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Report No: PAD4630

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED CREDIT
IN THE AMOUNT OF SDR 48.97 MILLION
(US$67.69 MILLION EQUIVALENT)

AND A
PROPOSED GRANT
IN THE AMOUNT OF SDR 15.57 MILLION
(US$21.52 MILLION EQUIVALENT)

TO THE
SOLOMON ISLANDS

FOR A
SECOND SOLOMON ISLANDS ROADS AND AVIATION PROJECT

May 10, 2022

Transport Global Practice
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective March 31, 2022)

Currency Unit =	Solomon Islands Dollar (SBD)
SBD8.09 =	US$1
US$1.3824 =	SDR 1

FISCAL YEAR
January 1 - December 31

Regional Vice President: Manuela V. Ferro

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
ADS-B	Automatic Dependent Surveillance-Broadcast
ATC	Air Traffic Control
AWOS	Automated Weather Observing System
CAASI	Civil Aviation Authority of Solomon Islands
CERC	Contingent Emergency Response Component
CPF	Country Partnership Framework
DA	Designated Account
EIRR	Economic Internal Rate of Return
ESA	Environmental and Social Assessment
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FM	Financial Management
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	Greenhouse Gas
GRM	Grievance Redress Mechanism
GRSF	Global Road Safety Facility
ICAO	International Civil Aviation Organization
ICR	Implementation Completion and Results Report
IDA	International Development Association
IFC	International Finance Corporation
IFR	Interim Financial Report
IPF	Investment Project Finance
JICA	Japan International Cooperation Agency
LED	Light-Emitting Diode
M&E	Monitoring and Evaluation
MCA	Ministry of Communications and Aviation
MFAT	Ministry of Foreign Affairs and Trade
MID	Ministry of Infrastructure Development
MOFT	Ministry of Finance and Treasury
NDS	National Development Strategy
NPV	Net Present Value
NSC	National Steering Committee
NTP	National Transport Plan
OAG	Office of Auditor General
OHS	Occupational Health and Safety
PAIP	Pacific Aviation Investment Program
PAPI	Precision Approach Path Indicator

PASO	Pacific Aviation Safety Office
PCRTP	Pacific Climate Resilient Transport Program
PDO	Project Development Objective
PIC	Pacific Island Country
PICASST	Pacific Islands Civil Aviation Safety Security Treaty
POM	Project Operations Manual
PPSD	Project Procurement Strategy for Development
PST	Project Support Team
RED	Roads Economic Decision
RSSAT	Road Safety Screening and Appraisal Tool
SARIP	Samoa Aviation and Roads Investment Project
SARP	Standards and Recommended Practice
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SEP	Stakeholder Engagement Plan
SIACL	Solomon Islands Airport Corporation Limited
SIG	Solomon Islands Government
SIRAP	Solomon Islands Roads and Aviation Project
SIRAP2	Second Solomon Islands Roads and Aviation Project
SOARR	Safety of Aviation for Regional Resilience
SORT	Systematic Operations Risk Rating Tool
STEP	Systematic Tracking of Exchanges in Procurement
TCRTP II	Tonga Climate Resilient Transport Project II
TIMS	Transport Infrastructure Management Services
TOR	Terms of Reference
USOAP	Universal Safety Oversight Audit Program
UXO	Unexploded Ordnance
VAC	Violence against Children
VSAT	Very Small Aperture Terminal
WHO	World Health Organization

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name
Solomon Islands	Second Solomon Islands Roads and Aviation Project

Project ID	Financing Instrument	Environmental and Social Risk Classification
P176548	Investment Project Financing	Substantial

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[✓] Contingent Emergency Response Component (CERC)
[✓] Series of Projects (SOP)	[✓] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[✓] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	[ ] Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
01-Jun-2022	30-Jun-2029

Bank/IFC Collaboration

No

Proposed Development Objective(s)

To improve the climate resilience and safety of the Recipient's road and aviation sectors, and in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.

Components

Component Name	Cost (US$, millions)

Component 1: Climate Resilience and Safety Investments in the Aviation Sector	64.43
Component 2: Climate Resilience and Safety Investments in the Road Sector	14.50
Component 3: Institutional Strengthening and Project Management	10.28
Component 4: Contingent Emergency Response	0.00

Organizations

Borrower:	Solomon Islands
Implementing Agency:	Ministry of Infrastructure Development Ministry of Communication and Aviation

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	89.21
Total Financing	89.21
of which IBRD/IDA	89.21
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	89.21
IDA Credit	67.69
IDA Grant	21.52

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Solomon Islands	67.69	21.52	0.00	89.21
National PBA	47.69	1.52	0.00	49.21
Regional	20.00	20.00	0.00	40.00

Total	**67.69**	**21.52**	**0.00**	**89.21**

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2022	2023	2024	2025	2026	2027	2028	2029
Annual	0.86	3.52	8.92	13.26	16.50	17.57	18.15	10.43
Cumulative	0.86	4.38	13.30	26.56	43.06	60.63	78.78	89.21

INSTITUTIONAL DATA

Practice Area (Lead)

Transport

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Moderate
6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	Moderate
9. Other	Substantial
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Relevant
Cultural Heritage	Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description

To ensure proper oversight of the Project at the national level, the Recipient shall maintain throughout Project implementation, the National Steering Committee, with a mandate, composition and resources satisfactory to the Association, which shall be: (a) responsible for, inter alia, providing Project oversight, approving Annual Work Plans and Budgets, and advising on Project related matters; and (b) comprised of, inter alia: (i) Permanent Secretary of the Ministry of Finance and Treasury (or his or her designee); (ii) the Permanent Secretary of the Ministry of Infrastructure Development (or his or her designee); (iii) the Permanent Secretary of the Ministry of Communication and Aviation (or his or her designee); (iv) the Provincial Secretary of Malaita Province (or his or her designee); (v) the Provincial Secretary of Western Province (or his or her designee); (vi) the Provincial Secretary of Temotu Province (or his or her designee); and (vii) the Deputy Secretary – Technical of the Ministry of Infrastructure Development (or his or her designee). (Section I.A.1 of Schedule 2 to the Financing Agreement)

Sections and Description

The Recipient shall maintain throughout Project implementation, the Project Support Team within the Ministry of Communication and Aviation, with a mandate, composition and resources satisfactory to the Association, which shall: (a) be responsible for, inter alia, day to day implementation of the Project including contract management, procurement, financial management, preparing and/or consolidating Annual Work Plans and Budgets, technical aspects, environmental and social risks management, monitoring, reporting, and evaluation; (b) report to the focal point within the Ministry of Communication and Aviation and the focal point within the Ministry of Infrastructure Development; and (c) be comprised of, inter alia: (i) a project manager; (ii) a deputy project manager; (iii) a national safeguards officer; (iv) a community liaison officer; (v) a Project accountant; (vi) a procurement specialist; (vii) an administrative assistant; and (viii) a finance manager. (Section I.A.2 of Schedule 2 to the Financing Agreement)

Sections and Description

In order to carry out Part 1(e) of the Project, the Recipient shall enter into a Performance-Based Contract, with a private sector contractor selected on the basis of terms of reference, qualifications and experience satisfactory to the Association, in accordancewith the provisions included or referred to in this Agreement (“PBC Contractor”), under terms and conditions acceptable to the Association. (Section I.B.1 of Schedule 2 to the Financing Agreement)

Sections and Description

The Recipient shall furnish to the Association each Project Report not later than forty-five (45) days after the end of each calendar quarter, covering the calendar quarter. (Section II.1 of Schedule 2 to the Financing Agreement)

Sections and Description

The Recipient shall: (a) by not later than three months after the Effective Date, prepare and adopt a Project Operations Manual; and (b) thereafter ensure that the Project is carried out in accordance with the Project Operations Manual. (Section C.3 of Schedule 2 to the Financing Agreement)

Sections and Description

The Recipient shall prepare and furnish to the Association, by not later than November 30 of each year during the implementation of the Project, an Annual Work Plan and Budget for the Project. The Recipient shall ensure that the Project is implemented in accordance with the Annual Work Plans and Budgets approved by the Association for the respective fiscal year. (Sections I.D.1 and I.D.2 of Schedule 2 to the Financing Agreement)

Sections and Description

The Recipient shall carry out, jointly with the Association, not later than three years after the Effective Date, or such

other period as may be agreed with the Association, a mid-term review of the Project to assess the status of Project implementation, as measured against the Project indicators acceptable to the Association, and compliance with the legal covenants. (Section II.2 of Schedule 2 to the Financing Agreement)

Conditions

Type	Financing source	Description
Disbursement	IBRD/IDA	Schedule 2, Section III.B.1.b. For Emergency Expenditures under Category (2), unless and until the Association all of the following conditions have been met in respect of said expenditures: (i) the Recipient has determined that an Eligible Crisis or Emergency has occurred and has furnished to the Association a request to withdraw Financing amounts under Category (2); and (ii) the Association has agreed with such determination, accepted said request and notified the Recipient thereof; and (iii) the Recipient has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Association.

I. STRATEGIC CONTEXT

A. Country Context

1. **Solomon Islands is a Pacific archipelagic nation, extending some 1,500 kilometers (km) from east to west and consisting of nearly 1,000 islands, the largest of which include Guadalcanal, Malaita, and New Georgia.** The country is bordered by Papua New Guinea to the west, Nauru to the north, Tuvalu and Fiji to the east, and Vanuatu to the south. In 2019, 76 percent of its population of 721,455, dispersed across some 90 inhabited islands, reside in Guadalcanal, Malaita, and Western Provinces (that include Munda and Noro), and the Capital Territory of Honiara.[1] With international ports and airports, Honiara and Munda/Noro are the gateways for visitors to Solomon Islands.

2. **Solomon Islands' per capita gross domestic product (GDP) was US$2,227 in 2020.**[2] The service sector, such as wholesale and retail trade, real estate and renting, transport and storage, and public administration and defense, is a major part of its economy, contributing 56 percent of GDP. Outside the service sector, agriculture, fisheries, forestry, and logging are the main economic activities, accounting for 35 percent of GDP. The industry sector, including manufacturing, construction, electricity and water, and mining and quarrying, make up the remainder of the economy. GDP contracted by 4.3 percent in 2020 due to the impact of COVID-19, and together with the impact of the November 2021 unrest, the latest GDP growth forecast is -0.2 percent in 2021 and -4.0 percent in 2022.[3]

3. **The country faced a difficult period of civil unrest known as 'the tensions' from 1998 to 2003, which led to the intervention of the Regional Assistance Mission to Solomon Islands from 2003 to 2017.** The tensions resulted from grievances between the Guadalcanal landowners and migrants, predominantly from Malaita, drawn by economic opportunities. Violent clashes led to nearly 200 deaths, displacement of about 35,000 people, and widespread destruction of property. Its economy grew strong following the restoration of peace and order, with an annualized average GDP growth rate of 4.6 percent in 2003–2019. However, the underlying structural challenges remain persistent as shown by the November 2021 unrest in Honiara, which resulted in three deaths and the damages to the building infrastructure and the loss in the value of goods estimated at 7 percent of GDP.

4. **Aggregate poverty has declined since the end of the tensions; however, a high proportion of Solomon Islanders are vulnerable to falling into poverty.** The poverty rate, based on the national poverty line, has reduced from 22 percent in 2005/06 to 14 percent in 2012/13, implying that some 45,000 people were lifted out of poverty over that period. Despite the improvement, the well-being of Solomon Islanders, especially women, is highly vulnerable to frequent shocks. In fact, poverty remains extensive in the country, with 12.7 percent of the people still living below the national poverty line. The country ranks 151 out of 189 on the 2019 United Nations Human Development Index, placing it in the 'medium human development' category.

5. **Gender constraints in Solomon Islands range from women's limited access to paid employment to the lack of representation in technical and management positions.** The labor force participation rate for women (ages 15+) in the country was 82.1 percent as of 2019, compared with 85.6 percent for men.[4] The number of female paid workers was nearly half that of males (of those in labor force, 49 percent for men, and 25 percent for women), with this gap more

[1] Solomon Islands Government (SIG). 2020. Provisional Count, 2019 National Population and Housing Census.
[2] International Monetary Fund. April 2022. World Economic Outlook Database.
[3] Ibid.
[4] United Nations Development Programme, Human Development Report 2020.

pronounced in rural areas (41 percent for men, and 19 percent for women).[5] Women are less represented in not only the paid workforce but also technical and leadership roles. The 2013 Household Income and Expenditure Survey reports that only nine percent of science and engineering professionals and associate professionals in the country are female.

6. **Solomon Islands is highly susceptible to climate change and natural disasters.** The country is vulnerable to natural hazards including strong winds, landslides, earthquakes, tsunamis, cyclones, and regional volcanic activity. It is also exposed to climate hazards such as coastal and river flooding, sea level rise, storm surges, and heavy rainfall. Temperature has increased in Honiara at a rate of 0.15 degrees Celsius (°C) per decade in 1951–2009 and is likely to increase up to 1.2°C by 2030 relative to the 1980-1999 average.[6] Satellite observations indicate that the sea level has risen by about 8 millimeters (mm) per year in 1993–2010. The April 2014 flash floods led to 22 fatalities, displacement of some 10,000 people, and widespread damage and economic losses estimated at US$108 million, equivalent to 9.2 percent of the GDP at the time.[7] In addition, located in the Pacific Ring of Fire, the country faces a substantial risk of earthquakes and potentially tsunamis, as demonstrated by the earthquake of magnitude 7.8 in 2016 which struck some 130 km from Honiara. With climate change, it is anticipated that average annual and seasonal rainfall will increase over the course of the twenty first century, and extreme rainfall days are likely to occur more often. Further, the intensity and frequency of days of extreme heat are projected to increase in Solomon Islands over the course of this century.

7. **Tourism has a high potential to be developed; however, insufficient transport connectivity is a limiting factor to its growth.** It has contributed to the economy, with the travel and tourism industry representing 9.3 percent of GDP and 8.4 percent of total employment in 2019.[8] With 28,907 visitor arrivals in 2019, the sector has significant potential to grow because of its rich cultural heritage, many World War II sites, and pristine natural environment. Solomon Islands can become competitive with other regional tourism destinations with the focus on (a) developing high-value tourism niche markets and expanding its promotional efforts into important source markets, and (b) improving the overall products offered including better accommodations, tour itineraries, and packages in each of the identified niche markets.[9]

8. **COVID-19 has significantly affected the Solomon Islands' tourism and aviation sectors, resulting in severe negative effects on the country's economy.** A State of Public Emergency was declared on March 25, 2020. International travel is restricted with borders remaining closed and scheduled international flights suspended except for occasional Government approved charter and cargo services. In May 2020, the Government announced a US$38 million economic stimulus package in response to COVID-19, which included financial support to Solomon Airlines. The State of Public Emergency is in place until July 24, 2022, and Solomon Airlines' suspension of scheduled international passenger services has been extended until July 2, 2022. Although geographical isolation and the swift border closure helped avert community transmission initially, COVID-19 cases started to rise rapidly in late January 2022, leading to 16,441 confirmed cases and 144 deaths by May 6, 2022.[10]

B. Sectoral and Institutional Context

9. **The challenge in providing connective transport infrastructure is a key obstacle to addressing uneven**

[5] SIG. 2009. Population and Housing Census, Report on Economic Activity and Labor Force.
[6] Pacific Climate Change Science Program. 2013. *Current and Future Climate of Solomon Islands*.
[7] SIG/Global Facility for Disaster Reduction and Recovery (GFDRR). 2014. *Rapid Assessment of Macro and Sectoral Impacts of Flash Floods in Solomon Islands*.
[8] World Travel and Tourism Council, Solomon Islands 2021 Annual Research: Key Highlights.
[9] MCA. 2021. *Solomon Airlines Strategic Options Analysis. Final Report.*
[10] World Health Organization (WHO), Coronavirus (COVID-19) Dashboard.

development and spatial inequality. Solomon Islands' transport network consists of some 1,500 km of roads and about 440 bridges, two international airports (Honiara and Munda) and 33 domestic airfields, and two international ports (Honiara and Noro) and some 90 community jetties and boat ramps. The network is vital for the country's connectivity to the world and cohesion within its borders. It supports trade and investment by facilitating the movement of goods and people and providing safe and efficient access to markets and social services.[11] However, the country's small size, remoteness, and internal dispersion and division drive transport costs up. In addition, poor road and bridge conditions constrain connectivity to urban centers, airports, and ports. Further, aviation plays a limited role in domestic connectivity due to its high cost for most Solomon Islanders and inadequate infrastructure, especially at domestic airfields.

