assessment	Under Consideration	**4,500,000**
	DOH-U-29	Building of Ijuw community sport courts	Health & Safety	Capacity Assessment	Under Consideration	**63,000**
	DOH-U-30	Nauru Sport Complex — Phase 2	Health & Safety	Capacity Assessment	Under Consideration	**2,883,000**
DOT	DOT-U-31	Develop new road for waterfront area near the port	Essential Public Services	Capacity Assessment	Under Consideration	**1,200,000**
	DOT-U-32	Addition of two sets of traffic lights on Simpson Rd	Essential Public Services	Capacity Assessment	Under Consideration	**77,000**
CIE	CIE-U-33	Construction of new rip rap in Boe district	Essential Public Services	Capacity Assessment	Under Consideration	**400,000**
NRC	NRC-U-34	Install recyclables sorting system	Essential Public Services	Capacity Assessment	Under Consideration	**60,000**
PSA	PSA-U-35	Development of new cemetery	Public Services	From NPP 2018/19	Under Consideration	**95,000**
Infrastructural equipment & vehicles replacement						**33,304,960**
DCA	DCA-R-36	Replacement VHF air–ground radio	Essential Public Services	from NPP 2018/19	Under Consideration	**225,000**
	DCA-R-37	Vaisala meteorological system	Essential Public Services	From NPP 2018/19	Under Consideration	**490,000**
NFMRA	NFMRA-R-38	Decompression chamber rehabilitation	Health & Safety	from NPP 2018/19	Under Consideration	**36,000**
	NFMRA-R-39	Replace heavy-duty vehicles as they reach end of life	Essential Public Services	Condition Assessment	Under Consideration	**80,000**
	NFMRA-R-A	Replace heavy-duty vehicles as they reach end of life	Essential Public Services	Condition Assessment	Under Consideration	**200,000**

Nauru Department/ Operator	Project number (1)	Project Description	Project Driver	Project Trigger	Approval Status	Estimated Total Investment (AUD)
NRC	NRC-R-A	Replace heavy-duty equipment (excavators, rock breakers, dump trucks, screens etc.) (6-year life)	Economic Development	Condition Assessment	Under Consideration	**10,098,115**
	NRC-R-B	Replace heavy-duty equipment (excavators, rock breakers, dump trucks, screens etc.) (6-year life)	Economic Development	Condition Assessment	Under Consideration	**4,716,265**
	NRC-R-40	Replace heavy-duty equipment for solid waste management	Essential Public Services	Condition Assessment	Under Consideration	**341,705**
	NRC-R-C	Replace heavy-duty equipment for solid waste management	Essential Public Services	Condition Assessment	Under Consideration	**200,685**
NES	NES-R-41	Replace fire trucks and ambulances as they reach end of life	Essential Public Services	Condition Assessment	Under Consideration	**150,000**
	NES-R-A	Replace fire trucks and ambulances as they reach end of life	Essential Public Services	Condition Assessment	Under Consideration	**810,000**
DOT	DOT-R-42	Purchase of 2 large and 2 smaller buses to complement existing fleet	Essential Public Services	Condition Assessment	Under Consideration	**222,000**
	DOT-R-A	Upgrade and replace public transport and school buses	Essential Public Services	Condition Assessment	Under Consideration	**260,000**
	DOT-R-B	Upgrade and replace public transport and school buses	Essential Public Services	Condition Assessment	Under Consideration	**130,000**
	DOT-R-C	Upgrade and replace public transport and school buses	Essential Public Services	Condition Assessment	Under Consideration	**510,000**
PAN	PAN-R-43	120-ton crane to unload containers from ships	Essential Public Services	Condition Assessment	Under Consideration	**1,200,000**
	PAN-R-44	Reach stacker for 20 ft containers	Essential Public Services	Condition Assessment	Under Consideration	**500,000**
	PAN-R-45	Replace mooring equipment as it reaches end of life	Essential Public Services	Condition Assessment	Under Consideration	**7,595,300**
	PAN-R-A	Replace other ship unloading equipment as it reaches end of life	Essential Public Services	Condition Assessment	Under Consideration	**123,000**
	PAN-R-B	Replace other ship unloading equipment as it reaches end of life	Essential Public Services	Condition Assessment	Under Consideration	**646,890**
PSA	PSA-R-A	Replace light-duty vehicles as they reach end of life	Essential Public Services	Condition Assessment	Under Consideration	**920,000**
	PSA-R-B	Replace light-duty vehicles as they reach end of life	Essential Public Services	Condition Assessment	Under Consideration	**1,335,000**
	PSA-R-C	Replace light-duty vehicles as they reach end of life	Essential Public Services	Condition Assessment	Under Consideration	**2,235,000**
	PSA-R-D	Replace heavy-duty vehicles as they reach end of life	Essential Public Services	Condition Assessment	Under Consideration	**280,000**
Type N: Large, already-committed projects						**209,840,000**
PAN	PAN-N-C	Redevelopment of Nauru Port	Essential Public Services	Condition Assessment	Approved under implementation	**113,000,000**
ICT	ICT-N-A	East Micronesian Cable Project (undersea internet cable)	Essential Public Services	Capacity Assessment	Approved under implementation	**56,800,000**
NES	NES-N-B	New NES headquarters & meteorology equipment	Essential Public Services	Capacity Assessment	Approved under implementation	**3,080,000**

Nauru Department/ Operator	Project number (1)	Project Description	Project Driver	Project Trigger	Approval Status	Estimated Total Investment (AUD)
NUC	NUC-N-46	6.5 MW PV power & 5 MW battery storage	NSDS objective	Capacity Assessment	Under Consideration	**36,660,000**
DOE	DOH-N-5	Treatment plant in Meneng for schools plus tanker	Essential Public Services	Condition Assessment	Approved under implementation	**300,000**
VEI & NUC infrastructure programme						**18,360,000**
VEI	VEI-U-47	Replace 8" diameter steel pipes from the cantilever location to the fuel tank farm	Essential Services	Port Redevelopment	Under consideration	**1,500,000**
	VEI-U-A	Install low- and high-level gauges on fuel storage tanks	Essential Services	Condition Assessment	Approved	**300,000**
	VEI-U-B	Improve firefighting capacity at fuel tank farm	Public Safety	Condition Assessment	Approved	**2,000,000**
NUC	NUC-R-A	G4- Replacement of 2.8 MW, Ruston, Med Speed Gen Set (used)	Essential Services	Condition Assessment	Approved	**1,000,000**
	NUC-R-B	G6 - Rehab of 2.4 MW, Ruston, Med Speed Gen Set	Essential Services	Condition Assessment	Approved	**1,000,000**
	NUC-R-48	G1 — Rehab of 2.4 MW, Ruston, med speed gen set	Essential Services	Condition Assessment	Under consideration	**1,000,000**
	NUC-R-49	G5 — Rehab of 1.0 MW, Ruston, med speed gen set	Essential Services	Condition Assessment	Under consideration	**500,000**
	NUC-R-C	Relocate 5x1MW high speed gen sets to solar farm site	Climate Change Adaptation	Capacity Assessment	Approved	**700,000**
	NUC-N-D	Addition of 1.1 MW PV solar generation	Climate Change Adaptation	Capacity Assessment	Approved	**4,000,000**
	NUC-R-E	Overhead HT line rehab (11 kV)	Essential Services	Condition Assessment	Approved	**3,000,000**
	NUC-U-50	Convert alternators to synchronous generators to improve stability	Climate Change Adaptation	Capacity Assessment	Under consideration	**100,000**
NUC	NUC-R-F	Meneng water production plant rehab (480 kl per day + 100 kl per day)	Essential Services	Capacity Assessment	Approved	**1,500,000**
	NUC-N-51	Pipeline from AIWO to RON hospital	Essential Services	Capacity Assessment	Under consideration	**500,000**
	NUC-R-G	Rehab 3 million L water storage tank and 2 x 300,000 L water treatment tanks for B-13 site	Essential Services	Condition Assessment	Approved	**700,000**
	NUC-N-52	Water remineralization plant	Essential Services	Capacity Assessment	Under consideration	**150,000**
	NUC-N-53	Relining of 4 C tanks	Essential Services	Condition Assessment	Under consideration	**160,000**
	NUC-N-H	Water office building (new building)	Essential Services	Capacity Assessment	Approved	**250,000**

(1) Prioritized projects have been given a numeral serial number and non-prioritized projects an alphabet serial number

7.2 Prioritization methodology

The methodology used for project prioritization is a multi-sectoral, multi-criteria quantitative assessment of project characteristics that are common and apply to all infrastructure sectors. Each project is documented in a one-page spreadsheet, which provides key characteristics of the project. These characteristics are then scored, weighted, and ranked using a common assessment and quantification grid.

