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Report No: PAD887

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT

IN THE AMOUNT OF SDR32.1 MILLION
($47.5 MILLION EQUIVALENT)

TO THE

FEDERATED STATES OF MICRONESIA

FOR A

SECOND PHASE OF THE

PACIFIC REGIONAL CONNECTIVITY PROGRAM:

PALAU-FSM CONNECTIVITY PROJECT

November 14, 2014

Transport and ICT Global Practice
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective September 30, 2014)
Curency Unit = United States Dollar ($)
$1.48 = SDR1

FISCAL YEAR

October 1 – September 30

ABBREVIATIONS AND ACRONYMS

$	All dollars are in United States dollars unless otherwise indicated
ADB	Asian Development Bank
ADSL	Asymmetric digital subscriber line
CAPEX	Capital expenditure
CTF	Compact Trust Fund
DoFA	Department of Finance and Administration
DTCI	Department of Transportation, Communication and Infrastructure
ESMP	Environmental and Social Management Plan
FM	Financial management
FSM	Federated States of Micronesia
FSMTC	FSM Telecommunications Corporation
Gbps	Gigabits per second
GDP	Gross domestic product
GSM	Global system for mobile communications
GSP	Gross state product
IBRD	International Bank for Reconstruction and Development
ICT	Information and communication technologies
IDA	International Development Association
IRU	Indefeasible right of use
Mbps	Megabits per second
MOU	Memorandum of understanding
O3b	Other three billion
OPEX	Operating expense
PMC	Palau Mobile Communications
PNCC	Palau National Communications Corporation
PRIF	Pacific Regional Infrastructure Facility
RUS	Rural Utilities Service
SOE	State-owned enterprise
SPV	Special purpose vehicle
TA	Technical assistance
TBTF	Telecommunications Broadband Task Force

Regional Vice President:	Axel van Trotsenburg
Country Director:	Franz Drees-Gross
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Global Practice Manager:	Randeep Sudan
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Federated States of Micronesia

PAD DATA SHEET

Pacific Islands

Pacific Regional Connectivity Program 2:Palau-FSM Connectivity Project (P130592)

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC

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Report No.: PAD887

Basic Information			
Project ID	EA Category		Team Leader
P130592	B - Partial Assessment		Natasha Beschorner
Lending Instrument	Fragile and/or Capacity Constraints [ ]		
Investment Project Financing	Financial Intermediaries [ ]		
	Series of Projects [X]		
Project Implementation Start Date	Project Implementation End Date		
31-Jan-2015	31-Jan-2020		
Expected Effectiveness Date	Expected Closing Date		
28-Feb-2015	31-Jan-2020		
Joint IFC			
No			
Practice Manager/Manager	Senior Global Practice Director	Country Director	Regional Vice President
Randeep Sudan	Pierre Guislain	Franz R. Drees-Gross	Axel van Trotsenburg

Borrower: Ministry of Finance			
Responsible Agency: Department of Transport, Communication and Infrastructure			
Contact:	Francis I. Itimai	Title:	Secretary
Telephone No.:	691-320-2865	Email:	itimaif@mail.fm
Responsible Agency: Asian Dev Bank			
Contact:	Sibesh Bhattacharya	Title:	ICT Specialist
Telephone No.:	6326324444	Email:	sbhattacharya@adb.org

Project Financing Data(in USD Million)					
[ ]	Loan	[X]	IDA Grant	[ ]	Guarantee
[ ]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	72.50	Total Bank Financing:	47.50
Financing Gap:	0.00		

Financing Source	**Amount**
BORROWER/RECIPIENT	0.00
International Development Association (IDA)	47.50
Asian Development Bank	25.00
Total	72.50

Expected Disbursements (in USD Million)

Fiscal Year	2015	2016	2017	2018	2019	2020	0000	0000	0000	0000
Annual	0.50	5.00	20.00	12.50	6.50	3.00	0.00	0.00	0.00	0.00
Cumulative	0.50	5.50	25.50	38.00	44.50	47.50	0.00	0.00	0.00	0.00

Institutional Data

Practice Area / Cross Cutting Solution Area

Transport & ICT

Cross Cutting Areas

[ ] Climate Change

[ ] Fragile, Conflict & Violence

[ ] Gender

[ ] Jobs

[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Information and communications	Telecommunications	100		
Total		100		

☑ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
Financial and private sector development	Infrastructure services for private sector development	85
Financial and private sector development	Regulation and competition policy	15
Total		100

Proposed Development Objective(s)
The development objective of the Project is to reduce the cost and increase the availability of ICT services needed to support social and economic development in the Recipient's territory.

Components	
Component Name	**Cost (USD Millions)**
Component 1A Palau-Yap-Guam Cable System	47.50
Component 1B Chuuk-Pohnpei Cable System	18.50
Component 1C Kosrae Connectivity	3.50
Component 2 Technical Assistance	2.25
Component 3 Project Management	0.75

Compliance

Policy		
Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04	**X**	
Forests OP/BP 4.36		**X**
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11	**X**	
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12		**X**
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50		**X**
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants			
Name	**Recurrent**	**Due Date**	**Frequency**
Competitive Framework-FSM (1)	X		Continuous
Description of Covenant			
Ensure implementation of the Telecommunications Act of 2014, in particular those aspects which support a competitive ICT sector, including licensing, wholesale access, guarantees around open access			

to international communications infrastructure and the creation and operationalization of an independent regulatory authority to oversee market activities-Financing Agreement (FA) Schedule (Sch.).2.I.D.

Name	Recurrent	Due Date	Frequency
Competitive Framework-FSM (2)	X		Continuous

Description of Covenant

FSM Open Access Entity: appoint directors, management, staff; maintain by-laws and governance arrangements, business and marketing plan, organizational plan, and financing arrangements ensuring adequate capitalization and operational financing including to address contingencies-FA Sch. 2.I.B.2.

Name	Recurrent	Due Date	Frequency
Competitive Framework-FSM (3)	X		Continuous

Description of Covenant

Ensure that : (i) FSM Open Access Entity and FSM Telecommunications Corporation (FSMTC) shall not compete against each other in the supply of connectivity services utilizing satellite or submarine fiber optic cable(s3); (ii) where FSMTC owns or controls capacity rights on HANTRU1 between Pohnpei and Guam, it shall supply such services to the FSM Open Access Entity free of charge, including system access, on terms as may be demanded by the FSM Open Access Entity-FA Sch. 2. I. B. 3(g) and (h).

Name	Recurrent	Due Date	Frequency
Project Coordinator	X		Continuous

Appoint and thereafter maintain throughout the period of Project implementation, a Project coordinator within DTCI, with qualifications and experience and under terms of reference acceptable to the Association, to be responsible for supporting DTCI, DoFA and the Project Implementing Entities with Project implementation-FA Sch. 2.I.A.3.

Name	Recurrent	Due Date	Frequency
Financial Management Specialist	X		Continuous

Appoint or assign, and thereafter maintain, throughout the period of Project implementation, a financial management specialist within DoFA, with qualifications and experience and under terms of reference acceptable to the Association, to support DTCI with financial management and reporting for the Project-FA Sch. 2.I.A.4.

Conditions.

Source Of Fund	Name	Type
ADB	FSM Conditions of Disbursement for Category (1)(a) for activities under Component 1A and 1B.	Disbursement

Description of Condition

No withdrawal shall be made under Category (1)(a) until the Asian Development Bank Co- financing Agreement with Palau is executed and all conditions precedent to its effectiveness or to the right of the Recipient to make withdrawals under it have been fulfilled. (FA Sch 2. IV. B. 1(b)(iv)).

Source Of Fund	Name	Type
IDA	FSM Condition of Disbursement for Category 1(a) and 1(b) for activities under Component 1	Disbursement

Description of Condition

No withdrawal shall be made under Categories (1)(a) and 1(b) until the FSM Open Access Entity has

been established and made operational; the Association has entered into a Project Agreement with the FSM Open Access Entity and FSM has entered into a Subsidiary Agreement; and the Association has received a legal opinion or opinions attesting that the Project Agreement and the Subsidiary Agreement has been duly executed, delivered and ratified by all necessary governmental or corporate action, and are legally binding upon FSM and FSM Open Access Entity, respectively. (FA Sch 2.IV.B.1(b) and (c)).

Source Of Fund	Name	Type
IDA	FSM Condition of Disbursement for Category (1)(a) for activities under Component 1A and 1B	Disbursement

Description of Condition

No withdrawal shall be made under Category (1)(a) until the FSM Open Access Entity has entered into the Consortium Agreements and the Association has received a legal opinion or opinions attesting that the Consortium Agreements have been duly authorized and are legally binding upon all parties. (FA Sch 2.IV.B.(b)(v)).

Source Of Fund	Name	Type
IDA	FSM Condition of Disbursement for Category (1)(a) for activities under Component 1A and 1B	Disbursement

No withdrawal shall be made under Category (1)(a) until the FSM Open Access Entity has obtained all licenses, permits, and approvals required for the operation and supply of international and domestic wholesale communication services in the Project areas. (FA Sch 2. IV.B. (b)(vi)).

Source Of Fund	Name	Type
IDA	FSM Condition of Disbursement for Category (1)(a) for activities under Component 1A and 1B	Disbursement

No withdrawal shall be made under Category (1)(a) until the Association and the Co-financier have entered into a memorandum of understanding setting forth the joint arrangements for implementation of Part 1(a) and (b) of the Project, in form and substance satisfactory to the Association. (FA Sch 2.IV. B. (b)(viii)).

Source Of Fund	Name	Type
IDA	FSM Conditions of Disbursement for Categories (1)(a) for activities under Component 1	Disbursement

Description of Condition

No withdrawal shall be made under Category (1)(a) until Landing Party Agreement(s) have been entered into, with any other necessary party thereto, setting forth the arrangements for landing rights for the landing of the submarine fiber optic cables to be constructed under Components 1(A) and (B); all necessary authorization and permits for landing of the cable in FSM, Palau and Guam have been obtained; and evidence is supplied that FSM Open Access Entity has secured, jointly or severally, adequate capacity for the cables serving Yap and Chuuk to connect to the global telecommunications network. (FA Sch 2.IV.B.(b)(vii) and (ix)).

Source Of Fund	Name	Type
IDA	FSM Conditions of Disbursement for Category (1)(b) for activities under Component 1C	Disbursement

Description of Condition

No withdrawal shall be made for payments under Category (1)(b) of the Project unless the FSM Open Access Entity has entered into arrangements with communication service providers, in form and substance satisfactory to the Association, for the provision of satellite services for Kosrae. (FA Sch 2, IV.B.(c)).

Source Of Fund	Name	Type
IDA	FSM Conditions of Disbursement for Category (3) for activities under Component 2C.	Disbursement

Description of Condition

No withdrawal shall be made for payments under Category (3) until: (a) the Office of the Regulator has been established and made operational in accordance with the Telecommunications Act; (b) the Association has entered into a Project Agreement with the Office of the Regulator; (c) the Recipient has entered into a Subsidiary Agreement with the Office of the Regulator; and (d) the Association has received a legal opinion or opinions attesting that the Project Agreement and the Subsidiary Agreement have been duly executed, delivered and ratified by all necessary governmental or corporate action, and are legally binding upon FSM and Office of the Regulator, respectively. (FA Sch 2. IV. B.(d)).

Team Composition

Bank Staff

Name	Title	Specialization	Unit
Natasha Beschorner	Senior ICT Policy Specialist	Team Lead	GTIDR
Yann Burtin	Senior Underwriter	Senior Underwriter	MIGOP
Ross James Butler	E T Consultant	E T Consultant	GSURR
Rushiran Tania Angeline Fernando	Temporary	Temporary	EACNF
Tendai Gregan	Energy Specialist	Energy Specialist	GEEDR
Tobias Haque	Economist	Economist	GMFDR
Stephen Paul Hartung	Financial Mgmt	Financial Mgmt	GGODR
Victoria Florian S. Lazaro	Operations Officer	Operations Officer	GSURR
Xavier Cledan Mandri-Perrott	Lead Financial Officer	Lead Financial Officer	GCPDR
Marjorie Mpundu	Senior Counsel	Senior Counsel	LEGES
James L. Neumann	Senior Counsel	Senior Counsel	GTIDR
Lucy Pan	Research Analyst	Research Analyst	GMFDR
Andrea Ruiz-Esparza	Senior Program Assistant	Senior Program Assistant	GTIDR
Jinan Shi	Senior Procurement Specialist	Senior Procurement Specialist	GGODR
Maya Gabriela Q. Villaluz	Senior Operations Officer	Senior Operations Officer	GENDR
Haiyan Wang	Senior Finance Officer	Senior Finance Officer	CTRLN
Zhuo Yu	Finance Officer	Finance Officer	CTRLN

Non Bank Staff

Name	Title	City
Antoine Geron	Submarine cable specialist	Paris
Douglas Webb	Legal/Regulatory Specialist	Wellington

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments

FSM	Pohnpei	Yap, Chuuk, Kosrae			

I. STRATEGIC CONTEXT

1.01 The World Bank has been requested to support the Government of the Federated States of Micronesia (FSM) and the Republic of Palau (Palau) in undertaking reforms and investments aimed at improving access to Information and Communications Technology (ICT). This support program will include two components. The first is this proposed International Development Association- (IDA) funded Palau-FSM Connectivity Project (P130592), under Phase 2 of the Pacific Regional Connectivity Program Series of Projects, focused on reducing the cost and increasing the availability of international bandwidth for FSM through catalytic public investments in telecommunications infrastructure. The second is a complementary Technical Assistance (TA) Project (P132686), financed by the Australian Government under the Pacific Region Infrastructure Facility (PRIF) Trust Fund. The TA grant, signed in September 2013, will provide advisory support and capacity-building needed to support sector reform and liberalization in FSM and Palau. Overall, this Palau-FSM Connectivity Project and the TA Project are expected to increase the availability of ICT infrastructure and enable the more widespread application of information communication technologies (ICT) services supporting improvements in economic and social development in these countries.

A. Country Context

Federated States of Micronesia

1.02 The FSM is an island nation in the northern Pacific Ocean comprising more than 600 islands and atolls with up to 1,000 miles between the farthest islands. The total population (2010) is estimated at 102,843, divided across four states: Pohnpei (36,196) Kosrae (6,616), Yap (11,377) and Chuuk (48,654). The FSM economy is based largely on natural resources (fisheries), which accounts for 70 percent of exports and external assistance,[1] primarily through transfers from the United States Government through the provisions of the Compact of Free Association.[2] It is dominated by a large public sector. One of the main challenges facing the FSM is to overcome its remoteness and dispersed geography by developing the infrastructure it needs to connect its people domestically and internationally, and to encourage social and economic development. The long-term viability of the FSM hinges on domestic and international economic integration. Improved connectivity and lower communications costs will contribute both to national economic development and to regional coordination and the integration of FSM in the Pacific and internationally. Broadband Internet offers improved connectivity, lowers transaction costs, creates new economic opportunities, and increases service delivery options. FSM is a lower-middle income country with an Atlas gross national income per capita of $3,430 (2013, World Development Indicators).[3] Growth in 2013 was estimated at 0.6 percent. FSM is currently eligible for assistance from the IDA on a grant basis. This is reassessed annually.

[1] On budget grant income is estimated to account for 43 percent of GDP.

[2] The Compact provides U.S. economic support for a 20-year period that began in FY2004. Under the Compact, FSM receives two streams of funds – Compact Sector Grants and contributions to the Compact Trust Fund (CTF_—that will total approximately $2.1 billion over the 20-year Compact period. While the Compact has no specified termination date, the annual fiscal transfers will cease in 2023 to be replaced by disbursements from the CTF from 2024. Eligibility for federal programs, the provision of U.S. services and the open migration provision will continue beyond 2023.

[3] See also IMF Article IV http://www.imf.org/external/np/sec/pn/2013/pn1306.htm

Republic of Palau

1.03 Palau is situated in the Micronesian group of islands in the northern Pacific with an estimated population of 17,611 (2013 World Development Indicators). Palau is the World Bank Group's second smallest member (only Tuvalu has a smaller population). Palau receives substantial financial assistance from the United States through the provisions of the Compact of Free Association. A package of renewed financial assistance for $250 million was approved in 2010.[4] The renewed Compact grant agreement is set to end in FY2024 and an overarching challenge for Palau is to achieve self-sufficiency when the renewed Compact grants expire. Withdrawals from the Compact Trust Fund post 2024 will not be sufficient to maintain a steady level of spending after Compact grants expire. Palau is an upper-middle income country with an Atlas gross national income per capita of $10,970 (2013, World Development Indicators). External aid has made up an average of 25 percent of Palau's GDP over the last decade. The principal source of growth and revenues is tourism, followed by fishing. Annual tourism receipts amount to about 50 percent of GDP, more than twice the Pacific island average and among the highest in the world. Visitors from Taiwan, China; Japan; and Korea account for the bulk of tourist arrivals. Palau was hit hard by the global economic crisis in 2008; however, economic growth rebounded in 2011-2013 owing to increased tourist arrivals as a result of new flight routes from Asian countries. After two years of strong expansion, growth is estimated at around zero in fiscal year ending September 2013 owing to declines in construction and tourism. Growth is however projected to pick up to around 1.8 percent in 2014 driven by the recovery in tourism and infrastructure developments.

B. Sectoral and Institutional Context

Federated States of Micronesia

1.04 **FSM faces a significant "digital divide" which compounds the development challenges of this dispersed archipelagic nation.** Table 1 shows the distribution of retail telecommunications services across FSM as of August, 2014. While access to basic telephony is slowly improving across the country, access to broadband (high-speed) Internet and its associated value-added services is limited, costly and unevenly-distributed. Pohnpei is the only FSM state with submarine cable connectivity through the HANTRU-1 cable which landed in 2010.[5] The cable was financed by a loan to FSM Telecommunications Corporation (FSMTC) from the US Department of Agriculture's Rural Utilities Service. Cable capacity is presently under-used, in part due to sector structure, the costs associated with financing the installation of the cable, and the limited potential demand that is available while only Pohnpei is connected to the cable. FSMTC has recently launched a mobile broadband (3G) service which will initially cover the most populated northern part of Pohnpei, or almost half of the population. Pohnpei is also covered by fixed broadband network which reaches almost 95 percent of the population, although there are only around 1,000 active subscribers.

[4] The 2010 agreement following the Compact of Free Association with the United States that will provide $229 million in grants during 2011-24 is pending ratification by the U.S. Congress, but Palau has continued to receive advances and to withdraw from the Compact Trust Fund (CTF).

[5] HANTRU-1 refers to the submarine cable system owned by Hannon Armstrong LLC (US) and operated by Truestone LLC (US) connecting Guam with Pohnpei, FSM; Kwajalein, Marshall Islands; and Majuro, Marshall Islands.

1.05 **Internet penetration is very limited in the states of Yap, Chuuk and Kosrae.** Mobile broadband services are planned, but not yet available. The total number of fixed broadband subscribers in these three states is approximately 900 people. A key reason for limited uptake is the high cost of backhaul (transmission) via geostationary satellite and its relatively low capacity (bandwidth). As an interim measure and due to rising demand for Internet service, FSMTC has entered into agreements with O3b Networks,[6] a medium-earth orbit satellite service provider, for supply of high-speed higher capacity satellite connectivity to Yap and Chuuk.

1.06 **Among the main reasons for the limited and costly services outside Pohnpei is the high cost of connecting remote and sparsely populated islands.** The monopolistic market structure, until recently prescribed by law, has also prevented investments by new entrants to improve access to services. While FSM has recently enacted new pro-competitive legislation further work is needed to give effect to the law to support the entry of new operators and establish a level playing field for all market participants. Rules and regulations are needed to provide for basic telecommunications market oversight, licensing, interconnection, universal access, service and coverage obligations, numbering, tariffs, and competitive behavior. Regulations also need to be put in place for open access or wholesaling capacity on the existing HANTRU-1 cable or new cable systems, and for dealing with convergence issues.

Table 1. FSM: ICT Access by State

	- - - 2010 - - -									
State	**Population**	**Pop. Main Island Only**	**Total House holds**	**Land Lines**	**GSM Mobile HLR [1]**	**GSM Mobile WIN [2]**	**Broad-band Internet [3]**	**Postpaid Dial-up Internet**	**Prepaid Dial-up Internet [4]**	**WiFi Prepaid [5]**
Pohnpei	36,196	34,789	6,289	5,393	51,913	15,928	1,150	236		19,732
Chuuk ++	48,654	36,152	7,024	1,506	27,849	11,662	343	62		7,612
Yap	11,377	7,371	2,311	1,727	23,899	5,703	331	68		8,149
Kosrae	6,616	6,616	1,143	1,334	7,899	1,775	269	57		10,712
Total	102,843	84,928	16,767	9,960	111,560	35,068	2,093	423	635	46,205

Source: FSMTC subscriber data as of August 7, 2014.
Demographic data source: FSM Census Report 2010, Division of Statistics, SBOC. Households include outer islands household count.
++FSMTC Copper network on Weno Island only—part of the Northern Namoneas Lagoon island region, total household of 1,408 and population of 13,802
[1] HLR count includes all subscriptions sold and may include subscribers that have been inactive for over 90 days but under 180 days.
[2] WIN count mobile subscribers attached to network on August 7, 2014.
[3] Broadband Internet includes VDSL, ADSL, and T1 customers.
[4] Prepaid dial-up cannot be segmented by state as the subscription is not unique to state.
[5] Numbers are unique accounts and active in the last six months.

1.07 **The Government has taken steps to introduce competition in order to stimulate additional investment.** The Government issued its first National Information and Communication Technology and Telecommunications Policy in September 2012. Its goal is secure, efficient, and affordable services to achieve equitable access to communications for all.