10. **Solomon Islands' transport infrastructure is heavily exposed to climate and natural disasters due to its overall climatic and geographic features.** This is compounded with the high sensitivity of the transport network towards extreme hazards such as heavy rainfall, flooding, landslides, and earthquakes due to poor structural characteristics and inadequate maintenance. Nearly 88 percent of the road network is unsealed, making these roads impassable during heavy rains. Similarly, all the domestic airfields except the one at Gizo have an unsealed runway, making these runways unserviceable during inclement weather. Once damaged, gravel roads and runways do not receive timely and adequate repair due to budgetary constraints.[12] In addition, most of the roads, airports, and airfields are situated on the perimeter of the islands and are only a few meters above sea level and hence extremely vulnerable to cyclones and storm surges. Flood-related disruptions of the transport network have significant socioeconomic consequences due mainly to the lack of alternative routes along the existing roads, and to the interdependencies of the aviation network.

11. **Strengthening the climate resilience of the transport network and improving the disaster risk management are among the Government's priorities that have been articulated in the National Development Strategy (NDS) 2016–2035 and the National Transport Plan (NTP) 2017–2036.** The NDS sets out a strategic direction to achieve the national vision of improving the social and equitable livelihoods of all Solomon Islanders.[13] It sets out 15 medium term strategies within the five key long-term objectives. One strategy is to build and upgrade climate resilient infrastructure with a focus on access to markets and essential services; another is to improve climate and disaster risk management; and others refer to poverty alleviation, increase in employment opportunities, and improvement in gender equality. The NTP outlines the Government policies, priorities, and plans for the transport sector over the 20-year period. The plan acknowledges the importance of improving transport network resilience and considers the implications of climate change and disaster risk for transport infrastructure.

12. **The proposed Second Solomon Islands Roads and Aviation Project (SIRAP2) will focus on improvement of safety and climate resilience of the Solomon Islands' aviation and road sectors.** SIRAP2 will build on the achievements and lessons learned from the ongoing Solomon Islands Roads and Aviation Project (SIRAP, P166622), which was approved on March 28, 2019, with US$51 million International Development Association (IDA) financing. SIRAP2 will include: (a) part of the activities at Honiara Airport planned under SIRAP but cannot be implemented due to cost overruns/financial gaps, (b) scale-up activities at Honiara and Munda Airports, and Malaita Bridges, and (c) newly introduced activities at Santa Cruz Airfield and on Noro Roads. The main outputs produced or envisaged under SIRAP include: (a) Munda Airport runway, taxiway, and apron overlaid, (b) Munda Airport new terminal building constructed, (c) Automatic Dependent Surveillance-Broadcast (ADS-B) ground stations and Very Small Aperture Terminal (VSAT) communication system installed at Honiara and Munda Airports with ADS-B aircraft equipage installed, (d) Malaita three small bridges (Koa,

[11] For example, air transport has served as a lifeline during the COVID-19 pandemic, delivering medical supplies and humanitarian workers, while also repatriating citizens to Solomon Islands.
[12] For example, the Santa Cruz Airfield was closed for 16 days from June 26 to July 11, 2021, due to poor runway and weather conditions.
[13] SIG. 2016. *National Development Strategy 2016–2035*.

Bio1, and Bio2) replaced, (e) 38 km of Malaita Roads maintained, with spot upgrading for climate resiliency and road safety improvement, and (f) Aviation Sector Strategy, Honiara and Munda Airports Master Plan, Solomon Airlines Strategic Options Analysis, and Road Safety Audit Manual developed. Under SIRAP, the progress towards achieving the Project Development Objective (PDO) is rated as Moderately Satisfactory, and the overall implementation progress is rated as Satisfactory. As of the first quarter of 2022, SIRAP's overall IDA disbursement is US$10.25 million, representing 20.1 percent of the project's total IDA financing.

13. **SIRAP2 is complementary to SIRAP and other recently completed or ongoing activities**, including (a) the Climate and Disaster Resilient Transport in Small Island Developing States (P164157) Advisory Services and Analytics, which developed a strategy to strengthen the resilience of the road system and is assessing the criticality and vulnerability of road assets on Guadalcanal and Malaita,[14] (b) the Implementation of Innovative and Efficient Bridge Technologies (TF0A6892), which undertook an assessment and pilot program to support implementation of modular bridges,[15] and (c) the Road Safety Management Capacity Assessment (TF073163), which assessed the national level road safety management capacity.[16]

Aviation

14. **The aviation sector is under the jurisdiction of the Ministry of Communication and Aviation (MCA), Civil Aviation Authority of Solomon Islands (CAASI), and Solomon Islands Airport Corporation Limited (SIACL).** MCA is responsible for aviation policy development, strategic planning, and development at the Government-owned airports and airfields; and is implementing the ongoing SIRAP. CAASI, established by the Civil Aviation Act of 2008, is responsible for providing safety and security regulatory oversight and other functions in a way that contribute to the aim of achieving an integrated, safe, responsive, and sustainable transport system. SIACL, a state-owned enterprise established in 2016, is responsible for managing 10 airports and airfields, including those at Honiara, Munda, and Santa Cruz (Lata). It is planned that all the remaining Government-owned airfields will be transferred from MCA to SIACL in six months after the mobilization of the SIACL's chief executive officer, which took place in February 2022.

15. **The Aviation Sector Strategy prepared under SIRAP was accepted by MCA in October 2020.** The strategy identified five focus areas: (a) safe aviation connectivity, (b) infrastructure, (c) sustainability and growth, (d) accountability and partnerships, and (e) capacity. It notes that funding the implementation of the strategy is key to achieving its vision of 'Safe and Secure Skies - Connecting Solomon Islands to the World'.[17] The priority actions listed in the strategy include, among others, implementation of corrective actions against the International Civil Aviation Organization (ICAO) Universal Safety Oversight Audit Program (USOAP) audit, establishment of a National Airports Development Plan, and development of airport asset management plans, all of which will be supported under SIRAP2.

16. **The Master Plan for Honiara and Munda International Airports, developed with the Solomon Islands aviation stakeholders under SIRAP, was completed in March 2020.** For each airport, the 20-year Master Plan prepared vision statements, development guidelines, necessary infrastructure, and layout for planned operations, and prioritized investment plans.[18] The plan also examined the impact on SIACL's financial performance under the proposed investment

[14] This activity was conducted with a US$1 million grant from the GFDRR Japan–World Bank Program for Mainstreaming Disaster Risk Management in Developing Countries.
[15] This activity was conducted under SIRAP with a US$0.19 million grant from the Quality Infrastructure Investment Partnership sponsored by the Government of Japan.
[16] This activity was conducted under the Samoa Climate Resilient Transport Project (P165782) with a US$0.19 million GRSF grant.
[17] MCA. 2020. *Aviation Sector Strategy Solomon Islands*. *Final Report.*
[18] MCA. 2020. *Solomon Islands Airport Master Plans*. *Final Report.*

plans. It notes that a total of US$106.5 million investments will be required to upgrade both airports up to 2030, including the ongoing Japan International Cooperation Agency (JICA) and World Bank investments. It does not recommend the runway extension at Honiara Airport within the timeframe of the Master Plan (that is, until 2039). SIRAP2 will invest in the items listed in the prioritized investment plans.

17. **Solomon Airlines, a state-owned national carrier,[19] provides domestic air services and together with the other airlines, including Air Niugini, Fiji Airways, and Virgin Australia, provides international air services.** International air traffic increased at an average rate of 5.2 percent per year from 2008 to 2019, while domestic air traffic grew at an average rate of 5.5 percent per year during the same period. In 2019, Solomon Islands airports handled 217,590 passengers (55 percent for international and 45 percent for domestic) and 835 tons of cargo. However, the traffic dropped to 85,739 passengers (29 percent for international and 71 percent for domestic) and 428 tons of cargo in 2020 due to the travel restrictions associated with the COVID-19 pandemic. Solomon Airlines accounted for about 50 percent of international passengers and all recorded domestic scheduled passengers in 2019. Australia has traditionally been the major source market for Solomon Islands (40 percent), followed by Fiji (10 percent), Papua New Guinea (8 percent), and New Zealand (7 percent).[20] Of these, 28 percent arrived for holiday and vacation, 24 percent for business and conference, 16 percent for visiting friends and relatives, 6 percent for transit and stopover, and 25 percent for other reasons.

18. **The Solomon Airlines Strategic Options Analysis was completed under SIRAP in May 2021 and led to the ongoing support to Solomon Airlines to develop its Strategic Plan over 2022–2024.** The Strategic Options Analysis was conducted to guide the Solomon Islands Government (SIG) to manage the impacts of COVID-19 on the aviation and tourism sectors in the short and medium term. It included Solomon Airlines route analysis, traffic forecast for 2021–2040, financial analysis, and COVID-19 aviation and tourism sectors recovery scenarios and strategies.[21] The recommended options provided in the analysis include, among others, drafting of a business plan that responds to the Statement of Corporate Objectives over 2021–2023, support to continue operating international and domestic routes and managing COVID-19 impacts, and assistance in engaging in a regional airline solution model (which allows for commercial partnerships, code sharing, and pooling and sharing of resources). SIRAP2 continues to assist the airline with the replacement and acquisition of ground and communication equipment that is essential for its service provision.

19. **Solomon Islands has been a member state of ICAO since May 1985 and has ratified the Convention on International Civil Aviation (or Chicago Convention), which requires the country to adopt ICAO's established Standards and Recommended Practices (SARPs) to the extent practicable.** The ICAO USOAP audit conducted in 2006 and subsequent ICAO missions benchmarked Solomon Islands below the latest global average in all the eight critical areas. Among these, a noteworthy deficiency is found on accident investigation where Solomon Islands scores 8.8 percent in effective implementation of SARPs, which is behind the global average of 56.6 percent. This lack of effective implementation of accident investigation is due to the absence of an independent accident investigation body. To address this, it is planned that MCA will sign a memorandum of understanding with the Papua New Guinea counterpart to obtain the necessary personnel in the event of an accident or a serious incident. Another deficiency is observed on aerodromes, which is one of the key areas where significant progress is needed to improve its overall score; hence, the high relevance of the ongoing SIRAP and the proposed SIRAP2 investments.

20. **While there have been upgrades to airport infrastructure and equipment, safety and resilience improvements**

[19] Solomon Airlines is wholly owned by SIG through the Investment Corporation of Solomon Islands (82.3 percent) and Solomon Islands Holding (17.7 percent).
[20] SIG. Visitor Arrivals Statistics. First Quarter 2020.
[21] MCA. 2021. *Solomon Airlines Strategic Options Analysis. Final Report.*

are still required. At Honiara Airport, the runway was overlaid with asphalt concrete in 2004–2005 through a JICA grant and is due for resurfacing to preserve its structural integrity. The airfield ground lighting is 17 years old and is difficult to maintain due to lack of spare parts as evidenced by the November 2021 unrest that damaged 48 runway edge lights. The air traffic control (ATC) tower was affected by earthquakes and the April 2014 floods. According to the control tower advisor hired under SIRAP, the concrete columns had cracked under a seismic event, and the spalling that occurred after the flooding enabled water to penetrate the cracks resulting in the reinforcement to rust.[22] Although the tower extended its service life by the temporary measures provided under SIRAP, its location is not suitable for the long term as it infringes a future runway strip transitional surface and conflicts with the future aviation support precinct.[23] The security fence is susceptible to wildlife incursion, which is another safety concern. Munda Airport does not have an ATC tower. Relocating the containerized control room in front of the west runway end area to a new tower improves safety for ATC personnel and enables observation of all Munda Airport operational areas and the airspace within the vicinity of the airport. The runway at Santa Cruz Airfield has been topsoiled and grassed, and it often becomes saturated with standing water. This makes the airfield unsuitable for Dash 8 aircraft operations, resulting in the use of smaller Twin Otter aircraft.[24] In addition, the northern end of the runway is exposed to wind-driven ocean swells and requires seawalls to reduce erosion during increasing storm risks under a changing climate.[25]

21. **Upgrading of Honiara Airport is an ongoing activity implemented by MCA with the support of JICA and the World Bank.** The ongoing JICA-funded Honiara Airport Improvement Project (2018–2023) is mainly for upgrading and expanding the taxiway and apron and international and domestic terminal buildings and providing a flood protection dike. Under SIRAP, the installation of ADS-B[26] ground stations was completed in April 2021, with ADS-B aircraft equipage being procured. The installation of a VSAT communications system is also ongoing. The proposed investments under SIRAP2 in runway overlay, airfield ground lighting, a rescue fire service vehicle station, an automated weather observing station (AWOS),[27] an ATC tower, crash alarms, and perimeter fence will support JICA's and SIRAP's investments at Honiara Airport, ensuring the airport meets regulatory compliance requirements and increases its climate resilience.

22. **SIRAP2 will complement the New Zealand Ministry of Foreign Affairs and Trade (MFAT) and SIRAP investments at Munda Airport by ensuring that the airport achieves full international operations.** To unlock the Solomon Islands' tourism potential and fishing industry, MFAT has supported the country's aviation sector by funding major rehabilitation works at Munda and Gizo.[28] The improvements at Munda Airport from 2014 to 2018 included runway overlay with chip seal, the installation of runway lighting, the replacement of non-directional beacon and distance measuring equipment, the setup of a container-based control room for ATC services, the installation of an airport perimeter fence, the construction of a rescue fire station, and the provision of two refurbished fire tenders. These investments led Munda Airport to receive its first international flight in March 2019, while also allowing the airport to serve as an alternate airport to Honiara Airport. SIRAP is investing in overlay of the runway, taxiway, and apron with asphalt concrete; a new terminal building; ADS-B; and VSAT. The proposed SIRAP2 investments, which will include an ATC tower and crash

[22] MCA. 2020. *Final Report for SIRAP Consulting Service for Control Tower Advisor.*
[23] MCA. 2020. *Solomon Islands Airport Master Plans*. *Final Report.*
[24] The seating capacity for Dash 8 is 36, while that for Twin Otter is 16.
[25] MFAT. 2019. *Basis of Design Report. Design Philosophy Statement and Approach*.
[26] ADS-B makes an aircraft visible, in real time, to ATC and other ADS-B equipped aircraft with position and velocity data transmitted every second. It also allows for more efficient aircraft operations (which reduce fuel burn) and providing continuous location data (including in likely poor navigation conditions caused by extremely weather events that limit visibility) which is of value in case of emergency.
[27] AWOS enables improved accuracy and efficiency of weather/meteorological monitoring and dissemination to inform the airport operation and preparedness to increasing extreme climatic events such as tropical cyclone and extreme rainfalls.
[28] In addition, MFAT is financing runway pavement works at Seghe and Choiseul Bay, with co-financing provided by the Australian Department of Foreign Affairs and Trade and SIG.

alarms, will complement the MFAT and SIRAP investments to ensure that Munda Airport can resume international flight operations after the COVID-19 pandemic, with an appropriate level of climate resilience and safety for infrastructure, facilities, and equipment.

Roads

23. **The road sector is under the overall jurisdiction of the Ministry of Infrastructure Development (MID).** The ministry consists of the following five departments: Corporate Support Services, Architecture Building Management Services, Mechanical Works Services, Transport Infrastructure Management Services (TIMS), and the Solomon Islands Maritime Safety Administration. TIMS is responsible for programming, design, and implementation of road infrastructure maintenance and new works. It is also responsible for asset management and Solomon Islands Transport Asset Management System. Under the Director of TIMS, there are three sections for (a) policy and planning, (b) quality control and assurance, and (c) operations and maintenance, each managed by a Deputy Director. MID is implementing SIRAP and the Community Access and Urban Services Enhancement Project (P161320).

24. **Much of the road network in Solomon Islands is in poor condition.** The approximately 1,500 km of the road network consists of 625 km of main roads, 523 km of feeder roads, and 346 km of access roads. Three-quarters of the road network is in Guadalcanal, Malaita, and Western Provinces, and the Capital Territory of Honiara. The network includes about 440 registered bridges, over 40 percent of which are in Malaita Province. Road condition data collected in 2015–2016 indicated that 4 percent of roads were rated good, 12 percent fair, 42 percent poor, 27 percent bad, and 15 percent very bad.[29] A deteriorated road network makes travel time longer, vehicle operating costs higher, and rural communities more isolated. It also has a negative impact on livelihoods and key basic services including employment, health, and education, limiting for example access to critical health care facilities during extreme weather events. The proposed investments under SIRAP2 aim to counteract damage due to high rainfall intensities, thereby ensuring year-round access for road users and reducing the need for frequent maintenance.