The proposed methodology:

- includes objective project quantitative data available for each project allowing scoring across sectors
- allows characteristics to be scored fairly and reflect the "triple bottom line" dimensions of a project (economic, social and environmental values)
- weights scores allows to fine tune rankings based on evolving national strategic interest
- retains the existing project proposal template for project data submission
- enriches the project proposal submissions with the help of an add-on simple spreadsheet.

The following data was used in the add-on project profile spreadsheet used for prioritization:

Project identifiers	Sector, Contact person, Project name, Project number, Project location
Project scale and status	Project stage of development; Brief project description; Linkage or synergy with other projects; Alignment with NSDS indicators; Alignment with sector strategy; Rationale for project proposal.
Public services improvement	Improved Remaining Service Potential (RSP) from the asset register review; System capacity improvement; Advancement of public services indicators (KPIs); Number of districts to benefit; Contribution to reduction of service cost; Local employment during construction; Added local employment after commissioning; Added women local employment after commissioning.
Project risks & sustainability	Land-related risks; Vulnerability to climate change adaptation and disaster risk management; Environmental impact; Involuntary resettlement needs; History of maintenance expenditure from operator as proxy for adequacy of maintenance management system quality
Project financial and economic aspects	Investment value; Expected economic benefits (GDP growth potential); Fund mobilized for investment to date; Committed maintenance budget; Source of funds needed for services operation

For scoring of each project, a subset of the data was used with the following possible scores:

A. Project scale and status (maximum score 10)

1. Type of project: Rehabilitation: 3; Upgrading: 2; New: 1
2. Project stage of development: Feasibility: 3; Pre-feasibility: 2; Concept: 1
3. Synergy with other projects: Two projects or more: 2; One project: 1; No other project: 1
4. Advancement of NSDS: Quantitative target: 2; Qualitative target: 1; No advancement: 0.

B. Public service improvement (Maximal score 10)

1. Improved RSP (%): >70%: 3; 70–30%: 2; <30%: 1
2. Improved system capacity: 100 % for next 5 years: 2; 100% for today's demand: 1; less than 100% : 0
3. Advancement of KPIs: Achieved: 2; Advances: 1; No advancement: 0
4. Districts benefiting (10 to 14: 3; 5 to 9: 2; 1 to 4: 1)

C. Project risks and sustainability (maximal score 10)

1. Land availability: Yes: 3; Negotiation ongoing: 2; Not clear: 1
2. Negative environmental impact: No impact: 3; Moderate impact: 2; High impact: 1
3. Maintenance expenditures: Within range: 2; Low compared to target: 1; Low & not documented: 0
4. Climate Change & Disaster Risk Management vulnerability factor (0 and 100): <34: 3; 35–71: 1; >72: 0

D: Financial & economic aspects

1. Local works for construction: >60%: 3; 60–20%: 2; <20%: 1
2. Capital funding mobilized: Some secured: 2; Some discussed: 1; No mobilization: 0
3. Finance for maintenance: Mostly from service charge: 2; Mostly from government budget: 1; Not clarified: 0.
4. Percentage of women's employment created: >60%: 3; 60–30%: 2; < 30%: 1

The list of the scored and ranked projects included 53 projects highlighted in the NIISS document. Projects not included in the project prioritization process were:

- projects already approved and already under implementation since or before 2018
- light-duty and heavy-duty vehicles from PSA as well as NRC (except solid waste needed vehicles) due to the special nature and financing of NRC equipment and the difficulty of properly allocating the use and function of the PSA equipment from a public service perspective.

The New Project Proposal on gender equality received for the FY 2018/19 concerned staffing needs (position of councillor to assist in safehouse-related matters, budget for safehouse caretaker overtime) or regulatory matters (alcohol import duty to support domestic violence reduction and children welfare). Both are outside infrastructure project programming.

Gender considerations were taken into account in the prioritization exercise at two levels:

- general safety and security of planned infrastructure for women in public spaces
- employment prospects for women coming out of the planned investments.

The investment planning process also considered the outcome of the National Stakeholders' Consultation Report (December 2017) for the preparation of the Nauru National Sustainable Development Strategy (NSDS) 2018–2030. The report highlighted the importance of enhancing the role of communities and women in the development process and recommended:

- the development of opportunities for training that is specifically geared to women and their interest in the development of future public infrastructure
- the development of more job opportunities for women in the management and operation of public infrastructure assets
- developing safehouse for women with special needs.

Although the prioritization methodology includes a weighting tool (see Appendix D), the results of the prioritization process was based on allocating one point to each score value for each criteria and a balanced weighting between the four groups of criteria (25% for each of the four groups of criteria).

The result of the prioritization process is shown in Table 7-2 and Figure 7-1. The raw scores have been levelled to a scale of 0–100 with 100 being then the maximum score.

Table 7-2: Prioritized project lists

Priority Serial #	Project Number	Project Name	Total Scores	Investment value (AUD1,000)
1	DOH-R-6	Renovate old building as maternity ward	82.69	320
2	DOE-R-1	Renovate two classrooms for NPS	77.88	120
3	DOH-R-7	Renovate old building as isolation ward	77.88	350
4	NUC-R-53	Relining of 4 C tanks	77.88	160
5	DOH-U-28	Construction of nursing home	76.92	4,500
6	DOH-R-9	Redevelopment of old ward for paediatrics.	76.92	480
7	NRC-R-17	Improvements to landfill site	75.96	1400
8	NUC-N-46	6.5 MW PV & 5 MW battery storage	75.96	36,660
9	NRC-R-18	Relocate medical waste incinerator to landfill site	72.12	20
10	DOE-U-20	Renovate two additional classrooms NPS	72.12	120
11	DOE-U-21	One new classroom for Kaiser College	72.12	75
12	DOT-U-32	Addition of two sets of traffic lights on Simpson Rd	72.12	77
13	DOE-U-25	Sanitary facility, 5 community centres, and storage room	72.12	17.5
14	DOT-R-12	Rehabilitate draining sumps & soak pits	71.15	300
15	DOT-R-42	Purchase of 2 large and 2 smaller buses	71.15	222

16	DOH-U-27	Phase 3 renovations hospital improvements	70.19	4,000
17	NUC-N-51	Pipeline from AIWO to RON hospital	70.19	500
18	PSA-R-4	Government Admin Building renovation	68.27	500
19	DOT-R-14	Resealing and repair of existing roads	68.27	14,000
20	CIE-R-19	Septage new treatment plant for country	68.27	6000
21	NRC-U-34	Install recyclables sorting system	68.27	60
22	ICT-R-2	New media building	67.31	300
23	NRC-R-40	Replace heavy duty equipment for solid waste	67.31	342
24	DCA-R-10	Renovation to nav-aid equipment building	67.31	60
25	DCA-R-11	Resealing and repair of runway & taxiway	67.31	15,000
26	DCA-R-36	Replacement VHF air–ground radio	67.31	225
27	DCA-R-37	Vaisala meteorological system	67.31	490
28	NES-R-41	Replace fire trucks	66.35	150
29	NUC-R-48	Rehab of G1 Generator Ruston, 2.4 MW	66.35	1,000
30	NUC-R-49	Rehab of G5 Generator Ruston, 1.0 MW	66.35	500
31	CIE-R-16	Repairs to existing rip raps	64.42	300
32	DOE-U-22	Provide roof on play area at Nauru College	64.42	40
33	DOE-U-26	Disability access to learning village and disabled school	64.42	32
34	DOT-U-31	Develop new road for waterfront area near the port	64.42	1,200
35	DOT-R-15	Capital repair to footpaths	64.42	300
36	NUC-U-50	Conversion to synchronous generators	63.46	100
37	DOE-U-23	Provide roof on play area at BIS	62.50	40
38	DOE-U-24	Cafeteria building at Nauru Secondary School	62.50	150
39	DOT-R-13	Repairs to roadside curbs and gutters	62.50	250
40	PAN-R-43	120-ton crane to unload containers	62.50	1,200
41	PAN-R-44	Reach stacker for 20-ft containers	62.50	500
42	NUC-N-52	Water remineralization plant	62.50	150
43	DOH-U-30	Nauru Sport Complex — Phase 2	59.62	2,883
44	PSA-R-3	Land Records building renovation	56.73	100
45	PSA-U-35	Development of new cemetery	55.77	95
46	VIE-U-47	Replacement 8" pipe cantilever to farm	55.77	1,500
47	DOH-U-29	Building of Ijuw community sport courts	54.81	63
48	CIE-U-33	Construction of new rip rap in Boe district	53.85	400
49	PAN-R-45	Replace mooring equipment at end of life	53.85	7,595
50	NFMRA-R-38	Decompression chamber rehabilitation	51.92	36
51	DOH-R-8	Hospital security fence and parking area	50.96	60
52	NFMRA-R-39	Rehabilitate 4 small boats	50.00	80
53	PSA-R-5	Home Affairs—renovate 4 buildings	44.23	150
TOTAL				**105,172.5**

