

# ICT FOR DEVELOPMENT IN THE PACIFIC ISLANDS

An assessment of e-government capabilities in  
Fiji, Papua New Guinea, Samoa, Solomon Islands,  
Tonga and Vanuatu

A S P I

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## Summary

Information and communication technologies (ICTs) as an invisible driver of socio-economic change have long captured the imagination of politicians, policymakers and aid professionals alike.

Since the first fibre-optic submarine cable connected Fiji 20 years ago, many reports and studies have been written about the potential that the introduction of ICTs in the South Pacific would bring for reaching targets of poverty reduction and economic growth.

The internet, mobile devices and e-commerce have already penetrated the Pacific, configured to the political, economic and sociocultural context of the various island nations.

This report takes a step back and zooms in on one aspect of that digital revolution: e-government.

E-Government is defined as a set of capabilities and activities that involves the use of ICTs by government to improve intragovernmental processes and to connect with citizens, businesses and industry.

Fiji was the first island to get linked up to the global network of submarine communications cables in 2000. In 2020, all major islands in the region are connected through one or more domestic and international fibre-optic cables. The region is connected.

This report finds that the potential of ICTs to enable stronger governance, effective public service delivery and better government services is there. In all countries that are part of this study, critical foundational infrastructure is in place:

- Government broadband networks that connect departments, schools and hospitals have been established.
- Central government data centres have been built, public registries are being digitised, and the introduction of national (digital) identities is currently being considered.
- All Pacific island states have introduced relevant strategy and policy documents and have reviewed, or are currently reviewing, legislation related to data-sharing, cybersecurity and universal access.
- All islands have an online presence that is steadily professionalising. Government (information) services are increasingly provided online, along with tourism information, fisheries data, geological data and meteorological forecasts.



### **Australia's Minister for Foreign Affairs, Senator the Hon Marise Payne, on the Coral Sea Cable System**

*'I have to say, if you're standing in Honiara and you're talking about delivering an internet capacity that cable will deliver, the anticipation, the excitement is absolutely palpable amongst young people looking forward to being able to study in a much more effective way, businesses looking forward to being able to do business in a much more effective way, government looking forward to being able to deliver to citizens in a much more effective way.'*—12 March 2019



### **President of Estonia, Ms Kersti Kaljulaid, during her visit to Vanuatu**

*‘Fast digitisation would give small countries a cutting edge and contribute to better communication with people living in different parts of the island and the state’—22 October 2018*

But there’s still a lot to be unlocked.

Increased internet connectivity, the availability of mobile devices and online services and access to information are creating a greater demand from users to their governments. International donors similarly focus on the delivery of ‘digital aid’, using ICTs to provide international assistance more efficiently and effectively.

This report asks the following questions:

- What capabilities have been established and are in place?
- What are the current policy issues?
- What can the international (donor) community do to enhance its support for the digitisation process of the Pacific island governments?

The report reaches five main conclusions for the implementation of e-government and digital government initiatives, and it concludes with four recommendations for future programming of international support in the area of ICTs and e-government.

### **Implementing e-government and digital government capabilities in the Pacific**

Conclusion 1: Establish a national coordinating body or committee for ICT

Conclusion 2: Develop an integrated e-government architecture

Conclusion 3: Ensure the quality of data in basic registries

Conclusion 4: Develop secure data exchanges and integrate cybersecurity

Conclusion 5: Implement a solid digital identity scheme

### **Enabling effective programming in the Pacific**

Recommendation 1: Pursue an integrated policy approach

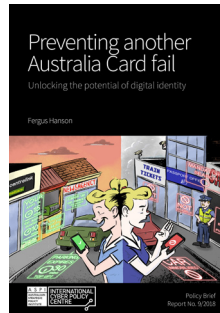
Recommendation 2: Include end-user perspectives

Recommendation 3: Establish a regional platform for ICT capacity building

Recommendation 4: Reinvigorate regional cooperation

# About the project

This project was conceived in 2017 by ASPI's International Cyber Policy Centre in cooperation with Estonia's e-Governance Academy (EGA). In May that year, officials from Solomon Islands, Fiji, Vanuatu, Samoa and Tonga participated in the e-Governance Conference in Tallinn.



In combination with ASPI's research on integrated e-government in Australia and Australia's experiences in introducing a digital identity scheme, a project proposal was developed and supported by the Cyber Cooperation Program of the Australian Government Department of Foreign Affairs and Trade (DFAT) and the Estonian Ministry of Foreign Affairs' Development Cooperation.

The project has brought together government officials, academics and representatives from international organisations on different occasions over nearly two years. During that time, ASPI and EGA organised two regional workshops, in Nuku'alofa and Canberra, and undertook four follow-up missions to individual Pacific island countries.

Participants in the activities were exposed to global good practices and case studies of e-government developments in other countries. At the same time, they were provided with opportunities to share and discuss common achievements and challenges with colleagues and peers.

By bringing in academia, regional organisations, donors and technical experts, the project also contributed to new partnerships while linking the activities to existing mechanisms under the Pacific Islands Forum.

The project initially focused on six countries: Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu. Following expressions of interest, we were also able to accommodate representatives from Kiribati and New Caledonia's Southern Province.



Participants of a regional workshop on 'e-government in the Pacific', Nuku'alofa, Tonga, October 2018.



# About this report

This report is the final deliverable under the project. The aim is to provide states in the Pacific and interested donors with an overview of achievements in building e-government capabilities and of current operational and policy-related issues.

It focuses on six Pacific countries: Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu.

The report concludes with a set of conclusions and recommendations on implementing e-government development projects in the region and overall coordination for programming of ICT-related investments.

## Methodology

Data for this report has been gathered from open-source information combined with observations from various engagements in the region in 2018 and 2019, including interviews with officials and civil society representatives, and from materials provided as part of the workshops conducted under the capacity-building project.

In the country profiles, data is presented on donor activities in each of the six Pacific island countries. This data is not absolute and should be read as estimates of the number of projects and the amount of official development aid involved. The bulk of the information is taken from the open-source Pacific Aid Map database unless indicated otherwise.

## Expectations

This report is expected to provide Pacific island governments, donor agencies and other relevant institutions with:

- details of some significant achievements in the development of e-government capabilities over the past 15 years
- country-specific and cross-cutting regional policy challenges and operational constraints
- pointers to the availability of global good practices and e-government expertise that could be beneficial to the Pacific community
- an assessment of the potential offered by regional approaches for tackling e-government challenges in situations of limited resources and capabilities.

# Introduction

Australia, New Zealand and other countries in the greater Pacific region have recently rearticulated their policies towards the Pacific island states.

In Australia's case, this was reflected in the *2017 Foreign Policy White Paper*, which introduced Australia's 'Pacific step-up', focusing on strengthening climate and disaster resilience; sustained economic growth; and support to promote healthy, educated, inclusive populations. Prime Minister Morrison, in November 2018, spoke of a 'new chapter in relations with our Pacific family'.

As part of its 'Pacific reset' policy, New Zealand decided to invest in building genuine, mature partnerships accompanied by a focus on leadership diplomacy, coherence between domestic and international policy and promoting Pacific regionalism and collective action.

The digital dimension is increasingly recognised as an important enabler of a nation's political, economic and development relations. In this vein, Australia's International Cyber Engagement Strategy places a focus on inclusive access to digital technologies to ensure that all individuals can more readily enjoy the benefits of increasingly digital societies.<sup>1</sup>

This focus on digital development was encouraged when the UN Sustainable Development Goals (SDGs) included the ambition to:

Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.<sup>2</sup>

Numerous studies have drawn the conclusion that e-government, and the accessibility and transparency it can provide, are 'critical to the development of good governance practices and vital for sustainable development' across the Pacific.<sup>3</sup>

The concept of 'e-government' subsequently gained attention from Pacific governments and international donors.<sup>4</sup> Given its own unique digital transformation, Estonia identifies the development of the ICT sector and e-governance issues as a strategic priority of the Estonian Development Cooperation.<sup>5</sup>

In 2017, Rowena Cullen and Graham Hassall from Victoria University in Wellington, New Zealand, published a tremendously valuable piece of academic research: *Achieving sustainable e-government in Pacific island states*. Their research, part of which is available online,<sup>6</sup> has been instrumental in compiling this report.

The authors conclude that '[t]here are some good things going on in the Pacific, at the level of individual government agencies and through regional co-operation at an operational level.' They also warn against applying ICT and e-government solutions from industrialised states and instead advocate for more South-to-South knowledge-sharing, including with Australia and New Zealand.

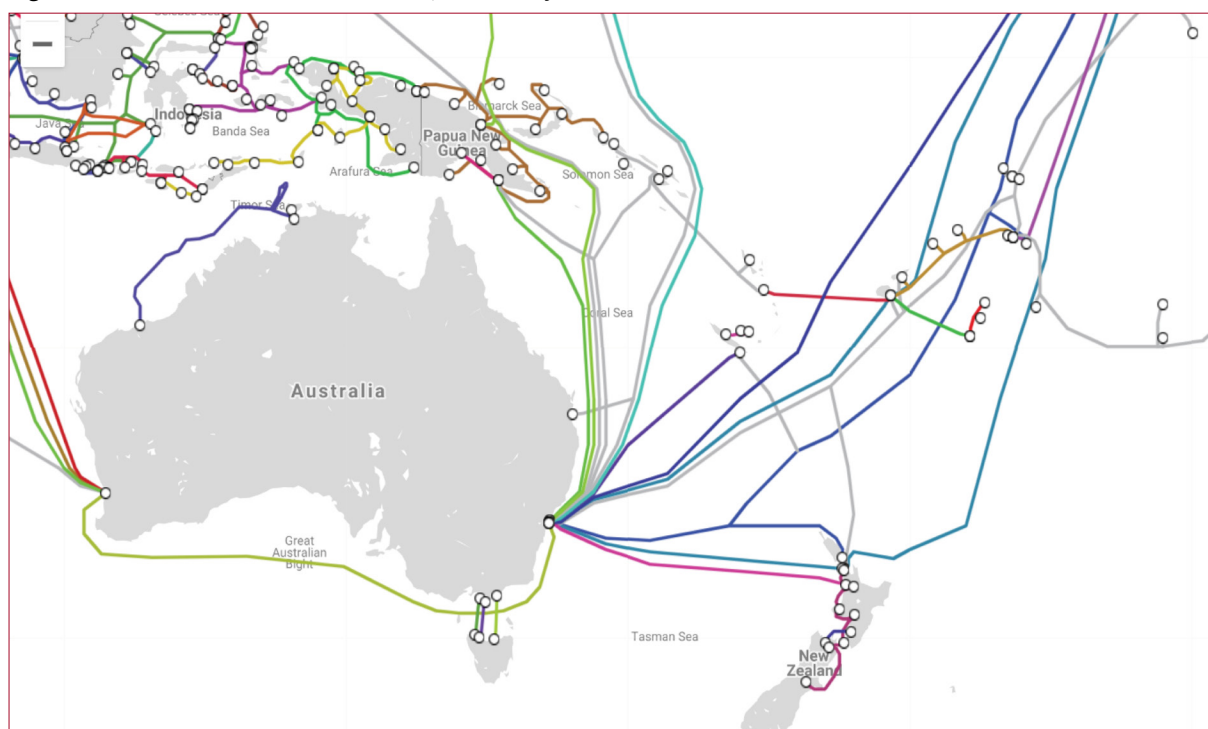
While states in the Pacific have the same responsibilities as other countries in delivering public services, such as health, education, taxation, disaster resilience and public communications, local appropriation and contextualisation are critical to ensure that e-government solutions are sustainable.



## ICTs in the Pacific: the start of a digital journey

The digital journey of the Pacific island states started in the early 2000s. The first trans-Pacific fibre-optic communications cable, the Southern Cross Cable, came into operation in 2000, connecting Fiji with the internet in Australia, New Zealand and the US. Thanks to investments through the World Bank, many more internet cables were laid in following years (Figure 1). The result is a good level of connectivity and internet speed in main urban centres across the region, albeit relatively expensive in some cases.<sup>7</sup> At the same time, satellites remain a critical asset for connecting remote outer islands and for backup purposes.<sup>8</sup>

**Figure 1: Submarine cables in the Pacific, 1 February 2020**



Source: The Submarine Cable Map, [online](#).