1.08 **A landmark decision—the enactment of the FSM Telecommunications Act of 2014—was taken on April 3, 2014 to give effect to the Government's September 2012 policy.** The new law ends FSMTC's right to be the sole provider of telecommunications services and allows for licenses to be issued to new network operators and other service providers. It is

[6] O3b Networks http://www.o3bnetworks.com is a provider of satellite connectivity using a new type of technology that offers lower latency. The acronym means "other 3 billion."

envisaged that FSMTC will be one of a number of service providers competing to provide retail services to customers. The law also provides for the creation of an independent Regulator of the telecommunications sector responsible for issuing licenses, ensuring that competing networks are interconnected on fair terms, and that expensive infrastructure is shared where practicable, protecting consumers, and overseeing the universal access scheme. In particular, the new regime is focused on ensuring that the responsibility and costs of providing services across the FSM is shared equitably by all service providers.

1.09 **Experience in comparable countries supports an assessment that new licensees will likely enter the market.** The Government acknowledges that the small size of the addressable customer base, comprising individuals, businesses, government and visitors, means that it will be challenging to attract new market entry. Experience elsewhere is that, in such environments, it is essential to maximize the attractiveness of market entry through clear and predictable regulatory oversight of the market, strong rules against anticompetitive behavior, fair and equal opportunities for all market participants, and the availability of shared access to high-cost essential infrastructure that cannot be economically replicated. This has been the experience in other small island economies in the Pacific, such as Fiji, Solomon Islands, and Vanuatu for example, where market liberalization has gone hand-in-hand with programs to improve the capacity of regulatory institutions.

1.10 **Existing World Bank support for the ICT sector in FSM, under a joint program with Palau, focuses on market liberalization and regulatory capacity-building.** The World Bank is providing assistance to the Government regarding the development of the regulatory framework including the operationalization of the independent regulator. The FSM-Palau ICT TA Project (P132686) will help the Government to develop a sustainable, workably competitive marketplace for ICT and maximize the attractiveness of the ICT sector as an investment opportunity.

Republic of Palau

1.11 **Telecommunications sector.** There are three service providers, each serving targeted, though overlapping market segments. The state-owned Palau National Communications Corporation (PNCC) provides fixed line services (6,000 subscribers), GSM 900 mobile service (about 14,000 subscribers), and Internet access (about 1,500 subscribers, mostly dial-up). The privately-owned Palau Mobile Communications (PMC) targets the overseas business and expatriate worker market and offers lower-cost international GSM 1800 service, although its operations were suspended in August 2014. PMC and PNCC have no technical or commercial network interconnection arrangements in place, so traffic cannot be exchanged between the two networks. As a result, there are weak incentives for the two operators to compete for the other's customers. The privately-owned Palau Telecom offers a WiFi Internet service. Subscriber numbers are not available for PMC or Palau Telecom. Each operator is looking to expand/diversify its service.

1.12 **Palau relies entirely on satellite links for international connectivity.** The high cost and limited availability of this international bandwidth has imposed a major constraint on the development of the sector, particularly to broadband Internet access, where growth in data demand is suppressed by expensive and restricted international transmission. While significant price and performance gains are promised by new satellite technologies, there is keen interest by

the Government and operators to use the lower marginal cost and greatly increased capacity that will be provided by a submarine fiber-optic cable to connect Palau to Guam, the regional hub for international data traffic to and from major American, Asian, and European markets.

1.13 **The legal and regulatory framework for ICT in Palau is too limited to support market competition**. There are no laws covering basic telecommunications market oversight, in particular: network interconnection, numbering, wholesale or retail tariffs, and competitive behavior. There is no formal regulatory institution. Moreover, as the Government and industry contemplate investment in a submarine cable there are no regulations in place for open access or wholesaling, or convergence issues. Technical assistance is required to build capacity and support skills development for implementing and managing a modern regulatory framework.

1.14 **The Government of Palau adopted a National ICT Policy in November 2013 to guide sector reforms.** The policy recognizes the importance of competitive telecommunications markets that will encourage investment, improve service quality and choice, and lead to efficient pricing. The policy recognizes that in order to achieve these outcomes, updated ICT policies, laws and regulations to support a competitive market must be put into place and that an independent regulator must be established to provide oversight of the sector. Such a regulator will have power to issue licenses, ensure network interconnection and access for all service providers to key wholesale inputs such as international connectivity, and prevent anticompetitive behavior. The above-mentioned FSM-Palau ICT TA Project (P132686) will provide advice and drafting support to the Government for the preparation of legislation required to support the Government's sector reforms.

C. Higher Level Objectives to which the Project Contributes

1.15 **The ICT sector is widely recognized as an enabler of economic growth and social stability and development worldwide.** ICT sector reforms implemented in similar countries, including elsewhere in the Pacific such as Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu demonstrate linkages between market-based reforms and improved economic and social indicators. Reliable and affordable telecommunications supports business development in all sectors, including small- and medium-enterprises, and, particularly in Palau, inbound international tourism. Existing business users of telecommunications can expand their reach and address new markets. The social value of widely available communications is also very important: facilitating a more mobile work force, enabling family and community links to be preserved despite distance, and assisting interaction between islands and communities. By increasing access to telecommunications, the Project is also expected to contribute to the economic and social empowerment of women, as has been the case in other countries, for example by facilitating communication with family members, enabling access to information on health, education, and job opportunities, and creating some opportunities for direct employment e.g., selling of ICT goods and services.

1.16 **Improved connectivity may also be considered a regional public good for the northern Pacific.** The Project will also contribute towards regional integration objectives of improved service delivery, trade and communications between Pacific island economies, and contribute to more efficient use of revenues within the region. Higher quality and lower-cost connectivity for FSM and Palau are likely to promote economic growth, permit greater efficiency of resource use, and facilitate cooperation and integration on numerous transnational issues,

including, for example, management and monitoring of natural resources, disaster mitigation, and collaborative service delivery. Improved, affordable connectivity, both domestic and international, is a cornerstone of the Framework for Action on ICT for Development in the Pacific, which is a regional strategy endorsed by Ministers and regional agencies that seeks to mobilize ICT for development, governance, and sustainable livelihoods.[7]

1.17 **Regional cooperation between FSM and Palau underpins the viability of the proposed submarine cable infrastructure investments for Palau and FSM.** FSM and Palau recognize that, by pooling their resources and coordinating their efforts, each country will obtain access to a substantial quantity of international bandwidth capacity more efficiently and more economically than if either country were to proceed independently. The project requires Palau and FSM to collaborate closely during preparation and implementation. The two governments have taken steps to establish collaborative planning and implementation arrangements for the Palau-Yap-Guam cable component. The FSM government has established a national task force with representation from Government and FSMTC. The MicroPal Fiber Optic Joint Committee has also been established by FSM and Palau as an apex body and single point of contact to represent and support the governments on joint aspects of the Palau-Yap-Guam submarine cable. Each government will establish an open-access entity to commission and implement the new connectivity infrastructure in each respective country.

1.18 **The Project supports the FSM Country Partnership Strategy (2014) objectives of increasing access to telecommunications. It is also consistent with the World Bank's regional engagement strategy in the Pacific and with its regional ICT engagement note.**[8] The Project supports improving incentives for private sector-led growth and employment. It also supports the regional strategy's objective of strengthening capabilities for service delivery by both public and private sectors. The Project is expected to contribute to the following longer-term, higher level goals: improved public service delivery, including online government services, health and education and financial services, increased private sector development opportunities, support for the tourism sector, and reduced transaction costs for businesses and individuals. The World Bank has extensive experience in supporting telecommunications market liberalization and development of new regulatory structures, including in small island economies in the Pacific (Fiji, Samoa, Solomon Islands, Tonga, and Vanuatu), Africa, and the Caribbean. The World Bank, together with other regional partners, is also supporting a Pacific ICT Regulatory Resource Centre for the Pacific, hosted at the University of the South Pacific in Fiji.

1.19 **The World Bank has experience in coordinating and financing regional connectivity Projects in the Pacific.**[9] Together with the Asian Development Bank (ADB), the World Bank

[7] See Declaration of the ICT Ministerial Meeting, Tonga, June 18, 2010. http://www.spc.int/edd/images/stories/ictpapers/Tonga%20Declaration%20(2).pdf

[8] World Bank-Regional Engagement Framework for the Pacific Islands (P079893), and Pacific ICT Engagement Note (May, 2013).

[9] The World Bank prepared a detailed report on international connectivity options for Pacific member countries in 2009, plus regular updates. The report was widely disseminated and discussed in the region. The main conclusions were that: (a) there is clear evidence of growing demand for bandwidth across the region; (b) improved connectivity contributes to economic and social development at the national level, and is regarded by stakeholders as a driver of regional cooperation and integration in several sectors. The findings of the report were endorsed by the regional ICT community—including representatives of telecommunications policymakers and regulators, the Pacific Islands Telecommunications Association, the Secretariat of the Pacific Community, and the Pacific Islands Forum Secretariat. As a follow-up the World Bank has undertaken detailed country/subregional options analyses for FSM, Palau, Samoa, Solomon Islands, and Vanuatu during the period 2010-2012. Analytical/advisory assistance was also provided to the Government of FSM in 2010-11 on: (a) ICT sector development options

financed the recently-commissioned Tonga-Fiji cable system which was launched commercially in August 2013. This was financed under Phase 1 of the Pacific Regional Connectivity Program (P113185). In other regions, the World Bank Group is the major player offering support to regional communications infrastructure development in Africa. In Eastern and Southern Africa, the World Bank supports a Regional Communications Infrastructure Program covering eight countries and expected to expand to several others. The World Bank Group also supports a new multiphase Central Africa Backbone Program using the fiber route along the Chad-Cameroon oil pipeline, a West Africa Regional Connectivity Program, and a Caribbean Communications Infrastructure Program.

1.20 **The Project meets the eligibility criteria for Regional IDA financing** on the following grounds: *the activities to be financed with an IDA grant are related to regional infrastructure development, institutional cooperation for economic integration, and coordinated interventions to provide regional public goods.*

(a) Pacific island countries are characterized by their small size and extreme geographic isolation. Analysis undertaken for the 2009 World Development Report ("Reshaping Economic Geography") indicates that the average Pacific island is located 11,500 km from any other randomly selected country, making the Pacific islands the most remote countries in the world. Distance from markets is not simply a geographic reality but results in substantial economic disadvantages for Pacific island countries. Countries that are close to markets have a natural advantage over more remote locations since the exchange of goods, services, labor, capital and ideas is easier and more rapid—a finding borne out by a clear correlation between market access and economic growth;

(b) For many Pacific island economies, overcoming this "tyranny of distance" will hinge on their ability to stimulate domestic growth and on the extent to which they can integrate with each other and with their larger neighbors. Isolation and limited economies of scale also mean that Pacific economies are often heavily reliant on aid, remittances, natural resource rents and tourism. In this context, improving connectivity throughout the region has the potential to support national economic growth and to underpin the critical processes of regional coordination and integration. Greater and more affordable connectivity in the Pacific would help lower transaction costs, create new economic opportunities and enhance communication and delivery of services to currently isolated domestic communities. From a regional perspective, improved connectivity has the potential to enhance the efficiency of resource use, to facilitate cooperation on a wide range of transnational issues including management and monitoring of natural resources (e.g., fisheries), comprehensive mitigation efforts addressing natural disasters and climate change and adaptation, as well as collaborative service delivery.

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and strategy issues, including an assessment of existing network infrastructure, a supply and demand analysis, and an initial review of the current policy and legal environment (2010/2011); and (b) policy reform and development. This report also indicated that improved intra-state connectivity (Chuuk, Kosrae, and Yap) would not be viable on purely commercial terms without contributory concessional financing.

II. PROJECT DEVELOPMENT OBJECTIVES

A. Project Development Objective

2.01 The development objective of the Project is to reduce the cost and increase the availability of ICT services needed to support social and economic development in the Recipient's territory.

B. Project Beneficiaries

2.02 The direct beneficiaries in FSM will be individuals, businesses, government, and nongovernment agencies that will receive improved access to voice and data services, as well as related value-added services or applications. The Project will contribute to the World Bank Group's twin goals of ending extreme poverty and increasing shared prosperity. By facilitating more reliable and affordable connectivity to remote communities in FSM, the Project is expected to contribute to improved social welfare, access to information and services as well as potential income-earning opportunities in some of FSM's poorest regions. In particular, Chuuk state has the largest number of low-income people in the country. The Project will support greater equity among states/regions in this highly-dispersed country. Illustrative beneficiaries are listed below:

(a) *Small- and medium-enterprises*: Lower communications costs reduce overall business transaction costs; communications infrastructure facilitates domestic and cross-border transactions, opens new marketing and distribution channels, and improves access to information about markets, prices, and consumers.

(b) *Primary producers*: Communications infrastructure facilitates access to information on market prices, weather, agricultural extension services, and e-commerce platforms.

(c) *Service industries*: ICT facilitates entrepreneurship—including specific opportunities for women. Telecommunications infrastructure also facilitates the extension of mobile phone and/or Internet-enabled financial services.

(d) *Health and education sectors*: In the health sector, reliable, affordable broadband can facilitate, *inter alia*, remote diagnostics and laboratory testing, remote consultations with specialists, and access to international medical networks and resources. In the education sector, access to high-speed Internet provides teaching and learning materials, and skills enhancement opportunities, among other benefits.

(e) *Government agencies*: Faster, cheaper, and more reliable connectivity improves communications and information management between government agencies. Governments can be better-positioned to deploy online services, permitting increased transparency and accountability of government and improvements in service delivery.

(f) *Disaster preparedness/management:* ICT tools can support governments as they plan and monitor climate change and natural disaster risks to which the region is particularly vulnerable. They can also provide "last mile" communications solutions for disaster early warning systems.

2.03 **PDO Level Results Indicators.** Progress will be measured against the following results indicators:

1. *Increased access to ICT infrastructure and services using two proxies*: (a) access to mobile phone services, measured in terms of penetration per 100 people; and (b) access to Internet services, measured in terms of penetration per 100 people.
2. *Increased international connectivity*: measured in terms of (a) reductions in the wholesale price of bandwidth to service providers and (b) increases in bandwidth availability (Mbps).
3. *Reduced price of international communications*: measured in terms of retail prices for core services (mobile calling and mobile and fixed broadband, including data caps).
4. *Impact on telecommunications sector of World Bank Technical Assistance* measured in terms of the strengthened FSM regulatory framework, in particular establishment of the Office of the Regulator.

III. PROJECT DESCRIPTION

A. Project Components (FSM)

3.01 **Component 1. International connectivity infrastructure ($69.5 million)** of which IDA financing of $44.5 million and ADB cofinancing of $25.0 million.

(a) **Subcomponent 1A: Palau-Yap-Guam Cable System ($47.5 million)** of which IDA $22.5 million for FSM to participate in a joint venture with Palau for the construction of the Palau-Yap-Guam cable system, comprising a one half share in the international cable system assets and an undivided right to own and manage the onshore FSM cable system assets in Yap including the Yap landing station and the point of interconnection for domestic operators to interconnect with the cable system; plus $25.0 million in ADB co-financing for Palau's participation in the cable system and related investments;

(b) **Subcomponent 1B: Chuuk-Pohnpei Cable System ($18.5 million).** For an undivided right to own and manage a new cable system which will be constructed between Chuuk and either the Pohnpei landing station or the branching unit on the Pohnpei spur to the HANTRU-1 cable system (whichever is financially and technically most advantageous); and

(c) **Subcomponent 1C: Kosrae Connectivity ($3.5 million)** will finance a one-time partial purchase of international bandwidth for Kosrae on terms which promote equitable access to broadband access across FSM.

3.02 **Component 2. Technical Assistance ($2.25 million)** will finance advisory services and training for:

(a) **ICT sector development including the design and ownership structure of existing and new infrastructure.** Complementing the TA Project, technical assistance for the technical, legal, and transactional aspects of the cable system, O3b deployment and possible separation of the existing HANTRU-1 cable system to Pohnpei.

(b) **Reform and development of FSMTC**. Options for restructuring FSMTC and resulting actions to strengthen FSMTC's capacity to operate in a competitive market.

(c) **Sector regulation and regulatory capacity development.** Complementing the TA Project, financing for medium-term technical assistance for sector regulation and developing key capacities within the new sector regulator.

3.03 **Component 3. Project management support ($0.75 million)** will finance Project management and coordination, financial management, audit, general Project reporting, monitoring and evaluation, and administrative costs associated with project implementation.

B. Project Financing

3.04 The total cost of the Project, including ADB cofinancing for Palau, is $72.5 million. The financing for the proposed Project is summarized in Table 2. The structure is as follows:

(a) **Federated States of Micronesia:** Country IDA plus Regional IDA Grant of $47.5 million; and

(b) **Republic of Palau:** ADB financing of $25.0 million.

Table 2. Project Cost and Financing ($ million)

Component	IDA	Cofinancing (ADB)	Total
1. International Connectivity Infrastructure	44.5	25.0	69.5
1A. Palau-Yap-Guam	22.5	25.0	
1B. Chuuk-Pohnpei	18.5	0.0	
1C. Kosrae Connectivity	3.5	0.0	
2. Technical assistance	2.25	0.0	2.25
3. Project management	0.75	0.0	0.75
Total	47.5	25.0	72.5

C. Lessons Learned and Reflected in the Project Design

3.05 The Project takes into account the lessons of experience from implementation of ICT sector reform/development Projects, from other regional connectivity Projects, and also from operations in the Pacific region more broadly. These lessons are reflected in the design of Project components, risk analysis and management, and selection of country readiness/eligibility criteria.

(a) A constructive and open relationship between the public and private sector is important for successful development of telecommunications sectors at the national level as well as at the regional level. In FSM, there is no private sector participation, reflecting the monopolistic character of the market. However, the Government is actively involving private sector users of telecommunications services in the design of the market reforms. It is also intended that the infrastructure investment should be implemented in a manner that it both facilitates competition in downstream markets and minimizes the need for *ex post* regulatory intervention and supervision.

(b) The legal and regulatory environment in participating countries needs to support open access to capacity on international communications infrastructure, and wholesale pricing needs to be cost-based, nondiscriminatory, and transparent; the regulatory institution needs to be empowered to protect the interests of consumers. Both Fiji and Papua New Guinea had access to submarine cables for many years, but until recent liberalization of international gateways, and even more recent regulations on wholesale pricing, these resources were to some extent "captured" by monopolies and the benefits have not accrued to consumers. The Project design includes support for the establishment of effective and independent regulatory capacity in Palau and FSM, in order to maximize use of the cable and promote financial viability. Both governments also wish to explore the scope for sharing regulatory functions for cost and consistency reasons and the technical assistance to be provided under the Project will include an examination of the scope for such regulatory sharing.

(c) Projects need to anticipate possible changes in technology that might alter the business case for investment in a particular type of communications infrastructure. The cable system to be financed under the Project will provide a future-proof system to support high-speed international data transmission over the life of the cable system. The system design will also include scope for further capacity growth should demand exceed expected system requirements.

(d) Collaboration between development partners needs to be extensive, given the limited capacity of counterparts; to the extent possible procurement and financial management procedures need to be aligned—if not harmonized—to minimize the administrative burdens of the Projects. The World Bank and ADB are working closely on all aspects of the submarine cable component of the Project and intend to harmonize procurement requirements. A related lesson is that Project design should match institutional capacity. The number of contracts to be procured under the proposed Project will also be minimized.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

4.01 FSM has established by Presidential Directive the Telecommunications Broadband Task Force (TBTF), comprised of representatives from the Department of Transportation, Communication and Infrastructure (DTCI), Department of Finance and Administration (DoFA), Department of Justice, Department of Resources and Development, Department of Foreign Affairs and FSMTC. TBTF reports to the President and is the overall steering committee for the Project for FSM. DTCI serves as secretariat for TBTF and is the point of contact for stakeholders including the World Bank. In addition, FSM and the Republic of Palau, by a Memorandum of Understanding (MOU) executed by the Presidents of each country, created the MicroPal Fiber Optic Joint Committee ("MicroPal Committee"). The MicroPal Committee consists of three representatives from each country, and serves as steering committee for the Palau-Yap-Guam cable segment and single point of contact for the shared FSM and Palau elements of Component 1A. The MicroPal Committee has retained a Project Manager to support implementation of Component 1A and manage technical issues.

4.02 The FSM Open Access Entity is now in the process of being established. This is provided for under the legislation approved in April 2014. With the support of a legal and transaction specialist engaged under the TA Project (P132686), the Government is currently reviewing the shareholding, governance, and operational arrangements and business case. The FSM Open Access Entity—once it is established and made operational—will assume responsibility for FSM connectivity infrastructure financed under Component 1. Palau will also establish Palau Cable Company, which will be responsible for Palau's interests on the Palau-Yap-Guam segment. Palau is working on establishing its cable company/entity before end-2014—also with the assistance of advisors financed under the above-mentioned TA Project. It is envisaged that each cable company/entity will undertake procurement of the cable system components according to their respective financial obligations as specified in a definitive agreement or suite of agreements that address ownership, governance and all other rights and obligations in respect of the procurement, ownership and operation of the Palau-Yap-Guam cable system (Consortium Agreement), executed by the two companies. All rights and obligations under the Palau-Yap-Guam cable consortium (as per the Consortium Agreement) will be transferred to and assumed by the FSM and Palau cable companies once construction is complete.[10]

4.03 Following the completion of the construction and asset transfer processes, FSM Open Access Entity will: (a) hold and manage an undivided one half interest in the Palau-Yap-Guam cable system, excluding the onshore FSM system assets (and excluding the onshore Palau system assets); (b) own and manage the onshore FSM cable system assets in Yap, primarily the Landing Station and the point of interconnection for domestic operators to interconnect with the cable system; (c) own and manage the Chuuk cable system assets; and (d) subject to agreement with third parties, own and manage the O3b contract and related system assets for Kosrae. These arrangements will require the following legal documents: (a) a Grant Agreement between IDA and the Recipient; (b) a subsidiary agreement between the Recipient and the FSM Open Access Entity; and (c) a Project Agreement between IDA and the FSM Open Access Entity. While not assets financed under this Project, it is also envisaged that the FSM Open Access Entity will assume responsibility for the existing interests of FSMTC on HANTRU-1 and in respect of its contract with O3b for services for Yap.