25. **Traffic volume is medium to low in Solomon Islands.** Only Kukum Highway that links Honiara Airport in the east to Honiara city center in the west has daily traffic of over 10,000 vehicles. The traffic count conducted in November and December 2013 showed that the four-lane section of Kukum Highway carried 18,045 to 38,072 vehicles per day with nine percent being heavy vehicles.[30] Along the project roads on Malaita, a 12-hour average traffic was 2,441 vehicles at Saint Paul (500 meters (m) north of Auki), and 223 vehicles at Bio1 Bridge (14 km north of Auki) with 38 percent being heavy vehicles, based on the traffic count in December 2019.[31] On the project roads in Noro, a 12-hour average traffic at the two survey locations ranged from 1,224 to 1,276 vehicles with 18 percent being heavy vehicles, based on the traffic count in January and February 2018.[32]

26. **Solomon Islands' poor road infrastructure condition, which is partly due to high exposure to frequent natural and climate change disasters, emphasizes the need for appropriate road safety measures to ensure the safety and well-being of road users.** In 2016, according to the World Health Organization (WHO), the road safety fatality rate was 17.4 fatalities per 100,000 population,[33] with an estimated 104 road traffic deaths in Solomon Islands that same year.[34]

[29] MID is conducting a nationwide road condition survey using its own fund. A criticality and vulnerability assessment for Guadalcanal and Malaita is also ongoing under the Climate and Disaster Resilient Transport in Small Island Developing States Advisory Services and Analytics.
[30] JICA. 2014. *Preparatory Survey for Kukum Highway Upgrade Project. Final Report.*
[31] MID. 2020. *Detailed Design Report for Malaita Bridge Replacement and Approach Works*.
[32] MID. 2018. *Report on the Summary of Preliminary Traffic Survey*.
[33] The road fatality rate is higher than that in Fiji (9.6), Samoa (11.3), Papua New Guinea (14.2), Vanuatu (15.9), and Tonga (16.8).
[34] WHO. *Global Status Report on Road Safety 2018*. Geneva.

A Global Road Safety Facility (GRSF)-funded Road Safety Management Capacity Assessment for Solomon Islands notes that lack of safe design standards for roads, poor road conditions in rural areas, poor pedestrian infrastructure, lack of speed limit signs and traffic calming, and overloaded logging trucks are key issues related to road safety management.[35] These issues were addressed under SIRAP where a road safety audit has been conducted to inform the designs. The road safety recommendations under SIRAP will be taken into consideration under SIRAP2. The Assessment also proposed to commence and implement 14 institutional management priority activities and 15 Safe System intervention priority activities during 2021–2023, some of which will be supported under SIRAP2 (for example, establishment of a National Road Safety Committee and potentially a road safety unit within MID).

27. **For the road sector investments under SIRAP2, SIG has given priority to the selected Malaita bridges and Noro roads.** These roads and bridges are critical for transportation of fishery and agriculture produces to markets, as well as for access to employment, health, education, and social services. The project bridges on Malaita connect the provincial capital of Auki to Fouia via Dala in the north and Huahui via Bina in the south. The proposed roads in Noro run through a tuna processing plant, Noro International Port, customs, and markets. While three small bridges on Malaita North Road will be replaced under SIRAP, and the Noro–Munda Road has been rehabilitated in 2014 with New Zealand assistance; no major upgrading has been undertaken for the rest of the Malaita bridges and Noro roads.

Regional Approach

28. **The aviation sector provides vital national, regional, and international connectivity for Pacific Island Countries (PICs).** Air connectivity is essential to meet educational and medical needs and enable effective regional integration with the neighboring countries. Air services are essential for the import and export of goods and are a prerequisite for tourism development. Characterized by a diverse mix of long-haul and thin air transport markets, the high dependence on air links emphasizes the importance of air transport in the economic and social development of PICs. A reliable network of air links, within and among island countries and to major hubs such as Australia and New Zealand and beyond, is therefore essential for the viability of these countries from humanitarian, political, and economic perspectives.

29. **However, safety and climate resilience of the airports in PICs are at risk mainly because of inadequate operation and maintenance procedures and insufficient infrastructure.** PICs generally take a reactive approach to infrastructure maintenance. This is characterized as a 'run-to-failure' strategy where assets are operated until they fail and are then repaired. The specialized nature of aviation places a high burden on small countries with limited human resources. Due to funding constraints and the relatively small, specialist nature of airport infrastructure, PICs do not have a robust proactive and preventative maintenance culture. This leads to slow and expensive repairs due to their remoteness and difficulty in maintaining supply chains and accessing the required expertise. For example, Kiribati and Vanuatu had international carriers cease operations to their countries due to the poor airport conditions, which resulted in major negative impacts on their economies and employment.[36] The COVID-19 pandemic has further worsened the situation as airport authorities in PICs suffer from a significant decrease in their revenues due to the limited number of flights.

30. **The World Bank will support a series of aviation activities under the three transport projects in the Pacific to effectively address the most common regional challenges, such as operational safety and resilience to natural disasters, which limit regional air transport connectivity.** These activities, collectively called Safety of Aviation for

[35] GRSF. 2020. *Road Safety Management Capacity Assessment for Solomon Islands. Final Report.*

[36] An assessment of the 2015 flight cancellations in Vanuatu by the World Bank suggested that they potentially led to a 7 percent decline in tourism spending, amounting to approximately 1.25 percent of GDP. This economic shock put some 700 jobs at risk, disproportionately affecting women who hold 48 percent of tourism jobs, versus 38 percent of paid jobs in the overall economy.

Regional Resilience (SOARR), aim at enhancing resilience, safety, and asset management of airport infrastructure in the region. One of the main activities will be multiyear performance-based maintenance for assets at regional airports, aiming at establishing a preventative maintenance culture for the aviation sector in the target countries and enhancing safety and climate resilience of airport operations. The other activities include acquisition of safety equipment and facilities, and development of resilient infrastructure. It is critical to ensure aviation safety through these activities when international flights resume after many airplanes have been grounded and airports have not been fully in operation during the COVID-19 pandemic. Annex 4 provides further details on the regional approach and its benefits.

31. **SIRAP2 will finance SOARR activities for Solomon Islands and tap into the IDA Regional Window to finance it.** The justifications for mobilizing Regional IDA include (a) three countries (Tonga, Samoa, and Solomon Islands) will join the activities through an Investment Project Financing (IPF) operation in each country, and all face similar aviation-related challenges and the urgent need to improve air transport safety and resilience to support economic growth, (b) all three countries are participating in the same regional safety oversight organization, the Pacific Aviation Safety Office (PASO) initiative, which promotes a regional and coordinated aviation safety oversight,[37] (c) the proposed periodic and routine maintenance is expected to generate significant cross-boundary benefits to improve airport safety and climate resilience by attracting private sector investment and generating economies of scale through regional airport asset maintenance, and (d) SOARR will contribute to a quick recovery of the regional economy by ensuring safety of air transport after a long suspension of international flights during the COVID-19 pandemic.

C. Relevance to Higher Level Objectives

32. **SIRAP2 is aligned with the World Bank Group's Country Partnership Framework (CPF) for Solomon Islands for FY2018–FY2023 (Report No. 122600-SB).** The CPF is organized around three focus areas (a) strengthening the foundations of well-being, (b) promoting inclusive and sustainable growth, and (c) managing uneven development. The proposed project aligns well with the second and third areas. Addressing critical roads and airport infrastructure improves connectivity, reduces costs associated with transport, and mitigates the exclusion engendered by uneven development across Solomon Islands. It is also vital to improving service delivery to underserved communities, as this will enable greater access to markets and improve living conditions in rural areas.

33. **SIRAP2 is also consistent with the NDS and NTP.** It supports the NDS objectives of sustainable and inclusive economic growth, and resilient and environmentally sustainable development with effective disaster risk management. It also contributes to the NTP, which provides for an investment program centered on rehabilitation and maintenance of existing infrastructure, and improvement of transport network resilience.

34. **SIRAP2 will contribute to implementation of the Nationally Determined Contributions of Solomon Islands to the Paris Agreement, its Climate Change Policy 2012–2017, and National Action Plan for Adaptation**, particularly in terms of building climate proofing infrastructure, and adapting to long-term climate impact in all development sectors.

[37] Solomon Islands is a party to the Pacific Islands Civil Aviation Safety Security Treaty (PICASST). Pursuant to PICASST, in 2007, the Solomon Islands entered into a service level agreement with PASO for safety and security oversight. However, the country has not accepted the 2009 amendment to PICASST expanding the functional jurisdiction of PASO.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

35. The PDO is to improve the climate resilience and safety of the Recipient's road and aviation sectors, and in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.

PDO Level Indicators

36. The achievement of the PDO will be measured against the following PDO-level result indicators:

(a) Airport or airfield runways with climate resilience and safety measures constructed and in use (Number)

(b) Modernization of air traffic and aviation safety management (Text)

(c) Enhanced climate resilience and operational safety at regional airports under preventative and corrective maintenance for airport equipment and facilities (Yes/No)

(d) Bridges with climate resilience and safety measures constructed and in use (Number)

(e) Roads with climate resilience and safety measures constructed and in use (Kilometers).

B. Project Components

37. **SIRAP2 will be financed through US$89.21 million (equivalent) IDA financing comprising US$49.21 million of National IDA and US$40.00 million of Regional IDA for a portion of Component 1.** The proposed PDO is to be achieved through four components, as described in the following paragraphs.

38. **Component 1: Climate Resilience and Safety Investments in the Aviation Sector (estimated cost US$64.43 million, including US$24.43 million from National IDA and US$40.00 million from Regional IDA).** This component will support investments to improve the climate resilience and safety of identified aviation infrastructure, facilities, and equipment and will be implemented by MCA. The following activities are proposed:

(a) **Subcomponent 1.1: Honiara Airport Infrastructure Investments (estimated cost US$37.75 million, including US$10.23 million from National IDA and US$27.52 million from Regional IDA).** To improve operational safety and overall infrastructure resilience to climate change at Honiara Airport, this subcomponent will finance the following cost overruns/financial gaps of SIRAP:[38] (i) overlay of the existing asphalt paved runway to enhance its resilience against increasing heat waves and the risk of accelerated pavement deterioration, including installation of energy-efficient airfield ground lighting, precision approach path indicators (PAPIs), and simple approach lighting,[39] (ii) design and construction of a rescue fire service vehicle station, (iii) installation of an

[38] The major causes of the financial gaps include (a) increased construction cost, driven by the increased price of construction materials and the escalation of the mobilization and establishment costs under the COVID-19 pandemic, and (b) underestimated costs from the use of unit costs of previous Government-funded projects due mainly to relaxed technical requirements. In addition, to a lesser extent, an increase in scope, including the Honiara ATC tower renovation works and advisory consultancy, the Solomon Airlines Strategic Options Analysis, and the sealing of 0.9 km for bridge approach, has contributed to the cost overruns of SIRAP.

[39] Major energy savings can be made by replacing the traditional incandescent lighting used for the current lighting equipment with modern light-emitting diode (LED) technologies. LED lighting advantages include: (a) power savings of up to 75 percent, (b) with average life

automatic weather observation station, and (iv) provision of standby generators.[40] Further, as a scale-up activity, this subcomponent will finance (i) design and construction of an ATC tower, (ii) construction of a new aviation complex building, (iii) provision of crash alarms, (iv) supply and replacement of perimeter fence, and (v) equipment support.

(b) **Subcomponent 1.2: Munda Airport Infrastructure Investments (estimated cost US$7.43 million from Regional IDA).** To enable Munda Airport to resume international flights operations after the COVID-19 pandemic with enhanced climate resilience and improved safety, this subcomponent will finance (i) design and construction of an ATC tower, (ii) construction of car parking with improved drainage at the terminal, and (iii) provision of crash alarms.

(c) **Subcomponent 1.3: Santa Cruz Airfield Infrastructure Investments (estimated cost US$14.20 million from National IDA).** To improve operational safety and provide a reliable wet weather operational capability for Code 2C (Dash 8) aircraft at Santa Cruz Airfield, this subcomponent will finance the improvement of drainages, construction of seawalls and base course, and sealing of grass/gravel runway, taxiway, and apron.[41]

(d) **Subcomponent 1.4: Modernization of Air Navigation Systems (estimated cost US$1.55 million from Regional IDA).** The aviation sector suffers from a lack of communication facilities and limited aircraft radio communication, which make it difficult to navigate aircrafts. This subcomponent will improve air traffic safety and climate resilience of air traffic navigation during inclement weather through the following investments in Makira-Ulawa and Temotu Provinces: (i) supply and installation of ADS-B ground stations, (ii) supply and installation of VSAT communications system, and (iii) provision of alternative energy source to support the operation of ADS-B and VSAT.[42] The installation of these will enable aircraft operations to adapt to the communication or navigation challenges in the increasing severe weathers, enhancing the safety and efficiency of aircraft operations and improving the ability to perform search and rescue missions.

(e) **Subcomponent 1.5: Regional Airport Maintenance (estimated cost US$3.50 million from Regional IDA).** To improve the climate resilience and safety of airport operations at Honiara and Munda Airports, this subcomponent will finance a five-year performance-based contract to maintain critical mechanical and electrical assets whose failure would compromise safety or disrupt operations at the international airports.[43] The regional airport maintenance contract will include emergency repair or maintenance of equipment in case of natural disasters. This subcomponent represents Solomon Islands' participation in SOARR.

39. **Component 2: Climate Resilience and Safety Investments in the Road Sector (estimated cost US$14.50 million from National IDA).** This component will support investments to improve the climate resilience and safety of identified road and bridge infrastructure using innovative materials, technologies, and adaptation measures and will be

expectancies of 35,000–50,000 hours or more, LED lighting offers longevity of seven to ten times the typical life cycle of incandescent airfield ground lightings, and (c) LED light heads are comprised of multiple LED luminaries so if one LED element fails the light remains functional—in direct contrast, when a single filament incandescent bulb fails, the light is out of service and requires replacement.

[40] The detailed design for activity (a) and the reference design for activity (b) have been prepared under SIRAP.

[41] The detailed design has been completed by an international consulting firm with New Zealand assistance. Santa Cruz Airfield is located about 645 km east-southeast of Honiara Airport, which makes it difficult for aircraft to return to Honiara Airport in case of inclement weather or mechanical failure, hence the need to have a sealed all-weather strip in the eastern part of the country.

[42] The alternative energy source will use renewable energy.

[43] Assets to be covered under the contract would include airfield ground lighting and signage, navigation aids, control towers and systems, power systems, critical vehicles, terminals, and fueling systems.

implemented by MID. The following activities are proposed:

(a) **Subcomponent 2.1: Malaita Bridges Improvement (estimated cost US$8.00 million from National IDA).** This subcomponent will replace four bridges—Kolofe1 and Kolofe2 Bridges on the North Road, and Su'u Harbor and Bira Bridges on the South Road—potentially with modular bridges with scour protection to address loss of connectivity issues resulting from previous climatic disasters and overloaded logging vehicles.

(b) **Subcomponent 2.2: Noro Roads Improvement (estimated cost US$6.50 million from National IDA).** Much of the existing road network in Noro, Western Province is nearing, or beyond, its service life. To enhance road resilience and connectivity during rainy seasons, this subcomponent will finance sealing of 4.4 km of gravel sections and resealing of 5.5 km of sealed sections of Noro Roads. These activities will undertake appropriate pothole/edge repairs, surfacing raising, base and subbase courses correction, crossfall correction, culvert/drainage improvement to adapt to the forecasted increases of rainfall volumes and intensities, and road safety improvements.

40. **Component 3: Institutional Strengthening and Project Management (estimated cost US$10.28 million from National IDA).** This component aims at strengthening capabilities within MCA and MID in the areas of aviation planning, climate resilience transport, and road safety. It will finance technical assistance, project implementation support costs, and operational costs associated with the implementation of the project.