In the mid-2000s, the Pacific countries began to liberalise domestic telecommunications markets. The state-owned telecommunications companies saw new businesses enter the market.<sup>9</sup> Of particular note in the Pacific are Vodafone and Digicel, which became important regional internet service providers.<sup>10</sup>

The introduction of the mobile phone may well be the most revolutionary ICT development that Pacific islanders have seen in a period during which other societies experienced the widespread use of desktop and laptop computers and smartphones.<sup>11</sup>

That said, social and business use tends to differ from what's observed in other economies.<sup>12</sup> A recent Australian National University study titled *The moral economy of mobile phones* observed that considerations of 'friendship, kinship, loyalty and propinquity' determine actual and effective phone usage.<sup>13</sup>

This is also reflected in conversations about digital literacy and connectivity in the region. While Facebook has become a commonly used social media platform, its use is not necessarily perceived by

users as ‘having access to the internet’. Such perceptions may easily lead to misunderstandings and potentially misrepresented metrics and statistics about internet use and penetration.

Around 2010, most Pacific island states were building core government IT infrastructure consisting of a government data centre and a network linking up government departments. In most cases, those pieces of infrastructure were funded from loans provided by the Export–Import Bank of China (China Eximbank) and involved Chinese providers.<sup>14</sup> Those government networks would allow departments to start digitising records, share information more effectively and maintain online web portals providing information to the public. As this report shows, the level of effective use differs substantially from country to country.

The potential of ICTs was also recognised, although with a delay, by the Pacific leaders. In 2015, the Pacific Islands Forum leaders adopted the Pacific Regional ICT Strategic Action Plan. Responsibility for the implementation of the plan was delegated to the ICT Working Group of the Council of Regional Organisations of the Pacific (CROP).

**Figure 2: Home page of the CROP ICT Working Group**



Source: CROP, [online](https://www.crop.org/).

to address ICT issues from a regional perspective and with engagement from all relevant donor agencies, the group did not manage to establish itself as a credible platform.

It might not have been the right time to pursue a regional approach to ICT policy issues. Others have suggested that the working group would have been better placed in a policy environment rather than an academic environment such as USP. In 2020, a new window of opportunity may open now that there are increasing demands to address and coordinate ICT development issues regionally, including on e-government capabilities.

The ICT Working Group is one of the seven agreed sectoral working groups of the CROP. The working group includes representatives of all Pacific island states, donor agencies, the CROP and the University of the South Pacific (USP) as the secretariat.

The working group has been provided with terms of reference that focus on preparing regional policy meetings, ensuring coordination with other sectoral groups and providing expertise in the implementation of the regional action plan.

While the CROP ICT Working Group is one of the rare mechanisms



Most donor agencies have recognised the potential of ICTs in aid delivery, in the promotion of good governance and in enabling economic growth. There are many successful case studies about the introduction of e-government applications, in particular in areas of registries (births, deaths and marriages; tax; business names), tender applications, disaster resilience and fisheries.

The expectation underpinning many policy decisions has been that developing economies can leapfrog development steps that ICT-mature nations had to take.<sup>15</sup> There also seems to be an expectation that citizens and communities will automatically use mobile applications and the internet for their public services.

In 2016, the World Development Report *Digital dividends* cautioned against this overoptimistic approach, warning that traditional barriers to development would also affect the introduction, take-up and use of new technologies.<sup>16</sup> For instance, in Solomon Islands, access to internet services beyond the capital, Honiara, is closely linked to the rollout of sustainable rural electrification infrastructure.<sup>17</sup> In this vein, Australia, New Zealand, the US and Japan announced a A\$2.3 billion plan to improve access to electricity and the internet in PNG during the APEC meeting in 2018.<sup>18</sup>

Beyond the wider socio-economic context—considering universal access and affordability—states in the Pacific have expressed broader concerns about the introduction of ICTs and of e-government applications.<sup>19</sup> They're conscious of their dependence on foreign providers of basic services such as the storage of government data, whether that's physical or cloud-based, in the context of national sovereignty and independence.

In 2018, Vanuatu was the first Pacific country to host the annual Asia–Pacific Regional Internet Governance Forum (APrIGF).<sup>20</sup> With community empowerment and affordability as running themes, speakers from governments and community groups cited concerns over e-safety, digital literacy and privacy. They fear that ICTs, mobile phones and the internet may damage cultural traditions and social cohesion.<sup>21</sup>

Another critical challenge is the ability of governments to allocate sustainable budgets for the procurement of IT products and services and account for subsequent operating and maintenance costs.

The current e-government agenda in the Pacific revolves around the following four concepts:

- Including *users' needs and local context* in the design, delivery and socialisation of e-government projects and services.
- Working towards establishing *national digital identity schemes* alongside ongoing efforts to provide each citizen with a form of identification.
- Establishing a *single access platform for e-government services* that supersedes current disjointed and largely bottom-up digitisation initiatives.
- Investing in *cybersafety and cybersecurity* in parallel to ongoing investments in infrastructure and service developments.

A final observation is about the regional dimension. The Pacific ICT ministers haven't convened in the context of the Pacific Islands Forum since 2015. This could suggest that ICT developments are still predominantly regarded as national issues instead of an opportunity for a collective, robust and sustainable regional approach. One can even sense a degree of intra-regional competition to become the leading ICT hub in the Pacific.

# Defining e-government

This report focuses on e-government capabilities. In most literature, e-government is defined as activities that involve the use of ICTs by government administrators for three types of activity:<sup>22</sup>

- improving internal government processes (also referred to as *government-to-government* processes)
- connecting government to citizens (referred to as *government-to-citizens*)
- connecting government and citizens to business and industry (referred to as *government-to-business*).

While ICTs are a powerful driver of change, transforming the practice, method and efficiency of government across the region, there's no 'one size fits all' approach.<sup>23</sup>

As in most development endeavours, local context, sustainable resourcing and leadership are crucial to the success of e-government initiatives in the Pacific. Consequently, infrastructure requirements, system design and institutional governance differ among nations.<sup>24</sup>

That said, among the Pacific island states there's a large degree of similarity in the factors that are considered important in developing e-government capabilities. Those factors don't differ fundamentally from those that have affected the ICT journeys of countries such as Estonia, Australia, New Zealand and others.

The main differences are observed in the scope of activities, policy direction, technical implementation, expediency, available resources and push and pull factors towards e-government from businesses and society.

## Factors that shape the policy context of e-government in the Pacific

An e-government capability is not static. It will be subject to continuous changes as expectations and demands from users mature. Strategic policy concepts about the design and use of e-government programs therefore evolve. This section describes four external factors that shape—or could shape—the policy context of future of e-government capabilities in the Pacific.

In research for this report, no data or assessments of user or business needs have been found. This lacuna has led to one this report's recommendations: to include end-user perspectives in the future design of e-government capabilities and applications.

### 1. 'Digital' aid

From 2000 onwards, international financial institutions such as the World Bank and the Asian Development Bank (ADB) have placed a focus on regional ICT development for e-government. Between 2000 and 2015, the ADB spent approximately US\$12 billion on ICTs in the Asia-Pacific region, with a direct reference to the UN SDGs.<sup>25</sup>

The increasing use of ICTs in the design and implementation of development assistance programs is an undeniable factor influencing the take-up of e-government initiatives by Pacific island countries.

DFAT established the innovationXchange to 'catalyse and support innovation across the aid program'.<sup>26</sup> The UK's Department for International Development launched its *Digital Strategy 2018 to 2020: doing development in a digital world*. It states that 'digital technologies offer an unprecedented opportunity

to revolutionise the global development system, change lives, transform entire economies, stimulate growth and, ultimately, end reliance on aid.<sup>27</sup> The UN Development Programme (UNDP)<sup>28</sup> and the US Agency for International Development (USAID)<sup>29</sup> followed with their respective digital aid strategies.

Given the important role of international aid in the Pacific, national priorities are inevitably shaped by changing priorities in aid delivery. In other words, the direction of ‘digital aid’ is likely to guide e-government developments in the region.

## 2. Digital government role models

Another factor shaping the direction of emerging e-governments is the role model of more mature digital governments. In this respect, the D9 group of the world’s leading digital governments is a valuable point of reference and potential source of expertise, skills and advice. The original group of five was formed in 2014 in London by founding members Estonia, Israel, New Zealand, the Republic of Korea and the UK. They came together with the goal of harnessing digital technology to improve citizens’ lives.<sup>30</sup> In subsequent years, Canada, Mexico, Portugal and Uruguay joined to form the D9.

Pacific island countries have also been watching developments in Australia. While Australia isn’t a member of the D9, the Australian Government’s Digital Transformation Agency (DTA) has a strong international profile. The DTA’s Digital Summit conference, which was organised for the first time in October 2019, provided a unique platform to exchange and discuss good practices and e-government case studies.

New Zealand and Australia’s experiences and memberships could potentially be leveraged to provide the Pacific with access to global good practices and expertise-holders in the areas of:

- building and sustaining digital government infrastructure
- developing and deploying digital services
- establishing collaborative mechanisms for problem-solving and helpdesk functions
- using e-government capabilities in boosting digital economies and e-commerce.

## 3. Private-sector incentives

The role of, and initiatives by, the private sector in encouraging governments to take up new technology is undeniable. For instance, banks and postal services have been at the forefront of mobile applications that give users access to their accounts and options to do instant transactions. This has led to increasing demands for verified personal identification and digital trust frameworks.

An interesting example is Digital Identity NZ, a private-sector initiative to develop open protocols and core principles for New Zealand’s digital identity ecosystem while taking particular sociocultural characteristics of the nation into account.<sup>31</sup>

The country profiles in this report show a few examples where the private sector has stepped in when government has been slow to, for instance, develop adequate regulations or verification frameworks. One of those examples is from PNG, where banks and financial institutions in collaboration with the PNG Digital Commerce Association introduced a private-sector digital trust framework (YuTru) among PNG’s licensed financial institutions.<sup>32</sup>

#### 4. Indexes and regional rankings

Finally, a growing number of cyber maturity assessments tend to influence directions of global and national policies. These indexes not only provide a ranking but also steer policies towards particular baseline capabilities.

##### **The UN e-Government Development Index**

The UN e-Government Development Index (EGDI) is a comparative ranking of the e-government maturity of all 193 UN member states. The index does not define e-government, but it describes e-government capacity as a composite measure of how IT is used to promote access and inclusion among a nation's people.<sup>33</sup>

The index incorporates three types of information: data about user experiences; data about the physical presence of infrastructure and connectivity; and data about the ability of citizens to use increased internet connectivity to access online government services.<sup>34</sup>

##### **The Gartner Digital Government Maturity Model**

IT consultancy company Gartner has developed the five-level Digital Government Maturity Model. Assessments range from Level 1 (government services are available online) to Level 5 ('smart' government, in which data is used to predict future requirements and deliver innovative new services). The Gartner model is also used in the World Bank's project appraisals.

##### **The Estonian e-Governance Academy's e-government questionnaire**

To inform its training and consultancy work, the e-Governance Academy uses an e-government readiness questionnaire. The questionnaire has a practical focus and asks about a country's current status of implementation. It covers:

- organisational structures and governance models
- legal frameworks
- strategy and policy priorities
- government IT networks and citizens' access to the internet
- digital identity management, digital signatures and trust services
- the management of data by the main registries, such as birth, deaths and marriages and land titles
- e-services provided by government.

## A framework for e-government capabilities

Informed by global good practices of reporting about, and assessing, e-government in a development context, this report takes the factors shown in Figure 3 into account to provide a qualitative assessment of a state's e-government capabilities.

**Figure 3: Framework for assessment**

<b>Facts and figures</b>	
<b>Geography</b> Description of the island's composition and main population centres.	<b>Connectivity and coverage</b> Facts about the country's connectivity status (submarine cables and satellites) and internet coverage.
<b>World rankings</b> A listing of where the country ranks on the International Telecommunication Union (ITU) ICT Development Index, the UN e-Government Index, the ITU Global Cybersecurity Index and GSMA Mobile Connectivity Index.	<b>Telecommunications operators and internet service providers</b> A listing of the country's service providers.
<b>e Government strategy and policy</b>	
An overview of developed and implemented policies and strategies on e-government.	
<b>Main achievements</b>	
The country's achievements in the areas of: IT infrastructure digital infrastructure and digital services digital identity and trust framework other.	
<b>Issues on the horizon</b>	
Operational or policy issues that are currently being addressed or that will require attention in the near future.	
<b>ICT security, personal data protection and privacy</b>	
A description of policy and operational capabilities for cybersecurity and e-safety.	
<b>Lead government agencies</b>	<b>Lead donors and funding details</b>
A listing of the lead government body or bodies for e-government development.	A summary of lead donor interventions.