4.04 DTCI will be responsible for Component 2(a) (TA for ICT sector development, including the design and ownership structure of existing and new submarine cable infrastructure) and Component 2(b) (TA for the reform and development of FSMTC). The Regulator will be responsible for Component 2(c) (sector regulation and regulatory capacity development). The assumption of responsibility by the Regulator for Component 2(c) will be formalized in: (a) a subsidiary agreement between the Recipient and the Regulator; and (b) a Project Agreement between IDA and the Regulator.

4.05 DTCI will also be responsible for the overall coordination, implementation, and supervision of the Project. Under Component 3 DTCI will recruit and supervise the activities of a Project Coordinator who will support DTCI, DoFA, the FSM Open Access Entity and the Office of the Regulator, as needed. The Project Coordinator will coordinate with the entities responsible for implementation; prepare annual work programs and procurement plans;

[10] The procurement of the Pohnpei to Chuuk segment may be undertaken by the FSM Open Access Entity severally, depending on the final terms of the Consortium Agreement. Irrespective, the procurement of the Chuuk-Pohnpei segment will be undertaken by FSM Open Access Entity in a manner designed to maximize the potential for cost savings to FSM.

disseminate audit reports; and, in respect of those activities being carried out by FSM severally, lead the interaction with the World Bank for procurement documents, evaluation reports, etc. The Project Coordinator will seek inputs from DoFA for overall Project financial management and financial reporting. A financial management specialist will be appointed or assigned by DoFA to assist with the additional workload required of the DoFA to complete budgets, audits and financial reporting under the Project.

4.06 In addition to the management and fiduciary support envisaged under this Project, the World Bank will provide intensified implementation review support through a World Bank-executed PRIF grant covering three North Pacific countries of Palau, FSM, and the Marshall Islands. This will entail engaging dedicated consultants for regular country visits and policy dialogue.

B. Results Monitoring and Evaluation

4.07 The Project Coordinator will be responsible for Project monitoring and evaluation (M&E) of progress and outcomes. The Project Coordinator will establish a standard format and guidelines for data collection and reporting and will submit to DTCI the M&E quarterly report that will include the updated Results Framework and the Action Table, listing the corrective actions to be implemented with deadlines and persons responsible clearly identified. A copy of the report will be provided to the World Bank.

4.08 The views of direct beneficiaries will be brought into the M&E process. Inputs also will be sought from other beneficiaries such as telecommunications operators and private ICT firms, which ultimately are the main beneficiaries of the proposed Project's outcomes. This will be done through periodic consultations and routine reporting. Once established input from the Office of the Regulator will be sought and incorporated in the M&E report.

4.09 Implementation support missions will be conducted at least twice a year. It is expected that the Government of FSM will perform evaluations jointly with the World Bank team and conduct supervision or implementation support missions at least twice a year.

C. Sustainability

4.10 The Government of FSM has placed ICT at the center of its new growth strategy, as demonstrated in its 2012 ICT policy. FSM has already landed a submarine cable for Pohnpei, which demonstrates the Government's commitment to the transformational potential of investments in ICT infrastructure. Additional commitment to telecommunications reform is evident in the Government's recent support for the enactment of the new FSM Telecommunications Act of 2014.

4.11 Legal and regulatory reform is a critical component to promote long-term sustainability. Predictability and transparency of the legal and regulatory framework that is conducive to private sector participation and competition will increase the demand for affordable quality ICT services, including advanced applications. The regulatory authority will be supported under this Project during its initial establishment phase. Longer term, the regulator is expected to generate sufficient resources and capacity through license and regulatory fees to become a self-funded institution and sustain the required regulatory capacity to supervise sector development;

sustainability will be enhanced if a regional approach is adopted which enables cost-sharing of the regulatory function across the Republic of the Marshall Islands, FSM and/or Palau.

4.12 The consolidation of the connectivity assets under a single purpose vehicle for Yap, Chuuk, and Kosrae will improve the attractiveness of the three connectivity activities compared to owning and operating the infrastructure separately. It would broaden and diversify the revenue base, minimizing the risk to any one state, and potentially allow for efficiencies and economies of scale which could reduce overall operating costs. A uniform pricing model across all three states would also best deliver the Government's objective of promoting equitable access to broadband—the per capita gross state product (GSP) is similar between Yap, Chuuk, and Kosrae which indicates price should be uniform to best ensure that broadband penetration develops evenly throughout FSM.

4.13 Improved coverage and prices will be sustained through the implementation of increased demand for international bandwidth. Improved service coverage and quality at more competitive prices for international connectivity and for data services will be sustained as it will create opportunities for increased use and the introduction of applications which depend upon high speed bandwidth. With the focus on building sustainable capacity in the Regulator and FSMTC, as key participants in the sector, the benefits of the proposed Project are expected to last beyond Project completion.

V. KEY RISKS AND MITIGATION MEASURES

A. Risk Ratings Summary Table

Risk Category	Rating
Stakeholder Risk	Substantial
Sector Risk	Substantial
Implementation Agency Risk	
- Capacity	High
- Governance	Substantial
Project Risk	
▪ Design	High
▪ Social and Environmental	Low
▪ Program and Donor	Moderate
▪ Delivery Monitoring and Sustainability	Substantial
▪ Other (Regional Nature of Project)	Moderate
Overall Implementation Risk	**Substantial**

5.01 The Project includes risks and benefits at the regional and country levels. The overall Project risk is rated substantial primarily due to the capacity and governance constraints facing the implementing entities. Risks identified are manageable and mitigation measures are in place.

5.02 **The regional nature of the Project creates risks.** Component 1 relies on joint implementation by Palau and FSM and negotiation of landing party arrangements in Guam. Risks will be mitigated through careful design of the Project drawing on experience of other

Projects implementing public private partnerships or establishing special purpose vehicles for telecommunications infrastructure. A formal joint venture between FSM and Palau to undertake the cable Project will be established in terms of a consortium agreement and related documentation, satisfactory to the Association, thus reducing stakeholder risks and complexity. Risks will also be minimized through clear formal delineation in the consortium agreement of roles and responsibilities of the FSM and Palau in key areas such as financing and procurement.

5.03 **Regulatory and financial risks.** The success of the Project will depend upon a sound regulatory environment in FSM and Palau. For the increase in the supply of low-cost bandwidth to feed through into lower prices and better quality of services for customers, a well-regulated, competitive market is needed in both countries, in order to ensure *inter alia* financial viability and sustainability. FSM also has an interest, as a joint venture partner, in ensuring that the cable business in Palau is successful and sustainable financially. Technical assistance is being given to both governments to implement sector reforms, including for the preparation and adoption of modern sector laws providing for the opening of the market to new entry and the establishment of independent regulation in Palau. The potential for sharing regulatory tasks on a subregional basis among the FSM, the Marshall Islands, and Palau (all of which are currently undertaking ICT sector legal and regulatory reforms, including the establishment of independent ICT sector regulators) will also be investigated to reduce regulatory costs and enhance the quality and consistency of regulatory outcomes.

5.04 **Risks associated with procurement and effective supervision of consultants.** Additional risks include the timely recruitment and effective supervision of consultants, which will be critical for core activities under the project including the operationalization of the Office of the Regulator, the design and implementation of the new connectivity infrastructure and the strengthening and reorganization of FSMTC, among other steps. These risks are amplified by the remoteness of FSM from major professional and technical resources and the lack of local experience in designing and implementing the activities envisaged by the Project. These risks are further complicated by the more limited role for the World Bank in Palau which does not include financing the costs of Palau's participation on the Palau-Yap-Guam segment. These risks will be mitigated through implementation review by the World Bank and an agreement or MOU between the World Bank and ADB on inter-creditor arrangements to promote effective information sharing and coordination between the two institutions.

5.05 **Changes in the current political commitment for sector reform.** Changes in the current political commitment for the sector reforms and infrastructure investment could delay or halt implementation of sector reform or project implementation. While the governments of Palau and FSM have shown political support for market liberalization—through the formulation of new policies and development of legislation—there is a risk to the process through incumbent opposition, as has been the case in other monopolistic or *quasi* monopolistic markets. The Project will accordingly promote a strong focus on mentoring and knowledge-sharing as part of the advisory assistance, and will encourage regular consultations and broad participation in the reform program across governments and other stakeholders. Continuous consultation with and raising awareness of stakeholders will take place around the social and economic benefits of improved connectivity and sector reform, including as part of World Bank-executed technical assistance focused on Project support and policy dialogue.

5.06 **The Project's management structure is potentially risky.** The design and implementation of a joint venture structure for financing, owning, and operating a submarine cable system between Palau-Yap-Guam is, by its nature, a complex undertaking, particularly when it involves the participation of two countries. Moreover, the arrangements for the procurement of the Chuuk Pohnpei cable system, including whether it will be jointly procured with the Palau-Yap-Guam cable system, are yet to be determined. Risks will be addressed by the engagement of specialist international advisors with expertise in the design and implementation of similar arrangements around the world.

5.07 **Implementation risks.** There is a substantial risk regarding counterpart preparation and implementation capacity at the national level. While the relevant Government ministries keenly support the proposed Project, they face severe budget and human resource constraints. This risk will be mitigated by: (a) providing technical support for Project implementation, in particular consultants responsible for project coordination, procurement and financial management; (b) close collaboration between the World Bank and the Government in Project preparation activities, and ensuring ongoing consultation among all stakeholders (Governments of FSM and Palau, implementing agencies, beneficiaries, ADB, and external development partners); and (c) setting achievable development objectives and a limited number of monitorable, strategic activities that will be within the capacity of the Government and implementing entities. Upfront training will be provided in World Bank procedures and processes, and the World Bank will provide ongoing operational advice and guidance as needed.

B. Overall Risk Rating Explanation

5.08 Given the scope and complexity of the Project, the limited capacity of institutions, and the limited previous experience of the World Bank Projects in FSM, the overall implementation risk rating is substantial.

VI. APPRAISAL SUMMARY

A. Financial and Economic Analysis

6.01 A detailed Financial and Economic Analysis, including tables, is available in Annex 6. The Project will leverage existing submarine cable infrastructure to minimize costs and maximize potential returns (Figure 1). The proposed approach will provide submarine fiber access points connecting the states of Yap and Chuuk to existing regional cable systems which terminate on Guam, plus a high-speed satellite solution (O3b) for Kosrae.

6.02 This solution will provide the underlying international connectivity infrastructure needed to support the supply of broadband Internet services to over 70 percent of the total population of FSM, accounting for the vast majority of educational, health facilities and businesses. The integrated FSM connectivity cable system would include the Palau-Yap-Guam segment and the Chuuk-Pohnpei segment, as shown in Figure 2.

Figure 1. Existing Cable Infrastructure

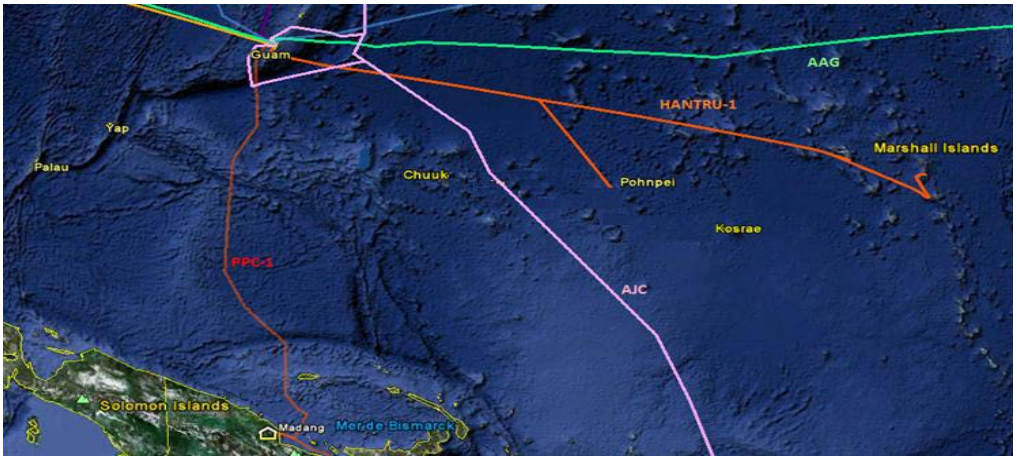
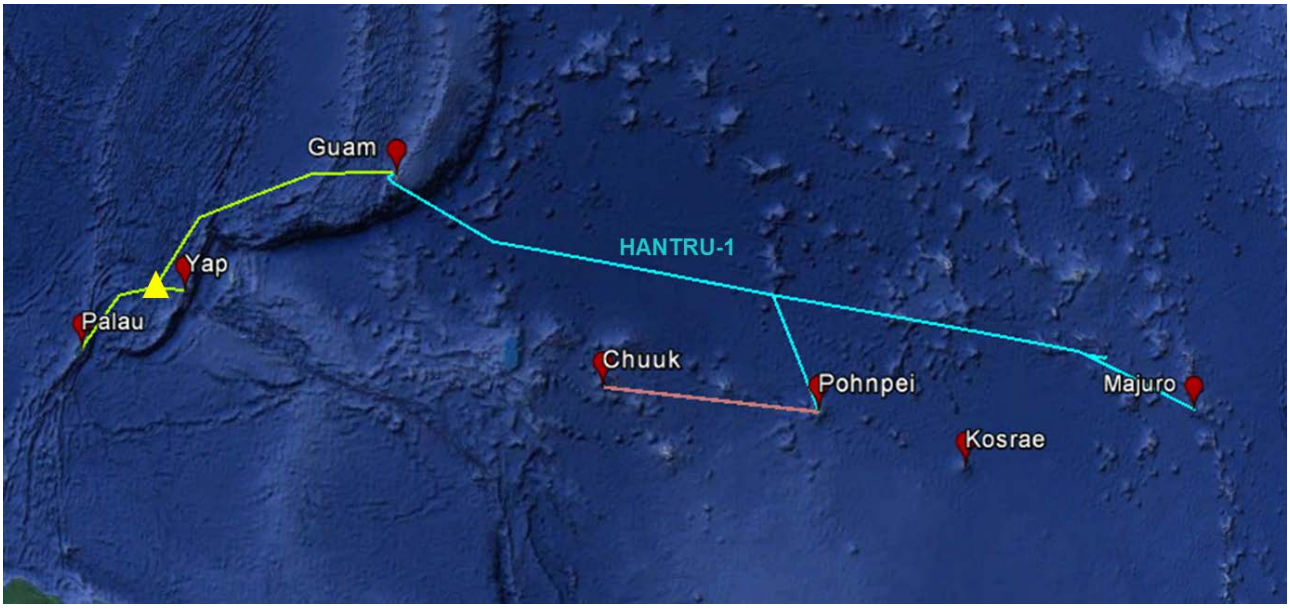


Figure 2. Proposed Cable System Overview and Map



Financial Analysis.

6.03 *Palau-Yap-Guam Cable System.* The total estimated capital costs (CAPEX) for the system is $45 million, plus annual operations and maintenance (OPEX) costs of $1.2 million. It is assumed that interconnection costs ex-Guam would be approximately $100/Mbps/month. The cable system's lifetime 25 years (at least). If a single entity were to operate the infrastructure for all three FSM states, with an efficient uniform pricing across the three states to deliver NPV=0,[11] then the price for bandwidth would be around $345/Mbps/month, assuming a decreasing pricing structure of 3 percent per annum. This pricing level is assumed to cover the operating costs; CAPEX will be financed on grant terms.

[11] Throughout it is assumed that the cost of capital = 6%.

6.04 *Chuuk-Pohnpei Cable System.* The total estimated CAPEX for the system is $18.5 million from Chuuk (Weno) to Pohnpei, plus annual OPEX costs of $0.3 million. It is assumed that interconnection costs ex-Guam would be approximately $80/Mbps/month, with cost-free transit from Pohnpei to Guam. The cable system lifetime is 25 years (at least). About $6 million in CAPEX savings could be realized by constructing the Chuuk-Pohnpei cable system jointly with the Palau-Yap-Guam cable system under a single contract. The construction of the cable segment for Chuuk is not profitable without substantial financing on grant terms, as proposed under the Project.

6.05 *Kosrae connectivity.* In May 2014 FSMTC signed a five-year fixed-term contract with O3b Networks to supply Chuuk with an interim high-speed satellite solution. The contract includes annual ramp-up obligations which are indicatively modelled against the anticipated revenues expected from Chuuk. Once the submarine cable lands in Chuuk it will displace the existing O3b service; this will then be migrated to Kosrae which currently uses lower-capacity and higher-cost geostationary satellite services. The Project will therefore part finance a one-time purchase of capacity to secure the redeployment of the O3b service from Chuuk to Kosrae. Without the $3.5 million subsidy under Component 1C of the Project, the starting bandwidth costs of the single entity across the three states would rise from $345/Mbps/month to $393/Mbps/month. The price for bandwidth for a single purpose activity on Kosrae alone, including the $3.5 million subsidy under Component 1C of the Project, would be approximately $759/Mpbs/month where NPV=0 (and price is decreasing 3 percent) or $676/Mpbs (flat price). Moreover, the O3b solution is likely not viable on Kosrae as a standalone activity—the price would be around $1,140/Mbps/month; at that price it is unlikely that demand would generate sufficient additional revenue.

6.06 The proposed approach promotes equitable treatment among all four states in FSM, and also provides an opportunity for bandwidth demand in Kosrae to grow over the short- to medium-term to levels that might support the future extension of the Chuuk-Pohnpei-Guam cable system. Connecting Kosrae via submarine cable is not financially or economically viable at this time. A single entity running the three connectivity projects, with an efficient uniform pricing model across all three states, including Kosrae, would best ensure the Government's objective of promoting equitable access to broadband and that broadband penetration develops evenly throughout FSM.

Economic Analysis

6.07 *Palau-Yap-Guam Cable System.* The cumulative discounted impact on GDP over the next 25 years is $27.5 million, with a 6 percent discount rate. Considering that the initial investment is $22.5 million, the net economic impact of the Project is $5 million. The economic rate of return is 8 percent. If the cable were to last a further 10 years (35 years in total), the net economic impact would be $9 million, and the economic rate of return would be 9 percent. This analysis is based on the assumption that broadband penetration will rise from 1 percent to 46 percent within 10 years due to the submarine cable, and data indicating that a 10 percent increase in broadband penetration (wireless Internet + broadband) correlates with a 1.38 percent increase in GDP in developing countries.[12] The submarine cable investment would have other direct and

[12] This conclusion has been drawn by a World Bank study "Economic impact of Broadband" from Christine Zhen-Wei Qiang and Carlo M. Rossotto with Kaoru Kimura dated on 2009. This ratio is quite conservative especially for Pacific Islands as

indirect impacts: potentially generating up to 800 additional jobs in the first 10 years. Social benefits of broadband are expected to include: delivery of essential public services such as health care and education in a more efficient way, achieving digital inclusion for people from remote areas, and attracting and retaining workers.

6.08 *Chuuk-Pohnpei Cable System.* The cumulative discounted impact on Chuuk's gross state product (GSP) over the next 25 years is $26 million, with a 6 percent discount rate. Therefore, considering that the initial investment is $18.5 million, the net economic impact of the project is $7.5 million. The economic rate of return is 9 percent. If the cable were to last a further 10 years (35 years in total), the net economic impact would be $12 million, and the economic rate of return would be 10 percent. This analysis is based on the correlation between broadband penetration and GDP growth described above. It is also estimated that the submarine cable investment could generate up to 1,500 additional jobs in the first 10 years. This estimate is based on the correlation between broadband penetration and job creation described above.

6.09 *Kosrae Connectivity.* The economic impact of the Kosrae component is assessed by estimating the impact on GSP over the next 10 years; and then comparing this impact to the cost of selling bandwidth at the same price as the other States that will have a submarine cable (although the cost structure of O3b is much higher than that of a cable). The cumulative discounted impact on GSP over 2017-2024 is around $6.5 million (with a 6 percent discount rate). Over the same period, the cost of selling below O3b's prices is also approximately $7 million, therefore the net economic impact of this component is close to zero. Nevertheless, providing broadband Internet should also generate direct and indirect impacts. The anticipated increase in Internet penetration could generate up to 300 additional jobs for Kosrae over a 10-year period.

B. Technical Analysis

6.10 The proposed submarine cable system is: (a) a point-to-point cable of 1,527 km between Palau and Guam with a branching unit and unrepeatered spur to Yap; and (b) a point-to-point cable of 750 km between Chuuk and Pohnpei. The system is likely to be two-fiber pair. Cable systems are generally designed with a capacity of 360 Gbps, comprising 36 wavelengths of 10 Gbps each. The minimum number of wavelengths to be made active when the system is commissioned is expected to be one or two, with a capacity of 10 Gbps per wavelength, which will be more than adequate to meet the anticipated bandwidth demand at that time for Palau and Yap, and for Chuuk. The Pohnpei-Chuuk cable may potentially include a branching unit for future use by the Outer Island region in Chuuk known as the Mortlocks. Cable type (armour) requirements—e.g., for deep-sea and near shore segments—will be included in the technical specifications for the proposed systems.

6.11 The high cost and poor financial and economic viability of a cable option for Kosrae means that at this time the redeployment of O3b from Chuuk once the cable lands there is the preferred option. The lifetime of the current O3b satellite constellation is about 12 years. Service is delivered via a "spot" beam directed at a target coverage area. Latency is approximately 130-160ms (between the local terminal and the O3b gateway terminal in Dubbo,

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populations are usually concentrated in the main cities and this concentration is supposed to improve the level of impact of a submarine cable which is landing directly in the main city.

outside of Sydney, or Oahu, Hawaii, depending on the region in the Pacific being served), with up to 1.2 Gbps capacity per beam—latency is expected to be approximately 3.5 times faster over O3b compared to existing geostationary satellite systems in FSM. The system offers generally good resilience, but is generally inoperable during cyclones (antennas have to be stored) and suffers a risk of rain fade (signal attenuation). In contrast, submarine cables offer generally greater resilience and are not affected by rain, but there is always some risk of cable breaks which greatly increases operational costs (insurance against service interruption and for repair costs).