A number of points to note about the prioritized pipeline projects are:

- The NUC PV solar project (6.5 MW PV & 5 MW battery storage) is currently being evaluated by ADB and it achieved a good score and ranking of 8.
- Other NUC projects achieved differentiated ranking 4, 8, 17, 29, 30, 36 and 42 based on the type of project (linkage with NSDS target, advancement of water supply MP, rehabilitation, upgrading, etc.).
- A number of DOE and DOH projects achieved high scores because they (i) involved important and necessary building rehabilitation or upgrading tasks and (ii) these investments can significantly improve the public service quality offered to the population.
- Investments needed to address the desolate and environmentally unsound landfill site also achieve high scores (ranked 7, 9).
- The need for a new septage treatment plant for the sludge from septic tanks achieved a ranking of 20.
- The high cost resealing of roads and the runway ranked 19 and 25.

These rankings would, of course, if different weightings are applied to the criteria. Therefore, the rankings are only indicative and only serve as general guidance for final project review and approval by authorities.

Note that a number of rehabilitation and upgrade projects have limited investment value. These fall into two groups:

1. infrastructure investment with an investment value below AUD1 million
2. infrastructure projects with investment value greater than AUD1 million.

Table 7-3 shows 40 projects have an individual investment value of less than AUD1 million and a cumulative investment value of AUD8.2 million, or an average project value of AUD206,000.

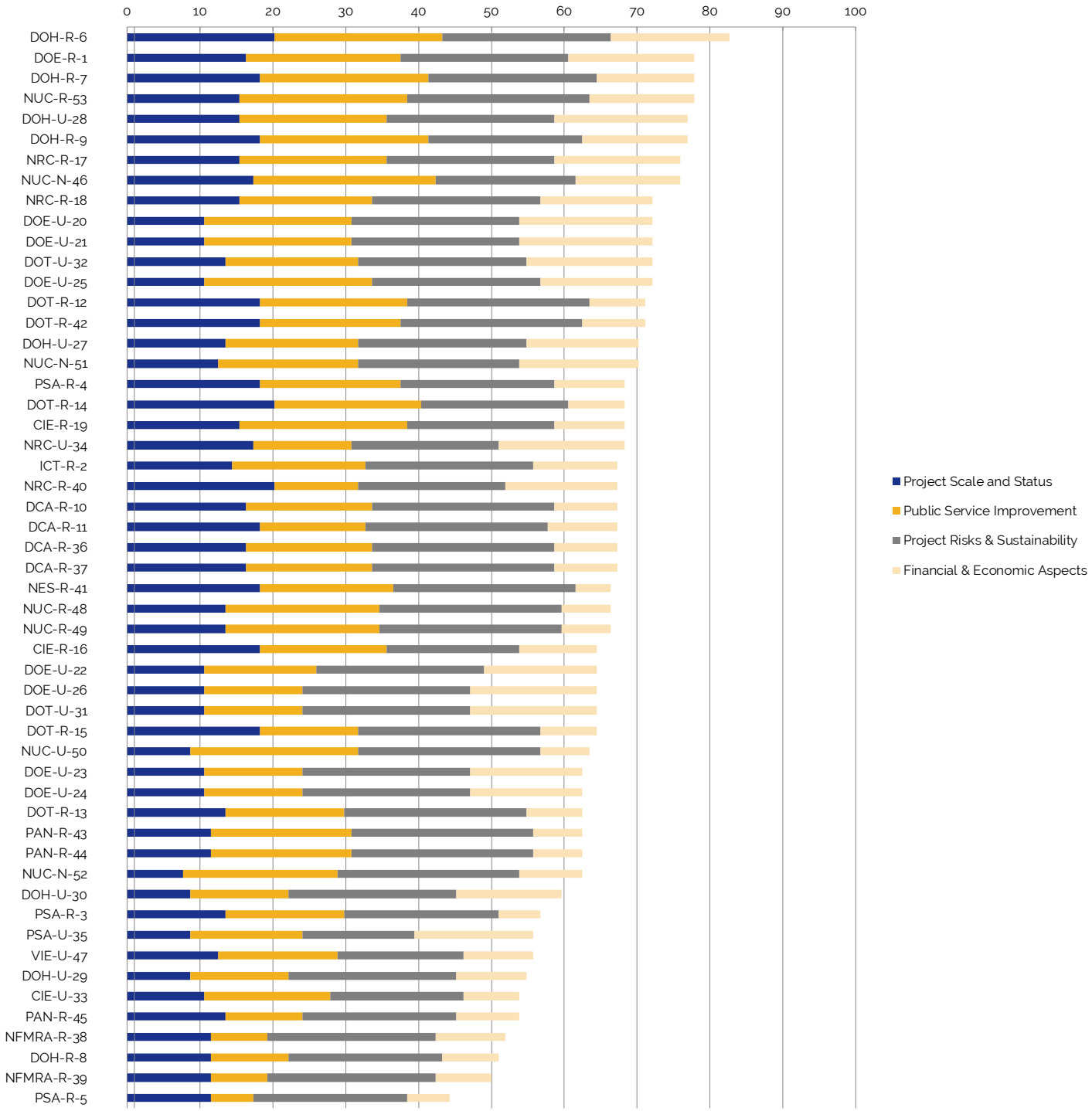
Table 7-4 shows 13 larger projects have a cumulated investment value of AUD97 million or an average project value of AUD7.4 million.

7.3 Infrastructure investment plan

The capital expenditure programmed for FY2019–2020 out of the NPP projects list, which PAD oversees was in the range of between AUD 2 million and 3 million.[3]

The investment plan in Table 7-3 was designed on the basis that GON can afford on its own to finance on a recurring basis every year of around at least AUD2 million of infrastructure capital investment. It would then need around four years to implement the list of the 40 smaller projects identified in the prioritized project list.

Figure 7-1: Projects scores and ranking graph



3 Excluding GON capital expenditures as contribution to development partners co-sponsored projects as well as contribution to NUC and VEI capital expenditure projects that follows a different appropriation pathway.