(a) **Subcomponent 3.1: Technical Assistance (estimated cost US$8.26 million from National IDA).** This subcomponent will finance (i) a consulting service for design and supervision of building and civil works under Subcomponents 1.1, 1.2, and 1.3, and Component 2, (ii) preparation of a national airports development plan to guide future infrastructure and facility development for 10 airfields, including the guidance on how to prepare for and respond to extreme weather events, (iii) technical support and training to MCA and Solomon Airlines to improve aviation safety and security including airport emergency preparedness and response planning,[44] (iv) climate resilient road asset management improvement through the improvement of the existing asset management system, expansion of the road network criticality and vulnerability assessments, and development of a sustainable transport financing strategy,[45] (v) road safety audits for the proposed Noro roads investments during the design and post-construction phases and training to MID staff to conduct road safety audits, (vi) road safety capacity improvement through the establishment of a National Road Safety Committee and potentially a road safety unit within MID, and (vii) activities to address the identified gender gap within MCA and expansion of the gender-based violence (GBV) training and awareness raising activities prepared under SIRAP for Munda/Noro and Malaita to include Santa Cruz.

(b) **Subcomponent 3.2: Project Implementation Support (estimated cost US$2.02 million from National IDA).** This subcomponent will finance the project support team (PST) contracted staff and operating costs associated with implementation of the project, and yearly audits of the project accounts that SIG will submit to the World Bank.

41. **Component 4: Contingent Emergency Response (US$0 million).** Since Solomon Islands remains vulnerable to climate change and severe weather events, even with the successful implementation of the first three components, supporting post-disaster/pandemic recovery is an important feature of the project. This zero-dollar component is

[44] The airport emergency preparedness and response planning will include preparedness to extreme weather events.
[45] The strategy will detail how climate change impacts transport infrastructure.

designed to provide swift response in the event of an Eligible Crisis or Emergency, by enabling SIG to request the World Bank to reallocate project funds to support emergency response and reconstruction. The definition of disasters that could trigger this component would be broad enough to include pandemics or other health-related events.

C. Project Beneficiaries

42. **Aviation component beneficiaries.** A large share of the entire population of Solomon Islands of approximately 721,000 people are regarded as beneficiaries of the aviation component. These people will benefit from improved and uninterrupted international and domestic air travel connections due to inadequate or unsafe infrastructure, and improved reliability of aviation infrastructure in the event of a natural disaster where airports are essential to the emergency response, as well as being capable of serving as a base of operations for emergency services such as search and rescue efforts. The improvements to the aviation infrastructure will also provide benefits to other sectors including tourism, fishery, agriculture, health, and general commerce. In addition, individual travelers, air freight users, including cargo owners, airlines, forwarders, and logistics companies will benefit from the provision of safer international and domestic air travel, and more efficient operations in the airport terminals. Further, the population of Munda will benefit from the economic development opportunities that will arise from international flights directly to Munda Airport—particularly with regard to tourism and the potential export of fresh tuna.

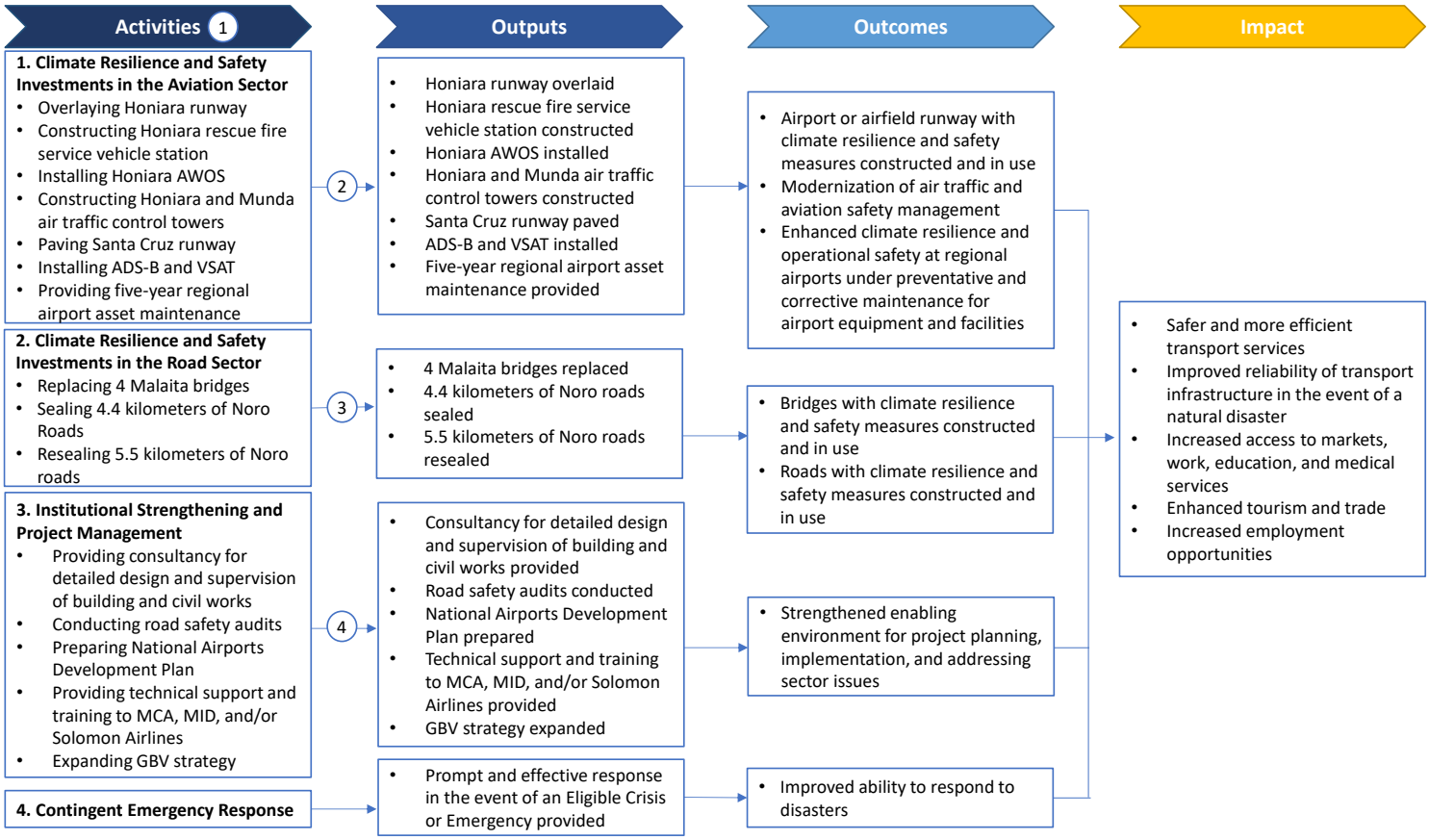
43. **Road component beneficiaries.** The principal beneficiaries of the road component in Malaita Province will be the nearly 108,000 people living in the 16 wards[46] connected by the North and South Roads where the proposed sites for bridge replacement are located. The main beneficiaries of the road component in Western Province will be the nearly 4,100 people living in Noro ward, as well as some 3,200 people in Munda ward that connect to the project roads through the main road. These people will benefit from improved access to markets and services in Auki in Malaita Province and Noro and Munda in Western Province and onward connections to Honiara, with better road and bridge conditions resulting in reduced travel times and vehicle operating costs. Public transport options would also be improved, with closed vans and buses complementing the open trucks on some routes.

D. Results Chain

44. Figure 1 provides the theory of change for SIRAP2.

[46] These consist of the following wards: Auki, Aimela, Buma, Fauabu, West Baegu/Fataleka, Mandalua/Folotana, Fo'ondo/Gwaiau, Malu'u, Matakwalao, Takwa, East Baegu, Tai, Kwarekwareo, Siesie, Waneagu Silana Sina, and Keaimela/Radefasu.

Figure 1: Theory of Change



Critical Assumptions

1. Impacts of COVID-19 pandemic are manageable by SIG and the World Bank in first years of implementation.
2. International contractors are interested in bidding for aviation works.
3. Local contractors have adequate capacity to upgrade the project roads and bridges with climate resilience and safety measures.
4. The detailed design and supervision consultant are procured on time and fully engaged throughout the project.

E. Rationale for Bank Involvement and Role of Partners

45. **The World Bank has considerable experience in the Pacific in strengthening transport sector infrastructure and responding to and building resilience against natural disasters.** This includes the Pacific Aviation Investment Program (PAIP),[47] the Pacific Climate Resilient Transport Program (PCRTP),[48] and the Climate and Disaster Resilient Transport in

[47] PAIP has invested in infrastructure, capacity development, and regulatory oversight to improve operational safety and oversight of international air transport infrastructure. The program, originally approved in December 2011, includes Kiribati (P128938), Tonga (P128939), and Tuvalu (P128940) in Phase I, Samoa (P143408) in Phase II, Vanuatu (P154149) in Phase III, and Solomon Islands in Phase IV. Of these, the projects in Kiribati, Tonga, Samoa, and Vanuatu have been completed. It has a PDO of improving operational safety and oversight of international air transport (and associated) infrastructure.

[48] PCRTP, launched from the approval of the Samoa Climate Resilient Transport Project (P165782) in September 2018, has active six projects in Samoa, Tonga (P161539, P174077), Tuvalu (P161540, P174089), Vanuatu (P167382, P177135), Kiribati (P165838), and the Federated States of Micronesia (P172225), with additional projects soon to follow again in Tuvalu and the Federated States of Micronesia. The goal of the program is to (a) support the Recipients in improving the resilience of their transport sector, and (b) in the event of an Eligible Crisis or Emergency, provide an immediate response to the Eligible Crisis or Emergency.

Small Island Developing States (RTSIDS, P164157) Advisory Services and Analytics. Among these, the World Bank has experience in the Solomon Islands transport sector through SIRAP and RTSIDS. SIRAP, approved in March 2019, upgrades Honiara and Munda Airports and Malaita roads and bridges and strengthens SIG capacity in airport planning, aviation safety and security oversight, road asset management, road safety, road maintenance, climate resilience, GBV, and emergency response. RTSIDS conducts the criticality and vulnerability assessments and develops the asset management strategy. Through SIRAP and RTSIDS, the World Bank has established a good working relationship with the Ministry of Finance and Treasury (MOFT), MCA, and MID. SIRAP2 will benefit from lessons learned and project implementation insights from the regional programs, including SIRAP, and analytical work. In addition, the inclusion of SOARR adds a regional dimension, which builds upon the World Bank experience in modernization of the transport sector in PICs.

46. **The World Bank's engagement provides value added benefits in the Solomon Islands transport sector,** including (a) bringing global experience of road and aviation infrastructure investments and associated technical assistance – particularly around enhancing resilience to the impact of climate change, (b) deepening the development impact of SIRAP, and the other donor-funded transport projects in Honiara, Munda/Noro, and Malaita by more comprehensively improving transport connectivity in selected corridors, (c) participating in sector-related donor coordination, (d) providing best practices in climate resilient transport solutions, (e) integrating road safety assessments into design and promoting road safety agenda in country, and (f) helping SIG address environmental and social safeguard issues, including mitigating risks of GBV and reducing gender inequalities. Transferring this expertise will be key to supporting the Government to prepare and implement the proposed project efficiently and effectively.

47. **Public sector financing is the appropriate vehicle for SIRAP2.** All assets that will be financed under the project are managed by MCA, MID, or the state-owned SIACL. Private sector financing is unavailable to undertake an aviation and road project of this nature as the investment costs cannot be recovered through tariffs and the traffic volumes would likely make profitability unachievable. However, there will be opportunities for local contractors to compete, particularly in the road sector. SIRAP2 will build on SIRAP, which undertook in September 2021 (a) a survey of all national civil contractors to establish their capability, historical performance, and experience and their wiliness to work in Malaita and Western Provinces, and (b) a capacity building/training workshop on bid preparation including calculation of unit rates. In this context, SIRAP2 will also contribute to further building capacity and sustainability of the private sector.

48. **SIRAP2 will complement the ongoing investments of JICA to improve Honiara Airport.** JICA has historically provided grant assistance to rehabilitate the airport. The major investments included (a) the Honiara Airport Restoration Project (2004–2005), which provided asphalt concrete overlay pavement for the runway and replaced airfield lighting, and (b) the Honiara Airport Improvement Project (2018–2023), which upgrades the taxiway and apron, international and domestic terminal buildings and provides a flood protection dike. Investments under SIRAP2 will support the JICA's ongoing investments, ensuring that the airport meets the ICAO safety and security standards and increases its climate resilience.

F. Lessons Learned and Reflected in the Project Design

49. The project draws upon the experiences of SIRAP and those of recent transport projects in the Pacific. Lessons that have been reflected in the SIRAP2 design include the following:

(a) In smaller and highly exposed economies, a broader PDO may be better to accommodate likely changes. A lesson learned from the recent Implementation Completion and Results Report (ICR) for the Samoa Enhancing the Climate Resilience of the West Coast Road Project is to keep the PDO not too restrictive to accommodate emerging

needs that may only become apparent during implementation. This is especially important due to the uncertainty of the proposed investments on Malaita under Subcomponent 2.1,[49] and the vulnerable and volatile climate situation in Solomon Islands. In addition, SIRAP2 has a similar framework to the Tonga Climate Resilient Transport Project II (TCRTP II) and the Samoa Aviation and Roads Investment Project (SARIP). Therefore, SIRAP2 has a flexible PDO consistent with that of TCRTP II and SARIP.

(b) It is important to choose indicators within the project's control to reflect its actual achievements.[50] PAIP, including SIRAP, has a PDO-level indicator of airport certification[51] and ICAO USOAP audit. However, these two indicators rely on external agencies: the Civil Aviation Authority of a given state and ICAO, respectively. They also cannot be used to measure the achievements fully attributable to the project. To avoid repeating the issue, SIRAP2 is designed instead with indicators that can be more directly controlled by the project.

(c) Lower-capacity environments may require longer implementation periods. Another lesson learned from the recent ICRs of other transport projects in Kiribati,[52] Tonga,[53] and Samoa[54] indicate that the standard five-year implementation period is unlikely to be sufficient in small island developing states where capacity is limited, and remoteness affects cost, timelines, and connectivity. In addition, the proposed regional airport asset maintenance contract will have a duration of five years. Further, the COVID-19 pandemic may result in unavoidable delays to SIRAP2 due to travel restrictions and disruptions in the supply chain. Taking these into account, SIRAP2 will have an implementation period of seven years.

(d) Higher cost contingencies need to be factored into project design. Similar to other PICs, the remoteness and internal dispersion and division of Solomon Islands has a significant impact on costs. These geographical challenges, along with the escalation of the mobilization and establishment costs under the COVID-19 pandemic, have increased construction costs. In fact, SIRAP experienced a works contract price being 25–50 percent higher than the estimate provided in the Request for Bids, which resulted in cost overruns/financial gaps in the project. To address this risk, the estimated costs under SIRAP2 includes contingencies of 20 percent.

(e) Activities to address climate change need to be undertaken in a holistic manner, through the integration of resilient transport interventions into decision-making and implementation. PCRTP follows a four-pillared framework for enhancing the climate resilience of the transport sector: (i) improving sectoral and spatial planning, (ii) using climate resilient infrastructure solutions, (iii) strengthening the enabling environment, and (iv) supporting post-disaster recovery. Informed by the framework, SIRAP2 includes several best practices in climate resilient transport solutions such as a road network vulnerability assessment, an innovative bridge construction technology, a long-term performance-based maintenance contract, and contingency programing.

[49] See the Political and Governance risk section for further details.
[50] World Bank. 2019. *ICR for Kiribati Aviation Investment Project.*
[51] CAASI reissued a Part 139 Aerodrome Operator Certificate for each of Honiara and Munda Airports, valid to March 31, 2021, indicating that the certificate can be issued without the SIRAP2 investments.
[52] World Bank. 2019. *ICR for Kiribati Road Rehabilitation Project*.
[53] World Bank. 2020. *ICR for Tonga Aviation Investment Project.*
[54] World Bank. 2021. *ICR for Samoa Aviation Investment Project;* World Bank. 2021. *ICR for Enhancing the Climate Resilience of the West Coast Road Project.*

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

50. **SIRAP2 will maintain a similar implementing arrangement as SIRAP.** The Recipient Representative will be MOFT. As the project includes both aviation and road components, implementation will be managed jointly by the respective ministries. MCA will be the implementing agency for the aviation component (Component 1, a part of Component 3,[55] and Component 4). MID will be the implementing agency for the road component (Component 2, a part of Component 3,[56] and Component 4). Each implementing agency has appointed a focal point for SIRAP, who will play the same role under SIRAP2.[57] The Permanent Secretary of MCA will be the central point of contact for the PST and the World Bank.