6.12 The legal and regulatory environment needs to support open access to capacity on international communications infrastructure, and wholesale pricing needs to be cost-based, nondiscriminatory, and transparent; and the regulatory institution needs to be empowered to protect the interests of consumers. FSMTC will be reorganized in order to prepare that company to meet the challenges and opportunities of liberalization. Technical design work will be needed to ensure that the design, procurement, construction, and maintenance of the new connectivity infrastructure assets are managed appropriately and effectively, including the technical specifications and design, organizational structure, business plan, ownership, governance arrangements, financing and capital adequacy of the responsible government entity (or entities). The Project will provide technical support in this regard, especially to: (a) ensure that the legal and regulatory framework is adequate; (b) support the design of the FSM Open Access Entity, and the joint venture and related bidding processes for the new infrastructure investment; (c) assist in the strengthening and restructuring of FSMTC; (d) support the roll-out of connectivity infrastructure; and (e) implement all the previous actions.

C. Financial Management

6.13 The financial management assessment was carried out in July 2012 in accordance with *"Principles Based Financial Management Practice Manual"* issued by the Board on March 1, 2010. Under the Bank's OP/BP 10 with respect to Projects financed by the World Bank, the Recipient is required to maintain financial management systems—including accounting, financial reporting, and auditing systems adequate to ensure they can provide the Bank with accurate and timely information regarding the project resources and expenditures. The financial management arrangements satisfy the financial management requirement as stipulated in OP/BP 10. The assessed financial management risk of the Project is considered substantial.

6.14 Because this is only the second World Bank-supported investment operation for FSM there is some risk due to the Government's still limited familiarity with World Bank requirements. The Project expenditure will be fully integrated into the Government accounting system which has been assessed as adequate to maintain the Project accounts. The following mitigating measures are required to be to reduce financial management (FM) risks of project implementation: (a) provision of input from a short term Finance Specialist to assist in budget preparation and advice and assistance in compliance with World Bank FM requirements; (b) nomination by the DoFA of a financial officer with accounting qualifications who will have responsibility for maintaining the Project accounts; (c) prior to the first disbursement the FM Specialist have an audio session with the dedicated officer from the DoFA to outline the FM requirements; (d) an early field mission by the FM Specialist to ensure the chart of accounts have

been set-up correctly within the government system; (e) regular FM implementation reviews. A Finance Specialist satisfactory to the Association shall be assigned within three months of effectiveness. The FM assessment mission determined that staff has the capacity to manage the FM requirements for this Project subject to the mitigating measures detailed above.

D. Procurement

6.15 **Joint procurement arrangements.** Component 1A, the Palau-Yap-Guam submarine cable system with a cost estimate of $45.0 million will be jointly financed by ADB and IDA.[13] The World Bank will be the lead cofinancier in terms of procurement procedures. World Bank Procurement Guidelines will be followed in procurement and contracting of the Palau-Yap-Guam submarine cable system. ADB will request a waiver from its Board of Executive Directors to permit bidders from non-ADB member countries to participate. An MOU will be signed between ADB and the World Bank which will state that the procurement of the Palau-Yap-Guam submarine cable system will be regulated by World Bank Procurement Guidelines.

6.16 The World Bank and ADB (cofinanciers) have a cross debarment list, which is available to the public. However, ADB has an additional, non-publicly disclosed debarment list. The cofinanciers recognize that, due to differences that may exist among their respective procurement and anticorruption policies, they may not have a uniform view on bidder eligibility. With respect to these particular differences, the cofinanciers will use their best efforts to give effect to the other's eligibility requirements and debarment lists, including seeking policy waivers and exceptions. If any cofinancier is unable to obtain the waivers and exceptions necessary to give effect to other cofinancier's eligibility requirements and debarment lists, then the cofinanciers' right to take necessary action to ensure compliance with their respective procurement and anticorruption policies, and related procedures, and enforce their rights under their respective financing agreement(s), will remain unaffected.

E. Social (including Safeguards)

6.17 The Project is anticipated to have many positive social impacts by improving access to communication that can help promote socioeconomic activities of FSM. The beneficiaries of the Project can expect improved operations through more efficient transactions and access to information are small- and medium-enterprises, primary producers, service industries, health and education sectors, government agencies, and disaster preparedness/management. Stakeholder consultations have been undertaken in Pohnpei, Yap, and Chuuk in the course of project preparation. A poverty reduction and social strategy undertaken as part of Project preparation concluded that the Project would likely improve access to social services and employment opportunities for women.

6.18 The population of FSM is comprised of many ethnicities; and all are descended from, and belong to, the Micronesian culture. These different ethnicities are Chuukese 48.8 percent, Pohnpeian 24.2 percent, Kosraean 6.2 percent, Yapese 5.2 percent, Yap outer islands 4.5 percent,

[13] It is also proposed that the Chuuk-Pohnpei segment would be procured jointly by FSM Open Access Entity and Palau Cable Company, under a single construction contract, according to the parties' respective financial obligations as specified in the Consortium Agreement. The additional costs associated with the Chuuk Pohnpei segment will be borne by FSM, financed by IDA under Component 1(B) of this Project.

Asian 1.8 percent, Polynesian 1.5 percent, other 6.4 percent, unknown 1.4 percent (2000 census). Based on recent analytical work completed by the World Bank, the communities within FSM are not considered to have the four characteristics required to trigger OP 4.10 (self-identification as distinct indigenous cultural group and recognition of this identity by others; collective attachment to geographically distinct habitats or ancestral territories in project area and the natural resources in these habitats or territories; customary cultural, economic, social or political institutions separate from those of the dominant society and culture; and Indigenous language, often different from official language of the country or region). Accordingly it is proposed that this OP not be triggered.

6.19 No land acquisition is required for any of the proposed landing sites and all proposed cable routes are along existing government owned roads. Construction related impacts are managed via the environmental and social management plan (ESMP) to ensure these are mitigated and inconvenience to local communities minimized.

6.20 Due diligence documentation has been prepared for the Palau and FSM cable landing sites. The Project sites (cable landing site and site for cable station) in Yap will be located on a government land in Nimar Village in Weloy Municipality, Colonia (Parcel No. 002 F 01 title) thus will not require land acquisition. Both the cable landing site and the site for the cable station are on vacant government land in a government precinct including staff quarters, government offices, the post office and Office of Lands in the capital.

6.21 The cable landing station for Chuuk will be on land purchased by the state government for the purposes of the airport. Part of the overall land area being acquired by the State Government for the airport has not been paid for in full, and this process is continuing. Notwithstanding this, no outstanding issues remain in relation to the actual land on which the cable landing site will be located; this land is fully owned by the Government. This is confirmed in a letter from the Governor of Chuuk State to the Chair of the FSM Fiber Optic Cable Taskforce. This is fully documented in the due diligence report.

6.22 The landing site and cable station in Palau (financed by ADB) are also documented in a separate due diligence report. The fiber optic cable landing site in Meyuns Hamlet in Koror does not require acquisition of private land nor entail displacement of people, food gardens, and physical structures. The landing site has an existing beach manhole to connect the cable once it reaches land from the marine channel. The landing site is on government-owned land, near the Office of the President's extension office and existing earth station complex of PNCC compound. The cable station is to be located inside the PNCC compound, is approximately 150 meters from the cable landing site and has an existing underground conduit connecting the station with the landing site which has the space required to receive the cable.

6.23 In Guam, one of the existing landing sites and stations will be used. No new sites/facilities or construction activities are required.

F. Environment (including Safeguards)

6.24 The Project will trigger the Environmental Assessment OP4.01, and has been assigned an EA category B. It has also triggered Natural Habitats OP4.04 and Physical Cultural Resources OP/BP 4.11.

6.25 Component 1A involves the laying of a 1,527 km submarine fiber optic cable between Palau, Yap and Guam. Component 1B involves the laying of a 750km submarine fiber optic cable between Chuuk and Pohnpei. According to the indicative design, the cable will be buried in the shallow water approaches to the landing sites and will likely be surface-laid along the deep water route. In sections where the cable is not buried it will lie directly on the seabed. By avoiding seamounts, it is possible to position the proposed cable so that it will only rise from below 1,000m depth as it nears the landing sites at each end. This will minimize the risk of damage from deep-sea bottom trawling.

6.26 The affected bodies of water (between Guam, Palau and Yap and between Pohnpei and Chuuk) are sensitive marine environments but there are no proposed or established protected areas documented along the oceanic portions of the cable routes. Although the area has several marine protected sea flora and fauna, these species and their habitats are unlikely to be disturbed for the most part by the Project activities. Disturbance during detailed survey and cable laying operation is expected to be localized and temporary.

6.27 The Chuuk branch line will run directly from junction to Weno, entering the Chuuk Lagoon through the northeast channel. The draft Chuuk Historic Preservation Act declares there are a significant number of sunken World War II relics (including 80 wrecks) in Chuuk Lagoon protected under law and these shipwrecks for nomination to UNESCO's World Heritage listing. The ESMP has identified potential impacts to the physical cultural resouces (PCR) and mitigating measures and chance find provisions are contained therein. A separate PCR management plan will be prepared and disclosed after detailed information on the relics is gathered during the oceanographic and bathymetric survey. The ESMP also establishes a chance-find procedure by requiring that if the alignment is found to affect any cultural heritage once the work has begun, mitigative actions will be discussed with local officials and an optional plan implemented and monitored.

6.28 The rest of the Project investments are limited to the landing station and renovations of offices in Palau, Yap, and Chuuk. Thus, an environment and social impact assessment has been prepared for the Project (in the form of an "Initial Environmental Examination" funded by the ADB. Potential environment and social impacts have been documented, and mitigation measures established in the ESMP which includes an environmental code of practice which lists the items defined in the ESMP and adds further detail on boundaries and restriction to be adhered to by contractors conducting work in the marine environment and on shore. The ESMP will be applicable to all project activities, starting with the laying of the submarine cable following standard best practice for laying and for repair of submarine cables. The deployment of broadband satellite service on Kosrae under Component 1C is expected to finance only limited investments in satellite terminating equipment to be located at existing sites.

6.29 A Safeguards monitor will assist in monitoring the Project's safeguards performance. Capacity building activities will be conducted to strengthen capacity to supervise compliance with the ESMP and the environmental code of practice.

6.30 Public consultation was carried out in FSM (both Yap and Chuuk) and Palau in July 2014 during which the government/consultant made a presentation of the project, as well as environmental and social sector safeguard issues, mitigation measures, and accompanying maps showing the location of the preferred alignment. This was followed by a question and answer period. Details of these consultations, issues raised and responses provided are held in the respective initial environmental examinations. The overwhelming opinion of all participants was full support for the project and an urgency to get this in place as quickly as possible. Although there were matters of clarification raised (size of cable, installation activities etc.), no negative comments were expressed. The community was advised that the safeguard documentation would be publicly disclosed both locally and on *InfoShop*.

G. Other Safeguards Policies Triggered

6.31 No other safeguards policies are triggered.

H. Legal Conditions and Covenants

6.32 The following covenants have been agreed to support effective Project implementation. In addition, conditions of disbursement have been agreed and are listed in Annex 3.

(a) The Recipient shall take all necessary measures on its part to ensure implementation of the Telecommunications Act, including those aspects which support a competitive ICT sector, such as: licensing, wholesale access, guarantees with respect to open access to international communications infrastructure, and the creation and operationalization of an independent regulatory authority to oversee market activities, in a manner satisfactory to the International Development Association ("Association")-Financing Agreement Schedule 2.I.D.

(b) For FSM Open Access Entity the Recipient shall take all measures required on its part to: (i) appoint a board of directors, chief executive officer, managerial and technical personnel necessary for operational requirements; (ii) adopt by-laws, governance arrangements, a business and marketing plan, and organizational plan; and (iii) put in place financing arrangements that would ensure adequate capitalization and operational financing including to address contingencies for the FSM Open Access Entity, all in a manner acceptable to the Association- Financing Agreement Schedule 2, I, B, 2.

(c) The Recipient shall take all measures on its part to put in place, and maintain throughout the Project implementation period, arrangements sufficient to ensure that: (i) FSM Open Access Entity and FSM Telecommunications Corporation (FSMTC) shall not compete against each other in the supply of connectivity services using satellite or submarine fiber optic cable(s); (ii) where FSMTC owns or controls capacity rights on HANTRU1 between Pohnpei and Guam, it shall supply such services to the FSM Open Access Entity free of charge, including system access, on terms as may be demanded by the FSM Open Access Entity-Financing Agreement Schedule 2, I, B, 3(g) and (h).

(d) The Recipient shall appoint, by not later than three months after the Effective Date, and thereafter maintain throughout the period of Project implementation, a Project coordinator within DTCI, with qualifications and experience and under terms of reference acceptable to the Association, to be responsible for supporting DTCI, DoFA and the Project Implementing Entities with Project implementation-Financing Agreement Schedule 2.I.A.3.

(e) The Recipient shall, by not later than three months after the Effective Date, appoint or assign, and thereafter maintain, throughout the period of Project implementation, a financial management specialist within DoFA, with qualifications and experience and under terms of reference acceptable to the Association, to support DTCI with financial management and reporting for the Project.-Financing Agreement Schedule 2.I.A.4.

ANNEX 1. RESULTS FRAMEWORK AND MONITORING

Country: Federated States of Micronesia

Pacific Regional Connectivity Program 2: Palau-FSM Connectivity Project (P130592)

Results Framework

FEDERATED STATES OF MICRONESIA

Project Development Objectives

PDO Statement

The development objective of the Project is to reduce the cost and increase the availability of ICT services needed to support social and economic development.

These results are at	Project Level

Project Development Objective Indicators

Indicator Name	Core	Unit of Measure	Baseline	Cumulative Target Values					Frequency	Data Source/ Methodology	Responsibility for Data Collection
				YR1	YR2	YR3	YR4	End Target			
Indicator 1(a): Access to Telephone Services (mobile phones per 100 people)	☒	Number	30	35	50	70	75	80	Annual	ITU, Telecoms Operators	Office of the Regulator
Indicator 1(b): Access to Internet Services including mobile (number of subscribers per 100 people)	☒	Number	2	5	10	20	30	40	Annual	ITU, Telecoms Operators	Office of the Regulator
Indicator 2(a):	☐	Amount	1,800			900	850	700	Annual	ITU,	Office of the

Wholesale internet bandwidth price ($/Mbps per month)		(USD)								Telecoms Operators	Regulator
Indicator 2(b): Available international bandwidth-Yap, Chuuk, Kosrae (Mbps)	☒	Number	15 Yap 15 Chuuk, 8 Kosrae					10,000 Yap, 10,000 Chuuk 150 Kosrae	Annual	ITU, Telecoms Operators	Office of the Regulator
Indicator 3: Retail Price of residential Internet Services (min 512kbps per Month, in $)	☒	Amount (USD)	65			30	30	20	Annual	Telecommunications operators	Office of the Regulator
Indicator 4: Impact on Telecom sector of World Bank Technical Assistance (composite score: 1- low impact to 5-high impact)	☒	Number	1					5	Annual	DTCI (Office of the Regulator, when established)	DTCI (Office of the Regulator, when established)
Direct project beneficiaries (Yap, Chuuk, Kosrae)	☒	Number	0					7,000 Yap, 30,000 Chuuk, 5,000 Kosrae	Annual	Telecoms industry, statistics office	DTCI
Female beneficiaries	☒	Percentage SubType Supplemental	0					3,500 Yap, 15,000 Chuuk, 2,500 Kosrae			DTCI

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	Cumulative Target Values					Frequency	Data Source/ Methodology	Responsibility for Data Collection
				YR1	YR2	YR3	YR4	End Target			
Intermediate Results Indicator 1: Length of Fiber Optic Cable Built (km)	☒	Kilometers	0	0		1,600	2,350		Annual	Telecommunications operators	DTCI
Intermediate Results Indicator 2: Regulatory capacity strengthened	☐	Yes/No	No ICT regulator or regulatory framework		Capacity-building (no.)			Establishment of the Office of the Regulator and hiring of its chief executive officer and other key staff.	Annual	DTCI	DTCI

ANNEX 2. DETAILED PROJECT DESCRIPTION

Country: Federated States of Micronesia

Pacific Regional Connectivity Program: Palau-FSM Connectivity Project

1. The Project will consist of three components: Component 1 International connectivity infrastructure ($69.5 million); Component 2 Technical Assistance ($2.25 million); and Component 3 Project Management ($0.75 million).

2. **Component 1: International connectivity infrastructure ($69.5 million)** is divided into three subcomponents focusing on investments in new connectivity infrastructure for three states—Yap, Chuuk, and Kosrae. The Project will support the deployment of submarine fiber optic cables for Yap and Chuuk, and finance a one-time partial purchase of international bandwidth for Kosrae on terms which promote equitable access to broadband access across FSM. The proposed infrastructure financing requirements are: (a) Palau-Yap-Guam ($47.5 million); (b) Chuuk-Pohnpei ($18.5 million); and (c) Kosrae connectivity: $3.5 million.

3. FSMTC has recently signed two new contracts with a medium-orbit satellite provider, O3b Networks—described in marketing materials as "fiber in the sky." The first is for services to Yap, in concert with a second contract between O3b and PNCC for services for Palau. The second is for services to Chuuk. The O3b service is seen by the Government and FSMTC as an interim "stop gap" measure to meet immediate rising demand. The development priority for the FSM Government is ultimately to connect all three remaining states to a fiber optic cable system. The O3b service is expected to commence during Q4, 2014.

4. **Subcomponent 1A: Palau-Yap-Guam Cable System ($47.5 million)** of which IDA $22.5 million for FSM to participate in a joint venture with Palau for the construction of the Palau-Yap-Guam cable system, comprising a half share in the international cable system assets and an undivided right to own and manage the onshore FSM cable system assets in Yap including the Yap landing station and the point of interconnection for domestic operators to interconnect with the cable system; plus $25.0 million in ADB co-financing for Palau's participation in the cable system and related investments. The design and construction of the Palau-Yap-Guam cable system will be the responsibility of a consortium which will be established between Palau and FSM cable companies. The two companies will enter into a joint venture and appropriate legal agreements will define the terms of their collaboration, the operation and management of the cable system once construction is complete, and the rights of each company in regard to capacity available on the system. The cable companies will jointly own the cable system up to the landing stations to be built in each country, comprising an undivided 50 percent share of the international bandwidth capacity available over the cable system, and will separately own their respective landing station and related domestic terrestrial infrastructure. Both Governments have agreed on the principle of equal sharing of construction costs for the cable.

5. An assessment of the Project's profitability was conducted based on bandwidth projections in Yap and estimates of the associated cable system costs. Different bandwidth scenarios were set for the next years based on the projections of the following parameters:

(a) Population evolution

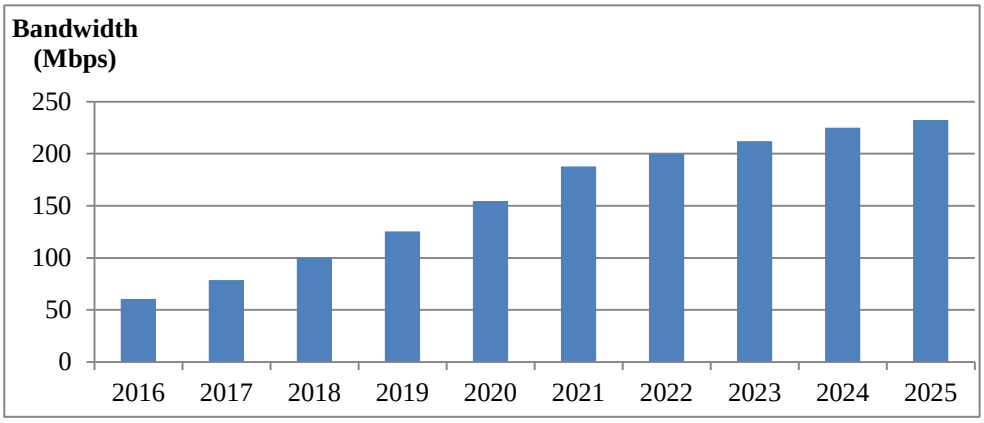
(b) Evolution of telecom service penetration (fixed and mobile broadband, corporate and leased lines, fixed and mobile telephony)

(c) Usage development per telecom service

(d) Changes in technical parameters including contention and compression

6. According to the base case scenario, bandwidth demand could reach 233 Mbps in Yap, 10 years following the commissioning of the Palau-Yap-Guam cable. In this case, if a single purpose vehicle were to operate the infrastructure for all three states, with an efficient uniform pricing across the three states to deliver NPV=0, then the price for bandwidth would be around $345/Mbps/month (assuming a decreasing pricing structure of 3 percent per annum). The price for bandwidth on a standalone basis for Yap would be approximately $344/Mbps/month (again assuming NPV=0 and price decreases of 3 percent per annum). In each case it is assumed that the existing O3b contract for Yap is controlled by the entity that owns the cable infrastructure.

Figure A2.1. Bandwidth Demand Forecasts for Yap



7. The cost of a submarine cable system (CAPEX) is $45 million and includes the submarine cable, repeaters, branching units, marine survey and operations, landing station costs, and project management costs. The recurring costs (OPEX) consist of annual operation and maintenance costs: technical work, maintenance of terminal stations, replacing defective equipment, energy, air conditioning etc. It also includes the costs of managing the cable and the various recurring overheads to ensure continuity of services. The annual OPEX costs are $1.2 million. The Project costs for Yap amount to $22.5 million CAPEX; final OPEX cost sharing arrangements for Palau-Yap will be determined through negotiations.