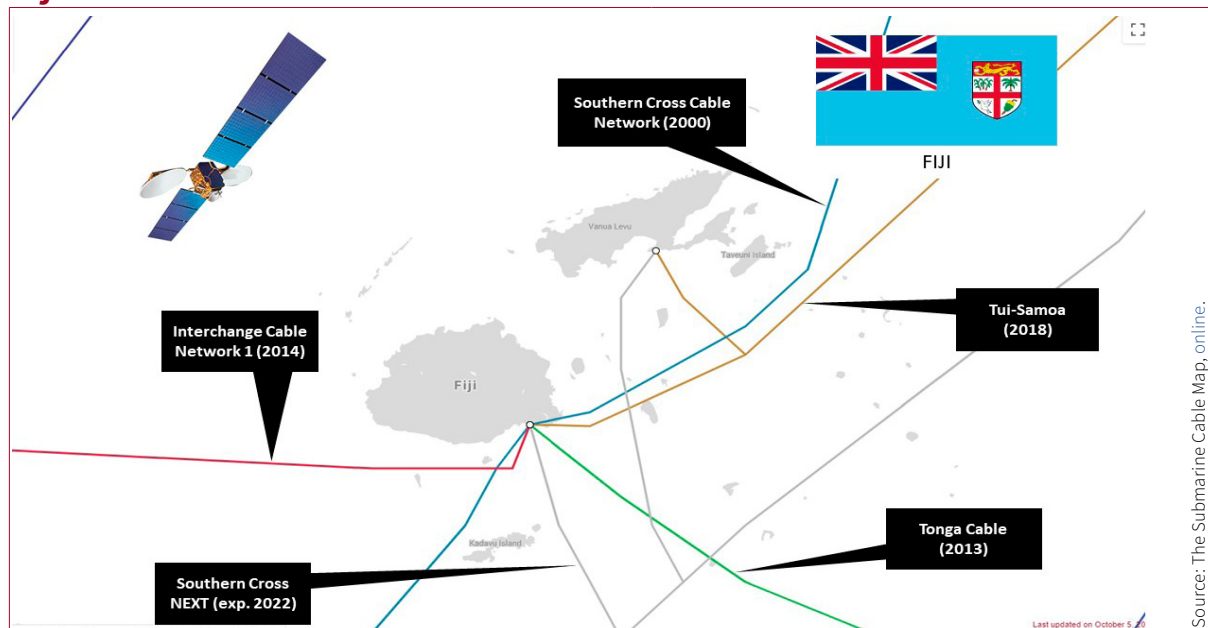
## Next section

The next section looks at the current state of development in individual Pacific countries in greater detail. The six country profiles show that most e-government capabilities don't develop from large and revolutionary programs, but often from relatively small, manageable and tangible projects that—when put together—amount to an e-government capability.

Examples include the establishment of government databases and file-sharing services, the introduction of SMS warning systems for natural disasters, the provision of online services to submit tax returns or to register births, and the launch of government departments' web portals.

# Country profiles

## Fiji



### Facts and figures

#### Geography

Fiji is an archipelago of more than 330 islands (of which 110 are permanently inhabited) and more than 500 islets. The two major islands (Viti Levu and Vanua Levu) account for 87% of the total population of 916,000 (2019 est.).

#### World rankings

- ITU ICT Development Index (2017): 107
- UN E-government Index (2018): 102
- ITU Global Cybersecurity Index (2018): 121
- GSMA: Transitioner

#### Connectivity and coverage

- Mobile subscriptions: 1.19 million
- Percentage of population: 130%
- Internet users: 550,000
- Percentage of population: 60%

#### Telecommunications operators and internet service providers

- Digicel
- Vodafone
- Telecom Fiji Ltd
- Fiji International Telecommunications Ltd (Fintel)

### e Government strategy and policy

By 2000, most government ministries and departments in the capital, Suva, were connected to internet services provided through the Department of Information Technology and Computing Services.

The first e-government strategic plan (2001) was a 10-year plan covering four key areas: e-development, e-government, e-business and e-personnel. A survey conducted in 2006 showed that almost half of government departments had no ICT budget plans in place. Nonetheless, all government departments had an online presence by 2009.

In 2006, the Fijian Government formally established an e-government program with the support of a loan from the PRC. The program encompassed the delivery of government services via an e-government portal and the development of the Government Information Infrastructure (GOVNET). GOVNET connects government offices and e-community centres ('telecentres') located in schools.<sup>35</sup>



The next e-government Master Plan, published in 2007, identified four strategic purposes:<sup>36</sup>

- To implement financially sustainable service delivery models
- To reinvent the services delivery model to provide citizen-centric outcomes
- To enhance operational efficiencies within and across government agencies
- To enhance the ICT skills competency of government employees at all levels.

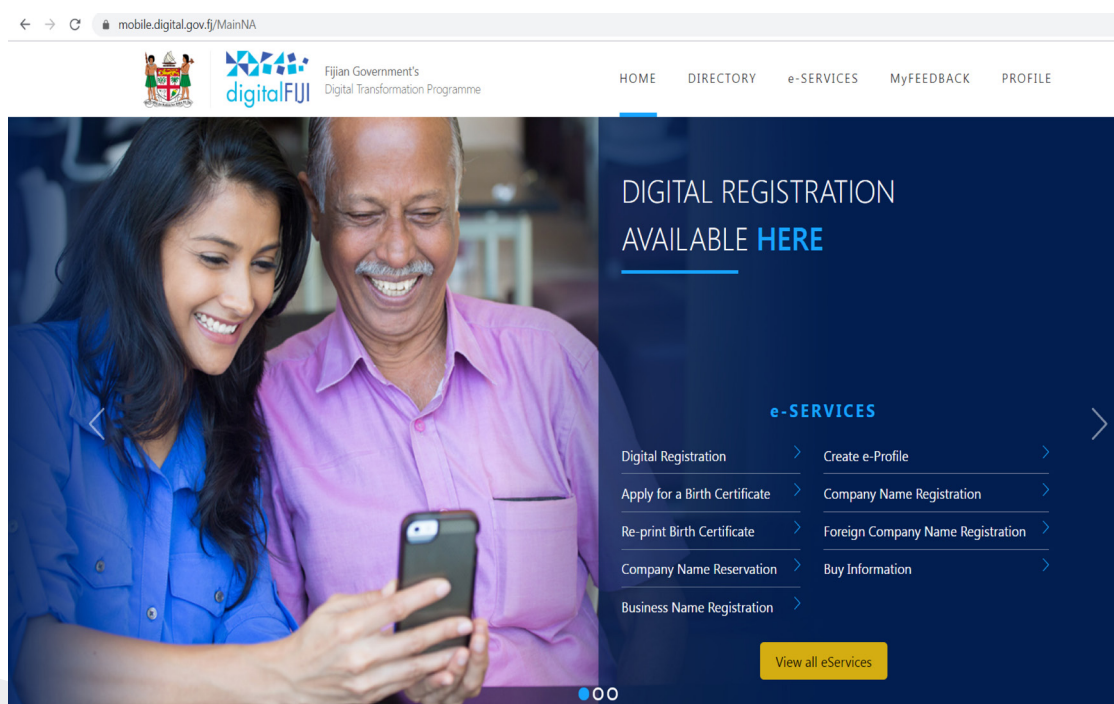
In June 2018, the government launched a new platform and a mobile app, DigitalFIJI, providing:

- a directory service with contact information for government departments and entities
- a feedback system allowing users to submit feedback on government services, including being able to attach documents and photos and to track the responses to their enquiries.<sup>37</sup>

## Main achievements

### Infrastructure

- Work on the GOVNET infrastructure and the Government Data Centre started in 2006.
- The Government Community Telecentre initiative started in 2011 and provided some 25 schools and colleges across the country with free access to ICT services. In 2015, the government reported that more 125,000 citizens had used those facilities since its start.<sup>38</sup>



### Services

- Fiji started a comprehensive endeavour to digitise civil registries such as the Births, Deaths and Marriages Registry, the Registry of Companies and the Registry of Titles and Deeds. Those services are now available online; tax and superannuation information is also accessible through an e-profile.



- The DigitalFIJI application includes an online government directory and myFeedback, which is an app that allows for instant feedback to government. E-services for birth and company registrations are also available.
- The Ministry of Economy manages the e-tender portal, TenderLink.
- Fiji operates Walesi (a state-owned company), which is a free digital TV platform that's available through aerial and satellite connections across the islands.
- The government operates a number of information portals and websites.

### **Digital identity and trust framework**

- The Fijian Government has completed a data harmonisation study, which involved cleaning several national identity databases and the introduction of a single naming system.

### **Other**

- Fiji secured a comprehensive support package from the Singaporean Government (Singapore Cooperation Enterprise) for the DigitalFIJI e-government project.

### **Issues on the horizon**

- Studies are currently underway to look at the parameters for the implementation of a national digital identity system. A taskforce has been formed to introduce a biometric national ID, building on current e-profiles that are used to access the government's digital services.<sup>39</sup>
- Coordination across government agencies is seen as challenging, although some departments are willing to move faster than others. There's also a discrepancy in priorities for investments in IT infrastructure and in the development of e-services.
- The Fijian Government has ambitious plans to become the first Pacific digital government but is confronted with local absorptive capacity constraints and its reliance on external support.
- A data harmonisation study has recommended the introduction of a data exchange platform that would ensure a 'single source of truth' of data across all government ministries and agencies. It should also eliminate duplication in data collection.

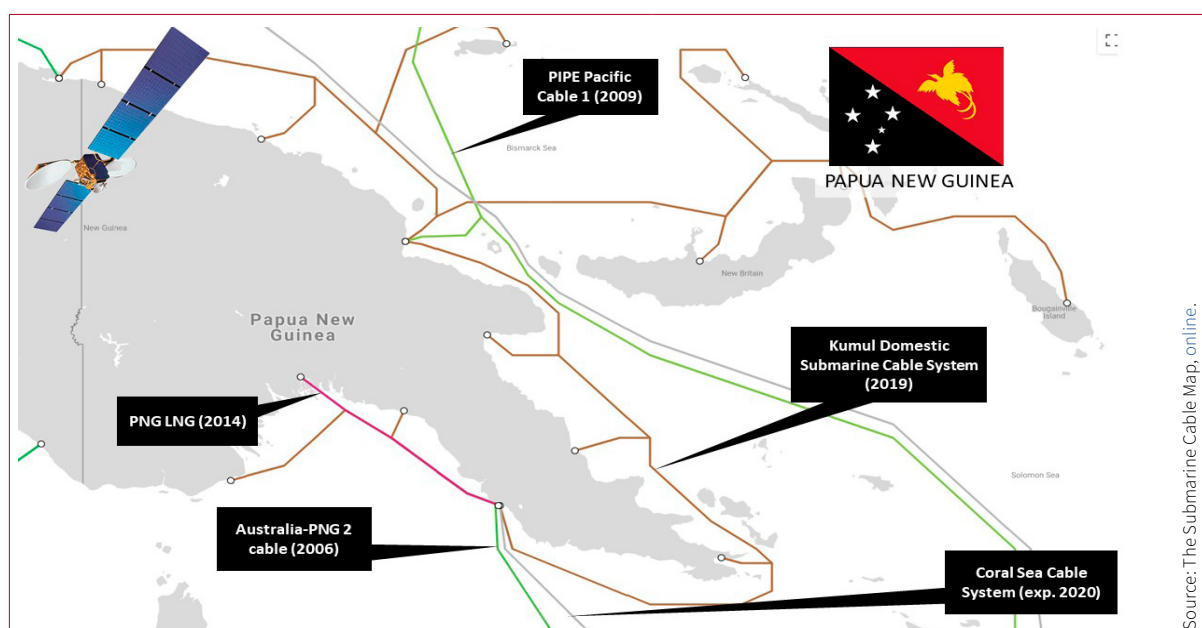
### **ICT security, personal data protection and privacy**

Fiji doesn't currently have a cybersecurity strategy or an established national CERT.<sup>40</sup> In 2018, the government introduced an Online Safety Bill that focuses on countering irresponsible social media use, stating:

The Fijian Government in its commitment to ensure access to connectivity for all Fijians, has embarked on promoting a safe online culture and environment in hindsight of the recent increase of reports on harmful online behaviour such as cyberbullying, cyber stalking, Internet trolling and exposure to offensive or harmful content, particularly in respect of children.<sup>41</sup>

Lead government agencies	Lead donors and funding details
<ul style="list-style-type: none"> <li>• Attorney General and Directorate of Communications, which oversees the contract with the Singapore Cooperation Enterprise for the DigitalFIJI project</li> <li>• ITC Services, a department under the Ministry of Finance</li> </ul>	<p><b>Total amount of international aid that included an ICT and/or e-government component between 2007 and 2019:</b></p> <p>44 projects worth approx. US\$35.7 million</p> <p><b>Lead donors (in aid volume):</b></p> <p><b>China: US\$22.5 million (2 projects)</b></p> <p>This includes the US\$21.6 million loan to finance Fiji's e-government project, which was officially completed in 2011.</p> <p><b>Australia: US\$6.8 million (18 projects)</b></p> <p>This includes the multi-year bilateral governance program that looks at enhancing good governance in Fiji.</p> <p><b>New Zealand: US\$3.3 million (4 projects)</b></p> <p>This pertains to New Zealand's support for Fiji's elections, the establishment of the Fiji Land Information System, and funding for the Ministry of Finance to procure auditing software and IT hardware and set up a centralised database.</p> <p><b>Singapore: unknown</b></p> <p>Provision of technical assistance and administrative support for the DigitalFIJI project through Singapore Cooperation Enterprise.</p> <p><b>Republic of Korea: US\$ 395,000 (18 projects)</b></p> <p>This includes special training programs on ICTs and a master's degree program in global e-policy and e-government.</p>

# Papua New Guinea



## Facts and figures

### Geography

PNG is the world's third largest island country in size. The two largest cities—Port Moresby (the capital; population 375,000) and Lae—are located on the mainland. The total population of 8.5 million is predominantly concentrated in the highlands and the eastern coastal areas.

### World rankings

- ITU ICT Development Index (2017): not available
- UN E-government Index (2018): 171
- ITU Global Cybersecurity Index (2018): 139
- GSMA: Emerging

### Connectivity and coverage

- Mobile subscriptions: 2.73 million
- Percentage of population: 32%
- Internet users: 906,700
- Percentage of population: 11%

### Telecommunications operators and internet service providers

- Digicel (Papua New Guinea) Ltd
- bmobile Ltd
- Telikom PNG
- Digitec
- DATEC
- Kacific
- Speedcast
- Lightspeed (Click Pacific)
- Emstret

## e Government strategy and policy

In 2005, the Department of Communications and Information Technology created the Integrated Government Information System (IGIS), which was funded by a concessionary loan from China Eximbank and built by Huawei. In 2016, technical management of the network was contracted to DataCo Ltd—PNG's telecommunications wholesaler.<sup>42</sup>

The first phase of IGIS was completed in 2014 and consisted of a network connection for PNG Government agency headquarters and a central data centre.<sup>43</sup> It was followed by an instruction from the Chief Secretary for all government agencies to migrate their networks to the newly established IGIS.<sup>44</sup>

The Medium-Term Development Strategy 2005–2010 included an ambition to provide access to e-government services by 2030.<sup>45</sup> While the new Medium-Term Development Strategy 2018–2022 doesn't explicitly mention e-government, it acknowledges 'slow progress on expansion of ICT infrastructure'. It further recognises that ICT 'is expected to improve dramatically with the submarine cable between Sydney and Port Moresby and expansion of [the] network throughout the nation'.<sup>46</sup>

PNG's hosting of the APEC meeting in 2018 seems to have reinvigorated the country's ambitions in the area of e-government. For example, the Department of Communications initiated an APEC TEL Seminar on 'Digital government: planning and implementing e-government projects in APEC'.<sup>47</sup>

In 2018, a global consulting firm prepared an ICT road map for the Department of Communications and Information. It was based on the priority areas from the PNG Digital Government Master Plan:<sup>48</sup>

- digital infrastructure
- digital government
- digital services
- digital skills
- digital business environment
- digital safety.

## Main achievements

### Infrastructure

- The IGIS has been established and in operation since 2014 but is currently regarded as largely ineffective and in poor repair. IGIS includes the Government Data Centre, a transport network nominally connecting 57 sites in Port Moresby with the data centre, and a WAN connecting five provincial sites to the Government Data Centre.<sup>49</sup>

### Services

- Website portals exist for government departments such as the Treasury (including the Tax Authority), the Immigration and Citizenship Authority, the National ICT Regulatory Authority, Customs and the parliament. With the exception of the e-VISA service, none of the portals enables interaction with citizens or businesses.
- The Department of Education has developed a data collection app called MyPNGSchool. It's used to collect students' enrolment data and teachers' data twice a year. The data is then verified and approved by the relevant district and provincial education inspectors.

### Digital identity and trust framework

- The government has completed an assessment for the rollout of a national ID program aiming to provide all 8.5 million citizens with digital ID cards by 2021, ahead of the 2022 election. In the absence of a trusted and credible government plan for a digital identity framework, industry partners, including the banks, are working on a digital trust framework. This includes the Bank of PNG's pilot project for a blockchain-based digital identification system, 'IDBox'.<sup>50</sup>

### Other

- During PNG's hosting of APEC meetings throughout 2018, the governments initiated a seminar titled 'Digital government: planning and implementing e-government projects in APEC' in cooperation with the APEC digital government research centre, hosted by Waseda University in Japan.<sup>51</sup>

### Issues on the horizon

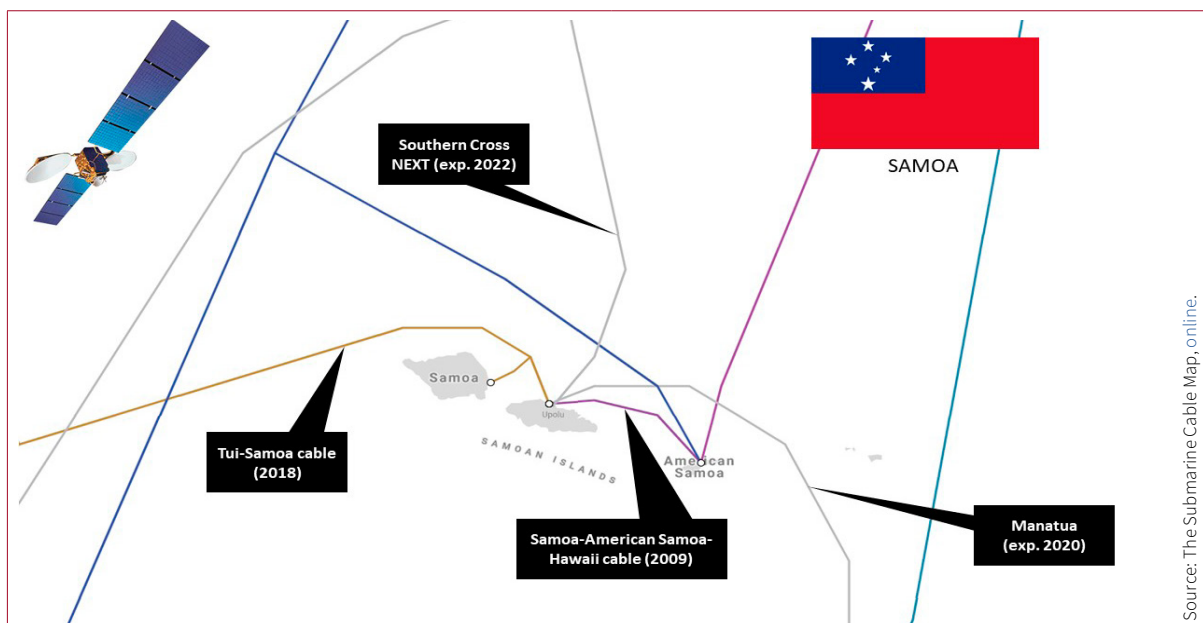
- PNG has some of the highest mobile and broadband internet costs in the region, partly due to the challenges posed by its mountainous terrain and widely dispersed population.<sup>52</sup> Additional cable capacities may create a dampening effect on current pricing.
- A high-level whole-of-government committee is being established to oversee the functioning and development of the IGIS and the implementation of the Digital Government Masterplan.
- While the Department of Communications and Information Technology has been assigned to develop operational policies governing digitisation, data collection and procurement, it isn't resourced as a matter of government priority.
- The PNG Government sees the IGIS infrastructure as a precursor to e-government in PNG and foresees the further development of the network across the country.

### ICT security, personal data protection and privacy

PNGCERT was established by the PNG Government and is facilitated through the National Information and Communication Technology Authority.<sup>53</sup> In 2018, in support of the APEC leaders meeting, the National Cyber Security Centre was established. Supported by Australia and New Zealand, the centre is one of the most advanced pieces of digital infrastructure in the Pacific.

Lead government agencies	Lead donors and funding details
<ul style="list-style-type: none"> <li>Department of Communications and Information Technology</li> </ul>	<p><b>Total amount of international aid that included an ICT and/or e-government component between 2007 and 2019:</b></p> <p>58 projects worth approx. US\$ 437.3 million</p> <p><b>Lead donors (in aid volume):</b></p> <p><b>Australia: US\$262.7 million (28 projects)</b></p> <p>This includes multi-year programming of PNG's subnational strategy, the economic and public sector program, and the provincial and local-level governments program. These projects were implemented by Coffey International Development, Praxis Consultants, Cardno, Australian Government departments and PNG Government departments.</p> <p><b>China: US\$146.6 million (4 projects)</b></p> <p>This includes the work of Huawei Technologies building IGIS, a biometric identity card and the National Broadband Network.</p> <p><b>UNDP: US\$14.7 million (5 projects)</b></p> <p>This includes the provincial Capacity Building and Enhancement Programme, which is aiming to develop capacity in public financial management at the subnational level, and assisting with the implementation of the Integrated Financial Management System.</p> <p><b>World Bank: US\$ 9.2 million (1 project)</b></p> <p>This pertains to the rural communications project aimed at providing access to telecommunications and internet in rural areas of PNG.</p>

## Samoa



### Facts and figures

#### Geography

Samoa is made up of two main islands (Savai'i and Upolu) and four smaller islands. Of the population of 198,000 (2019 est.) about 75% live on the island of Upolu. The capital city, Apia, is home to approximately 36,000 people.

#### World rankings

- ITU ICT Development Index (2017): 127
- UN E-government Index (2018): 128
- ITU Global Cybersecurity Index (2018): 98
- GSMA (2019): Transitioner

#### Connectivity and coverage

- Mobile subscriptions: 142,600
- Percentage of population: 72%
- Internet users: 100,000
- Percentage of population: 50–57%

#### Telecommunications operators and internet service providers

- Bluesky Samoa Ltd
- Digicel (Samoa) Ltd
- Computer Services Limited
- Netvo Samoa
- Lesa's Telephone Services Ltd

### e Government strategy and policy

The National ICT Committee comprising government and industry officials was formed in 2002 to focus on the development of a national ICT strategy, and the first National ICT Plan (2004–2009) was launched in 2003.

In 2010, the Samoan Government worked on an e-government strategy and established an e-government steering committee. In mid-2011, the committee paused its work and instead decided to focus first on getting infrastructure in place.<sup>54</sup>

In 2016, the government published the National Cybersecurity Strategy 2016–2021, with the goal of strengthening existing IT systems and critical infrastructure sectors that support economic growth and protect the public.<sup>55</sup>



This was preceded by the National ICT Policy, which ran from 2012 to 2017. Under the overall themes of accessibility, capacity and community, the policy has five goals:

1. To achieve accessible and affordable communications for all
2. To create an enabling environment for the development and adoption of ICT through policy reform and improvements in legal frameworks
3. To strengthen ICT human resources and increase human resource development opportunities through ICT
4. To improve economic growth, social improvements and their sustainability through ICT
5. To utilise ICT for good governance.

