Government of Samoa

SAMOA

National Infrastructure Strategic Plan

This is a publication of the Government of Samoa.

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PIAC operates under the coordination of the Pacific Region Infrastructure Facility (PRIF), a partnership for improved infrastructure in the Pacific Region between the Asian Development Bank, the Australian Agency for International Development, the European Commission, the European Investment Bank, the New Zealand Ministry for Foreign Affairs and Trade, and the World Bank Group.

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PRIF

Pacific Regional Infrastructure Facility

May 2011

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FOREWORD

I am pleased to present Samoa's National Infrastructure Strategic Plan (NISP) which presents the priorities of the Government and the strategic direction for major initiatives in economic infrastructure over the next 5-10 years. This is the first attempt to compile the development needs that fall under the various components of the infrastructure sector – transport in terms land, sea and air; energy; port and airport development; and telecommunications.

The NISP is closely linked to the Strategy for the Development of Samoa 2008–2012 (SDS), and its vision of "… improved quality of life for all". Infrastructure plays a critical role in achieving the goals of the SDS, because there is a clear and positive linkage between infrastructure, social development, community wellbeing and economic growth. That is why it is critical for Samoa to invest in infrastructure and ensure that infrastructure facilities are efficiently operated and adequately maintained.

The priority themes and investments contained in the NISP set the direction for infrastructure development in Samoa and are the core of this document. But Samoa also faces challenges to better manage and maintain new and existing infrastructure. The Government recognizes the importance of maintenance and that in the past, insufficient attention has been given to provide adequate maintenance. The Government is therefore committed to improving the delivery and funding of maintenance and the NISP outlines a number of strategies and initiatives for that purpose.

It will be very difficult with the limited resources available to meet all demands for infrastructure for the next 5-10 years. Therefore priorities have to be set. These priorities were developed through a process of consultation and analysis, with the aim of identifying key strategic development directions, infrastructure investments and complementary initiatives (planning studies, sector reforms, capacity building) that align strongly with national goals and would deliver substantial community benefits. As a result, the NISP is much more than a list of investment priorities - it is an integrated program of new investments and supporting initiatives reflecting the Government of Samoa's aspirations for the economic infrastructure sector, including a funding strategy to meet capital and recurrent budget requirements.

Moreover the NISP supports the sector wide approach framework, and as such, provides the basis for engaging development partners in the development of Samoa's infrastructural needs.

The NISP was developed in close consultation with CEOs of current infrastructure providers, representatives of the community, the private sector, and development partners. The NISP was formally endorsed by the Government at the Cabinet Development Committee meeting of 26 May 2011. It is therefore a country owned and led document.

It is important to recognize that the NISP is a living document that must respond to a continuously changing environment. The Government therefore has the intention to update the NISP on a regular basis to align it with the latest planning and budget priorities.

Finally, I commend this document to all national stakeholders and development partners and again reiterate my hope that it will help lift the quality of life of all Samoans.

Hon Faumuinā Faaolatane Tiatia Liuga
Minister of Finance

EXECUTIVE SUMMARY

Background

Economic infrastructure (energy, telecommunications, water, waste management, transport) provides many services that underpin quality of life and the economy. Basic services and service coverage in Samoa are generally good; the country has some of the best human development outcomes in the region in terms of the Millennium Development Goals (MDGs) and other measures; and the institutional reforms put in place by Government over the last ten years have established a strong platform on which to continue to build and improve the economic infrastructure sector. But there are still many challenges in terms of keeping pace with growth in demand; addressing specific issues and deficiencies with existing infrastructure; and improving the quality and reliability of infrastructure services to meet community expectations.

The National Infrastructure Strategic Plan (NISP) outlines the Government's priorities and strategic directions for major initiatives in the economic infrastructure sector over the next 5-10 years. The Plan is country owned and led, and was developed in close consultation with representatives of infrastructure managers, the community, the private sector, and development partners.

In particular, NISP is closely linked to the *Strategy for the Development of Samoa 2008–2012* (SDS), and its vision of "*… improved quality of life for all*". Infrastructure plays a critical role in achieving the goals of the SDS, because there is a clear and positive linkage between infrastructure, social development, community wellbeing and economic growth. That is why it is critical for Samoa to invest in infrastructure and ensure that infrastructure is operating as efficiently as possible.

Infrastructure priorities

It is unlikely that it will be possible to fully address all of the challenges facing the economic infrastructure sector within over the next five to ten years from resources available to Government and State-Owned Enterprises (SOEs). Therefore a strategic approach is required and priorities need to be set. These priorities were developed through a process of consultation and analysis, with the aim of identifying key strategic development directions, infrastructure investments and complementary initiatives (planning studies, sector reforms, capacity building) that align strongly with national goals and would deliver substantial community benefits. As a result, NISP is much more than a list of investment priorities, it is ***an integrated program of new investments and supporting initiatives reflecting the Government of Samoa's aspirations for the economic infrastructure sector.***

In each sector, the Government's infrastructure priorities are structured around one or more strategic themes that reflect the goals and priorities of the SDS, and the specific development priorities for sector:

NISP Priority themes for infrastructure development

Sector	Strategic Directions
ENERGY	▪ Investing in renewable energy ▪ More efficient use of energy
TELECOMMUNICATIONS	▪ Improved domestic & international connectivity
WATER	▪ Reliable, affordable water supply ▪ Improved waste water management
SOLID WASTE	▪ Sustainable waste management
ROADS	▪ Samoa Economic Corridor ▪ Safe and resilient road network
SEA PORTS	▪ Meeting international sea freight needs ▪ Safer and better inter-island ferry facilities
AIRPORTS	▪ Supporting international air travel and trade
MULTI-SECTOR	▪ Climate change and disaster risk reduction ▪ Streamlining Government responses ▪ Making better use of existing infrastructure ▪ Improved planning and evaluation

These themes provide a framework of strategic directions and priorities for the economic infrastructure sector. The first priority is to successfully complete projects that are already underway. The Government has adopted a sector-wide approach to planning and improving infrastructure performance, and major medium/long-term infrastructure programs are already underway in the energy, water, sanitation, and roads sectors.

Major projects already underway or in preparation

Project	FY11	FY12	FY13	FY14	FY15	after FY15
Power (Power Sector Expansion Project)	■■	■■	■■	■■	■■	■■
Water (Sector Budget Support Program)	■■	■■	■■	■■		
Sanitation and Drainage (SSDP I/II)	■■	□□	□□	□□	□□	
Roads (SIAM2)	■■	□□	□□	□□		
Tsunami Recovery	■■	■■				

■■ Underway
□□ Follow-up project under preparation or discussion

These ongoing projects provide a foundation for improving economic infrastructure over the next five to ten years, but will not address all of the current and emerging infrastructure challenges. Therefore additional initiatives and investments will be required. The process of consultation and screening identified around 30 additional priority investments, plus a range of complementary initiatives designed to improve management and delivery of infrastructure (see Appendix 1). For each priority investment or initiative, Appendix 1 provides a short descriptive title, the estimated cost (in tala), the preferred timing of each initiative, and the responsible agency. Further description of the strategic themes for each sector and the ongoing and additional priority projects and complementary initiatives are provided in Chapter 3.

Funding strategy

If all of these priority initiatives proceed over the next 5 years, total investment would be some T$1,020 million, comprising T$430 million in ongoing projects and around T$590 million in proposed projects. Funding for ongoing projects is already committed and discussions are underway regarding funding for several proposed projects, including additional road upgrading; expansion of the Apia sewerage system and drainage upgrading program; upgrading the national broadband network; an additional undersea communications cable; and large on-grid solar power generation. But there remains a large financing gap.

The challenge for Government is to work with SOEs, the private sector and development partners to put in place sustainable funding arrangements so that as many as possible of the priority initiatives can proceed over the next five years. This means that a combination of financing mechanisms will be required, with funding mechanisms matched to the characteristics of specific projects. Appendix 2 provides an assessment of the current suitability of different financing sources for priority new investments, maintenance, and complementary activities. In summary and bearing in mind current economic and budgetary conditions in Samoa, the key elements of the strategy for funding the NISP priority program are:

- funding operations and maintenance, and increasingly an ability to fund infrastructure investments, from internal sources. Government intends to work closely with SOEs, the private sector, and development partners to lift the overall performance of the economic infrastructure sector, and as a minimum, achieve self-funding of operations, sustainable maintenance and small infrastructure investment by Government and SOEs;
- seeking the assistance of development partners to fund complementary activities, especially technical assistance for planning studies and reform initiatives; and
- working with SOEs and development partners to help fund medium-large infrastructure investment with the assistance of concessional loans, or grants where possible. Over the next five years, the capacity of

Government to budget fund capital investment in economic infrastructure is limited, but over the medium-longer term, the budget position is expected to strengthen and financial reforms put in place by Government are expected to deliver an increasing capacity of Government and SOEs to self-fund major capital investments.

Managing and maintaining our infrastructure

The priority themes and investments set the direction for infrastructure development in Samoa and are the core of the NISP, but they are only part of the story. Samoa also faces challenges to better manage and maintain new and existing infrastructure. The Government recognises the importance of maintenance and that in the past, insufficient attention has been given to maintenance and some Government and SOE-owned assets have deteriorated. The Government is committed to improving the delivery and funding of maintenance by Ministries and SOEs. This will involve a range of initiatives:

- a *National Asset Management Policy*, will be developed and implemented as a framework for strategic life cycle management of assets, and sustainable financing of maintenance;
- Government will work with SOEs to accelerate progress on improving their financial performance, because weak financial performance is one of the leading causes of inadequate spending on maintenance; and
- Government will strengthen its project planning and evaluation processes to take greater account of full life cycle costing in investment decisions, and will work with SOEs to strengthen capacity to prepare and evaluate the commercial business case for proposed infrastructure investments. This is critical to good decision making and ensuring that best value for money is achieved from investments.

In addition, the Government will take steps to streamline the planning and delivery of multi-sector infrastructure projects. This initiative has the potential to result in a faster and better coordinated response to opportunities; reduced cost; and a streamlined interface with the private sector. In particular, the Government intends to strengthen the role of the Ministry of Works, Transport & Infrastructure (MWTI) as a focal point for infrastructure coordination. The scope of this role would also extend to facilitating major Government-initiated projects with multi-sector implications; and infrastructure policy and planning. MWTI would also be responsible for monitoring and updating the NISP; and implementing whole-of-government initiatives in areas such as asset management.

Updating the NISP

Starting with this report, the NISP will be updated on a regular basis to align with the latest planning and budget priorities, and reflect progress on implementation. There are several sector development plans currently under preparation, with many expected to be finalised by mid-2011. Building on the outputs of these sector plans, it is planned that the NISP will be updated in the second half of 2011.

CONTENTS

ACKNOWLEDGMENTS

The preparation of the National Infrastructure Strategic Plan was prepared with the assistance of many organisations and individuals. The input of the following organisations is gratefully acknowledged.

- Ministry of Finance (MOF)
- Ministry of Natural Resources & Environment (MNRE)
- Ministry of Communications & Information Technology (MCIT)
- Ministry of Commerce, Industry & Labour (MCIL)
- Ministry of Works, Transport & Infrastructure (MWTI)
- Land Transport Authority (LTA)
- Samoa Ports Authority (SPA)
- Samoa Airports Authority (SAA)
- Electric Power Corporation (EPC)
- Samoa Water Board (SWA)
- Samoa Shipping Corporation (SSC)
- Samoa Chamber of Commerce and Industry
- Samoa Umbrella for Non-Government Organisations (SUNGO)
- ADB/World Bank Office Samoa
- AusAID
- Embassy of the People's Republic of China
- European Union
- JICA
- NZAID

EXCHANGE RATES

All figures quoted in the NISP are in Samoan tala (WST). The abbreviation T$ is used in this Plan to distinguish tala from other currencies.

Exchange rates as at 1 December 2010 are:

WST 1 =	USD 0.409	NZD 0.543	RMB 2.726
	AUD 0.416	EUR 0.293	

ABBREVIATIONS

AusAID	Australia's official aid agency
CBA	Cost-Benefit Analysis
CBD	Central Business District
CDC	Cabinet Development Committee
CSO	Community Service Obligation
DSM	Demand-Side Management
EU	European Union
EBIT	Earnings before Interest and Tax
EBITDA	Earnings before Interest, Tax, Depreciation and Amortization
EIM	Economic Infrastructure Ministry
EIRR	Economic Internal Rate of Return
EPC	Electric Power Corporation
EPPD	Economic Policy and Planning Division, Ministry of Finance
FIRR	Financial Internal Rate of Return
GEF	Global Environment Fund
ICAO	International Civil Aviation Organisation
IMO	International Maritime Organisation
JICA	Japan International Cooperation Agency
LED	Light Emitting Diode
LTA	Land Transport Authority
MAF	Ministry of Agriculture & Fisheries
MCIT	Ministry of Communication & Information Technology
MOH	Ministry of Health
MOF	Ministry of Finance
MNRE	Ministry of Natural Resources & Environment
MTEF	Medium Term Expenditure Framework
MWTI	Ministry of Works, Transport & Infrastructure
NISP	National Infrastructure Strategic Plan
NZAID	New Zealand's official aid agency
PECF	Pacific Environment Community Fund
PPCR	Pilot Projects for Climate Resilience
PFM	Public Financial Management
PUMA	Planning and Urban Management Authority
SAA	Samoa Airports Authority
SCCI	Samoa Chamber of Commerce & Industry
SDS	Strategy for the Development of Samoa
SOE	State-Owned Enterprise
SPA	Samoa Port Authority
SSS	Samoa Shipping Services
SUNGO	Samoa Umbrella for Non Governmental Organisations
SWA	Samoa Water Authority
WaSSP	Water Sector Support Programme

1. CONTEXT

1.1 About the National Infrastructure Strategic Plan

The National Infrastructure Strategic Plan (NISP) outlines the Government of Samoa's priorities and strategic directions for major initiatives in the economic infrastructure sector over the next 5-10 years. This is the first NISP and it is Government's intention that the Plan will be regularly updated as part of the national planning and budgeting process. The Plan covers infrastructure initiatives with national significance, and looks at the next five years to 2015 in detail and the five years from 2015 to 2020 in terms of broad directions for infrastructure development. It is the result of extensive consultation with infrastructure managers, users and development partners.

Infrastructure is a well-known term and most people understand what it is, but there are many different types of infrastructure. This Plan focuses on the basic infrastructure facilities that support everyday life and business activity, such as electricity, water, transport and communications. The *Strategy for the Development of Samoa 2008–2012* (SDS) refers to these key service areas as *economic infrastructure*. In particular, the NISP focuses on priorities for major infrastructure initiatives in the following sectors:

- energy (electricity, fuel)
- telecommunications (telephone, internet, broadcasting)
- water and waste related services (water supply, waste water, drainage, solid waste)
- transport (airports, roads, sea ports, shipping)

Construction for social and economic sectors (such as education, health, justice, public administration, tourism, agriculture) and other general building construction are not included in this Plan, but may be included in future updates.

The Government recognises that investment in infrastructure projects is critical, but it is only part of the story. Investment in "hard" infrastructure goes hand in hand with improved management and maintenance of existing and new infrastructure, and initiatives to improve the overall institutional and regulatory environment for infrastructure development. As a result, this NISP is much more than a list of investment priorities …

> *NISP is an integrated program of new investments and supporting initiatives reflecting the Government of Samoa's aspirations for the economic infrastructure sector.*

The supporting initiatives are non-infrastructure measures (planning roadmaps; policy changes; institutional/regulatory/financial reforms; technical assistance) that support the Government priority to make the most of existing infrastructure and obtain best value from new investments.

1.2 Why is the plan needed

Samoa has a quite mature infrastructure system in terms of the availability and capacity of basic services and has some of the best human development outcomes in the region in terms of the Millennium Development Goals (MDGs) and other measures. The overall picture is that basic services and service coverage are good, with full national coverage of basic telecoms and improving; a high level of access to reticulated power and water and off-grid arrangements in place elsewhere; a high level of road density in inhabited areas; and a strategically located network of ports and airports throughout the country (see Annex B for more details of the current situation). In addition, the institutional reforms put in place by Government over the last ten years have established a strong platform on which to continue to build and improve the economic infrastructure sector.

But in other areas of infrastructure asset management, such as the cost, quality and sustainability of infrastructure and services, Samoa is not keeping pace with needs and community expectations. This Plan is another initiative by Government towards improving our economic infrastructure through a more systematic approach to infrastructure planning, coordination, investment and asset management. It is needed for a number of reasons:

- information about Government priorities and current and planned investments in the economic infrastructure sector is currently fragmented. The sector-wide planning approach adopted by the

Government is working well, but does not provide a complete picture. The NISP brings together information about all economic infrastructure into a single source of information about priorities and plans. This provides a catalyst for a more coordinated and integrated approach to infrastructure planning, development and service delivery by Government agencies, State Owned Enterprises (SOEs) and the private sector;

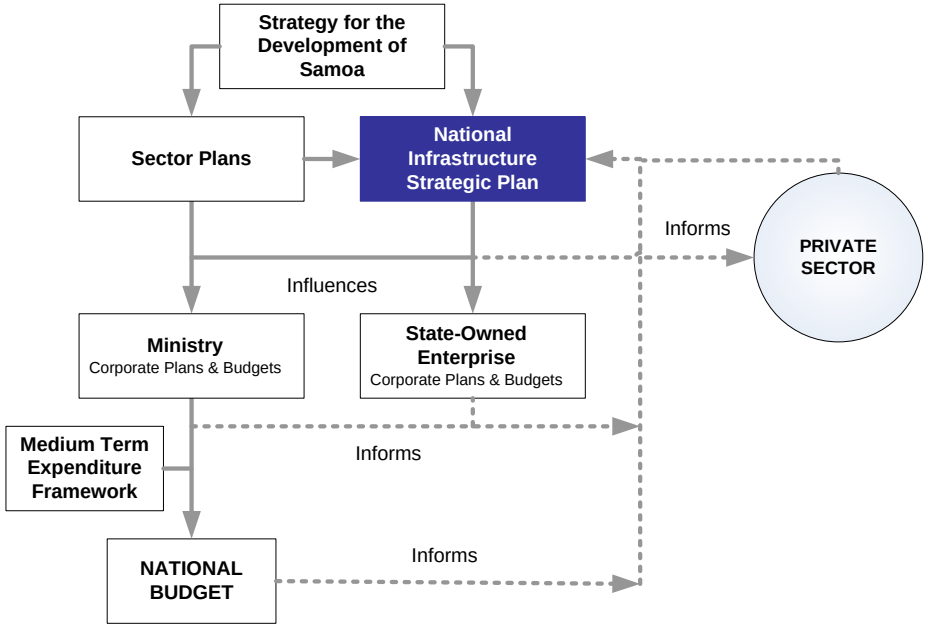
- the NISP complements Public Financial Management (PFM) reform initiatives. The PFM framework integrates Government's strategic planning and budgeting at different levels, across sectors, and within the context of the operating macroeconomic environment;
- the NISP is also a further step towards establishing asset management as a core function of Government and infrastructure managers; instilling a greater emphasis on maintenance; and incorporating a life-cycle approach to infrastructure management;
- in addition, the NISP is a key input to medium and longer term budget planning. It provides a picture of the scale and sequencing of future investment and financing needs, and ongoing maintenance requirements; and
- finally, by providing greater certainty about the nature and timing of infrastructure projects, the NISP improves the investment environment for the private sector. It also provides development partners with clear information about Government priorities and plans for infrastructure development, and the areas where assistance is needed most.

1.3 How does NISP relate to other plans

The NISP is an important part of the national planning and budgeting process. This process and the role of the Plan in the overall infrastructure planning process is summarised in Figure 1.1. The overall direction and priorities of national infrastructure planning and the NISP are shaped by the *Strategy for the Development of Samoa 2008–2012* (SDS). The SDS is a statement of the Government's principal economic and social development objectives together with how those objectives will be realised. It looks forward over the next 5 to 10 years and sets the development vision for Samoa as "*… improved quality of life for all*". Economic infrastructure plays a major part in meeting this goal:

> "Government will continue to improve economic infrastructure services as a means of creating a more attractive business environment and increasing public access to basic social services." (SDS p18)

Figure 1.1 Relationship between NISP and the planning process



In particular, the emphasis of the SDS is on:

- developing and maintaining infrastructure to improve the everyday lives of the Samoan people;

- bolstering the private sector, in part by improving physical infrastructure and also by reducing business costs; and
- the need to integrate environmental sustainability and climate change into all planning and delivery of programs, especially in relation to developing renewable sources of energy, improved management of water resources and sanitation, and disaster risk management.

This provides an integrating framework for the NISP and identifying infrastructure priorities.

1.4 How to read the plan

The NISP outlines Government priorities and plans for economic infrastructure for the next 5-10 years and lists priority themes and initiatives planned for this period. The Plan is organised as follows:

- it starts by analysing the current situation, economic and social factors that drive the need for infrastructure, the specific challenges for Samoa, and the way that Government intends to respond to these challenges;
- the results of the analysis of infrastructure challenges, priority directions, planned investments and supporting systems are then brought together as a set of priority initiatives for development of the economic infrastructure sector. This section also briefly describes the process that was used to determine these priorities; and
- the final sections focus on issues of managing and delivering the infrastructure priorities. This involves the broader issues relating to planning, managing and operating infrastructure assets, and what Government can do (and is doing) to facilitate better outcomes from the economic infrastructure sector. It also looks at how the infrastructure will be delivered, including demand for infrastructure finance, funding strategy, and partnership arrangements.

The Plan also includes several Technical Annexes that provide further detail on the following topics:

- about each of the projects (Annex A);
- a status report on economic infrastructure, services and planning, and a summary of each sector's current investment plans (Annex B);
- the project prioritisation methodology (Annex C);
- more information and analysis about adopting a life-cycle approach to infrastructure management, including the maintenance performance of the economic infrastructure sector, strategic asset management, life cycle costing and maintenance (Annex D); and
- the current financial environment for economic infrastructure development and a proposed funding strategy (Annex E).

1.5 Monitoring and updating the Plan

The NISP is an integral part of the Government's national planning and budgeting process. Starting with this report, the Plan will be monitored and updated on a regular basis to align with the latest planning and budget priorities, and reflect progress on implementation. This will include establishing a Performance Monitoring and Evaluation Framework that reports on progress of implementation and achievements of NISP and its linkages with SDS, sector planning, and agency corporate plans. Monitoring and updating the NISP will be coordinated by the Ministry of Works, Transport & Infrastructure (MWTI).

There are several planning studies and sector plans currently under preparation, with most expected to be finalised by mid-2011. Building on the outputs of these sector plans, it is proposed that the NISP will be updated regularly, with the first updated scheduled for the second half of 2011. The updating process will then be reviewed and recommendations made on how often updates would be required in the future.

2. THE INFRASTRUCTURE CHALLENGE

2.1 The link between infrastructure and development

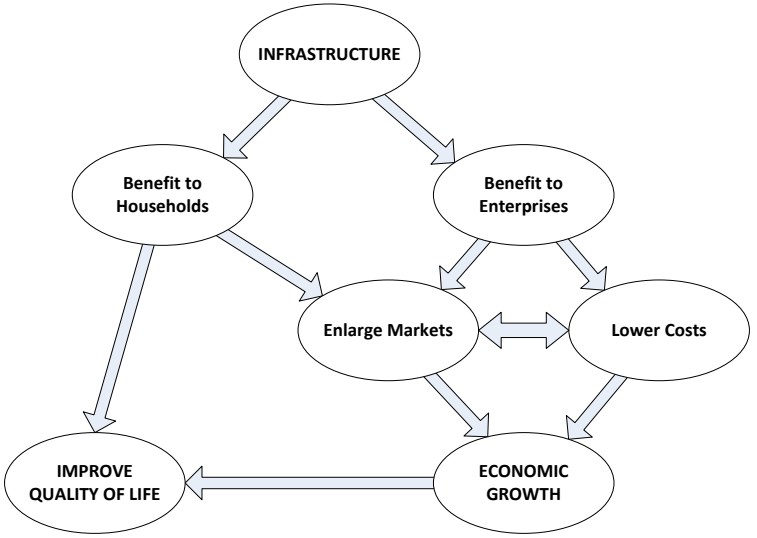
Infrastructure plays a critical role in achieving the goals of the SDS, because there is a clear and positive linkage between infrastructure, social development and economic growth. In general terms, demand for infrastructure capacity and services is linked to population; to the needs of individuals and businesses; and to national development objectives, especially quality of life, economic growth and sustainability, as outlined in the SDS. More specifically, infrastructure contributes to the wellbeing of individuals by providing access to services and social and economic opportunities; and the services delivered by economic infrastructure are an intermediate input into production and affect business efficiency. This means that infrastructure supports the economy and community, and can also be a catalyst for improved quality of life and economic growth. These linkages are shown in Figure 2.1. That is why it is critical for Samoa to invest in infrastructure and ensure that infrastructure is operating as efficiently as possible.

International research provides further evidence of the strong positive link between infrastructure and economic and welfare outcomes. In particular, research results indicate that:

- investment in core economic infrastructure (such as electricity, telecoms, transport, sewerage and water systems) produce the largest gains in productivity. Investments in roads and telecommunications typically deliver the greatest *social* returns;
- maintenance is not "visible" but is more likely to have a greater positive influence on economic output than new projects;
- when access to core infrastructure has been addressed, the best economic results come from improving efficiency and then from reducing service prices; and
- ultimately, infrastructure investment only adds value if it is allocated in the right way.

This means that well-targeted investment in infrastructure can have significant benefits for economic growth and quality of life. But the reverse is also true. Inadequate infrastructure is a bottleneck to economic activity, and also reduces the day-to-day well being of people and their ability to withstand and respond to natural disasters. Sustainability is also compromised because resources are used wastefully. However, it is important to understand that inadequate infrastructure does not necessarily mean that there is not enough infrastructure. It extends to whether or not existing infrastructure is being used and managed effectively. When it is not, service coverage, pricing and quality are all affected, and the benefits of appropriate infrastructure are not realised. As a result, this Plan focuses not just on physical infrastructure but also on the way that it is used and managed.

Figure 2.1 How infrastructure contributes to development[1]



[1] Adapted from Prudhomme, R. (2004) *Infrastructure and Development*. Paper prepared for the World Bank Annual Conference on Development Economics) May 3-5, 2004.

2.2 The infrastructure challenge for Samoa

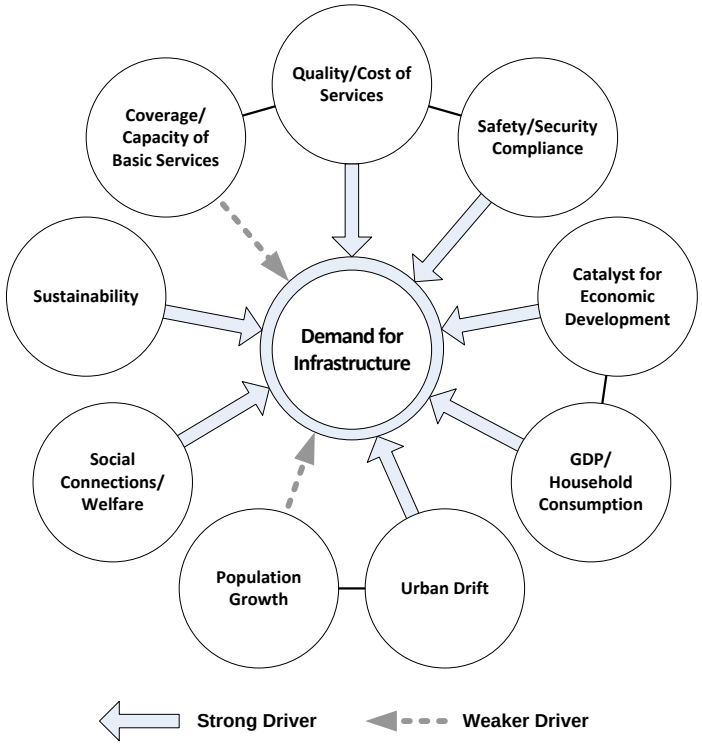
As described earlier, international evidence shows that economic infrastructure can be a powerful catalyst for improved social and economic outcomes, but at the same time, poor infrastructure is a brake on development. This creates the challenge for Samoa to both improve the management of existing infrastructure and to invest wisely in infrastructure improvements. In particular, the challenge is to:

- keep pace with growth in demand for infrastructure services. There is strong growth in demand for infrastructure services in Samoa driven by a range of factors, such as population trends and economic activity;
- address a range of specific issues and deficiencies with existing infrastructure so that the infrastructure system functions more effectively; and
- improve the coverage, quality and reliability of economic infrastructure. As well as ensuring access to basic services, there are growing community expectations regarding the quality of the services provided.

The factors that are driving demand for infrastructure improvements in Samoa are summarised in Figure 2.2. It shows that in addition to infrastructure responding to and being a catalyst for economic activity, significant drivers include quality and cost of services, safety and security compliance, urban drift as more people move to Apia, welfare, and sustainability.

In addition, the small population, remoteness from markets and small market size of Samoa creates special challenges for development and operation of economic infrastructure[2]. This can add significantly to the cost and difficulty of supplying economic infrastructure services throughout the country.

Figure 2.2 Drivers of infrastructure demand in Samoa



Demand for infrastructure is growing strongly …

Over the last 10 years, annual growth in Samoa's population has averaged around 0.5% and annual growth in real GDP has been mixed, ranging from a high of nearly 7% at the start of the decade to -4.9% in 2009/10. The combined effect[3] of these factors is that overall growth in underlying demand for infrastructure over the last decade has averaged around 4.5% per year and is expected to recover to around 4% per year over the next five years as Samoa recovers from the Global Financial Crisis. This strong and

[2] For a general overview of the challenges facing Samoa and other Pacific nations, see ADB (2004) *Swimming Against the Tide*.

[3] Assuming an elasticity of demand for infrastructure with respect to real GDP of 1-1.2.

continuing growth in underlying demand puts pressure on existing services and infrastructure. In some sectors (such as airports) there is capacity available to absorb this growth, but in others (such as electricity), continued investment and a focus on efficiency and asset management is required to keep pace with increasing demand.

There are specific problems that need to be addressed …

In addition to growth pressures, there is also a range of specific problems and deficiencies affecting the current performance of economic infrastructure. These issues range from localised road flooding through to national issues such as energy security. Figure 2.4 highlights these specific problems and the general challenges currently facing economic infrastructure in Samoa. All countries are faced with similar problems, irrespective of their stage of development.

The way forward …

Samoa has good coverage of basic infrastructure and largely achieved the goal of providing basic services. Meeting these basic needs will always be the foundation requirement for economic infrastructure, but with these basic needs mostly being met, the national challenge for further investment in economic infrastructure is now moving to higher-level goals. Figure 2.3 provides a conceptual framework for understanding the current situation, the rationale for the NISP, and the way forward.

To serve the two key SDS goals for infrastructure development (quality of life and economic development), a range of types of investment activities are needed and these will deliver different outcomes. The initial focus is on providing basic services: capacity, coverage and safety/security. Once these issues have been addressed, attention moves to reliability, efficiency and cost effectiveness of infrastructure services, and to asset management. Ultimately, infrastructure investment centres on building the reputation of organisations and the nation as a whole for infrastructure quality and services.

On this spectrum, Samoa is well advanced in providing basic services. The main priority now for the development of Samoa's economic infrastructure is to continue improving basic services, but at the same time, to improve service delivery so that infrastructure is able to deliver good economic, social and environmental outcomes. This means addressing specific deficiencies in current infrastructure, making the most from existing infrastructure, and investing in new infrastructure when there is a strong case to do so.

In summary, the way forward is an increasing focus on the delivery of the community's expectations for reliable, efficient and affordable services on developing infrastructure to underpin economic growth; and on managing infrastructure assets well. This sets the challenge for the next phase of infrastructure development in Samoa and is the guiding theme for this NISP.

