



Infrastructure Road Map

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PALAU: Country Partnership Strategy (2009–2013)

INFRASTRUCTURE ROAD MAP

A. Key Issues in the Sector

1. Substantial development of infrastructure has occurred since Palau gained independence from the United States on 1 October 1994. All substantial infrastructure has been financed through grants from foreign donors. The Compact Road, the Palau-Japan Friendship Bridge, the construction of the new capital at Melekeok and the buildings accommodating the chambers of the Congress and Senate are a small sample of many infrastructure projects gifted by foreign donors since Independence.

2. Assets to the value of approximately \$300 million have been built within the last 15 years. Older assets constructed when Palau was a Trust Territory of the US and earlier when Palau was under Japanese colonial rule, are estimated to have a replacement value of about \$1 billion. Assets constructed within the past 15 years are generally in good condition while older assets, particularly buildings and associated facilities, are generally in poor condition.

3. The burden of maintenance management, planning and financing has greatly increased in the last 15 years, requiring enhanced professional and technical skills and information flows. However, maintenance budget provisions for operations and maintenance of public infrastructure have remained inadequately low and most agencies cannot afford preventive maintenance including regular and incisive inspections, and backup of spare parts. Consequently, most maintenance is reactive in nature to infrastructure breakdowns or to executive interventions.

4. Recent condition assessment of Palau's public infrastructure conclude that roughly 10 percent of the National assets, such as obsolescent technology, polluting or dangerous equipment, and old buildings on sites which have much better alternative uses, should, in economic terms, be abandoned and scrapped.¹ The condition assessment also concluded that the estimated cost of deferred maintenance is approximately \$50 million and the medium term future recurrent maintenance liability is estimated \$16 million per year increasing to \$25 million by 2018. Average annual expenditure by the National Government on operations and maintenance between 1999 and 2006 was \$7.1 million and ranged from \$4.8 million to \$8.6 million as shown in Table 1.

Table 1: Annual National Government Expenditure on Operations and Maintenance

Year	O&M Expenditure (in \$ millions)
1999	4.803
2000	7.883
2001	7.553
2002	8.597
2003	6.655
2004	6.520
2005	7.117
2006	7.276
2007 (Budgeted)	8.279
2008 (Budgeted)	8.209
2009 (Budgeted)	9.454
2010 (Budgeted)	8.704

¹ PINZ. 2008. *Working Paper on Infrastructure Needs, Priorities, Maintenance and Regulations*. Koror.

5. Concern has expressed by a number of key stakeholders in Palau regarding high design standards, appropriateness of facilities, quality of construction and affordability of some infrastructure investments given the high cost of equipment, materials and construction, relatively low productivity and small markets. There is a high risk that the benefits and service life of some assets will be sub-optimal, unless there are critical changes in funding, regulations and management.

6. The National Government plans substantial infrastructure development from 2008 to 2013 to improve the quality and the extent of services. Planned infrastructure, which is reliant on donor funding, include the Babeldaob Water Supply, augmentation and replacement of electricity generators, loading ramps at Koror international Airport, replacement of sewerage collector pumps, and the provision of solar energy for the new Capitol. These new assets will increase the national Government's operations and maintenance liabilities and place greater pressure on Government to plan and manage the maintenance of assets, recover costs for depreciation, replacement, and operations and maintenance, and retrain and recruit staff with modern skills.

7. In the private domain, there is increased competition for business, employment, land, resources, power and prestige, reflected partly in the multiplication of identical businesses, and partly in the sustained intensity of customary exchanges. The value of customary exchanges² is about equal to the annual gap of \$16 million between GOP revenue and recurrent expenditure. Sustaining two systems is a rational response to Palauans' vulnerability and to the constraints on growth and profits in a fragile ecosystem and with small markets with low productivity and low return on investments. However, the informal system does entail considerable cost and can affect development incentives as well.

8. National Government revenue covers about 60% of recurrent expenditure, but almost none of capital works. There have been various hopes and schemes aiming at public-private partnerships (PPPs) for state-owned provision of infrastructure and/or services in road maintenance, water services and sewer treatment, electricity generation, garbage collection and buildings management. To date, Palau has limited success in establishing PPPs.