Table 7-3: Prioritized investment plan of small (< 1 million AUD) projects

Project #	Priority serial number	2020–21 projects 1–14	2021–22 projects 15–24	2022–23 projects 25–35	2023–24 projects 36–51	2024–25 projects 52–53	Total Investment (2020–2030) (AUD)
Total small projects		**1,799,500**	**1,973,705**	**2,037,000**	**2,044,000**	**330,000**	**8,184,205**
Project Type R		**1,350,000**	**1,100,000**	**600,000**	**410,000**	**150,000**	**3,610,000**
DOE-R-1	2	120,000					120,000
ICT-R-2	22		300,000				300,000
PSA-R-3	44				100,000		100,000
PSA-R-4	18		500,000				500,000
PSA-R-5	53					150,000	150,000
DOH-R-6	1	320,000					320,000
DOH-R-7	3	350,000					350,000
DOH-R-8	51				60,000		60,000
DOH-R-9	6	240,000	240,000				480,000
DCA-R-10	24		60,000				60,000
DOT-R-12	14	300,000					300,000
DOT-R-13	39				250,000		250,000
DOT-R-15	35			300,000			300,000
CIE-R-16	34			300,000			300,000
NRC-R-18	9	20,000					20,000
Project Type U		**289,500**	**60,000**	**72,000**	**748,000**		**1,169,500**
DOE-U-20	10	120,000					120,000
DOE-U-21	11	75,000					75,000
DOE-U-22	31			40,000			40,000
DOE-U-23	38				40,000		40,000
DOE-U-24	37				150,000		150,000
DOE-U-25	13	17,500					17,500
DOE-U-26	32			32,000			32,000
DOH-U-29	47				63,000		63,000
DOT-U-32	12	77,000					77,000
CIE-U-33	49				400,000		400,000
NRC-U-34	21		60,000				60,000
PSA-U-35	46				95,000		95,000
Equipment & vehicles replacement			**563,705**	**865,000**	**536,000**	**80,000**	**2,044,705**
DCA-R-36	26			225,000			225,000
DCA-R-37	27			490,000			490,000
NFMRA-R-38	50				36,000		36,000
NFMRA-R-39	52					80,000	80,000
NRC-R-40	23		341,705				341,705
NES-R-41	28			150,000			150,000
DOT-R-42	15		222,000				222,000
PAN-R-44	41				500,000		500,000
VEI & NUC infrastructure		**160,000**	**250,000**	**500,000**	**350,000**	**100,000**	**1,360,000**
NUC-R-49	30			250,000	250,000		500,000
NUC-U-50	36				25,000	25,000	50,000
NUC-N-51	17		250,000	250,000			500,000
NUC-N-52	42				75,000	75,000	150,000
NUC-N-53	4	160,000					160,000

Larger projects with an investment value above AUD1 million were considered suitable for co-sponsorship with development partners (DPs) to be identified and mobilized. The list and proposed investment schedule are shown in Table 7-4.

Table 7-4: Prioritized investment plan for larger (> 1 million AUD) projects

Project #	Priority serial number	2020–21 projects 1–14	2021–22 projects 15–24	2022–23 projects 25-35	2023–24 projects 36–51	2024–25 projects 52–53	Total investment (2020–2030) (AUD)
Total larger projects		**67,579,500**	**91,396,667**	**86,358,667**	**22,971,467**	**1,441,500**	**269,747,500**
Project Type R		**1,400,000**	**20,000,000**	**15,000,000**			**36,400,000**
DCA-R-11	25			15,000,000			15,000,000
DOT-R-14	19		14,000,000				14,000,000
NRC-R-17	7	1,400,000					1,400,000
CIE-R-19	20		6,000,000				6,000,000
Project Type U		**2,539,500**	**4,310,000**	**3,272,000**	**2,189,500**	**1,441,500**	**13,752,500**
DOH-U-27	16		2,000,000	2,000,000			4,000,000
DOH-U-28	5	2,250,000	2,250,000				4,500,000
DOH-U-30	43				1,441,500	1,441,500	2,883,000
DOT-U-31	33			1,200,000			1,200,000
Equipment & vehicles replacement					**8,795,300**		**8,795,000**
PAN-R-43	40				1,200,000		1,200,000
PAN-R-45	48				7,595,300		7,595,300
Large already committed projects (Project type N)		**63,640,000**	**67,086,667**	**67,086,667**	**10,486,667**		**208,300,000**
PAN-N		37,666,667	37,666,667	37,666,667			113,000,000
ICT-N		18,933,333	18,933,333	18,933,333			56,800,000
NES-N		1,540,000					1,540,000
NUC-N-46	8	5,200,000	10,486,667	10,486,667	10,486,667		36,660,000
DOH-N [1]		300,000					300,000
VEI & NUC infrastructure				1,000,000	1,500,000		2,500,000
VEI-U-47	45				1,500,000		1,500,000
NUC-R-48	29			1,000,000			1,000,000

(1) Project is approved and ongoing; equipment is being sponsored by Israel.

As previously noted, some equipment, in particular vehicles from PSA and NRC, was not prioritized due to the special character and financing of NRC equipment and due to the difficulty of properly allocating the use and function of PSA vehicles from a public service perspective. Investment in this equipment will, however, be necessary. Table 7-5 provides an overview of the overall proposed investment plan for all projects listed in the pipeline, including those already under implementation until the year 2030. The R projects and U projects were bundled together as they were all prioritized and their proposed annual financing is already shown in Tables 7-3 and 7-4.

Table 7-5: Overall NIIP 2019 Investment Plan, 2020–2030

Nauru Department/ Operator	Project #	2020–21 projects 1–14	2021–22 projects 15–24	2022–23 projects 25–35	2023–24 projects 36–51	2024–25 projects 52–53	2025–26
Overall infrastructure Investment Pipeline 2019–2030		**85,420,948**	**94,910,372**	**89,090,333**	**24,267,467**	**1,771,500**	**3,471,768**
Infrastructure rehabilitation (Project Type R)		**2,750,000**	**21,100,000**	**15,600,000**	**410,000**	**150,000**	**-**
Infrastructure upgrading (Project Type U)		**2,539,500**	**4,310,000**	**3,272,000**	**2,189,500**	**1,441,500**	**-**
Infrastructural equipment & vehicles replacement		**10,098,115**	**563,705**	**865,000**	**9,331,300**	**80,000**	**3,446,768**
DCA	DCA-R-36			225,000			
	DCA-R-37			490,000			
NFMRA	NFMRA-R-38				36,000		
	NFMRA-R-39					80,000	
	NFMRA-R-A						40,000
NRC	NRC-R-A	10,098,115					
	NRC-R-B						943,253
	NRC-R-40		341,705				
	NRC-R-C						40,137
NES	NES-R-41			150,000			
	NES-R-A						162,000
DOT	DOT-R-42		222,000				
	DOT-R-A						260,000
	DOT-R-B						
	DOT-R-C						102,000
PAN	PAN-R-43				1,200,000		
	PAN-R-44				500,000		
	PAN-R-45				7,595,300		
	PAN-R-A						123,000
	PAN-R-B						129,378
PSA	PSA-R-A						920,000
	PSA-R-B						
	PSA-R-C						447,000
	PSA-R-D						280,000
Large already committed projects (Project type N)		**63,640,000**	**67,086,667**	**67,086,667**	**10,486,667**		
PAN	PAN-N	37,666,667	37,666,667	37,666,667			
ICT	ICT-N	18,933,333	18,933,333	18,933,333			
NES	NES-N	1,540,000					
NUC	NUC-N-46	5,200,000	10,486,667	10,486,667	10,486,667		
DOE	DOH-N	300,000					
VEI & NUC infrastructure		**6,393,333**	**1,850,000**	**2,266,667**	**1,850,000**	**100,000**	**25,000**
VEI	VEI-U-47				1,500,000		
	VEI-U-A	100,000	100,000	100,000			
	VEI-U-B	666,667	666,667	666,667			
NUC	NUC-R-A	500,000					
	NUC-R-B	333,333					
	NUC-R-48			1,000,000			
	NUC-R-49			250,000	250,000		
	NUC-R-C	700,000					
	NUC-N-D	2,000,000					
	NUC-R-E	**750,000**	**750,000**				
	NUC-U-50				**25,000**	**25,000**	**25,000**
NUC	NUC-R-F	**750,000**					
	NUC-N-51		**250,000**	**250,000**			
	NUC-R-G	**350,000**					
	NUC-N-52				**75,000**	**75,000**	
	NUC-N-53	**160,000**					
	NUC-N-H	**83,333**	**83,333**				

Table 7-5: (continued)