Figure 2.3 Status of infrastructure development in Samoa

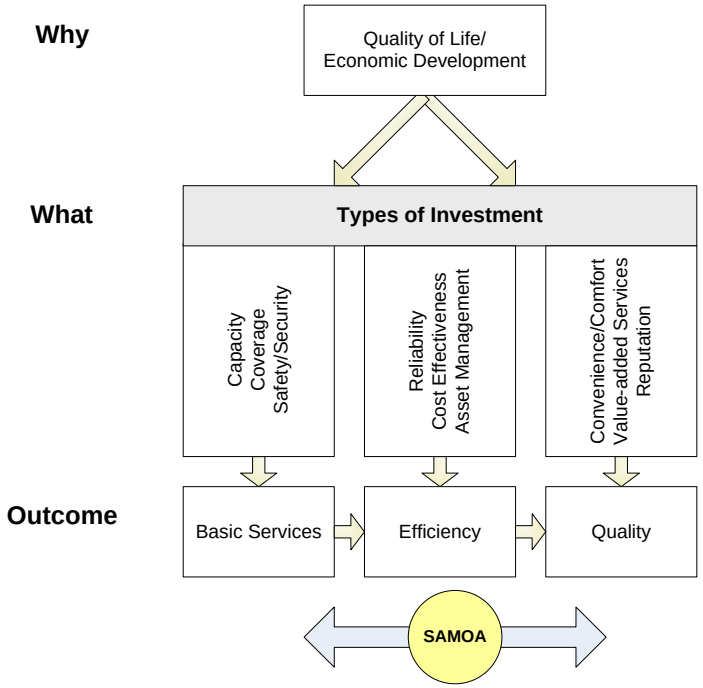
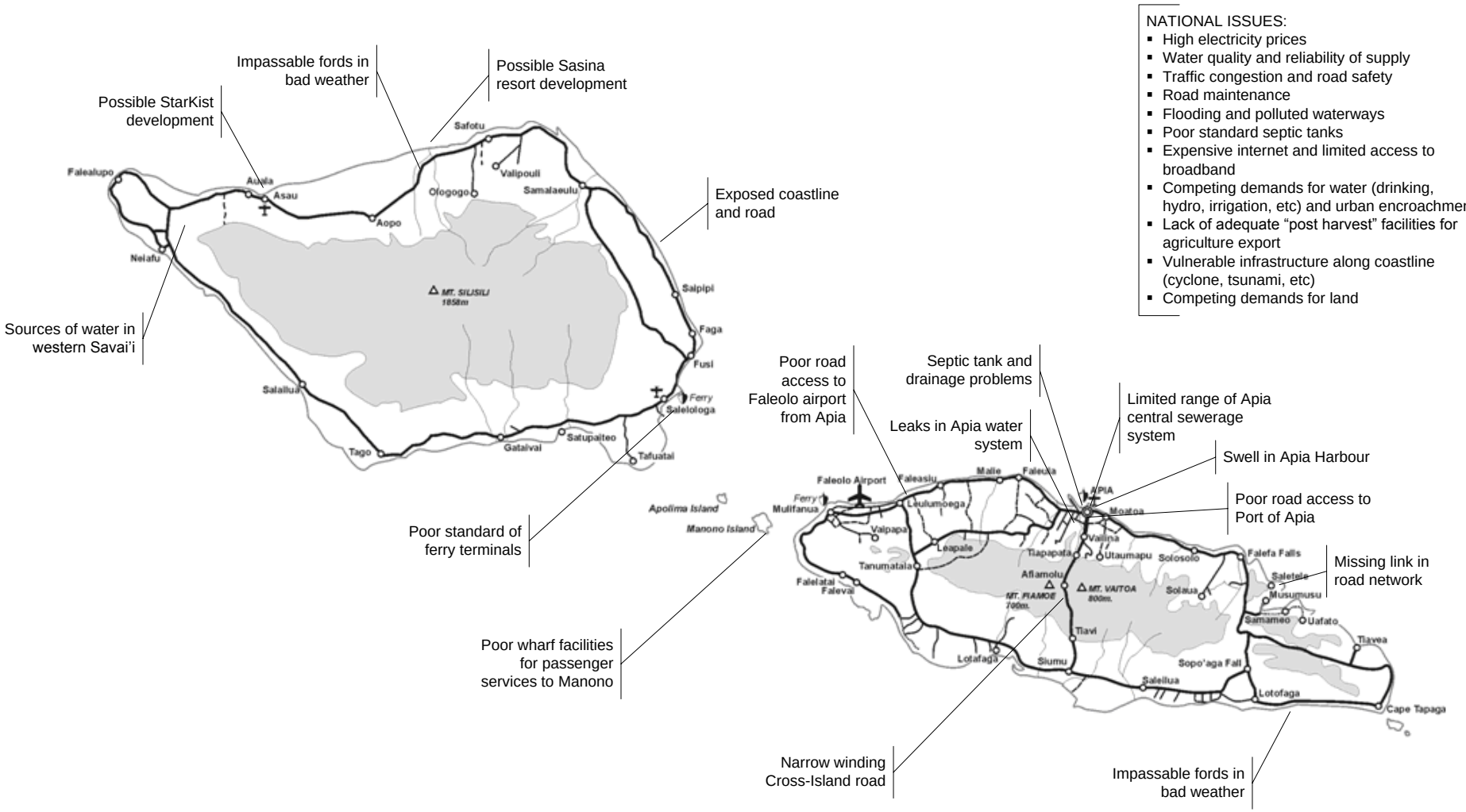


Figure 2.4 Infrastructure issues and challenges



3. INFRASTRUCTURE STRATEGY

The NISP is the Government's response to the challenges facing the infrastructure sector over the next five to ten years. It is unlikely that it will be possible to fully address all of these challenges within this timeframe from resources available to Government and State-Owned Enterprises. Therefore a strategic approach is required and priorities need to be set. This section is the core of NISP. It describes the approach that was used to determine the priorities; and then outlines Government's strategic directions for the future and priority investments for each type of economic infrastructure.

3.1 How the priorities have been determined

The first priority is to successfully complete projects that are already underway. Government has adopted a sector-wide approach to planning and improving infrastructure performance, and has several major medium/long-term infrastructure programs underway or in preparation (Table 3.1). These sector programs include:

- Power Sector Expansion Project (PSEP), which is a multi-year project that is supporting a long-term investment program in the electricity distribution system, and diesel and hydro generation, as well as setting up mechanisms for achieving Samoa's renewable energy targets;
- Water Sector Budget Support program is a sector-wide program implementing the *Water for Life* plan over the next 4-5 years;
- Samoa Sanitation and Drainage Project (SSDP) which supported construction of the Apia sewerage system and drainage works around Apia. A follow-up project is being prepared to extend the sewerage system and drainage improvements;
- Samoa Infrastructure Asset Management (SIAM2) project which has supported a range of infrastructure works, most notably the major upgrade of Vaitele St. A follow-up project that will further extend the Vaitele St upgrade is currently being considered by Government; and
- Tsunami Recovery works continuing in the energy, water, telecommunications and transport sectors.

In addition, there are around 15 smaller economic infrastructure projects already underway or committed (see Annex A).

Table 3.1 Major projects already underway or in preparation

Project	FY11	FY12	FY13	FY14	FY15	after FY15
Power (PSEP)	■■	■■	■■	■■	■■	■■
Water (Sector Budget Support Program)	■■	■■	■■	■■		
Sanitation and Drainage (SSDP I/II)	■■	□□	□□	□□	□□	
Roads (SIAM2)	■■	□□	□□	□□		
Tsunami Recovery	■■	■■				

■■ Underway
□□ Follow-up project under preparation or discussion

These ongoing projects provide a foundation for improving economic infrastructure over the next 5 to 10 years, but will not address all of the current and emerging challenges. Therefore additional initiatives and investments will be required.

Priorities for additional projects over the next five to ten years were identified through a process of consultation and analysis. The first step was consultation with infrastructure managers (Ministries, SOEs) and users (community and private sector) to identify a long list of ideas for infrastructure projects and related initiatives that address current deficiencies and emerging infrastructure needs, and support economic and social development. These project ideas were then refined in discussions with infrastructure managers to ensure that the project objectives, concept and likely cost were clearly identified. This process generated around 45

ideas for improving the infrastructure system. This set of project proposals is listed in Annex A and described in Annex B.

The next step was to screen the long list of project proposals against several tests:

- strategic alignment;
- project benefits; and
- project dependency.

The first two tests checked whether each project concept is strongly aligned with SDS goals and MDGs; is consistent with the relevant sector and corporate plans; and would deliver strong and clear benefits to Samoa. Some of the proposed projects had already been formally appraised so that indicators of economic return (e.g., EIRR, NPV) are available. Others were in an early stage of development and for these, a qualitative assessment of the scope and scale of likely benefits was undertaken using a Multi-Criterion Assessment approach. The criteria included economic (employment generation, effect on the cost/quality of infrastructure services); social (access to social opportunities and interaction); environmental (climate change mitigation, other impacts); and disaster management factors (climate change adaptation, disaster preparedness). These criteria and the overall process used to identify infrastructure priorities are described in detail in Annex C.

Project proposals with clear benefits and strong alignment with national strategic goals progressed to the next stage of screening. If not, then the project concept was re-examined in consultation with infrastructure managers to test whether it could be amended to produce better alignment with key national goals and deliver greater benefits, and if not, was dropped from further consideration.

The next step checked on inter-dependency and linkages between projects. This involved asking several questions:

- are there viable alternatives that have not been fully investigated?
- is the project so highly inter-linked with other possible projects that it cannot be considered separately?
- does the project rely on other things happening first or at the same time so that it can deliver its full value?

These are key questions for developing an infrastructure strategy because most economic infrastructure is part of a network of linked components (roads, water supply network, electricity network, etc). This means that the order in which projects are implemented can be important (e.g. staged upgrading of Vaitele St); there can be different ways of achieving the same objective (e.g. different options for an improved road connection between Apia to Faleolo Airport); projects can be complementary which means that they rely on each other to deliver their full benefits (e.g. local and international broadband links); and different projects can be so closely linked that investing in one means that another is no longer needed (or can be delayed). Many of the proposed projects had these types of dependencies. If the dependencies are weak or have already been resolved in previous studies, then the project is self-contained. Otherwise, the project concept requires further investigation in its broader network context (sector planning or options assessment studies) to ensure that it is implemented in a way that delivers best value for Samoa.

The outcome of the screening process was a set of self-contained projects and project concepts that align strongly with national goals and would deliver substantial community benefits. These projects comprise the Government's additional priorities in the economic infrastructure sector, but in all cases, detailed feasibility/economic/financial evaluation will be required to confirm their value-for-money before a final commitment to investment. The combination of ongoing projects and these additional priorities formed the basis for framing strategies for infrastructure sectors over the next five to ten years.

3.2 Priorities for each infrastructure sector

The Government's strategy for each sector is structured around one or more themes that reflect the goals and priorities of the SDS, and priority initiatives that support each theme. In particular, these themes and initiatives reflect the SDS emphasis on:

- Enhancing Quality of Life
- Supporting a Competitive Economy
- Enhancing Environmental Sustainability
- Building a Resilient and Robust Infrastructure System

The strategies are structured in a common format that describes:

- the current situation, outlining sector status and challenges, and projects already underway;
- the future, focusing on strategic directions and priorities for the next five years but also highlighting longer term needs and options; and
- a summary table for each strategic direction that lists ongoing projects and additional priority initiatives and investments for the next five years (with a reference code, such as E3 or W5, which provides a link to detailed project descriptions in Annex A); project costs; and key outcomes.

ENERGY

The current situation

Samoa has one of the highest levels of access to electricity in the region with around 95% of the population on-grid, and off-grid solar systems being progressively installed for the remaining 5%. But at the same time, the cost of electricity is high. In part, this is a result of Samoa's high level of reliance on diesel-powered generation (varying in the range of 60-70% with seasonal variation in hydro generation capacity) and high level of system losses (averaging around 18%).

Initiatives are underway in the energy sector to address these problems and upgrade the Samoa electricity network. These initiatives are centred on the Power Sector Expansion Project (PSEP), which is a large (T$260M) multi-component project that is already underway and extends to 2016 with financing from a consortium of ADB, AusAID and JICA. In particular, PSEP is supporting a long-term investment program in the electricity distribution system, and diesel and hydro generation. It is also supporting:

- a demand-side management strategy. Demand-side management involves measures to reduce consumption of electricity, such as use of energy-efficient light bulbs, appliances and equipment; turning off unnecessary lighting; and running air conditioners at a slightly higher temperature;
- development of clean energy resources through the establishment of a local Clean Energy Fund (CEF). The CEF is scheduled to commence operation in 2013, and will make small-medium grants (T$0.2-1.0M) to business, households or the community for renewable energy projects; and
- establishment of Samoa under the global Clean Development Mechanism (CDM). This will allow Samoa to participate in global emissions trading schemes.

In parallel with PSEP, EPC has a smaller ongoing investment program from its own resources (around T$2-5M per year), and is implementing a program to reinstate electricity infrastructure damaged in the 2009 tsunami and extend distribution to resettlement areas.

The future

The *Samoa National Energy Policy 2007* (SNEP) has the overarching goal "to increase the share and contribution of renewable energy in mass production and energy services and supply by 20% by year 2030". This sets an ambitious target for total national energy use which is also adopted by the SDS as the focus of the national strategic direction for the energy sector.

In support of this goal, the medium-longer term emphasis of planned projects in the energy sector shifts to reducing reliance on imported petroleum and a move towards greater energy self-sufficiency, in particular, by increasing the use of renewable energy sources (including hydro-electric) and related measures. The strategic direction for the energy sector is *Investing in Renewable Energy and Energy Efficiency*. A range of investigations and pilot studies are already underway to assess the feasibility of renewable energy sources, including solar, wind power, coconut oil, landfill gas and biomass gasification. This research will identify the

renewable energy sources that are cost-effective in terms of investment, operational and maintenance costs under Samoan conditions. Potential future investments may include:

- construction of around 5M KWH p.a. of on-grid solar energy installation within the next 3 years. Options include static photovoltaic and sun tracking technologies (T$50M);
- full-scale development of other renewable energy sources (wind power, coconut oil, landfill gas, small-scale biomass gasification), depending on the outcomes of research and technical and financial feasibility studies currently underway (T$50M); and
- in the longer term, the option of large-scale gasification of biomass (from sources such as leucaena and coconut oil production waste) is also being investigated.

In addition, from 2013, the Clean Energy Fund will assist users (business, households, community facilities) to participate in the conversion to a "clean" energy economy and potentially reduce their future electricity costs. The CEF will be seeded by Government payments, but if the pool of funds can be made larger, then the transition to use of renewable energy sources can progress more rapidly. So Government is actively encouraging development partners and other sources of funding to supplement its own contributions. Implementation of the demand-side management strategy components of PSEP will further help to reduce demand on the electricity generation system, and reduce (or at least delay) the need for future investment in diesel generators.

This combination of increased generation of electricity from renewable sources; increased efficiency of power generation and distribution; and more efficient use of electricity by consumers is the Government's number one priority for infrastructure in the energy sector.

Summary of energy sector priorities for the next five years

Strategic Direction:	**INVESTING IN RENEWABLE ENERGY AND ENERGY EFFICIENCY**	Est. Cost T$M
Ongoing Program:	▪ Continue to implement the *Samoa National Energy Policy* ▪ Continue electricity system investments through PSEP and EPC programs.	 270
Additional Priority Initiatives:	▪ Establish Clean Energy Fund (E4) and seek additional funds ▪ Large On-Grid Solar Generation (E5) ▪ Other Renewable Energy Implementation, dependent on outcome of research and feasibility studies currently underway (E6,7)	35.0 50.0 >50.0
Outcome:	Achieve national targets for renewable energy. Reduce reliance on imported diesel for electricity generation. Increased use of renewable energy sources. More stable and affordable energy prices.	

TELECOMMUNICATIONS

The current situation

In terms of access to basic telecommunications services, Samoa is well positioned. Mobile phone and internet services are already available throughout the country. There are more than 110,000 mobile phone customers and a further 15,000 landline connections. Competition and private sector involvement in the telecommunications sector has been a strong force driving these developments, with Digicel entering the market as the second mobile service operator in 2006 and the privatisation of SamoaTel in early 2011.

Quality of internet access is mixed. There is strong competition in the ISP (Internet Service Provider) market and fixed line and wireless broadband services are widely available in the Apia urban area. In 2009, Samoa connected to the American Samoa-Hawaii (ASH) undersea cable. This

significantly increased internet speed and bandwidth (the volume of internet traffic that the connection can handle), but the cost of internet access has remained high, in part because of the small subscriber base (around 3,000 connections and estimated 15,000 users). In rural areas, internet access is available but not at broadband speeds. A fibre-optic backbone ring around Upolu and covering part of Savai'i is already in place, but in many areas, the final broadband link to schools, homes and businesses is not yet connected. Internet traffic is currently doubling about every 2 years, but this growth rate is expected to accelerate as mobile phone-based internet applications become available.

The future

Telecommunications and especially the internet are expected to underpin Government goals for economic growth and employment creation. In particular, the SDS identifies improved domestic connectivity through use of internet, and improved international capacity through connections to regional submarine fibre-optic cable networks as key strategies. This sets the strategic direction for the telecoms sector.

Initiatives in both of these areas are already underway. The Government is currently considering options for upgrading the existing domestic network to create a National Broadband Network (NBN). This will facilitate measures to increase broadband access in rural areas through technologies such as WiMAX, and support the SchoolNet project already underway. Initiatives are also underway to establish a second undersea fibre-optic connection to international networks. The existing ASH cable connection is only a temporary solution. Compared to more modern cables, it is relatively slow and within the next 5-10 years, issues of reliability and available bandwidth are likely to become a constraint on growth and development of new internet-based community applications, local business opportunities, and Government services. Several options are available for a second international cable connection, including a spur line to the proposed *Pacific Fibre Cable* linking Australia, New Zealand and USA. Looking further into the future, the *National Strategic Plan for Information and Communication Technology* will be updated in 2011, and become a basis for longer-term development in the sector.

Another major challenge is ensuring reliable nationwide coverage by AM Radio. Although an old technology, AM Radio continues to play an important ongoing role in broadcasting news and information, and has a vital role in broadcasting weather reports and cyclone and tsunami warnings. It is a vital lifeline during times of natural disasters. The current transmitter at Mulinu'u in Apia is reaching the end of its useful life and is at a vulnerable seafront location. A location for a backup/replacement transmitter station has been identified at Nu'u on higher ground and land has been allocated. The next step is to construct the proposed AM radio facility at Nu'u.

Strategic Direction:	**IMPROVE DOMESTIC AND INTERNATIONAL CONNECTIVITY**	Est. Cost T$M
Ongoing Program:	Continued investment by the private sector and Government in telecoms technology and extending access to services	
Additional Priority Initiatives:	▪ Update the *National Strategic Plan for Information and Communication Technology* as a basis for long-term planning	0.5
	▪ Upgrade the National Broadband Network (T2)	30.0
	▪ Second International Fibre-Optic Cable (T4)	40.0
	▪ AM Radio Transmitter (T3)	6.0
Outcome:	Wider access to broadband internet. Ultimately reduce the cost of internet access. Long-term security of high quality internet access. Reliable AM radio available during natural disasters.	

WATER

The current situation

Some 97% of the Samoan population has access to improved water supply, from either the Samoa Water Authority (SWA) system or independent water schemes; and 89% of the population has access to improved sanitation facilities. So in terms of meeting the Millennium Development Goals and providing basic access to water and sanitation, the sector is performing well.

However, problems exist in the efficiency of water supply, and there are several major challenges facing the water sector. These are outlined in the sector plan *Water for Life: Sector Plan and Framework for Action* which provides a comprehensive overview of issues and programs underway and planned to address challenges in the water sector. Briefly, the challenges include:

- very high levels of water use (per capita) and lack of understanding of the *value* of water by many users;
- water treatment capacity is not adequate for current demand on the SWA system, and independent water schemes do not treat water. This contributes to historically high levels of water borne diseases;
- total water losses in the SWA system vary, but are mostly high. In some parts of the Apia water system, losses are up to 60%, which means that more than half of the water entering the system is lost. This compares to benchmark levels of 20-30% achieved by some developing countries in the Asia-Pacific region and 10% in developed countries[4]. Addressing these water losses is a very high priority for the Government because it is a major factor in many of the problems facing the water sector;
- important issues relating to disposal of grey water and septage (sludge pumped from septic tanks) are emerging in both urban and rural areas. Access to flush toilets is high (more than 80% in Apia urban area) and growing quickly, but treatment of waste is a problem. Surveys indicated more than 80% of tanks are not true septic facilities and could pose threats to public health as well as nearby groundwater or surface water;
- a central sewerage collection and treatment system is in place in central Apia, but the area covered by the system is small and does not currently extend to several key locations such as the Apia Hospital. Connection and ongoing use of the system is currently provided for free;
- drainage is inadequate, especially in central Apia. As well as direct water damage to property, other impacts include the spilling or overflowing of septic facilities which bring health risks due to exposure to raw sewage. The *Water for Life* sector plan concludes that improved drainage alone will not solve the problem. A holistic approach is required including long-term mitigation through flood-proofing measures, flood preparedness guidance, and more sustainable development of flood plains through cooperative approaches to land use management;
- in some locations, there are competing demands for water resources, for instance from hydro power and irrigation; and
- the 2009 tsunami damaged existing water supply systems and created demand for expansion of water supply to resettlement areas.

In the short-medium term, there are several ongoing projects addressing these challenges:

- the Water Sector Budget Support program is a sector-wide program assisting with the implementation of the *Water for Life* plan, with support from EU. It is a comprehensive program of investment, capacity building and budget support aimed at upgrading water supply infrastructure; reducing the high level of water leakage; and improving the technical, maintenance and financial performance of SWA. In addition to the general upgrading of the SWA urban and rural water supply systems, specific projects to be funded from the overall budget support program include:
  - upgrading and repair of independent water schemes (intakes, pipes, etc);

[4] Castalia (2006); ADB (2003) *Asian Water Supplies: Reaching the Urban Poor*.

- rehabilitation of the Apia Hospital sewerage system and public toilets to enable connection to the existing pressure sewerage system; and
- repair and expansion of the water supply system in tsunami affected areas.

- completion and monitoring of Stage 1 of the Samoa Sanitation and Drainage Project (SSDP), which includes construction of CBD central pressure sewerage system and drainage works in central Apia.
- preparation of a national sanitation master plan for improving water supply, sanitation and drainage in Apia. This plan, prepared with assistance from ADB, is expected to be completed in early 2011 and will contribute to the development of priority projects to improve water supply and sanitation services.

The future

After the completion of the Water Sector Budget Support in 2015, it is expected that the water system will be in good shape and SWA will be in a position to operate and finance the water system from its own resources. In the meantime, there are several additional priorities in terms of *Reliable, Affordable Water Supply* and *Improved Waste Water Management,* as follows:

- improving the Manono water supply, including options such as rehabilitation of the undersea connection to the mainland supply and supplementing the water supply with a solar-powered reverse-osmosis desalination plant (T$8.5M); and
- extension of the pressure sewerage system in central Apia and additional drainage works. A follow-up SSDP II project is already under preparation with assistance from ADB and is a priority for Government (T$43.0M).

Summary of water sector priorities for the next five years

Strategic Direction:	**RELIABLE, AFFORDABLE WATER SUPPLY**	Est. Cost T$M
Ongoing Program:	Continue to upgrade and better manage water supply systems under the Water Sector Budget Support program, including ▪ tsunami recovery (W1) ▪ upgrading of SWA water systems (W2) ▪ upgrade of independent water schemes (W3)	120
Additional Priority Initiatives:	▪ Improved water supply for Manono (W7)	8.5
Outcome:	Integrated water resource management. More efficient water supply system (reduced leaks). Greater access to clean, treated water.	

Strategic Direction:	**IMPROVED WASTE WATER MANAGEMENT**	Est. Cost T$M
Ongoing Program:	Continue investments to improve sanitation and drainage, especially in the Apia town area, including ▪ completion of the SSDP program (W4) ▪ rehabilitation of the Apia Hospital sewerage system and public toilets (W5)	5.0
Additional Priority Initiatives:	▪ Extension of the pressure sewerage system in central Apia; and additional drainage works (follow-up SSDP II project, W9)	43.0
Outcome:	Greater coverage of the sewerage system and improved sanitation. Improved drainage in the Apia town area.	

SOLID WASTE

The current situation

Household rubbish collection services operate throughout Samoa reaching 100% of households, and semi-aerobic landfill facilities are in place at Tafaigata (Upolu) and Vaiaata (Savai'i). This system and current collection arrangements are working well. A range of challenges are emerging:

- some areas are a long way from the landfill sites at Tafaigata and Vaiaata, which adds to the cost of waste disposal and can cause environmental problems as a result of local dumping of waste under less-controlled conditions;
- disposal of hazardous waste and septage (sludge pumped from septic tanks) is an ongoing problem throughout Samoa, with some illegal dumping occurring;
- current arrangements under which household rubbish collection service is funded from the MNRE budget and contracted out to the private sector have served the country well, but the cost is increasing; and
- recycling rates are low, in part due to lack of arrangements for regular collection from households.

Some of these problems will be alleviated by projects that are currently underway. Improved sewage sludge treatment pools are being developed at the Tafaigata and Vaiata landfills, with assistance under the Water Sector Support Program (WaSSP). Construction of the sludge treatment pools at Tafaigata is completed and expected to commence operation before the end of 2010. A project is also underway to upgrade solid waste management infrastructure (weighbridge, fencing etc) at the existing landfill sites, under a JICA regional program.

The future

Although current solid waste management arrangements are working well, to build on these successes there is a need for a strategic long-term sustainable approach to solid waste management. Accordingly, the strategic direction for this sector is *Sustainable Waste Management*.

The need for additional landfill sites in eastern Upolu and western Savai'i has been identified to reduce transport distances and pressure on existing sites. But at this stage, the optimal location, staging and management arrangements for these landfill sites is uncertain. Similarly, a strategic approach is required to best address issues such as sustainable financing for solid waste management (for instance through user-pays mechanisms); recycling; and disposal of hazardous waste and septage. These issues were examined in the *National Waste Management Strategy 2000-2010*, but it is now time to update this strategy.

The key priority for the solid waste sector is to firstly prepare an updated *National Waste Management Strategy*. Then, based on the recommendations of the strategy, to invest in additional or upgraded waste management facilities.

Strategic Direction:	**SUSTAINABLE WASTE MANAGEMENT**	Est. Cost T$M
Ongoing Program:	Consolidate operation of Tafaigata and Vaiata landfills	
Additional Priority Initiatives:	▪ Prepare a *National Waste Management Strategy 2011-2020*, and implement the recommendations. This roadmap should guide further development in terms of location, staging and management arrangements of landfill sites; and long-term sustainable financing for solid waste collection and management. ▪ Implement the priority recommendations of the updated *National Waste Management Strategy*. This is may include development of additional landfill sites in Upolu and Savai'i. (S3)	0.5 10.0
Outcome:	Improved management of waste and septage. Reduced illegal dumping and environmental impact. Long-term sustainable financing arrangements.	

ROADS

The current situation

Samoa has an extensive network of roads and a high level of road network density in inhabited areas[5]. This network provides good access links to communities in terms of connectivity, and is generally in good condition, with around two-thirds of the total network and all major roads paved. The Government has placed a strong emphasis on road maintenance and Samoa is a leader in the region in outsourcing road maintenance and developing local private sector maintenance and road construction capability. The challenges now facing the road sector include:

- increasing levels of car ownership and traffic, especially in the central Apia area;
- high levels of truck traffic on some roads, especially large multi-axle vehicles carrying shipping containers;
- lack of an effective and connected road hierarchy in urban Apia, which results in heavy trucks using narrow residential streets;
- lack of footpaths on most roads and generally poor facilities for pedestrians; and
- many roads are vulnerable to natural hazards (flooding, cyclone/tsunami damage) and become impassable, cutting off access to villages during periods of severe weather/natural disaster.

The Government is addressing some of these challenges through the Land Transport Authority (LTA) road maintenance and upgrading program, including completing the Convent St extension; rural access roads program; post-tsunami reconstruction and upgrading of access roads to resettlement areas; and through the ongoing World Bank-supported Samoa Infrastructure Asset Management program (SIAM2).

[5] Measured in terms of road length/square km of land area (Castalia 2006).

The future

The next step is to look beyond the current road maintenance and upgrading program towards longer-term needs, integrated under an updated *National Road Network Plan*. In particular, major initiatives proposed for the roads sector are:

- the Samoa Economic Corridor; and
- adapting the road network to be safer and continue to function effectively during periods of bad weather and natural disasters.

Samoa Economic Corridor (SEC)

The road corridor linking the Port of Apia to the commercial activities along Vaitele St, the Vaitele industrial area, and then to Faleolo Airport and the inter-island ferry terminal is the economic backbone of Samoa and a major artery for social travel. It provides access to many of our key economic and social activity nodes. In future, this key transport corridor may extend to Aliepata as it develops as a transport hub.

Vaitele St has been recently upgraded between Malifa and Lepea, but the remainder of the corridor is in mixed condition that is generally inadequate for its role. This initiative involves an integrated and phased development of this vital road corridor, and an improved link from Vaitele St to the Apia city centre via Fugalei St. It will extend the recently completed Vaitele Street upgrade to the west and east; and provide a by-pass of the Apia town centre for east-west traffic[6]. In addition it will provide much improved access to Apia Park and the Port of Apia and mean that trucks carrying containers will not need to use narrow residential streets. Proposed staging over the next 5-10 years is:

- Stage 1: upgrade and widen Vaitele St between Malifa and Lepea (already completed under SIAM2)

[6] Sections of the SEC with the Apia town area were evaluated in the *Apia Road Network and Traffic Management Study* (Beca 2003) and shown to deliver strong benefits.

- Stage 2: upgrade and widen Vaitele St between Lepea and Vailoa (estimated T$8.0m) and feasibility study for longer-term solutions for an improved road link to Faleolo Airport (T$1.0M)
- Stage 3: upgrade and widen Vaitele St between Vailoa and Vaitele (est. T$30m); and feasibility study for long-term solutions for an improved link from Vaitele St to Matafagatele St and the Port of Apia (T$1M)
- Stage 4: upgrade Fagelei St (T$20M)
- Stage 5: upgrade the Vaitele St link to Matafagatele St (T$30M) based on the results of the feasibility study
- Stage 6: major upgrade of road link from Apia to Faleolo Airport based on the results of the feasibility study (T$50-120M).

In the longer term, the option of further upgrading the corridor with a new direct road link from Vaiusu to Fugalei will also be investigated.

Strategic Direction:	**SAMOA ECONOMIC CORRIDOR**	Est. Cost T$M
Ongoing Program:	Staged development of the Vaitele St corridor with links to the Port of Apia; Apia town centre; the Vaitele industrial area; Faleolo Airport; and the inter-island ferry terminal.	
Additional Priority Initiatives:	▪ Upgrade and widen Vaitele St between Lepea and Vailoa (R4)	8.0
	▪ Upgrade and widen Vaitele St to Vaitele (R5)	30.0
	▪ Feasibility studies for extending the high quality road corridor to Faleolo Airport and the Port of Apia (R8,9)	2.0
	▪ Upgrade Fagelei St (R7)	20.0
Outcome:	Efficient linkages between major economic nodes. Capacity for traffic growth. Effective road hierarchy that separates through traffic from local access, and reduces truck traffic on residential streets.	

Safer and more resilient road network

This initiative involves packages of works to address specific problems at particular locations, with the aim of increasing the safety of the road network and its ability to continue to function effectively during periods of bad weather and natural disasters. Urgent and high priority investments include:

- local works to address vulnerable road sections and/or upgrading alternative routes to provide improved access in all weather conditions and in the aftermath of natural disasters, in particular
  - upgrades of existing fords/bridges (Sapalii, Maliolio, Sasina/Letui), roads (Vaia'ata Rd) and seawalls on Savai'I to reduce flooding risk and provide all-weather access (estimated T$20M);
  - upgrades to West Coast Rd to enhance its safety and climate resilience; and upgrade of existing fords (Lalomanu, Saleapaga, Lepa, Lotofaga, Vaipu) and seawalls on exposed road sections in south-east Upolu to reduce flooding risk and provide improved all-weather access (T$60M);
  - improve the safety of Aleisa Rd as an alternative all-weather route to Faleolo Airport (T$15M)
  - continue to upgrade and extend plantation access roads, also providing access to resettlement areas and escape routes in times of natural disaster (T$10M program)
- road safety works, especially improving safety for pedestrians on major roads linking to key activity centres (hospital, schools, etc) (T$6M program)[7] and for traffic on the Upolu Cross-island Road through Vailima (T$30M); and

In the longer term, this program will involve further safety works and connect "missing links" in the road network, such as the link from Saletele to Taelegaga.

[7] See *Greenhouse Gas Abatement Through Energy Efficiency and Biofuel Applications in the Land Transport Sector Project* (IPA 2010) for more details.

Strategic Direction:	**SAFE AND RESILIENT ROAD NETWORK**	Est. Cost T$M
Ongoing Program:	Packages of small local works to provide improved access in all weather conditions and in the aftermath of natural disasters; and improve the safety of the road network.	
Additional Priority Initiatives:	▪ All-weather roads program Savai'I (R10)	20.0
	▪ All weather roads program Upolu (R11)	60.0
	▪ Improve Aleisa Rd as an alternative route to Faleolo Airport (R6)	15.0
	▪ Rural access roads program (R12)	10.0
	▪ Install footpaths on major roads connecting to schools, hospital, etc. (R13)	6.0
	▪ Upgrade Cross-Island Rd through Vailima (R14)	30.0
Outcome:	Resilient road network. Safer roads, especially for pedestrians. Improved access.	

SEA PORTS

The current situation

The maritime sector plays an important role in the Samoa economy and community, supporting tourism; inter-island and international commerce; and inter-island travel for social, educational and medical needs. The Samoa maritime sector has set high standards and is widely regarded to be a leader in the maritime sector in the region. Fixed infrastructure is generally in good condition, appropriate for needs, and with capacity to absorb further growth; and the Samoa Ports Authority (SPA) and Samoa Shipping Corporation (SSC) are financially stable and comply with relevant international standards. Apia port has been assessed as "one of the best performing ports in the Pacific"[8].