51. **The existing SIRAP PST will be expanded with additional staff to manage both SIRAP and SIRAP2.** Since the majority of the project investments are with MCA, the PST will continue to be housed within MCA and will manage both the aviation and road investments.[58] The PST will be responsible for a day-to-day management of the project, including technical, FM, procurement, and safeguards matters that will support both the aviation and road component, reporting to the MCA and MID focal points. The PST includes a project manager, a deputy project manager (seconded from MID), a national safeguards specialist, a community liaison officer, a finance manager, a project accountant, a procurement specialist, a communications specialist, and an administrative assistant. The team will be augmented with additional staff, including a national environmental and social officer and a national project manager, to manage both projects. Further, the PST continues to be supported by a team of international specialists, including a procurement specialist, a safeguards specialist, a pavement specialist, and an ADS-B specialist.

52. **The SIRAP National Steering Committee (NSC) will also provide oversight for SIRAP2 and will make strategic decisions for both projects.** The NSC comprises the (a) permanent secretary of MOFT, (b) permanent secretary of MID, (c) permanent secretary of MCA, (d) provincial secretary of Malaita Province, (e) provincial secretary of Western Province, (f) provincial secretary of Temotu Province, and (g) deputy secretary - technical of MID. The PST project manager is providing the secretariat support to the committee.

53. **There will be technical coordination for procuring a contract for regional airport asset maintenance.** This contract will consider common technical specifications and potentially be jointly advertised with TCRTP II and SARIP, which plan to finance the same type of contract in each country. Joint technical meetings will be organized to prepare the common specifications and coordinate the timing of advertising the procurement. The contract management, including technical supervision and financial management (FM), will be conducted separately by each project as the contract will be separated by each country. The participants of the technical meetings will consist of project staff responsible for project management, procurement, and contract management and a representative of the airport authority from each of the three countries.

[55] This includes activities (a) (jointly with MID), (b), (c), and (g) under Subcomponent 3.1, and all of Subcomponent 3.2.
[56] This includes activities (a) (Jointly with MCA), (d), (e), and (f) under Subcomponent 3.1.
[57] The MCA focal point will be responsible for day-to-day implementation, reporting, and monitoring and evaluation of the MCA's respective part of the project, while the MID focal point will be responsible for those of the MID's respective part of the project.
[58] Except for the Community Liaison Officer who relocated to Auki from the start of 2020 and the Deputy Project Manager who will work from the MID/SIRAP Auki office when the works on Malaita commences.

B. Results Monitoring and Evaluation Arrangements

54. **Project monitoring and evaluation (M&E) will be the responsibility of the PST.** As with the case of SIRAP, the PST will prepare SIRAP2 project reports for each quarter in collaboration with MOFT, MCA, and MID. The PST will submit the reports to the World Bank within 45 days after the end of the quarter. The project reports will track progress in terms of distribution of inputs, disbursement of funds, and achievement of indicators as outlined in the Results Framework (section VII). The key instrument for evaluating SIRAP2 will be the indicators identified within the framework.

C. Sustainability

55. **Maintenance is a concern for the Solomon Islands transport sector if the connectivity provided by the network is to be sustained.** The proposed approach for having a securely funded, five-year performance-based maintenance contract will help ensure that the international airports receive the maintenance that is required. The introduction of new technologies with a focus on strengthening climate resilience (for example, a modular bridge with a longer design life) will also enhance the sustainability of the network. SIRAP2 will invest in the priority items listed in the 20-year Aviation Sector Strategy and Honiara and Munda Airports Master Plan. It will also finance a national airports development plan to ensure the sustainability of long-term investments for domestic airfields. In the road sector, the project will continue to improve the existing asset management system, expand the road network criticality and vulnerability assessments, and develop a sustainable transport financing strategy. Maintenance informed by the improved asset management system will contribute to enhancing the longevity of the network and helping to effectively cope with increasing climate risks through a preemptive management approach.

IV. PROJECT APPRAISAL SUMMARY

A. Technical and Economic Analysis

(i) Technical Analysis

56. **The planned activities under SIRAP2 are in general straightforward from a technical and design perspective, reflecting the preparatory and analytical work conducted with the World Bank and other donors.** The technical solutions proposed involve the design and construction of works, and the provision of software and hardware, all based on tried and tested technology that will be adopted to suit Solomon Islands' conditions. SIRAP2 will significantly invest in a range of climate resilient and safety infrastructure solutions under Components 1 and 2. Design of works will conform to international design codes of practice such as Austroads for road and bridge design together with New Zealand Transport Agency's Bridge Manual for seismic design and ICAO SARPs for international aviation activities. Specifications for all works and materials will also be in accordance with international standards, making use of innovative materials, technologies, and approaches such as a modular bridge used under SIRAP if they will enhance climate resilience.

57. **The regional airport asset maintenance contract will be carefully designed, building on the experiences and lessons of PAIP.** Previous projects have shown that airport equipment failure often occurred because of a lack of both preventive and corrective maintenance, and sometimes access to low-value spares which Government procurement processes made difficult to secure. The contract will address this through the creation of preventive and corrective maintenance programs that PICs will implement and review on a semiannual basis. Low-value critical parts may be supplied by the contractor through the contract. More broadly, the regional performance-based contract will stimulate

competition that has previously been limited, as evidenced through assessments of the status quo as national governments have struggled to hire and retain qualified firms to help maintain their airports in good condition.

58. **SIRAP2 will finance surfacing/resurfacing works for runways at Honiara Airport and Santa Cruz Airfield (38 percent of project costs).** The existing pavement is displaying oxidation and cracking which allows water to permeate the pavement. Given the increased volume and intensity of rainfall associated with climate change, failing to overlay will lead to accelerated pavement deterioration. Therefore, the project will resurface the existing asphalt paved runway to enhance its resilience against increasing heat waves and the risk of accelerated pavement deterioration as a preventative maintenance measure. The existing surface of runways at Santa Cruz Airfield is topsoiled and grassed, often saturated with standing water. Further, without proper pavement and drainage system, the existing runway is easily flooded, and would be detrimental to the integrity of the runway and is inadequate for any aircraft operation. The northern end of the runway is exposed to increasing wind driven ocean swells. To adapt to these climate risks, the project will finance seawall construction and runway, taxiway, and apron pavement rehabilitation which include surfacing with bituminous surfacing, base course construction, and drainage improvement.

59. **The project will finance several key airport buildings (23 percent of project costs), including a new Honiara aviation complex building, a new Honiara fire service vehicle station, and new ATC towers at Honiara and Munda Airports.** Located within the airports with large open space and near to the coastline, these critical assets are highly exposed to increasing cyclones, extreme rainfall, and strong wind under a constantly changing climate condition. The design of these buildings will consider climate resilience, including raising the ground level and improving the drainage system to adapt to flooding risks and designing of structure using materials with robust resilience level to withstand extreme winds and rainfalls. In addition, energy efficiency measures will be applied across these buildings to reduce energy consumption and emissions. This includes using light emitting diode and alternative energy source for lighting and heating system, together with water storage tanks for rainwater harvesting.

60. **For the road component, SIRAP2 will replace four bridges on Malaita Roads (9 percent of project costs) and upgrade 9.9 km of Noro Roads (7 percent of project costs) in response to their poor conditions and increasing risk of flooding.** Modular bridge technologies are likely to be applied, which provide strong resilient bridge structures with lower maintenance requirements. Heavy and constant flooding is the major cause of rapid deterioration of the 4.4 km of gravel sections and 5.5 km of paved sections. Considering the traffic volume on these road sections, a double bituminous surface treatment will be applied as a climate resilient solution to protect road connectivity under increasing extreme rain and flood risks. Critically, the roads will be raised, the base and subbase courses strengthened, and improved longitudinal and cross drainage installed for the targeted road sections.

(ii) Economic Analysis

61. **An Economic analysis was conducted based on a standard methodology applied for appraisal of transport infrastructure, which demonstrates the overall economic internal rate of return (EIRR) of 15.9 percent and a net present value (NPV) of US$33.0 million.** For aviation, the economic evaluation focuses on Subcomponents 1.1, 1.2, and 1.3. For roads, the analysis focuses on Subcomponents 2.1 and 2.2. The discount rate is assumed to be 6 percent with the standard conversion factor of 0.87. The cost-benefit analysis was conducted to calculate the EIRR and NPV of the project covering the period of 20 years from 2023 to 2042.

62. **To examine the impact of changes in key variables on the EIRR and NPV estimate, a sensitivity analysis was conducted.** For the overall project, the EIRR is estimated at 11.0 percent and the NPV at US$18.0 million in the case that

both the project benefits decrease by 10 percent and the project costs increase by 10 percent, which demonstrates the robustness of the economic rationale for the project. The switching value analysis shows that the construction costs would have to increase by 57 percent for the NPV to be equal to zero.

63. **The overall EIRR of the aviation infrastructure investments is 13.6 percent and the NPV is US$15.2 million.** The EIRR of the Honiara and Munda Airports investment is 16.3 percent and the NPV is US$11.6 million, while the EIRR of the Santa Cruz Airfield investments is 9.6 percent and the NPV is US$3.6 million. Key benefits are the avoided disruption and further investment for Honiara and Munda Airports due to safety standards, and the increased demand and efficiency for domestic flights for Santa Cruz Airfield.

64. **The overall EIRR of the road infrastructure investments is 21.2 percent and the NPV is US$17.8 million**. Most of the benefits come from the avoided disruption from the four bridges collapse (70 percent) and the vehicle operating cost savings (20 percent), while the remaining benefits are from time saving (4 percent), avoided emergency repairs (3 percent), and road safety (3 percent).

65. **The analysis from the Road Safety Screening and Appraisal Tool (RSSAT) indicates that the project will reduce road fatality by about 16.5 percent, with the Project Safety Impact (PSI) of 0.84.** Most of the fatality reduction will be for pedestrians, which constitute a large share (50 percent) of road users. The estimated benefit from improved road safety is about US$1 million for the analysis period of 20 years.

66. **An analysis of greenhouse gas (GHG) emissions was undertaken based on fuel consumption rates at different speeds under 'with project' and 'without project' scenarios.**[59] Without the project, the deteriorated condition of the roads limits vehicle speed, leading to higher fuel consumption per vehicle-km compared to the 'with project' scenario. With the project, improved road condition leads to improved speed, and hence lower fuel consumption. Gross GHG emission in the 'with project' scenario is 140.5 tCO_2e. Total net GHG emission is estimated to be −58.6 tCO_2e—a net reduction over the evaluation period (20 years). The annual average net GHG emission is −2.9 tCO_2e per year. The social benefit from GHG reduction is estimated to be US$3,268, based on social cost of emission reduction from the World Bank's Guidance Note on Shadow Price of Carbon in Economic Analysis (2017).

B. Fiduciary

(i) Financial Management

67. **A FM capacity assessment has been conducted by the World Bank.** The assessment concluded that the project meets the minimum World Bank FM requirements, as stipulated in the World Bank Policy/Directive on IPF**.** The existing SIRAP FM arrangement of having a finance manager and a project accountant under the PST, which is proposed to continue under SIRAP2, is assessed as adequate to meet the World Bank's FM requirements as stipulated in the Policy/Directive. The PST's FM staffing, budgeting, planning procedures, accounting system (including accounting policies), financial reporting, and internal controls procedures are also adequate. However, the PST must establish and maintain separate budget, accounting, funds flow, reporting, and audit arrangements to properly distinguish the SIRAP2 and SIRAP as two distinct projects. The main FM actions required to be completed include (a) appointment of a finance manager and a project accountant to be in charge of SIRAP2 FM arrangements, (b) preparation of a project FM manual as part of a Project Operations Manual (POM) with all the detailed project FM requirements and procedures, (c) update

[59] GHG accounting was conducted only for the road and bridge investments as the World Bank does not have formally adopted GHG accounting methodology for aviation.

of the current project accounting software used under SIRAP to include the separate accounting environment for SIRAP2, with the function of recording foreign currency and foreign exchange differences, (d) confirmation of the Office of Auditor General (OAG) in Solomon Islands as the project annual auditor, and (e) attendance of the PST staff at the relevant World Bank training on FM and disbursement. Additional details are provided in Annex 1.

(ii) Procurement

68. **Procurement for SIRAP2 will be carried out in accordance with the World Bank's Procurement Regulations for IPF Borrowers for Goods, Works, Non-Consulting and Consulting Services, dated July 2016, revised November 2017, August 2018 and November 2020 (referred to as Procurement Regulations), as well as the provisions stipulated in the Financing Agreement and in the project's Procurement Plan.** As with the case of SIRAP, SIRAP2 will use the World Bank's Systematic Tracking of Exchanges in Procurement (STEP) system.

69. **The PST will continue to conduct and monitor the procurement activities under SIRAP2.** During implementation of SIRAP, the PST has developed strong expertise in project implementation, including all fiduciary aspects. In particular it has sufficient procurement capacity consisting of the full-time National Procurement Specialist and periodic (75 percent per year) International Procurement Specialist. The PST has satisfactorily managed the procurement activities under SIRAP to this point of time. Therefore, it has sufficient capacity to manage the procurement activities under SIRAP2. The SIRAP POM will be updated as needed and the updated POM for SIRAP2 must be adopted within three months after the Effective Date. In addition, an annual work plan and budget will be submitted to the World Bank not later than November 30 of each year during the implementation of the project.

70. **The project Procurement Plan has been prepared and is detailed in the Project Procurement Strategy for Development (PPSD).** Annex 1 provides further details on the procurement arrangements, including the summary of the initial Procurement Plan.

C. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

D. Environmental and Social

71. **During project preparation, the PST on behalf of the implementing agencies (MCA and MID) conducted an environmental and social assessment (ESA), which included screening of environmental and social sensitive receptors along the proposed road networks and baseline conditions of the proposed subprojects.** The overall Environmental and Social Risk Classification is Substantial, with a Moderate rating for environment and a Substantial rating for social. Justification of the risk classification is provided in Section VI: Key Risks. The ESA provided the basis for the environmental and social risk management instruments for the project: an Environmental and Social Commitment Plan (ESCP); Environmental and Social Management Plans (ESMPs) for Honiara Airport, Munda Airport, Malaita Bridges, and Noro Roads; a Stakeholder Engagement Plan (SEP); Labor Management Procedures (LMP); and a Resettlement Plan.

Table 1: Disclosure Dates for SIRAP2 Safeguards Instrument

Instrument	Disclosure Dates	
	In-Country	World Bank's External Website
ESCP	March 27, 2022	March 23, 2022
ESMP for Honiara Airport	March 27, 2022	March 28, 2022
ESMP for Munda Airport	March 27, 2022	March 28, 2022
ESMP for Malaita Bridges	March 27, 2022	March 28, 2022
ESMP for Noro Roads	March 27, 2022	March 28, 2022
SEP	March 27, 2022	March 23, 2022
LMP	March 27, 2022	March 28, 2022
Resettlement Plan	March 27, 2022	March 28, 2022

72. **These instruments have captured the key direct and indirect potential environmental risks and impacts which include (a) direct impacts and risks related to airport construction, (b) direct impacts and risks related to road and bridges construction, (c) indirect impacts that may be potentially amplified following road upgrading, and (d) downstream impacts that may arise from the technical assistance activities.** Key risk management measures include (a) ensuring that technical/engineering road design comprise solutions to mitigate risks of natural disasters such as integrating flood control and climate resilience with road design, integrating slope stability with erosion control plan, and structural design to incorporate earthquake resilience, (b) addressing pollution prevention and management throughout the project lifecycle, implementing ambient air quality and noise management plan, implementing plant/equipment maintenance and management plan, ensuring that the laydown and stockpile sites are located at least 150 m from waterways and coastal sections, and including hard stand areas and watertight bunding with clean water diversion drains that allow for complete containment, (c) applying good engineering designs and good practices for construction by incorporating environmental mitigation measures (for example, dust prevention measures, proper management of hazardous and non-hazardous site wastes and surplus materials, spill response plan, and so on) in the technical design and bid documents, pollution prevention and management, and spill prevention and response measures, (d) incorporating technically and financially feasible road safety measures into the project design to prevent and mitigate potential road safety risks to road users and affected communities, and (e) addressing road safety related risks through traffic management planning during construction stage. At the operational stage, the project will identify, evaluate and monitor potential traffic and road safety risks to road users and affected communities throughout the project lifecycle.