9. With the limited National Government revenue, there is no local funding for Government investment and little prospect of any over the medium term. There is a need to develop alternative commercial arrangements for utilities. Some services have been outsourced including the operation of the commercial port, ground and security services at the airport, and the catering for schools. With increasing experience and international exposure, more providers are seeking business opportunities. However, there is no effective regulation of the price and service standards for any of the utilities, ports, or the airport. Limited competition has recently brought price reductions in telecommunications; but in other sectors, the laws have prevented competitive pressure on prices or standards. The general need is for governance and regulatory arrangements that will lead to improved commercial performance of public enterprises and an improved enabling environment for the private sector.

i. Subsector Summaries

10. The **water supply system**, including treatment works, has been much improved, and lines have been extended particularly in Airai and Aimeliik States. Operations are still inefficient: losses are high (estimated at 50%), revenue is low, unmetered usage continues in many areas,

² 2006. *Household Income and Expenditure Survey (HIES)*, p. 27. Palau.

and the tariff is inadequate to cover operating costs. Subsidies for the operation and maintenance of the Palau's public water supply systems are a major burden on the national budget. Revenue from water charges is less than 50% of the operating budget. ADB is preparing a project for securing water in Koror, Airai, and Aimeliik States, including many institutional reforms and demand management.

11. **Sewerage and wastewater** services have been improved with upgrading and enlarging of the Malakal treatment station in 2002-2006, and recently with the repair and upgrading of 38 of 46 pump stations which service the Koror sewerage network. However, there is an urgent need to reduce major leakage into and out of sewers, augment the capacity of the sewers, and reduce electricity costs. There is also an urgent need to increase funding for emergency maintenance of high-risk components, and development of a sewerage master plan through to 2035.

12. **Solid waste management** and landfill services and plans have been well served by cooperation between National Government, Koror State, consultants supported by Japan International Cooperation Agency (JICA), several nongovernment organizations, schools and community groups. Management of collection, segregation, recycling, composting, dumping and covering, and public education on "reduce-reuse-recycle" has been greatly improved. The major challenges are to extend the life of the present M-dock site and to prepare a new clean-technology landfill site, probably in Aimeliik, when the M-dock site is closed, probably in 2011.

13. **Electricity Supply.** The National Government and the Palau Public Utilities Corporation (PPUC) have made significant improvements in electricity supply: the operating deficit of PPUC has been reduced, and new engines installed with a grant from Taipei, China. Palau is reliant on imported diesel for the generation of electricity and is highly vulnerable to shocks in world oil prices. The impact of soaring world oil prices have been dampened by fuel surcharges applied to consumers. Recent fuel surcharge increases have resulted in reduced consumer demand. Currently (as was the case in 1993), there is inadequate revenue to maintain and upgrade the system, and still unclear regulations and obligations to guide the PPUC Board and managers. A master plan for supply, transmission and distribution through to 2025 is now being prepared, with JICA support. Preliminary indications are that \$50 million of capital development and replacement will be needed to ensure reliable services over that period.

14. **The road network** has substantially expanded since 1996, including about 150 kms of high cost new and rehabilitated roads. With low cost of imported vehicles, low fuel taxes and new access to ancestral lands in Babeldaob, there has been a large increase in the number of vehicles (growing at 8% per annum over the last 4 years) and in the total travel 'consumed'. However, planning, managing and financing of road maintenance have not yet improved, and more effort is required to prevent overloading and damage.

15. **Major buildings** have been completed under Capital Improvement Program (CIP); but some land matters, maintenance, a building code and master planning for zoning remain to be resolved. Sufficient demand is emerging to support a competitive industry in management, security, maintenance and replacement of buildings. Consistent financing, and timely payment by customers including GOP, are required for an efficient small industry.