In May 2019, the Minister of Communication and Information Technology announced a cabinet-approved plan to create a Digital Transformation Authority. The authority is expected to set whole-of-government standards with a focus on digital identity, e-health and an online payments gateway.<sup>56</sup>

## Main achievements

### Infrastructure

- The Samoa National Broadband Highway, which is a local area network for government offices in Apia and other locations, was launched in 2014. The network build was funded under a concessionary loan from the Peoples' Republic of China (PRC) and comprised connections to the two main islands (Upolu and Savai'i) and the National Data Centre in Apia.
- Between 2007 and 2015, the SchoolNet project connected all 39 secondary schools to the internet, enabling them to use e-learning applications. At this moment, the network seems to have fallen into disuse.
- From 2005, Fesootai centres (community learning centres) were established throughout the country. They provide access to computers and the internet. Reporting suggests only a few cases of the effective use of the facilities due to lack of computer literacy and interest. Reportedly, 12 telecentres have been established in rural areas of Upolu and Savaii.<sup>57</sup>

### Services

- The most prominent online services provided by government are the Samoa Business Registry and Samoa e-Tax.
- The government is running several ministry-centric applications, such as:
  - Payroll and human resources: FinanceOne
  - Ministry for Revenue: Automated System for Customs Data
  - Justice (digitisation of Land and Titles Court records): SAMLII
  - Ministry of Education, Sports and Culture: Education Management Information System
  - Samoa Quarantine Services: Electronic Phytosanitary Certification System
  - Ministry of Health: Inventory Logistics Management System
  - Office of the Electoral System: Electronic Electoral/Voting System

- Work is underway for the introduction of an e-health system that, initially, includes an electronic medical records management system.<sup>58</sup>
- An integrated government website portal is operational and contains basic information, media updates and key constitutional documents.

### **Digital identity and trust framework**

- The Samoa Bureau of Statistics is developing plans for the introduction of a national digital ID (see ‘Issues on the horizon’).

### **Other**

The UNDP office in Samoa implemented the Digital Samoa project between 2017 and 2019. The project included a regional Digital Pacific conference in June 2018 that was jointly funded by the UNDP, the Global Centre for Public Service Excellence and DFAT through the Australian High Commission in Apia.<sup>59</sup>

### **Issues on the horizon**

- The Samoan Government has entered into a partnership with India that includes the establishment of the Centre for Excellence in IT at the National University of Samoa. The centre was launched in 2019 with four ‘trained trainers’ to facilitate its programs.<sup>60</sup>
- The establishment of the whole-of-government Digital Transformation Authority should ensure a strong intragovernmental lead coordinator to circumvent current issues with strongly siloed and ministry-centric systems.
- Many small-scale projects have included connecting schools (for example, the SchoolNet and One Laptop per Child programs), hospitals (e-health) and local community centres. Bad connectivity outside urban areas, underuse of resources and lack of long-term funding have impeded national rollout and sustainability.
- Trust issues have hampered a greater take-up of ICTs in government, by government and in local communities. More investments need to be made in socialising new technologies to overcome barriers in the exchange of ministry-owned data and in engaging citizens in online interactions with government and public services.<sup>61</sup>
- Part of the World Bank’s Pacific Regional Connectivity Program, phase 3 Samoa (total value: US\$49.94 million), looks at the enrolment of a national digital identity (NDID) system supported by legislation, public consultations and awareness campaigns. The project also includes the provision of civil registration software and arrangements for data-sharing between the NDID system and the Civil Registry.<sup>62</sup>

## ICT security, personal data protection and privacy

Samoa's National Cybersecurity Policy (2016–2021) was developed around the ITU framework. Organisational cybersecurity structures, with the Ministry for Communications and Information Technology as the recognised coordinating body, are still in a formative stage. For the moment, Samoa doesn't have a CERT capability, although scoping activities have been undertaken with support from APNIC.

Samoa currently doesn't have national legislation or regulations addressing data protection other than dispersed references in the *Telecommunications Act (2005)*, the *Statistics Act (2015)*, the *Electoral Act (1963)* and the *National Provident Fund Act (1972)*.

### Lead government agencies

- The Ministry of Communication and Information Technology

When the Digital Transformation Authority is established and operational, it's likely that it will take over the lead role in driving ICT projects and policy.

### Lead donors and funding details

**Total amount of international aid that included an ICT and/or e-government component between 2007 and 2019:**

22 projects worth approx. US\$24 million

**Lead donors (in aid volume):**

**China: US\$20 million (1 project)**

This pertains to building the Samoa National Broadband Highway by Huawei Technologies.

**New Zealand: US\$1.9 million (2 projects)**

This includes funding to the Public Sector Improvement Facility, established in 2002 by Australia and New Zealand. Funds from the facility were used by the Ministry of Revenue to improve policy, legislation and business processes and to invest in ICT and programme management.

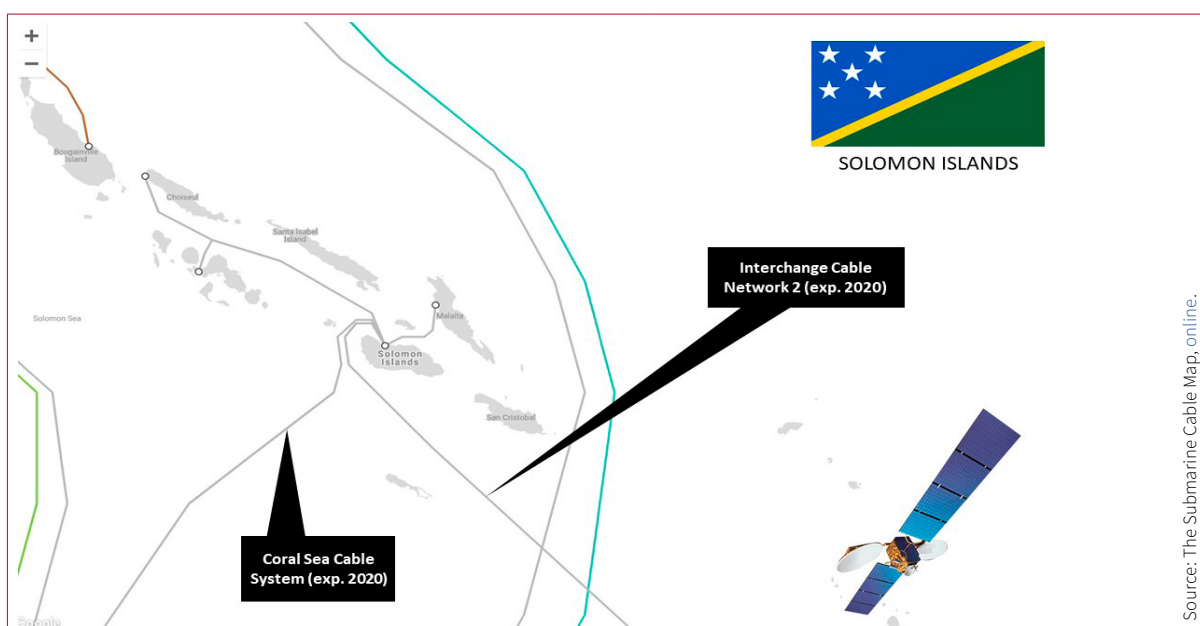
**Australia: US\$1.8 million (14 projects)**

This includes funding to the Public Sector Improvement Facility and the bilateral Samoa Governance Support Programme implemented by Adam Smith International, Cardno, Scope Global and Charles Kendall.

**Republic of Korea: US\$514,000 (5 projects)**

This includes a special training program on IT development and ICT policy that's sharing Korea's experiences in the area of IT and e-government

# Solomon Islands



## Facts and figures

### Geography

Solomon Islands is made up of six major islands and more than 900 smaller islands. The capital, Honiara, is home to approximately 85,000 people. About 20% of the total populace of 630,000 (2019 est.) lives in urban areas.

### World rankings

- ITU ICT Development Index (2017): 157
- UN E-government Index (2018): 169
- ITU Global Cybersecurity Index (2018): 160
- GSMA: Emerging

### Connectivity and coverage

- Mobile subscriptions: 459,000
- Percentage of population: 73%
- Internet users: 88,000
- Percentage of population: 14%

### Telecommunications operators and internet service providers

- Solomon Telecom / Our Telekom
- Vodafone

## e Government strategy and policy

The Ministry of Communications and Aviation launched the Solomon Islands National ICT Policy in 2017. The policy supports Solomon Islands' National Development Strategy and contains nine objectives:

1. Accessible ICT
2. Legal environment for ICT
3. ICT for good governance
4. ICT for peace and unity
5. ICT for health
6. ICT for learning

7. ICT for business
8. ICT for the environment
9. ICT for equity.

A World Bank report notes that the policy seems to lack synchronisation with other ongoing efforts.<sup>63</sup> Several line ministries, including the ministries of Finance, Public Services, Justice, Home Affairs, Health and Education, all operate domain-specific information systems, often supported by the Ministry of Finance's ICT Support Unit. The ICT Support Unit also hosts government data in a consolidated data centre.

The World Bank assesses Solomon Islands' e-government to be at an initial stage according to the Gartner model (see 'Indexes and rankings' section). The assessment further notes that there's currently no consensus on the implementation of the ICT policy. The proposed ICT Policy Committee has not yet been formed.<sup>64</sup>

## Main achievements

### Infrastructure

- SIG Connect is the government access network connecting the Honiara-based government institutions. It has around 6,500 end users (government employees) and 4,000 end devices. SIG Connect provides the link between users and the hosting environment.<sup>65</sup>
- A new data centre was built in 2019 in a purpose-built facility of the Ministry of Finance's ICT Support Unit. Other entities, such as the parliament and the Electoral Commission, continue to operate their own servers within their own premises.
- The ICT Support Unit is an operational capability that provides technical and helpdesk services across the Solomon Islands Government.

### Services

- Government websites are operational, but an internal review found that the quality of the web portals is insufficient and that they're in need of standardisation and improved local content. This effort is now ongoing.
- The Solomon Islands Business Registry portal is one example of an online service. Launched in 2016, the online registry allows businesspeople to register as foreign investors, incorporate companies and register business names in one sitting.<sup>66</sup>

### Digital identity and trust framework

- Solomon Islands doesn't have a digital ID system, but a biometric voter registration system was introduced successfully for the 2019 elections. A revision of the Civil Registration legislation is currently underway to allow the introduction of a unique identifier system.

## Other

- PF Net (People First Network) was initially a series of email stations around Solomon Islands. The network provides email and other services to very remote rural areas. The project operated between 2000 and 2008, providing rural communications and a participatory news and information service.<sup>67</sup> The network is no longer functioning as a result of lack of sustainability.
- The expansion of SIG Connect and ICT-enabled public financial management are integral parts of the multi-year Solomon Islands Governance Program, which is supported by the Australian Government with A\$30 million between 2017 and 2021. Support includes a long-term technical adviser embedded with the ICT Support Unit.<sup>68</sup>

## Issues on the horizon

- The Coral Sea Cable System came online in early 2020. The cable network includes three landing points at remote outer islands and should strengthen connectivity and data exchange between Honiara and three remote islands.
- Solomon Islands suffers from a severe shortage of skilled staff and lacks the ability to retain staff in government service. A strong reliance on external aid providers and international subject matter experts (consultants) is expected to remain.
- After the Regional Assistance Mission to Solomon Islands, Solomon Islands is still struggling to establish an absorptive capacity that can accommodate donor interests in line with government plans. The Solomon Islands Government is continuing work to update relevant legal provisions that should allow government departments to start sharing data.