The future

The next step is to build on this strong foundation of good port facilities and shipping standards. Future plans for the port sector can be divided into two groups:

- proposals relating to upgrading facilities for inter-island shipping; and
- upgrading port facilities for international shipping and commercial port services.

Safer and better inter-island ferry facilities

This initiative involves several projects aimed at upgrading the quality and safety of facilities for local inter-island travel by Samoans and visitors. Better inter-island access is a major focus area of the *Samoa Tourism Development Plan 2009-2013*.

Manono is an important tourist destination and home to many Samoans, but shore facilities (wharves, terminals) at Manono-tai and Manono-uta for travel by residents and visitors and for transfer of goods are basic and safety in rough seas is an ongoing problem. This initiative would upgrade facilities both on Manono and Upolu to provide safer and better access for ferries, tourist cruises and pleasure boats under a wide range of weather and tidal conditions.

The Government also supports renovating the inter-island passenger terminals at Malifanua and Salelologa. The arrival of the new Upolu-Savai'i inter-island ferry in 2010 has given this service a boost in terms quality and comfort, but the shore facilities for passengers are not of the same standard. Upgrading both terminals will support tourism development and complement the introduction of the new ferry by giving the whole Upolu-Savai'i inter-island ferry service a facelift.

[8] Castalia (2006) *The Pacific Infrastructure Challenge*. The World Bank.

Strategic Direction:	**SAFER AND BETTER INTER-ISLAND FERRY FACILITIES**	Est. Cost T$M
Ongoing Program:	Staged upgrading of port and terminal facilities for inter-island sea transport.	
Additional Priority Initiatives:	▪ Improve access to Manono (wharves and terminals) (P6)	6.0
	▪ Renovate the inter-island passenger terminals at Malifanua and Saleloga (P7)	2.0
Outcome:	Improved/safer access to Manono in all weather and tidal conditions. Improved quality of passenger facilities for inter-island travel. Improved image for the tourist market.	

Meeting international sea freight needs

International shipping includes large container ships, fuel tankers, cruise liners and smaller regional services, especially to American Samoa. These shipping service mostly use the same channels and shore facilities; may visit more than one port in Samoa; or may choose to visit one port over another. Therefore there are strong linkages between the different shipping markets and their demand for infrastructure at the various international ports, and related investment decisions. In addition, port infrastructure investments tend to be very large and have national significance, with single projects generally costing more than T$20M. This means that the international ports in Samoa should be considered as a single nationwide system, where investment in one port potentially affects the need for investment in another, and where efficiency of operation and investment should be optimised across the entire port system rather than separately at each port. This approach will best serve the national interest.

In the short-medium term, SPA has ambitious plans for its international ports. SPA is already committed to extending the existing container storage area at the Apia Port; and has proposals to upgrade port facilities for international shipping throughout the country, including extending cargo berths and deepening channels at Apia, Saleloga and Aliepata; and constructing a floating pier at Fagamalo to cater for small cruise ships. In November, Samoa Shipping Corporation (SSC) transferred the departure point of its services to American Samoa from Apia to Aliepata; and SSC is already establishing passenger and freight facilities at the port of Aliepata as part of this switch.

The existing port at Asau may also need upgrading in the future, but this is largely linked to the possible development of a fish processing plant (StarKist) at Asau. The proposal to upgrade the Port of Asau also has implications for other sectors (electricity, water, roads, airports) and is included under the Multi-Sector projects category. In the longer term (beyond 2015), construction of a new port at Palauli on Savai'i for tourist cruises, yachting, and as an alternative to Salelonga are also being considered. But this concept is in the early stages of development and will require detailed feasibility and environmental studies.

As noted above, international ports in Samoa are part of a linked nationwide system of ports. Rather than consider each of these proposed investments separately, this points to the need for a comprehensive *National Ports Plan* and staged development strategy covering all ports and facilities, with investments linked to forecasts of likely future patterns of demand and supported by solid business case analysis. Then investment decisions about specific ports and facilities can be placed in the context of the overall port system to deliver best value for money. A provisional amount of T$50-80M is included in this NISP, pending the results of the analysis.

However there is one problem that needs urgent attention and can be progressed in parallel with the development of a *National Ports Plan*. There is an ongoing navigation problem at the Port of Apia that SPA has identified as needing attention prior to further investment. During periods of bad weather, swells in the harbour affect docking of ships and limit container handling for several weeks each year. SPA is undertaking scientific and engineering studies to identify a cost-effective solution that could be implemented as soon as possible, for instance by reconfiguring breakwaters and channels to alleviate the problem. A provisional project costing of T$20M is included in this NISP, pending the results of these studies. An updated estimate of project cost and timing will be included in the next update of the NISP.

In addition to investments in channels and wharves, SPA is proposing to upgrade its equipment for maintenance dredging and channel deepening/widening, and upgrade the slipway at Aleipata to cater for larger vessels. These are commercial decisions for SPA that should be based on an assessment of options and strong business case, taking into account the findings of the *National Port Plan*.

Strategic Direction:	**MEETING INTERNATIONAL SEA FREIGHT NEEDS**	Est. Cost T$M
Ongoing Program:	Staged upgrading of international port facilities, linked to established future needs and business case.	
Additional Priority Initiatives:	▪ Prepare a *National Ports Plan* and implement the recommendations. In particular, this port development roadmap should guide further investment in terms of staging of port upgrades for international cargo shipping; and infrastructure priorities for serving the cruise ship market (in conjunction with the Samoa Tourism Authority). ▪ Reconfigure channels/breakwaters at Apia to reduce swell problem (P3) ▪ Investment programs based on the finding of the *National Ports Plan* (some of P5,8,10-12)	1.0 >20.0 50-80.0
Outcome:	More efficient nationwide system of ports. Better investment decisions.	

AIRPORTS

The current situation

Aviation also plays a vital role in the Samoan economy and community in terms of tourism; international commerce; and travel for social, educational and medical needs. The importance of the role played by Samoa's airports underpinning growth in tourism is highlighted in the *Samoa Tourism Development Plan 2009-2013*.

Overall, existing airport infrastructure is in good condition, meets relevant international standards, and can absorb further growth. All commercial airports in Samoa are owned and operated by the Samoa Airports Authority (SAA), except Fagali'i which is operated by Polynesian Airlines. The SAA has an ongoing program of investment focused on meeting safety and security compliance requirements in terms of fire and rescue capability, navigational aids, and airport facilities. This includes a program to progressively replace the runway lights; replace key navigational aids (DVOR-DME, NDB) with updated technology; and construct a new building at Faleolo for storing and marshalling air cargo. Improved facilities for air cargo is critical for developing exports of agricultural and fisheries products.

The future

The next step is to strengthen the role of airports in *Supporting International Air Travel and Trade*. This will involve continuing to upgrade fire and rescue capability, security and navigational aids at all airports to maintain compliance with increasingly stringent international requirements; and upgrading and reconfiguring the terminal building and facilities at Faleolo International Airport to improve its efficiency, provide better passenger and air cargo facilities; and project an improved image to the international tourism market.

Master planning for Faleolo International Airport is currently underway and is expected to be completed in early 2011. This will identify needs and refine plans for upgrading the airport terminal and other facilities at Faleolo, and define further investment needs for all airports over the next 10-20 years. A provisional amount of T$30-40M is included in this NISP for Faleolo terminal and apron improvements, pending the outcomes of the Master Plan. A refined medium-long term investment plan for airports will be included in the next update of the NISP. To maintain Category 9 safety rating and ICAO certification at Faleolo, a need has been identified to refurbish two fire tenders at an estimated cost of T$2M. Preferably this should happen within the next two years, and can be progressed independently of master planning for the airport.

In the medium-longer term, several large investments are foreshadowed for Faleolo:

- SAA has proposed a project to reconfigure the road alongside Faleolo airport as a 1.8km secondary runway for use if the main runway is damaged, for instance by cyclone, earthquake or tsunami. This would allow military and other smaller aircraft to land safely, for instance to deliver emergency supplies and other assistance.
- There is also a medium-longer term need to widen and seal the shoulders of the main runway at Faleolo to improve its safety as a designated alternate airport for use by airline services across the Pacific in emergency conditions.
- In addition, it is likely that the main runway itself and associated aprons and taxiways at Faleolo will require resurfacing within the next ten years to ensure safe operation and ongoing compliance, at an estimated total cost of around T$40M. Detailed testing of the runway condition, scheduled by SAA for the period 2011-2013, will provide an improved estimate of cost and required timing of the resurfacing. The results will be included in future updates of the NISP.

In addition, the existing airstrip at Asau may need upgrading, but again, this is linked to the possible development of a fish processing plant (StarKist) at Asau. There are also implications for other sectors (electricity, water, roads, airports), included under the Multi-Sector projects category.

In the longer term, construction of a new airport at Aliepata has been proposed as a possible alternative base for air services to American Samoa. However the concept is in the early stages of development and will require detailed technical and financial feasibility assessments and environmental studies. An early estimate of the cost of a new airport at Aliepata is in the range T$50-100M depending on the site and construction option.

Summary of aviation sector priorities for the next five years

Strategic Direction:	**SUPPORTING INTERNATIONAL AIR TRAVEL AND TRADE**	Est. Cost T$M
Ongoing Program:	▪ Complete SAA *Airports Master Plan* to provide a roadmap for airport investment over the next 10-20 years.	
	▪ Continue SAA investments in safety and security system to ensure ongoing compliance with international requirements.	10.0
Additional Priority Initiatives:	▪ Refurbish Fire Tenders (2 vehicles) (A4)	2.0
	▪ Upgrade Faleolo terminal and aprons based on the recommendations of the Master Plan (A5,6)	30-40.0
	▪ Secondary Runway at Faleolo (A7)	15.0
Outcome:	Compliance with international requirements. Improved passenger experience at Faleolo. Reduced vulnerability to natural disasters.	

MULTI-SECTOR

In addition to priorities for particular infrastructure sectors, there are infrastructure issues that cut across several sectors. In particular, these key issues are:

- climate change and disaster management initiatives;
- Government response to major developments (factories/resorts) and major construction projects, that have multi-sector infrastructure implications;
- maintenance and asset management; and
- infrastructure planning and project evaluation.

Climate change and disaster risk reduction

Environmental sustainability, climate change adaptation and disaster risk reduction are key Government goals and a foundation theme of the SDS.

These issues have implications for many economic infrastructure sectors; and many of the specific initiatives described already have significant climate change adaptation and disaster risk reduction outcomes, such as tsunami reconstruction programs, improved water resource management, all-weather roads programs, and projects to ensure continued airport operations under extreme conditions. But there are other initiatives that are difficult to categorise and/or extend across several sectors. In particular this includes:

- coastal and river protection, including seawalls and related measures. Coastal Infrastructure Management (CIM) Plans are already in place for all districts of Samoa. Each CIM Plan outlines local adaptation and infrastructure needs;
- infrastructure components of climate change adaptation programs in economic and social sectors; and
- early warning systems for tsunami and cyclone events.

MNRE is working closely with development partners, including GEF (Global Environment Fund) and PPCR (Pilot Program for Climate Resilience), on climate change adaptation, land management, and disaster risk reduction and response projects. It is a high priority for Government to continue to implement and expand these programs. An important infrastructure aspect of these programs is coastal and river protection through mechanisms such as seawalls. CIM Plans outline related infrastructure needs based on community consultation, but what is missing at this stage is a nationwide approach to identifying risk levels, prioritising investment in coastal protection works, and setting standards for seawall construction. The preparation of a *National Coastal Protection Strategy* is the next important step in the process. It will ensure that coastal protection works are directed at the most vulnerable areas so that homes and land are protected, and ensure that construction is undertaken to a high and consistent standard. A provisional amount of T$50M is included in this NISP for climate change adaptation investments, pending the outcomes of the *National Coastal Protection Strategy* and other adaptation and resilience studies aimed at identifying cost-effective priority investments.

The other Government priority for disaster management is the installation of an Early Warning System for broadcasting information to the community as quickly as possible when a disaster risk is identified. This could involve broadcasting warnings by multiple media, such as sirens and mobile phones. It would complement projects already underway to provide earlier detection of tsunami and cyclone risk.

Strategic Direction:	**CLIMATE CHANGE AND DISASTER RISK REDUCTION**	Est. Cost T$M
Ongoing Program:	Ongoing program in climate change adaptation and coastal protection	
Additional Priority Initiatives:	▪ Prepare a *National Coastal Protection Strategy* ▪ Climate change adaptation investments, based on the findings of the *National Coastal Protection Strategy* (M2) ▪ Disaster Early Warning System (M5)	0.5 50.0 10.0
Outcome:	Coordinated and staged program of coastal protection works targeting the most vulnerable locations first. Improved resilience to natural disasters.	

Major economic and infrastructure developments

As the Samoa economy grows and the country's participation in the international economy increases, new economic and employment opportunities are arising and these developments are getting larger and more complex. Recent examples include the possible relocation of StarKist fish processing operations to Asau, Savai'i and planned development of large resort/residential complexes at Sasina on Savai'i and Vavau on Upolu. Developments of this scale have complex infrastructure requirements that must be planned as early as possible and then addressed quickly when the go-ahead is confirmed. Government and SOEs must be ready to respond to these opportunities quickly and in a coordinated way. This leads to a strategic direction of *Streamlining Government Response to Major Projects*.

Strategic Direction:	**STREAMLINING GOVERNMENT RESPONSE TO MAJOR PROJECTS**	Est. Cost T$M
Ongoing Program:	Streamline government processes to enable a faster and more coordinated response to major economic development opportunities and infrastructure projects.	
Additional Priority Initiatives:	▪ Strengthen the role of MWTI as the lead agency for infrastructure coordination ▪ Investments as required when developments are confirmed [such as M3 StarKist (M3), M4 Sasina (M4)]	
Outcome:	Faster and more coordinated whole-of-government response. Reduced cost and improved commercial arrangements with infrastructure users.	

Each of these proposed developments is unique and has its own specific challenges, but there are initiatives that Government can take to be better prepared to respond to these opportunities when they arise. Government intends to strengthen the role of the Ministry of Works, Transport & Infrastructure (MWTI) as a focal point for coordinating the planning and delivery of multi-sector infrastructure projects. This initiative has the potential to result in a faster and better coordinated response to opportunities; reduced cost of delivery of infrastructure due to better coordination and reduced duplication; and a streamlined interface with the private sector. The scope of this role would also extend to facilitating major Government-initiated projects with multi-sector implications (such as road projects that have implications for power lines and water pipes); and infrastructure policy and planning. In particular, MWTI would be responsible for monitoring and updating the NISP; and implementing whole-of-government initiatives in areas such as asset management.

Maintenance and making better use of existing infrastructure

The Government recognises that in the past, insufficient attention has been given to maintenance and some Government and SOE-owned assets have deteriorated. This must change. Not only will improved asset management deliver better performance from existing infrastructure, it can also delay (or eliminate) the need for investment in expensive new infrastructure. Issues of strategic asset management and life cycle approach are discussed further in Chapter 4.

The Government intends to place a much greater emphasis on improved asset management as a key multi-sector strategy and establish asset management as a core function of Ministries and SOEs. In particular, this will involve preparing and implementing a *National Asset Management Policy* that provides a framework for a life cycle approach to better management of economic infrastructure by government and SOEs. This Policy will also provide specific guidance on development of asset management plans by agencies; improved transparency and consistency in the reporting of maintenance spending in corporate accounts; and sustainable financing of maintenance, through options such as earmarking a defined benchmark amount into a reserve account. For some sectors, this may involve setting targets for minimum levels of routine and periodic maintenance. The Government will work with Ministries and SOEs to put in place a *National Asset Management Policy* and associated asset management plans. These are considered to be critical tools for informing short-medium term and annual budget setting processes, and ensuring appropriate levels of funding is committed to maintaining key infrastructure assets. The Government will also work with SOEs to accelerate progress on improving SOE financial performance, as a way of strengthening their capacity to meet maintenance and investment needs.

Strategic asset management also includes reducing the demand for new assets through demand management techniques, improved efficiency of service delivery, and consideration of alternative service delivery options. Some simple changes can make a large difference. For instance, replacing household incandescent bulbs with compact fluorescent lights, upgrading streetlights to use either LED or dimming, and reducing the demand in large Government buildings with more energy efficient cooling, ventilation and

lighting systems have the potential to significant energy savings[9]. Likewise innovative approaches to service provision and pricing can reduce the need for investment in new infrastructure. Demand-side management and other non-infrastructure initiatives are already an integral part of the PSEP program and have potential across all sectors.

Strategic Direction:	**MAKING BETTER USE OF EXISTING INFRASTRUCTURE**	Est. Cost T$M
Ongoing Program:	Increased emphasis on maintenance and asset management as a core function of Government and economic infrastructure SOEs.	
Additional Priority Initiatives:	▪ Prepare and implement a *National Asset Management Policy*, which also includes analysis of options and guidance on options for financing of sustainable maintenance. ▪ Strengthen Sector and Project planning and evaluation guidelines to require that: - demand-side management is considered as an integral part of long-term strategic planning and an alternative to build/buy responses - innovative approaches and non-infrastructure solutions are considered as an alternative to build/buy responses.	0.5
Outcome:	Improved maintenance and asset management. Better value from existing infrastructure. Better understanding of life cycle costs. Reduced need for infrastructure investment.	

Improved planning and evaluation

Strengthening the role of MWTI as the lead agency for infrastructure coordination has already been proposed in this NISP as a positive step towards improved planning and coordination across all economic infrastructure sectors. There are several additional areas where performance can be improved.

For a start, it is a priority to complete sector plans for all economic infrastructure as soon as possible. Sector-wide planning has been adopted by Government as the cornerstone of its approach to improving the planning, management and delivery of services across all sectors, as outlined in the *Sector Planning Manual for Samoa* (2009). Sector Plans provide a detailed statement of sector performance, issues and opportunities, and sectoral development objectives, policies and strategies that support the SDS. Most infrastructure sectors do not have an up-to-date sector plan. This NISP includes planning studies (strategies, master plans) as priority initiatives for several sectors. These planning studies will feed into and accelerate the process of completing outstanding sector plans for all economic infrastructure.

The Government also plans to strengthen sector and project planning guidelines to place a greater emphasis on market-based forecasts of demand for use of infrastructure, for instance, future demand for water or ship arrivals and container handling. This will provide an improved basis for sector planning, project appraisal and business case preparation. Current sector planning guidelines include a review over the last 5-10 years, but do not specify a requirement for forecasting future demand. Sector plans should be strengthened to include base and alternative forecasts of demand.

Demand forecasts also play a fundamental role in assessing whether or not a specific investment provides value for money. The Government's *Manual on Project Planning and Programming* (2009) emphasises the need for a systematic approach to matching supply of infrastructure with likely demand for use of the infrastructure; but in many cases, project proposals are not backed up by reliable demand forecasts.

This will form part of an overall strengthening of the project preparation, evaluation and business case process. At present, some infrastructure investment proposals are not backed by the depth of economic and financial analysis required to determine whether the investment is value-for-money and provides the best solution to the infrastructure service requirement. The

[9] World Bank (2010) *Tonga Energy Road Map 2010-2020* estimated savings of up to 4.5% of national electricity consumption.

Government will work with Ministries and SOEs to strengthen their capacity to evaluate the feasibility of proposed infrastructure investments and prepare a business case for Government or Board consideration. This will be a significant step towards more informed decision making and better allocation of resources.

Strategic Direction:	**IMPROVED PLANNING AND EVALUATION**	Est. Cost T$M
Ongoing Program:	Strengthen project planning and evaluation guidelines and capacity.	
Additional Priority Initiatives:	▪ Complete all outstanding sector plans for economic infrastructure as soon as possible ▪ Establish market-based forecasts of demand for use of the infrastructure, as a basis for sector planning, improved project appraisal and business case preparation ▪ Strengthen the capacity of Government and infrastructure managers to prepare and evaluate the business case for proposed infrastructure investments	1.0
Outcome:	Improved sector planning and analysis of investment proposals. Better informed decision making.	

3.3 An integrated development strategy

The NISP is an integrated program of ongoing projects, priority investments and complementary initiatives that is tightly integrated with the goals of the SDS. The table at right highlights the alignment between the key strategic directions of the NISP and the key SDS themes of quality of life; private-sector led economic growth; environmental sustainability; resilience and disaster risk reduction; and improved governance. The table links NISP strategic directions and SDS goals with

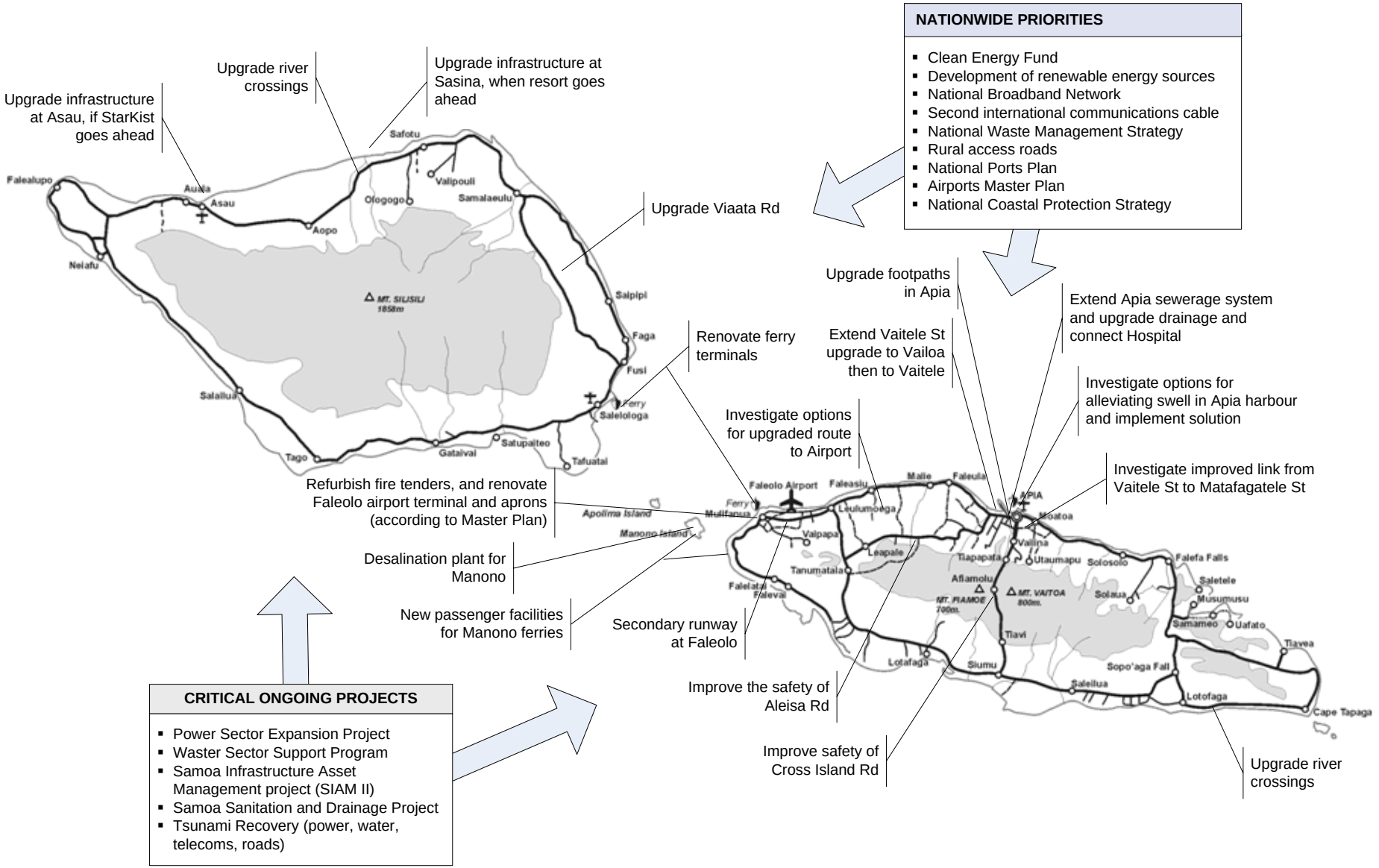
- ● indicating that the NISP strategic direction will make a strong and direct contribution to achieving the SDS objective; and
- ○ indicating a significant but indirect linkage.

NISP is also a nationwide program that contributes to improving infrastructure services and quality of life throughout Samoa. The distribution of ongoing and priority investments is shown in Figure 3.1.

If all of these priorities are implemented, it would involve investment of some T$430M in ongoing projects and T$590M in new investments over the next five years, and an additional T$130M in the period 2016-2020. Cost details and preferred timing of initiatives that make up the priority program are tabulated in Appendix A in the NISP Summary Strategy Matrix, and funding issues are discussed in Chapter 5.

ALIGNMENT OF NISP THEMES WITH SDS GOALS	Quality of Life	Economic Growth	Sustainability	Resilience	Governance
ENERGY					
Investing in renewable energy	○	●	●	○	
More efficient use of energy	○	○	●		
TELECOMMUNICATIONS					
Improve domestic & international connectivity	●	●		○	
WATER					
Reliable, affordable water supply	●	●	○		
Improved waste water management	●	○	●	○	
SOLID WASTE					
Sustainable waste management	○	○	●		
ROADS					
Samoa Economic Corridor	○	●	○	○	
Safe and resilient road network	○	○		●	
SEA PORTS					
Meeting international sea freight needs		●		○	
Safer and better inter-island ferry facilities	●	●		○	
AIRPORTS					
Supporting international air travel and trade	●	●		○	
MULTI-SECTOR					
Climate change and disaster risk reduction	○	○	●	●	
Streamlining Government responses		○		○	●
Making better use of existing infrastructure	○	●	○	○	●
Improved planning and evaluation	○	○	○	○	●

Figure 3.1 Infrastructure priorities for next 5 years



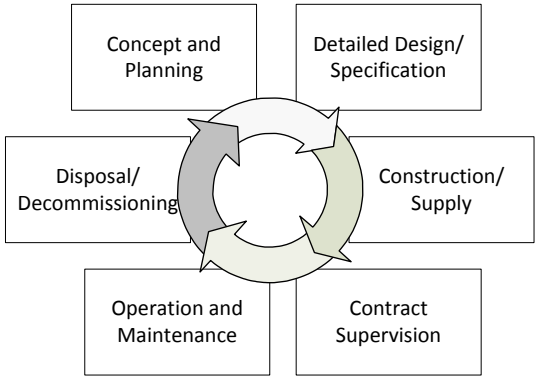
4. MANAGING THE INFRASTRUCTURE

The priority themes set the direction for infrastructure development in Samoa and are the core of the NISP, but they are only part of the story. Samoa also faces challenges to fund the planned infrastructure improvements, and to better manage and maintain new and existing infrastructure. This section of the NISP focuses on the broader issues of infrastructure asset management and maintenance.

4.1 Maintenance and asset management and maintenance

The purchase or construction of an infrastructure asset is just one step in the life cycle of an asset that extends from the initial identification of needs through to disposal of the asset at the end of its useful life.

Figure 4.1 The asset life cycle



All of these steps require planning and coordination and involve costs and time:

- the cost and time involved in planning investigations, development of the design concept, and associated studies such as environmental impact assessment;
- the cost and time required for preparing detailed designs and/or specifications and the cost of preparing contract documentation;
- the construction/supply cost of the infrastructure, plus allowance for contingencies and cost escalation. For a major infrastructure project, the combined duration of planning, detailed design/specification, contracting and delivery can amount to several years;
- the cost of supervising the contract (technical, financial, legal) to ensure that the work is done to the required standard and in compliance with contracts;
- the cost of operating the infrastructure (such as labour, energy costs and consumables);
- the cost of maintaining the infrastructure over its entire operating life to keep it in good condition. This includes routine maintenance (small-scale activities undertaken regularly as general upkeep against normal wear and tear) and periodic maintenance (larger scale activities carried out at longer intervals to sustain the infrastructure condition or operational status). Both types of maintenance are critical for ensuring that infrastructure is kept in good condition and is delivering efficient services. The economic life over which infrastructure is operated and maintained can range from around 5-10 years for some equipment up to 100 years for major civil works; and
- the cost of disposal which can include the cost of decommissioning the asset, demolishing/ removing it from the current location, and disposing of the waste. This can involve a range of environmental costs associated with disposal. The unused infrastructure should not be just left in place to decay and potentially pollute its surroundings.

This means that the total cost of owning an infrastructure asset is the sum of all of these life cycle costs and will generally be much higher than the initial construction/ purchase cost. The typical breakdown of life cycle costs of infrastructure is summarised in Table 4.1 along with some benchmarks for the typical contribution of each cost component. The figures demonstrate

that up-front costs (planning, design/specification, contract management) can add 10-20% to the cost of projects before operation commences, and when combined with ongoing maintenance and contingencies for cost escalation, the total 20 year life cycle cost of major infrastructure can be up to double the initial construction/purchase cost. On the other hand, in some cases lower operating costs of upgraded infrastructure can offset a higher initial purchase price and produce a lower life-cycle cost. This highlights the need to consider full life cycle costing in infrastructure decision making and make provision for maintenance in annual and medium-term budgeting.

Table 4.1 Indicative analysis of life cycle costs

Stage	Rate [a]	Construct/ Supply Only	+ Other Up-front	20 year Mainte-nance
Concept development & planning	2-5%		$2-5	
Detailed design & documentation	5-10%		$5-10	
Infrastructure construction/supply		$100	$100	
Contingency/escalation	10%		$10	
Contract supervision	5%		$5	
Operating cost	variable			
Maintenance – routine [b]	0-5%			$0-100
Maintenance – periodic [c]	5-10%			$10-20
Disposal/decommissioning	variable			
TOTAL		$100	$120-130	$10-120

Notes: a. Based on typical infrastructure costing parameters.
b. Varies from minimal routine/periodic maintenance for buried infrastructure (such as water pipes) up to 5% per year for routine and 10% periodic maintenance for gravel roads.
c. Based on 20 year asset life with periodic maintenance every 7 years.

The Government recognises the importance of maintenance and life cycle costing and that, in the past, insufficient attention has been given to maintenance and some Government and SOE-owned assets have deteriorated. The Government is committed to improving the delivery and funding of routine and periodic maintenance by Ministries and SOEs.

4.2 Strategic asset management

At present, there is no consistent policy framework for asset management across Government and SOEs. The concept of *strategic asset management* encompasses a life cycle approach and provides a framework for guiding the acquisition, use and disposal of assets to make the most of their service delivery potential and manage costs over their entire life.

Principles of Strategic Asset Management[10]

- achieving greater value for money through a rigorous project planning and evaluation process which takes into account life cycle costing and potential for private sector involvement;
- focusing attention on results by clearly assigning responsibility, accountability and reporting requirements in relation to asset management;
- reducing the demand for new assets through demand management techniques, improved efficiency of service delivery, and consideration of alternative service delivery options;
- maximising the performance of existing assets by ensuring that they are appropriately used and maintained; and
- eliminating unnecessary acquisition and holding of assets by ensuring agencies are aware of (and required to pay for) the full costs of holding and using assets.

[10] Adapted from DTF (2004) *Developing Strategic Asset Management Plans*, Department of Treasury and Finance, Government of Tasmania.

The principles of strategic asset management and the infrastructure asset life cycle provide a strong foundation for better management of infrastructure in Samoa. The Government intends to promote these principles as a framework for an improved approach to infrastructure management by Ministries and SOEs. As noted above, the first step will be to develop and implement a *National Asset Management Policy* that establishes asset management as a core function of agencies and provides guidelines on specific issues including development of asset management plans; improved transparency and consistency in the reporting of maintenance spending; and mechanisms for sustainable funding of maintenance. At the same time, the Government will strengthen its project planning and evaluation processes to take greater account of full life cycle costing in investment decisions.

4.3 Maintenance implications of the NISP priority program

If all of the ongoing and proposed projects go ahead over the next five years, the total capital cost of projects would be around T$1B. This increase in infrastructure assets has the potential to add substantially to the overall cost of maintenance, because as shown in Table 4.1, each T$1M of initial capital investments adds, on average, around T$30,000 to the annual maintenance bill. But not all of this is "new" maintenance. Much of the ongoing and proposed projects upgrade existing infrastructure or could be considered to be deferred maintenance. These projects that repair/replace/upgrade existing infrastructure may conversely lead to a short/medium-term decrease in required maintenance spending (assuming that the maintenance of the old infrastructure was funded). This means that the net effect of the ongoing and proposed investments on total maintenance cost is considerably lower than may be expected.

It is estimated that projects that add new infrastructure to the national stock would require around T$10-11M in annual maintenance spending by 2015. This means that if sustainable maintenance funding arrangements are put in place in conjunction with NISP projects, the net effect of implementing all ongoing and proposed projects is to add around T$10-11M per year to the national maintenance bill. This point to the need for Government to work with SOEs to ensure that adequate funding arrangements are in place for existing maintenance requirements and for the maintenance needs of new infrastructure.