16. **Port services.** There have been improvements in equipment, but not in facilities. The current Malakal port operator is considering a landfill extension to improve container operations. Crowding and conflicting uses persist. A large resort hotel has been built adjacent to Malakal port, and other residential and commercial services are expanding. Koror State has invited

proposals for commercial development of the State Fish Port. Activities of tuna fishing and processing have been scaled down. USA has military use rights under the Compact. There have been proposals for a Free Trade Zone port in Ngardmau, and for port development in Aimeliik.

17. **Airports.** There have been major improvements to the Koror International Airport terminal, runway, aprons, loading walkways, equipment, security and fencing, all with the steady support of Japan and USA. The challenge now is to realize the commercial and revenue benefits while recurrent maintenance burdens are low, and to build up financial reserves for future opportunities, maintenance and replacement needs. Such objectives will require a corporatized government agency, or a comprehensive lease to a private operator.

18. **Telecommunications** have been expanded, and service and productivity greatly improved through a \$39 million loan and much increased domestic revenue. Plans for the loan in 1997 did not anticipate the growth in demand for mobiles and internet, which has radically altered the business. Servicing the loan and provision of obligatory services to remote customers is constraining the profitability of Palau National Communications Corporation. There is an urgent need for regulations on competition and service obligations, and for some relief of the massive debt (now around \$53 million).

19. In summary, some infrastructure is not adequate for current and impending needs of consumers and broad-based national development. Cost recovery is inadequate and consumers are not willing to pay more. The productivity of staff and assets are low. A medium-term strategy to identify risks and improve the sustainability of assets is essential.

B. Government's Sector Policy and Planning Framework

20. The Public Sector Investment Program 2002 (PSIP), Management Action Plans (MAP) in 2002-2003, and *National Policy on Population and Sustainable Development*³ provides the strategy for provision of efficient and effective infrastructure. The Leadership Symposium and Education Master Plan in 2006, the National Economic Symposium, the Compact Review Commission (CRC) and the Tax Reform Task Force in 2007, show a search for a unifying and motivating vision. The near completion of most nation building projects and the responsibility for their use and maintenance sets a new challenge for the whole community. ADB is currently supporting Palau in meeting the challenge through TA 4929 Facility for Economic and Infrastructure Management which focuses on a medium-term development strategy.

C. Government's Institutional Arrangements and Capacity in the Sector

21. Capital Improvement Projects (CIP) is responsible for the planning and implementation of Palau's public infrastructure projects. CIP's ability to plan and implement new projects is constrained by small staff numbers. There is an immediate need to improve systems for monitoring, planning and selection of maintenance and assets.

22. The Bureau of Public Works (BPW) manages and maintains a wide range of services. Relative to the challenge, its budget is too small, its financing too unreliable, and its productivity too low. For example, at the end of 2007, the Rural Sanitation Program had a waitlist equal to 50% of its 2007 completions, indicating an overhang of six months work.

³ Government of Palau. 2007. *National Policy on Population and Sustainable Development*. Koror.

23. PPUC, an SOE, provides electricity to over 90% of Palau's population. PPUC has a history of providing a reliable electricity supply to its customers. Recently, disruptions to the electricity supply have become more frequent as generation equipment nears the end of its economic life. PPUC has been operating in deficit for at least fifteen years, and has not been able to afford the maintenance and replacement regimes necessary to lift efficiency and reliability.

24. With the exception of the water supply for Koror and Airai, Palau's water supply systems are operated and maintained by state governments. The Koror-Airai water supply is operated and maintained by the BPW and supplies water to approximately 64% of the country's population. Based on 2005 census data, the population of Palau is growing annually at about 1.4%. BPW reports that approximately 50% of water produced for the Koror-Airai water supply cannot be accounted for, and the PWD believes that illegal connections are the major cause. The rate of arrears is also high, accounting for 1.8 months of average water rates revenue.

D. ADB Sector Experience

25. Palau, as a relatively new member of ADB, has only recently received ADB assistance. ADB is supporting the development of medium-term development strategy through its TA 4929 Facility for Economic and Infrastructure Management. ADB is supporting the provision of improved public water supply services through TA 4977-PAL: Preparing the Babeldaob Water Supply Project which is scheduled for completion in October 2008.