## ICT security, personal data protection and privacy

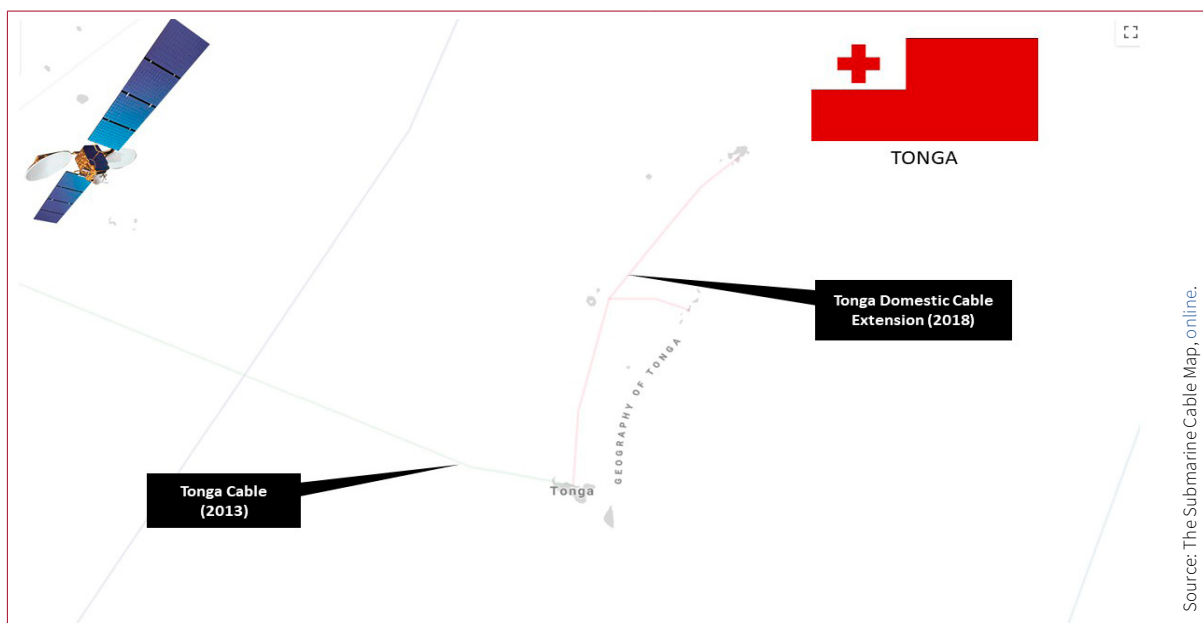
Cybersecurity hasn't been a priority for government. Efforts are underway to develop a national cybersecurity framework. A cybersecurity working group has been formed. The ITU and the Ministry of Communications and Aviation have been organising workshops on child safety online and a cybersecurity framework.

The Ministry of Finance's ICT Support Unit hosted a short-term cybersecurity consultancy from FireEye that produced a design for a cybersecurity operations centre, a draft incident response plan and a communications plan.

Lead government agencies	Lead donors and funding details
<ul style="list-style-type: none"> <li>• The ICT Support Unit of the Ministry of Finance—rebranded to SIG ICT Services—which manages and oversees most whole-of-government operational IT infrastructure</li> <li>• The Ministry of Communications and Aviation.</li> </ul>	<p><b>Total amount of international aid that included an ICT and/or e-government component between 2007 and 2019:</b></p> <p>45 projects worth approx. US\$71.2 million</p> <p><b>Lead donors (in aid volume):</b></p> <p><b>Australia: US\$42.6 million (15 projects)</b></p> <p>This includes the multi-year economic and public sector governance program. Among other elements, the program supports the Ministry of Finance and the ICT Support Unit.</p> <p><b>UNDP: US\$7.1 million (1 project)</b></p> <p>This pertains to the Strengthening the Electoral Cycle in the Solomon Islands project, which includes developing the biometric voter registration system.</p> <p><b>World Bank: US\$11.8 million (3 projects)</b></p> <p>The Telecommunications and ICT Development Project looked at support for developing ICT-sector-related policies, regulatory support to the new Telecommunications Commission and technical assistance for providing universal access to ICTs in rural centres and outer islands.</p> <p><b>Republic of Korea: US\$ 1.1 million (16 projects)</b></p> <p>This includes special training programs on ICTs and secondments of IT technical and policy advisers and volunteers.</p>



# Tonga



## Facts and figures

### Geography

Tonga is an archipelago comprising 169 islands, of which 36–45 are inhabited. The country has a population of 109,500 people (2019 est.), of whom 70% reside on the main island of Tongatapu.

### World rankings

- ITU ICT Development Index (2017): 110
- UN E-government Index (2018): 109
- ITU Global Cybersecurity Index (2018): 116
- GSMA: Transitioner

### Connectivity and coverage

- Mobile cellular subscriptions: 109,800
- Percentage of population: 100%
- Internet users: 66,000
- Percentage of population: 60%

### Telecommunications operators and internet service providers

- Digicel Tonga Ltd
- Tonga Communications Corporation Ltd
- EZNet

## e Government strategy and policy

Tonga's digitisation journey started in 2002, when the telecommunications sector was liberalised. That was the first market liberalisation in the region. The decision enabled a significant increase in access to basic telecommunications in the country.<sup>69</sup> Nonetheless, the ADB assesses that Tonga's dependence on 'expensive and scarce satellite capacity' is causing a slowing of good-quality internet access.

In 2009, the Tongan Government developed the National ICT Strategic Plan.<sup>70</sup> This policy resulted in the first fibre-optic submarine cable system for Tonga in 2013. Furthermore, line ministries received access to broadband internet, and e-commerce and e-business were introduced in the banking and private sectors. Tonga also saw a growth in the use of social media.<sup>71</sup>

In December 2013, the Tongan Government created the Cyber Challenge Task Force to address cyber issues and coordinate responses across government, including on cybersecurity, cybercrime and cybersafety.<sup>72</sup> Key stakeholders include the telecommunications providers, NGOs and the private sector.

In 2015, the cabinet set up the e-Government Unit under the Information Department of the Ministry of Environment, Energy, Climate Change, Disaster Management, Meteorology, Information and Communications.<sup>73</sup> In 2017, the e-Government Unit was tasked with the implementation of the National ICT Project, which entails:

- the development of a secure private IP network
- the development a government data centre to host applications and provide cloud services
- the rollout of a unified communications system
- the training of IT technical specialists

In May 2019, the World Bank announced a new US\$4.65 million project to improve digital access to key public services in Tonga, including upgrades to civil registration and national ID systems. The project will ensure that all Tongan citizens are assigned unique ID numbers, allowing their legal identity to be authenticated for in-person and online government services.<sup>74</sup>

At the start of this multi-year World Bank project, Tonga adopted its first Digital Government Strategic Framework 2019–2024. The project’s core objective is to improve Tonga’s capacity for digital public service delivery.

The framework has the following goals:<sup>75</sup>

- Implement digital government across all government agencies and activities.
- Advance digital inclusion for all Tongans.
- Strengthen governance and efficiency.
- Promote data-sharing and a service-oriented information systems architecture.
- Enhance citizen engagement.

## Main achievements

### Infrastructure

- The dedicated e-Government Unit was set up under the Ministry of Meteorology, Energy, Information, Disaster Management, Climate Change and Communications.
- A containerised data centre and government network infrastructure (the Secure Government Network) were established through a five-year contract with TCC and Huawei. The data centre now services 15 out of 38 government sites.

### Services

- Email and gateway services are centrally provided for the Ministry of Education, the Ministry of Foreign Affairs, the Ombudsman, and the Ministry of Meteorology, Energy, Information, Disaster Management, Climate Change and Communications.
- The Tongan Government runs a central web portal in addition to the websites of individual ministries. The portals provide information services and aren’t presently intended to enable online services.

## Other

- In May 2017, Tonga became the only Pacific island state that has ratified the Budapest Convention on Cybercrime.

## Issues on the horizon

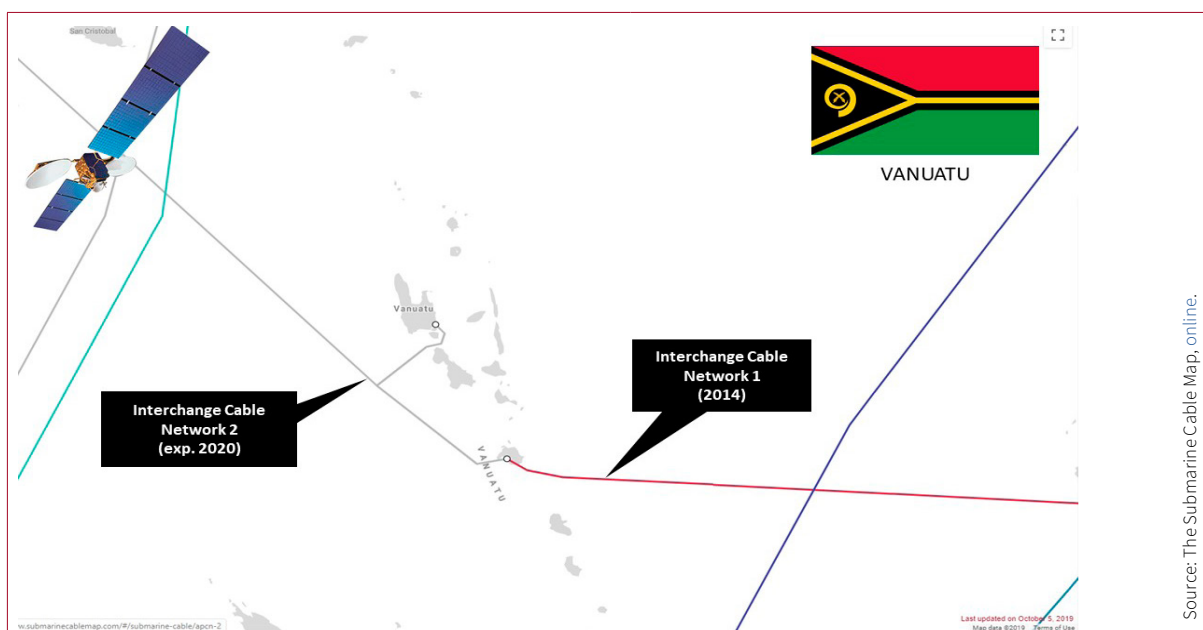
- Tonga's remote location and dispersed islands increase the costs of infrastructure development and connectivity. The availability of bandwidth isn't expected to change in the short to medium term despite additional satellite capacity having been contracted.<sup>76</sup>
- Resistance to change and a general lack of awareness are slowing digital adoption. This applies to government staff as well as to citizens. Demand for digitising government is not strong.<sup>77</sup>
- Most ministries maintain their own paper-based databases, including the Ministry of Land Files. Databases are also not connected.
- The ADB is about to start a project supporting an e-health program making use of the high-speed submarine cable.
- Part of World Bank funding is allocated to the development of a national digital ID in addition to the current national ID, which is used only for voting.

## ICT security, personal data protection and privacy

In 2016, Tonga became the first Pacific island country to establish a national CERT.<sup>78</sup> In May 2018, Tonga hosted a regional cybersecurity workshop, with a focus on building capacity for CERTs in the Pacific. The workshop was conducted with the support of APNIC and the Cyber Cooperation Program of DFAT and included more than 20 participants from the region.<sup>79</sup>

Lead government agencies	Lead donors and funding details
<ul style="list-style-type: none"> <li>• The Ministry of Meteorology, Energy, Information, Disaster Management, Climate Change and Communications</li> <li>• In November 2018, the Ministry of Finance was designated as the implementing agency responsible for the World Bank e-government project.<sup>80</sup></li> </ul>	<p><b>Total amount of international aid that included an ICT and/or e-government component between 2007 and 2019:</b></p> <p>21 projects worth approx. US\$25.3 million</p> <p><b>Lead donors</b></p> <p><b>Australia: US\$12.7 million (12 projects)</b></p> <p>This includes support to the Pacific Public Administration Governance initiative (implemented by USP) and support for economic and public sector management implemented by Australian Volunteers International and Charles Kendall.</p> <p><b>Republic of Korea: US\$650,000 (5 projects)</b></p> <p>This includes special training programs in ICTs and supporting opportunities for Tonga to participate in the planning and evaluation efforts of international organisations.</p> <p><b>World Bank: US\$ 4.65 million (1 project)<sup>81</sup></b></p> <p>This pertains to the World Bank’s Digital Government support project approved in May 2019.</p>

# Vanuatu



## Facts and figures

### Geography

Vanuatu is made up of four main islands and 80 smaller islands. Of the population of 285,000 (2019 est.) about 25% live in the cities of Port Vila (the capital) and Luganville.

### World rankings

- ITU ICT Development Index (2017): 141
- UN E-government Index (2018): 137
- ITU Global Cybersecurity Index (2018): 147
- GSMA Mobile Connectivity Index (2019): Transitioner

### Connectivity and coverage

- Mobile subscriptions: 329,700
- Percentage of population: 116%
- Internet users: 90,000
- Percentage of population with internet access: 32%

### Telecommunications operators and internet service providers

- Digicel (Vanuatu) Ltd
- Telecom Vanuatu Ltd (TVL)

## e Government strategy and policy

Vanuatu's first e-government plan was released in 2008. It envisioned the creation of the Government Broadband Network (GBN)—the core network infrastructure connecting Port Vila with provincial centres. The plan coincided with the introduction of the 2009 Telecommunications and Radiocommunications Regulation Act, which deregulated the telecommunications market.

A series of additional new policies were introduced between 2012 and 2014. In 2012, the integrated government (iGov) initiative was launched. Along with an overall goal to facilitate good governance, the initiative had three specific aims for the use of ICTs:

- to enable transparency and accountability
- to optimise human and financial resources
- to improve the availability of public information and ICT literacy for government employees.