73. **At the advanced/later stage of the project preparation the following activities were identified: (a) runway pavement works at Santa Cruz Airfield in Temotu Province, and (b) Honiara Aviation Complex Building.** These two investments will be constructed in Year 2 of project implementation at the earliest. An ESMP will be prepared for each of the new investments withing six months after project effectiveness. This provision has been included in the ESCP. These ESMPs will include (a) baseline conditions—natural and social environment—of the project locations including screening results of the environmental and social sensitive receptors surrounding the areas adjacent to the airports, construction facilities (workers' accommodation and laydown areas) that may need land clearing, and potential haulage routes, (b) consultation and stakeholder engagement, (c) potential environmental and social impacts, (d) proposed mitigation measures and monitoring plan, (e) institutional capacity for ESMP implementation, (f) COVID-19 safety protocols, and (g) chance find procedures. The ESMPs will be prepared in line with the national regulations, the World Bank's Environmental and Social Framework (ESF) policy and the Environmental, Health and Safety Guidelines. These ESMPs will be used to to guide the preparation of appropriate outcome-based specifications in accordance with the World Bank's procurement policy and will also serve as the basis for the contractor's ESMPs.

74. **Lessons learned from SIRAP suggest that there is experience in operationalizing the World Bank safeguards policies and that performance has been rated Satisfactory; however, the implementing agencies have no experience in preparing and implementing World Bank-financed projects under the ESF.** SIG has deployed adequate skills and resources in environmental and social management to prepare the project with the engagement of international and national safeguard specialists. Both resources are experienced in aviation and road sectors and are familiar with World Bank safeguards policies and SIG environmental regulations. A project-level institutional capacity assessment has been conducted as part of project preparation, and it identified measures to strengthen capacities for effective implementation of the relevant guidelines and standards applicable to SIRAP2. These measures have also been incorporated into the ESMPs and the ESCP to ensure ownership and sustainability of the dedicated resources.

75. **For technical assistance activities, terms of references are to be reviewed by the World Bank to ensure that the requirements of the ESF policy are effectively integrated.** These include: design and supervision consultancy, design of ATC towers, national airports development plan, technical support and training to MCA and Solomon Airlines, climate resilient road asset management improvement, road safety capacity improvement, and technical support and training to address GBV. This provision has been included in the ESCP.

76. **The project also includes the CERC.** A CERC Manual and associated Environmental and Social Management Framework were prepared under SIRAP. SIRAP2 will update these instruments within the first six months of project effectiveness to ensure that they are aligned with the ESF requirements. This provision has been included in the ESCP.

77. **The social risks associated with the project relate to land (with history of land disputes and civil conflict), labor and working conditions, and community health and safety.** During preparation of SIRAP, the risk of GBV associated with transport projects was deemed high at the time. However, extensive consultations, including broad and meaningful community engagement has taken place under SIRAP and therefore the PST is prepared to continue the engagement on the ground. Under SIRAP2, a resettlement plan has been prepared to identify areas of land impact, including information on land tenure arrangements and existing land disputes and outline a clear process on how MCA is dealing with land acquisition and dispute resolution. An SEP has been prepared for the project, with details of the consultations that will take place in Munda, Malaita, and Santa Cruz. The project continues consultations that are culturally appropriate and free of manipulation, interference, coercion, discrimination, and intimidation. The SEP includes all stakeholders at all levels including national and provincial (governments) and will include a grievance redress mechanism and LMP, in line with the applicable Environmental and Social Standards (ESS) of the World Bank ESF. It is anticipated that vulnerable groups (disabled, women) may be impacted by the labor influx, so equal opportunity for work should be considered during implementation. The LMP will address any risk of unequal work distribution under the project.

78. **The risk of COVID-19 transmission under this project is a potential social risk; however, a plan to address COVID-19 has been developed by the Ministry of Health and Medical Services.** The project will ensure that the right measures are in place, especially during consultations and community engagement. While the travel restrictions are in place because of COVID-19, appropriate measures will be taken to reduce the risk.

79. **The ongoing JICA-funded project at Honiara Airport is not considered as Associated Facilities since SIRAP2 would exist and be viable without the JICA-funded project, and vice-versa.** Indeed, the JICA-funded project commenced in 2018, three years before SIRAP2 was requested by SIG. As these projects are likely to be implemented concurrently and the projects will physically interact at various points, there is a need to support SIG through MCA in managing the implementation of environmental and social safeguards aspects of both investments. While the World Bank has no supervision responsibilities on the environmental and social aspects of the JICA-funded project, the World Bank will liaise

with SIG to ensure any environmental and social risks from the JICA-funded project that may impact SIRAP2 are identified and addressed in a timely manner.

80. **The Climate and Disaster Risk Screening for SIRAP2 shows that the overall road and aviation sectors and the targeted infrastructure is moderately and highly exposed and sensitive to climatic hazards.** As noted in paragraph 6, Solomon Islands is vulnerable to natural disasters such as earthquakes, volcanic eruptions, cyclones, tsunamis, coastal and river flooding, and landslides. This vulnerability is in large part because most of the population live within 1.5 km of the coastline, rendering a considerable portion of the country's economy, infrastructure, and livelihoods vulnerable to changes in climate.[60] To address these challenges, the proposed works will improve the climate resilience of road and aviation infrastructure from future extreme weather events through improved design (for example, raised road, improved drainage, sealed shoulders, seawall protection, scour protection, and crossfall correction). The proposed works will also provide support for improved maintenance practices in the aviation sector. Modernization of air navigation systems, technical support and training in airport emergency preparedness and response planning and climate resilient road asset management, and the inclusion of emergency protocols will further help reduce the impacts of future climate related extreme events. Building this resilience is of relevance for women and girls, who experience a disproportionate level of impact from climate change and disasters.

81. **All works activities will call for contractors to implement appropriate standards for occupational health and safety (OHS) and submit an OHS Management Plan as part of their contractor's ESMP using the codes of practice attached to the ESMP.** The OHS Management Plan will include issues such as workers compensation, first aid services, sanitation and hygiene at the workplace, use of personal protective equipment, site safety, and accidents as well as implementation of a traffic management plan during construction. The plan will be reviewed and cleared by the supervision consultant who will then monitor its implementation. There will be strict requirements for reporting on OHS issues, with serious issues and fatalities reported to the World Bank within 24 hours. The contractors will be required to submit monthly reports on leading and lagging OHS indicators, and the supervision consultant on its oversight.

82. **Gender. Women's access to paid employment is limited in Solomon Islands.** Based on the 2009 Population Census, of those employed, women are only half as likely as men to be in paid work (25 percent of women and percent of men), with this gap even more pronounced in rural areas (only 19 percent of rural women and 41 percent of men are engaged in paid work). Rural women face difficulties in accessing income generating opportunities[61] and key services because of poor infrastructure and transport services. This is further exacerbated by their limited time to travel because of childcare and household duties. Infrastructural barriers in project provinces include poor road quality and cost of transportation[62], safety concerns due to lack of pedestrian footpaths, lighting, shelter, and access to the river from the roads for washing clothes[63]. Women's representation in technical and leadership roles is also limited. The 2013 Household Income and Expenditure Survey reports that only nine percent of science and engineering professionals and associate professionals in the country are female. Currently, women account for 37 percent [59 staff] at MCA, 45 percent [5 staff] at CAASI, and 31 percent [71 staff] at Solomon Airlines.[64] Within law enforcement, women comprise 24 percent of the workforce in the Royal Solomon Islands Police Force and about 10 percent of officers in its Fire and Rescue Service. Evidence from East Asia and the Pacific region suggests that lack of adequate facilities, gender stereotypes, and concerns

[60] 2011. *Climate Risk and Adaptation Country Profile*.
[61] The overwhelming majority of produce vendors in local and provincial markets across Solomon Islands are female.
[62] UN Women. 2009. *Solomon Islands Market Profiles.*
[63] Based on community consultations led by the ADB in preparation of the ADB's 2021 Land and Maritime Connectivity Project in Solomon Islands.
[64] MCA. 2020. *Aviation Sector Strategy Solomon Islands. Final Report.*

about discrimination and harassment are important constraints to women's employment in male-dominated areas such as law enforcement.[65]

83. **SIRAP2 will include specific actions to address gender gaps by allowing women to take advantage of already available economic opportunities.** These include (a) implementation of the Aviation Sector Strategy prepared under SIRAP with focus on strengthening the recruitment, promotion, and retention of women in the aviation sector,[66] (b) design and construction of a rescue fire service vehicle station at Honiara to allow for female workforce growth in the MCA's Airport Rescue and Fire Service, which has been supported by the Royal Solomon Islands Police Force Fire and Rescue Service; this will involve the construction of separate male/female sleeping quarters, showers, and changing rooms and will be complemented by activities such as establishing and training all personnel in codes of conduct, as well as targeted outreach/training for women,[67] and (c) inclusion of gender responsive road safety infrastructure (for example, lighting on bus shelters, footpaths, and guardrails) as part of the investments on Malaita bridges and Noro roads. During community consultations, separate meetings will be held with women and women's groups to identify their specific road safety needs and concerns within communities. The project will track progress on these activities through the following indicators: (a) 'Women employed in technical or management positions within MCA (Percentage) (baseline: 20 percent, target: 40 percent)', (b) 'Honiara rescue fire service vehicle station constructed and code of conduct established (Yes/No) (baseline: No, target: Yes)', and (c) 'Roads rehabilitated, which are equipped with gender responsive road safety infrastructure (Percentage) (baseline: 0 percent, target 100 percent)'.

84. **High GBV prevalence has been identified as a key gender gap that the project will address.** Sixty-four percent of ever-partnered women ages 15-49 report experiencing physical and/or sexual violence by an intimate partner, and 18 percent of women ages 15-49 report experiencing sexual violence by someone other than an intimate partner.[68] Improved connectivity could exacerbate these risks by increased exposure to human trafficking and exploitation, which is already a significant problem in the country. To address this, SIRAP2 will expand the GBV training and awareness raising activities prepared under SIRAP for Munda/Noro and Malaita to Santa Cruz. The project will also complement the GBV, violence against children (VAC), and trafficking strategy prepared and being implemented under SIRAP by potentially making GBV/VAC referral details available at bus shelters and communities along the project airports, airfield, roads, and bridges.

85. **Citizen Engagement. SIRAP2 will adopt a citizen-oriented approach in both its design and implementation, by seeking to involve all stakeholders including beneficiaries and affected persons inclusive of location, age, education, gender, disability, ethnicity, and poverty.** The project plans to undertake consultations and engagements throughout the project cycle, to regularly obtain feedback from the beneficiaries and stakeholders. Alongside this, the project's grievance redress mechanism (GRM), operated by the PST, will cover all aspects of project implementation and will be available to project beneficiaries, affected persons, and other interested parties. It will be open to register grievances of citizens from all groups and provide notifications and outcomes to the concerned citizens. The Results Framework will monitor (a) 'Grievances registered related to delivery of project benefits that are addressed (Percentage)', and (b) 'Roads upgraded using participatory design approaches (Kilometers)'.

[65] UN Women. 2020. *Women in Law Enforcement in the ASEAN Region*.
[66] This is aligned with MID's Gender Strategy, prepared with support from ADB which includes recommendations and targets for increasing women's employment and supporting women in technical and leadership roles in MID.
[67] In alignment with Solomon Islands Royal Police Force 's Gender Strategy 2019–2021.
[68] World Bank. 2016. *Gender-Based Violence in Timor-Leste, Papua New Guinea and the Pacific Islands - Country Overviews*.

V. GRIEVANCE REDRESS SERVICES

86. **Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms or the World Bank's Grievance Redress Service (GRS).** The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the World Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and World Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's GRS, please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VI. KEY RISKS

87. **Overall risk rating - Substantial.** The overall risk rating for SIRAP2 has been assessed to be Substantial, due to Substantial risks to achieving the PDO from five key areas: political and governance, macroeconomic, fiduciary (procurement), environmental and social, and other risks.

(a) **Political and Governance - Substantial.** Solomon Islands is a fragile state and has experienced a fluid political environment and prior periods of civil unrest. Changes in the political leadership, including the prime minister, are common. Tensions have been elevated between the central government and the Malaita provincial government. There have also been increasing geopolitical tensions in the region. These factors, alongside a combination of domestic issues including the perceived discrimination in allocation of national resources, resulted in the November 2021 anti-government protests in Honiara that caused significant damage to infrastructure and the country's economy. To mitigate these risks, SIRAP2 activities are aligned with the Government's priorities in the development strategy and relevant plans and has been designed with a delivery timeline which has taken into consideration elections. SIRAP2 also includes investments in Malaita Province to help address the country's uneven development, which is further amplified by lack of connectivity and high vulnerability to climate change and natural disasters. Further, SIRAP2 will draw from the experiences, learning, and systems put in place with SIRAP. However, there are still residual risks that the country's political disputes between the central and provincial governments could slow the implementation of the project.

(b) **Macroeconomic - Substantial.** There is a risk of higher costs due to large material price movements as well as lack of government counterpart staff if there are budget cuts. These risks will be mitigated through the World Bank's growing engagement on fiscal management issues. In addition, the proposed SIRAP2 investments use innovative technologies such as modular bridges will require less maintenance, reducing their whole-of-life cost and lessening the country's financial burden linked to public infrastructure in the long term.

(c) **Fiduciary - Substantial.** The procurement risk is assessed as Substantial, and FM risk is assessed as Moderate; thus, the overall fiduciary risk is assessed as Substantial. The key procurement risks include (i) potential lack of response from qualified consultants and contractors to the bidding opportunities under the project, and (ii) inaccurate cost estimates that may cause delays and inefficiency. To mitigate these risks, there will be wider advertisement of procurement opportunities together with market outreach actions, and frequent updates of the

cost estimates will be required before bidding. While the PST's procurement performance is satisfactory under SIRAP, the ongoing travel restrictions due to the COVID-19 pandemic may add more difficulty in both during procurement process and contract execution.

(d) **Environmental and Social - Substantial.** The overall Environmental and Social Risk Classification is Substantial, with a Moderate rating for environment and a Substantial rating for social.

(i) **Environmental.** The two main concerns involve the potential adverse risks and impacts on human population and the environment that are not likely to be significant are predictable and expected to be temporary, site-specific, and reversible, and the limited experience of the implementing agencies to meet the ESF requirements. The project's risks and impacts can be easily mitigated in a predictable manner. The potential direct impacts associated with the construction works may include noise, dust and air emissions, waste disposal, management of storm water, community and workers health and safety, sourcing of construction materials, impacts on local natural habitats along the road corridor's right-of-way, areas adjacent to the airports, and construction facilities such as workers accommodation and laydown areas that may need land clearing, and impact on biodiversity at some sections of Noro Roads upgrading works on New Georgia Island.[69] The island hosts a key biodiversity area which encompasses part of the southern end of Noro Town. The project interacts with the northern edge of the area for a 700 m stretch of the targeted road, which is a developed peri-urban setting with no areas of significance along the road or the road surroundings. The road works are minor (for example, pothole repairs, base and subbase courses correction, drainage improvement, road safety improvement, sealing of gravel roads, and resealing of sealed roads) and limited to the existing right-of-way. No construction camps, stockpile sites or laydown areas will be within the key biodiversity area. In this case, potential biodiversity risk at Noro Roads is considered moderate. Asbestos containing material may be relevant if it involves demolition of existing building at Honiara Airport. The potential risks on human population and the environment are not likely to be significant. During the operational stage, road upgrading may potentially amplify road safety-related risks to the community and road users and potential risks for biodiversity due to increased traffic and open up areas for new mining or illegal logging (indirect impacts). Mitigation measures are readily available and reliable. Potential downstream environmental impacts may arise from the technical assistance activities such as design and supervision consultancy, design of ATC towers, national airports development plan, technical support and training to MCA and Solomon Airlines, climate resilient road asset management improvement, road safety capacity improvement, and technical support and training to address GBV. These activities may not result in any direct environmental risks and impacts but can have downstream environmental, health and safety implications such as potential use of hazardous materials in the construction of ATC towers that will be designed during implementation. The implementing agencies have developed experience with implementing World Bank-financed project requirements regarding safeguards policies. The environmental safeguards performance rating for SIRAP has consistently been Satisfactory. However, the agencies are yet to prepare and implement a project under the World Bank ESF.