Nauru Department/ Operator	Project #	2026–27	2027–28	2028–29	2029–30	Total Investment (2020–2030) (AUD)
Overall infrastructure Investment Pipeline 2019–2030		**2,255,018**	**2,230,018**	**2,230,018**	**2,230,018**	**307,877,460**
Infrastructure rehabilitation (Project Type R)		**-**	**-**	**-**	**-**	**40,010,000**
Infrastructure upgrading (Project Type U)		-	-	-	-	**13,752,500**
Infrastructural equipment & vehicles replacement		**2,230,018**	**2,230,018**	**2,230,018**	**2,230,018**	**33,304,960**
DCA	DCA-R-36					225,000
	DCA-R-37					490,000
NFMRA	NFMRA-R-38					36,000
	NFMRA-R-39					80,000
	NFMRA-R-A	40,000	40,000	40,000	40,000	200,000
NRC	NRC-R-A					10,098,115
	NRC-R-B	943,253	943,253	943,253	943,253	4,716,265
	NRC-R-40					341,705
	NRC-R-C	40,137	40,137	40,137	40,137	200,685
NES	NES-R-41					150,000
	NES-R-A	162,000	162,000	162,000	162,000	810,000
DOT	DOT-R-42					222,000
	DOT-R-A					260,000
	DOT-R-B	32,500	32,500	32,500	32,500	130,000
	DOT-R-C	102,000	102,000	102,000	102,000	510,000
PAN	PAN-R-43					1,200,000
	PAN-R-44					500,000
	PAN-R-45					7,595,300
	PAN-R-A					123,000
	PAN-R-B	129,378	129,378	129,378	129,378	646,890
PSA	PSA-R-A					920,000
	PSA-R-B	333,750	333,750	333,750	333,750	1,335,000
	PSA-R-C	447,000	447,000	447,000	447,000	2,235,000
	PSA-R-D					280,000
Large already committed projects (Project type N)						**208,300,000**
PAN	PAN-N					113,000,000
ICT	ICT-N					56,800,000
NES	NES-N					1,540,000
NUC	NUC-N-46					36,660,000
DOE	DOH-N					300,000
VEI & NUC infrastructure		**25,000**	**-**	**-**	**-**	**12,510,000**
VEI	VEI-U-47					1,500,000
	VEI-U-A					300,000
	VEI-U-B					2,000,000
NUC	NUC-R-A					500,000
	NUC-R-B					333,333
	NUC-R-48					1,000,000
	NUC-R-49					500,000
	NUC-R-C					700,000
	NUC-N-D					2,000,000
	NUC-R-E					**1,500,000**
	NUC-U-50	**25,000**				**100,000**
NUC	NUC-R-F					**750,000**
	NUC-N-51					**500,000**
	NUC-R-G					**350,000**
	NUC-N-52					**150,000**
	NUC-N-53					**160,000**
	NUC-N-H					**166,667**

Based on the investment plan in Table 7-5, it is possible to estimate the funding resources needed based on assumptions about the contribution of development partners and the Government of Nauru for each project. Table 7-6 shows the distribution of funding sources based on the following assumptions:

- The funding for already approved for development partner co-sponsored projects is known. The average Government of Nauru contribution towards these projects is approximately 16.5%.
- Smaller projects below AUD1 million are assumed to be fully financed from the Government of Nauru budget.
- Larger projects above AUD1 million are assumed to be financed using the same co-funding contribution from the Government of Nauru (16.5%) with the remaining funding coming from development partners, yet to be identified.

Table 7-6: Estimated sources of funding for the NIIP 2019 investment plan by groups of projects

Group of projects / funding sources	2020–21 projects 1–14	2021–22 projects 15–24	2022–23 projects 25–35	2023–24 projects 36–51	2024–25 projects 52–53	2025–26
Overall Infrastructure investment pipeline 2019–2030	**85,420,948**	**94,910,372**	**89,090,333**	**24,267,467**	**1,771,500**	**3,471,768**
Approved projects 2019–2029 (large development partners & NUC)	64,673,333	58,200,000	57,366,667	-	-	-
Prioritized infrastructure investment pipeline 2019–2030	10,649,500	36,710,372	31,723,667	24,267,467	1,771,500	25,000
Non-prioritized projects (Vehicles)	10,098,115	-	-	-	-	3,446,768
Total large already committed projects	**63,640,000**	**67,086,667**	**67,086,667**	**10,486,667**	**-**	**-**
Development partners funding (large development partners projects) (83.54%)	53,162,467	56,041,683	56,041,683	8,760,168	-	-
GoN funding (large development partners projects) (16.5%)	10,477,533	11,044,984	11,044,984	1,726,499	-	-
Total SOEs prioritized projects (VEI, NUC, NRC Rehab.)	**160,000**	**591,705**	**1,500,000**	**1,850,000**	**100,000**	**25,000**
Total approved SOEs projects	**6,233,333**	**1,600,000**	**766,667**	**-**	**-**	**-**
Total not prioritized projects (vehicles)	**10,098,115**	**-**	**-**	**-**	**-**	**3,446,768**
Estimated GoN funding SOEs all projects (100%)	16,491,448	2,191,705	2,266,667	1,850,000	100,000	3,471,768
Total prioritized rehabilitation projects	**2,750,000**	**21,100,000**	**15,600,000**	**410,000**	**150,000**	**-**
Total prioritized upgrading projects	**2,539,500**	**4,310,000**	**3,272,000**	**2,189,500**	**1,441,500**	**-**
Total prioritized equipment projects	**-**	**222,000**	**865,000**	**9,331,300**	**80,000**	**-**
Estimated development partners funding (Type R, Type U and equipment projects)	**3,049,073**	**20,257,540**	**15,203,597**	**8,551,438**	**1,204,175**	**-**
Estimated GoN funding (Type R, Type U and equipment projects)	**2,240,427**	**5,374,460**	**4,533,403**	**3,379,362**	**467,325**	**-**
Total development partners funding	**56,211,540**	**76,299,222**	**71,245,280**	**17,311,606**	**1,204,175**	**-**
Total GON funding	**29,209,408**	**18,611,150**	**17,845,054**	**6,955,861**	**567,325**	**3,471,768**

Table 7-6: (continued)

Group of projects / funding sources	2026–27	2027–28	2028–29	2029–30	Total investment (2020–2030) (AUD)
Overall Infrastructure investment pipeline 2019–2030	**2,255,018**	**2,230,018**	**2,230,018**	**2,230,018**	**307,877,460**
Approved projects 2019–2029 (large development partners & NUC)	-	-	-	-	180,240,000
Prioritized infrastructure investment pipeline 2019–2030	25,000	-	-	-	105,172,505
Non-prioritized projects (Vehicles)	2,230,018	2,230,018	2,230,018	2,230,018	22,464,955
Total large already committed projects	**-**	**-**	**-**	**-**	208,300,000
Development partners funding (large development partners projects) (83.54%)	-	-	-	-	174,006,000
GoN funding (large development partners projects) (16.5%)	-	-	-	-	34,294,000
Total SOEs prioritized projects (VEI, NUC, NRC Rehab.)	**25,000**	**-**	**-**	**-**	**4,251,705**
Total approved SOEs projects	**-**	**-**	**-**	**-**	**8,600,000**
Total not prioritized projects (vehicles)	**2,230,018**	**2,230,018**	**2,230,018**	**2,230,018**	**22,464,955**
Estimated GoN funding SOEs all projects (100%)	2,255,018	2,230,018	2,230,018	2,230,018	35,316,660
Total prioritized rehabilitation projects	**-**	**-**	**-**	**-**	40,010,000
Total prioritized upgrading projects	**-**	**-**	**-**	**-**	13,752,500
Total prioritized equipment projects	**-**	**-**	**-**	**-**	10,498,300
Estimated development partners funding (Type R, Type U and equipment projects)	**-**	**-**	**-**	**-**	**48,265,823**
Estimated GoN funding (Type R, Type U and equipment projects)	**-**	**-**	**-**	**-**	**15,994,977**
Total development partners funding	**-**	**-**	**-**	**-**	**222,271,823**
Total GON funding	**2,255,018**	**2,230,018**	**2,230,018**	**2,230,018**	**85,605,637**

7.4 Capital and maintenance budgets

Table 7-7 provides an estimate of the capital and maintenance budget required to build and maintain the infrastructure to be implemented under the investment plan highlighted in
Table 7-6.

The table shows each type or group of projects in the investment plan:

- the capital investment needed for the period 2020–2030
- the gross replacement value taking into account the improved remaining service potential of the assets after rehabilitation or upgrading
- the estimated overall annual maintenance cost based on fair maintenance expenditure defined in the developed asset register
- the estimated annualized life cycle cost of the provided infrastructure in real terms ($2019 undiscounted).