The Government's commitment to put in place a *National Asset Management Policy* is a significant step towards improving the maintenance performance of Government and SOEs and establishing improved mechanisms for financing sustainable maintenance. The Government will also work with SOEs to accelerate progress on improving their financial performance. Organisations with weak financial performance generally also have the biggest gap between current spending and the level required to sustainably maintain their infrastructure assets. This is not surprising and is observed worldwide because maintenance is often viewed as an optional and non-urgent activity with a lower priority than immediate operational concerns. It means that one of the most effective ways to close the gap between current maintenance spending and long-term sustainable requirement is to strengthen the financial performance of the organisation.

5. FUNDING STRATEGY

This NISP outlines the Government's strategic directions for major infrastructure development over the next 5-10 years, and a set of proposed initiatives for the next 5 years. If all of these priority initiatives proceed over the next 5 years, total investment would be some T$1,020M, comprising T$430M in ongoing projects and around T$590M in proposed projects (excluding StarKist, Sasina). Funding for ongoing projects is already committed, and discussions are underway regarding funding for several proposed projects, including SIAM2 additional finance, SSDP II, Broadband network, undersea cable, and large on-grid solar power generation. But there remains a large financing gap.

The challenge for Government is to work with SOEs, the private sector and development partners to put in place sustainable funding arrangements so that as many as possible of the priority initiatives can proceed over the next 5 years. This will involve identifying sustainable capital and maintenance funding mechanisms suitable for each proposed initiative.

5.1 Financing options and sustainability

A range of options are available for infrastructure financing. These include:

- Public financing
  - Government Budget (revenue, cost recovery, dividends from SOEs)
  - SOE internal finance (cost recovery)
  - Government's external relationships (grants, concessional loans, non-concessional loans)
- Commercial financing
  - loans raised by government or SOEs from private financial institutions
  - direct investment in SOEs by IFC (or similar)
  - joint ventures or private direct investment

The current outlook for public financing of infrastructure is mixed. The Government Budget position is weak but is expected to recover slowly as Samoa recovers from the tsunami and Global Financial Crisis. The Budget deficit is forecast to peak in 2010/11 but will continue to be in deficit until at least 2012/13, and remain outside the target range of -3.5% to +3.5% of GDP. This constrains the capacity of Government to make capital investments in economic infrastructure from the budget. However over the medium-longer term, financial reforms put in place by Government under the Public Financial Management program are expected to deliver an increasing capacity to self-fund major capital investments. Dividends from SOEs are another potential source of investment funds but total dividends paid by SOEs managing economic infrastructure is expected to be less than T$1 million per year after the sale of SamoaTel.

Following reforms put in place over the last decade, almost all economic infrastructure is now under the management of SOEs. The capacity of SOEs to fund infrastructure investment varies. As part of the NISP process, an assessment was made of the financial strength and cost recovery of SOEs and their capacity to fund infrastructure at different levels, taking into account historical performance and the likely impact of projects underway (such as PSEP and Water Sector Budget Support program). The results are shown in Table 5.1 along with an assessment of Government capacity to fund investment in sectors where it still has a direct role. This analysis is discussed in more detail in Annex D.

In general, SOEs have the capacity to fund operations, maintenance and small capital from operating cashflow, but would struggle to self-finance large capital investment required to replace/upgrade the largest item of infrastructure that they manage (such as a dam, airport runway, shipping container berth) or to transform the sector technology (such as undersea communications cable, or large scale renewable energy projects). In this case, other funding mechanisms would be required, such as grants or concessional loans from development partners with Government guarantee. For those SOEs with financial capacity to support additional borrowings, concessional loans channelled through the Government are a cost-effective financing option.

The Government external debt as a percentage of GDP is currently above the budget target of less than 40% of GDP, and is expected to continue to rise to 2012/13 and then reduce. Another perspective on Government capacity to fund infrastructure investment is provided by the 2010 International Monetary Fund (IMF) Article IV consultation and debt sustainability assessment for Samoa. IMF uses the ratio of the Present Value (PV) of debt to GDP as a key indicator (less than 50% is considered sustainable). IMF forecasts that the PV ratio to 2030 would not be above 40%, however in some years, the share of the annual value of debt to GDP would rise above 50% even with concessional loans. The IMF concluded that Samoa has scope for further borrowing but advised the Government of Samoa to continue to focus on grants and concessional loans from development partners.

Table 5.1 Capacity of agencies to self-fund infrastructure costs

Sector	Agency	Opera-tions	Mainten-ance	Small CAPEX	Medium CAPEX	Large CAPEX
Energy	Electric Power Corporation	High	High	High	High	Medium
Telecoms	Telecommunications Industry	High	High	High	High	Medium
Water	Samoa Water Authority	High	High	High	Medium	Low
Waste	Government of Samoa	High	High	High	Medium	Low
Transport	Land Transport Authority	High	High	High	Medium	Low
	Samoa Airports Authority	High	High	High	Medium	Low
	Samoa Ports Authority	High	High	High	High	Low

Loan funding of economic infrastructure from local and offshore commercial sources is another option. SOEs are small users of local commercial financing and Samoa has a credit rating which provides entry to the external capital market. However, this is a relatively expensive source of funds, and commercial loans are expected to remain a small component of the overall infrastructure financing picture. But this does not prevent increased private sector involvement in the infrastructure sector.

5.2 Private sector involvement

Increased private sector leadership in economic development is a cornerstone of the SDS. However, the government remains committed to its basic policy position, which is "that enterprises with highly significant strategic, security or social importance should remain in public ownership." All of the SOEs in the economic infrastructure sector (EPC, SWA, LTA, SAA, SPA, SSC) fall into this category. Therefore the government has no plans for further privatisation in the economic infrastructure sector at this stage.

There are other opportunities for private sector participation. Samoa is a leader in the region in outsourcing infrastructure construction and operational activities to the private sector, especially in the roads sector. The Government intends to engage further with the private sector and continue the successful reform processes already started, especially by encouraging further outsourcing of selected government and SOE functions to the private sector. This will involve maximising competition and regulating where necessary. Opportunities for expansion of private sector involvement in the infrastructure sector, in particular, include management of the Apia sewerage system; further outsourcing of solid waste collection and management activities under the *Waste Management Act 2010*; and electricity generation. The *Electricity Act 2010* has established a new framework for competition and regulation in the energy sector. It opened the way for participation of the private sector in electricity generation, for instance the development of large-scale on-grid solar power.

5.3 Summary of funding strategy

The NISP funding strategy needs to address financing requirements for three basic infrastructure activities: maintenance, complementary activities (such as planning studies and reform initiatives), and priority investments. Analysis of the infrastructure funding situation and funding options indicates that:

- funding for almost half of the NISP investments is already committed under ongoing programs, and discussions are underway with development partners regarding funding for several proposed major projects;
- SOEs and Government have the capacity to fund the cost of infrastructure operations and maintenance from their own resources and are improving their performance. Government policy is that the cost of operations and maintenance of economic infrastructure should be funded from user charges wherever possible. This provides SOEs with the resources to sustainably maintain and operate infrastructure investments, and also ensures that users pay in accordance with the volume and type of services that they use. The Government intends to work closely with SOEs, the private sector, and development partners to lift the overall performance of the economic infrastructure sector, and as a minimum, achieve self-funding of operations, sustainable maintenance and small infrastructure investment by Government and SOEs. This sets the foundation for further investment in developing economic infrastructure and is considered achievable, building on the ongoing improvements from PSEP, Water Sector Budget Support program, etc;
- the Government Budget position is currently weak, but expected to pick up over the next few years. Over the next 5 years, the capacity of Government to budget-fund medium-larger capital investment in economic infrastructure is small, and dividends from SOEs are not a significant source of revenue. However, over the medium-longer term, financial reforms put in place by Government are expected to deliver an increasing capacity to self-fund major capital investments;
- local or offshore commercial financing of economic infrastructure is an option but is likely to be a small component of overall financing;
- recent reforms have created opportunities for private sector investment in infrastructure, especially in areas such as electricity generation and solid waste management;
- Government has capacity for further borrowing but needs to be careful not to exceed debt sustainability thresholds. IMF has recommended a focus on grants and concessional loans in dealing with development partners;
- The capacity of SOEs to finance infrastructure from internal sources varies. They generally have the capacity to self-fund small to medium infrastructure investment, but borrowing would be required to replace/rehabilitate major infrastructure items. For those SOEs with the financial capacity to support additional borrowings, concessional loan channelled through Government is a cost-effective financing option.

This means that a combination of financing mechanisms will be required to enable as much as possible of the priority initiatives to be delivered over the next five years, with funding mechanisms matched to the characteristics of specific projects. Appendix 2 provides an assessment of the current suitability of different financing sources for priority new investments, maintenance, and complementary activities. In summary and bearing in mind current economic and budgetary conditions in Samoa, the key elements of the strategy for funding the NISP priority program are:

- funding operations and maintenance, and increasingly an ability to fund small infrastructure investments, from internal sources. The Government intends to work closely with SOEs, the private sector, and development partners to achieve, as a minimum, self-funding of operations, sustainable maintenance and small infrastructure investment by Government and SOEs;

- seeking the assistance of development partners to fund complementary activities, especially technical assistance for planning studies and reform initiatives; and
- working with SOEs and development partners to help fund medium-large infrastructure investment with the assistance of concessional loans, or grants where possible. Over the medium-longer term, financial reforms put in place by Government are expected to deliver an increasing capacity to self-fund major capital investments.

APPENDICES

Appendix 1: NISP Summary Strategy Matrix

Sector	Major Ongoing Projects	T$M	Additional Priorities (next 5 years)	T$M	Preferred Timing 2011 - 2015	Preferred Timing 2016-2020	Responsible Agency
ENERGY							
	E1 Power Sector Expansion Project	$287			■	⇔	EPC
	E2 EPC Investment Program	$30			■	⇔	EPC
			E4 Clean Energy Fund	$70		⇔	MOF
			E5 Large On-Grid Solar Generation	$50	■		EPC/MOF
			E6 Other Renewable Energy Implementation	$50	■	⇔	MOF
TELECOMS							
			TA Update *National Strategic Plan for ICT*	$0.5	■		MCIT
			T2 Upgrade National Broadband Network (T2)	$30	■		MCIT
			T3 AM Radio Transmitter (T3)	$6	■		MCIT
			T4 Second International Fibre-Optic Cable (T4)	$40	■		MCIT
WATER							
	W2 Water Sector Budget Support program	$90			■		SWA
	W3 Upgrade of Independent water schemes	$12			■		IWSA
	W4 Samoa Sanitation and Drainage Project (SSDP)	$35			■		SWA

Sector	Major Ongoing Projects	T$M	Additional Priorities (next 5 years)	T$M	Preferred Timing 2011 - 2015	Preferred Timing 2016-2020	Responsible Agency
WATER	W5 Connect Apia Hospital to the sewerage system	$3.5					SWA
			W7 Improved water supply for Manono (desalination)	$8.5			SWA
			W9 SSDP Stage II	$43		⇔	SWA
			TOTAL	$55			
WASTE							
			TA Prepare *National Waste Management Strategy*	$0.5			MNRE
			S3 Additional land fill facilities (Upolu, Savaii)	$10			MNRE
			TOTAL	$10.5			
ROADS							
	R1 Samoa Infrastructure Asset Management (SIAM2)	$93					LTA
			R4 Upgrade of Vaitele St between Lepea and Vailoa	$8			LTA
			TA Feasibility study for Apia-Faoleolo corridor	$1.0			LTA
			R5 Upgrade of Vaitele St to Vaitele	$30			LTA
			R7 Upgrade Fagelei St	$20			LTA
			TA Feasibility study for Vaitele St to Port corridor	$1.0			LTA
			R10 All-weather Roads Program – Savai'i	$20			LTA
			R6 Upgrade Aleisa Rd	$15			LTA
			R11 All-weather Roads Program – Upolu	$60			LTA

Sector	Major Ongoing Projects	T$M	Additional Priorities (next 5 years)	T$M	Preferred Timing 2011 - 2015	Preferred Timing 2016-2020	Responsible Agency
ROADS			R12 Rural Access Roads program	$10		⇔	LTA
			R13 Program of new Footpaths	$6			LTA
			R14 Upgrade Upolu Cross-island Road through Vailima	$30			LTA
SEA PORTS							
	P1 Passenger and Freight Facilities at Aliepata	$1.5					SSC
	P2 Extend Container Park at Port of Apia	$5.0					SPA
			P3 Reconfigure channels/breakwaters at Apia	over $20			SPA
			TA Prepare a *National Ports Plan*	$1.0			SPA
			Implementation of *National Ports Plan*	$50-80		⇔	SPA
			P6 Improve access to Manono (wharves, terminals)	$6			SPA
			P7 Renovate the inter-island passenger terminals	$2			SPA
AIRPORTS							
	A1,2 Upgrade Navigational Aids	$6.5					SAA
	TA Airport Master Plan	N.A.					SAA
			A4 Refurbish Fire Tenders (2 vehicles)	$2			SAA
			A5,6 Upgrade Faleolo terminal based on Master Plan	$30-40			SAA
			A7 Secondary Runway at Faleolo	$15			SAA

Sector	Major Ongoing Projects	T$M	Additional Priorities (next 5 years)	T$M	Preferred Timing 2011 - 2015	2016-2020	Responsible Agency
MULTI							
			TA Prepare *National Coastal Protection Strategy*	$0.5			MNRE
			M2 Climate Change Adaptation Projects	$50		⇔	MNRE
			M5 Disaster Early Warning System	$10.0			MNRE
			Infrastructure for Major Industry/Tourism projects	N.A.			All
			TA Prepare *National Asset Management Policy*	$0.5			MOF/MWTI
			TA Prepare outstanding sector plans (Transport)	$1.0			MWTI

Appendix 2: Suitable Sources of Finance by Activity

Project	Internal Finance	Budget	Development Partners			Commercial Finance	Private Sector Investment
			Grant	Concess-ional Loan	Ordinary Loan		
1. Maintenance	●	○	○	○	○	○	○
2. Complementary Activities	○	◔	●	○	○	○	○
3. Priority Projects							
E4 Clean Energy Fund	◔	○	●	◔	○	○	○
E5 On-Grid Solar Generation	◑	○	●	◔	○	○	●
E6/7 Other Renewable Energy	◔	○	●	◔	○	○	◕
T2 National Broadband Network	◔	◔	◔	●	○	○	◑
T3 AM Radio Transmission	◔	◑	●	◑	○	○	○
T4 Second International Cable	◑	◑	◑	●	◑	○	◕
W5 Hospital Sewer System	◔	○	●	●	○	○	○
W7 Desalination Plant for Manono	◔	○	●	◑	○	○	○
W9 SSDP follow-up	◔	○	○	●	○	○	○
S3 Additional Landfills	◔	◑	●	◑	○	○	◔
R4 Vaitele St – to Vailoa	◔	◔	◑	●	○	○	○
R5 Vaitele St – to Vaitele	◔	◔	◑	●	○	○	○
R6 Upgrade Aleisa Rd	◔	◔	◑	●	○	○	○
R7 Upgrade Fugalei St	◔	◔	◑	●	○	○	○
R10 All-weather Roads – Savai'i	○	◔	●	●	○	○	○
R11 All-weather Roads – Upolu	○	◔	●	●	○	○	○
R12 Rural Access Roads	○	◑	●	●	○	○	○

LEGEND

- ○ Not a realistic option or not applicable
- ◔ Low likelihood of financing interest
- ◑ Average likelihood of financing interest
- ◕ Strong likelihood of financing interest
- ● Very Strong likelihood of financing interest

Project	Internal Finance	Budget	Development Partners			Commercial Finance	Private Sector Investment
			Grant	Concess-ional Loan	Ordinary Loan		
R13 Footpaths	○	○	●	●	○	○	○
R14 Cross-island Rd through Vailima	○	◔	◑	●	○	○	○
P3 Reconfigure Apia port channels/breakwaters	◔	○	●	◑	○	○	○
P6 Manono Wharves and Terminals	◔	◔	●	◕	○	○	○
P7 Inter-island Ferry terminals	◔	○	●	◕	○	○	○
P+ International port investment program	◔	◔	◑	●	◑	◔	○
A4 Refurbish fire trucks	◑	○	◑	●	○	◔	○
A5,6 Faleolo Terminal Upgrade	◔	○	◑	●	○	○	◔
A7 Secondary Runway at Faleolo	◔	◔	◑	●	○	○	○
A8 Widen/seal Runway Shoulders at Faleolo	◔	○	◑	●	○	○	○
M2 Climate Change Adaptation projects	○	○	●	◑	○	○	○
M5 Disaster Early Warning System	◔	◔	◕	◑	○	○	○

ANNEXES

ANNEX A: SUMMARY OF PROJECT DETAILS

The following Tables provide a summary of ongoing, pipeline and proposed infrastructure projects. The projects were developed through a process of consultation with infrastructure managers (Ministries, SOEs) and users (community and private sector) that identified a long list of ideas for infrastructure projects and related initiatives that address current deficiencies and emerging infrastructure needs. These project ideas were then refined in discussions with infrastructure managers to ensure that the project objectives, concept and likely cost were clearly identified. The process generated a long list of around 45 ideas for improving the infrastructure system, as described below. This long list was a key input to the process of identifying priority projects (see Annex C) and developing the NISP strategic directions as described in the Main Report.

The following information is provided for each of the projects:

- Project Name – a short descriptive title for the project.
- Implementing Agency – the Government agency or Public Enterprise that is most responsible for delivering the project.
- Project Cost – estimated cost in WST (T$) million. For most projects, this is an estimate for planning purposes and is not a firm cost based on detailed design/specification.
- Start – the year that the project is planned to start (preferred start year if funding is available).
- Finish – the year that the project is expected to be completed and operational.
- Status – the stage that the project has reached, classified as:
  - *Underway*: work has already started on implementation;
  - *Committed*: funding has already been identified and agreed for the investment and there is a high probability that it will proceed, but the timing may change; or
  - *Proposed*: these are planned investments for which funding has not been confirmed and timing is not certain. Some are at an early stage of planning and development without fully defined components.
- Funding Source – the expected source of funding for the project, and if it involves development partners (DP) or a Global Fund (such as GEF, PPCR), which partner/fund and the status of the funding commitment (*Confirmed* or *Under discussion*). For many projects, the need has been identified and preliminary planning undertaken, but the source of funding is unknown at this stage.
- Description – a more detailed description of the project components and rationale.

More details of current sector status and the way that the projects fit into overall development plans are provided in Annex B.

Energy Sector

Reference	E1	E2	E3	E4
Project Name	**Power Sector Expansion Project (PSEP)**	**EPC Investment Program**	**Electricity Sector Tsunami Recovery**	**Clean Energy Fund**
Implementing Agency	EPC	EPC	EPC	MOF
Project Cost (T$M)	263.0	3-5.0 p.a.	28.8	10.0 p.a.
Start	2008	Ongoing	2009	2013
Finish	2016		2012	Ongoing
Status	Underway	Underway	Underway	Committed
Funding Source	DP Grant/Loan	EPC	GOS	Various
if donor, who	ADB, JICA, AusAID			Global Fund
if donor, status				
Description	Improve the quality, reliability and cost effectiveness of power supply by: (a) supporting EPC investment plan; (b) improving EPC operational performance; (c) improving EPC financial performance; (d) establishing effective regulation of the power sector; (e) developing a demand side strategy and; (f) developing clean energy resources through the establishment of a clean energy fund (CEF), a clean development mechanism (CDM) sub-fund, and a designated national authority (DNA).	EPC annual investment program comprising various small projects that upgrade/ rehabilitate generation, distribution and control systems.	Reinstate electricity supply after the tsunami and extend supply to resettlement areas.	Grants of T$0.2-1.0M to business, households or the community for renewable energy projects. Funded from interest on PSEP loans plus top-up from other sources, such as Global Funds.

Energy Sector

Reference	E5	E6	E7
Project Name	**Large On-Grid Solar Generation**	**Other Renewable Energy Implementation**	**Large-Scale Biomass Gasification Project**
Implementing Agency	MOF, EPC	MOF, EPC	EPC
Project Cost (T$M)	50-80.0	50.0	24.0
Start	2011	2013	2015
Finish	2013	2020	2020
Status	Proposed	Proposed	Proposed
Funding Source	(GOS, Industry)	(DP, Global Fund)	Unknown
if donor, who			
if donor, status			
Description	Installation of a solar facility producing 5-8million KWH p.a. Options include static photovoltaic and sun tracking technologies.	Full-scale renewable energy projects based on the outcomes of ongoing research and feasibility studies (excluding hydro). Assumed 2MW wind power, full scale CNO plant and small scale biomass gasification plant.	Large scale biomass gasification project, using plantation feedstock (such as leucaena plant) and other feedstock options, such as coconut waste from oil production, etc. Dependent on results of feasibility studies.

Telecommunications Sector

Reference	T1	T2	T3	T4
Project Name	**Communications Sector Tsunami Recovery**	**Upgrade National Broadband Network (NBN)**	**New AM Radio Transmitter**	**Second Undersea International Cable**
Implementing Agency	MCIT	MCIT	MCIT	MCIT
Project Cost (T$M)	9.0	30.0	6.0	50.0
Start	2009	2010	2011	2013
Finish	2012	2012	2012	2015
Status	Underway	Proposed	Proposed	Proposed
Funding Source	GOS	-	-	-
if donor, who				
if donor, status		Under discussion		Under discussion
Description	Reinstate communications infrastructure after the tsunami and extend services to resettlement areas.	Upgrade existing fibre-optic ring and micro-wave link to Savai'i and other places. Establish national data centre.	New transmission station at Nu'u as backup to existing station at Mulinu'u and as a possible long-term replacement.	Second international fibre-optic link. Several options available (direct link to Fiji; new NZ-US cable; spur line to French Polynesia cable).

Water Sector

Reference	W1	W2	W3	W4	W5
Project Name	**Water Sector Tsunami Recovery**	**Water Sector Budget Support Program**	**Upgrade Independent Water Schemes**	**Samoa Sanitation and Drainage Project (SSDP)**	**Upgrade Hospital Sewerage System**
Implementing Agency	SWA	SWA	Independent Water Systems Assoc.	MNRE, MWTI, SWA	MOH
Project Cost (T$M)	18.0	90.0	12.0	35.0	3.5
Start	2009	2009	2009	2008	2011
Finish	2012	2015	2014	2011	2011
Status	Underway	Underway	Underway	Underway	Committed
Funding Source	GOS	DP Grant	DP Grant	DP Grant/Loan	DP Grant
if donor, who		EU	EU	ADB	EU
if donor, status			Recommended		Recommended
Description	Reinstate water infrastructure after the tsunami and extend services to resettlement areas.	Support for “Water for Life” program, including T$52M budget support and T$51M mechanism B (excludes additional support for specific projects tsunami recovery; Independent Water Schemes; Hospital sewerage upgrade).	Repair and upgrading of existing independent water schemes.	Construction of CBD central sewerage system; and CBD drainage works.	Upgrade Hospital sewerage system and public toilets.

Water Sector

Reference	W6	W7	W8	W9
Project Name	**Pre-Treatment of Water**	**Improved Water Supply for Manono**	**Desalination Plant for Vailele Area**	**SSDP II**
Implementing Agency	SWA	SWA	SWA	MNRE, MWTI, SWA
Project Cost (T$M)	3.0	8.5	8.0	42.0
Start	2011	2011	2011	2012
Finish	2012	2012	2012	2015
Status	Proposed	Proposed	Proposed	Proposed
Funding Source	(DP Grant)	(DP Grant)	(DP Grant)	(DP Grant or Loan)
if donor, who	JICA	PECF	PECF	ADB
if donor, status	Under discussion	Under discussion	Under discussion	Under preparation
Description	Pre-treat water before it gets to main treatment plant to reduce impurities and reduce contamination of the treatment plant.	Improved water supply, in particular, the option of a solar-powered reverse osmosis desalination plant to provide drinking water for Manono. Would supplement existing sources to provide a more reliable supply.	Installation of a solar-powered reverse osmosis desalination plant to provide reliable drinking water for the Vailele area.	Extension of sewerage system in central Apia; and additional drainage works.

Solid Waste Management

Reference	S1	S2	S3
Project Name	**Sewerage Sludge Disposal Facility**	**Improved Waste Management Infrastructure**	**Additional Sanitary Landfill Facilities**
Implementing Agency	MNRE	MNRE	MNRE
Project Cost (T$M)	1.2	8.8	10.0
Start	2009	2009	2012
Finish	2011	2011	2014
Status	Underway	Underway	Proposed
Funding Source	EU	GOS, DP	Unknown
if donor, who		JICA	
if donor, status			
Description	Construction of a new disposal facility for sewerage sludge at the Apia and Savai'i landfill sites under the WaSSP program.	Upgrading of solid waste management infrastructure (weighbridge, fencing etc) under the JICA regional program.	Additional landfill and septage disposal facilities on Savai'i and eastern Upolu.

Roads Sector

Reference	R1	R2	R3	R4	R5
Project Name	**SIAM2 Roads Component**	**Convent St Extension**	**Tsunami Recovery Road Program**	**Vaitele St Upgrade – Lepea to Vailoa**	**Vaitele St Upgrade – Vailoa to Vaitele**
Implementing Agency	LTA	LTA	LTA	LTA	LTA
Project Cost (T$M)	93.0	1.5	29.0	8.0	30.0
Start	2004	2010	2010	2011	2013
Finish	2011	2011	2013	2011	2014
Status	Underway	Committed	Proposed	Proposed	Proposed
Funding Source	DP, GOS	GOS	DP	(DP Grant/Loan)	Unknown
if donor, who	WB (IDA)		IDA, PRIF	IDA, PRIF	
if donor, status	Confirmed		Board Proposal	Under discussion	
Description	Package of road improvements, including upgrade of Vaitele St from Malifa to Lepea.	Extension of Convent St in central Apia to link with Ifiifi St.	Package of road repair, new roads and sea walls to repair tsunami damage; provide access to resettlement areas; and provide alternative high-level road links. Includes upgrade of Saleapaga-Lalomanu link road and new road from Samusu to Lalomanu.	Next stage of upgrade and 4-lane widening of Vaitele St, west from the end of the existing upgrade at Lepea to Vailoa (~1km).	Further western upgrade and 4-lane widening of Vaitele St from Lepea to Vaitele industrial area (~3 km).

Roads Sector

Reference	R6	R7	R8	R9	R10
Project Name	**Upgrade Aleisa Rd**	**Upgrade Fugalei St**	**Vaitele St Extension – to Matafagatele St**	**Improved Link from Apia to Faleolo Airport**	**All-weather Roads Program – Savai'i**
Implementing Agency	LTA	LTA	LTA	LTA	LTA
Project Cost (T$M)	15.0	20.0	15.0	50-120	20.0
Start	2012	2014	2015	2014	2012
Finish	2013	2015	2016	2016	2013
Status	Proposed	Proposed	Proposed	Proposed	Proposed
Funding Source	Unknown	Unknown	Unknown	Unknown	Unknown
if donor, who					
if donor, status					
Description	Package of minor works to upgrade the safety of Aleisa Rd as an alternative all-weather link between Apia and Faleolo Airport/Mulifanua ferry terminal.	Upgrade Fugalei Rd to provide an improved road link from the Vaitele St upgrade to central Apia.	New road link connecting the eastern end of the Vaitele St upgrade at Malifa to Matafagatele St, providing improved access to the Port of Apia and to the East Coast.	Improved road link to Faleolo Airport, options include major upgrade of West Coast Rd, new Inland Route, and major upgrade of Aleisa Rd.	Package of upgrades of existing fords/bridges (Sapalii, Maliolio, Sasina/Letui), roads (Vaia'ata Rd) and seawalls to reduce flooding and provide all-weather access.

Roads Sector

Reference	R11	R12	R13	R14	R15	R16
Project Name	**All-weather Roads Program – Upolu**	**Rural Access Roads**	**Footpaths**	**Upgrade Upolu Cross-island Road through Vailima**	**Upgrade Link from Saletele to Taelegaga**	**Apia Town – Link from Vaiusu to Fugalei**
Implementing Agency	LTA	LTA	MNRE, LTA	LTA	LTA	LTA
Project Cost (T$M)	60.0	10.0	6.0	30.0	10.0	60.0
Start		2011	2013	2012	2014	2015
Finish		2016	2015	2014	2015	2017
Status	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
Funding Source	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
if donor, who	Global Fund (PPCR)		Global Fund			
if donor, status			Concept			
Description	Upgrade of West Coast Rd (Apia to Faleolo) to enhance its safety and climate resilience. Package of upgrades of existing fords (Lalomanu, Saleapaga, Lepa, Lotofaga, Vaipu) and seawalls to reduce flooding risk and provide improved all-weather access.	Upgrade and extend plantation access roads. Also provides access to resettlement areas and escape routes in times of natural disaster.	Encourage safe walking by installing footpaths on roads in Apia, in accordance with the recommendations of the *GHG Abatement through Energy Efficiency & Bio-fuel* study.	Upgrade the existing narrow, steep road to improve safety for vehicles and pedestrians. This road is a major tourist route.	Upgrade existing track to complete the loop road joining Saletele and Taelegaga (~5km).	New link from West coast road into Apia Town through Fugalei St. This road can also link up with Mulinuu peninsular. Total length of about 6km.

Ports and Shipping

Reference	P1	P2	P3	P4	P5
Project Name	**Passenger and Freight Facilities at Aliepata**	**Extend Container Park at Port of Apia**	**Reconfigure Breakwaters and Channels at Apia**	**Upgrade Dredging Capability**	**Fagamalo Floating Pier**
Implementing Agency	SSC	SPA	SPA	SPA	SPA
Project Cost (T$M)	2.0	5.0	more than 20.0	60.0	2.0
Start	2010	2011	asap	2012	2012
Finish	2011	2011		2012	2012
Status	Underway	Committed	Proposed	Proposed	Proposed
Funding Source	Self-funded	SPA	Unknown	Unknown	(SPA)
if donor, who					
if donor, status					
Description	Establish passenger and freight facilities at the port of Aliepata as part of switch of departure point for services to American Samoa.	Extend the container storage area by paving the area adjacent to the existing container park.	Swell in the harbour limits ship operation for several weeks each year. This project is expected to address these problems and dredge the channel to 11m.	Upgrade SPA dredging capability, for instance by acquiring excavator(s) and associated barge(s) for channel maintenance and deepening.	Construct a floating pier at Fagamal (Savai'i) to cater for small cruise ships.

Ports and Shipping

Reference	P6	P7	P8	P9	P10
Project Name	**Manono-tai & Manono-uta Wharfs & Terminals**	**Refurbish Inter-island Ferry Terminals**	**Rehabilitate Old Wharf at Apia International Port**	**Upgrade Slipway at Aleipata**	**Upgrade Port of Aleipata**
Implementing Agency	SPA	SPA	SPA	SPA	SPA
Project Cost (T$M)	6.0	2.0	32.0	4.0	20.0
Start	2012	2012	2013	2012	2013
Finish	2012	2013	2014	2013	2013
Status	Proposed	Proposed	Proposed	Proposed	Proposed
Funding Source	Unknown	Unknown	Unknown	Unknown	(DP Grant)
if donor, who					JICA
if donor, status					Proposal submitted
Description	Upgrade wharves and terminals for improved access to Manono for residents and tourist; and for pleasure craft.	Refurbish inter-island ferry terminal at Mulifanua and Saleloga to raise the image of the service consistent with the quality of the new ferry.	Repair the old container wharf to enable unrestricted operation of cargo handling.	Improve the existing slipway to cater for ships larger than Lady Naomi.	Upgrade Aleipata, by extending the wharf from 120 to 250m length; channel dredging; and infrastructure for equipping Apeipata as an international cargo port.

Ports and Shipping

Reference	P11	P12
Project Name	**Extend International Wharf at Saleloga**	**New Port at Palauli**
Implementing Agency	SPA	SPA
Project Cost (T$M)	32.0	100.0
Start	2014	2016
Finish	2014	2018
Status	Proposed	Proposed
Funding Source	(DP Grant)	Unknown
if donor, who	JICA	
if donor, status	Proposal submitted	
Description	Extend the wharf length from 130 m to 250 m.	New port at Palauli on Savai'i for tourist cruises; yachting; and as an alternative to Salelonga.

Airports and Aviation

Reference	A1	A2	A3	A4	A5
Project Name	**Upgrade Runway Lights**	**New Air Cargo Building**	**Replace Navigational Aids (DVOR, NDB)**	**Refurbish Fire Tenders (2 vehicles)**	**Upgrade Faleolo Passenger Terminal**
Implementing Agency	SAA	SAA	SAA	SAA	SAA
Project Cost (T$M)	3.5	3.5	3.0	2.0	35.0
Start	2010	2011	2012	2011	2012
Finish	2012	2012	2014	2012	2013
Status	Underway	Committed	Committed	Proposed	Proposed
Funding Source	SAA	SAA	SAA	Unknown	Unknown
if donor, who					
if donor, status					
Description	Program of replacement of runway lights.	New building at Faleolo for storing and marshalling air cargo.	Replace navigational aids (DVOR-DME, NDB) to replace existing out-dated and unreliable equipment.	Refurbish 2 fire tenders, to maintain airport Category 9 safety rating and ICAO certification.	Upgrade and reconfigure the Faleolo passenger terminal based on recommendations of the airport Master Plan. May include terminal expansion, aerobridges, tugs, etc.