E. Role of Other Development Partners in the Sector

26. Official development assistance (ODA) provides almost all the capital budget, supports improved facilities and services, and supports general economic growth. USA, Japan and Taipei,China provide substantial ODA to Palau. Other donors that have expressed interest in providing to Palau are the People's Republic of China and the Republic of Korea. Table 2 summarizes ODA projects from 2006 to 2008.

Table 2: Capital Improvement Program Projects, 2006- 2008

Project	Budget US\$ (million)	Source
Airport Runway Resurfacing, Phase 1 and 2	15.9	US
Airport ARFF Building Design & Construction	1.5	US
Airport Apron Rehabilitation Design	0.5	US
Airport Loading Bridges (2x) Installation	1.5	US
Airport Perimeter Security Fence	1.0	US
National Weather Service Building	2.5	US
New Capitol/Melekeok Sewer System	2.6	Taipei,China
New Capitol Complex Management Information System	1.8	Taipei,China
New Capitol Complex Completion Package	3.3	Taipei,China
Compact Road Lighting/New & Renewable Energy	2.0	EU
Babeldaob Inter-State Roads Improvement, I and II	3.5	Taipei,China
Airport/Ngerikil to Compact Road, 13.5 kms Phase I, II, III	12.3	Taipei,China
Koror-Airai Metrop Road Improvement, 12.5 kms Phase II, III	12.6	Japan
Public School Facilities Improvements	2.0	Taipei,China
Koror/Airai/Rural Water Systems Improvements	0.6	Taipei,China
Ngerbeched (Koror M-Dock) Landfill Rehabilitation	3.0	Japan

Project	Budget US\$ (million)	Source
Peleliu Dock Improvement & Channel Dredging, Phase II	4.0	Japan
Okotol Dock Improvement Project, Ngarchelong	1.0	Taipei,China
State Economic Stimulus Package 2006	2.6	Taipei,China
State Economic Stimulus Package 2007	2.6	Taipei,China
State Economic Stimulus Package 2008	4.2	Taipei,China
Total	81.0	

EU = European Union; US = United States of America.

Source: Ministry of Resources and Development, Capital Improvement Program Office (annual and quarterly reports).

F. Intended Sector Outcomes and Key Outputs Supported by the Asian Development Bank

27. ADB assistance to the water sector will focus on water and sanitation including (i) the Babeldaob Water Supply Project which is currently being prepared and will improve the security of the water supply to Koror, Airai, and Aimeliik States and provide institutional reforms and strengthening of the water sector, (ii) the preparation of a national sanitation master plan which will identify investment priorities and budgets, and (iii) the implementation of high priority sewerage infrastructure identified in the national sanitation master plan. ADB may also provide assistance for rehabilitation and replacement of electricity generation equipment and ancillary equipment in collaboration with JICA/JBIC, subject to the findings of feasibility studies currently being commissioned by JICA.

G. Links to CPS Outcomes and Other Sectors and Themes

28. A goal of the *National Policy on Population and Sustainable Development*⁴ is "to stimulate controlled economic development in balance with the carrying capacities of Palau's environment and infrastructure," which is consistent with the third element of ADB's strategic focus for assistance to Palau, "[to] deliver safe water and sanitation services to Palauans."⁵

H. Monitoring Mechanism

29. ADB will monitor the performance in the sector through project performance monitoring systems (PPMS) to be established under the proposed MFF. PPMS will also be established for performance monitoring of potential power sector projects. The PPMS framework will be updated regularly by the various project management units (PMUs). This will confirm achievable goals and refine monitoring and recording arrangements and design and implement procedures. In doing so, the framework will systematically generate data on inputs and outputs of the project components and the agreed socioeconomic and environmental indicators used to measure project impacts. Under the PPMS framework, baseline and progress data will be reported at the requisite time intervals by the PMUs, which will be responsible for analyzing and consolidating the data through its management information system. The PPMS will permit adequate flexibility to adopt remedial action for project design, schedules, activities, and development impacts.