Table 7-7: Overall maintenance cost estimate (AUD) for the investment plan 2020–2030

Groups of project types	Total investment (2020–2030) (AUD)	Gross Replacement Cost (GRC) (AUD)	Estimated annual maintenance cost (AUD)	Annualized life cycle cost (real, $2019 undiscounted) (AUD)
Overall infrastructure investment pipeline 2019–2030	307,877,460	355,313,643	4,778,719	10,354,333
Infrastructure rehabilitation (Project Type R)	40,010,000	79,897,183	763,148	1,582,678
Infrastructure capacity upgrading (Project Type U)	13,752,500	13,911,500	76,933	235,379
Infrastructural equipment & vehicles replacement	33,304,960	33,304,960	991,639	2,826,477
PSA, NRC and PAN vehicles only	22,464,955	22,464,955	673,949	1,928,242
Infrastructure equipment (without vehicles)	10,840,005	10,840,005	317,690	898,235
Large already committed projects (Project type N)	208,300,000	209,840,000	2,503,300	4,900,465
VEI & NUC infrastructure (only projects developed between 2020 & 2030)	12,510,000	18,360,000	443,700	809,335
All existing infrastructure assets	-	289,433,647	3,610,227	3,610,227

Table 7-8 shows the annual maintenance budget required for existing infrastructure assets managed by all government departments and corporations, expressed in AUD 2019.

Table 7-8:
Annual maintenance requirements (AUD) for existing infrastructure assets 2019

Assets	Gross Replacement Cost	Annual Maintenance Allowance
Buildings:		
Education Buildings	$36,834,920	$184,175
Public Service Admin, Emergency, Police, Justice Buildings	$44,118,930	$220,595
ICT Buildings	$1,728,250	$8,641
Health Buildings	$12,298,440	$61,492
Fisheries and Marine Resources Buildings	$2,627,000	$13,135
Civil Aviation Buildings	$10,536,840	$52,684
Port Authority Buildings	$-	$-
CIE Buildings	$102,600	$513
Total Buildings	$108,246,980	$541,235
Coastal Protection:		
Total Seawalls & ripraps	$6,600,000	$71,250
Department of Transport:		
Sealed Roads	$27,755,644	$148,364
Footpaths	$3,116,400	$31,164
Total Dept of Transport	$30,872,044	$179,528
Civil Aviation Assets:		
Runway, Taxiways and Hard stop Areas	$34,540,299	$128,030
Other navigation assets	$1,995,000	$39,900
Total Civil Aviation Assets	$36,535,299	$167,930
Port Authority Assets:		
Motor Vehicles:	$1,535,000	$22,050
Boats, Mooring and Unloading Equipment	$10,040,000	$261,600
Total Port Authority Assets	$11,575,000	$283,650
Emergency Services Assets:		
Motor Vehicles:	$960,000	$28,800
Motor boats	$100,000	$4,000
Total Emergency Service Assets	$1,060,000	$32,800
Fisheries and Natural Resources Assets:		
Heavy Duty Vehicles and boats	$280,000	$10,400
Total Fisheries Assets	$280,000	$10,400
NRC Assets:		
Unsealed Roads	$5,896,000	$294,800
Motor vehicles	$15,356,770	$460,703
Total NRC Assets	$21,252,770	$755,503
ICT Assets:		
Antenna Towers & IT equipment	$641,553	$12,831
Total ICT Assets	$641,553	$12,831
Public Service Admin Assets:		
Light Duty Motor vehicles	$9,160,000	$274,800
Heavy Duty Vehicles and Equipment	$1,440,000	$43,200
Total Public Service Admin Motor Vehicles	$9,160,000	$274,800
Fuel Storage Farm Assets	$25,000,000	$500,000
Electricity Sector Assets	$35,000,000	$700,000
Water Sector Assets	$4,000,000	$80,000
Total GON Infrastructure Assets	**$290,223,647**	**$3,609,927**

7.5 Opportunities for development partners

The opportunities for the development partners have been defined in this investment plan as any infrastructure projects where the investment cost exceed AUD1 million. Table 7-8 shows the list of these new, but not yet approved, infrastructure and equipment projects with estimated investment value and possible timing of funding needs.

Table 7-9: Upcoming projects that are opportunities for the development partners

Organization	Asset type	Project number	Project description	Priority serial number	2020–21 projects 1–14	2021–22 projects 15–24	2022–23 projects 25–35	2023–24 projects 36–51
Project Type R					1,400,000	20,000,000	15,600,000	
DCA	Airfield	DCA-R-11	Resealing and repair of runway, taxiway and hardtops area	25			15,000,000	
DOT	Road	DOT-R-14	Resealing and repair of existing roads	19		14,000,000		
NRC	Sanitary landfill	NRC-R-17	Improvements to landfill site — liner & leachate collection system	7	1,400,000			
CIE	Septage treatment	CIE-R-19	New septage treatment plant for the country	20		6,000,000		
Project Type U					2,250,000	4,250,000	3,200,000	1,441,500
DOH	Building	DOH-U-27	Phase 3 renovations and hospital improvements	16		2,000,000	2,000,000	
DOH	Building	DOH-U-28	Construction of nursing home	5	2,250,000	2,250,000		
DOH	Building	DOH-U-30	Nauru Sport Complex — Phase 2	43				1,441,500
DOT	Road	DOT-U-31	New road for waterfront area near the port	33			1,200,000	
					2,250,000	4,250,000	3,200,000	1,441,500
Equipment & vehicles replacement					10,098,115			8,795,300
NRC	Heavy-duty vehicles	NRC-R-A	Replace heavy duty equipment		10,098,115			
PAN	Heavy-duty vehicles	PAN-R-43	120-ton crane to unload containers from ships	40				1,200,000
PAN	Equipment	PAN-R-45	Replace mooring equipment as it reaches end of life	48				7,595,300
PSA	Light-duty vehicles	PSA-R-B	Replace light-duty vehicles as they reach end of life					
PSA	Light-duty vehicles	PSA-R-C	Replace light-duty vehicles as they reach end of life					
Large already committed projects (Project type N)					5,200,000	10,486,667	10,486,667	10,486,667
NUC	Solar power & storage	NUC-N-46	6.5 MW PV power & 5 MW battery storage	8	5,200,000	10,486,667	10,486,667	10,486,667

Table 7-9: (continued)

Organization	Asset type	Project number	Project description	Priority serial number	2024–25 projects 52–53	2025–26	2026–27	2027–28	2028–29	2029–30	Total investment (2020–2030) (AUD)
Project Type R						-	-	-	-	-	**40,010,000**
DCA	Airfield	DCA-R-11	Resealing and repair of runway, taxiway and hardtops area	25							**15,000,000**
DOT	Road	DOT-R-14	Resealing and repair of existing roads	19							**14,000,000**
NRC	Sanitary landfill	NRC-R-17	Improvements to landfill site — liner & leachate collection system	7							**1,400,000**
CIE	Septage treatment	CIE-R-19	New septage treatment plant for the country	20							**6,000,000**
Project Type U					1,441,500	-	-	-	-	-	**13,752,500**
DOH	Building	DOH-U-27	Phase 3 renovations and hospital improvements	16							**4,000,000**
DOH	Building	DOH-U-28	Construction of nursing home	5							**4,500,000**
DOH	Building	DOH-U-30	Nauru Sport Complex — Phase 2	43	1,441,500						**2,883,000**
DOT	Road	DOT-U-31	New road for waterfront area near the port	33							**1,200,000**
					1,441,500						**12,583,000**
Equipment & vehicles replacement						447,700	780,750	780,750	780,750	780,750	**22,463,415**
NRC	Heavy-duty vehicles	NRC-R-A	Replace heavy duty equipment								**10,098,115**
PAN	Heavy-duty vehicles	PAN-R-43	120-ton crane to unload containers from ships	40							**1,200,000**
PAN	Equipment	PAN-R-45	Replace mooring equipment as it reaches end of life	48							**7,595,300**
PSA	Light-duty vehicles	PSA-R-B	Replace light-duty vehicles as they reach end of life				333,750	333,750	333,750	333,750	**1,335,000**
PSA	Light-duty vehicles	PSA-R-C	Replace light-duty vehicles as they reach end of life			447,000	447,000	447,000	447,000	447,000	**2,235,000**
Large already committed projects (Project type N)											**36,660,000**
NUC	Solar power & storage	NUC-N-46	6.5 MW PV power & 5 MW battery storage	8							**36,660,000**

8 Human resources and capacity development

There is lack of trained staff in public sector organizations in Nauru to undertake the asset management activities proposed in the NIAMF, with the exception of staff within NUC (water and electricity) and VEI (fuel storage and distribution). The 2009 review of the NSDS identified several factors that have prevented NSDS goals from being achieved in a timely manner. Lack of capacity was a prominent factor that has not only prevented the NSDS goals from being achieved, but has also impacted infrastructure asset management activities and asset performance.