In 2013, iGov was followed by the introduction of the national ICT policy, cybersecurity policy and universal access policy. The universal access policy set out minimum standards for telecommunications services, including required levels of access, especially for schools, health facilities and public offices; the policy governing uniform prices; compliance mechanisms; and administration of the universal access fund, which is financed by a levy on service providers.

In 2014, Vanuatu published its m-Gov strategy. Based on the UN's Mobile Governance for Development (MGOV4D) project, it includes a suite of e-government initiatives tailored to mobile devices. The strategy is regarded as a blueprint for other small island developing states in the region.<sup>82</sup>

Vanuatu's National Sustainable Development Plan (Vanuatu 2030) lists the "Increase[d] use of and access to information and communications technologies, including on-line government services' as one of its objectives.

The Office of the Government Chief Information Officer (OGCIO) is currently developing a Digital Governance Road Map, Cybersecurity Strategy and *Government security policy handbook* and is reviewing the national ICT policy, cybersecurity policy and universal access policy.<sup>83</sup>

The Ministry of Health is finalising a 'digital health strategy' that looks at establishing a set of integrated information systems. The strategy aims to streamline existing digitisation processes into one integral whole while providing medical professionals and managers of medical facilities access to electronic laboratory information, mSupply (an application for pharmaceutical warehouses and stores) and electronic patient records.

## Main achievements

### Infrastructure

- The establishment of the OGCIO in 2012 enabled whole-of-government policy leadership on ICT matters. Its mandate is to 'to encourage the spread of ICTs in society to efficiently and effectively achieve an educated, healthy and wealthy Vanuatu' and 'to lead the iGov initiative'.<sup>84</sup> It now hosts 90% of government departments' data.
- The first Vanuatu e-government plan was developed in 2008. It focused on creating the GBN, which is a private fibre-optic and fixed wireless network linking the government offices in the main provincial centres of Vanuatu. The network also provides internet access to government offices.<sup>85</sup> Integral to this activity are the maintenance of data centres and the provision of a helpdesk service for all users of the GBN.<sup>86</sup>

### Services

- Databases running on OGCIO servers include the Court Management System, the Civil Registry information management system, ASYCUDA World—the Automated System for Customs Data developed by the UN Conference on Trade and Development (UNCTAD)—and the Police Information Management System.<sup>87</sup> The Civil Registry is now accessible in all provincial hospitals and municipal headquarters. Data from the registry is used to validate the electoral roll.



- The Ministry of Finance's Smartstream system is the largest system run by government. It's the government's central planning and budgeting system and has ancillary modules, including human resource management, payroll services, donor information and project reporting. For security reasons, access is tightly controlled and maintenance is ensured by donors and the commercial provider.<sup>88</sup> In 2010, the system was evaluated by the Pacific Financial Technical Assistance Centre as one of the best public financial management systems in the region. The report credited the Ministry of Finance's active engagement, the fact that the system is made up of multiple subsystems, and its dynamic character.<sup>89</sup>
- To date, the Ministry of Education's scholarships website is the only e-government service where members of the public may submit an online application. It was launched in September 2017.

### Digital identity and trust framework

- Less than 50% of the populace uses a national ID. The government is currently pursuing an exercise to register more citizens as part of a voter registration process. The new identity card is embedded with a QR code. Its use is being applied by commercial banks, airlines and other businesses but not yet by government.
- The Vanuatu Government is using personal identification details of accounts of the National Provident Fund as the main identifier.



### Other

- In 2015, as Cyclone Pam approached, the OGCI0 worked with the Meteorological and Geohazards Department to push out early-warning SMS messages. The two groups coordinated with Digicel and TVL to disseminate texts to all mobile subscribers at no cost to the government. Following the cyclone, the OGCI0 worked with international NGOs and the ITU to respond to damage to ICT infrastructure. The coordinated use of telecommunication infrastructure and the quick restoration of mobile connectivity are partly credited for the low death toll (11 deaths) from Cyclone Pam.<sup>90</sup>

### Issues on the horizon

- Further investment in infrastructure is needed, including a potential domestic cable network that connects key provincial centres. The Vanuatu Government is progressing discussions on cable options.
- Whole-of-nation training efforts should be focused on ICT literacy, good cybersecurity practices and cyber hygiene. Awareness raising and training are needed to overcome sceptical communities (mostly living outside urban centres) and older generations.
- As the provision of online applications with e-payment and verification requirements increases, the need for a single national digital ID is expected to become more apparent.
- As most social services data is collected manually and on paper, a considerable effort is required to digitise existing paper records and encourage digital recordings from the outset.

- There's evidence of successful small-scale projects, for example in the social domain. National rollout at scale is a prerequisite to ensure that economic efficiencies are achieved.
- Now that government departments have an online presence, a shift in focus is needed to develop and provide meaningful content and opportunities for public engagement. This could include the frequent provision of new local content and the introduction of complementary applications and e-services.

### ICT security, personal data protection and privacy

In 2013, Vanuatu became one of the first Pacific states to develop and publish a national cybersecurity policy, which is currently being reviewed. An accompanying cybersecurity strategy and information security handbook are under development.

In 2018, Vanuatu launched CERT VU with support from the Australian Government and the Asia-Pacific Network Information Centre (APNIC). CERT VU is 'the central cybersecurity information and incident response hub for Vanuatu. Its primary objectives are to respond to malicious incidents targeting Vanuatu's internet and IP communications network.'<sup>91</sup> CERT NZ and Stay Smart Online (Australia) are operational partners.

Data protection and privacy are overseen by the Civil Registry and the Civil Registry Act. At the moment, consideration is being given to tabling a cybercrime bill in parliament.



Lead government agencies	Lead donors and funding details
<ul style="list-style-type: none"> <li>Office of the Government Chief Information Officer, Office of the Prime Minister</li> </ul> <p>Other key agencies include:</p> <ul style="list-style-type: none"> <li>the Ministry of Health and the Ministry of Education and Training, which have been tasked to work closely with the OGCIO in championing the adoption of e-government capabilities</li> <li>the Ministry of Finance and Economic Development, which manages the Smartstream system for whole-of-government financial management</li> <li>the Department of Customs and Internal Revenue, which operates the ASYCUDA World customs administration system, which is overseen by UNCTAD.</li> </ul>	<p><b>Total amount of international aid that included an ICT and/or e-government component between 2007 and 2019:</b></p> <p>38 projects worth approx. US\$60 million</p> <p><b>Lead donors (in aid volume):</b></p> <p>China: US\$28.8 million (1 project)</p> <p>This project, implemented by Huawei Technologies, pertains to the construction and commissioning of the GBN and Government Data Centre.</p> <p><b>Australia: US\$25.2 million (22 projects)</b></p> <p>This includes the multi-year and multi-phase Governance for Growth program that included support for the liberalisation of the telecommunication market, access to banking services, government communications infrastructure and ICT management.</p> <p><b>New Zealand: US\$3.9 million (3 projects)</b></p> <p>This includes activities aimed at upgrading Vanuatu's passport system to be machine-readable and in line with International Civil Aviation Organization standards, and strengthening information management at Vanuatu's Customary Land Tribunal and the Department of Lands of the Ministry of Lands and Natural Resources.</p>

# International donors in e-government in the Pacific

International donors play an important role in the Pacific, including in the area of introducing ICTs and developing e-government capabilities. Evidently, those investments are predicated on the availability of connectivity and access to the internet.

The World Bank is playing a critical role here by extending the fibre-optic cable system to all Pacific island states through the Pacific Regional Connectivity Program (see box). Australia's investments in building the Coral Sea Cable System, connecting Sydney to Honiara and Port Moresby, should be seen in the same context. The system is a critical enabler for e-government and the use of ICTs in Solomon Islands and PNG.

## World Bank: Pacific Regional Connectivity Program

**Objectives:** To reduce the cost and increase the availability of international bandwidth for participating countries, and thereby to facilitate the development of a wide range of ICT applications to support social and economic development in the Pacific region.

**Phase 1 (2011–2018):** Building the Tonga–Fiji submarine cable and providing technical assistance to the Ministry of Information and Communications to review relevant policies, regulations and licensing processes.

**Phase 2 (2014–2022):** Building a submarine cable system connecting the Federated States of Micronesia, Kiribati and Nauru to Guam, accompanied by technical support in reviewing policies, regulations and legal frameworks.

**Phase 3 (2015–2021):** Building the Samoa–Fiji submarine cable system, including landing stations and equipment, accompanied by regulatory assistance in reviewing regulations for the ICT sector and legal frameworks and conducting a consumer survey on the benefits of ICTs.

**Phase 4 (2017–2022):** Building the submarine cable system for Kiribati, including landing stations and equipment, accompanied by regulatory assistance in reviewing regulations for the ICT sector and legal frameworks as well as the operation and management of the East Micronesia Cable.

While the World Bank is the main international donor in the area of regional connectivity, effective donor coordination and transparency about international assistance provided in individual Pacific island countries are more problematic. This isn't a specific Pacific challenge; it's a global one.

Given the large geographical size of the Pacific region, its relatively small populations and the limited number of active donors, the issue seems more acute and potentially more manageable at the same time.

Australia's Lowy Institute started an effort to map all aid in the Pacific in 2015. The Pacific Aid Map has grown into an invaluable resource for the aid community. Almost all donor and most project data in this report has been sourced from the Pacific Aid database, which is available at: <https://pacificaidmap.lowyinstitute.org>.

Despite this effort, interlocutors from Pacific island governments, academia and the international community regularly raise the issue of lack of donor coordination ('No one really knows what the others are doing') and lack of information about many projects ('What are these projects really about?').

This also seems to apply to investments in the relatively new area of ICTs, cybersecurity and other digital developments. As various donors are ramping up their attention to ICTs in the Pacific and e-government solutions, this report provides an overview of assistance provided so far.

Based on the Pacific Aid map database, we found as follows:

- Between 2007 and 2019, a total of about US\$653.5 million was invested in 228 projects that involved the introduction or use of ICTs and components of an e-government capability.

*The data analysis shows that e-government is not a main single focus area for development programming. No donor has focused its aid on developing or strengthening e-government capabilities. Instead, support for elements of the e-government ecosystem has been taken up as part of broader infrastructure and social and public sector development projects. These e-government elements can be found in:*

- *investments that focus on increasing ICT connectivity to the islands and throughout individual archipelagos*
  - *investments in governance support programs, particularly in the public financial management area*
  - *investments in digital literacy skills and tertiary education ICTs.*
- Between 2007 and 2016, 13 projects were directly and explicitly related to e-government and had a total value of US\$57 million.

*These projects pertain to China's funding for building national broadband networks and data centres in five countries and Korea's activities in ICT education across the region. Singapore's support to DigitalFiji, the World Bank's support to digital government in Tonga and Japan's funding for the ICT building at the USP are not yet part of the dataset.*

These observations also demonstrate a lack of accessibility to and transparency of donor data in the area of ICT for development. Donor investments in e-government or ICTs don't fit into a specific OECD reporting line and are 'hidden' in sectors such as communications and governance. Maintaining proper oversight and providing specific figures are therefore nearly impossible.

The donors involved in developing and strengthening the use of ICTs in the context of e-governance in the Pacific are shown in Table 1, with estimated investment values and numbers of projects.

**Table 1: Donors most active in the area of ICT for development in the Pacific, 2007 to 2019**

Rank	Donor country	Approximate value (US\$)	Approximate no. of projects
1	Australia	350 million	109
2	China	218 million	8
3	World Bank	25.5 million	5
4	UNDP	22 million	6
5	New Zealand	10.5 million	11
6	Republic of Korea	3.4 million	58

China's investments seem to diverge from other donors' practice: it delivers a relatively small number of projects, but each is large in aid volume. In fact, the largest projects in terms of aid volume are funded by the PRC, and often via China Eximbank loans (Table 2).

**Table 2: Large China-funded projects**

Project	Contractor	Pacific island country	Project size (US\$)
Biometric identity verification system <sup>a</sup>	Huawei	PNG	82.7 million
Government Broadband Network and Government Data Centre <sup>b</sup>	Huawei	Vanuatu	28.7 million
National Broadband Network <sup>c</sup>	Huawei	Samoa	22.1 million
E-government masterplan and infrastructure	Alcatel Shanghai Bell	Fiji	21.6 million

a ASPI, *Mapping China's tech giants*, [online](#).

b ASPI, *Mapping China's tech giants*, [online](#).

c ASPI, *Mapping China's tech giants*, [online](#).