8. O3b is an alternative connectivity option which was considered for Yap. The O3b proposed contract terms for Yap are more attractive than Chuuk as the pricing is based on the aggregate demand of Palau and Yap (from $600/Mbps/month for 150 Mbps to $475/Mbps/month for 300 Mbps). Assuming that the current O3b contract for Yap is extended for another five years under the same terms, price for bandwidth would be around $528/Mbps/month over the 10-year project duration (assuming a flat pricing structure). Nonetheless, it is the policy of the FSM to move away from reliance on satellite and to connect all four states to fiber optic cables.

Moreover, the cable solution remains the most attractive solution for Yap and will lower the cost of capacity.[14] Other cable alternatives were previously considered for Yap:

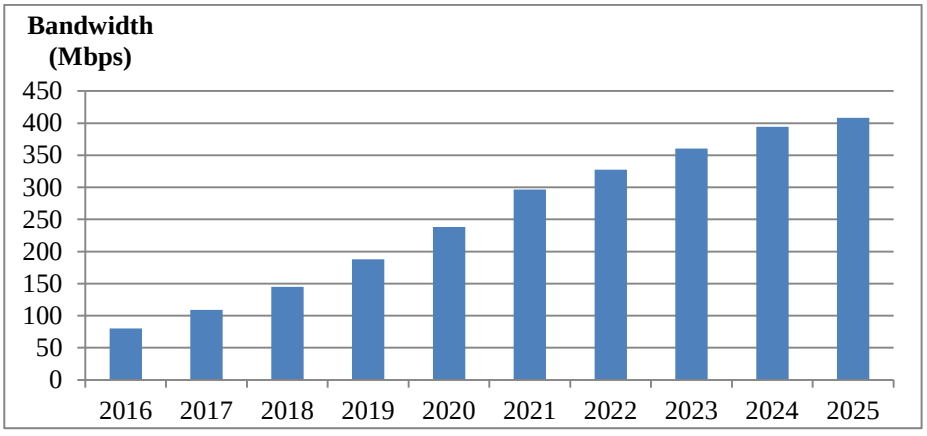
(a) A recovered cable: the re-use of the Guam—Philippines cable was considered by FSMTC and PNCC (under the umbrella of the Caroline Cable Corporation) to connect Palau and Yap to Guam. This option was not pursued.

(b) Yap-Guam cable: this alternative is technically possible but would only lead to higher CAPEX. The Palau-Yap-Guam collaboration provides an opportunity for both Yap and Palau to share the capital costs for a project which is likely not financially viable for either party alone.

9. **Subcomponent 1B: Chuuk-Pohnpei Cable System ($18.5 million).** For an undivided right to own and manage a new cable system which will be constructed between Chuuk (Weno) and either the Pohnpei landing station or the branching unit on the Pohnpei spur to the HANTRU-1 cable system (whichever is financially and technically most advantageous). The financing for the cable connection for Chuuk will be separate from the consortium which will be formed for the Palau-Yap-Guam cable system. However, it is envisaged that each cable company will undertake procurement of the entire cable system jointly, including the Pohnpei to Chuuk segment, according to their respective financial obligations as specified in the Consortium Agreement. Similarly, any arrangements which might bundle operational activities across the two cable systems is also a matter for negotiation between FSM and Palau, although some coordination is anticipated in order to reduce operational costs.

10. The bandwidth demand of the Chuuk atoll is expected to reach 408 Mbps, 10 years following the commissioning of the Chuuk-Pohnpei cable. In this case, if a single purpose vehicle were to operate the infrastructure for all three states, with an efficient uniform pricing across the three states to deliver NPV=0, then the price for bandwidth would be around $345/Mbps/month (assuming a decreasing pricing structure of 3 percent per annum). The price for bandwidth on a standalone basis for Chuuk would be approximately $255/Mbps/month (again assuming NPV=0 and price decreases 3 percent per annum). In each case it is assumed that the existing O3b contract for Chuuk is migrated to Kosrae.

Figure A2.2. Bandwidth Demand Forecasts for Chuuk (excluding the outer islands)



[14] This comparison compares the costs of bandwidth via cable including $22.5 million grant financing versus the cost of O3b without grant financing.

11. A number of alternative options for connecting Chuuk were examined and rejected:

(a) O3b: The existing O3b contract for Chuuk starts with a price for capacity at $950/Mbps/month for 50 Mbps in year 1 and includes ramp-up obligations that increase to $660/Mbps/month for 175 Mbps in year 5. Assuming that O3b contract is extended to 10 years under approximately the same terms (minimum monthly engagement of $150,000), the wholesale price for bandwidth in Chuuk would be approximately $922/Mbps/month (assuming a flat pricing structure), which is substantially higher than what is envisaged under the Project.

(b) Chuuk- Guam and Chuuk-Yap cables: these options are technically feasible, but are significantly more expensive (additional capital costs of +$6 million for the Chuuk-Guam cable and +$9 million for Chuuk-Yap). These routes would also impose additional technical challenges.

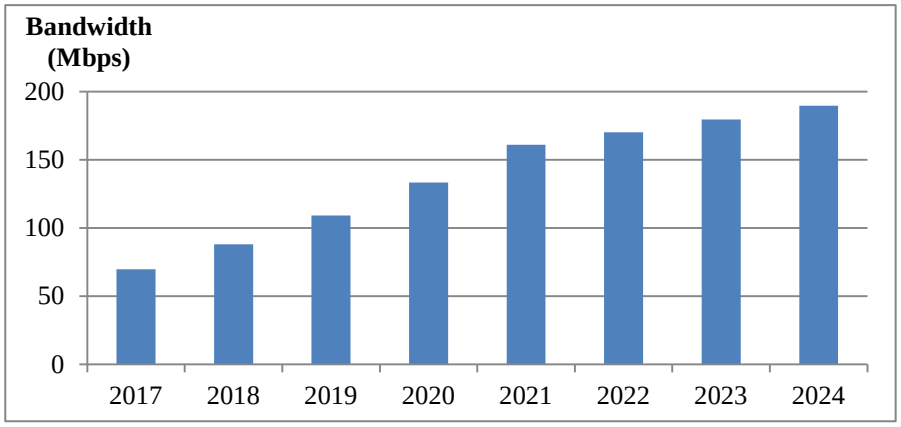
12. **Extension of the regional cable system to Chuuk delivers substantial economic and social gains.** The inclusion of Chuuk as part of the Project provides a means of including a large proportion of the almost 50 percent of the population of FSM who reside in Chuuk—a social, economic and political priority for FSM. Compared to the cost of procuring two separate cable systems for Yap and Chuuk, pursuing both investments contemporaneously will potentially deliver cost savings of approximately $13.5 million over the anticipated 25-year lifetime of the infrastructure (comprising upfront capital cost savings of approximately $6.4 million and operational savings of $7.25 million). The financing arrangements for the cable connection for Chuuk will be separate from the consortium which will be formed for the Palau-Yap-Guam cable system, although the substance and structure of these arrangements will be negotiated by Palau and FSM during implementation. Depending on the final terms of the Consortium Agreement with Palau, any arrangements for the procurement of the Pohnpei to Chuuk segment to be undertaken by the FSM Open Access Entity severally will be managed in a way that maximizes the potential for cost savings to FSM. For current budgeting purposes it is assumed that the risks and benefits associated with Chuuk accrue to FSM, although final determination of this issue is a matter for negotiation between Palau and FSM.

13. An alternative “non cable” option is to connect Chuuk via O3b. However, the Government has decided against a long-term O3b solution in favor of a fiber optic cable for Chuuk (despite the greater footprint of O3b versus cable). The O3b service is seen by Government as an interim measure as noted above. While the O3b option is attractive from a CAPEX perspective, marginal operational costs are substantially higher, as broadband demand increases, and it cannot fully match the performance or operational standards of cable systems. As noted above, the price of O3b for Chuuk over the next 10 years would likely exceed $900/Mbps/month. Networks that depend solely upon satellite links may also incur additional financial costs due to under use (satellite links cannot be efficiently operated above approximately 90 percent use) and operators typically suffer foregone bandwidth sales during peak demand periods (and users may experience degraded services) because satellite links cannot be easily expanded to meet peak demand. Accordingly, the Project will support the transition for Chuuk from O3b to cable infrastructure, with the existing O3b contract being redeployed to supply Kosrae which has a substantially smaller population and lower bandwidth demand than Chuuk.

14. **Subcomponent 1C: Kosrae Connectivity ($3.5 million)** will finance a one-time partial purchase of international bandwidth for Kosrae on terms which promote equitable access to

broadband access across FSM. For Kosrae an O3b medium-earth orbit low-latency satellite solution remains the most cost effective means to increase access to bandwidth in the short to medium term—bandwidth supply in Kosrae is the lowest of all four states comprising less than 10Mbps and internet revenues are approximately $26,000 per month. Demand is expected to reach 190 Mbps in 2024. Without the $3.5 million contribution, the starting bandwidth costs of the single entity across the three states would rise from $345/Mbps/month to $393/Mbps/month. The price for bandwidth for a single purpose activity on Kosrae alone, including the $3.5 million subsidy under component 1(c) of the Project, would be approximately $759/Mbps/month where NPV=0 (and price is decreasing 3 percent) or $676/Mbps (flat price). O3b is likely not viable on Kosrae as a standalone activity—the price would be around $1,140, but at that price it is unlikely that demand would generate sufficient additional revenue. It is intended that the redeployment of the existing O3b contract from Chuuk to Kosrae will be implemented by FSM Open Access Entity—subject to third-party consent(s)—regarding any changes to existing contractual arrangements, among other matters.

Figure A2.3. Bandwidth Demand Forecasts for Kosrae



15. Component 1C assumes that the O3b contract for Chuuk is migrated to Kosrae (2017-2019) and that a minimum cost of capacity of $150,000 month is considered for the (2019-2024) period. Connecting Kosrae would require an individual beam. If the beam were to cover also Pohnpei, both states would be at about 300km from the center of the beam. The signal quality and service performance would thus deteriorate. If the O3b project were run as a single purpose activity, price for capacity would be around $759/Mbps/month, decreasing by 3 percent per annum, which is a little more than two times higher than the wholesale price if the components were managed together under the same entity ($345/Mbps/month, decreasing by 3 percent per annum).

16. **Component 2. Technical Assistance ($2.25 million) will finance advisory services and training for:**

(a) *ICT sector development including the design and ownership structure of existing and new infrastructure*. Complementing the TA Project, technical assistance for the technical, legal, and transactional aspects of the cable system, including the technical specifications and design, institutional structure, business plan and financing arrangements of the Government entity leading the delivery of the cable system to Yap and Chuuk. Support will be available for costs incurred in connection with the design, construction and

commissioning of the cable system and its institutional arrangements. Additional support will be available for the redeployment of O3b services in Kosrae, including the ownership and management arrangements. A related aspect of this work will also consider possible separation from FSMTC of the submarine cable system for Pohnpei and the vesting of that system in a new entity to be established by the Government as an open access provider of international connectivity. The intention is to maximize usage of international bandwidth in FSM.

(b) *Reform and development of FSMTC*. Options for restructuring FSMTC and resulting actions to strengthen FSMTC's capacity to operate in a competitive market, including: (i) commercial capacity to compete effectively with new entrants; and (ii) technical capacity to operate in a competitive market, such as providing interconnection with its fixed and mobile networks, and the sharing with other service providers of other essential facilities. Technical assistance may include advice to assess, provide recommendations and implement measures to improve the operational and financial performance of FSMTC having regard to the Government's objectives for the company and the ICT sector, including *inter alia* corporate reorganization and change management.

(c) *Sector regulation and regulatory capacity development.* Complementing the TA Project, financing for medium-term technical assistance to develop key capacities within the new sector regulator, including: (i) preparing internal procedures and documentation for the conduct of the functions of that office, including licensing (and marketing and negotiating for new market entry), spectrum allocation, numbering allocation, number portability, interconnection and wholesale access services, consumer protection, universal access, and control of anticompetitive behavior; (ii) preparing regulatory policies and procedures as to the manner in which regulatory functions (e.g., interconnection and access disputes between operators) will be exercised; (iii) developing criteria for the setting of fees for licensing and the use of spectrum; (iv) establishing and maintaining internal financial controls to ensure effective financial management and proper financial reporting; (v) preparing plans (short-, medium-, and longer-term) for carrying out its responsibilities under the Telecommunications Act and enforcing its decisions; (vi) maximizing the benefits of the new investments in connectivity infrastructure, for example cyber-security, privacy, e-commerce, and e-government issues among others, leveraging broadband infrastructure and promoting the delivery of a wide variety of e-services; and (vii) general regulatory advice and assistance.

17. **New legal and regulatory arrangements and infrastructure investment are critical for development.** In this context, the proposed approach supported by this Project is to remove or ameliorate two major constraints to the expansion of low cost and affordable telecommunications services: (a) the high cost of international connectivity, and (b) the market structure which has resulted in no competition in the supply of communications services. Together, these constraints restrict access to ICT services and inhibit the growth of the sector. The response to these constraints is to acquire new international connectivity in a cost-efficient manner, to supply that connectivity on an open access basis and on nondiscriminatory terms to any service provider, and to liberalize entry into telecommunications markets in order to promote competition and thereby drive wider access, lower prices and increased usage. Technical assistance under this Component 2 is designed to support these activities.

18. **Component 3. Project management support ($0.75 million)** will finance Project management and coordination, financial management, audit, general Project reporting, monitoring and evaluation, and administrative costs associated with project implementation.

ANNEX 3. IMPLEMENTATION ARRANGEMENTS

Country: Federated States of Micronesia

Pacific Regional Connectivity Program: Palau-FSM Connectivity Project

A. Federated States of Micronesia

Project Institutional and Implementation Arrangements

1. **Recipient.** The Recipient of IDA funds will be DoFA. For Component 1 DoFA will provide the funds to the FSM Open Access Entity.

2. **Implementing entities.** The implementing entity for FSM Component 1 will be the FSM Open Access Entity, once established. Prior to its establishment, the implementing entity will be the Department of Transport, Communications and Infrastructure (DTCI). The FSM Open Access Entity will use the Project proceeds to progressively pay for its obligations: (a) under Component 1A, pursuant to the Palau-FSM Consortium Agreement for the procurement of the Palau-Yap-Guam cable system from the cable system supplier; (b) under Component 1B, pursuant to the Consortium Agreement (if applicable) or otherwise, for the procurement of the Chuuk-Pohnpei cable system from the cable system supplier; and (c) under Component 1C for a one-time partial purchase of international bandwidth for Kosrae.

3. These arrangements will require the following legal documents: (a) a Grant Agreement between IDA and the Recipient; (b) a subsidiary agreement between the Recipient and the FSM Open Access Entity; and (c) a Project Agreement between IDA and the FSM Open Access Entity, to be negotiated once the FSM Open Access Entity has been established.

4. DTCI will be responsible for Component 2 (a) (TA for ICT sector development including the design and ownership structure of existing and new infrastructure) and Component 2 (b) (TA for the reform and development of FSMTC). The Regulator will be responsible for Component 2 (c) (Sector Regulation and Regulatory Capacity Development). The assumption of responsibility by the Regulator for Component 2 (c) will be formalized in: (a) a Subsidiary Agreement between the Recipient and the Regulator; and (b) a Project Agreement between IDA and the Regulator.

5. DTCI will also be responsible for the overall coordination, implementation, and supervision of the Project. Under Component 3 DTCI will recruit and supervise the activities of a Project Coordinator who will support DTCI, DoFA, the FSM Open Access Entity and the Office of the Regulator, as needed. The Project Coordinator will coordinate with the entities responsible for implementation; prepare annual work programs and procurement plans; disseminate audit reports; and, in respect of those activities being carried out by FSM severally, lead the interaction with the World Bank for procurement documents, evaluation reports, etc. The Project Coordinator will seek inputs from DoFA for overall Project financial management and financial reporting. A financial management specialist will be retained by DoFA to assist with the additional workload required of DoFA to complete budgets, audits, and financial reporting under the Project.

6. Given the existing institutional structure for aid management in the FSM (for other development partner-funded activities), DoFA will be responsible for Project financial management, including financial reporting. DTCI will be responsible for overall reporting, monitoring and evaluation. The implementing entities (DTCI, Open Access Entity and Regulator) will be responsible for their respective activities for procurement, contract management, certification of deliverables, etc. DoFA and DTCI both have heavy workloads, a relatively limited number of staff, and are stretched in terms of their capacity to implement this Project in a timely manner. In addition to the management and fiduciary support envisaged under this Project, the World Bank will therefore provide intensified implementation review support through a World Bank-executed PRIF grant covering Palau, FSM, and the Marshall Islands. This will entail regular country visits and policy dialogue.

Financial Management, Disbursement

7. The financial management arrangements in FSM satisfy the financial management requirement as stipulated in OP/BP 10.00. The assessed financial management risk, given the current arrangements and the limited complexity of this Project, is considered Substantial.

8. This is the second World Bank-supported investment operation in FSM, however to date there has been limited implementation in the first investment so there is limited in-country experience with World Bank FM requirements. Mitigating measures to be implemented to reduce FM risks associated with the current Financial Management System are: (a) DTCI will recruit a short-term financial advisor to assist with budget preparation and advice on and assistance with compliance with World Bank FM requirements; (b) DoFA will nominate a qualified finance officer who will have responsibility for maintaining the project accounts; (c) prior to the first disbursement the FMS have an audio conference with the dedicated officer from DoFA to outline the FM requirements; (d) the World Bank FMS will undertake an early visit to the site to ensure the chart of accounts have been correctly set-up within the government system and subcontracting of the audit; and (e) regular FM implementation reviews. A Finance Specialist satisfactory to the Association shall be assigned within three months of effectiveness. In addition, the Project Coordinator will also be required to liaise between the involved entities and included in their role will be to ensure project FM information is available on a timely basis.

9. The most recent government financial statements for year ended September 30, 2013, were unqualified. Based on the request from DoFA staff and the strength of the government accounting system, project expenditure will be fully integrated into the government accounting system. The integration of donor funds into the government accounts is consistent with the financial arrangements for aid funds provided through the United States. The FM assessment mission determined that staff has the capacity to manage the FM requirements for this project subject to the full implementation of the mitigating measures.

Budgeting Arrangements

10. DTCI must submit the Project budget to the Office of Statistics, Budget and Economic Management, Overseas Development Assistance and Compact Management for review for consistency with the National Strategic Development Plan after which it will it include the project into the annual budget allocations. If the Project funds are not initially included in the estimates Appropriation Bill there is provision that foreign funds can be reviewed by congress for approval by resolution. It is recommended the whole amount of the Project funds is entered into the 2013/14 budget and, if not fully expended, any outstanding amounts are carried forward

into the next year.

11. DoFA will prepare and monitor the Project budget which will be consistent with the procurement plan but will also include proposed nonprocurable expenditures, i.e., incremental operating costs and training costs. There will be provision in the Project budget for a short-term FM Advisor to provide assistance to DoFA in the preparation of the Project budget. It is recommended the whole amount of the Project funds is entered into the 2013/14 budget and, if not fully expended, any outstanding amounts are carried forward into the next year. The budget will be monitored by DoFA through FundWare.

Accounting Arrangements

12. The FSM government uses the software, FundWare (United States-based). The accounts payable, accounts receivable, payroll modules integrate into the general ledger. FundWare has an extensive chart of accounts which can classify by state, (e.g., Chuuk, Kosrae), funding source, department, division, and program number. This system is capable of maintaining accounting records that meet the Bank's reporting requirements for this Project. The system creates an obligation function when purchase order information is entered; when orders are paid the commitment amount is reduced. DoFA centrally maintains the accounts for the National Government.

13. DoFA has experience with integrating other donor-financed projects into the accounting system, each with their own assigned program number and own designated account. Other government departments do not enter information into FundWare but have access to it. When established, the FSM Open Access Entity will prepare the financial documentation for Component 1 and the Regulator will prepare the documentation for Component 2(C) and submit this to the DoFA. There is adequate staffing within DoFA to complete the accounting arrangements for this Project and the accounting will be fully integrated into the FundWare system. However, to ensure commitment of adequate FM resources to the project DoFA will nominate a suitably qualified finance officer before the first project disbursement, who will be responsible to ensure the day to day FM requirements of the project are met, work with the short-term finance expert to ensure the correct setting up of the project with the government accounting system, will liaise with DCTI, the FSM Open Access Entity and the Regulator to ensure project documentation is received by DoFA and will act as the FM contact person between FSM and the World Bank. Subject to prior discussion with DoFA the World Bank reserves the right to reject the nomination if the person is not suitably experienced and qualified or does not perform the required tasks. The Project coordinator and short-term finance specialist will also work closely with the DoFA to ensure they receive all the necessary information to maintain up to date accounts and timely reporting. The financial year is from October to September.

Internal Controls

14. The Financial Management Regulations dictate the internal controls framework for the FSM which is sufficiently comprehensive to provide adequate segregation of duties, controls over assets and approval and authorization controls. The most recent audits of the national government indicate there is reasonable compliance and breaches have not been sufficiently material for the auditor to qualify the accounts. All invoices will need to be approved by the nominated person(s) with the appropriate qualifications and technical skills to authorize that the work completed is consistent with the contractual requirements, prior to payment. These

controls are deemed adequate and will be reviewed as part of the Bank's implementation review process.

Flow of Funds

15. All four methods of disbursement will be available, advance, reimbursement, direct payment, and special commitment.

Financial Reporting

16. Financial reporting will be fully integrated into the government accounting system. The Project will allocate a cost center and sub accounts will be created to reflect the specific activities. Hence reports will be generated from the government accounting system. The Project will prepare quarterly interim financial reports in a format agreed to with the Bank that will be consistent with the reports generated from FundWare. Interim financial reports will be prepared on a modified accrual basis, consistent with government reporting and will be submitted not later than 45 days after the end of the reporting period.

External Audit

17. As the Project funds will be fully integrated into the government accounts the audit of the Project funds will become part of the National Government Accounts. Hence no project audit will be required if the National Accounts can include the following note to the accounts:

"Note ***X***. World Bank Financing

(a) The Government of the Federated States of Micronesia received financial support from the World Bank IDA Grant D0040 *dated mm/dd/yyyy* [upon signature of the Grant] to support implementation of [describe].