Airports and Aviation

Reference	A6	A7	A8	A9	A10
Project Name	**Expand Runway Apron at Faleolo**	**Secondary Runway at Faleolo**	**Widen/Seal Runway Shoulders at Faleolo**	**Resurface Runway and Taxiways at Faleolo**	**New Airport at Aleipata**
Implementing Agency	SAA	SAA	SAA	SAA	SAA
Project Cost (T$M)	5.0	15.0	10.0	40.0	50-100.0
Start	2013	2013	2015	2018	Beyond 2015
Finish	2014	2014	2016	2020	
Status	Proposed	Proposed	Proposed	Proposed	Proposed
Funding Source	Unknown	Unknown	Unknown	Unknown	Unknown
if donor, who		PPCR ??			
if donor, status					
Description	Expand the runway apron to cater for larger aircraft and reduce congestion, as part of proposed terminal redevelopment (A4).	Reconfigure the road alongside Faleolo airport as a 1.8km secondary runway for use if the main runway is damaged.	Widen/seal runway shoulders to improve safety of Faleolo's designated role as an alternate and emergency airport for Pacific airline services.	Resurface the runway to ensure safe ongoing operations and compliance with ICAO requirements; enable continued operation of aircraft at full loads; and enable future services by heavier aircraft.	New airstrip (~1.5km runway) and terminal at Aleipata for services to American Samoa.

Multi-Sector and Other Projects

Reference	M1	M2	M3	M4	M5
Project Name	**Coast and River Protection Project**	**Climate Change Adaptation Projects**	**Infrastructure for StarKist at Asau**	**Infrastructure for resort Development at Sasina**	**Natural Disaster Early Warning System**
Implementing Agency	MNRE	MNRE	All	All	MNRE
Project Cost (T$M)	2.0	50.0	120-150	more than 20	10.0
Start	2010	2011	2011	2012	2011
Finish	2011	2020	2012	2014	2012
Status	Underway	Proposed	Proposed	Proposed	Proposed
Funding Source	DP Grant	(DP Grant)	GOS, Industry	GOS, Industry	(DP Grant; Industry Grant)
if donor, who	GEF	GEF, PPCR, etc			
if donor, status					
Description	Construction of seawalls and river protection works.	Construction of seawalls and river protection works and other Infrastructure components of adaptation projects under GEF, PPCR, etc.	Upgrade infrastructure (power, water, roads, port, airport) to provide services, if the proposed StarKist fish cannery at Asau goes ahead.	Upgrade infrastructure (power, water, roads, airport) to provide services, when the proposed resort at Sasina on Savai'I goes ahead.	Possible project to implement a national early warning system for natural disasters, including sirens, mobile phone broadcasts, etc.

ANNEX B: SUMMARY OF SECTOR STATUS AND PROPOSED INVESTMENT PLANS

This Annex provides an overview of the current state of economic infrastructure and infrastructure planning in Samoa; and an overview of ongoing and proposed investment programs for each sector, including a summary of planned projects for each sector over the next 10 years. This comprises the long list of candidate that were considered for inclusion in the NISP. To provide a complete picture of public sector investment, this includes Government and SOE projects that are underway, committed or in the planning pipeline, but does not include private sector investments.

1. The current situation

The overall picture is that basic services and service coverage are good, with full national coverage of basic telecoms and broadband available in the Apia urban area; a high level of access to reticulated power and water and off-grid arrangements in place elsewhere; one of the highest levels of road density in the region; and a strategically located network of ports and airports throughout the country. Table B.1 shows a snapshot of the current state of the economic infrastructure sector.

Table B.1 Overview of the economic infrastructure sector

Sector	Notes
Energy	37 MW total installed capacity (60-70% from diesel generation, depending on seasonal variation in hydro) 100% of population have access to electricity 95% of population on-grid (5% off-grid solar) 18% line losses
Telecommunications	Telephone access available throughout the country (fixed line or mobile) 15,000 landline connections More than 110,000 mobile customers (SamoaTel, Digicel) Cellular coverage to 95% of the population 3,000 internet subscribers (estimated 15,000 users)
Water	97% of population have access to improved drinking water supply (reticulated supply, rainwater tanks, wells, etc) 95% of the population have piped water (85% central SWA system; 10% independent systems; 5% rainwater tanks, etc) 15-60% Total losses on central system (up to 75% in some areas)
Sanitation	89% of population has access to improved sanitation facilities 80% of households in urban Apia have flush toilets (60% nationwide) Sewerage system is installed along the Apia CBD/waterfront (~130 connections)
Solid Waste	2 x sanitary "semi-aerobic" landfill (Tafaigata, Vaiaata) Household collection of solid waste on all islands (100% of households) No charge for household collection of solid waste No regular system for collection of recyclables
Transport	
Airports	2 x International airports on Upolu (Faleolo, Fagalii) 2 x airports on Savai'i (Maota, Asau, both not in regular operation) 160,000 international passenger arrivals per year (no domestic air services) around 1,000 tonnes of air freight per year 7 international destinations (direct flights to Australia, Fiji, New Zealand, Tonga and United States)
Roads	1,000 km (including community roads) 65% sealed 20,000 registered vehicles
Sea Ports	2 x International ports (Apia – 2 international, 2 inter-island berths; Salelologa – 1 international berth) 2 x inter-island ferry terminals (Mulifanua, Salelologa) around 300,000 one-way ferry trips per year between Upolu and Savai'i 2 x minor ports (Asau, Aleipata) 22,000 international container movements per year (full TEU) (80% imports)

Sources: Infrastructure managers (EPC, SW, SPA, SAA, Ministries); Samoa Census; various feasibility studies.

The current state of formal planning is mixed (Table B.2). Water is the only economic infrastructure sector with an up-to-date whole-of-sector plan; the

energy sector has a recent policy statement, but for other sectors, formal planning documents are fragmented or at least five years old.

Table B.2 Status of sector strategic and master planning

Sector	Master Plan/ Roadmap	Notes
Energy	Yes	*Samoa National Energy Policy 2007* (SNEP)
Telecommunications	Outdated	No up-to-date sector strategy; latest *National Strategic Plan for Information and Communication Technology* (ICT) 2004-2009. Due to be updated in 2011
Water and sanitation	Yes	*Water for Life: Water Sector Plan and Framework for Action, 2008–2013*
Solid Waste	Outdated	No up-to-date sector strategy; latest *National Waste Management Strategy 2000-2010*
Transport	No	No roadmap for the sector as a whole
Airports	Partial	Master Plan for Faleolo Airport underway; to be completed in early 2011. No integrated national plan.
Roads	Outdated	No up-to-date sector strategy; *Road Sector Plan 2003* was last reviewed and updated in 2005 as part of SIAM2
Sea Ports	Partial	Planning for single ports, but no integrated national plan
Multi-Sector		
Climate Change	Outdated	*National Adaptation Programme of Action* (NAPA 2005)

2. Sector investment plans

The following sections provide an overview of investment plans and proposals in each economic infrastructure sector for the next 5-10 years. It includes projects already underway; projects with committed funding that have not started yet; and proposed projects that were identified through a process of consultation with infrastructure managers (Ministries, SOEs) and users (community and private sector). The consultation process generated the following long list of ideas for infrastructure projects and related initiatives that address current deficiencies and emerging infrastructure needs. These project ideas were then refined in discussions with infrastructure managers to ensure that the project objectives, concept and likely cost were clearly identified. Further discussion of related sector issues is contained in a separate Economic Analysis Background Paper that was prepared as part of the NISP analysis process.

For each sub-sector, planned projects (underway, committed, proposed) are tabulated in a consistent format which includes a short descriptive name for the project; estimated cost; project status and funding source; and the preferred timing of project implementation.

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	UNDERWAY AND COMMITTED PROJECTS								
X1	Example Project #1	$X.X	SOE	.	.				
X2	Example Project #2	$X.X	DG			.	.		
	PROPOSED PROJECTS								
X3	Example Project #3	$X.X	-						⇔

For each sector, the projects are divided into two groups, according to project status:

Underway and Committed – these are ongoing projects for which implementation has already started (underway); or funding has already been identified and confirmed for the investment and there is a high probability that it will proceed, but the timing may change (committed).

Proposed – these are planned investments which are in the pipeline but funding has not been confirmed and timing is not certain.

When reading the project tables, it is important to understand the following background details:

- The tables list major projects only. Projects must be of national/regional/local significance and deliver widespread community benefits. Generally, project size is greater than T$1 million. Projects must have had at least some preliminary planning undertaken.
- The definition of infrastructure is broad. The projects are mostly physical infrastructure, which may include major items of mobile infrastructure, but the scope also extends to large information infrastructure projects (such as major new systems, whole-of Government website development, electronic commerce systems, etc). Projects that involve new infrastructure, replacement of existing infrastructure and major refurbishment are included in the scope of the tables, but generally routine maintenance, planning and technical assistance is not included.
- Project costs are in million tala (T$M). The figure is for the estimated cost over the period from 2010/11 to 2020. For projects that started before 2010, the total cost for the project is given in the project description. For most projects, the cost is an estimate of the construction/supply costs only. It is an estimate for planning purposes only, and is not a firm cost based on detailed design/specifications. The cost estimate does not include up-front costs, contract supervision and escalation contingencies, and can be expected to change as more information becomes available, and detailed feasibility studies are conducted. Where the project cost is confidential, it is marked as "-". Where the investment details are not fully defined at this stage, the cost is marked as "tbd" (to be defined).
- Years are financial years (July to June) with the timing of project implementation shown on a year-by-year basis for the first 5 years, and on an indicative basis for years 6-10. For projects planned for the period 2016-2020 such as Example Project #3, timing is generally less certain.
- Projects are classified according to the confirmed or expected source of funding using the following codes:

Source of Funding	Description
G - Government budget allocation	Funded from Government of Samoa budget allocation
SOE -State Owned Enterprise	Self-funded by a SOE from its own resources (cashflow or commercial loan)
DG - Development partner Grant (approved)	Funded by an approved grant from an official development partner. This includes in-kind assistance.
DL - Development partner Loan (approved)	Funded by an approved loan from an official development partner
PR - Private Finance	Funded (at least in part) by private investment
-- Source of funding is not certain	This includes projects for which discussions are underway with a potential financing partner (such as bank or development agency) but are not confirmed.

3. Energy

Samoa has one of the highest levels of access to electricity in the region with around 95% of the population on-grid, and off-grid solar systems being progressively installed for the remaining 5%. But at the same time, the cost of electricity is higher than several other developing countries in the region (such as Fiji and PNG which have a high percentage of hydro power), and significantly higher than Australia and New Zealand. In part, this is a result of Samoa's high level of reliance on diesel-powered generation (varying in the range 60-70% with seasonal variation in hydro generation capacity) and high level of system losses (around 18%).

In the short-medium term, initiatives in the energy sector are centred on the Power Sector Expansion Project (PSEP), which is a large (T$280M) multi-component project that is already underway and extending to 2016, with financing from a consortium of ADB, AusAID and JICA. PSEP aims to improve the quality, reliability and cost effectiveness of the Samoa power supply by:

(a) supporting the Electric Power Corporation (EPC) investment plan; (b) improving EPC operational and financial performance; (c) improved regulation of the power sector; (d) developing a demand side management strategy; and; (e) developing clean energy resources through the establishment of a local Clean Energy Fund (CEF) and establishing Samoa under the global Clean Development Mechanism (CDM). In particular, PSEP is supporting a long-term investment program in the electricity distribution system, and diesel and hydro generation. This will result in a rapid expansion of EPC assets and will increase the Corporation's operations and maintenance obligations. The CEF is scheduled to commence operation in 2013, seeded by interest payments on PSEP loans and other sources. It will make small-medium grants (T$0.2-1.0M) to business, households or the community for renewable energy projects.

In parallel with PSEP, EPC has a small ongoing investment program from its resources (around T$2-5M per year), and is undertaking a program to reinstate electricity infrastructure damaged in the 2009 tsunami and extend distribution to resettlement areas.

In the medium-longer term, the emphasis of planned projects shifts to reducing reliance on imported petroleum and a move towards greater energy self-sufficiency by increasing the use of renewable energy sources and other measures (in addition to existing and planned hydro schemes). The Government is considering several options for construction of around 5 MWh of on-grid solar energy installation within the next 3 years. Future development of full-scale development of other renewable energy sources (wind power, coconut oil and landfill gas) will depend on the outcomes of ongoing research and feasibility studies currently underway. In the longer term, the option of gasification of biomass (from sources such as leucaena and coconut oil production waste) is also being investigated.

Table B.3 Energy sector – major projects underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	UNDERWAY AND COMMITTED PROJECTS								
E1	Power Sector Expansion Project (T$287M total)	237	DG/DL	.	.	.	.	.	⇔
E2	EPC Investment Program	30	SOE	.	.	.	.	.	⇔
E3	Electricity Sector Tsunami Recovery (T$29M total)	19	G	.	.				
E4	Clean Energy Fund	35	G/DG				.	.	⇔
	PROPOSED PROJECTS								
E5	Large On-Grid Solar Generation	50	-		.	.			
E6	Other Renewable Energy Implementation (wind CNO, etc)	50	-			.	.	.	⇔
E7	Biomass Gasification Project	24	-						⇔
	TOTAL	**445**							

4. Telecommunications

In terms of access to basic telecommunications services, Samoa is well positioned. Mobile phone and internet services are already available throughout the country, and there are currently more than 110,000 mobile phone customers and a further 15,000 landline connections. Competition and private sector involvement in the telecommunications sector has been a strong force driving these developments, with Digicel entering the market as the second mobile service operator in 2006 and the privatisation of SamoaTel in early 2011.

Quality of internet access is mixed. There is strong competition in the ISP (Internet Service Provider) market and fixed line and wireless broadband

services are widely available in the Apia urban area. In 2009, Samoa connected to the American Samoa-Hawaii (ASH) undersea cable. This significantly increased internet speed and bandwidth (the volume of internet traffic that the connection can handle), but the cost of internet access has remained high, in part because of the small subscriber base (around 3,000 connections and estimated 15,000 users). In rural areas, internet access is available but not at broadband speeds. A fibre-optic backbone ring around Upolu and covering part of Savai'i is already in place, but the final broadband link to schools, homes and businesses through cabling or wireless technologies such as WiMAX is not yet in place. Government is currently finalising a project to upgrade this network to create a National Broadband Network (NBN). The other major project currently underway in the telecommunications sector is restoring communications infrastructure in tsunami-affected areas, and extending services to resettlement areas (Table B.4).

Table B.4 Telecommunications – major projects underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015				2016-2020	
	UNDERWAY AND COMMITTED PROJECTS								
T1	Communications Sector Tsunami Recovery (T$9m total)	6	G	.	.				
	PROPOSED PROJECTS								
T2	Upgrade National Broadband Network	30	-	.	.	.			
T3	AM Radio Transmission	6	-		.				
T4	Second International Communications Cable	40	-			.	.	.	
	TOTAL	**82**							

In the short-medium term, the next step is proposed development of a second undersea fibre-optic connection to international networks. Although the number of internet connections is currently small, internet traffic in Samoa has been doubling every two years and in future, access to the internet via mobile phones is expected to become the driving force behind substantial growth in internet traffic. The ASH cable connection is only a temporary solution. Compared to more modern cables, it is relatively slow and within the next 5-10 years, the available bandwidth is likely to become a significant constraint on growth and development of new internet-based community applications, local business opportunities and internet-based Government services. In addition, because it is a recycled second-hand cable, there is also a growing risk of reduced reliability as the cable ages. Several options are available for a second international cable connection[11], with Government currently favouring a spur line connection to the proposed Pacific Fibre Cable linking Australia, New Zealand and USA.

Another major challenge facing the telecommunications sector is the continuation of reliable AM Radio coverage throughout the country. AM Radio plays an important and ongoing role in broadcasting news and information, and has a vital role in broadcasting regular weather reports and cyclone and tsunami warnings. It is a vital lifeline during times of natural disasters. The current transmitter at Mulinu'u in Apia is reaching the end of its useful life and is in a vulnerable seafront location. A location for a backup/replacement transmitter station has been identified at Nu'u on higher ground on the outskirts of Apia and land has been allocated. The next step is to construct the proposed AM radio facility at Nu'u.

5. Water and Sanitation

Some 97% of the Samoan population has access to improved water supply, from either the Samoa Water Authority (SWA) system or independent water schemes; and 89% of the population has access to improved sanitation

[11] For an overview of issues and options see, World Bank (2010) *Technical, Economic and Financial Connectivity Study for Tonga and Samoa.*

facilities. In terms meeting the MDGs and providing basic access to water and sanitation, the sector is performing well.

However, problems exist in the efficiency of water supply, and there are several major challenges facing the water sector. The sector plan *Water for Life* provides a comprehensive overview of issues facing the water sector and programs underway and planned to address these challenges. Briefly, the key challenges facing the sector are:

- very high levels of water use (per capita) and lack of understanding of the *value* of water by many users. The *Water for Life* plan reports a target of reducing water usage to less than 300 litres per capita per day, but even this level, is double the average used in some developed countries;
- water treatment plants are not adequate for current demand on the SWA system, and independent water schemes do not treat water. This contributes to historically high levels of water borne diseases[12];
- total water losses in the SWA system vary, but are mostly high. In some parts of the Apia water system, non-revenue water[13] levels are up to 60%, which means that more than half of the water is lost[14]. This compares to benchmark levels of 20-30% achieved by some developing countries in the Asia-Pacific region and 10% in developed countries[15];
- access to flush toilets is high (more than 80% in Apia urban area) and growing quickly, but treatment of waste is a problem. The interpretation of what constitutes a "septic" tank or facility can also vary, and is often considered as any tank which receives toilet waste. Surveys indicated more than 80% of tanks are not true septic facilities and could pose threats to public health as well as nearby groundwater or surface water sources. Important issues relating to disposal of grey water and septage (sludge pumped from septic tanks) are emerging in both urban and rural areas;
- a central sewerage collection and treatment system is in place in central Apia, but the area covered by the system is small and does not extend to several key locations such as Apia Hospital. Connection to the system is currently provided free, with no user-pays model in place;
- drainage is inadequate, especially in central Apia. As well as direct water damage to property, other impacts include the spilling or overflowing of septic facilities which bring health risks due to exposure to raw sewage. The *Water for Life* sector plan concludes that improved drainage alone will not solve the problem. A holistic approach including long-term mitigation through flood-proofing measures, flood preparedness guidance, and more sustainable development of flood plains through cooperative approaches to land use management; and
- the 2009 tsunami damaged existing water supply systems and created demand for expansion of water supply to resettlement areas.

In the short-medium term, ongoing projects in the water sector (Table B.5) focus on addressing these challenges through several major projects:

- Water Sector Budget Support program, which is a sector-wide program implementing the *Water for Life* sector plan, with support from EU. It is a comprehensive program of investment, capacity building and budget support aimed at upgrading water supply infrastructure; and improving the technical, maintenance and financial performance of SWA. After its completion in 2015, is expected that SWA will be in a position to operate and finance the water system from its own resources. In addition to general upgrading of the SWA urban and rural water supply systems, specific projects to be funded from the overall budget support funding include:

[12] GOS (2008) *Water for Life: Water Sector Plan and Framework for Action (2008/9-2011/12).*

[13] Non-revenue water is an important measure of efficiency. It refers to the difference between system input volume and the billed or authorised consumption, and includes un-billed consumption from faulty meters, illegal connections or under-billing as well as physical losses from leakages and overflows.

[14] The losses include un-metered and illegal consumption, but it is acknowledged by SWA that losses due to leakages in the system are very high by regional and international standards.

[15] Castalia (2006); ADB (2003) *Asian Water Supplies: Reaching the Urban Poor*.

- upgrading and repair of independent water schemes (intakes, pipes, etc);
- rehabilitation of the Apia Hospital sewerage system and public toilets to enable connection to the existing pressure sewerage system; and
- repair and expansion of the water supply system in tsunami affected areas.

- completion and monitoring of Stage 1 of the Samoa Sanitation and Drainage Project (SSDP), which includes construction of CBD central pressure sewerage system and drainage works in central Apia.
- preparation of a national sanitation master plan for improving water supply, sanitation and drainage in Apia. This plan, prepared with assistance from ADB, is expected to be completed in early 2011 and will contribute to the development of priority projects to improve water supply and sanitation services.

Additional proposed projects in the water sector include:

- investigation of options for adding a pre-treatment stage before water enters the existing SWA water treatment plants to reduce the level of sediment entering the system and increase the efficiency of the existing treatment plants;
- improved water supply for the island of Manono, including consideration of options such as rehabilitation of the undersea connection to the mainland supply and supplementing the water supply with a solar-powered reverse-osmosis desalination plant;
- solar-powered reverse-osmosis desalination plant for the Vailele area of Upolu; and
- extension of the pressure sewerage system in central Apia; and additional drainage works under a follow-up SSDP II project which is already under preparation with assistance from ADB.

Table B.1 Water and sanitation – major projects underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	UNDERWAY AND COMMITTED PROJECTS								
W1	Water Sector Tsunami Recovery (T$18M total)	12	G	.	.				
W2	Water Sector Budget Support Program A&B (T$90M total)	82	DG	.	.	.	.	.	
W3	Upgrade of Independent water schemes	12	DG	.	.	.	.	.	
W4	Samoa Sanitation and Drainage Project (SSDP) (T$35M total)	5	DL/DG	.					
W5	Upgrade Hospital Sewerage System and Public Toilets	4	DG	.					
	PROPOSED PROJECTS								
W6	Pre-Treatment of Water	3	-		.				
W7	Improved Water Supply for Manono	9	-		.				
W8	Desalination Plant for Vailele Area	8	-		.				
W9	Samoa Sanitation and Drainage Project Phase II	42	-		.	.	.	.	⇔
	TOTAL	**177**							

6. Solid Waste

Household rubbish collection services operate throughout Samoa reaching 100% of households, and semi-aerobic landfill facilities are in place at Tafaigata (Upolu) and Vaiata (Savai'i). Collection is provided as a free service and is working well. Under current arrangements, the service is funded from the MNRE budget and contracted out to the private sector. No recycling is provided at source, but informal recycling takes place at the disposal site.

Disposal of hazardous waste and septage (sludge pumped from septic tanks) is an ongoing problem throughout Samoa, but will be alleviated by a project that is currently underway, with assistance under the WaSSP program. This project involves constructing sewage sludge treatment pools at the Tafaigata and Vaiata landfills. Construction of the sludge treatment pools at Tafaigata is completed and expected to commence operation before the end of 2010. A project is also underway to upgrade solid waste management infrastructure (weighbridge, fencing etc) at the landfill sites, under a JICA regional program.

Planning is not well advanced beyond the projects currently underway. The need for additional landfill sites in eastern Upolu and western Savai'i has been identified to reduce transport distances and pressure on existing sites, but planning has not progressed beyond the concept stage. Although current waste management arrangements are working well, to build on these successes there is a need for a long term strategic approach based on a sector roadmap. This roadmap should guide further development of solid waste management by addressing issues including the optimal location, staging and management arrangements of landfill sites; and long-term sustainable financing options for solid waste management (such as user-pays approaches).

Table B.1 Solid Waste – major investment projects underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	UNDERWAY AND COMMITTED PROJECTS								
S1	Sewerage Sludge Disposal Facility	1	DG	•					
S2	Improved Waste Management Infrastructure	9	DG	•					
	PROPOSED PROJECTS								
S3	Additional land fill facilities (Upolu, Savai'i)	10	-			•	•		
	TOTAL	**20**							

7. Roads

Samoa has an extensive network of roads and a high level of road network density in inhabited areas[16]. This network provides good access links to communities in terms of connectivity, and is generally in good condition, with around two-thirds of the total network and all major roads paved. Government has placed a strong emphasis on road maintenance and Samoa is a leader in the region in outsourcing road maintenance and developing local private sector maintenance and road construction capability. The challenges now facing the road sector include:

- increasing levels of car ownership and traffic, especially in the central Apia area;
- high levels of truck traffic, especially large multi-axle vehicles carrying shipping containers;

[16] Measured in terms of road length/square km of land area (Castalia 2006).

- lack of an effective and connected road hierarchy in urban Apia, which results in heavy trucks using narrow residential streets;
- lack of footpaths on most roads and generally poor facilities for pedestrians and cyclists; and
- many roads are vulnerable to natural hazards (flooding, cyclone/tsunami damage) and become impassable, cutting off access to villages during periods of severe weather/natural disaster.

The Government is addressing some of these challenges through the Land Transport Authority (LTA) road maintenance and upgrading program, including completing the Convent St extension; rural access roads program; post-tsunami reconstruction and upgrading of access roads to resettlement areas (including the planned Samusu-Lepa link road); and the ongoing World Bank-supported Samoa Infrastructure Asset Management program (SIAM2) (see Table B.7).

The next step is to look beyond the current road maintenance and upgrading program towards longer-term needs. In particular, major initiatives proposed for the roads sector include:

- integrated and phased development of the vital road corridor linking the Apia seaport; key commercial/industrial areas along Vaitele St; Faleolo airport; and the inter-island ferry terminal. This corridor will extend the recently completed Vaitele Street upgrade and incorporate a possible inland route to the airport;
- addressing vulnerable road sections and/or upgrading alternative routes on Upolu and Savai'i to provide improved safety and access in all weather conditions and in the aftermath of natural disasters;
- upgrade and extend plantation access roads, and provide access to resettlement areas and escape routes in times of natural disaster;
- road safety works, especially improving safety for pedestrians on major roads[17] and for traffic on the Upolu Cross-island Road through Vailima; and
- a longer term program to connect "missing links" in the road network.

As noted in Table B.2, the roads sector does not have an up-to-date sector plan. Therefore, there is also a need to integrate these initiatives under an updated *National Road Network Plan*.

Table B.1 Roads – major investments underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	UNDERWAY AND COMMITTED PROJECTS								
R1	SIAM2 - Road infrastructure component (T$93m total)	10	DG/DL	•					
R2	Convent St Extension	2	G	•					
R3	Post-Tsunami Reconstruction Project	29	DG	•	•	•			
	PROPOSED PROJECTS								
R4	Vaitele St upgrade to Vailoa	8	-		•				
R5	Vaitele St upgrade - Vailoa to Vaitele	30	-			•	•		
R6	Upgrade Aleisa Rd	15	-			•			
R7	Upgrade Fugalei St	20	-				•	•	
R8	Vaitele St Extension – to Matafagatele St	15	-					•	⇔

[17] See *Greenhouse Gas Abatement Through Energy Efficiency and Biofuel Applications in the Land Transport Sector Project* (IPA 2010) for more details.

Table B.2 (Cont.) Roads – major investments underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	PROPOSED PROJECTS								
R9	Improved Link from Apia to Faleolo Airport	50-120	-					·	⇔
R10	All-weather Roads Program – Savai'i	20	-		·	·			
R11	All-weather Roads Program – Upolu	60	-			·	·	·	
R12	Rural Access Roads program	10	-		·	·	·	·	⇔
R13	Footpaths	6	-		·	·	·		
R14	Upgrade Upolu Cross-island Road through Vailima	30	-			·	·	·	
R15	Upgrade Link from Saletele to Taelegaga	10	-					·	
R16	Apia Town – Link from Vaiusu to Fugalei	60	-						⇔
	TOTAL	**325-395**							

8. Ports and Shipping

The maritime sector plays an important role in the Samoa economy and community, supporting tourism; inter-island and international commerce; and inter-island travel for social, educational and medical needs. The Samoa maritime sector has set high standards and is widely regarded to be a leader in the maritime sector in the region. Fixed infrastructure is generally in good condition, appropriate for needs, and with capacity to absorb further growth; and the Samoa Ports Authority (SPA) and Samoa Shipping Corporation (SSC) are financially stable and comply with relevant international standards. The introduction of a new Upolu-Savai'i inter-island ferry in 2010 with assistance from Japan has further strengthened maritime sector capability. In November 2010, SSC transferred the departure point of its services to American Samoa from Apia to Aliepata; and is establishing passenger and freight facilities at the port of Aliepata as part of this switch.

In the short-medium term, SPA has ambitious plans for the ports sector (Table B.8). SPA is already committed to extending the existing container storage area at the Apia Port; and has proposals to upgrade port facilities throughout the country, including

- extending cargo berths and deepening channels at Apia, Saleloga and Aliepata;
- upgrading SPA equipment for maintenance dredging and channel deepening/widening;
- upgrading the slipway at Aleipata to cater for larger vessels;
- improving passengers facilities at the inter-island ferry terminals (Mulifanua, Saleloga);
- improving access to Manono; and
- constructing a floating pier at Fagamalo to cater for small cruise ships.

There is also a proposal to upgrade the existing port at Asau, linked to the possible development of a fish processing plant (StarKist) at Asau. This proposal also has implications for other sectors (electricity, water, roads, airports) and included under the Multi-Sector projects category.

However, before rehabilitating the Old Wharf and dredging channels at Apia International Port, there is an ongoing port navigation problem that SPA has identified as needing attention prior to further investment. During periods of bad weather, swells in the harbour affect docking of ships and limit container handling for several weeks each year. SPA is undertaking scientific and engineering studies to identify a cost-effective solution that could be implemented as soon as possible to reconfigure breakwaters and channels to alleviate the problem. A provisional project costing of T$20M is included in

this NISP, pending the results of these studies. An updated estimate of project cost and timing will be included in the next update of the NISP.

In the longer term (beyond 2015), investment planning for the port sector is less well developed. There is a proposal to construct a new port at Palauli on Savai'i for tourist cruises, yachting, and as an alternative to Salelonga; but this concept is in the early stages of development and will require detailed feasibility and environmental studies, and identification of a suitable funding source.

In total, these proposed port infrastructure upgrades would involve investment of some $280 million over the next 10 years (excluding Asau). The ports in Samoa are part of a linked nationwide system of ports, with investment in one port potentially affecting the need for investment in others. This point to the need for a comprehensive national port plan and staged development strategy covering all ports and facilities, with investments linked to likely future patterns of demand and supported by solid business case analysis. Otherwise, there is a risk of duplication and unproductive over-investment in port infrastructure.

Table B.1 Ports and shipping – major investments underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	UNDERWAY AND COMMITTED PROJECTS								
P1	Passenger and Freight Facilities at Aliepata	2	SOE	•					
P2	Extend Container Park at Port of Apia	5	SOE	•	•				

Table B.2 (Cont.) Ports and shipping – major investments underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	PROPOSED PROJECTS								
P3	Reconfigure Breakwaters and Channels at Apia	> 20	-		•	•	•		
P4	Upgrade Dredging SPA Capability	60	-		•				
P5	Fagamalo Floating Pier	2	-		•				
P6	Manono Wharves and Terminals	6	-		•				
P7	Refurbish Inter-island Ferry Terminals	2	-			•			
P8	Rehabilitate Old Wharf at Apia International Port	32	-			•	•		
P9	Upgrade Slipway at Aleipata	4	-			•			
P10	Upgrade Port of Aleipata	20	-			•	•		
P11	Extend International Wharf at Saleloga	32	-				•	•	
P12	New Port at Palauli	100	-						⇔
	TOTAL	**285**							

9. Airports

Aviation also plays a vital role in the Samoan economy and community in terms of tourism; international commerce; and travel for social, educational and medical needs. Overall, existing airport infrastructure is in good condition, meets relevant international standards, and is suitable for further growth and possible reintroduction of domestic services if justified by

demand. All commercial airports in Samoa are owned and operated by the Samoa Airports Authority (SAA), except Fagali'i which is operated by Polynesian Airlines.

Committed and planned investments in the airport sector in the short term (Table B.9) mostly focus on meeting safety and security compliance requirements in terms of fire and rescue capability, navigational aids, and runway condition. There are also plans to upgrade and reconfigure the terminal building at Faleolo International Airport. Master planning for Faleolo International Airport is currently underway and is expected to be completed in early 2011. This will refine plans for upgrading of the airport terminal at Faleolo, and define further investment needs over the next 10-20 years. A refined medium-long term investment plan for airports will be included in the next update of the NISP.