## Existing coordination and expertise-sharing mechanisms

While coordination and pooling of resources at the policy level can be problematic, there are existing mechanisms at the operational level. For the purpose of this report, three are detailed here.

The **Pacific Regional Infrastructure Facility** (PRIF) was established in 2008 to act as an interface between major donor agencies and recipients of development assistance. PRIF members include the ADB, DFAT, the New Zealand Ministry of Foreign Affairs and Trade, the World Bank Group, the European Commission and the Japan International Cooperation Agency.

Enabled by a coordination office and a technical assistance and research fund, the PRIF serves as a resource that Pacific island states and donors can use to support the planning, development, management and maintenance of infrastructure, and infrastructure development programs.

The PRIF's activities currently focus on conventional infrastructure development in the Pacific and have thus far not touched ICTs or e-government except for commissioning studies on the economic and social impact of ICT in the Pacific (2015)<sup>92</sup> and on cybersecurity and safeguarding electronic transactions (2019)<sup>93</sup>.

The **Global Forum on Cyber Expertise** (GFCE) was established in 2015 as a global platform for countries, international organisations and private companies to exchange best practices and expertise on cyber capacity-building. The forum's aim is to identify successful policies, practices and ideas and multiply them on the global level. Together with partners such as NGOs, the internet technical community and academia, GFCE members develop practical initiatives to build cyber capacity.

The GFCE is focusing its work on five priorities: cybersecurity policy and strategy; incident management and critical infrastructure protection; cybercrime; cybersecurity culture and skills; and cybersecurity standards.

In 2019, the GFCE and its knowledge partners launched the cyber capacity-building knowledge-sharing portal, Cybil, in an effort to become a global source for validated information on projects, resources and toolkits and for access to available expertise.

While Australia and New Zealand are members of the GFCE, partners from the Pacific region haven't been effectively represented in the forum. For instance, the area of 'ICT for development' isn't yet one of the forum's focus areas.

The **CROP ICT Working Group** was established under the Pacific Islands Forum as a platform to coordinate work on ICT developments in the region. Despite its challenges (see 'Introduction'), it's the only existing Pacific coordination mechanism with all relevant stakeholders nominally represented and with a mandate to pursue the implementation of the Pacific Regional ICT Strategic Action Plan (PRISAP).

## Conclusions and recommendations

This report began by noting the renewed focus on the Pacific region. Besides Australia's Pacific step-up, which is reflected in DFAT's International Cyber Engagement Strategy, other states have also started to intensify their offering of support to the region.

While the World Bank has been and remains the major driving force behind e-governance and ICT developments in the Pacific, New Zealand is now supporting the development of e-governance strategies, the UK's Department for International Development is doubling its aid portfolio, and the US has launched the Digital Connectivity and Cybersecurity Partnership, which also targets the Pacific.

To inform the direction of those investments, this final section of the report presents a set of conclusions for the initiation and implementation of specific e-government and digital government development programs in the Pacific.

The report ends with recommendations to donor and Pacific island governments, with a focus on enabling factors for greater efficiency and effectiveness in ICT for development programming.

## Implementing e-government and digital government capabilities in the Pacific

### Conclusion 1: Establish a national coordinating body or committee for ICT

A precondition for the successful and sustainable implementation of e-government capabilities is for each Pacific island state to establish a well-functioning, competent and mandated national coordinating body. Management of ICT and digitisation issues is directly connected to change management in public administration and should therefore be coordinated by a central coordinating body or committee.

Outcomes from this project have shown that all states currently face major challenges in establishing effective whole-of-government coordination for ICTs and the development of e-government capabilities.

### Conclusion 2: Develop an integrated e-government architecture

Building an e-government capability is an extensive and costly task. Therefore, it's essential to establish a set of reusable components that all government department systems can use. Such reusable components should not only save money, but also increase efficiency and service quality.

The main enablers of an integrated e-government architecture are:

- digital services available to citizens (users)
- interoperability of systems and a secure data exchange
- an NDID system and a trust infrastructure
- foundational digitised registries
- a management system for metadata of government systems

- a government network
- a government cloud-based data storage.

As this report shows, most countries possess most of those enablers. To build and integrate the enablers and avoid interoperability issues later, it's important to develop a clear e-government architecture. That architecture should include agreed principles (for instance, on privacy and security) and a system design that integrates the enablers.

Some of the enablers, such as the NDID and the foundational registries, could also be designed and operated as part of a regional arrangement.

### **Conclusion 3: Ensure the quality of data in basic registries**

Another key component of an e-government system is authentic data sources (that is, registries). The data collected and stored in the registries is the outcome of business processes of the relevant agencies.

Moving from paper-based to digital processes provides an opportunity to optimise business processes and compare different data sources. It's important that arrangements for data-sharing between government departments are in place to avoid duplication and the mismatching of records.

The primary focus in digitising registries in Pacific island states should be to develop and ensure the quality of data in foundational registries, such as registries for births, deaths and marriages, businesses and land entitlements.

An established good practice is to assign unique numeric identifiers to citizens, businesses, real estate, land parcels and other relevant objects. This allows administrators to identify people or objects in different databases across multiple transactions, such as in education, health care, taxation, justice and finance. It also helps to assure public servants that they are dealing with the same person or object in all life events.

### **Conclusion 4: Develop secure data exchanges and integrate cybersecurity**

Citizen-centric and service-oriented information systems require information systems to be linked into an integrated logical whole. This requires government departments and their information systems to be interoperable. In other words, they must be able to work together.

A secure data exchange is another priority in developing an e-government capability in the region. Information from national databases must be accessible in real time, and that requires secure and controlled data exchanges.

Considerations of cybersecurity should be included from the beginning. This report shows that, to date, that hasn't been the case, and most e-government schemes lack a reliable cybersecurity approach.

### **Conclusion 5: Implement a solid digital identity scheme**

An NDID is the final cornerstone of an e-government system. It allows citizens to carry out secure electronic transactions and take full advantage of available e-government services. NDID schemes need to be secure and protective of privacy, while relying on a proper and high-quality basic registry (see Conclusion 3).

# Enabling effective ICT and cyber capacity-building programming in the Pacific

## Recommendation 1: Pursue an integrated policy approach

ICT infrastructure and e-government capabilities have become foundations for national development plans in the Pacific region.

Until now, responsibility for implementing these projects has largely been borne by ICT specialists located mainly in ministries of communication and information. As foundational infrastructure and services have moved from 'build' to 'operate', other arms of government need to be involved. E-Government needs to become an integral part of public policymaking. The development of an e-government road map could encourage and guide such endeavours, providing specified targets, tasks, roles, responsibilities, resources and measurable indicators.

A similar observation applies to the donor community. Aid programs, political dialogues and the enabling role of ICTs need to be part of an integrated engagement policy. Examples of this improving practice are the World Bank's digital government project in Tonga and Australia's Governance Support Program in Solomon Islands. In both cases, e-government components are part of an integral bilateral and multilateral engagement.

Aid agencies active in the Pacific should invest in in-house and dedicated expertise in the area of ICTs for development and ideally assign a dedicated ICT portfolio holder at headquarters to be responsible for regional or bilateral engagements.

## Recommendation 2: Include end-user perspectives

Now that foundational infrastructure and e-government capabilities are in place, attention is shifting to ensuring that government departments, citizens and businesses start using those capabilities effectively.

The initial development phase of setting up infrastructure may have been a relatively straightforward undertaking. The installation of hardware tends to be largely supply-driven and doesn't require many social-context specifications or intensive stakeholder involvement.

To understand end users' needs and demands, it's recommended that ICT endeavours in the Pacific start making use of community needs assessments, public perception surveys and business needs assessments. Those results would inform the procurement and development of e-government services and enhance the socialisation of new technologies across society. A much deeper understanding of what people want from e-government will be critical to the long-term success of projects and to donors' returns on investment.

## Recommendation 3: Establish a regional platform for ICT capacity-building

The region doesn't lack expertise and knowledge products in the area of ICTs for development and e-government. The main challenge lies in accessibility: recognising what information is available, knowing where it can be found and understanding how expertise can be commissioned.

One example is Victoria University's publication *Achieving sustainable e-government in Pacific island states*. It's a unique and high-value knowledge product. At the same time, accessibility to the volume

for policymakers, technical experts, the media and non-academics is relatively low, which inhibits the potential that this research could have in shaping aid programming in the region.

The USP is the region's premier forum for academic research and education and has longstanding partnerships with universities in New Zealand and Australia on issues particular to the Pacific. Japan donated an ICT building to USP to specially promote ICT education in the region. Therefore, it seems to have been a sound decision that USP was to coordinate the work of the CROP ICT Working Group—the region's only institutionalised knowledge-sharing platform.

For traditional areas of infrastructure investment in the Pacific, such as roads, bridges, waste management, energy, water and sanitation, the donor community established the PRIF in 2008. The purpose of PRIF is to coordinate and prioritise international support and ensure that it's delivered in a sustainable manner. It also provides technical assistance.

Coordinated cyber capacity-building support is yet to properly reach the Pacific region. In 2015, the GFCE was established with a remit similar to the PRIF's but focused on cyber expertise. The forum, consisting of government and private-sector members, hosted its first 'Pacific regional event' in Melbourne in February 2020.

It's suggested that the current regional support framework for ICTs and cyber affairs be reconsidered. Relevant stakeholders could look at equipping a facility such as the Pacific Regional Infrastructure Facility with a dedicated ICT/cyber component. Alternatively, they could also consider establishing a 'Pacific front office' of a forum such as the GFCE. There's also a need to reassess the CROP ICT Working Group's mandate, terms of reference, leadership and operating resources in connection to the training and education facilities at USP.

#### **Recommendation 4: Reinvigorate regional cooperation**

The country profiles in this report show that Pacific island states have managed to develop their e-government capability. The assessment also reveals that some states have more mature capabilities in some areas than others. The opportunity for networking and sharing knowledge and practices during the ASPI/EGA project was highly valued by the participating officials.

The two regional events (see 'about the project' section) and this report highlight that the challenges each Pacific island state faces are largely the same: similar types of constraints in policy development, organisational capabilities, finding and retaining qualified staff, a reliance on external partners, mounting costs of IT equipment and support packages, and scarce CERT resources.

The time may be right to reconsider regional cooperation now that foundational national infrastructure is in place. The lessons learned and resources developed for the PNG Cyber Security Operations Centre, as well as those from the Vanuatu and Tonga CERTs, could perhaps benefit other start-up cybersecurity incident response teams. The experience in Fiji, where DigitalFIJI is developing e-service applications, could potentially be replicated in other states, and Vanuatu's operational policies could serve as model for other nations.

The often-invoked concern of national sovereignty seems to have become technically obsolete. Dependence on overseas providers is already a reality. Most e-government applications don't touch on sensitive infrastructure, services or capabilities. In industry, on the other hand, proven mechanisms that ensure the sovereignty of government or private data have been developed, despite the data being stored in a third jurisdiction.<sup>94</sup>

## Acronyms and abbreviations

ADB	Asian Development Bank
APEC	Asia–Pacific Economic Cooperation
APNIC	Asia–Pacific Network Information Centre
CERT	computer emergency response team
China Eximbank	Export–Import Bank of China
CROP	Council of Regional Organisations of the Pacific
DFAT	Department of Foreign Affairs and Trade (Australia)
DTA	Digital Transformation Agency (Australia)
EGA	e-Governance Academy (Estonia)
EGDI	UN e-Government Development Index
EU	European Union
GBN	Government Broadband Network (Vanuatu)
GFCE	Global Forum on Cyber Expertise
ICT	information and communications technology
IGIS	Integrated Government Information System (PNG)
ISP	internet service provider
IT	information technology
ITU	International Telecommunication Union
NDID	national digital identity
NGO	nongovernment organisation
OECD	Organisation for Economic Development and Co-operation
OGCIO	Office of the Government Chief Information Officer (Vanuatu)
PNG	Papua New Guinea
PRC	People’s Republic of China
PRIF	Pacific Regional Infrastructure Facility
SDG	Sustainable Development Goals
SMS	short messaging service
UN	United Nations
UNCTAD	UN Conference on Trade and Development
UNDP	UN Development Programme
USP	University of the South Pacific
WAN	wide area network



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## Some previous ICPC publications