The summary information on transactions taking place during the year is as follows:

	Current year	**Preceding year**
	$	**$**
Opening Balance of Designated Account	X	X
Amounts received during the year	X	X
Expenditures during the year	(X)	(X)
Balance of Designated Account	X	X

(b) The total amounts received from World Bank IDA Grant D0040 which includes Direct Payments since its commencement were [X] as at [*mm/dd/yyyy*]

(c) The proceeds of the World Bank grant have been expended in accordance with the intended purposes as specified in the Grant Agreement."

The Audited National Government Accounts of FSM is required to be submitted to the Bank within nine months of the end of each fiscal year. However the first audit will not be due until the end of the first full year after the signing of the Financing Agreement.

Disbursement Procedures

18. The Project will have all four Disbursement Methods available: Advance, Reimbursement, Direct Payment and Special Commitment. An officer from DoFA will be identified to authorize Withdrawal Applications. A Designated Account will be opened in the Bank of the Federated States of Micronesia or other financial institution acceptable to the World Bank to facilitate the payment of incremental operating costs. Further details will be provided in the Disbursement Letter. The Project will have four disbursement categories as outlined in Table A3.1.

Table A3.1. Disbursement Categories

Category	Amount of the Financing Allocated USD equivalent	Amount of the Financing Allocated in SDR	Percentage of Expenditures to be Financed by the Grant (Inclusive of Taxes) (%)
(1)(a) Goods, works, non-consulting services, and consultants' services for Components 1(a) and (b) of the Project	41,000,000.0	27,700,000.0	100
(1)(b) Goods, works, non-consulting services, and consultants' services for Component 1(c) of the Project	3,500,000.0	2,360,000.0	100
(2) Consultants' services and Training for Component 2(a) and (b) of the Project	1,000,000.0	670,000.0	100
(3) Goods, Consultants Services and Training for Component 2(c) of the Project	1,250,000.0	840,000.0	100
(4) Consultants' services, goods and Operating Costs for Component 3 of the Project	750,000.0	500,000.0	100
Total Amount	**47,500,000.0**	**32,100,000.0**	100

19. **Disbursement conditions:**

(a) No withdrawal shall be made under Category (1)(a)-Component 1 until the Asian Development Bank Cofinancing Agreement with Palau is executed and all conditions precedent to its effectiveness or to the right of the recipient to make withdrawals under it have been fulfilled-Financing Agreement Schedule 2, IV, B, 1(b)(iv).

(b) No withdrawal shall be made under Categories (1)(a) and 1(b)-Component 1 until the FSM Open Access Entity has been established and made operational; the Association has entered into a Project Agreement with the FSM Open Access Entity and FSM has entered into a Subsidiary Agreement; and the Association has received a legal opinion or opinions attesting that the Project Agreement and the Subsidiary Agreement has been duly executed, delivered and ratified by all necessary governmental or corporate action, and are legally binding upon FSM and FSM Open Access Entity, respectively- Financing Agreement Schedule 2, IV, B, 1(b) and (c).

(c) No withdrawal shall be made under Category (1)(a)-Component 1 until the FSM Open Access Entity has entered into the Consortium Agreements and the Association has

received a legal opinion or opinions attesting that the Consortium Agreements have been duly authorized and are legally binding upon all parties- Financing Agreement Schedule 2, IV, B, (b)(v).

(d) No withdrawal shall be made under Category (1)(a)-Component 1 until the FSM Open Access Entity has obtained all licenses, permits, and approvals required for the operation and supply of international and domestic wholesale communication services in the Project areas- Financing Agreement Schedule 2, IV, B, (b)(vi).

(e) No withdrawal shall be made under Category (1)(a)-Component 1 until the Association and the Co-financier have entered into a memorandum of understanding setting forth the joint arrangements for implementation of Part 1(a) and (b) of the Project, in form and substance satisfactory to the Association- Financing Agreement Schedule 2, IV, B, (b) (viii).

(f) No withdrawal shall be made for payments under Category (1)(a)-Component 1 until Landing Party Agreement(s) have been entered into; all necessary authorization and permits for landing of the cable in FSM, Palau and Guam have been obtained; & evidence is supplied that FSM Open Access Entity has secured, jointly or severally, adequate capacity for the cables serving Yap & Chuuk to connect to the global telecommunications network- Financing Agreement Schedule 2, IV, B, (b)(vii) and (ix).

(g) No withdrawal shall be made for payments under Category (1)(b)-Component 1 of the Project unless the FSM Open Access Entity has entered into arrangements with communication service providers, in form and substance satisfactory to the Association, for the provision of satellite services for Kosrae- Financing Agreement Schedule 2, IV, B, (c).

(h) No withdrawal shall be made for payments under Category (3)-Component 2 until: (a) the Office of the Regulator has been established and made operational in accordance with the Telecommunications Act; (b) the Association has entered into a Project Agreement with the Office of the Regulator; (c) the Recipient has entered into a Subsidiary Agreement with the Office of the Regulator; and (d) the Association has received a legal opinion or opinions attesting that the Project Agreement and the Subsidiary Agreement have been duly executed, delivered and ratified by all necessary governmental or corporate action, and are legally binding upon FSM and Office of the Regulator, respectively- Financing Agreement Schedule, IV, B, (d).

Procurement

20. Procurement for the proposed Project will be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits," dated January 2011 and revised July 2014 (Procurement Guidelines); and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers," dated January 2011 and revised July 2014 (Consultant Guidelines); and the provisions stipulated in the Financing Agreement.

21. **Component 1A:** an IDA grant of $22.5 million for FSM will be used to finance the capital costs of the Palau-Yap-Guam submarine cable system. The procurement will be done through international competitive bidding (ICB) procedures using the World Bank's Standard Bidding Documents for Procurement of Plant Design, Supply, and Installation. This procurement will be jointly cofinanced by ADB ($25 million for Palau). The MOU under preparation between ADB and the World Bank will state that this procurement will be regulated

by the World Bank's Procurement Guidelines. ADB will request a waiver from its Board of Executive Directors to permit bidders from non-ADB member countries to participate. As lead cofinancier from a procurement perspective, procurement reviews will be managed by the World Bank, with due consultation to take place with ADB. The protocols on the procurement review and supervision will be stipulated in the MOU between the ADB and the World Bank. Responsibility for the procurement of the Palau-Yap-Guam submarine cable system will rest with Palau Cable Company and the FSM Open Access Entity in accordance with the terms of the Consortium Agreement.

22. **Component 1B:** an IDA grant of $18.5 million will finance the Chuuk-Pohnpei submarine cable system. The Chuuk-Pohnpei submarine cable system would be packaged together with Palau-Yap-Guam submarine cable system and would be procured through ICB procedures. The World Bank's Standard Bidding documents for Plant Design, Supply and Installation will be used. FSM Open Access Entity will undertake the procurement of the entire cable system jointly with Palau Cable Company, including the Pohnpei to Chuuk segment, according to the terms of the Consortium Agreement. In circumstances where no such agreement is reached to procure the Palau-Yap-Guam, and Chuuk-Pohnpei cables jointly, an appropriate alternative will be determined. For example: (a) the Chuuk to Pohnpei segment may be procured by the two cable companies under one bidding process but with two lots; or (b) it may be procured by the FSM Open Access Entity severally under a separate bidding process.

23. **Component 1C:** an IDA grant of $3.5 million will be used to part-finance the purchase of capacity to provide broadband Internet to Kosrae. As noted in Section VI above, O3b Networks offers the most cost effective solution for Kosrae broadband connectivity and the technology used (low-latency medium earth orbit satellite connectivity) is only provided by a single supplier globally. Given these circumstances, Direct Contracting will be used for procurement of the service to Kosrae from O3b Networks.

24. **Component 2: Technical Assistance, and Component 3: Project Management.** Standard procurement procedures in the Procurement Guidelines and Consultant Selection Guidelines included in Table A3-2 will be followed for these Components.

25. **The procurement thresholds and prior review thresholds** applicable to the Project are set out in Table A3-2. In addition to the prior review, the capacity assessment of the implementing agency has recommended that procurement implementation support shall be carried out at least once a year.

Table A3.2. Procurement Thresholds and Prior Review Thresholds

Procurement Methods	Procurement Thresholds	Prior Review Thresholds
Procurement of Goods		
International Competitive Bidding (ICB)	≥$500,000.	All contracts subject to prior review
Shopping	<$50,000.	First two contracts subject to prior review
Direct Contracting	Meet the criteria set out in para. 3.7 of Procurement Guidelines	All contracts subject to prior review
Procurement of Submarine Cable Systems		
International Competitive Bidding (ICB)	Apply to Palau-Yap-Guam Submarine Cable System and Chuuk-Pohnpei Submarine Cable System	All contracts are subject to prior review
Selection of Consultants		
Selection Methods	Applicability	Prior Review Thresholds
Firms (QCBS, QBS, LCS, CQS and SSS)	In accordance with the Bank's Consultants Guidelines	≥$100,000, and all SSS contracts
Individual Consultants		≥$50,000 (exception made to SSS, legal and procurement related assignments, where all contracts are subject to prior review)

Procurement Risk and Mitigating Measures

26. The overall procurement risk for the Project is rated as high. The main procurement-related risks identified include: (a) lack of coordination between two participating countries, (b) complexity of procurement, (c) lack of procurement and technical capacity, and (d) delays in the procurement process due to internal and external clearance. To address those risks, the following mitigating actions have been agreed: (a) a qualified Project Coordinator will be selected in FSM to manage day to day Project implementation in FSM including procurement, (b) a technical specialist (Project Manager) has been hired jointly by FSM and Palau to assist with the preparation of technical specifications, bidding documents and evaluation of bids for the joint aspects of the project, (c) an MOU will be signed between ADB and the World Bank which will define their roles and responsibilities and the procurement procedures for joint co-financed Palau-Yap-Guam submarine cable system, (d) procurement progress will be closely monitored against the procurement plan by FSM with assistance from the Project Coordinator.

27. **Procurement plan**. FSM has prepared a procurement plan for Project implementation which provides the basis for the procurement methods. This plan has been agreed between the Recipient and the Bank and will be available in the Bank‘s external website. The Procurement Plan will be updated in agreement with the Bank annually or as required to reflect the actual Project implementation needs and improvements in institutional capacity. Summaries of the procurement plans for FSM are presented in Table A3.3 and A3.4 below:

Table A3.3. Procurement Plan - Procurement of Goods, Works, and Nonconsulting Service

Ref. No.	Description of item	Estimated Cost $ million	Category	Procurement Method	World Bank Review (Prior/Post)
FSM-1	Submarine cable system (1) Palau-Yap-Guam submarine cable system, and	47.50 *	Works	ICB	Prior
	(2) Chuuk-Pohnpei submarine cable system	18.50			
FSM-2	Kosrae Broadband Connectivity	3.50	Non-consulting services	Direct Contracting	Prior
FSM-3	Office equipment	0.025	Goods	Shopping	Prior

*Jointly financed with ADB

Table A3.4. Procurement Plan - Consulting Services

Ref. No.	Description of item	Estimated Cost $	Selection Method	World Bank Review (Prior/Post)
FSM-1	Technical advisor/project director for Chuuk and Kosrae subcomponents	150,000	IC	Prior
FSM-2	Restructuring of FSMTC and ownership of new international connectivity assets	250,000	CQS	Prior
FSM-3	Legislative and policy advisory assistance	200,000	IC	Prior
FSM-4	Development of regulatory and universal access policy	400,000	QCBS	Prior
FSM-5	Regulatory specialist	300,000	IC	Prior
FSM-6	Project coordinator	150,000	IC	Prior
FSM-7	Financial management specialist	100,000	IC	Prior
FSM-8	Communications specialist	50,000	IC	Prior
FSM-9	Auditor	50,000	CQS	Prior

Environmental and Social (including safeguards)

28. *Social safeguards.* The Project is anticipated to have many positive social impacts by improving access to communication that can help promote socioeconomic activities of FSM. The beneficiaries of the Project which can expect improved operations through more efficient transactions and access to information include small- and medium-enterprises, primary producers, service industries, health and education sectors, government agencies, and disaster preparedness/management.

29. Stakeholder consultations were undertaken in Pohnpei, Yap, and Chuuk in July 2014 during which the government/consultant made a presentation of the project, as well as environmental and social sector safeguard issues, mitigating measures and accompanying maps showing the location of the preferred alignment. This was followed by a question and answer period. Details of these consultations, issues raised and responses provided are held in the respective initial environmental examinations. The overwhelming opinion of all participants was full support for the Project and an urgency to get this in place as quickly as possible. Although there were matters of clarification raised (size of cable, installation activities etc.), no negative comments were expressed. The community was advised that the safeguard documents would be

publicly disclosed both locally and on *InfoShop*.

30. The poverty reduction and social strategy undertaken as part of Project preparation concluded that access to ICT (telecommunications) also improved women's access (young and elderly) to family members within FSM but most importantly for family members and friends who live overseas. Moreover, it has also helped improve time management between home and work (rural women) and home in urban and rural areas. Access to faster and cheaper Internet is expected to further improve people's opportunities to communicate their needs. With improved telecommunications and access points made available in communities, women can easily communicate with their counterparts in other areas without having to travel and incurring high expenses as well as relying on other people for information and transactions. The key gender issues that the Project is expected to impact are: (a) women's improved access to social services particularly through e-education and health as a result of improved communications services; (b) employment opportunities for women in both project management and maintenance including creation of spin-off employment or business opportunities from fiber optic cable; and (c) increasing awareness on internet security and safety among girls and women.

31. The safeguards documentation prepared by the Recipient confirms that in Yap, the land for both the landing site, and the site for the cable station are on vacant government land and that the sites are not being used by other parties. No structures, crops or productive trees will be affected. No land acquisition is required for any of the landing sites and all cable routes are along existing government owned roads. Construction related impacts are managed via the ESMP to ensure these are mitigated and inconvenience to local communities minimized. Due diligence documentation has been prepared for the Palau and FSM landing sites.

32. The Project sites (cable landing site and site for cable station) in Yap will be located on a government land in Nimar Village in Weloy Municipality, Colonia (Parcel No. 002 F 01 title) thus will not require land acquisition. Both the cable landing site and the site for the cable station are on a vacant government land in a government precinct including staff quarters, government offices, the post office and Office of Lands in the capital.

33. The cable landing station for Chuuk will be on land purchased by the state Government for the purposes of the airport. Part of the overall land area being acquired by the state Government for the airport has not been paid for in full, and this process is continuing. Notwithstanding this, no outstanding issues remain in relation to the actual land on which the cable landing site will be located; this land is fully owned by the Government. This is confirmed in a letter from the Governor of Chuuk State to the Chairperson of the FSM Fiber Optic Cable Taskforce. This is fully documented in the due diligence report.

34. The landing site and cable station in Palau are also covered by a due diligence report. The fiber optic cable landing site in Meyuns Hamlet in Koror does not require acquisition of private land nor entail displacement of people, food gardens or physical structures. The landing site has an existing beach manhole to connect the cable once it reaches land from the marine channel. The landing site is on government-owned land, near the Office of the President's extension office and existing earth station complex of Palau National Communications Corporation compound. The cable station, located inside the PNCC compound, is approximately 150 meters from the cable landing site and has an existing underground conduit connecting the station with the landing site which has the space required to receive the cable.

35. In Guam, one of the existing landing sites and stations will be used. No new

sites/facilities or construction activities are required.

36. The population of FSM is comprised of many ethnicities; and all are descended from, and belong to, the Micronesian culture. These different ethnicities are Chuukese 48.8 percent, Pohnpeian 24.2 percent, Kosraean 6.2 percent, Yapese 5.2 percent, Yap outer islands 4.5 percent, Asian 1.8 percent, Polynesian 1.5 percent, other 6.4 percent, unknown 1.4 percent (2000 census). Based on recent analytical work completed by the World Bank, the communities within FSM are not considered to have the four characteristics required to trigger OP 4.10 (Self-identification as distinct indigenous cultural group and recognition of this identity by others; Collective attachment to geographically distinct habitats or ancestral territories in project area and the natural resources in these habitats or territories; customary cultural, economic, social or political institutions separate from those of the dominant society and culture; and indigenous language, often different from official language of the country or region). Accordingly it is proposed that this OP not be triggered.

37. Component 1A involves the laying of a 1,527 km submarine fiber optic cable between Palau, Yap and Guam. Component 1B involves the laying of a 750km submarine fiber optic cable between Chuuk and Pohnpei. According to the indicative design, the cable will be buried in the shallow water approaches to the landing sites and will likely be surface-laid along the deep water route. In sections where the cable is not buried it will lie directly on the seabed. By avoiding seamounts, it is possible to position the proposed cable so that it will only rise from below 1,000m depth as it nears the landing sites at each end. This will minimize the risk of damage from deep sea bottom trawling.

38. The affected bodies of water (between Guam, Palau, and Yap and between Pohnpei and Chuuk) are sensitive marine environments but there are no proposed or established protected areas documented along the oceanic portions of the cable routes. Although the area has several marine protected sea flora and fauna, these species and their habitats are unlikely to be disturbed for the most part by the Project activities. Any disturbance during detailed survey and cable laying operation is expected to be localized and temporary. The cable will be placed along the seafloor, with deep sea sections resting on the seabed, and sections inside the 40m contour (approximation), buried about 0.75m below the seabed. The cable will be brought to shore by following existing shipping channel routes, thereby minimally interfering with coastal ecology.

39. The Project will impact a corridor of not more than 0.5 m wide on the sea floor, and in some locations up to 0.75 m beneath the sediment. The cable, 3-7.5 cm in diameter, will be either sitting on the seafloor in the deep ocean, or be buried as it passes through the natural channel through the barrier reef into the Yap or Chuuk near-shore zone. Burial of the cable will be done to reduce interference with coastal fishing gear and reduce the risk of damage from severe storms. As it enters into the near-shore waters, the cable alignment will be in the shipping channel which is inside the barrier reef and essentially has a coral rubble and sand seafloor. For the last 1-2 km the cable will be buried at a depth of about 0.75m, using a special trenching device which disturbs an area of about 0.4m wide x 0.7m deep, threads the cable into the trench and closes the trench as it is towed by the cable laying vessel. There is no other disturbance to the sea floor or the water column.

40. The Chuuk branch line will run directly from the junction to Weno, entering the Chuuk Lagoon through the northeast channel. The draft Chuuk Historic Preservation Act declares there are a significant number of sunken WW2 relics (including 80 wrecks) in Chuuk Lagoon protected under law and these shipwrecks for nomination to UNESCO's World Heritage listing.

The ESMP has identified potential impacts to the physical cultural resources (PCR) and mitigating measures and chance find provisions are contained therein. A separate PCR management plan will be prepared and disclosed after detailed information on the relics is gathered during the oceanographic and bathymetric survey. The ESMP also establishes a chance-find procedure by requiring that if the alignment is found to affect any cultural heritage once the work has begun, mitigating actions will be discussed with local officials and an optional plan implemented and monitored.

41. The rest of the Project investments are limited to the landing station and renovations of offices in Palau, Yap and Chuuk. Thus, an environment and social impact assessment has been prepared for the Project (in the form of an initial environmental examination funded by the ADB). Potential environment and social impacts have been documented and mitigation measures established in the ESMP which includes an ECOP which lists the items defined in the ESMP and adds further detail on boundaries and restriction to be adhered to by contractors conducting work in the marine environment and on shore. The ESMP will be applicable to all Project activities, starting with the laying of the submarine cable following standard best practice for laying and for repair of submarine cables.

42. The Project will trigger the Environmental Assessment OP4.01, and has been assigned an EA category "B." It has also triggered Natural Habitats OP4.04 and Physical Cultural Resources OP/BP 4.11.

43. In order to effectively implement the mitigation and monitoring tasks defined in the ESMP, DTCI will hire a Safeguards monitor who will assist with implementation and monitoring of the ESMP, primarily during the construction period of the project. FSM National and State governments are fully committed to implementing the ESMP. DTCI will take overall responsibility for all reporting requirements, recruitment and supervision of the Safeguards monitor, and will manage any noncompliance issues and public complaints.

44. Safeguards documentation was disclosed in FSM on October 23, 2014 and in Palau on October 24, 2014.

Monitoring and Evaluation

45. Monitoring and evaluation will be undertaken by DTCI in accordance with the Results Framework established for the Project. Data on actual Project outputs and outcomes will be gathered, analyzed and included in semi-annual progress reports to be submitted to the World Bank.

C. Role of Partners

46. The ADB is cofinancing the Project (Palau components) through its North Pacific Connectivity Project. Component 1 of the Project for the construction of the Palau-Yap-Guam submarine cable system will be implemented using the World Bank's policies in relation to, *inter alia*, procurement, safeguards, fraud and corruption, financial management, communication, etc. Within these limits, issues that have arisen so far as a result of the different policy regimes of ADB and the World Bank have been dealt with pragmatically, and have been addressed through consultations and the sharing of documents. In particular:

(a) *Joint safeguards requirements and monitoring.* ADB and the World Bank recognize the importance of environmental and social safeguards under the Project and agree to cooperate in implementation and monitoring safeguards under Component 1A;

(b) *Consultation and coordination.* To ensure smooth operation and efficient implementation and monitoring of Project implementation, a co-financiers' coordination committee composed of ADB and World Bank representatives will be put in place.

(c) *Joint procurement arrangements.* These are described in paragraph 20 above.

47. Moving forward into implementation, ADB and the World Bank will make best efforts to field joint missions and will, in any event, share any aide-memoires, back-to-office reports, and other key information to ensure that all aspects of the overall project remain in compliance with World Bank safeguards requirements.