Table B.1 Airports – major investments underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	UNDERWAY AND COMMITTED PROJECTS								
A1	Replace Runway Lighting	4	SOE	·	·	·			
A2	New Air Cargo Building	4	SOE	·	·				
A3	Upgrade Navigational Aids at Faleolo (DVOR-DME, etc)	3	SOE			·	·		
	PROPOSED PROJECTS								
A4	Refurbish Fire Tenders (2 vehicles)	2	-		·				
A5	Upgrade Faleolo Passenger Terminal	32	-		·	·	·		
A6	Expand Runway Apron at Faleolo	5	-			·	·		
A7	Secondary Runway at Faleolo	15	-			·	·		
A8	Widen/Seal Runway Shoulders at Faleolo	10	-						⇔
A9	Resurface Runway and Taxiways at Faleolo	40	-						⇔
A10	New Airport at Aliepata	50	-						⇔
	TOTAL	**154**							

In the medium-longer term, there are plans for several large investments. SAA has proposed a project to reconfigure the road alongside Faleolo airport as a 1.8km secondary runway for use if the main runway is damaged, for instance by cyclone or tsunami. This would allow military and other smaller aircraft to land safely to deliver emergency supplies and other assistance. There is also a need to widen and seal the shoulders of the main runway at Faleolo to improve its role as an emergency alternate airport for airline services across the Pacific. In addition, it is likely that the main runway itself and associated aprons and taxiways at Faleolo will require resurfacing within the next 10 years to ensure safe operation and ongoing compliance at an estimated total cost of around T$40M. Detailed testing of the runway condition, scheduled by SAA for the period 2011-2013, will provide an

improved estimate of cost and required timing of the resurfacing. The construction of a new airport at Aliepata has been proposed as a possible alternative base for air services to American Samoa. However the concept of a new airport at Aliepata is in the early stages of development and will require detailed technical feasibility and environmental studies; and identification of a suitable funding source. An early estimate of the cost of a new airport at Aliepata is in the range T$50-100M depending on the site and construction option.

10. Multi-Sector and Other

Several multi-sector projects are also underway or may arise over the next 5-10 years (Table B.10). MNRE is currently undertaking a program of coastal and river protection works (mostly seawalls) that is funded up to 2011 under the Global Environment Fund (GEF), and has proposed projects to continue this program and related projects in climate change adaptation and disaster risk management over the next 10 years.

In addition to these multi-sector adaptation and risk management projects, there are several proposed major industry/tourism developments with significant multi-sector economic infrastructure implications and the potential need for substantial investment. These include the possible StarKist and Sasina developments on Savai'i. The StarKist project involves the possible development of a large fish processing plant at Asau. It has large electricity and water requirements (up to 2-3 times existing supply capacity on Savai'i), as well as recommissioning and upgrading of the existing port and airport facility at Asau and upgrading road access links. The Sasina project is a planned hotel, resort and residential development at Sasina on the north shore of Savai'i. It is planned to be a "green" development that is self-sufficient in most services, but nonetheless, is likely to have implications for power, water, road and airport infrastructure on Savai'i. The financing of supporting infrastructure for both projects is unclear and the need for investment is contingent on the projects going ahead.

Table B.1 Multi-sector – major projects underway, committed or proposed

Ref	Project	Est. Cost (T$M)	Funding Source	2011-2015					2016-2020
	UNDERWAY AND COMMITTED PROJECTS								
M1	Coast and River Protection Program	2	DG	.					
	PROPOSED PROJECTS								
M2	Climate Change Adaptation Projects	50	-		.	.	.	.	⇔
M3	Infrastructure for StarKist at Asau	n.a.	-		.	.	.		
M4	Infrastructure for resort development at Sasina	n.a.	-		.	.			
M5	Disaster Early Warning System	10	-		.	.			
	TOTAL	**62**							

11. Overview of Planned Investments

The NISP consultation process identified a long list of ongoing and proposed investments in the economic infrastructure sector. If all of the proposed projects go ahead, the total investment would be around T$1,150M on over the next 5 years; and an additional T$500M in years 5-10 (Table B.11). This includes proposed projects which at this stage do not have a confirmed funding source.

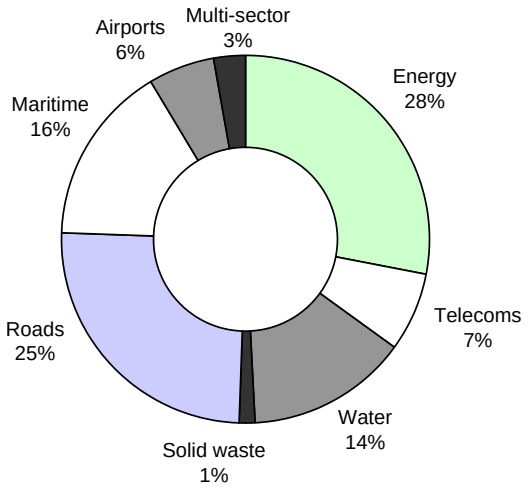
The split of planned investments by sector over the next five years is shown in Figure B.1. There are proposals to invest more than T$200M in each of the energy, roads and maritime sectors. Around 85% of total infrastructure investments would be made by State Owned Enterprises using a combination of self-funding from their own resources and participation in a range of development partner programs.

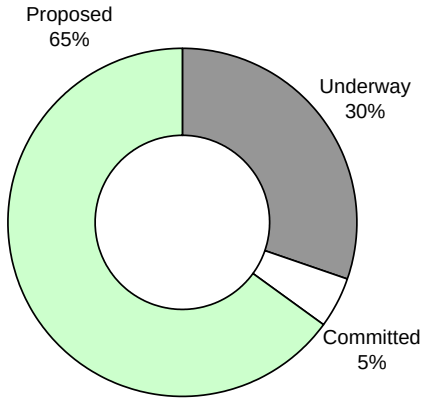
Table B.1 Planned investment by sector and year (T$ million)

Project [1]	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2016-2020	TOTAL
Energy	40	70	75	85	60	115	445
Telecommunications [2]	15	20	20	20	10	0	85
Water	30	50	25	30	30	10	175
Solid waste	5	0	5	5	0	0	15
Roads	25	30	80	60	100	130	425
Ports and shipping	5	75	40	50	15	100	285
Airports	5	10	30	20	5	95	165
Multi-sector [3]	5	5	5	5	5	30	55
TOTAL	130	260	280	275	220	480	1,650

Notes:
1. Includes investment projects that are underway, committed or proposed.
2. Excludes SamoaTel, Digicel.
3. Excludes StarKist and Sasina developments.

Figure B.1 Ongoing and proposed investments by sector over the next 5 years





ANNEX C: PROJECT SCREENING

This Annex describes the conceptual framework and methodology that was used to screen the long list of NISP projects; and applies the methodology to the pool of candidate project listed in Annex A. The outcome is the set of projects which are ready to commence in the next five years and considered to be a high priority in terms of aligning well with overall Government objectives and delivering a high level of benefits to the community.

1. Projects already underway

The Government has adopted a sector-wide approach to planning and improving infrastructure performance, and has several major medium/long-term infrastructure programs underway or in preparation (Table C.1). These sector programs include:

- Power Sector Expansion Project (PSEP), which is a multi-year project that is supporting a long-term investment program in the electricity distribution system, and diesel and hydro-generation, as well as setting up mechanisms for achieving Samoa's renewable energy targets;
- Water Sector Budget Support program, which is a sector-wide program implementing the *Water for Life* plan over the next 4-5 years;
- Samoa Sanitation and Drainage Project (SSDP) which supported the construction of the sewerage system and drainage works around Apia. A follow-up project is being prepared to extend the sewerage system and drainage improvements;
- Samoa Infrastructure Asset Management (SIAM2) project which has supported a range of infrastructure works, most notably the major upgrade of Vaitele St. A follow-up project that will further extend Vaitele St is currently being considered by Government; and
- Tsunami Recovery works continuing in the energy, water, telecommunications and transport sectors.

In addition, there are around 15 smaller infrastructure projects already underway or committed (see Annex A).

Table C.1 Major projects already underway or in preparation

Project	FY11	FY12	FY13	FY14	FY15	after FY15
Power (PSEP)	■■	■■	■■	■■	■■	■■
Water Sector Budget Support	■■	■■	■■	■■		
Sanitation and Drainage (SSDP I/II)	■■	■■	■■	■■	■■	
Roads (SIAM2)	■■	■■	■■	■■		
Tsunami Recovery	■■	■■				

■■ Underway
■■ Follow-up project under preparation or discussion

These ongoing projects provide a foundation for improving economic infrastructure over the next 5 to 10 years, and the first priority is to successfully complete projects that are already underway. However, the ongoing projects will not address all of the current and emerging infrastructure challenges. Therefore, additional initiatives and investments will be required.

2. Proposed projects

Priorities for additional projects over the next 5 to 10 were identified through a process of consultation and analysis. The first step was consultation with infrastructure managers (Ministries, SOEs) and users (community and private sector) to identify a long list of ideas for infrastructure projects and related initiatives that address current deficiencies and emerging infrastructure needs. These project ideas were then refined in discussions with infrastructure managers to ensure that the project objectives, concept and likely cost were clearly identified. This process generated a long list of

almost 50 ideas for improving the infrastructure system. This set of proposed projects is listed in Annex A and described in Annex B.

3. Project screening – background

It is unlikely that it will be possible to implement all of the proposed projects over the timeframe of this NISP, therefore a strategic approach is required and priorities need to be set. The next step was to screen the proposed project ideas to identify a short of priority projects that formed the basis of the infrastructure strategy. However before describing the process adopted for the NISP, it is important to put this in context by reviewing the current situation in Samoa regarding project planning and programming.

Samoa already has a well-established process for sector/project planning and programming. The process is defined in two inter-related documents:

- *Manual on Project Planning and Programming*: 2009 Edition; and
- *Sector Planning Manual for Samoa*: 2009 Edition.

The process starts with the preparation of a project proposal by the project proposer (Proposer). This proposal is prepared in accordance with a standard format and sent to Economic Policy and Planning Division (EPPD) of the Ministry of Finance (MOF). The proposal should show that the project:

- has a sound development orientation and approach in line with the Strategy for Development of Samoa 2008-2012 (SDS) and other Government policy statements;
- is in line and is consistent with the relevant sector plan;
- has valid fundamental assumptions;
- is financially self contained or that the financial implications (as appropriate) can be accommodated through future budget allocations; and
- is environmentally sound and is expected to have a sustainable future.

According to the guidelines, the proposal should include investment and recurring costs and then should either: provide its own project analysis, including estimates for revenues and costs, economic/financial indicators (FIRR and EIRR[18]), etc.; or identify the need for consultancy and more in-depth feasibility studies, with draft Terms of Reference (TOR). If the latter, the draft TOR would be reviewed by EPPD. The proposal is then sent to EPPD as a request for funding of either the consultancy or the project.

When it has reached project stage, the proposal is appraised by EPPD (for projects greater than T$100,000), or the Aid Coordination Committee (ACC) for smaller projects asking for foreign funding. When appraised positively, the proposal is forwarded to the Cabinet Development Committee (CDC). Foreign funding is then noted by ACC and local funding by the Budget and Planning Committee, and the project is included in the three-year rolling Public Sector Investment Program (PSIP) and Medium Term Expenditure Framework (MTEF), which comprises three-year rolling revenue and expenditure forecasts prepared by MOF based on Ministries' budget estimates.

In theory, this procedure would mean that all the proposed projects would be in line with SDS, be backed by a strategic Sector Plan with historic statistics and provide data for a defined 3 year rolling expenditure program, and have be subject to economic/financial appraisal (or include TOR for formal appraisal to take place). However in practice, there are departures from the formal process:

- in some case, project Proposers go directly to the CDC, over-ruling the need for EPPD review and making more difficult the inclusion of costs in future expenditure programs;
- as at late 2010, water is the only infrastructure sector with an up-to-date sector plan, *Water for Life*. This backlog of sector plans and the lack of emphasis in (current and outdated) plans on demand and tariff analysis constrains coordinated planning and project appraisal based on sound market-based demand forecasts; and
- in many cases project proposals are being made to MOF which do not include formal appraisal [such as Cost-Benefit Analysis (CBA)] or a

[18] Financial Internal Rate of Return (FIRR) or Economic Internal Rate of Return (EIRR).

feasibility study. Few project proposals considered by EPPD include formal economic/financial appraisal and EPPD generally does not have its own resources to undertake the analysis. Generally, this appraisal is only undertaken as part of the project preparation process by development partners, for example, for the PSEP, WaSSP, SSDP and SIAM2 projects.

Of the almost 50 NISP candidate projects identified through consultation with infrastructure managers and users, only 10 had been presented to EPPD for appraisal and the only projects for which economic/financial indicators (EIRR) are available are a small number of projects associated with the PSEP, Water Sector Budget Support, SSDP and SIAM2 programs. However, this is not surprising given that the NISP timeframe of 5-10 years is longer than the standard Samoa Government and SOE corporate planning horizon of three years; and has captured many projects that Ministries and SOEs are formulating but have not previously formalised into project proposals.

4. Project screening – approach

Based on the review of current procedures and consultation with MOF, several principles were developed for screening the candidate projects:

- as far as possible, the process should be consistent with the MOF guidelines and in particular, place an emphasis on
  - alignment with SDS, other Government policy statements, relevant sector plan;
  - sector-wide approach to planning;
  - project definition and assumptions;
  - environmental sustainability.
- projects should not be excluded simply because their net benefits could not be adequately quantified at this stage, whether by the proponents, by EPPD or by the assisting consultants.
- social, financial, institutional and other criteria are all important, and that CBA is the preferred approach. However it was agreed with MOF that for practical reasons full CBA would be conducted only after the priority project list was prepared and with the assistance from development partners during project preparation. As a general principle, detailed feasibility/economic/financial evaluation will be required to confirm the value-for-money of projects before a final commitment to investment.

In line with these principles, a multi-stage screening approach was adopted. This involved screening the proposed project ideas (candidate projects) against several tests:

- strategic alignment
- project benefits
- project dependency

The first test checked two things. Firstly, each project concept was tested to see how well it agrees with Samoan needs and development goals. This involved checking whether the project concept is strongly aligned with SDS goals and MDGs; and is consistent with the relevant sector and corporate plan. Secondly, project preparedness was checked, in terms of project preparation and progress of the project through the official planning and approvals pipeline; and whether the project is likely to commence within the next five years.

The second test checked whether the project would deliver strong and clear benefits to Samoa. As noted above, some of the proposed projects had already been formally appraised so that indicators of economic return (such as EIRR, NPV) were available. However most were at an early stage of development and formal CBA appraisal has not been undertaken. For these, a simplified qualitative assessment of the scope and scale of likely benefits was undertaken using a multi-criterion approach. The criteria included economic (employment generation, effect on the cost/quality of infrastructure services); social (access to social opportunities and interaction); environment (climate change mitigation, other environmental impacts); and disaster management factors (climate change adaptation, disaster preparedness).

Project proposals with clear benefits and strong alignment with national strategic goals progressed to the next stage of screening. If not, then the project concept was re-examined in consultation with infrastructure managers to test whether it could be amended to produce better alignment

with key national goals and deliver greater benefits, and if not, was dropped from further consideration.

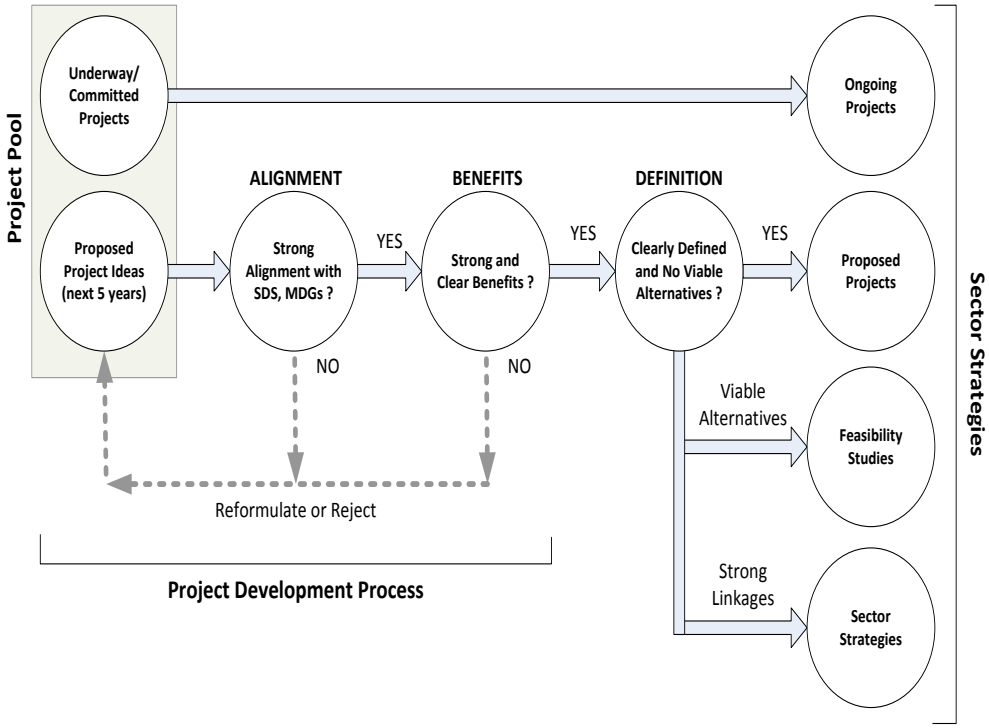
The next step checked on dependency and linkages between projects. This involved asking several questions:

- are there viable alternatives that have not been fully investigated?
- is the project so highly inter-linked with other possible projects that it cannot be considered separately?
- does the project rely on other things happening first or at the same time so that it can deliver its full value?

These are key questions for developing an infrastructure strategy because most economic infrastructure is part of a network of linked components (roads, water supply network, electricity network, etc). This means that the order in which projects are implemented can be important (e.g. staged upgrading of Vaitele St); there can be different ways of achieving the same objective (e.g. different options for an improved road connection between Apia to Faleolo Airport); projects can be complementary which means that they rely on each other to deliver their full benefits (e.g. local and international broadband links); and different projects can be so closely linked that investing in one means that another is no longer needed (or can be delayed). Many of the proposed projects had these types of dependencies. If the dependencies are weak or have already been resolved in previous studies, then the project is self-contained. Otherwise, the project concept requires further investigation in its broader network context (sector planning, options assessment studies) to ensure that it is implemented in a way that delivers best value for Samoa.

The overall screening process is shown schematically in Figure C.1.

Figure C.1 Project screening process



The outcome of the screening process is a set of self-contained projects and project concepts that align strongly with national goals and would deliver substantial community benefits. The process sorts the projects into four groups:

- projects that could be immediately short-listed because they are self-contained, well-defined projects that align well with national goals and sufficient evidence is available to verify that they would likely deliver strong returns in terms of community benefits;
- projects that have strong potential but require a specific feasibility study before inclusion in the Short List to fully resolve project alternatives and

benefits. So, while the projects are not excluded from a long list, they require more analysis before inclusion in the short list;

- projects that require a sector study before inclusion. These are projects that are so inter-linked that they required a combined or sector study so resolve the optimum combination of projects and staging; and
- projects where the identified benefits do not support the project being classified as a national priority. In practice, few projects were classified as not meeting national priority criteria, mainly because during the consultation and project development phase of preparing this NISP, the proponents decided to remove or reformulate the projects themselves.

In conjunction with ongoing projects, the priorities to emerge from this process formed the basis for framing strategies for infrastructure sectors over the next 5 to 10 years.

5. Screening the NISP project pool

The framework described above was applied to the NISP pool of proposed infrastructure investment projects to identify the high priority projects and initiatives that are expected to deliver substantial benefits to the Samoan people and economy. Note that ongoing projects were not included in the screening process, since these ongoing projects had already been appraised and identified as a high priority by Government. Multi-sector projects that involve providing infrastructure services to planned major private sector developments (such as the proposed StarKist fish processing plant at Asau on Savai'i and Sasina resort development on Savai'i) were also not included in the screening because they involve commercial and national development decisions beyond infrastructure factors.

The first step was to assess the strategic alignment of each project and its readiness to proceed. Information was also collected at this stage about the availability of economic indicators (EIRR, FIRR) of project merit. The results are shown in Table C.2.

Table C.2 NISP Project long list and screening framework – Stage 1

	Screening Framework	Base Cost	SDS	MDGs	Sector Plan	Corp. Plan	EPPD	Next 5 years	Readiness	Agency/Inst.	EIRR
Ref	**Name**	**T$M**	**Strategic Alignment**				**Readiness**				**CBA**
	Energy										
E4	Clean Energy Fund	35	●	●	◑	◑	◕	●	◕	◕	○
E5	On-Grid Solar Generation	50	●	●	◑	◕	◕	●	●	◕	○
E6	Other Renewable Energy	50	●	●	◑	●	◕	●	◕	◕	○
E7	Biomass Gasification	24	●	●	◑	◔	◕	○	◑	◕	○
	Telecom										
T2	National Broadband Network	30	●	●	○	◔	○	●	●	●	○
T3	AM Radio Transmission	6	●	●	○	◑	◕	●	●	●	○
T4	Second International Cable	40	●	◔	○	◔	○	●	●	●	○
	Water/Sanitation										
W5	Hospital Sewer System	3.5	●	●	●	◔	○	●	●	●	35%
W6	Pre-Treatment of Water	3	●	●	●	◔	○	●	◑	●	○
W7	Desalination Plant Manono	8.5	●	●	◑	◔	○	●	◕	●	○
W8	Desalination Plant Vailele	8.	●	●	◑	◔	○	●	◕	●	○
W9	SSDP II	43	●	●	●	◔	○	●	◕	●	13-17%
	Solid Waste										
S3	Land fill (Upolu, Savaii)	10	◕	◔	◑	◑	○	●	◑	●	○

Table C2 (Cont.)

Ref	Screening Framework / Name	Base Cost	SDS	MDGs	Sector Plan	Corp. Plan	EPPD	Next 5 years	Readiness	Agency/Inst.	EIRR
		T$M	Strategic Alignment				Readiness				CBA
	Roads										
R4	Vaitele St to Vailoa	8	●	◔	○	◔	◕	●	●	●	35%
R5	Vaitele St to Vaitele	30	●	◔	○	◔	◕	●	◑	●	40%
R6	Upgrade Aleisa Rd	15	●	◔	○	◔	◕	●	◑	●	○
R7	Upgrade Fugalei St	20	●	◔	○	◔	◕	●	◑	●	22%
R8	Vaitele St to Matafagatele St	15	●	◔	○	◔	○	●	◔	●	89%
R9	Inland Link Apia to Airport	52	●	◔	○	◔	○	●	◔	●	27%
R10	All-weather Roads – Savai'i	20	●	◔	○	◔	○	●	◕	●	○
R11	All-weather Roads – Upolu	60	●	◔	○	◔	○	●	◕	●	○
R12	Rural Access Roads	10	●	◔	○	◔	○	●	◑	●	○
R13	Footpaths	6	●	◔	○	◔	○	●	◔	●	○
R14	Cross-island Rd through Vailima	30	●	◔	○	◔	○	●	◑	●	○
R15	Saletele to Taelegaga	10	●	◔	○	◔	○	○	◔	●	○
R16	Apia: Link from Vaiusu to Fugalei	60	●	◔	○	◔	○	○	◔	●	○
	Ports										
P3	Apia Breakwaters/Channels	20	◕	◔	○	◔	○	●	◑	●	○
P4	Dredging Equipment	60	◕	◔	○	●	○	●	●	●	○
P5	Fagamalo Floating Pier	2	◕	◔	○	●	○	●	●	●	○
P6	Manono Wharves/Terminals	6	◕	◔	○	●	○	●	◑	●	○
P7	Inter-island Ferry Terminals	2	◕	◔	○	◔	○	●	◑	●	○
P8	Old Wharf Apia Port	32	◕	◔	○	◔	○	●	●	●	○
P9	Upgrade Slipway at Aleipata	4	◕	◔	○	◑	○	●	◕	●	○
P10	Upgrade Port of Aleipata	20	◕	◔	○	◑	○	●	◕	●	○
P11	Saleloga International Wharf	32	◕	◔	○	◑	○	●	◕	●	
P12	New Port at Palauli	100	◕	◔	○	◔	○	○	◔	●	○
	Airports										
A4	Fire Tenders (2 vehicles)	2	◕	◔	○	◔	○	●	●	●	○
A5	Faleolo Passenger Terminal	32	◕	◔	○	◕	○	●	◑	●	○
A6	Runway Apron at Faleolo	5	◕	◔	○	●	○	●	◑	●	○
A7	Secondary Runway at Faleolo	15	◕	◔	○	◔	○	●	◑	●	○
A8	Seal Faleolo Runway Shoulders	10	◕	◔	○	◔	○	○	◕	●	○
A9	Reseal Faleolo Runway/Taxiways	40	◕	◔	○	◑	○	○	◑	●	○
A10	New Airport at Aliepata	50	◕	◔	○	◔	○	○	◔	●	○
	Multi Sector										
M2	Climate Change Adaptation	50	●	◑	●	◑	◕	●	◑	◑	○
M5	Early Warning System	10	◕	◑	○	◔	○	●	◑	●	○

Legend: Level of alignment or readiness: ● Strong; ◕ Medium; ◑ Weak; ○ or 0 None

The key features of the analysis are:

- all projects show high to very high levels of alignment with SDS goals. In part this is because infrastructure managers are familiar with SDS goals and projects that are not well aligned with the SDS were weeded out or reformulated during discussions in the NISP consultation process;
- the analysis highlights the lack of an up-to-date sector plan for most sectors and the short planning horizon of corporate plans (3 years);
- most of the projects are at an early stage of development, with few projects having been considered and endorsed by EPPD. Again, this reflects the longer horizon for NISP than for most other infrastructure planning processes;
- most projects are scheduled to proceed during the next five years, but the level of project readiness varies. Adequate institutional and financial structures are in place for most projects, but for many, preparation has not progressed far beyond the conceptual and perhaps pre-feasibility stage; and
- few projects have been formally appraised with CBA. The only projects are those for which formal project preparation has been undertaken with support from a development partner. This reinforces the observation that formal CBA is not routinely undertaken during the project formulation phase, and typically only happens after an in-principle decision has been made and discussions held with potential funding partners. However as noted above, detailed economic/ financial evaluation will be required as project preparation progresses to confirm the value-for-money of projects before a final commitment to investment.

Considering that most proposed projects have not been formally appraised, a Multi-Criteria Analysis (MCA) was undertaken to clarify the spread of likely benefits and gauge the overall strength of benefits expected to be delivered to the community. The criteria used for this analysis were:

Table C.3 Hierarchy of criteria

Headline Criterion	Sub-Criterion	Description
Economic	Employment	Whether the project creates new jobs in the sector (direct generation)
	Service Cost/Quality/ Efficiency	Whether the project increases service quality/reliability/safety; and/or reduces the cost to consumers; and/or the cost of supply (through efficiency gains)
Social	Social Access	Improved access to social opportunities and services, such as social, recreational, education, health, etc
Environmental	Air Quality/GHG	Impacts/benefits to air quality and Greenhouse Gas (GHG) emissions
	Other	Impact/benefits to maritime environment, water quality, wildlife, vegetation, soils, etc
Disaster Preparedness	Climate Change Adaptation	Whether the project assists with adaptation to long term climate change
	Disaster Risk Reduction	Whether the project reduces disaster risk and/or improves response to natural disasters

All candidate projects were then assessed against the base case of the project not going ahead. This means that in some cases a project that maintains services at current levels (such as resurfacing an airport runway) delivers a major benefit because the base case alternative is a significant cut in services. Each of the headline criteria were given equal weighting and scaled to give a raw score out of 100. The results of the simple MCA are summarised in Figure C.2. The results show a spread of scores, with

- most of the projects clustered around the medium range of 40-50/100 (average score across all projects is 46/100);
- several projects with notably higher MCA scores, in particular, the Clean Energy Fund, internet connectivity projects, extension of the Apia sanitation and drainage system, climate change adaptation projects, and improved access to Manono; and
- a small number of projects, especially in the ports and airports sectors, scoring in the lower priority range. In some cases this is because projects

in these sectors are strongly linked and they do not perform well as stand-alone projects.

The sensitivity of the results to changes in weighting of headline criteria was also tested by varying the weights within reasonable ranges.

The final stage of the screening process was to examine issues of project dependency to identify projects which require further analysis, either feasibility study or sector study, before being short-listed as NISP priorities. The results are shown in Table C.4, along with a summary of tests for strategic alignment, readiness and project benefits. This provides an overall assessment of the merits and preparedness of the candidate projects.

Figure C.2 Socio-economic benefits of projects proposed for implementation in the next five years

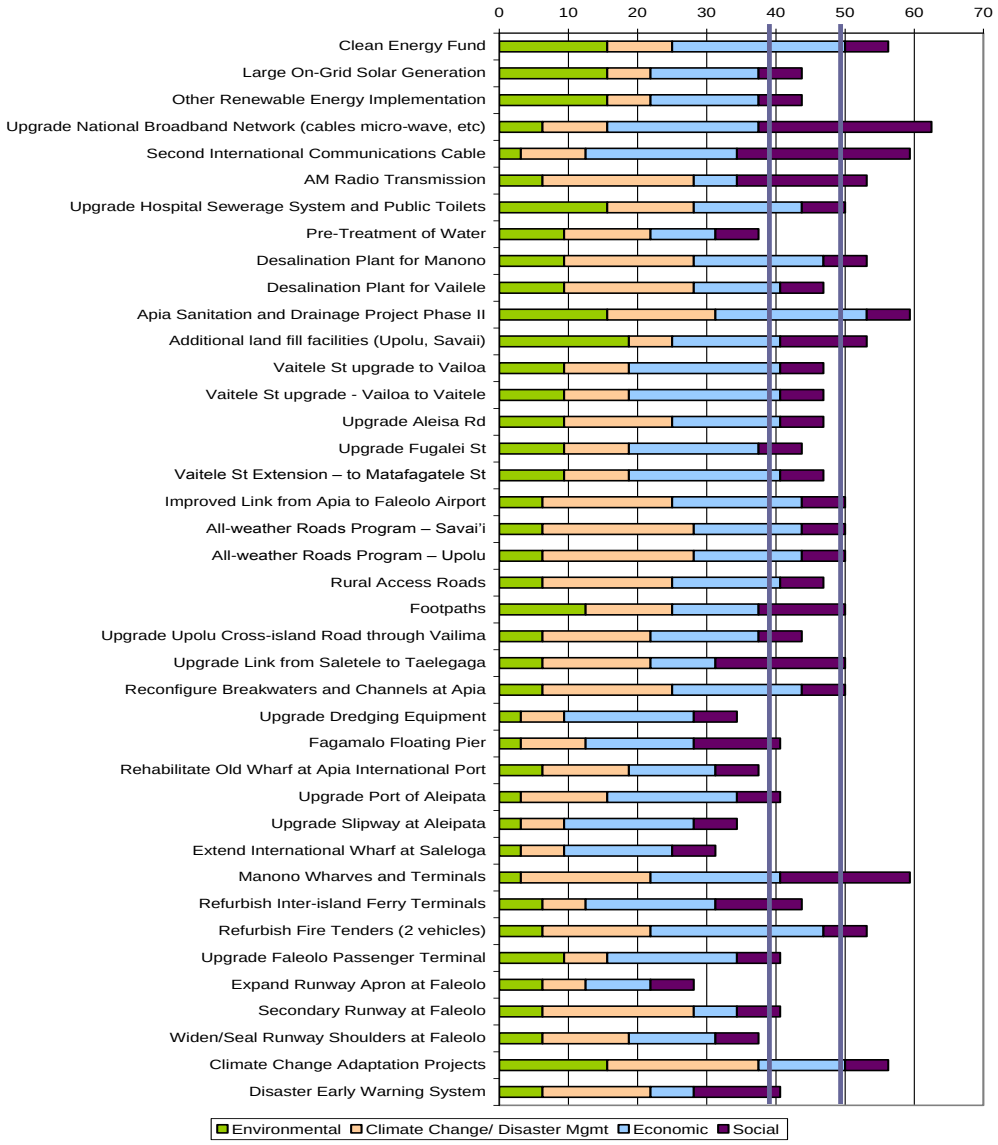


Table C.4 NISP project long list and screening framework – Stage 2

		Base Cost (T$M)	SDS Alignment	Next 5 years	Benefits	Alternatives	Linked Project	Notes
	Energy							
E4	Clean Energy Fund	35	●	●	●			
E5	On-Grid Solar Generation	50	●	●	◕			
E6	Other Renewable Energy	50	●	●	◕		●	Jointly depends on results
E7	Biomass Gasification	24	●	○			●	of research underway
	Telecom							
T2	National Broadband Network	30	●	●	●			
T3	AM Radio Transmission	6	●	●	●			
T4	Second International Cable	40	●	●	●			
	Water/Sanitation							
W5	Hospital Sewer System	3.5	●	●	●			
W6	Pre-Treatment of Water	3	●	●	◔			Low benefits
W7	Desalination Plant Manono	8.5	●	●	●			
W8	Desalination Plant Vailele	8	●	●	◕			
W9	SSDP II	43	●	●	●			
	Solid Waste							
S3	Land fill (Upolu, Savaii)	10	◕	●	●	●	●	Needs nation-wide approach

		Base Cost (T$M)	SDS Alignment	Next 5 years	Benefits	Alternatives	Linked Project	Notes
	Roads							
R4	Vaitele St to Vailoa	8	●	●	◕		●	Links of the same road
R5	Vaitele St to Vaitele	30	●	●	◕		●	Corridor
R7	Upgrade Fugalei St	20	●	●	◕		●	
R8	Vaitele St to Matafagatele St	15	●	●	◕	●	●	Several alignment options
R9	Improved Link from Apia to Airport	52	●	●	●	●	●	Available
R6	Upgrade Aleisa Rd	15	●	●	◕			
R10	All-weather Roads – Savai'i	20	●	●	●			
R11	All-weather Roads – Upolu	60	●	●	●			
R12	Rural Access Roads	10	●	●	◕			
R13	Footpaths	6	●	●	●			
R14	Cross-island Rd through Vailima	30	●	●	◕			
R15	Saletele to Taelegaga	10	●	○				Beyond 2015
R16	Apia: Link from Vaiusu to Fugalei	60	●	○				Beyond 2015
	Ports							
P3	Apia Breakwaters/Channels	20	◕	●	●	●		Multiple options
P6	Manono Wharves/Terminals	6	◕	●	●			
P7	Inter-island Ferry Terminals	2	◕	●	◕			
P4	Dredging Equipment	60	◕	●	◔	●	●	Part of nationwide system

		Base Cost (T$M)	SDS Alignment	Next 5 years	Benefits	Alternatives	Linked Project	Notes
	Ports							
P5	Fagamalo Floating Pier	2	◕	●	◕		●	of ports and port
P8	Old Wharf Apia Port	32	◕	●	◔		●	functions
P9	Upgrade Slipway at Aleipata	4	◕	●	◔		●	
P10	Upgrade Port of Aleipata	20	◕	●	◕		●	
P11	Saleloga International Wharf	32	◕	●	◔		●	
P12	New Port at Palauli	100	◕	○		●	●	Multiple options
	Airports							
A4	Fire Tenders (2 vehicles)	2	◕	●	●			
A5	Faleolo Passenger Terminal	32	◕	●	◕	●	●	Linked parts of overall
A6	Runway Apron at Faleolo	5	◕	●	◔		●	terminal upgrading
A7	Secondary Runway at Faleolo	15	◕	●	◕			
A8	Seal Faleolo Runway Shoulders	10	◕	●	◔			Can be delayed to beyond 2015
A9	Reseal Faleolo Runway/Taxiways	40	◕	○				Beyond 2015
A10	New Airport at Aliepata	50	◕	○				Beyond 2015
	Multi Sector							
M2	Climate Change Adaptation	50	●	●	●	●		Staging of seawalls needs national approach/ priorities
M5	Early Warning System	10	◕	●	◕	●		Alternative technologies available

Based on the results, shown in Table C.4, the long list of candidate projects was classified as either:

- self-contained projects that are well-aligned with national goals, ready to start in the next 5 years and have medium-high benefits. These qualify as priority projects, but as planning progresses, they will require detailed feasibility/economic/financial evaluation to confirm their value-for-money before a final commitment to investment;
- linked projects that require either a feasibility study or a sector study as the next step in project preparation. In particular, the analysis of project linkages identified needs for:
  - *National Waste Management Strategy* to further define needs and optimal locations and operating plans for proposed landfills (S3);
  - feasibility study to compare route/alignment/upgrade alternatives for the road corridor linking Apia to Faleolo airport (R9);
  - feasibility study to compare route/alignment/upgrade alternatives for an improved road corridor linking Vaitele St to the Port of Apia (R8);
  - *National Sea Ports Plan* to identify the best combination and staging of port improvement projects (P4,5,8-12);
  - *Airports Master Plan* to develop a long-term upgrade strategy for Faleolo International Airport terminal, aprons, etc (A5,6). Preparation of the master plan is scheduled for early 2011; and
  - *National Coastal Protection Strategy* to identify coastal risks and develop a prioritised and coordinated program of sea wall construction.
- a small number of self-contained projects (W6, A8) did not show sufficient evidence of national significance at this stage, and were dropped from further consideration in this NISP. These projects should be reconsidered in future updates of NISP. All of the other projects that did not show sufficient evidence of national significance are linked projects that would be reconsidered as part of a proposed feasibility or sector study.