(ii) **Social.** Solomon Islands has complex land holding arrangements and accessing land and addressing

[69] The risk of finding unexploded ordnance (UXO) is considered low as clearance was completed at project sites of Honiara and Munda Airports under SIRAP, and UXO is not believed to be present at or around Santa Cruz Airfield according to the Aviation Sector Strategy. Thus, SIRAP2 does not include the removal of UXO; however, should UXO be found and the Government requests financing of their removal, SIRAP2 would be restructured to include UXO removal as a project activity.

compensation for loss of assets is difficult. It will be important to address these issues effectively, with a focus on the road component and recognize that the land at Munda Airport will be closely monitored by the PST. The social risk rating is Substantial because of the complexity of the land arrangements. The customary-owned land for the new ATC tower at Munda Airport will be acquired. MCA is progressing the land acquisition process under the Land and Titles Act. The impacts will be mitigated and addressed by MCA. Any delay to the land arrangements may have an impact on the SIRAP2 investment on the ATC tower at Munda Airport during implementation. There is also a risk of GBV and sexual exploitation and abuse/sexual harassment (SEA/SH).[70] As with SIRAP, extensive and meaningful community consultations and stakeholder engagement continue to be a key focus under SIRAP2. The risk will also be addressed through a Resettlement Plan that has identified areas of land impact (including information on land tenure arrangements and existing land disputes) and outlined a clear process for land acquisition and dispute resolution. An SEP has been prepared to keep the local communities and other stakeholders informed about the project as well as to address GBV and SEA/SH related issues. Further, a full-time national environmental and social officer will be hired under SIRAP2, and together with an international safeguards specialist, a national safeguards specialist, and a community liaison officer, will provide necessary support to SIRAP2. The national safeguards specialist and the community liaison officer have built a good relationship with the community on Malaita, having held several consultations during the life of SIRAP.

(e) **Other - Substantial.** This risk has been triggered due to the COVID-19 pandemic, which presents an unprecedented challenge for Solomon Islands. The country is still in an official State of Public Emergency and Solomon Airlines has suspended scheduled international passenger services until July 2, 2022. Although responding to the pandemic is the priority of both SIG and World Bank, COVID-19 may result in unavoidable delays to SIRAP2 due to the travel restrictions and disruption in the supply chain as international consultants and contractors cannot enter the country with ease.

[70] Under SIRAP, existing GBV and SEA/SH measures have been in place to ensure that the project is able to address GBV issues and direct any incidents through a referral pathway to service providers in the country.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Solomon Islands

Second Solomon Islands Roads and Aviation Project

Project Development Objectives(s)

To improve the climate resilience and safety of the Recipient's road and aviation sectors, and in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Improve the climate resilience and safety of the Recipient's aviation sector									
Airport or airfield runway with climate resilience and safety measures constructed and in use (Number)		0.00	0.00	1.00	2.00	2.00	2.00	2.00	2.00
Modernization of air traffic and aviation safety management (Text)		No ADS-B or VSAT	No ADS-B or VSAT	ADS-B and VSAT partially operational	ADS-B and VSAT fully operational	ADS-B and VSAT fully operational	ADS-B and VSAT fully operational	ADS-B and VSAT fully operational	ADS-B and VSAT fully operational
Enhanced climate resilience and operational safety at regional airports under preventative and corrective airport maintenance program for airport equipment		No	No	Yes	Yes	Yes	Yes	Yes	Yes

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
and facilities (Yes/No)									
Improve the climate resilience and safety of the Recipient's road sector									
Bridges with climate resilience and safety measures constructed and in use (Number)		0.00	0.00	0.00	0.00	2.00	4.00	4.00	4.00
Roads with climate resilience and safety measures constructed and in use (Kilometers)		0.00	0.00	0.00	0.00	4.95	9.90	9.90	9.90

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Component 1: Climate Resilience and Safety Investments in the Aviation Sector									
Honiara Airport rescue fire service vehicle station constructed and code of conduct established (Yes/No)		No	No	No	Yes	Yes	Yes	Yes	Yes
Honiara Airport Automated Weather Observation System (AWOS) installed and operational (Yes/No)		No	No	Yes	Yes	Yes	Yes	Yes	Yes
Honiara and Munda Airports air traffic control		0.00	0.00	0.00	1.00	2.00	2.00	2.00	2.00

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
(ATC) towers constructed and operational (Number)									
Regional Airport Asset Maintenance Contract in place (Yes/No)		No	No	Yes	Yes	Yes	Yes	Yes	Yes
Component 2: Climate Resilience and Safety Investments in the Road Sector									
People with enhanced access to transportation services (CRI, Number)		0.00	0.00	0.00	0.00	60,000.00	120,000.00	120,000.00	120,000.00
People with enhanced access to transportation services - Roads/Highways (CRI, Number)		0.00	0.00	0.00	0.00	60,000.00	120,000.00	120,000.00	120,000.00
Roads rehabilitated, which are equipped with gender responsive road safety infrastructure (Percentage)		0.00	0.00	0.00	0.00	50.00	100.00	100.00	100.00
Component 3: Institutional Strengthening and Project Management									
Consultancy for detailed design and supervision of building and civil works provided (Text)		No contract with the consulting firm in place	The contract with the consulting firm signed with the Inception Report accepted	The Detailed Design Reports for the key infrastructure investments accepted	Procurement support for the key infrastructure investments completed	Supervision of building and civil works ongoing	Supervision of building and civil works ongoing	Supervision of building and civil works completed with Taking Over Certificates issued	Supervision of building and civil works completed with Defect Liability Period completed
National Airports Development Plan prepared (Yes/No)		No	No	No	Yes	Yes	Yes	Yes	Yes

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Successful implementation of agreed training plan for MCA and Solomon Airlines (Text)		No training	Training plan prepared and agreed	Training commenced	Training commenced	Training commenced	Training commenced	Training plan completed	Training plan completed
Women employed in technical or management positions within MCA (Percentage)		20.00	20.00	20.00	20.00	20.00	40.00	40.00	40.00
Road safety audits completed (Number)		0.00	0.00	1.00	1.00	1.00	2.00	2.00	2.00
Road network criticality and vulnerability assessments and sustainable road financing strategy completed and in use (Text)		Road network criticality and vulnerability assessments done for Guadalcanal and Malaita under RTSIDS	Road network criticality and vulnerability assessments expanded for the remaining provinces	Sustainable transport financing strategy developed	Road network criticality and vulnerability assessments and sustainable transport financing strategy used to inform future investments	Road network criticality and vulnerability assessments and sustainable transport financing strategy used to inform future investments	Road network criticality and vulnerability assessments and sustainable transport financing strategy used to inform future investments	Road network criticality and vulnerability assessments and sustainable transport financing strategy used to inform future investments	Road network criticality and vulnerability assessments and sustainable transport financing strategy used to inform future investments
Grievance registered related to delivery of project benefits that are addressed (Percentage)		0.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00
Road upgraded using participatory design approaches (Kilometers)		0.00	0.00	0.00	0.00	4.95	9.90	9.90	9.90

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Airport or airfield runway with climate resilience and safety measures constructed and in use	Overlay of Honiara Airport runway and sealing of Santa Cruz Airfield runway with climate resilience and safety measures (e.g., improved runway crossfall, Runway End Safety Areas)	Quarter	Project Report	Reviewing reports and site inspections	PST
Modernization of air traffic and aviation safety management	Implementation of ADS-B and VSAT systems in Makira-Ulawa and Temotu Provinces	Once	Acceptance reports that equipment are fully operational and site inspections	Reviewing reports	PST
Enhanced climate resilience and operational safety at regional airports under preventative and corrective airport maintenance program for airport equipment and facilities	Preventive and corrective maintenance in place for equipment and facilities at international airports.	Quarter	Project Reports	Reviewing reports	PST
Bridges with climate resilience and safety measures constructed and in use	A cumulative measure that tracks progress of making the four bridges on Malaita (Kolofe1, Kolofe2, Su'u Harbor, and Bira) more climate resilient and safer through targeted investments (e.g., modular	Quarter	Project Reports	Reviewing reports and site inspection	PST

	bridges, scour protection, separate footpaths).				
Roads with climate resilience and safety measures constructed and in use	A cumulative measure of the kilometers of roads upgraded with climate resilience and safety measures such as through improved design (e.g., raised road, improved drainage, sealed shoulders).	Quarter	Project Reports	Reviewing reports and site inspection	PST

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Honiara Airport rescue fire service vehicle station constructed and code of conduct established	Construction of a rescue fire service vehicle station at Honiara Airport to allow for female workforce growth in particular considerations for separation of male/female sleeping quarters, showers, and changing rooms. This will also include activities such as establishing and training all personnel in codes of conduct and targeted outreach/training for women.	Quarter	Project Reports	Reviewing reports and site inspections	PST
Honiara Airport Automated Weather Observation System (AWOS) installed and	Installation of AWOS at Honiara Airport	Once	Acceptance report that	Reviewing reports and site inspections	PST

operational			the system is fully operational		
Honiara and Munda Airports air traffic control (ATC) towers constructed and operational	Construction of a new ATC tower at Honiara and Munda Airports	Quarter	Acceptance reports that the ATC towers including new equipment are fully operational	Reviewing reports and site inspections	PST
Regional Airport Asset Maintenance Contract in place	The performance-based contract is put in place to maintain critical mechanical and electrical airport assets whose failure would compromise safety or disrupt operations at international airports.	Quarter	Project Reports	Reviewing reports	PST
People with enhanced access to transportation services	The indicator measures the number of direct beneficiaries that experience improved access to transport infrastructure and services that have been built or rehabilitated through a WBG-financed project (including highways, rural roads, urban and	Quarter	Project Reports	This will be measured by multiplying the total number of beneficiaries by the proportion of the roads and bridges upgraded.	PST

	interurban roads, mass transit systems, ports/waterways, railways, and airports). Beneficiaries typically experience reductions in cost and time to travel and/or improvements in safety, as well as increased access to markets, job opportunities, and health and education services. In urban areas, beneficiaries include the increase in the number of users of improved services. In rural areas, beneficiaries include the increase in the number of people who live in proximity to improved services.				
People with enhanced access to transportation services - Roads/Highways		Quarter	Project Reports	This will be measured by multiplying the total number of beneficiaries by the proportion of the roads and bridges upgraded.	PST
Roads rehabilitated, which are equipped with gender responsive road safety infrastructure	Inclusion of gender responsive road safety infrastructure (e.g., lighting on bus shelters, footpath, guardrail) as part of the	Quarter	Project Reports	Reviewing reports and site inspection. It should be noted that during community consultations, separate	PST

	investments on Malaita bridges and Noro roads.			meetings will be held with women and women's groups to identify their specific road safety needs and concerns within communities.	
Consultancy for detailed design and supervision of building and civil works provided	Provision of consultancy for detailed design and supervision of building and civil works	Quarter	Project Reports	Reviewing reports	PST
National Airports Development Plan prepared	Preparation of a National Airports Development Plan	Once	Final Report	Acceptance of Final Report	PST
Successful implementation of agreed training plan for MCA and Solomon Airlines	SIRAP will undertake training needs assessment for MCA, CAASI, SIACL, and Solomon Airlines, which will be used to develop an agreed training plan for each entity. This activity will measure the progress of implementing the agreed training plan for MCA and Solomon Airlines.	Quarter	Project Reports	Reviewing reports	PST
Women employed in technical or management positions within MCA	Percentage of women employed in management positions within MCA. MCA has five technical or management positions, of which one (20 percent) are	Quarter	MCA	Interview with MCA	PST

	women.				
Road safety audits completed	Road safety audits will be conducted for project sites twice, including (i) at design phase to recommend road safety improvement; and (ii) post construction phase to confirm road safety issues are properly addressed.	Twice	Road safety audit reports	Acceptance of the road safety audit reports	PST
Road network criticality and vulnerability assessments and sustainable road financing strategy completed and in use	Undertaking of road network criticality and vulnerability assessments and preparation of sustainable transport financing strategy	Quarter	Project Reports	Reviewing reports	PST
Grievance registered related to delivery of project benefits that are addressed	A measure of citizen engagement	Continuous (project website); quarter (Project Reports)	Project website and Project Reports	Reviewing project website and Project Reports	PST
Road upgraded using participatory design approaches	Participatory design approaches to engage landowners and occupiers in the design phase are described in the Resettlement Framework. The sites where such processes are used to inform the design will be	Quarter	Project Reports	Site inspection to verify completed works against approved detailed designs	PST

	recorded and the kilometer lengths combined.				

ANNEX 1: Implementation Arrangements and Support Plan

COUNTRY: Solomon Islands
Second Solomon Islands Roads and Aviation Project

Project Institutional and Implementation Arrangements

1. Table 1.1 summarizes the roles and responsibilities of the key participants in the implementation of SIRAP2.

Table 1.1: SIRAP2 Management Roles and Responsibilities

Organization	Management Roles and Responsibilities
MOFT	• Sign Financing Agreement with the World Bank • Responsible for overall project as Recipient Representative
MCA (implementing agency)	• Responsible for the overall implementation of the aviation components of the project with support of the PST • Jointly responsible for CERC • Approve contract award recommended by the PST • Sign contracts procured under the project (works, consultants including PST specialists and suppliers) • Provide aviation technical inputs, as required • House the PST • Provide staff for Honiara MCA/PST office • Responsible for aviation environmental and social safeguards compliance through the PST • Participate in joint technical meetings for regional airport maintenance (until SIACL is adequately staffed) • Participate in capacity development activities
MID (implementing agency)	• Responsible for the overall implementation of the road components of the project with support of the PST • Jointly responsible for CERC • Approve contract award recommended by the PST • Sign contracts procured under the project (works, consultants including PST specialists and suppliers) • Provide road technical inputs, as required • Provide staff for Malaita MID/PST office • Responsible for road environmental and social safeguards compliance through the PST • Participate in capacity development activities • Operate and maintain the project roads and bridges
PST	• Responsible for day-to-day implementation of the project on behalf of MCA and MID • Undertake procurement (selection) of consultants and contractors (prepare bid documents, issue invitation for bid, evaluate proposals/bids, prepare Bid Evaluation Reports, recommend contract award to MCA and MID) • Responsible for FM, including authorizing payment requests to MOFT for consultants and contractors • Manage contracts for all activities under SIRAP2, including progress of deliverables and payments

Organization	Management Roles and Responsibilities
	• Operate the GRM with support of PST • Operate the project website with Open Contracting and GRM • Monitor environmental and social safeguards compliance for MCA and MID • Collect M&E data • Prepare quarterly project reports in collaboration with MOFT, MCA, and MID • Serve as the secretariat of NSC • Participate in joint technical meetings for regional airport maintenance • Prepare the mid-term review report and the Borrower's implementation completion and results report (ICR)
NSC	• Provide oversight to the project and the PST, with obligatory responsibility to Ministers of MOFT, MCA, and MID • Advise SIG of issues or concerns affecting project implementation and propose remedial actions
CAASI	• Provide technical inputs for the scope of works and services as appropriate
SIACL	• Participate in joint technical meetings for regional airport maintenance • Provide aviation technical inputs, as required • Operate and maintain the project airports and airfield
Solomon Airlines	• Participate in capacity development activities • Maintain ground and communication equipment procured for providing its services under the project

Note: The roles and responsibilities of CAASI, SIACL, and Solomon Airlines will be set out in the POM.

FM Implementation Arrangements

2. **The FM assessment noted that SIRAP PST has accumulated nearly three years FM implementation experience from SIRAP.** It is proposed that PST will continue to support the FM arrangements under SIRAP2, especially in terms of contract management and internal control issues, funds flow monitoring and financial reporting and auditing requirements. The PST must establish and maintain separate budget, accounting, funds flow, reporting, and audit arrangements to properly distinguish the SIRAP2 and SIRAP as two distinct projects. This requires sound FM management and coordination between the two implementing agencies. Therefore, a 'Substantial' FM risk is assigned to the project before the completion of the mitigation measures as described above in paragraph 67. It is expected that after these mitigation measures are fully implemented, the project's residual FM risk will be reduced to Moderate.

3. **Implementing agencies.** The two implementing agencies have both accumulated FM experience in World Bank-financed projects, not only with the ongoing SIRAP but also with previous projects. MID has FM experience through the Rapid Employment Project and the Community Access and Urban Services Enhancement Project.

4. **Staffing.** At least one project accountant and one finance manager will be mobilized within the PST to support the FM arrangements of SIRAP2. It is important that the terms of reference and the selection of these FM positions will be technically reviewed by the World Bank to ensure that these staff have adequate qualifications and experience and are promptly trained on the project FM and World Bank disbursement policies and requirements.

5. **Budgeting arrangements.** In consultation with the NSC, the PST will prepare and submit to the Implementing Agencies a consolidated project budget covering the life of SIRAP2. Once approved the original budget and subsequent revisions (at least annually) will be shared with the World Bank for its no objection. Each approved project budget will

include an annualized budget, which outlines project components and activities to detail how the budget will be managed and expended. Details will be provided in the FM manual.