⁴ Government of Palau. 2007. *National Policy on Population and Sustainable Development*. Koror.

⁵ Asian Development Bank. 2006. *Palau (2007 – 2009) Country Strategy and Program Update*. Manila.

Table 3: Infrastructure Sector Results Framework

Relevant CPS Outcomes		Sector-level Outputs		ADB Assistance	Risk
CPS Outcomes Relevant to the Sector	Key Opportunities and Constraints	Subsector Outcome/ Key Sector Outputs	Sector Milestone/ Tracking Indicators/ Interim Indicators		
Economic growth and great social inclusiveness through enhanced delivery of public infrastructure services.	<p>Institutional frameworks have limited capacity to implement infrastructure services.</p> <p>Operations and maintenance budgets are inadequate to sustain infrastructure.</p> <p>Tariff structures and cost recovery mechanisms are inadequate to fund O&M and capital replacement programs.</p> <p>Water supplies are vulnerable to drought and climate change.</p> <p>Inadequate and poorly maintained sewage collection and treatment facilities result in frequent sewage overflows creating health hazards and degrading aquatic environments.</p> <p>Disruptions to Palau's electricity generators are becoming more frequent as electricity generators approach the end of their design lives.</p> <p>Palau is totally reliant on imported diesel to generate</p>	<p>Secure, reliable, and affordable water supplies to communities on Babeldaob and in Koror.</p> <p>Improved collection and treatment of sewage in Koror and Aimeliik States.</p> <p>Reliable and affordable electricity services to communities on Babeldaob and in Koror.</p>	<p>The reliability of the water supply increases from the current 95%+ to 99.9%+ by 2012.</p> <p>Accounted-for-water losses from the Koror-Airai water supply network decreases from 50% (baseline 2008) to less than 30% by 2012.</p> <p>Average per capita consumption decreases from approximately 900 liters per person per day to less than 450 liters per person per day by 2012.</p> <p>The BPW is able to meet requests for all new connections in Koror, Airai, and Aimeliik by 2012, as currently the PWD is unable to provide connections to customers in Aimeliik.</p> <p>The number of sewage overflows from the Koror sewerage networks decreases from X in 2007 to Y by 2013.</p> <p>The frequency and length of disruptions to the electricity supply reduce from X and Y in 2008 to Z and ZZ by 2013.</p>	<p><u>2009 – 2013</u></p> <p>Development of up to 10 water supply wells in Airai and / or Aimeliik States to supplement surface water supplies during droughts.</p> <p>Rehabilitation of the water supply network incorporating replacement of up to 10km of distribution mains, replacement of up to 1,500 leaking service connections, installation of bulk supply flow meters, and installation of up to 1,500 new water meters.</p> <p>Rehabilitation of existing water supply service reservoirs in Koror and Airai States and construction of service reservoir(s) with a capacity of approximately 750,000 gallons in Aimeliik State.</p> <p>Design and implementation of an institutional reform program for public water and sanitation services.</p>	<p>- OEK supports reform of Government water supply and sewerage services.</p> <p>- Civil society does not recognizes Government's role in providing reticulated water</p> <p>- OEK and State Legislatures fail to recognize need for adequate recurrent O&M budgets.</p>

Relevant CPS Outcomes		Sector-level Outputs		ADB Assistance	Risk
CPS Outcomes Relevant to the Sector	Key Opportunities and Constraints	Subsector Outcome/ Key Sector Outputs	Sector Milestone/ Tracking Indicators/ Interim Indicators		
	electricity and is exposed to shocks in the world oil price.			<p>Implementation of demand management programs to reduce per capita demand.</p> <p>Development of a National sewer master plan.</p> <p>Implementation of high priority sewerage projects identified in the National sewerage master plan.</p> <p>Supply and installation of electricity generators to service Babeldaob and Koror electricity network.</p> <p>Implementation of physical and managerial measures to reduce losses in the electricity transmission and distribution systems in Babeldaob and Koror.</p>	

Source: Asian Development Bank.