The list of priority projects and complementary initiatives (feasibility/sector studies) that emerged from this process is shown in Table C.5. The combination of ongoing projects and these additional priorities formed the basis for framing strategies for infrastructure sectors over the next five to ten years. The strategy and packaging of projects is described in Chapter 3 of the NISP.

Table C5 Priority projects and complementary initiatives (next 5 years)

	Priority Projects	Base Cost (T$M)	2011-2015					2016-2020
	Energy							
E4	Clean Energy Fund	35						⇔
E5	On-Grid Solar Generation	50						
E6	Other Renewable Energy	50						⇔
	Telecom							
T2	National Broadband Network	30						
T3	AM Radio Transmission	6						
T4	Second International Cable	40						
	Water/Sanitation							
W5	Hospital Sewer System	3.5						
W7	Desalination Plant Manono	8.5						
W9	SSDP II	43						⇔
	Solid Waste							
TA	Prepare National Waste Management Strategy	0.5						
S3	Land fill (Upolu, Savaii)	10						
	Roads							
TA	Feasibility study for Apia-Faleolo corridor	1						
TA	Feasibility study for Vaitele St to Port corridor	1						
R4	Vaitele St to Vailoa	8						
R5	Vaitele St to Vaitele	30						
R7	Upgrade Fugalei St	20						
R6	Upgrade Aleisa Rd	15						
R10	All-weather Roads – Savai'i	20						
R11	All-weather Roads – Upolu	60						
R12	Rural Access Roads	10						⇔
R13	Footpaths	6						
R14	Cross-island Rd through Vailima	30						
	Ports							
TA	Prepare a *National Ports Plan*							
P3	Apia Breakwaters/Channels	20						
	Implement *National Ports Plan*	50-80						⇔
P6	Manono Wharves/Terminals	6						
P7	Inter-island Ferry Terminals	2						
	Airports							
A4	Fire Tenders (2 vehicles)	2						
A5,6	Upgrade Faleolo Terminal based on *Master Plan*	32						

	Priority Projects	Base Cost (T$M)	2011-2015					2016-2020
A7	Secondary Runway at Faleolo	15						
	Multi Sector							
TA	Prepare *National Coastal Protection Strategy*	0.5						
M2	Climate Change Adaptation	50						⇔
M5	Early Warning System	10						

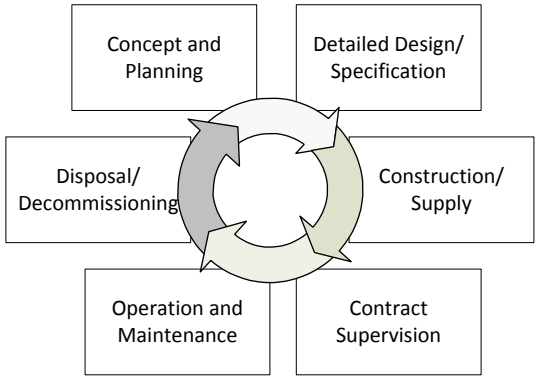
ANNEX D: ANALYSIS OF LIFE CYCLE COSTING ISSUES

This Annex provides background information and analysis relating to life cycle costing, and the track record and financial capacity of Government and State Owned Enterprises (SOEs) in relation to economic infrastructure. It also examines the current situation regarding the balance between maintenance needs and maintenance spending; and the maintenance implications of the NISP for the next 5 to 10 years. Issues of future funding of infrastructure are covered as part of the funding strategy in Annex E.

1. Infrastructure life cycle costs

The purchase or construction of an infrastructure asset is not an end or even a beginning. The life cycle of an infrastructure asset involves a sequence of steps that extend from the initial identification of needs through to disposal of the asset at the end of its useful life. Figure D.1 shows the steps in the infrastructure asset life cycle.

Figure D.1 The asset life cycle



All of the following steps require planning and coordination and involve costs and time:

- Planning investigations, development of the design concept, and required studies such as environmental impact assessment involve cost and time.
- Preparing detailed designs and/or specifications and the cost of preparing contract documentation involve cost and time.
- Construction/supply of the infrastructure, plus allowance for contingencies and cost escalation over the supply period involve costs and time. For a major infrastructure project, the combined duration of planning, detailed design/specification, contracting and delivery can amount to several years.
- Supervising the contract (technical, financial, legal) to ensure that the work is done to the required standard and in compliance with contract requirements involve costs and time.
- Operating the infrastructure over its useful life (involve labour, energy costs and consumables) and involve costs and time. The economic life over which infrastructure is operated and maintained can range from around 5-10 years for some equipment and up to 100 years for major civil works.
- Maintaining the infrastructure over its entire operating life to keep it in good condition involves costs and time. This includes routine maintenance (small-scale activities undertaken regularly as general upkeep against normal wear and tear) and periodic maintenance (larger scale activities carried out at longer intervals to sustain the infrastructure condition or operational status).
- Disposal can include the cost of decommissioning the asset, demolishing/removing it from the current location, and disposing of the waste involve costs and time. This can involve a range of environmental costs associated with disposal. The unused infrastructure should not be just left in place to decay and potentially pollute its surroundings.

In most cases, asset owners are well aware of the construction/supply cost of infrastructure and its ongoing operating costs (such as labour, energy

costs and consumables), but are less aware of the extent and scale of other life-cycle costs. The total life cycle cost can be expressed as:

Life Cycle Cost = [Concept Development & Planning] + [Detailed Design & Documentation] + [Construction/Supply including Escalation] + [Contract Supervision] + [Operating Cost] x [Asset Life] + [Routine/Periodic Maintenance] x [Asset Life] + [Disposal/Decommissioning Cost]

The typical breakdown of life cycle costs of infrastructure is summarised in Table D.1 along with some benchmarks for the typical contribution of each cost component. The Table shows an example of an infrastructure project with a nominal construction/supply cost of $100 (for ease of calculation) and an assumed operating life of 20 years.

Table D.1 Indicative analysis of life cycle costs

Stage	Rate [a]	Construct/ Supply Only	+ Other Up-front	20 Year Maintenance
Concept Development and Planning	2-5%		$2-5	
Detailed Design and Documentation	5-10%		$5-10	
Infrastructure Construction/Supply		$100	$100	
Contingency/Escalation	10%		$10	
Contract Supervision	5%		$5	
Operating Cost	variable			
Maintenance – Routine [b]	0-6%			$0-120
Maintenance – Periodic [c]	5-10%			$10-20
Disposal/Decommissioning	variable			
TOTAL		$100	$120-130	$10-140

Notes: a. Based on typical infrastructure costing parameters, derived from literature review and consultation with infrastructure project management specialists in Samoa and internationally.
b. Varies from minimal periodic/periodic maintenance for buried infrastructure (such as water pipes) up to 5% per year routine and 10% periodic for gravel roads.
c. Based on 20-year asset life with periodic maintenance every 7 years.

This calculation shows that other up-front costs can add 20-30% to the nominal cost of the infrastructure and over the life of the asset, the total cost of maintenance can be as high as the initial capital (depending on the type of infrastructure). In other words, for some infrastructure, the actual cost of owning the asset over its lifetime (excluding operating cost) can be double the initial quoted construction/supply cost.

This has important planning and budgeting implications for ensuring that sufficient resources are available for proper planning and design/specification of the infrastructure and for proper maintenance throughout the asset life. The relative size of these components will vary according to the details of the specific infrastructure, but as a general guideline, the following cost allowances should be included in infrastructure budgeting:

- 10-20% up-front allowance for planning, detailed design and documentation, and contract supervision;
- 10% contingency for physical changes to the infrastructure works/ specification and cost escalation over the supply period. This is in addition to any contingency already included in the construction/supply cost estimate; and
- 5% of construction/supply cost as a recurrent allowance for maintenance each year of the asset life (depending on the type of infrastructure). Issues of maintenance requirements are discussed in more detail in the following sections of this Annex.

Disposal costs are more problematic in terms of budgeting because the disposal/decommissioning may be 20 years or more into the future. However, it is important to recognise that there may be significant costs associated with disposal, and as noted earlier, the unused infrastructure should not be just left in place to decay and potentially pollute its surroundings.

As shown in Table D.1, the life cycle maintenance cost of infrastructure can be as high as the initial build/buy cost, and in addition, maintenance also affects operating cost. Insufficient maintenance will tend to adversely affect

operating efficiency and increase operating cost. The following sections of this Annex examine maintenance issues in more detail. In particular, financial analysis was undertaken to assess:

- the financial capacity of Ministries and State Owned Enterprises (SOEs) to meet maintenance and infrastructure renewal costs from their own resources;
- the extent of actual spending on maintenance and asset renewal;
- whether actual spending is in the right ballpark for sustainable asset management; and
- the maintenance implications of infrastructure projects that are underway, committed and planned.

2. State Owned Enterprises (SOEs)

SOEs are responsible for infrastructure management and service delivery in all areas of the economic infrastructure sector, except construction seawalls, solid waste management and telecommunications. In the telecoms sector, Government operates AM radio services through the Ministry of Communications and Information technology, and currently owns the SamoaTel which competes against private sector operators in the telephone and internet market. Initiatives are underway to privatise SamoaTel, and from some time in 2011, it is expected that SamoaTel will have majority private ownership. Table D.2 provides a summary profile of the six SOEs operating in the economic infrastructure sector in terms of their sector of operations and basic financial indicators.

Based on these financial indicators, the SOEs break into three groups:

- Large/Strong: this category has two SOEs (SamoaTel and EPC) with annual revenue exceeding T$50M; EBITDA (Earnings Before Interest, Tax, Depreciation and Amortisation) of more than T$10M; and significant net profit after tax (exceeding T$5M). Note that EPC has rundown assets and is currently in a reinvestment phase; and the profitability of SamoaTel has been affected by fierce competition in the telecommunications market with Digicel.
- Small/Capable: this category contains two SOEs (SPA, SSC) with annual revenue less than T$20M and positive in both EBITDA and profit after tax.

Table D.2 SOE – Financial Indicators (2008/09 T$'000)

Sub-Sector	SOEs	Total [a] Revenue	Subsidy	EBITDA [b]	Net Profit After Tax	Return on Equity	Dividend
Energy	Electric Power Corporation (EPC)	96,348	5,366	13,617	5,712	4.0%	0
Telecoms	SamoaTel (ST)[ac]	52,197	0	16,611	6,645	8.0%	1500
Water and Sanitation	Samoa Water Authority (SWA)	16,556	6,209	3,848	-1,473	-1.8%	0
Transport	Samoa Ports Authority (SPA)	11,752	401	5,989	425	0.4%	65
	Samoa Shipping Corporation (SSC)	16,085	0	2,348	1,108	26.0%	0
	Samoa Airports Authority (SAA)	10,317	248	3,510	-383	-1.6%	0

Notes: a. Total revenue includes operating revenue plus grants and CSO payments for specific purposes.
b. EBITDA excludes subsidies.
c. SamoaTel is included for comparison purposes only of maintenance costs in the telecommunications sub-sector. The Government is in the process of privatising SamoaTel and from 2011, it is expected that SamoaTel will have majority private ownership.

- Small/Marginal: this category contains two SOEs (SWA, SAA) which also have revenue in the T$10-20M range and positive EBITDA, but register an after tax loss and negative return on equity.

Other important issues highlighted in Table D.2 are:

- The revenue of most SOEs is subsidised in the form of grants and CSO payments and operating subsidies from government through the government Budget. Grants and CSO payments are for specific purposes, generally to compensate the SOE for providing non-commercial services on behalf of Government. Operating subsidies amount to general budget support for the SOE and have been excluded from the EIDTBA calculation to provide a better indication of financial self-sufficiency. All SOEs have positive EBITDA, excluding operating subsidies.
- There is inconsistent treatment of donated assets and grants from government to SOEs for economic infrastructure or investment projects. Most SOEs treat these as either deferred income and write them off as income to the Profit and Loss over the useful life of the donated assets/grant; or they are only recognised when there is reasonable assurance that the SOE will comply with the conditions attached to the grants when received. Therefore, funding to SOEs through the annual government Budget can not be easily reconciled to the financial statements due to different treatment of SOEs and also the period in which they are received either in grant payment or donated asset as shown in the SOE audited accounts.
- Government involvement in SOE operations also comes in the form of constraints on setting tariffs and charges. SOEs generally do not have the flexibility to adjust their charges to maintain cost recovery levels. Instead, SOEs require Government approval for changes to the fees that they charge, which tends to erode the link between costs and revenues and constrain the commercial operation of SOEs.
- Most SOEs are not paying dividends. The Public Bodies (Performance and Accountability) Regulations 2002 Schedule 7 (paragraph 25.2) requires "a company to pay dividend in accordance with Government's dividend policy as advised by the Financial Secretary from time to time." In May 2005, the Chief Executive Officer of MOF advised that Public Trading Bodies would be accountable for a dividend of 50% of Net Profit after tax. In FY2008/2009, only two of the SOEs (SamoaTel and SPA) paid dividends to the Government of T$1.5M and T$0.065M, respectively.
- Judged on the basis of return on equity, only EPC, SamoaTel and SSC can be considered viable businesses.

In addition, it is important to note that most of the SOEs have outstanding borrowings:

- as of FY2008/2009, total EPC debt from Government is T$35.6M through restructured loans from the ADB with repayment of T$5M per annum with interest rate of 5% per annum after a 5 year grace period. The expiry date was extended from June 2007 to June 2009. The Government bears the foreign currency exchange risk on the repayment of the ADB loan. EPC has a loan with ANZ Bank of T$0.94M and finance lease liabilities of T$0.61M. EPC has another borrowing from Government of US$80M through an ADB loan and Japan Bank for International Cooperation (JBIC) for the Power Sector Expansion Project (PSEP). The repayment of the first tranche will commence in 2013 after a grace period of 5 years at an interest rate of 6.5% per annum. EPC counterpart funding for PSEP is from internal sources. Grant from Australia for the PSEP will be recognised as equity in the EPC account of T$0.65 million. This is a different treatment to some SOEs where grants from government are treated as deferred income.
- SPA's main debts (amounting to some T$18M) are with Government for construction of the wharves at Salelologa and Aleipata (including slipway project), and Apia Marina project and purchase of work boats in 2000 and 2002. SPA has ability to repay its debt to government.
- SSC has a total outstanding debt of some T$7M mainly arising from acquisition of new vessels (MV Samoa Express in 2001, MV Fotu-o-Samoa II in 2004, and MV Lady Filifilia in 2008), purchase of land at Matautu, and expansion of workshops. These debts are all with local commercial banks.

- SAA has several debts including a long term debt of T$21.9M and Government debts with MOF of T$9.65M. SAA does not have ability to repay its debt. In FY2008/2009, repayments of the SAA debt with the National Provident Fund (NPF) were met by MOF on its behalf and are shown in SAA accounts as a grant from MOF/government of T$0.25M. A new Airports Master Plan and Business Plan for SAA are currently being prepared and is expected to be completed in early 2011. This includes a review of all airport charges (both aeronautical and non aeronautical); investigation of new business opportunities; and assessment of the feasibility of setting up a sinking fund for major maintenance projects and asset replacement. The outcomes of this process are expected to lead to a strengthening of the overall financial performance of SAA, and its ability to fully meet its debt and maintenance obligations.
- SWA has a modest debt mainly bank overdraft facility of T$0.60M, finance lease liabilities, and commercial borrowing. SWA has the financial capacity to service its borrowing. The overall financial performance of SWA places it in the Small/Marginal category. However, over the next five years this is expected to change. Under WaSSP and the ongoing Water Sector Budget Support program (with support from EU), major changes are underway in terms of billing and financial systems, and attending to deferred maintenance and water supply system deficiencies. Successful implementation of this program is expected to result in significantly improved financial performance.

Assessment of SOEs spending on maintenance and infrastructure renewal

The financial analysis of maintenance performance is complicated by the way repairs and maintenance expenses/costs are recorded and treated in the SOEs' accounts. Almost all SOEs have dedicated staff in their payroll to undertake routine repairs and maintenance to existing assets. This means that SOE accounts tend to under-represent maintenance because much of the cost is recorded as personnel costs and mainly form part of general operating expenses, and not maintenance. Table D.3 provides detail of maintenance and capital-related spending using SOEs audited annual accounts, and in cases where most maintenance is done in-house and not fully recorded in the accounts as maintenance, a *rule of thumb* of around 10% of total personnel and overhead costs was allocated to repair and maintenance costs.

To provide an overall picture of infrastructure spending, Table D.3 provides details of infrastructure asset value, spending on repairs and maintenance and acquisition of new plant and equipment where they are available in the accounts. This Table also includes the ratio of the total amount spent on repairs, maintenance and acquisition of new plant and equipment relative to the infrastructure asset value. This is a rough indicator of overall spending on expanding, renewing and maintaining infrastructure relative to the total size of the infrastructure asset base for each SOE.

Table D.3 SOE – Maintenance and Capital Indicators (2008/09 T$'000)

Sub-Sector	SOEs	Infra Asset Value [a]	Repairs & Mtnce	CAPEX	Mtnce + CAPEX	Capital Sustain Ratio
Energy	EPC	181,665	10,631	10,194	20,825	11.5%
Telecommu-nications	ST [b]	109,667	8,259	12,829	21,088	19.2%
Water and Sanitation	SWA	80,872	5,173	43	5,216	6.4%
Transport	SPA	127,907	817	4,379	5,196	4.1%
	SSC	12,112	987	0	987	8.1%
	SAA	55,761	744	2,000	2,744	4.9%
TOTAL		567,984	26,611	29,445	56,056	

Notes: a Book value of Land, Buildings, Plant & Equipment, Office Fixtures & Fittings & Furniture, Motor Vehicles, Vessels, Wharfs and Terminals (SSC, SPA) etc.
b Included for comparison purposes only of maintenance costs in the telecommunications sub-sector.

This analysis splits the SOEs into three spending bands:

- High: this category contains SamoaTel and EPC. SamoaTel is in a fast changing business with private sector competition and must spend on infrastructure maintenance to keep pace with technology and remain competitive. EPC has rundown assets and is currently spending on infrastructure to rehabilitate the system.
- Medium: this category contains SSC and SWA. SWA infrastructure is dominated by a small number of large fixed assets (water supply and treatment plant assets, land and buildings, workshop and office equipment) and much of its maintenance spending is governed by the need to meet international standards of water supply services. SSC maintenance and capital spending is governed by the need to meet international shipping and safety standards and to expand its freight and passengers services including cruise services.
- Low: this category contains two businesses (SPA and SAA) for which spending on repairs and maintenance is low and potentially below sustainable levels. However they have both shown a good level of spending on acquisition of new plant and equipment or investment.

The adequacy of spending on maintenance is explored further in Table D.4. This Table shows figures for infrastructure asset value, spending on maintenance, an estimate of the required level of sustainable maintenance spending for two scenarios (2% and 4% of asset value); and an overall rating of the maintenance spending gap. The gap is rated Small if actual spending is within the suggested range; Medium if slightly below the 2% scenario; and High if well below the 2% scenario. The required spending scenarios are based on the rules-of-thumb in Table D.1. For an individual item of infrastructure, recommended average annual spending on maintenance (routine, periodic) is in the range 1-6% depending on the type of infrastructure, but for an organisation with a diverse infrastructure stock, this will tend to average out and reduce the range.

Table D.4 SOEs – Comparison of Maintenance needs and spending (2008/09 T$'000)

Sector	Agency	Infra Asset Value	Mtnce Spending	Required Mtnce 2%	Required Mtnce 4%	Gap
Energy	EPC	181,665	10,631	3,633	7,267	Small
Telecoms	ST	109,667	8,259	2,193	4,387	Small
Water	SWA	80,872	5,173	1,617	3,235	Small
Transport	SPA	127,907	817	2,558	5,116	Large
	SSC	12,112	987	242	484	Small
	SAA	55,761	744	1,115	2,230	Medium

The analysis of the adequacy of current spending on maintenance again splits the SOEs into three groups:

- Large Gap: SPA has a very large asset base and based on this analysis it appears that SPA is not spending sufficient to keep pace with the maintenance requirements and as a result may have a deteriorating infrastructure stock.
- Medium Gap: SAA may not be spending sufficient on maintenance.
- Small Gap: EPC, SamoaTel, SWA and SSC appear to be currently spending sufficient to keep their infrastructure in good condition and possibly rehabilitate assets that are rundown. EPC appears to be spending a good

level of resources to maintain its infrastructure and is in the process of an infrastructure renewal process (partly funded by Grants from Government and external borrowing through the Government also on on-lending arrangement) so it has a good level of capital spending, some of which is an alternative to maintenance of existing assets.

Based on a combined assessment that considered current financial strength (Table D.2); historical spending on maintenance and capital (Tables D.3, D.4); discussions with operators; and the likely impact of projects underway (such as PSEP and Water Sector Budget Support program), an overall assessment was made of the capacity of SOEs to fund operations, maintenance and capital requirements from their own resources (Table D.5). More detailed analysis of mechanisms for funding infrastructure is provided in Annex E.

The assessment rates the capacity of each SOE on a High/Medium/Low scale relative to its capital base, as follows:

- High: indicates a full capacity to self-fund without assistance;
- Medium: indicates a partial capacity, whereby the SOE can self-fund some needs but a backlog will gradually accumulate; and
- Low: indicates that the SOE is effectively unable to self-fund this activity.

Note that for each SOE, the CAPEX (capital expenditure) scale relates to a Small, Medium or Large individual investment relative to its asset base. A Small investment involves routine replacement/upgrading of equipment and facilities (up to several million tala); while a Large investment would involve replacement or major rehabilitation of the largest item of infrastructure that the SOE already owns (such as the airport runway), or the scale of investment required to transform the business (such as an undersea fibre-optic cable). Therefore, the monetary value of each level of investment will vary across the range of SOEs according to the type and size of infrastructure in its asset stock.

Table D.5 Analysis of capacity for self-funding infrastructure costs

Sector	Agency	Operations	Mainten-ance	Small CAPEX	Medium CAPEX	Large CAPEX
Energy	EPC	High	High	High	High	Medium
Telecoms	ST	High	High	High	High	Medium
Water	SWA	High	High	High	Medium	Low
Transport	SPA	High	High	High	High	Low
	SSC	High	High	High	High	Low
	SAA	High	High	High	Medium	Low

The overall assessment of the capacity of SOEs to self-fund infrastructure indicates that:

- All SOEs are financially stable with positive cashflow, positive EBITDA, and the financial capacity to self-fund operations and maintenance (O&M) and small infrastructure investment.
- EPC and SamoaTel are quite strong businesses with capacity to also partly self-fund the largest infrastructure projects.
- SPA and SSC can generally fund all but the largest infrastructure projects from their own resources. The challenge faced by these SOEs is that they are custodians of some very large single item of infrastructure (vessels and international wharf facilities) that require infrequent but very expensive rehabilitation. These SOEs do not have the financial strength to renew/upgrade these large items of infrastructure from their own resources.

- SWA and SAA could potentially part-fund medium infrastructure projects, but would struggle to fund larger projects. They face similar challenges in terms of being custodians of large single items of infrastructure that require infrequent but very expensive rehabilitation.

The performance of SOEs can also be judged in terms of cost recovery. Cost recovery can be defined in several ways. First, is the ability to cover cash flow costs, including maintenance at a sufficient level. Second, is the ability to cover accounting costs plus the larger of depreciation and debt repayments. The third adds the ability to provide a return on capital employed. Subsidies should be included as revenue as long as they are defined and predictable[19]. Based on cash flows including interest, all the SOEs cover costs. Most SOEs also cover depreciation, with the exception of SWA and SAA. EPC, SamoaTel and SSC also provide a reasonable return on capital employed.

3. Economic Infrastructure Ministries (EIMs)

The EIMs' funding for maintenance and asset rehabilitation for the sub-sectors such as Construction (buildings and seawalls), Telecommunications, Transport (roads), and Solid Waste is made through the annual budget appropriations of the Ministry of Works, Transport & Infrastructure (MWTI), Ministry of Communications, Information & Technology (MCIT), Ministry of Natural Resources and Environment (MNRE) and the Ministry of Finance (MoF). Table D.6 shows estimated Government and external donors spending by sub-sectors.

Table D.6 indicates significant levels of spending on maintenance but it is difficult to draw firm conclusions because:

- expenditure figures for external donor contributions to medium to large investment projects are available from MOF classified by the following purposes: a) budget support, b) capital investment, c) technical assistance, and d) training/capacity building. With this level of detail, it is difficult to identify external donors contribution to maintenance programs (if any);
- Government accounts are not structured in a way that enables maintenance to be readily identified. The exception is the roads sub-sector which has available breakdown and details of maintenance and capital investment data. The three years to 2010/2011, average spending on the roads maintenance program was about T$21M/yr. In FY2008/2009, about 83% of maintenance cost was funded by government through the annual budget and 17% from external sources. Government spending on road maintenance has been consistent, ranging from T$20M in 2008/09 to T$23M in 2009/2010.

These factors make it difficult to extract a full picture of maintenance spending levels due to unavailability of information in the right form from EIMs and SOEs. This is an area that needs immediate improvement to enable reliable monitoring of maintenance levels in the economic infrastructure sector.

The analysis in Table D.6 also provides an indication of the capacity of Government to fund capital expenditure on economic infrastructure from the Budget. Budgeted expenditure varies but averages around T$10-12M per annum throughout the analysis period.

[19] See Beyond Cost Recovery, David Dole and Ian Bartlett, ADB ERD TN 10, Manila, 2004.

Table D.6 Spending by Infrastructure Ministries on Maintenance (T$'000)

Sub-Sector	Ministry	Item/Source	Actual 2008/2009[1/]	Provisional Actuals 2009/2010[2/]	Budget Estimate 2010/ 2011[3/]
Construction (Buildings & Seawall)	Ministry of Works, Transport & Infrastructure (MWTI)	Government			
		- Maintenance	3,537	950	1,002
		- Capital	0	0	0
		- External Donor	1,557	0	0
		Total	5,094	950	1,002
Telecommunications	Ministry of Communica-tions, Information & Technology (MCIT)	Government			
		- Maintenance	1,025	781	587
		- Capital	0	2,000	0
		- External Donor	0	0	0
		Total	1,025	2,781	587
Transport - Roads	MWTI & Land Transport Authority (LTA)	Government			
		- Maintenance	20,357	23,444	21,904
		- Capital	5,162	12,000	12,296
		- External Donor	4,234	0	0
		Total	29,753	35,444	34,200
Solid Waste	Ministry of Natural Resources & Environment (MNRE)	Government			
		- Maintenance	2,202	2,551	0
		- Capital	0	0	0
		- External Donor	0	0	0
		Total	2,202	2,551	0

Notes:
1. Excludes salaries, technical assistance and overhead costs.
2. Based on budget details provided by MOF, difficult to identify maintenance costs. Assuming Transactions on Behalf of State in budget documents is for maintenance and reconstruction of existing facilities. For 2009/2010 financial data from LTA Draft Accounts and for 2010/2011 from LTA Corporate Plan 2010/2011-2012/2013.
3. Based on available data from MOF where breakdown of maintenance costs for 2009/2010 and 2010/2011 was not available from IMs and MOF despite numerous follow-ups.

4. Overview of capacity for self-funding infrastructure

The overall picture regarding spending on infrastructure maintenance and renewal is mixed:

- All SOEs are financially stable and have the financial capacity to self-fund operations and maintenance (O&M) and small infrastructure investment. The capacity to fund medium-large capital investment varies:
  - EPC and SamoaTel have the financial capacity to partly fund investments to replace or rehabilitate even the largest item of infrastructure they own; and
  - other SOEs would struggle with large capital investments and would require substantial assistance or borrowings. In part, this is because they are custodians of some very large single items of infrastructure (such as airport runway, international wharf facilities) that are expensive to build and require infrequent but very expensive replacement/rehabilitation;
- Government has some capacity to fund capital investment in economic infrastructure from the Budget. Current and projected expenditure is at a level of around T$10-12M per year, although in past years this has been higher for specific high priority projects (such as upgrading of Vaitele St).
- Government spending on maintenance and rehabilitation of roads has been at a consistent and sustainable level. For other areas of Government activity in the economic infrastructure sector (seawalls, solid waste management, and telecommunications), it is difficult to reliably judge maintenance performance because of the non-availability of breakdown of financial data on maintenance in the EIMs and MoF to clarify maintenance spending.

This lack of readily available information on maintenance spending has the potential to adversely affect asset management and decision making. It is important that EIMs and SOEs improve and strengthen organisational management information through timely collection, analysis and availability

of data and information for decision making. It is important to emphasise the early gains to be made from having financial information on maintenance (routine and periodic) for informed decisions and support further strategic management decisions. Likewise, the lack of a uniform approach to SOEs recording, reporting and treating of government grants and donated assets in their accounts hinders timely financial performance and costing analysis.