...infrastructure planning and implementation became the responsibility of different sector ministries that do not have staff with technical skills, knowledge, or experience managing infrastructure assets.

The Ministry of Public Works was dissolved under the 2008 government reform to reduce the number of public servants. The ministry was responsible for: developing infrastructure policy, coordinating sub-sectors, and implementing infrastructure projects. Subsequently, infrastructure planning and implementation became the responsibility of different sector ministries that do not have staff with technical skills, knowledge, or experience managing infrastructure assets. Government departments and ministries rely on private contractors for advice on the scope and scheduling of infrastructure rehabilitation and project management, but, sometimes, the private contractors have a conflict of interests in providing fair and objective advice. Infrastructure maintenance is carried out on ad hoc basis.

To provide the services within their scope, government departments and corporations manage a diverse set of infrastructure assets. Figure 8.1 shows the responsibilities of departments and corporations for managing different types of assets and Figure 8.2 shows the strength of technical skills available within these organizations to manage the different infrastructure assets. There is a significant mismatch between the asset management tasks and the capacity available.

For example, virtually all the departments are required to manage asset management activities for large institutional buildings, with little capacity for the task. Similarly, the transport, civil aviation and port authority have only modest skillsets to manage the roads, air strips and wharf structures, mostly relying on external contractors for advice on infrastructure investment decisions. The newly created infrastructure department has no technical staff for asset management activities. Similarly, the technical skills to manage sewage and solid waste disposal are weak.

Figure 8-1: Responsibility matrix for infrastructure asset management

	Public Service Admin	National Emergency Services	Nauru Rehabilitation Corporation (NRC)	Nauru Utilities Corporation (NUC)	Fisheries and Marine Resources	Department of Health	Department of Education	Civil Aviation	Infrastructure Development Department	Department of Transport	Port Authority of Nauru	Nauru Fuel Storage (VEI)	Information and Communication Technology (ICT)
Large Institutional Buildings and Civil Structures	▬	▽	▽	▽	▽	▬	▬	▽			▽	▽	▽
Sealed Roads & Footpaths										▬			
Unsealed Roads			▬										
Air Strip and Nav-Aids								▬					
Wharf and Boat Harbour					▽						▬		
Coastal Protection									▬				
Light Duty Passenger Vehicles	▬	▽		▽								▽	
Heavy Duty Vehicles and Equipment	▬	▽	▬	▬	▽					▬			
Boats		▽			▽						▽		
Electricity Generation and Distribution Assets				▬									
Telecom Assets													▬
Water Desalination and Distribution Assets				▬									
Fuel Storage Assets												▬	
Land fill Site Assets			▽										
Sewage Treatment Plant				▽									

▽ = A few assets ▬ = Many Assets

Figure 8-2: Assessment of technical skills and competencies in operating departments

	Public Service Admin	National Emergency Services	Nauru Rehabilitation Corporation (NRC)	Nauru Utilities Corporation (NUC)	Fisheries and Marine Resources	Department of Health	Department of Education	Civil Aviation	Infrastructure Development Department	Department of Transport	Nauru Port Authority	Vital Energy Inc. (VEI)	Information and Communication Technology (ICT)
Large Institutional Buildings and Civil Structures	▽	▽	▽	▽	▽	▽	▽	▽			▽	▽	▽
Sealed Roads & Footpaths									▼				
Unsealed Roads			■										
Air Strip and Nav-Aids								▼					
Wharf and Boat Harbour					▽						▽		
Coastal Protection									▼				
Light Duty Passenger Vehicles	■	▽		▽									
Heavy Duty Vehicles and Equipment	▼	▽	▽	▽	▼						▼	▽	
Boats		▽			▼						▼		
Electricity Generation and Distribution Assets				■									
Telecom Assets													▼
Water Desalination and Distribution Assets				■									
Fuel Storage & Distribution												■	
Land fill Site Assets			▽										
Sewage Treatment Plant				▽									

▽ = Weak skills and technical competency ▼ = Modest skills and technical competency ■ = Acceptable skills and technical competency

8.1 Capacity building for managing assets

This report investigated options for capacity building to strengthen the skill sets required for the asset management activities to successfully implement the NIAMF and the NIISP.

Capacity building within the existing departments would require duplication of technical skills across departments. For example, since all departments are responsible for managing buildings, they would all require competent building inspectors to assess the condition of buildings and undertake maintenance within their departments. This would not be a cost-efficient solution.

To achieve economies of scale and scope for the cost-effective implementation of NIAMF, it is recommended that major assets of similar type be grouped together and that maintenance and condition assessment of similar types of assets is assigned to a small team, as shown in
Figure 8.3.

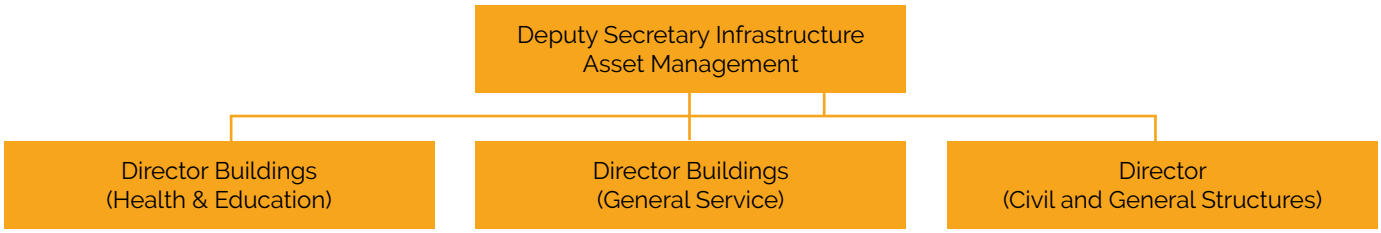


Figure 8-3: Proposed NIAMF implementation team

For example, as shown in Figure 8-3, it is recommended that the Health and Education buildings are grouped into a common pool, for which the Director Buildings (Health and Education) would be accountable for all asset management activities. The Director Buildings (General Services) would be accountable for all administrative and general service buildings. The Director Civil and General Structures would be accountable for all the remaining structural assets, including roads, runway, coastal protection structures, and wharfs and boat harbours.

The three directors position, requiring civil engineering/architectural degrees or diplomas, can be filled locally. To provide hands-on training to local staff, it is recommended to retain a regional (civil engineer) consultant for a period of two to three years. During this period the entire team should report to the Secretary for Infrastructure.

Those corporations that do not have the required level of skills for carrying out preventative maintenance and condition assessment of infrastructure assets should be able to see assistance from the Infrastructure Department. The technical team, shown in Figure 8-3, would be responsible for Tasks 1–8 that are described in Section 9.

In parallel with the asset management organization, it is recommended to retain an Infrastructure Investment Planner within the Ministry of Finance. This position would be responsible for Tasks 9–10 described in Section 9.

9 Monitoring, Evaluation, and Review

Detailed asset management procedures and guidelines to effectively implement the asset management policy are described in detail in the appendices. These procedures focus on collecting and managing key information about assets to make timely and informed investment decisions and to act as the control and monitoring tool for management to provide good governance. Management must adhere to these procedures to make reliable, rational, and optimal decisions during the entire life cycle of assets, including acquisition, operation and maintenance and disposal of assets.

Effective asset management involves achieving cost efficient and optimal performance of infrastructure assets by completing the following key tasks:

Task 1: Monitor and benchmark asset performance by measuring and recording service levels.

Task 2: Maintain compete and up-to-date information about infrastructure assets' design and construction.

Task 3: Maintain accurate and up-to-date information in asset register.

Task 4: Maintain an asset procurement plan and asset disposal plan.

Task 5: Maintain an asset maintenance plan and a performance maintenance plan in accordance with the maintenance plan.

Task 6: Develop asset condition assessment plans and determine the operating condition of infrastructure assets, using accurate and objective techniques.

Task 7: Develop an asset capacity assessment plan and determine the adequacy of infrastructure capacity.

Task 8: Accurately establish the investment requirements for asset maintenance, renewal and replacement and prepare a New Project Proposal (NPP) for capital repairs, renewal, or replacement of assets.

Task 9: Maintain an up-to-date pipeline of potential investment projects.

Task 10: Prioritize projects in the investment project pipeline and schedule project implementation and secure funding.