ANNEX 4. OPERATIONAL RISK ASSESSMENT FRAMEWORK (ORAF)

Palau-FSM Connectivity Project

Risks

Project Stakeholder Risks							
Stakeholder Risk	Rating	Substantial					
Risk Description: Change in political commitment and cooperation of telecoms industry (opposition to move from partial to full competition).	**Risk Management:** Enactment of new Telecommunications Bill in FSM (April 2014);new Telecommunications Bill to be prepared for Palau in 2015.						
	Resp: Client	Status: In Progress	Stage: Both	Recurrent:	Due Date: 29-May-2014	Frequency:	
	Risk Management: FSM Telecommunications Corporation and Palau National Communications Corporation have formed a joint MicroPal Committee.						
	Resp: Client	Status: Completed	Stage: Both	Recurrent: ☑	Due Date:	Frequency:	
	Risk Management: Continuous consultation and awareness-raising around benefits of sector reforms, including improved connectivity.						
	Resp: Both	Status: In Progress	Stage: Both	Recurrent: ☑	Due Date:	Frequency:	

Implementing Agency (IA) Risks (including Fiduciary Risks)							
Capacity	Rating	High					
Risk Description: There is a substantial risk regarding counterpart preparation and implementation capacity at the national level. While the relevant Government ministries in FSM and Palau both keenly support the proposed Project, they face severe budget and human resource constraints. As a result, there are significant risks of delays in management of procurement, financial management and project oversight generally.	**Risk Management:** This risk will be mitigated by: (a) providing technical support for project implementation; (b) close collaboration between the World Bank, ADB and the Governments in project preparation activities, and ensuring ongoing consultation among all stakeholders (Governments and implementing agencies, beneficiaries, external development partners); and (c) setting achievable development objectives and a limited number of monitorable, strategic activities that will be within the capacity of the Governments and implementing entities.						
	Resp: Both	Status: In Progress	Stage: Both	Recurrent: ☑	Due Date:	Frequency:	
	Risk Management: Frequent meetings (face to face and virtual) between World Bank, ADB, FSM and Palau task force members.						

	Resp: Client	Status: In Progress	Stage: Preparation	Recurrent: ☑	Due Date:	Frequency:
Governance	Rating: Substantial					
Risk Description: Inadequate framework for instructing and managing specialist TA.	**Risk Management:** President-appointed task forces in both Palau and FSM to oversee sector reform, including possible industry restructuring, will promote transparent and sound governance among stakeholders. World Bank will closely review project execution.					
	Resp: Client	Status: Not Yet Due	Stage: Implementation	Recurrent: ☑	Due Date:	Frequency: CONTINUOUS
Project Risks						
Design	Rating: High					
Risk Description: The design and implementation of a joint venture structure for financing, owning and operating a submarine cable system between Palau-Yap-Guam on an open access basis is, by its nature, a complex undertaking, particularly when it involves the participation of two countries.	**Risk Management:** Design and implementation arrangements extensively discussed upfront, but institutional arrangements will take some time to be put in place and disbursement conditions have therefore been included for component 1 in particular. Risks will be addressed by the engagement of specialist international advisors with expertise in the design and implementation of similar structures around the world.					
	Resp: Client	Status: In Progress	Stage: Both	Recurrent: ☑	Due Date:	Frequency: CONTINUOUS
Social and Environmental	Rating: Low					
Risk Description: Environment risks associated with laying and operating submarine cables and supporting infrastructure (e.g. the cable landing stations).	**Risk Management:** The Project will provide TA to support the implementing agencies to manage these risks. A Safeguards monitor will assist in assessing the Project's safeguards performance.					
	Resp:	Status:	Stage:	Recurrent:	Due Date:	Frequency:
Program and Donor	Rating: Moderate					
Risk Description: Coordination with the ADB as cofinancing partner.	**Risk Management:** Agreed preparation timetable, joint missions, proposed Memorandum of Understanding.					
	Resp: Bank	Status: In Progress	Stage: Preparation	Recurrent:	Due Date: 01-May-2014	Frequency:
Delivery Monitoring and Sustainability	Rating: Substantial					

Risk Description: Procurement delays and other contractual delays associated with the submarine cable system.	**Risk Management:** Close support on procurement, and project management and execution. Bank executed TA will provide monitoring and support. Advance preparation of as much relevant documentation as possible.					
	Resp: Client	Status: Not Yet Due	Stage: Implementation	Recurrent: ☑	Due Date:	Frequency: CONTINUOUS
Other	Rating: Moderate					
Risk Description: The regional nature of the Project creates risks. Component 1 covers two countries and relies on joint implementation by Palau and FSM and negotiation of landing party arrangements in Guam.	**Risk Management:** Risks will be mitigated through careful design of the Project drawing on experience of other projects implementing public private partnerships or establishing special purpose vehicles for telecommunications infrastructure. A formal joint venture between FSM and Palau to undertake the cable project will be established in terms of a Consortium Agreement and related documentation satisfactory to IBRD, thus reducing stakeholder risks and complexity. Risks will also be minimized through clear formal delineation in the Consortium Agreement of roles and responsibilities of the FSM and Palau in key areas such as financing and procurement.					
	Resp: Client	Status: Not Yet Due	Stage: Both	Recurrent:	Due Date: 30-Sep-2014	Frequency:

6. Overall Risk

Overall Implementation Risk: **Substantial**

Risk Description:

Given the scope and complexity of the Project and its financing structure, the limited capacity of the participating countries' institutions, and the limited previous experience of managing World Bank-financed projects in FSM, the overall implementation risk rating is substantial. This will be mitigated by close coordination efforts through the MicroPal steering committee, and ongoing provision of technical assistance. In addition, FSM and Palau have jointly hired a project director, financed under the PRIF grant (P132686). The WB-ADB MOU will guide coordination between the cofinanciers.

ANNEX 5. IMPLEMENTATION SUPPORT PLAN

Palau-FSM Connectivity Project

Strategy and Approach for Implementation Support

1. The Implementation Support Plan focuses on mitigating the risks identified in the ORAF, and aims at making implementation support to the client more flexible and efficient. It seeks to provide the technical advice necessary to facilitate achievement of the PDO (linked to results/outcomes identified in the result framework), as well as identify the minimum requirements to meet the World Bank's fiduciary obligations.

- **Procurement.** Implementation support will include: (a) providing training to implementation agency staff on procurement; (b) supporting the Procurement specialists hired under the Project; (c) reviewing procurement documents and providing timely feedback to the implementing agency; (d) providing detailed guidance on the World Bank's Procurement Guidelines to the Government; (e) monitoring procurement progress against the detailed Procurement Plan; and (f) providing just-in-time training and support at key moments in the procurement cycle;
- **Financial management.** Implementation support will include: (a) reviewing of the country's financial management system, including but not limited to, accounting, reporting and internal controls; (b) leveraging the financial management specialists hired to support the Project; (c) hiring additional staff and providing training as needed to the implementing agency; and (d) reviewing submitted reports and providing timely feedback to DTCI.
- **Other issues.** Sector level risks will be addressed through policy dialogue with the government's departments and agencies.

Implementation Support Plan

2. FSM has limited experience in implementing World Bank financed Projects, and given the relative complexity of structuring and implementing the Project, this operation will require fairly intensive supervision, especially during the first two years of implementation. The World Bank team is based primarily in country offices, and will be available to provide timely, efficient and effective implementation support to the clients. Formal implementation review and field visits will be carried out at least four times annually in the first two years, with two to three annual visits in later years of the Project. These will be complemented with bi-monthly audio-conferences to discuss Project progress. In addition, as there is no World Bank country office in FSM, an operations specialist will be deployed on an extended mission basis to provide advice and support as needed to the Project implementing entities. Detailed inputs from the World Bank team are outlined below:

- Technical and policy inputs. Technical and policy related inputs will be required to review bid documents to ensure fair competition, sound technical specifications and assessments, and confirmation that activities are in line with Government' ICT and growth strategies.

- Fiduciary requirements and inputs. Training will be provided by the World Bank's financial management and procurement specialists as needed. The World Bank team will help identify capacity building needs to strengthen financial management capacity and to improve procurement management efficiency. Financial management and the procurement specialists will be based in the region to provide timely support. Formal supervision of financial management will be carried out semi-annually or annually, while procurement supervision will be carried out on a timely basis as required by client needs.
- Safeguards. Inputs from gender, environment and social specialists will be provided as needed.
- Operation. The Task Team will provide day-to-day review of all operational aspects, as well as coordination with the clients, partners (ADB) and among World Bank team members. Relevant specialists will be identified as needed.

3. The World Bank will conduct a minimum of two review missions per year during Project implementation. This will be undertaken jointly with the ADB, and the particular modalities of cooperation will be agreed. A midterm review will be conducted after 2.5 years, which will encompass: (a) a thorough review of the execution of the Project and the achievement of Project objectives to date; and (b) agreement between the World Bank and the two governments on recommended measures to ensure efficient execution of each component and successful achievement of the project objectives in the period after the review, all in accordance with agreed performance indicators. Each Government will provide the World Bank a Project Completion Report six months prior to Project closing and inputs to the Implementation Completion Report to be prepared by the World Bank. The World Bank will support public dissemination of Project information.

Implementation Support

Time	Focus	Skills Needed	Resource Estimate (SWs)
Years 1-3	Technical review of submarine cable system implementation, Kosrae connectivity, plus TA documents and outputs	Technical and Legal Specialists	16
	Environmental Monitoring	Environ. Specialist	2
	Social Monitoring	Social Specialist	2
	Review of financial management & training	FM Specialist	8
	Review of procurement & training	Procurement Specialist	6
	Implementation Support	Operations officer	10
	Implementation Support	Program Assistant	6
	Team Leadership	Task Team Leader	8
	Communications advice and support	Communications Specialist	6
Years 1-5	Technical Reviews of TA Outputs & Reform Progress	Technical & Legal Specialists	12

Time	Focus	Skills Needed	Resource Estimate (SWs)
	Environmental Monitoring	Environ. Specialist	2
	Social Monitoring	Social Specialist	2
	Review of procurement documents	Procurement Specialist	6
	Review of financial management	Financial Specialist	8
	Implementation Support	Operations officer	24
	Implementation Support	Program Assistant	6
	Communications advice and support	Communications Specialist	4
	Team Leadership	Task Team Leader	18

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
TTL	26	8	Country office based
Program Assistant	12	0	Country office based
Technical Specialist	36	12	Globally sourced
Legal Specialist	25	8	Globally sourced
Environ. Specialist	6	2	Country office based
Social Specialist	6	1	Country office based
Financial Mgmt Specialist	16	6	Country office based
Procurement Specialist	12	6	Country office based
Operations officer	34	12	Country office based
Country Counsel	6	1	For negotiations.
Communications	8	2	Country office based

Partners

Name	*Institution/Country*	*Role*
Francis Itimai	Secretary of DTCI (FSM)	FSM/MicroPal Task Forces
Mark de Orio	Asst. Secretary, DTCI (FSM)	Chair of FSM Task Force
Scott Garvey	Department of Finance and Administration, FSM	FSM/MicroPal Task Forces
Aaron Warren	Department of Justice, FSM	FSM/MicroPal Task Forces
Jolden Jonnyboy	Consultant, DTCI (FSM)	FSM/MicroPal Task Forces
Rhinehart Silas	Director of Taxation (Palau)	MicroPal Task Force
Keobel Sakuma	Office of the President (Palau)	MicroPal Task Force
Ryan Zinchefsky	Office of the President (Palau)	MicroPal Task Force
Sibesh Bhattacharya	Asian Development World Bank	Task Team Leader-ADB (Palau)

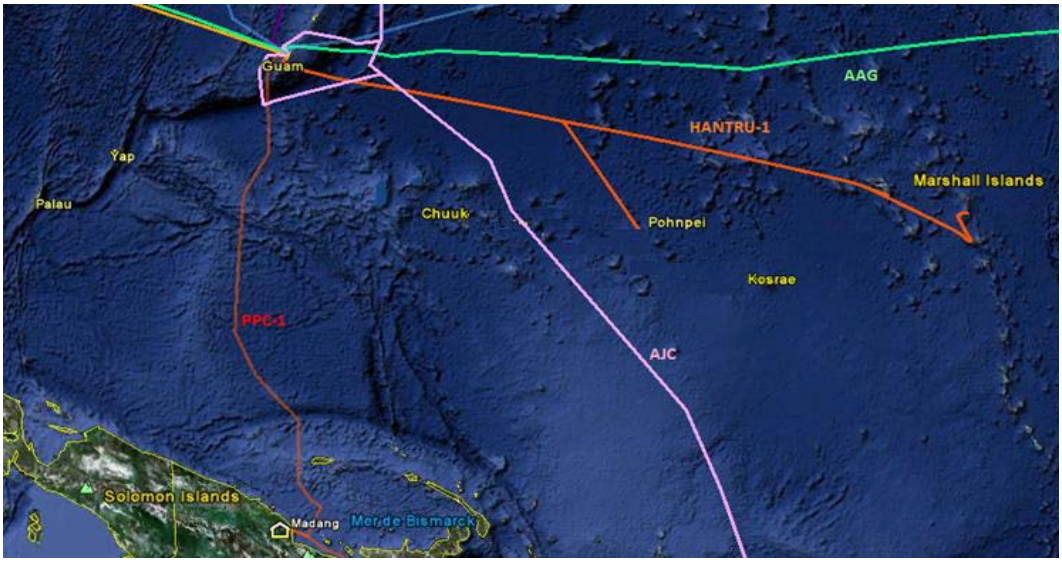
ANNEX 6. FINANCIAL AND ECONOMIC ANALYSIS

Palau-FSM Connectivity Project

Financial and Economic Analysis

1. The Project will leverage existing submarine cable infrastructure to minimize costs and maximize potential return. Landing on Guam, the branching unit on the Pohnpei spur (to the existing HANTRU-1 cable) and the Pohnpei landing station provide the only viable landing/interconnection points for the proposed cable systems. None of the other existing submarine cables in the region shown in Figure A6.1 (e.g., HANTRU-1, PPC-1 or Australia to Japan) were designed and manufactured to allow for new midpoint connections for Palau or FSM and no viable commercial opportunities are available on these cables to connect Yap/Palau, or Chuuk. The proposed segments are effectively connected nodes as part of the Northern Pacific telecommunications cable network, HANTRU-1, which connects two IDA member states, the Marshall Islands and FSM, to the rest of the world.

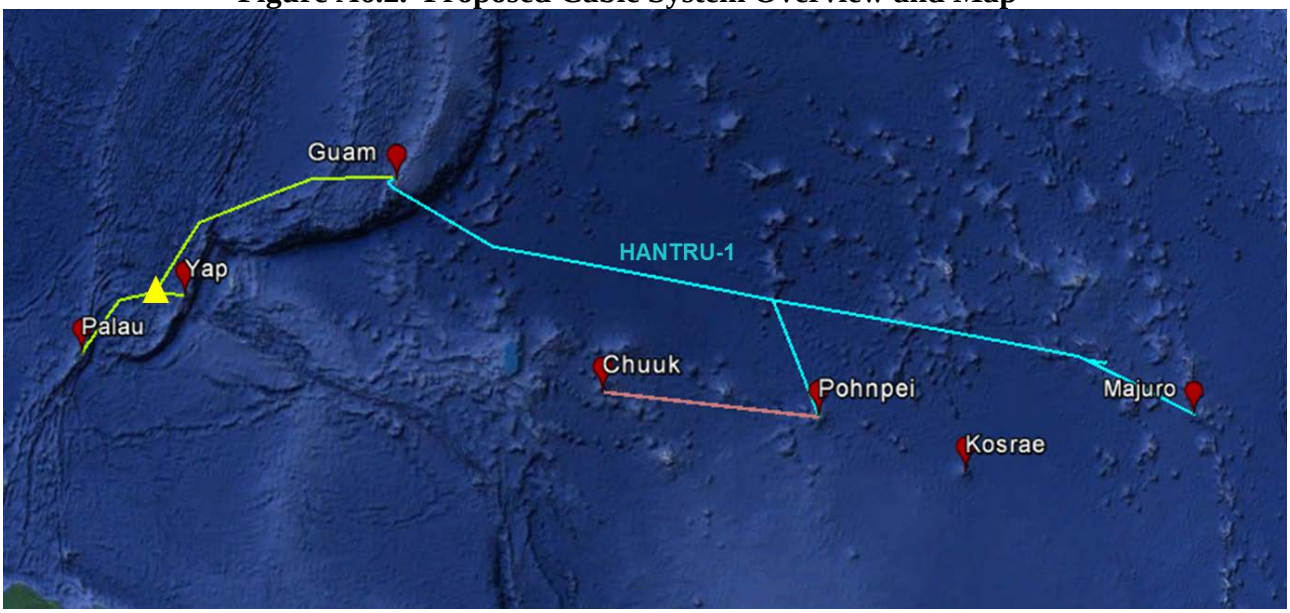
Figure A6.1. Existing Cable Infrastructure



2. The proposed approach will provide submarine fiber access points connecting the states of Yap and Chuuk to the existing regional cable systems which terminate on Guam. It will also deploy high-speed medium-earth orbit satellite capacity for Kosrae. This solution will provide the underlying international connectivity infrastructure needed in order to support the supply of broadband services to over 70 percent of the total population of FSM (accounting for the vast majority of educational, health facilities and businesses). This would be done through:
(a) connecting the FSM State of Yap via the proposed Palau-Yap-Guam cable system;
(b) connecting the FSM State of Chuuk to the HANTRU-1 Cable in Pohnpei, the existing regional cable system that connects Guam (US), Pohnpei (FSM), Kwajalein and Majuro (Marshall Islands); and (c) deploying O3b services on Kosrae.

3. The integrated FSM connectivity cable system would include the Palau-Yap-Guam segment and the Chuuk-Pohnpei segment, as shown in Figure A6.2.

Figure A6.2. Proposed Cable System Overview and Map



Financial Analysis: Palau-Yap-Guam Cable System

4. The total estimated CAPEX for the system is $45 million, plus annual OPEX costs of $1.2 million. It is assumed that interconnection costs ex-Guam would be approximately $100/Mbps/month.[15] The cable system's lifetime is 25 years (at least). The profitability for FSM on the Palau-Yap-Guam cable, after financing, is summarized in Table A6.1. It assumes: (a) a dedicated new cable from Palau-Yap-Guam; (b) fifty-fifty sharing of CAPEX between Palau and Yap; (c) OPEX costs shared 1/4 for Yap and 3/4 for Palau, having regard to the anticipated economic impact of the cable to each consortium member, though the final OPEX cost share will be determined in the final business plan and through negotiation between the parties. [16] The financing calculations in Table A6.1 also take into account the impact of the five-year contract which has been entered into by FSMTC with a satellite service provider, O3b networks, for interim bandwidth for Yap. The evolving bandwidth demand, particularly in Palau, and the greater operational security of a cable solution for Palau and Yap means that O3b or other satellite solution is not considered a desirable long-term solution. It is the policy of the FSM to connect all four states to fiber optic cables.

[15] FSMTC pays approximately $80/Mbps/month for transit on Guam, however, it is not known whether it will be possible for the Palau-Yap-Guam consortium, or for Yap severally, to take advantage of that landing arrangement. For present purposes a more conservative $100/Mbps/month is assumed on the basis that initial bandwidth demand on the PYG cable is forecast at approximately 150Mbps. It is expected and assumed that the Pohnpei-Chuuk cable will pay no more than $80/Mbps/month for transit on Guam and will take advantage of transit between Pohnpei and Guam on HANTRU1 at no cost.

[16] The financial obligations of the members, including sharing of costs for the operation of the PYG cable system, are subject to negotiation and agreement, and will be specified in the Consortium Agreement.

Table A6.1. Financing Assumptions for Yap[17]

Palau-Yap-Guam cable project for Yap		
Project characteristics	**CAPEX**	$22.5M
	OPEX	$0.3M
	IP transit cost	$100Mbps
Three states combined	**Price for bandwidth**	$345/Mbps/mth
	State contribution to NPV=0	$0.03M
Yap as a standalone activity	**Price for bandwidth**	$344/Mb/mth
	Profitability	$0

5. If a single purpose vehicle were to operate the infrastructure for all three FSM states, with an efficient uniform pricing across the three states to deliver NPV=0,[18] then the price for bandwidth would be around $345/Mbps/month (assuming a decreasing pricing structure of 3 percent per annum).[19] This pricing would cover only the operating costs since CAPEX costs will be financed on grant terms. Alternatively, if the Yap segment were run as a single purpose activity, the price for bandwidth where NPV=0 would be approximately $344/Mbps/month (again assuming price decreases 3 percent per annum). In each case it is assumed that the existing O3b contract for Yap is controlled by the Open Access Entity that owns the cable infrastructure—if the O3b contract were to be controlled separately, it could lead to competition between two wholly-owned SOEs which would undermine the business case for each investment. FSM has considered and rejected the possibility of Yap remaining on a satellite only solution via O3b. In that scenario, over the next 10 years (the existing five-year contract plus another five-year contract renewal) the price for bandwidth on Yap would be around $528/Mbps/month where NPV=0 (and assuming a flat pricing structure).

Financial Analysis: Chuuk-Pohnpei Cable System

6. The total estimated capital costs (CAPEX) for the system is $18.5 million from Chuuk (Weno) to Pohnpei, plus annual operations and maintenance (OPEX) costs of $0.3 million. It is assumed that interconnection costs ex-Guam would be approximately $80/Mbps/month, with cost free transit from Pohnpei to Guam. The cable system lifetime is 25 years (at least). The profitability for the Project after financing is summarized in Table A6.2. It assumes approximately $6 million in CAPEX savings associated with constructing the Chuuk-Pohnpei cable system jointly with the Palau-Yap-Guam cable system under a single price contract.