5. Life cycle cost implications of the NISP priority initiatives

If all of the ongoing and additional priority projects go ahead over the next five years, the total cost of projects would be almost T$1 billion. This has significant implications in terms of long term maintenance requirements, because as shown in Table D.1, each T$1 million of initial capital investment adds on average around T$30,000 to the annual maintenance bill. To obtain a sense of the scale and allocation of these recurrent costs, an analysis was undertaken of estimated forward maintenance costs based on the maintenance requirements of different types of infrastructure. The results are shown in Table D.7 by project status (ongoing, proposed); and Table D.8 by sector and whether the infrastructure is new, an upgrade to existing infrastructure, or addresses a deferred maintenance issue[20]. Note that the figures in Tables D.7 and D.8 are estimates of the ongoing annual cost of maintenance after the five-year investment program has been completed.

[20] The categories are defined as follows: Deferred maintenance involves repair or replacement on a largely like-for-like basis. Upgrades involve replacing existing infrastructure with newer technology/design which may reduce operating costs, improve reliability/safety, or add new service features. New infrastructure provides additional capacity or access to services that did not exist before.

Table D.1 Estimated annual maintenance requirements of NISP projects at 2015 (T$'000)

Status	Ongoing (underway or committed)	Proposed	Total
New Infrastructure	3,500	7,300	10.800
Upgrades	3,300	7,500	10,800
Deferred Maintenance	4,400	100	4,500
Total	11,200	14,900	26,100

Table D.2 Estimated Maintenance Requirements of priority NISP projects at 2015 (T$'000)

Sector		New Infrastructure	Upgrades	Deferred Maintenance	Total
Energy [a]		5,500	2,400	2,400	10,300
Telecoms		1,200	1,200	0	2,400
Water		1,400	500	1,900	3,800
Solid Waste		200	100	0	300
Transport	- Roads	900	3,800	0	4,700
	- Ports	200	1,500	0	1,700
	- Airports	500	1,300	200	2,000
Multi		900	0	0	900
TOTAL		10,800	10,800	4,500	26,100

Notes: a. Assumes that PSEP is equally split between new infrastructure, upgrades and deferred maintenance.

The analysis shows that if all of the NISP priority projects went ahead, the total annual recurrent cost of sustainable maintenance after Year 5 of the ongoing and proposed investment program would be around T$26M. About 45% (T$11.7M) of this amount is for projects that are already underway or committed, and about 55% (T$14.5M) for planned projects. Since all economic infrastructure (except waste management and seawalls) is managed by SOEs, most (all but around T$1M) of this maintenance liability accrues to SOEs.

However, not all of the projected maintenance cost is "new" maintenance. Almost T$11M of this recurrent annual maintenance cost relates to projects that upgrade existing infrastructure and a further T$4.5M to projects that could be considered to be deferred maintenance. These projects that repair/replace/upgrade existing infrastructure may lead to a short-term decrease in required maintenance spending (assuming that the maintenance of the old infrastructure was funded). Projects that add new infrastructure to national stock would add around T$10.8M in required annual maintenance expenditure. This means that if sustainable maintenance funding arrangements are put in place in conjunction with NISP projects, the net effect of implementing all projects that are underway, committed or planned is to add around T$10-11M to the national maintenance bill.

In summary, the overall maintenance implications of NISP priority initiatives are:

- NISP priority projects would require around T$26M in annual maintenance spending, including about T$11M of "new" maintenance. Almost all of this additional maintenance cost would accrue to SOEs (T$10M), with the largest share associated with energy and telecommunications projects; and
- total annual maintenance cost to Government of the NISP priority program is some T$1.2M per year, including an estimated T$1.1M per year in new maintenance for ongoing sustainable upkeep of sea walls and waste management facilities.

To further illustrate the importance of life-cycle costing, Table D.9 provides an indicative breakdown of the life cycle costs of owning the infrastructure associated with the proposed NISP projects[21], using the cost categories and rules-of-thumb shown in Table D.1. The analysis shows that when full life cycle costs are included, the total up-front costs of delivering the proposed NISP priority infrastructure projects (including concept development, detailed design, construction/purchase, allowance for cost contingency/escalation, contract supervision) increase from T$590M to an estimated T$740M. In total, the 20-year life cycle cost of proposed NISP priority projects is estimated at almost T$1,100M.

Table D.3 Estimated 20-year life cycle costs of proposed projects (T$'000)

Sector	Concept Planning & Detailed Design	Capital Cost	Supervision & Contingency/ Escalation	Annual Mainte-nance	Total 20-year Life cycle
Energy	7.0	100.0	15.0	3.0	182.0
Telecoms	5.3	76.0	11.4	2.3	138.3
Water	4.1	41.0	6.2	1.6	84.1
Solid Waste	1.3	10.0	1.5	0.3	18.8
Roads	25.6	197.0	29.6	5.9	370.4
Ports	9.9	76.0	11.4	1.5	127.7
Airports	8.1	62.0	9.3	1.2	104.2
Multi-sector	2.1	30.0	4.5	0.6	48.6
Total	63.4	592.0	88.8	16.5	1.074.0

[21] For ongoing projects, some or all of the concept planning & detailed design, capital, escalation, contingency, and contract supervision costs are already expended. Limiting the analysis to proposed projects provides a more useful indication of the implications of life cycle costs.

6. Other maintenance issues

This section highlights some additional maintenance issues/challenges facing the Government and SOEs in Samoa.

Recording and reporting of maintenance spending

As noted above, it is difficult to reliably judge maintenance performance of Government and SOEs because of the lack of transparency and consistency in reporting financial data on maintenance in the accounts of most agencies. This lack of readily available information on maintenance spending has the potential to adversely affect asset management and decision making. It is important that the Government and SOEs improve and strengthen organisational management information through timely collection, analysis and availability of data and information for decision making. This also means that budget structure and details should ensure maintenance costs are transparently shown and provided for in the budgets. The corporate accounts should also provide for such details so that maintenance costs are able to be collected in a standard form. It is important to emphasise the potential for early gains to be made from having financial information on maintenance (routine and periodic) for informed decisions and support further strategic management decisions. Likewise, the lack of a uniform approach to SOEs recording, reporting and treating of government grants and donated assets in their accounts hinders timely financial performance and costing analysis.

Funding of maintenance and asset replacement

In general, funding of maintenance is from the general budget allocation. This approach can work satisfactorily, but in the case of major infrastructure, it can lead to a shortfall in maintenance spending and funding available for eventual asset replacement. Other options should be considered with the aim of achieving maintenance spending at consistent and sustainable levels.

The SSC has established a 'counterpart fund' or 'sinking fund' similar to a 'reserve fund' for vessel replacement. This approach is one model that could also be adopted by other SOEs and form part of their annual budgets so that appropriate funds are put aside to fund life-cycle asset management. For instance, one option would be for each infrastructure agency to establish an Asset Management and Maintenance Fund (AMMF), which is funded at the rate of X% of total capital budget per year to ensure assets are regularly maintained and supports the goals of the NISP by assuring sustainability and longevity of the assets' economic life. This and other options for long-term sustainable maintenance of infrastructure assets should be considered as part of the process of formulating and implementing a *National Asset Management Policy* for Samoa.

Link between maintenance gap and financial strength

The second issue relates to the link between overall financial strength of an organisation and its capacity to fund maintenance. This link is demonstrated in the above analysis of SOEs financial performance and maintenance spending (see Tables D.2 and D.4). The SOEs with the weakest financial performance generally also have the biggest gap between current and preferred maintenance spending. This means that one of the most effective ways to close the gap between current maintenance spending and the long-term sustainable requirement is to strengthen the financial performance of the organisation. Improved financial viability also supports capacity to borrow to fund large economically viable investments (with government closely monitoring SOEs' financial performance).

The link between maintenance gap and financial strength is not surprising and is observed worldwide because maintenance is often viewed as an optional and non-urgent activity with a lower priority than immediate operational concerns. But even for enterprises with greater financial strength, the problem of insufficient attention to maintenance can often be one of management decision making regarding resource allocation, not lack of funding.

Mismatch of infrastructure supply and demand

A major challenge is that supply of infrastructure and subsequent maintenance needs cannot be matched to demand for services for some

economic infrastructure sectors. This can lead to significant financial issues with initial funding of infrastructure and meeting requirements for infrastructure rehabilitation.

An example of this situation is SAA. An international airport must meet a range of safety/security requirements (runway length/condition, navigational aids, terminal configuration, security screening, etc) whether the airport has 15 flights a week or 50 flights a week. Unlike many other sectors, the quantum of infrastructure cannot be closely matched to the service demand or grown in small increments. An international port is another but less extreme example. This means that, in theory, service charges at Faleolo International Airport (such as passenger service fee and landing charges) would need to be substantially higher than a busier airport to fully recover long term capital and periodic maintenance costs associated with the large (but under-utilised) major assets. But in practice it is not possible to raise charges beyond industry standards without jeopardising demand and international competitiveness; so charges cannot be closely matched to long-term costs. This suggests that special funding arrangements for large capital and periodic maintenance may need to be considered for some items of infrastructure, especially those with one or more of the following features:

- large minimum size of infrastructure that cannot be closely matched to demand;
- minimum infrastructure and service requirements governed by international standards; and
- level of charges affected by international market pressures.

ANNEX E: INFRASTRUCTURE FUNDING STRATEGY

This funding strategy Annex describes the alternative ways in which infrastructure can be financed or funded. In particular, it first quantifies the present demand for infrastructure funding, in terms of capital investment, maintenance and complementary activities such as feasibility and sector studies. It then discusses the range of ways in which individual projects might be funded and the possibility of internal financing, and shows that State Owned Enterprises (SOEs), if not the government, could finance more investment, particularly using debt. It shows that private financing is possible but is specific to particular circumstances. It provides details on past and future donor funding and gives details of projects which have present donor funding committed. The Annex concludes by outlining a suggested funding strategy, and types of funding mechanisms most suitable for each type of funding requirement and separately for each NISP priority project.

More detailed discussion of related issues, such as financial viability, cost recovery and asset maintenance, are contained in a separate Economic Analysis Background Paper that was prepared as part of the NISP analysis process.

1. Demand for infrastructure finance

The project screening process (Annex C) identified a NISP priority program as comprising of investment projects that are already underway or committed; high priority proposed projects; and some planning studies required to get best value from subsequent investments. In addition, Annex D defined the broader life cycle and maintenance costs associated with infrastructure investments, and several multi-modal planning and policy initiatives are identified in the main report. This combination of investments, maintenance, and complementary initiatives add up to the total demand for infrastructure finance to implement the NISP priority program. This demand is quantified in Table E.1, which shows a breakdown of costs over the next 5 years on the assumption that all proposed priority investments will go ahead. The breakdown includes the following components:

- capital cost of infrastructure investments (ongoing and proposed);
- other up-front costs involved in delivering infrastructure (concept development, planning, detailed design, contingencies, contract management);
- downstream maintenance costs, split into categories depending on whether the project can be considered new infrastructure, an upgrade or deferred maintenance;
- complementary initiatives; and
- total demand for infrastructure financing and the unfunded component.

In calculating the unfunded component, it is assumed that the capital and other up-front costs of ongoing projects is already budgeted, and that existing maintenance liabilities offset the cost of maintenance for projects that upgrade existing infrastructure or can be considered to be deferred maintenance.

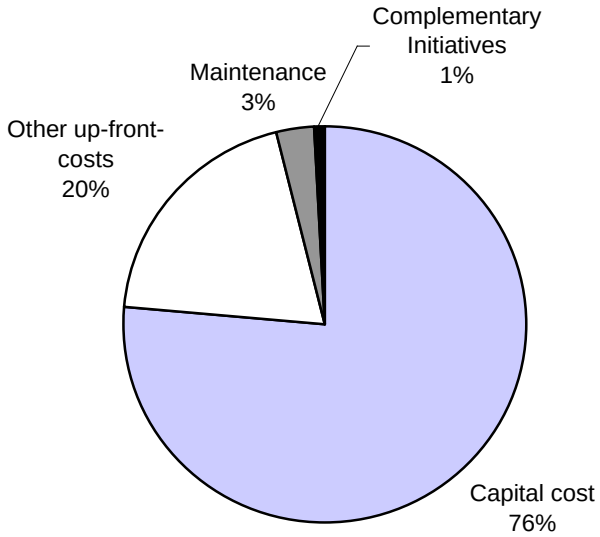
Table E.1 Summary of demand for infrastructure finance for NISP priority program: total next 5 years (T$ million)

Category	Ongoing Projects	Proposed Projects	Total	Total Unfunded
Investments				
Capital cost	430	590	1,020	590
Other up-front costs	100	152	252	152
Maintenance				
New Infrastructure	6	19	25	25
Upgrades	24	20	44	
Deferred Maintenance	7	1	8	
Complementary Initiatives (TA)	-	6	6	6
TOTAL	467	788	1,355	773

Taking into account capital cost, other up-front costs, maintenance and supporting complementary initiatives, the total demand for economic infrastructure finance over the next 5 years if all NISP priority projects go ahead is some T$1,350M. In addition, the analysis in Annex D indicates a total maintenance cost of existing infrastructure that is not replaced of T$150M over the next 5 years (excluding telecommunications), giving a total 5-year demand for infrastructure finance of some T$1,500M or around T$300M per year.

Excluding ongoing projects for which funding is already in place, the total unfunded demand for economic infrastructure finance over the next 5 years if all NISP priority projects go ahead is some T$770M. The breakdown by component is shown in Figure E.1.

Figure E.1 Unfunded demand for infrastructure financing (next 5 years)



The largest component of the unfunded demand for financing is capital cost, at T$590M over the next 5 years. However, discussions are already underway regarding funding for several of the proposed projects, including SIAM2 additional finance, SSDP II, national broadband network, and large on-grid solar power generation.

2. Infrastructure funding issues and options

Infrastructure investments are large. If they are spread over a large government budget they might be fundable from day-to-day revenues, as developed countries often do. But for smaller economies, individual infrastructure costs are generally too high for direct financing by government and alternative sources are needed. In broad terms, there are three potential sources for infrastructure funding: internal revenues, private investments, and grants and loans from development partners.

Internal Financing

The official government budget and SOE resources are possible sources of internal financing of infrastructure investments. The Government budget position is weak but is expected to recover slowly as Samoa recovers from the tsunami and Global Financial Crisis. The budget deficit is forecast to peak in 2010/11 but continue to be in deficit until at least 2012/13, and remain outside the target range of -3.5% to +3.5% of GDP. This suggests that in the short-medium term, the Government will not be able to budget-fund substantially more capital investment in economic infrastructure than the T$10-12M already budgeted in Forward Estimates (see Annex D).

Table E.2 Summary of Budget outlook (T$ million)

Category	2009-10	2010-11	2011-12	2012-13
Total Receipts and Grants	626	596	597	615
less Current Payments	547	522	512	502
less Development Payments	271	225	234	221
Cash (Deficit)/Surplus	(197)	(151)	(149)	(108)
finance by Soft Term Financing	197	149	125	100
Movement in Cash Balance	-	(2)	(23)	(8)

SOEs can also finance investment in economic infrastructure from their internal resources. The analysis in Annex D and a review of their corporate plans provides an indication of the capacity of SOEs to self-fund infrastructure investment. It shows that:

- most SOEs (except SWA) currently sustain a self-funded investment program of around T$2-5M per year or more, sufficient to replace/upgrade small infrastructure investments. Building on the outcomes of the Water Sector Support Program, SWA should also have the capacity to self-fund small infrastructure investments in the future; and
- all SOEs have significant positive cashflow, as measured by EBITDA (Earnings Before Interest, Tax, Depreciation and Amortisation), which indicates a potential capacity for loan funding of infrastructure. A preliminary analysis of indicative borrowing capacity based on EBITDA and existing loan liabilities suggests that only SamoaTel would have capacity for additional borrowing at commercial rates; whereas EPC, SSC and SPA would also have the capacity to support substantial borrowings at concessional rates, if available through the government.

In theory, it should be possible to obtain a picture of the overall situation by combining the Government and SOE accounts, but in practice, this is complicated by differences in accounting policies as noted in Annex D.

Private Investment

Private investment is possible. It falls into three main classes: (a) loans to the government or to operators; (b) foreign direct investment, which often includes a significant loan element but to the investor; and (c) investments by International Finance Corporation (IFC) or equivalent agencies. For the investor, the possibility of providing a direct loan depends mainly on collateral. For the receiving government/operator a more important question is the loan terms. Concessional loans from MDBs have long terms and interest rates around 1%. Even if not concessional, their interest rates are around 3% whereas loans from commercial banks cost over 11%. Under these circumstances, the Government would have little interest in obtaining commercial loans except under very special conditions.

Foreign direct investment is more interesting, but in volume terms, the flow into Samoa has been limited, for instance to the telecommunications and air transport sectors. The last ADB Country Strategy reports that it remains low even by small country standards. Given the country's overall debt position, this is understandable. The World Bank also reports[22] that in sectors such as water supply, while they initially had high hopes for private sector foreign direct investment, they have come to accept that the role of the private sector was probably best left to operational support. An earlier report dealing with all sectors concurred but concentrated its advice on the difficulties involved with private sector foreign direct investment in sectors where incomes depend on tariffs and tariffs that are set or controlled by Government. Otherwise, the situation depended mainly on government financial sustainability.

The environment for private investment is further impacted by the Government policy position that enterprises with highly significant strategic, security or social importance should remain in public ownership. All of the

[22] Public Private Partnerships for Water Utilities, A Review of Experience in Developing Countries, The World Bank/PPIAF 2009.

SOEs in the economic infrastructure sector (EPC, SWA, LTA, SAA, SPA, SSC) belong to this category. Therefore, the Government has no plans for privatisation in the economic infrastructure sector at this stage. However, recent reforms have created opportunities for private sector investment in solid waste collection and management activities under the *Waste Management Act 2010*; and in electricity generation. The *Electricity Act 2010* has established a new framework for competition and regulation in the energy sector. It opens the way for participation of the private sector in electricity generation, for instance investment in large-scale on-grid solar power.

Development Partners

The third potential source of infrastructure financing is Samoa's external relationships with development partners. The succeeding tables provide a picture of the recent and current environment for financing economic infrastructure with assistance from development partners.

Some development partners have a country strategy which directs its assistance. The current status of country strategies from major development partners and their involvement in economic infrastructure is summarised in Table E.3. It shows a mixed picture, with around half of the partners having a current country strategy, and with most of the others, being flexible in terms of responding to needs identified by Government. The table also shows that most of the major development partners have an existing involvement in economic infrastructure, and there is a strong alignment between development partners and specific sectors, which reflects the GOS emphasis on sector-based planning. This indicates strong opportunities for working with development partners in improving economic infrastructure.

Past Funding

The way that the development assistance has been allocated in terms of committed and available donor contributions is shown in the following Tables. Table E.4 shows ongoing and "pipeline" donations for infrastructure sectors by country and type, with the share of infrastructure in the country total.

Table E.3 Donor Country Strategies for Samoa

Develop-ment Partner	Strategy	Infrastructure sectors involved
ADB	Overall country strategy with focus on improved delivery of public services, including the removal of infrastructure constraints; and promotion of private sector development.	Energy (EPC) – Power Sector Expansion Program Sanitation and Drainage (SWA)
WB	No country strategy	Roads – SIAM2
NZ	Joint country strategy. Due to be updated.	No infrastructure sector involved
Australia	Joint country strategy. Due to be updated.	Energy (EPC) – Power Sector Expansion Program
China	No country strategy. Assistance as and when requested	Through loans for building infrastructure
Japan	No country strategy. Assistance as and when requested based on alignment with SDS.	SSC – vessel SPA – Ports development Energy (EPC) – Power Sector Expansion Program
UN	UNDAF	No infrastructure sector involved
EU	Country strategy 2008-2013	Water is the focal sector delivered through budget support
OPEC	No country strategy	Energy – petroleum storage facilities

Source: MOF.

Table E4. Donor Contribution to Infrastructure (T$ million)

Sector	Project Grant		Concession Loan		TA Grant		Budget Support		Total
	Comm.	Avail.	Comm.	Avail.	Comm.	Avail.	Comm.	Avail.	Comm.
Energy									
ADB (power)	39.4	36.1	67.3	64.2	0.0	0.0	0.0	0.0	16.5%
Japan (pow.)	0.0	0.0	136.6	132.4	0.0	0.0	0.0	0.0	21.2%
AusAID (pow.)	43.9	21.2	0.0	0.0	0.0	0.0	0.0	0.0	6.8%
OPEC (fuel)	0.0	0.0	12.4	2.6	0.0	0.0	0.0	0.0	1.9%
Total	83.3	57.4	216.2	199.3	0.0	0.0	0.0	0.0	46.4%
Telecom									
WB (PSP)	0.0	0.0	11.5	0.0	0.0	0.0	0.0	0.0	1.8%
Total	0.0	0.0	11.5	0.0	0.0	0.0	0.0	0.0	1.8%
Water/Sanitation									
EU (water)	69.7	20.6	0.0	0.0	0.9	0.9	72.6	72.6	22.2%
EIB (water)	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2%
ADB (sanitation)	5.7	1.3	71.1	52.1	2.8	2.8	0.0	0.0	12.3%
AusAID (water)	1.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3%
Total	78.4	25.0	71.1	52.1	3.7	3.7	72.6	72.6	35.0%
Transport									
WB (road)	10.6	6.5	43.4	8.1	0.0	0.0	0.0	0.0	8.4%
Japan (ferry)	0.0	0.0	0.0	0.0	39.2	0.2	0.0	0.0	6.1%
PRC (tsunami)	0.0	0.0	0.0	0.0	15.0	15.0	0.0	0.0	2.3%
Total	10.6	6.5	43.4	8.1	54.2	15.2	0.0	0.0	16.8%
Infrastructure Total									
EU/EIB	71.0	21.9	0.0	0.0	0.9	0.9	72.6	72.6	22.4%
ADB	45.1	37.5	138.4	116.3	2.8	2.8	0.0	0.0	28.9%
WB	10.6	6.5	54.8	8.1	0.0	0.0	0.0	0.0	10.1%
AusAID	45.6	23.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1%
Japan	0.0	0.0	136.6	132.4	39.2	0.2	0.0	0.0	27.3%
PRC	0.0	0.0	0.0	0.0	15.0	15.0	0.0	0.0	2.3%
OPEC	0.0	0.0	12.4	2.6	0.0	0.0	0.0	0.0	1.9%
Total	**172.3**	**88.9**	**342.1**	**259.5**	**57.9**	**18.8**	**72.6**	**72.6**	**100.0%**
Share	27%	20%	53%	59%	9%	4%	11%	17%	
Excl. Budget Support	30%	24%	60%	71%	10%	5%			
Infra % Nation	**41%**	**42%**	**47%**	**49%**	**21%**	**14%**	**46%**	**50%**	
Nation (Type)	**(3)**	**(3)**	**(6)**	**(6)**	**(4+5)**	**(4+5)**	**(8+9)**	**(8+9)**	**Comm.**
By Type	416.4	210.5	730.3	529.5	277.1	139.2	156.2	145.5	1580.0
Share	26%	21%	46%	52%	18%	14%	10%	14%	1580.0
Excl. Budget Support	29%	24%	51%	60%	19%	16%			1423.9

Source: MOF/Aid Funding by Sector database.

The broader and longer term picture is shown in Table E.5 which shows total donor funding by source committed, disbursed, budgeted for 2010/11 and available thereafter. This provides an overview of the total scale and source of committed development assistance. It shows that, ADB have the highest share of committed funding, 18.5%, followed by AusAID and PRC. ADB and WB funding is split between grant and loan. AusAID funding is grant, as is EU funding, but most of the PRC funding is concessionary loan. Overall only 35% of committed donor funding has been distributed.

Table E.4 Donor contributions by source (T$ million)

Source	Commit-ted	Distrib to 2/10	Budgetd 2010/11	Available 2011+	Commi tted/ Distrib	Comm -itted	Distrib to 2/10	Share Infra.
ADB	292.8	34.1	70.8	187.9	11.7%	18.5%	6.1%	63%
AusAID	281.0	106.4	60.6	114.0	37.9%	17.8%	19.2%	18%
PRC	251.3	114.4	51.9	85.0	45.5%	15.9%	20.6%	0%
EU/EIB	164.8	57.2	34.3	73.3	34.7%	10.4%	10.3%	43%
WB	164.8	51.4	42.6	70.7	31.2%	10.4%	9.3%	40%
NZAID	148.3	94.9	33.7	19.7	64.0%	9.4%	17.1%	0%
JICA	136.6	4.1	2.7	129.7	3.0%	8.6%	0.7%	62%
Japan	83.5	61.3	12.2	10.0	73.4%	5.3%	11.0%	62%
OPEC	12.4	9.7	0.0	2.6	78.6%	0.8%	1.7%	100%
Other	44.7	21.7	3.3	19.7	48.6%	2.8%	3.9%	
Total	1580.0	555.3	312.0	712.8	35.1%	100%	100%	33%

Source: MOF/Aid Funding by Sector database.

The MOF program for future use of committed funding across all sectors is shown in Table E.6. Disbursements shown are at February 2010. The World Bank's US$20M budget support is a zero-interest loan. The EU budget support to the water sector (SWA) is a grant.

Table E.5. Forecast Use of Donor Funding (T$ million)

Funding	Comm-itted	Disb-ursed 2/2010	Avail-able 2/2010	Rem. Budget 09/10	Budget 10/11	Budget 11/12	Budget 12/13
Grants - Project Funding	332.5	143.1	189.3	32.2	54.2	45.7	26.4
Grants - Aid in Kind	114.2	72.1	42.1	12.3	13.4	0.3	0.0
Grants - channel through government accounts	162.9	65.8	97.1	35.4	53.9	48.2	21.5
Loans – Concessional	730.3	200.8	529.5	20.0	121.9	76.7	51.4
General Budget Support	76.0	5.4	70.7	39.3	25.6	0.0	0.0
Sector/Programme Budget Support	80.2	5.3	74.9	0.6	24.1	26.1	17.4
of which, EU to SWA	72.6	-	72.6	-	-	0.0	23.1
Other, mainly unclassified NZAID	83.9	62.8	21.1	13.2	18.8	16.3	0.0
Total	1,580.0	555.3	1,024.8	152.9	312.0	213.4	116.6

Source: MOF.

Loan Funding

Relatively small investments can be funded from cash flow. Larger investments, however, require loan funding if grants are not available. As noted above, concessional and even non-concessional loan terms from MDBs such as the ADB and World Bank are much more reasonable than those from private banks. This applies to the interest rate, the loan and the grace period. Concessional interest rates are around 1%; repayment periods can be up to 40 years including up to 10 years grace. Loans at concessional terms are limited, but limits do not seem to have yet been reached. With such good terms, SOEs might consider locking in concessional loans now. Even non-concessional MDB loans have terms much more reasonable than commercial banks.

Since loan funding will continue to have to be made to and via the Government, it is useful to look at the effect of loans on future national

debt. The 2010 International Monetary Fund (IMF) Article IV consultation and debt sustainability assessment for Samoa assumed that grant funding would stabilise at 43% of the total and that forecast public sector debt as a percentage of GDP would be as shown in Table E.7.

Table E.6 Public sector debt as percentage of GDP

Status	06/07	07/08	08/09	09/10	2015	2020	2030
Public Sector Debt	37.1	30.3	40.4	54.3	57.1	47.7	37.3
PV of Public Sector Debt			30.2	38.6	39.0	33.0	25.5

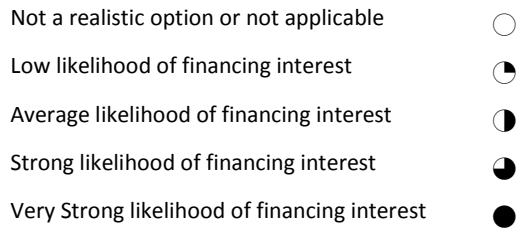
The IMF uses the Present Value (PV) of future debt as their criteria for possible debt distress and consider 50% the cut-off point, with the result that they forecast no such distress for Samoa. However as can be seen in Table E.5, in some years the share of the annual value of debt to GDP is forecast to rise above 50% even with concessional loans. IMF concluded that Samoa has scope for further borrowing but advised Government of Samoa to continue to focus on grants and concessional loans from development partners.

3. Overall funding strategy

Analysis of the infrastructure funding situation and funding options indicates that:

- funding for the capital cost of almost half of the NISP investments is already committed under ongoing programs, and discussions are underway with development partners regarding funding for several proposed major projects;
- based on the analysis in Annex D, SOEs and Government have the capacity to fund the cost of infrastructure operations and maintenance and small infrastructure investments from their own resources and are improving their performance;
- the Government budget position is weak, but expected to pick up over the next few years. However, over the next 5 years, the capacity of Government to budget-fund medium to larger capital investment in economic infrastructure is small, and dividends from SOEs are not a significant source of revenue;
- local or offshore commercial financing of economic infrastructure is an option but is likely to be a small component of overall financing;
- there are several development partners and global funds with an existing or potential interest in assisting with improvement of economic infrastructure through grants or loans;
- the Government has capacity for further borrowing but needs to be careful not to exceed debt sustainability thresholds. The IMF has recommended a focus on grants and concessional loans in dealing with development partners; and
- The capacity of SOEs to finance infrastructure from internal sources varies. They generally have the capacity to self-fund small to medium infrastructure investment, but borrowing would be required to replace/rehabilitate major infrastructure items. Concessional loans borrowed through Government are attractive financing options.

Samoa will need to consider a range of financing options for the proposed infrastructure investment, maintenance and complementary activities. Table E.8 provides an indication of the suitability of different financing sources for each of these activities, bearing in mind current economic and budgetary conditions in Samoa. These options include Internal Finance (funding by SOEs or Ministries from normal operating cashflow); Budget (special allocation from the Government Budget); Development Partners (as grant, concessional loan or standard loans); and Commercial Finance. The level of suitability of each financing option is rated as:



The main elements of the funding strategy depicted in Table E.8 are:

- all maintenance should be fundable from internal sources (normal operating cashflow of SOEs or Ministries). This is a basic foundation for sustainable infrastructure management and is considered achievable building on the ongoing improvements from WaSSP, PSEP, etc;
- assistance in the form of grants from development partners to help fund complementary activities, especially technical assistance for planning studies and reform initiatives; and
- general reliance on concessional loans, and where possible grants, for capital investment as recommended by IMF and consistent with budget position and keeping within loan sustainability thresholds.

Table E.7 Suitability of funding mechanisms for NISP priority initiatives

Project	Inter-nal Finance	Budget	Development Partners			Commer cial Finance	Private Sector Invest-ment
			Grant	Conces sional Loan	Ordi-nary Loan		
1. Maintenance	●	○	○	○	○	○	○
2. Complementary Activities	○	◔	●	○	○	○	○
3. Priority Projects							
E4 Clean Energy Fund	◔	○	●	◔	○	○	○
E5 On-Grid Solar Generation	◑	○	●	◔	○	○	●
E6/7 Other Renewable Energy	◔	○	●	◔	○	○	◕
T2 National Broadband Network	◔	◔	◔	●	○	○	◑
T3 AM Radio Transmission	◔	◑	●	◑	○	○	○
T4 Second International Cable	◑	◑	◑	●	◑	○	◕
W5 Hospital Sewer System	◔	○	●	●	○	○	○
W7 Desalination Plant for Manono	◔	○	●	◑	○	○	○
W9 SSDP follow-up	◔	○	○	●	○	○	○
S3 Additional Landfills	◔	◑	●	◑	○	○	◔

Project	Inter-nal Finance	Budget	Development Partners			Commer cial Finance	Private Sector Invest-ment
			Grant	Conces sional Loan	Ordi-nary Loan		
R4 Vaitele St – to Vailoa	◔	◔	◑	●	○	○	○
R5 Vaitele St – to Vaitele	◔	◔	◑	●	○	○	○
R6 Upgrade Aleisa Rd	◔	◔	◑	●	○	○	○
R7 Upgrade Fugalei St	◔	◔	◑	●	○	○	○
R10 All-weather Roads – Savai'i	○	◔	●	●	○	○	○
R11 All-weather Roads – Upolu	○	◔	●	●	○	○	○
R12 Rural Access Roads	○	◑	●	●	○	○	○
R13 Footpaths	○	○	●	●	○	○	○
R14 Cross-island Rd through Vailima	○	◔	◑	●	○	○	○
P3 Reconfigure Apia port channels/break waters	◔	○	●	◑	○	○	○
P6 Manono Wharves and Terminals	◔	◔	●	◕	○	○	○
P7 Inter-island Ferry terminals	◔	○	●	◕	○	○	○
P+ International port investment	◔	◔	◑	●	◑	◔	○
program							
A4 Refurbish fire trucks	◑	○	◑	●	○	◔	○
A5,6 Faleolo Terminal Upgrade	◔	○	◑	●	○	○	○
A7 Secondary Runway at Faleolo	◔	◔	◑	●	○	○	○
A8 Widen/seal Runway Shoulders at Faleolo	◔	○	◑	●	○	○	○
M2 Climate Change Adaptation projects	○	○	●	◑	○	○	○
M5 Disaster Early Warning System	◔	◔	◕	◑	○	○	○