Task 1: Monitor and benchmark asset performance

Monitoring and benchmarking asset performance should be undertaken annually for each service sector and asset type. The Asset Director accountable for an asset will be responsible for performing this task for all assets under their control.

This task involves measuring and recording infrastructure assets' performance in terms of service levels. When service levels fall below the recommended benchmarks, the underlying reasons for drop must be investigated and reported.

Section 4.4 of this report recommends the initial service levels, but these levels may be revised, with approval of the sector secretaries, to meet the changing needs for public service.

Task 2: Maintain compete and up-to-date information about infrastructure assets' design and construction

Maintaining complete and up-to-date information about infrastructure assets' design and construction should only be undertaken when a new infrastructure asset is installed or constructed and placed in service. The Asset Director accountable for an asset will be responsible for performing this task for performing this task for all assets under their control.

This task involves creating a file with all pertinent information about the asset, including the technical specifications, design drawings, as-built drawings and the maintenance plan for the asset. Asset records can be kept as an electronic file with scanned images of drawings, specifications, asset nameplate data etc.

Task 3: Maintain accurate and up-to-date information in the asset register

The purpose of maintaining the asset register with current information is two-fold:

1. to have management control over the assets of significant value and accurately reflect asset values in the asset register (accounting function)
2. to provide an accurate picture of asset performance and condition for financial planning for asset maintenance and renewal.

The following information is required to be kept current in the asset register current and the following tasks must be undertaken annually by the Asset Director.

At the beginning of each year:

- Change the current year in cell "C1" of each worksheet.
- Update the inflation for the previous year in Cells "BI2 through to BS2" in the worksheet titled "Inflation adjustments". If this information is not available, leave the inflation as the default value of 2.5%, already entered in the worksheet.
- Completing these entries will automatically update the following information for all assets in the asset register:
  - asset gross replacement cost (GRC)
  - annual asset maintenance cost
  - accumulated depreciation
  - current book value.

Updating asset condition:

After asset condition assessment, update the condition of assets using the dropdown menu button (rating scale 0–5).

Updating the asset condition will automatically change the RSP of the assets. When the RSP drops below acceptable levels, the cell color will change, indicating it is time to plan asset renewal or replacement.

Adding new assets:

When a new asset is added to the system, create asset records in the next vacant row. Fill in all the cells colored cream yellow and the locked cells will automatically populate.

For the complex infrastructure assets with multiple components, such as buildings, roads, and the runway, there is no need to enter construction costs. Enter dimensions, such as the number of stories of buildings, the year of construction, and the sub-type of each component, and the worksheet will automatically calculate the construction costs and populate all the cells with financial information. The estimated cost cells can be overridden with the actual construction costs. However, the cost of each asset component must be entered for the model to automatically update the financial data in future.

Removing an asset when it is retired:

When an asset is retired from service, change the asset status from "in service" to "retired".

This change will automatically reduce the maintenance cost for the asset to 0 for future years.

Task 4: Maintain an asset procurement plan and asset disposal plan

Develop an asset procurement plan and a disposal plan for an infrastructure asset. The Asset Director accountable for that asset is responsible writing the plans for all assets under their control. The task must be undertaken at least one year before an asset is to be retired from service and replaced.

Asset procurement plan:

An asset procurement plan must include technical specifications and construction drawings. The technical specifications and construction standards must take into account any lessons learned from similar assets in the past, including asset operation in a harsh climate and corrosive operating conditions. It is highly desirable to use standardized specifications and construction designs for most assets. Therefore, construction standards and standardized procurement specifications should be developed for infrastructure assets. There is also a need for national building code to standardize construction.

Asset disposal plan:

An asset disposal plan must include specific activities needed to salvage recyclable components and dispose of the waste in a safe and environmentally sound way when an asset is retired from service, particularly assets containing hazardous materials. Appropriate disposal costs related to assets being retired should be included in cost estimates of asset renewal projects.

Task 5: Maintain an asset maintenance plan and a performance maintenance plan

The asset maintenance plan for each asset only needs to be prepared once for an infrastructure asset, and the maintenance plan needs to be implemented throughout an asset's life cycle, in accordance with the maintenance schedule. The Asset Director accountable for an asset is responsible for this task for all assets under their control.

The maintenance plan must include specific maintenance activities and the intervals at which they are to be undertaken. Asset maintenance plans should take into account the equipment manufacturer's recommendations. Appendix C provides guidelines for developing maintenance plans for various assets. The department responsible for each infrastructure assets should undertake all maintenance activities required by the maintenance plan and keep records of maintenance in a logbook. For each asset in service, the operating department must prepare a maintenance budget annually for the following year.

The operating department shall also keep an asset log book, in form of an electronic diary, in which all pertinent operating information about assets should be recorded chronologically, including asset performance records in meeting service levels, asset maintenance records, asset condition assessment results and asset failure mode (if the asset fails in service).

The log book records are intended to serve as the institutional memory. Matching the asset requirements to its service delivery strategy, should result in the assets being correctly specified with respect to the required capacity, performance and environmental resiliency.

Task 6: Develop asset condition assessment plans and determine the operating condition of infrastructure assets, using accurate and objective techniques

An asset condition assessment plan for each infrastructure asset only needs to be prepared once; however, it must be implemented throughout asset's life cycle, in accordance with the condition assessment schedule. The Asset Director accountable for an asset is responsible for this task for all assets under their control.

For each infrastructure asset, the operating department must establish transparent and objective criteria for condition assessments of assets. Asset condition assessment criteria must include all relevant information on the condition of the asset collected through: (a) visual inspections, (b) non-destructive in-situ testing; (c) lab testing and, where applicable, also include asset maintenance history and obsolescence ranking. By applying appropriate weights to various condition indicators, an asset's RSP can be calculated. Guidelines for asset condition assessment and determination assets' RSPs are in Appendix E.

While local staff should be able to undertake condition assessments of most infrastructure assets, some of the complex structural assets, such as the wharf and offshore mooring, may require the services of external consultants.

As a rule, for assets in "very good" or "good" condition, condition assessments should be carried out at about five-year intervals. For assets in "fair" condition, condition assessments should be carried out at about two- or three-year intervals. For assets found in "poor" condition, condition assessments should be carried out annually or biannually. Asset condition

assessments are also required after an asset has experienced degradation during an extreme weather event, such as storm or flood event.

Task 7: Develop an asset capacity assessment plan and determine the adequacy of infrastructure capacity

A capacity assessment plan is implemented for an entire class of asset, rather than for specific assets. The plan only needs to be developed once; however, it must be implemented periodically, typically at about five- to ten-year intervals. The Asset Director accountable for the asset is responsible for this task for all assets under their control. Guidelines for asset capacity assessment for each different class of asset are documented in Appendix E.

Task 8: Accurately establish the investment requirements for asset maintenance, renewal and replacement and prepare a New Project Proposal for capital repairs, renewal, or replacement of assets

Preparing a New Project Plan is only required after an asset reaches "poor" or "very poor" condition. The Asset Director accountable for the asset is responsible for this task.

The NPP involves: (a) identifying available options to restore the assets' operating condition to "fair" or "good" and these options would normally include capital repairs, component renewal or asset replacement, (b) costing all options and determining the most economical option, and (c) preparing the NPP for the most economical option and submitting it to the Ministry of Finance for inclusion in the investment pipeline.

Task 9: Maintain an up-to-date pipeline of potential investment projects

This task is required to be undertaken annually. The Infrastructure Investment Director (Ministry of Finance) is accountable for this task.

The task involves receiving business cases from Asset Directors for asset repairs, renewal, and replacement and adding them to the asset pipeline, complete with all the pertinent information required for investment prioritization. Detailed information about the data required for investment prioritization is documented in Section 7 and Appendix F of this report.

Task 10: Prioritize projects in the investment project pipeline, schedule project implementation, and secure funding

Prioritizing projects in the investment pipeline and scheduling project implementation and securing funding is required to be undertaken annually. The Infrastructure Investment Director (Ministry of Finance) is accountable for this task.

The task involves prioritizing the infrastructure repair, renewal, and replacement projects requiring capital investments, using the methodology and criteria described in detail in Section 7 and Appendix F of this report and securing funding for projects with higher priority.

Access the appendices online at:
www.theprif.org/nauru-reports

APPENDICES