[17] For Yap, Chuuk and Kosrae, the wholesale bandwidth price calculation is indicative only of the level of pricing that could be achieved where NPV=0, based on assumptions around forecast costs and revenues. However, a number of parameters are unknown, including market structure and elasticity, revenue, capital and operational cashflow demands, and the marketing and pricing strategy of the operator. It is anticipated that FSM Open Access Entity will be cautious in developing and implementing its business plan; in comparable markets, owners of new cable infrastructure have invariably set the price relatively high at commencement in order to ensure that costs are met. Regardless, it is important that the price is set so as to maximize social surplus. Technical assistance under the TA Grant and this Project will support government and FSM Open Access Entity in undertaking this analysis. The final cost-sharing ratio for OPEX will be a matter for negotiation between the parties.

[18] Throughout it is assumed that the cost of capital = 6%.

[19] While the model assumes the same OPEX across both institutional models, it is likely that a single purpose vehicle operating infrastructure for all three states (or possibly four, if Pohnpei is included) would deliver material operating cost savings.

Table A6.2. Financing Assumptions for Chuuk

Chuuk-Pohnpei Cable Project		
Project characteristics	**CAPEX**	$18.5M
	OPEX	$0.3M
	IP transit cost	$80/Mbps[20]
Three states combined	**Price for bandwidth**	$345Mbps/mth
	State contribution to NPV=0	$3.3M
Chuuk as a standalone activity	**Price for bandwidth**	$255Mbps/mth
	Profitability	$0

7. The construction of the cable segment for Chuuk is not profitable without substantial financing on grant terms, as proposed under the Project. A uniform pricing model across all three states would best deliver the Government's objective of promoting equitable access to broadband—the per capita GSP is similar between Yap, Chuuk, and Kosrae which indicates price should be uniform to best ensure that broadband penetration develops evenly throughout FSM. If a single purpose vehicle were to operate the infrastructure for all three states, with an efficient uniform pricing across the three states to deliver NPV=0, then as above the price for bandwidth would be around $345/Mbps/month. While O3b service could potentially reach a higher proportion of the population of Chuuk (e.g., without the need for additional terrestrial infrastructure to distribute bandwidth throughout the Lagoon, or unrepeatered fiber spurs to the North West and the Mortlocks), FSM has considered and rejected the possibility of Chuuk remaining on a satellite only solution via O3b. In that scenario, over the next 10 years (the existing five-year contract plus another 5 year contract renewal) the price for bandwidth on Chuuk would be around $922/Mbps/month where NPV=0 (assuming a flat pricing structure). It is assumed that the five-year contract between FSMTC and O3b networks is migrated from Chuuk to Kosrae. It is not financially or economically viable to duplicate cable and O3b bandwidth on Chuuk.[21]

Infrastructure investment for Kosrae

8. In May 2014, with the benefit of a $2 million subsidy from the Congress of the FSM, FSMTC signed a five-year fixed term contract with O3b to supply Chuuk. The commencement date is expected before the end of calendar year 2014. The contract includes annual ramp-up obligations which are indicatively modelled against the anticipated revenues expected from Chuuk. Once the submarine cable lands in Chuuk, at Weno, it will displace the existing O3b service—the Government intends that the O3b service should be migrated to Kosrae, which otherwise is solely reliant upon geostationary satellite services which are costly and offer more

[20] It is assumed that FSMTC holds an IRU for 10Gbps which is sufficient to carry traffic for Chuuk at no additional cost. The modeling here does not provide for any transit fees on HANTRU1 from Pohnpei to Guam. It is expected that FSM Open Access Entity and FSMTC will cooperate and coordinate their activities in order to ensure the efficient operation and management of international connectivity assets in the best interests of consumers. FSM Open Access Entity and FSMTC will not compete in the supply of submarine fiber optic cable services or satellite services.

[21] The continuation of the O3b contract could undermine the business case for the cable for Chuuk, especially slowing down or preventing the build out of the access network throughout the Lagoon that would be needed to distribute bandwidth on the cable from the landing station at Weno.

limited capacity. The inclusion of support for Kosrae is consistent with the government's policy imperative to ensure equitable treatment among all states.

9. The Project will part finance a one-time partial purchase of capacity to secure the redeployment of the existing O3b contract from Chuuk to Kosrae, on terms which promote equality of broadband access across FSM. The financing assumptions in Table A6.3 show the returns for Kosrae over the next eight years until 2024 (notionally, the remainder of the existing O3b contract from the date of redeployment in Q1 2017, plus a new five-year term). Without the $3.5 million subsidy, the starting bandwidth costs of the single entity across the three states would rise from $345/Mbps/month to $393/Mbps/month. The price for bandwidth for a single purpose activity on Kosrae alone, including the $3.5 million subsidy under Component 1C of the Project, would be approximately $759/Mpbs/month where NPV=0 (and price is decreasing 3 percent) or $676/Mpbs (flat price). O3b is likely not viable on Kosrae as a standalone activity—the price would be around $1,140/Mbps/month, but at that price it is unlikely that demand would generate sufficient additional revenue.

Table A6.3. Financing Assumptions for Kosrae

O3b project for Kosrae		
Project characteristics	**CAPEX**	$0.6M
	OPEX	$0.3M
Three states combined	**Price for bandwidth**	$345Mbps/mth
	State contribution to NPV=0	-$3.3M
Kosrae as a standalone activity	**Price for bandwidth**	$759Mbps/mth
	Profitability	$0

10. This solution is financially and technically appropriate, promotes equitable treatment among all four states in FSM, and would provide an opportunity for bandwidth demand in Kosrae to grow over the short- to medium-term (five years plus) to levels which could potentially support the future extension of the Chuuk-Pohnpei-Guam cable system. Beyond the period of service supported by Component 1C, an O3b service for Kosrae is expected to be financially sustainable, either as a standalone activity or combined with Chuuk and Yap. The forecast bandwidth costs in Kosrae beyond 2025 depend upon the particular scenario being considered. It is also recognized that in the medium-term FSM may instead decide to move towards fiber optic connectivity for Kosrae.

Table A6.4. Forecast sustainability of O3b services for Kosrae ($Mbps/mth, decreasing 3% per annum)

	Three states combined					**Kosrae as a standalone activity**				
1-year extension	2025	X				2025	X			
Price for bandwidth ($/Mbps)	279	X				880	X			
5 year extension	2025	2026	2027	2028	2029	2025	2026	2027	2028	2029
Price for bandwidth ($/Mbps)	337	327	317	308	299	933	905	878	851	826

11. An alternative option to connect Kosrae via submarine fiber optic cable is not financially or economically viable at this time. A single entity running the three connectivity projects, with an efficient uniform pricing model across all three states including Kosrae, would best ensure the Government's objective of promoting equitable access to broadband and that broadband penetration develops evenly throughout FSM. Moreover, price for bandwidth will be considerably lower than the existing geostationary satellite solution, at $1,800/Mbps/month.

Economic Analysis: Palau-Yap-Guam Cable System

12. The economic impact of the Palau-Yap-Guam cable on Yap is assessed by estimating the impact on GDP over the next 25 years. The cumulative discounted impact on GDP over the next 25 years is $27.5 million (with a 6 percent discount rate). Therefore, considering that the initial investment is $22.5 million, the net economic impact of the Project is $5 million. The economic rate of return is 8 percent. If the cable were to last a further 10 years (35 years in total), the net economic impact would be $9 million, and the economic rate of return would be 9 percent. This analysis is based on the assumption that broadband penetration (including mobile Internet) will rise from 1 percent to 46 percent within 10 years due to the submarine cable, and data indicating that a 10 percent increase in broadband penetration (wireless Internet + broadband) correlates with a 1.38 percent increase in GDP in developing countries.[22]

13. The submarine cable project would have other direct and indirect impacts: potentially generating up to 800 additional jobs in the first 10 years. This estimation is based on While Crandall, Lehr & Litan's study entitled *"The effect of broadband deployment on output and employment"* dated on 2007, which indicates a ratio between 0.2 and 0.3 percent of job creation per year for 1 percent increase of broadband penetration.

14. Social benefits of broadband are difficult to quantify, but they are nonetheless an essential part of the overall value of broadband along with its economic benefits: delivery of essential public services such as health care and education in a more efficient way, achieving digital inclusion for people from remote areas, attracting and retaining workers.

Economic Analysis: Chuuk-Pohnpei Cable System

15. The economic impact of the Chuuk-Pohnpei cable (Component 1B) is assessed by estimating the impact on GSP of Chuuk over the next 25 years. The cumulative discounted impact on GSP over the next 25 years is $26 million (with a 6 percent discount rate). Therefore, considering that the initial investment is $18.5 million, the net economic impact of the project is $7.5 million. The economic rate of return is 9 percent. If the cable were to last a further 10 years (35 years in total), the net economic impact would be $12 million, and the economic rate of return would be 10 percent. This analysis is based on the correlation between broadband penetration and GDP growth described above. It is also estimated that the submarine cable could generate up to 1,500 additional jobs in the first 10 years. This estimation is based on the correlation between broadband penetration and job creation described above.

[22] This conclusion is based in part on a World Bank study "Economic impact of Broadband" from Christine Zhen-Wei Qiang and Carlo M. Rossotto with Kaoru Kimura (2009). This ratio is quite conservative especially for Pacific Islands as populations are usually concentrated in the main cities and this concentration is supposed to improve the level of impact of a submarine cable which is landing directly in the main city.

Economic Analysis: Kosrae (O3b) Connectivity

16. The economic impact of the Kosrae component is assessed by estimating the impact on gross state product (GSP) over the next 10 years; and then comparing this impact to the cost of selling bandwidth at the same price as the other States that will have a submarine cable (although the cost structure of O3b is much higher than that of a cable). The cumulative discounted impact on GSP over the 2017-2024 period is around $6.5 million (with a 6 percent discount rate). Over the same period, the cost of selling below O3b's prices is also approximately $7 million therefore the net economic impact of this component is close to zero. This analysis is based on the correlation between broadband penetration and GDP growth described above.

17. Nevertheless, providing broadband Internet should also generate direct and indirect impacts. Based on the same methodology as previously described, we estimate that the additional penetration rate provided by the improved connectivity could generate up to 300 additional jobs for Kosrae over a 10-year period.

ANNEX 7. SECTOR BACKGROUND

Palau-FSM Connectivity Project

Federated States of Micronesia (FSM)

1. **FSM faces a significant "digital divide" which compounds the development challenges of this dispersed archipelagic nation.** While access to basic telephony is slowly improving across the country, access to high-speed Internet and its associated value-added services is limited, costly and unevenly-distributed. Pohnpei is the only FSM state with submarine cable connectivity. The HANTRU-1 cable[23] provides 80 Gigabits per second (Gbps) of total capacity to the FSM Telecommunications Corporation (FSMTC), a Government corporation that currently is the sole provider of telecommunications services in FSM. This cable links the islands of Pohnpei (FSM), Majuro and Kwajalein (Marshall Islands) to the United States territory of Guam, the Internet hub for the northern Pacific region (numerous cables ex-Guam link East Asian economies with the west coast of the United States).

2. **Broadband internet access is available in Pohnpei State.** The FSM section of the HANTRU-1 cable was financed by a loan to FSMTC from the United States Department of Agriculture's Rural Utilities Service (RUS). Cable capacity is presently under-used, in part due to sector structure, the costs associated with financing the installation of the cable, and the limited potential demand that is available while only Pohnpei is connected to the cable. Two Gbps of total cable capacity is in service. Monthly bandwidth demand for Pohnpei (95th percentile, based on monthly 5 minute cycle averages) is approximately 240/25 megabits per second (Mbps) total capacity. Currently the direct cost incurred by FSMTC in landing this bandwidth is approximately $460/Mbps/month (comprising $375/Mbps/month in fixed costs and $80/Mbps/month in variable operating costs). The variable cost of transit in Guam on the cable decreases as utilization increases. The price per megabit for 1Gbps, for example, would decrease to approximately $30/Mbps/month. FSMTC has recently launched a 3G service which will initially cover the most populated northern part of Pohnpei, or almost half of the population. Pohnpei is also covered by an asymmetric digital subscriber line (ADSL) service which reaches almost 95 percent of the population, although there are only around 1,000 active subscribers.

3. **But Internet penetration is very limited outside Pohnpei.** The other three FSM states use approximately 50Mbps total capacity, comprising Chuuk 15 Mbps downlink/5 Mbps uplink, Yap 15/5Mbs and Kosrae 8/2 Mbps respectively. The average price per Mbps to FSMTC over satellite is approximately $1,800. However, FSMTC has recently entered into agreements with O3b Networks,[24] a medium-earth orbit low-latency satellite service provider, for capacity for Yap and Chuuk at contract prices which would reduce the cost of supply by approximately half for Chuuk and by 66 percent for Yap—O3b services are expected to begin in the fourth quarter of 2014. The mobile service outside Pohnpei state is largely limited to voice. While there are plans to roll-out 3G across Chuuk, Yap, and Kosrae, FSMTC is constrained by the cost of

[23] HANTRU-1 refers to the submarine cable system owned by Hannon Armstrong LLC (US) and operated by Truestone LLC (US) connecting Guam with Pohnpei, FSM; Kwajalein, Marshall Islands; and Majuro, Marshall Islands.

[24] O3b Networks http://www.o3bnetworks.com is a provider of satellite connectivity. The acronym means "other 3 billion."

international bandwidth to these states, lack of capital funds to finance its network rollout and the need to develop a new strategic corporate plan which addresses market liberalization. ADSL services are available in each of these states, although it is also severely constrained by the costs and latency of international bandwidth via traditional geostationary satellite services. ADSL subscriber numbers across all three states (outside Pohnpei) is approximately 900 people. Table A7.1 shows the distribution of retail services across the FSM as of August, 2014.

4. **Among the main reasons for the limited and costly services outside Pohnpei is the high cost of connecting remote and sparsely populated islands.** The monopolistic market structure, until recently prescribed by law, has also prevented new non-incumbent investment to improve access to services. While FSM has recently enacted a new, modern, legal framework further work is needed to give effect to the law to support the entry of new operators and establish a level playing field for all market participants. Rules and regulations are needed to provide for basic telecommunications market oversight, licensing, interconnection, universal access, service and coverage obligations, numbering, tariffs, and competitive behavior. Regulations also need to be put in place for open access or wholesaling capacity on the existing HANTRU-1 cable or new cable systems, and for dealing with convergence issues.

Table A7.1. FSM: ICT Access by State

	- - - 2010 - - -									
State	Population	Pop. Main Island Only	Total House holds	Land Lines	GSM Mobile HLR [1]	GSM Mobile WIN [2]	Broad-band Internet [3]	Postpaid Dial-up Internet	Prepaid Dial-up Internet [4]	WiFi Prepaid [5]
Pohnpei	36,196	34,789	6,289	5,393	51,913	15,928	1,150	236		19,732
Chuuk ++	48,654	36,152	7,024	1,506	27,849	11,662	343	62		7,612
Yap	11,377	7,371	2,311	1,727	23,899	5,703	331	68		8,149
Kosrae	6,616	6,616	1,143	1,334	7,899	1,775	269	57		10,712
Total	102,843	84,928	16,767	9,960	111,560	35,068	2,093	423	635	46,205

Source: FSMTC subscriber data as of August 7, 2014.
Demographic data source: FSM Census Report 2010, Division of Statistics, SBOC. Households include outer islands household count.
++FSMTC Copper network on Weno Island only—part of the Northern Namoneas Lagoon island region, total household of 1,408 and population of 13,802
[1] HLR count includes all subscriptions sold and may include subscribers that have been inactive for over 90 days but under 180 days.
[2] WIN count mobile subscribers attached to network on August 7, 2014.
[3] Broadband Internet includes VDSL, ADSL, and T1 customers.
[4] Prepaid dial-up cannot be segmented by state as the subscription is not unique to state.
[5] Numbers are unique accounts and active in the last six months.

5. **The Government has taken steps to introduce competition in order to stimulate additional investment.** The Government issued its first National Information and Communication Technology and Telecommunications Policy in September 2012, with the goal of secure, efficient, and affordable services to achieve equitable access to communications for all. The policy calls for sector reforms to increase private participation and investment in the provision of ICT services, strengthening the incumbent operator, and opening the sector to competition. The Government recognizes that critical changes are needed in terms of market structure, regulation and the capacity of institutions to lead and implement the Government's vision for the sector. The liberalization and licensing processes, and the restructuring and strengthening of FSMTC, supported by technical assistance under the Project, will also focus on

options for dealing with legacy issues including the costs and debt associated with the Pohnpei cable.

6. **A landmark decision—the enactment of the FSM Telecommunications Act of 2014—was taken on April 3, 2014 to give effect to the Government's September 2012 policy.** The new law ends FSMTC's right to be the sole provider of telecommunications services and allows for licenses to be issued to new network operators and other service providers. It is envisaged that FSMTC will be one of a number of service providers competing to provide retail services to customers. The law also provides for the creation of an independent regulator of the telecommunications sector responsible for issuing licenses, ensuring that competing networks are interconnected on fair terms and that where practicable expensive infrastructure is shared, protecting consumers, and overseeing the universal access scheme. Under the Telecommunications Act of 2014, FSM has a modern legal framework that will support the Government's development of the telecommunications sector and is consistent with international best practice, as modified to reflect the unique challenges of small island states remote from major population centers.

7. **The new regime is focused on ensuring that the responsibility and costs of providing services across the FSM is shared equitably by all service providers.** FSMTC, as the sole service provider, was so far expected to invest in providing access to telecommunications services for remote communities, even where such investment is not commercially viable. There are significant shortcomings with this approach. There is no definition as to the scope of FSMTC's obligation, no agreed standard as to the coverage to be achieved and the services to be provided, and no mechanism for setting priorities as between groups of potential users and geographic areas. Nor has there been any form of explicit subsidy provided to FSMTC to compensate the corporation for uneconomic infrastructure investments or insufficient service revenues. Instead, FSMTC is compensated on an *ad hoc* basis, such as by the Government appropriation for specific activities or through cross-subsidies from revenues earned in lower-cost urban areas, with the result that urban connection and usage charges are higher than is needed to meet service provision costs in those areas. The regulator will be responsible for ensuring that license terms and obligations, and other universal access mechanisms, will maximize access for remote customers who would not otherwise receive services on purely commercial terms.

7. **Sector experience in comparable countries supports an assessment that new licensees will likely enter the market.** The Government acknowledges that the small size of the addressable customer base, comprising individuals, businesses, government and visitors, means that it will be challenging to attract new market entry. Experience elsewhere is that, in such environments, it is essential to maximize the attractiveness of market entry through clear and predictable regulatory oversight of the market, strong rules against anticompetitive behavior, fair and equal opportunities for all market participants, and the availability of shared access to high-cost essential infrastructure that cannot be economically replicated. This has been the experience in other small island economies in the Pacific, such as Fiji, Solomon Islands, and Vanuatu for example, where market liberalization has gone hand-in-hand with programs to improve the capacity of regulatory institutions.

8. Existing World Bank support for the ICT sector in FSM, under a joint TA program with Palau, focuses on market liberalization and regulatory capacity-building. The World Bank is providing assistance to the Government regarding the development of the regulatory framework including the operationalization of the independent regulator. The FSM-Palau ICT TA Project (P132686) will help the Government to develop a sustainable, workably competitive marketplace for ICT and maximize the attractiveness of the ICT sector as an investment opportunity. It can also be expected that the prospect of new competitive entry and the introduction of effective regulatory oversight will encourage FSMTC to position itself for future competition by improving the availability and attractiveness of its services in advance of that competition occurring.

Republic of Palau

9. **Telecommunications sector.** There are three service providers, each serving targeted, though overlapping market segments. The state-owned Palau National Communications Corporation (PNCC) provides fixed line services (6,000 subscribers), GSM 900 mobile service (about 14,000 subscribers), and Internet access (about 1,500 subscribers, mostly dial-up). The privately-owned Palau Mobile Communications (PMC) targets the overseas business and expatriate worker market and offers lower-cost international GSM 1800 service, although its operations were suspended in August 2014. PMC and PNCC have no technical or commercial network interconnection arrangements in place, so traffic cannot be exchanged between the two networks. As a result, there are weak incentives for the two operators to compete for the other's customers. The privately-owned Palau Telecom offers a WiFi Internet service. Subscriber numbers are not available for PMC or Palau Telecom. Each operator is looking to expand/diversify its service.

10. **Palau relies entirely on satellite links for international connectivity.** The high cost and limited availability of this international bandwidth has imposed a major constraint on the development of the sector, particularly to broadband Internet access, where growth in data demand is suppressed by expensive and restricted international transmission. While significant price and performance gains are promised by new medium earth orbit solutions such as that offered by O3b, there is keen interest by the Government and operators to use the lower marginal cost and greatly increased capacity that will be provided by a submarine fiber-optic cable to connect Palau to Guam, the regional hub for international data traffic to and from major American, Asian, and European markets.

11. **The legal and regulatory framework for ICT in Palau is outdated, extremely limited and deals only with radio spectrum regulation.** It is therefore unsuitable to support market competition. There are no laws covering basic telecommunications market oversight, in particular: network interconnection (with serious consequences in a market that has multiple operators), numbering, wholesale or retail tariffs, and competitive behavior. Moreover, as the Government and industry contemplate investment in a fiber-optic submarine cable to provide low-cost international bandwidth, there are no regulations in place for open access or wholesaling, or convergence issues. The Division of Communication under the Ministry of Public Infrastructure, Industries and Commerce comprises a division chief, two staff and a technical specialist. Technical assistance is required to build capacity and support skills development for implementing and managing a modern regulatory framework.

12. **The Government of Palau adopted a National ICT Policy in November 2013 to guide sector reforms.** The policy recognizes the importance of competitive telecommunications markets that will encourage investment, improve service quality and choice, and lead to efficient pricing. The policy recognizes that in order to achieve these outcomes, updated ICT policies, laws and regulations to support a competitive market must be put into place and that an independent regulator must be established to provide oversight of the sector. Such a regulator will have power to issue licenses, ensure network interconnection and access for all service providers to key wholesale inputs such as international connectivity, and prevent anticompetitive behavior. The above-mentioned FSM-Palau ICT TA Project (P132686) will provide advice and drafting support to the Government for the preparation of legislation required to support the Government's sector reforms.