6. **Accounting system and accounting software.** Accounting data under SIRAP are converting to a new accounting software environment, with the objective to ensure the consistency. The conversion is expected to be completed by the first half of 2022. Consideration should be given to the creation of a separate accounting environment for the IDA credit financed activities and IDA grant financed activities to accommodate the bank account and funds flow arrangements described in paragraph 8 below. Accounting records for SIRAP2 shall be managed separately from those for SIRAP.

7. **Internal controls.** Where possible, internal control procedures will be consistent with the SIG procedures under the Public Financial Management Act (2013) and accompanying Financial Instructions. In addition, the SIRAP2 POM will have an FM section to cover specific project FM requirements in accordance with the Financing Agreement. As with the other World Bank-financed projects in Solomon Islands, authorization and payment processes will need to be clearly segregated.

8. **Funds flow.** Similar to SIRAP, the project will not channel the funding through the National Transport Fund so two segregated Designated Accounts (DAs) will be opened—one for the IDA credit and one for the IDA grant—at the Central Bank of Solomon Islands in Solomon Island dollars (SBD). The project will need to open an operational bank account in SBD with a commercial bank and have a standing order for the transfer (pass-through) of funds from the DA at the Central Bank of Solomon Islands to the operational bank account.

9. **Financial reporting.** Quarterly unaudited interim financial reports (IFRs) will be submitted to the World Bank (via the Client Connections system) not later than 45 days after the end of each reporting period. The reports will be for SIRAP2 only and will be prepared and consolidated by the PST on behalf of MCA and MID. The reports must include project commitments, and receipts and payments for the reporting period, year to date and cumulative figures. The format for IFRs will be agreed during initial stages of implementation.

10. **Auditing.** Annual audits of the SIRAP2 project financial statements will be required for the life of the project and each annual audited project financial statements must be submitted to the World Bank (via the Client Connections system) within six months after the end of each financial year. The audited annual project financial statements must be made publicly available by the Implementing Agencies. As the OAG in Solomon Islands has been auditing SIRAP, it is expected that the OAG will continue auditing SIRAP2. The audit scope for SIRAP2 should be discussed and agreed in the first year of implementation. In case the OAG cannot provide the audit services as required, it is the responsibility of the implementing agencies to ensure that the PST hires a private audit firm acceptable to the World Bank. The auditors will also be required to provide a detailed management letter containing their assessment of the internal controls, accounting system, and compliance with financial covenants in the Disbursement and Financial Information Letter. The management letter must be submitted to the World Bank at the same time as the annual audited project financial statements. The incremental costs of the audit (for example, domestic travel, accommodation, private audit firm costs) may be eligible for financing from project funds.

11. **Supervision plan.** A World Bank FM implementation review mission will be conducted at least twice a year with additional implementation support provided particularly during the early stages of the project. These reviews will be conducted virtually whilst the current COVID19 travel restrictions are in place. In addition, the FM team will conduct a desk review of the quarterly IFRs and the audited annual project financial statements.

Disbursements

12. Withdrawal applications will be prepared by the PST on behalf of MCA or MID, and MOFT will be an authorized signatory for the withdrawal applications. The project will be able to use any of the four disbursement methods: (a) direct payment, (b) replenishment, (c) reimbursement, and (d) special commitment. The DA will be used for relatively small disbursements related to all project components including local purchases of goods and services, project management support and operating costs.

13. It is anticipated that most disbursements will be made through direct payment to suppliers, contractors, and consultants for eligible expenditures incurred. The minimum threshold for direct payment, reimbursements and special commitments and the DA ceiling will be specified in the Disbursement and Financial Information Letter. Replenishment applications will be submitted quarterly as a minimum but may be required on a more frequent basis.

14. IDA financing for the project is 100 percent, inclusive of taxes. No retroactive financing or counterpart funds are anticipated under the project. Table 1.2 shows the project withdrawal categories.

Table 1.2: Project Withdrawal Categories

Category	IDA Credit Allocated		IDA Grant Allocated		Percentage of Expenditures to be Financed
	(expressed in SDR)	(expressed in US$ equivalent)	(expressed in SDR)	(expressed in US$ equivalent)	(inclusive of taxes)
(1) Goods, works, non-consulting services, consulting services, training, and operating costs for Parts 1, 2, and 3 of the project	48,970,000	67,690,000	15,570,000	21,520,000	100%
(2) Emergency expenditures under Part 4 of the project	0	0	0	0	
Total amount	**48,970,000**	**67,690,000**	**15,570,000**	**21,520,000**	

15. **Disbursement conditions.** No withdrawals should be made for payments made prior to the Signature Date. No withdrawal shall be made for payments from Category 2 (Component 4) unless the World Bank has determined, at the Recipient's request, that an 'Eligible Crisis or Emergency' (as defined in the Financing Agreement) has occurred, and that the Recipient has adopted the CERC Manual and Emergency Action Plan in form and substance acceptable to the World Bank.

Procurement

16. **Applied Procurement Regulations.** Procurement under the project would be carried out in accordance with the World Bank's Procurement Regulations and relevant provisions in the Financing Agreement and in the project's Procurement Plan. Under the proposed project, World Bank's planning and tracking tool STEP will be used to prepare, clear, and update Procurement Plans and conduct all procurement transactions for the project. Accordingly, all the procurement activities under the proposed project will be entered, tracked, and monitored online through the STEP tool.

17. **Procurement implementation arrangement.** The implementation arrangement remains the same as for SIRAP. In particularly, MCA and MID are the implementing agencies of the project with support from the PST. The PST will assist MCA and MID to conduct and monitor the procurement activities under the project. The PST includes an international and a national procurement specialist who will be supported by a project manager. This is considered adequate for implementation of the procurement activities under the project.

18. **Procurement capacity and risk assessment.** A procurement capacity and risk assessment of the PST has been conducted. In general, it found that the PST has adequate staff, including qualified procurement staff, to implement the procurement activities under the project. As a result, the provision of hands-on extended implementation support will not be needed. The PST staff have gained good experience in implementing procurement for World Bank-financed projects including SIRAP that is currently being implemented in satisfactory manner. Nevertheless, a number of potential risks have been identified that could cause delays and inefficiencies in project implementation and/or noncompliance if not properly mitigated during the project implementation, as follows: (a) potential lack of response from qualified consultants and qualified contractors to the bidding opportunities under the project, (b) inaccurate cost estimates, and (c) limited capacity of the PST to conduct procurement activities and manage and administer various contracts under the project. A number of measures will be applied to mitigate identified risks, including (a) wider advertisement of procurement opportunities under the project together with market outreach actions, (b) frequently updating of the cost estimates before bidding, (c) updating of the POM as needed including procurement chapter used for SIRAP that will be also used for SIRAP2, and (d) maintaining of various national and international specialists including a national procurement specialist, an international procurement specialist, and an international project manager.

19. **Procurement strategy.** The procurement scopes under the project will include procurement of works, goods and consulting services relating to the following major activities:

a. **For Honiara Airport:** (i) Overlay of the existing asphalt paved runway, including installation of airfield ground lighting, PAPI, and simple approach lighting, (ii) design and construction of a rescue fire service vehicle station, (iii) installation of an automatic weather observation station, (iv) provision of standby generators, (v) design and construction of an ATC tower, (vi) construction of a new aviation complex building (vii) provision of crash alarms, (viii) supply and replacement of perimeter fence at Honiara, and (iv) equipment support.

b. **For Munda Airport:** (i) Design and construction of an ATC tower, (ii) construction of car parking at the terminal, and (iii) provision of crash alarms.

c. **For Santa Cruz Airfield:** Construction of runway pavement works.

d. **For modernization of air navigation systems:** (i) Supply and installation of ADS-B ground stations, (ii) supply and installation of VSAT communications system, and (iii) provision of alternative energy source in Makira-Ulawa and Temotu Provinces.

e. **For regional airport maintenance:** Financing five-year regional airport asset maintenance contract to maintain critical mechanical and electrical assets.

f. **For climate resilience and safety investments in the road sector:** (i) upgrading subbase and sealing of the existing 4.4 km of gravel roads, and (ii) resealing of 5.5 km of sealed roads in Noro, Western Province.

20. The PPSD shows that both civil works and consulting services are considered of moderate to substantial risk because they are of relatively large value, of relatively complex and critical for the achievement of project objectives. The market research has shown that the PST has opportunities to select international and/or domestic

contractors/consultants/suppliers available in the market, which have the required capacity, to execute the works and perform the consulting services under the project. Considering the market conditions and other factors, civil works are packaged to (a) increase the level of competition, (b) allow better opportunity for national/local contractors to participate, (c) be aligned with the current contract management capacity of the PST, (d) reduce the impact of failure risk, and (e) have the flexibility to deal with implementation delay risks. Given that the technical nature of civil works is not so complex and does not require special technology or method to execute, the Request for Bids method will mainly be applied. As the construction market in Solomon Islands is not strong with a limited number of local and national contractors having sufficient resources and capacity for the types and sizes of the civil works under the project, the market approach for most of civil works contracts under the project is likely to be international with single stage and one envelope process.

21. Regarding the consultant services, the consultancy market in Solomon Islands is also not strong. Therefore, the market approach for critical consulting services including designing and supervision of civil works under the project and various technical assistance services under the project will likely be international. The relatively large assignments will be procured using Quality- and Cost-Based Selection (QCBS) with international market approach. Other smaller consulting assignments will be procured using Selection Under a Fixed Budget Selection (FBS), Least-Cost Selection (LCS), Selection Based on the Consultants' Qualifications (CQS), and Individual Consultant method with international or national market approach as appropriate depending on the size and nature of the services. There may be several packages for procurement of goods under the project that may be procured using the Request for Bids with international market approach for the cases that goods are not available in Solomon Islands. Civil works and goods packages may also be procured using the Request for Quotation method with national or international market approach if the cost of package is less than US$1 million and US$0.5 million, respectively. The full PPSD is available for reference as a separate project file.

22. **Procurement Plan.** Based on the PPSD, the initial Procurement Plan for the project has been prepared by the PST and agreed by the World Bank at negotiation. The Procurement Plan will be updated at least on an annual basis by the PST to (a) reflect project implementation, (b) accommodate changes that should be made, and (c) add new packages as needed for the project. All Procurement Plans and their updates or modifications will be subject to the World Bank's prior review and 'no objection'. The Procurement Plan identifies the risk for each activity and prior review of these activities is conducted based on the performance and risk rating. Contracts not subject to prior review will be subject to post review and the World Bank will carry out procurement post reviews on an annual basis with an appropriate sample. The initial Procurement Plan is available for reference as a separate project file.

Strategy and Approach for Implementation Support

23. The implementation support plan is based on experience and lessons learned from other projects in Solomon Islands, as well as the project's risk profile. The approach is to provide ongoing and regular implementation support.

24. MOFT, in consultation with MCA and MID, will determine the appropriate timing of semi-annual reviews, considering the availability of participants. The World Bank implementation review will cover non-technical aspects of the support including: (a) FM, (b) procurement, (c) implementation arrangements, and (d) safeguards. In addition, field visits will also be undertaken to project sites. To the greatest extent possible, the World Bank will accommodate any written request for 'as-needed' support for the project, including fiduciary aspects.

25. Each implementation support mission will result in the production of a joint Aide-Memoire that will be discussed

at a wrap-up meeting to be chaired by MOFT. It is envisaged that the Aide-Memoire will provide an overall view of the current situation relating to project implementation, including findings and observations from the World Bank. Representatives from the relevant SIG agencies will be invited to attend the kick-off, wrap-up, and technical meetings. Further, any adjustment requiring more frequent reviews will be discussed, agreed upon, and documented in the Aide Memoire.

26. A midterm review mission will be held not later than three years after the effective date, or such other period as may be agreed with the World Bank. It is envisaged that the review will be conducted at either the halfway point of the project period or when the funds are 50 percent disbursed and provides an opportunity to review the project and take stock of implementation progress. Following the review, adjustments to project support may be required, including a project restructuring and/or possible additional financing from any other sources based on the implementation experience. The World Bank will work with MOFT, MCA, and MID to clarify the requirements necessary to effect any changes. Any changes to the project that require a restructuring or amendments to the Financing Agreement will require a formal request from the Government's signatory to the Financing Agreement.

27. SIG will commence the preparation of its ICR six months before the closing date of the project. The World Bank ICR author will participate in the final implementation review and will gather the necessary information to help prepare the ICR.

Implementation Support Plan and Resource Requirements

28. Missions to support implementation for SIRAP2 will be carried out every three to six months, either in-country or virtually. At least once per year, the missions will include technical, fiduciary, and safeguards team members who will provide inputs for infrastructure design and construction, carry out post reviews on contract management, review safeguards compliance, and provide formal training where required. The implementation support plan will be reviewed annually to ensure that it meets the support needs of the project. The estimated level of annual support needed to implement SIRAP2 is identified in table 1.3.

Table 1.3. Implementation Support Plan

Focus of Implementation Support		
Time	**Focus**	**Skills Needed**
First 12 months	Project launch and start-up	Task team leader, co-task team leader, operations officer, air transport specialist, project engineer, procurement specialist, FM specialist, environment safeguards specialist, social safeguards specialist, gender specialist, administrative support
13–84 months	Project implementation	Task team leader, co-task team leader, operations officer, air transport specialist, project engineer, procurement specialist, FM specialist, environment safeguards specialist, social safeguards specialist, gender specialist, administrative support

Skills Mix Required		
Skills Needed	**Number of Staff Weeks per Year**	**Number of Trips per Year**
Task team leader	8	3
Co-task team leader	8	3
Operations officer	8	2
Air transport specialist	4	2
Project engineer	4	2
Procurement specialist	3	2
FM specialist	3	2
Environment safeguard specialist	3	2
Social safeguards specialist	3	2
Gender specialist	3	1
Administrative support	3	0

ANNEX 2: Detailed Project Descriptions

COUNTRY: Solomon Islands
Second Solomon Islands Roads and Aviation Project

1. SIRAP2 will focus on investments that seek to improve the climate resilience and safety of the Solomon Islands' road and aviation sectors through (a) upgrading Honiara and Munda Airports, Santa Cruz Airfield, Malaita bridges, and Noro roads, and (b) strengthen MCA's capacity in airport planning, management, and maintenance and MID's capacity in climate resilient road asset management, road safety, and project implementation support. The project also includes provision for CERC. Table 2.1 summarizes conditions for each bridge. The details of the proposed investments are provided in table 2.2 for the aviation sector, and table 2.3 for the road sector. Table 2.4 also provides details of aviation and road sectors technical assistance activities.

Table 2.1: Bridge Conditions

Name	Chainage	Length (m)	Condition
North Road			
Kolofe1	91.20	17.5	This log bridge has collapsed. A temporary crossing has been constructed using the original logs, but not to standard.
Kolofe2	91.50	11.3	This log bridge has gabion abutments, log beams, and a timer deck. It was constructed in 2009 but has been deteriorated and needs replacement.
South Road			
Su'u Harbor	66.42	21.0	This baily bridge was destroyed by logging trucks. A temporary log bridge has been constructed by the logging company, but it needs to be replaced.
Bira	68.00	15.0	Traffic has been crossing in stream, which becomes deeper after several flooding. Traffic is unable to cross the stream during floods and high tides.

Table 2.2: Description of Aviation Investments

Location	Investment	Description
Honiara Airport	Runway overlay, including installation of airfield ground lighting	The existing runway of 2,200 m long and 45 m wide is suffering from pavement deterioration and will be provided with an appropriate surface (including a Runway End Safety Area at both ends of the runway) to extend the service life. The existing runway airfield ground lighting also needs improvements for energy-efficient technologies, along with approach lights and PAPIs.
Honiara Airport	Rescue fire service vehicle station	This activity will design and build a station that meets the Airport Rescue Fire Fighting Category 7 requirements.
Honiara Airport	AWOS	AWOS consists of an array of meteorological sensors installed near the runway and a central computer system which will be installed in the terminal or in the tower. There are remote meteorological display screens mounted in the control towers or other suitable location. They will disseminate meteorological data verbally via very high frequency radio and telephone connection, and as METAR data (an international standard for reporting weather used by pilots) over appropriate communications links.
Honiara Airport	Standby generators	Back-up power is critical infrastructure supporting aeronautical operations. JICA has provided some generators; SIRAP2 will do the rest.
Honiara Airport	Aviation complex building	CAASI building was burned down in July 2020, and MCA's divisions have been scattered across different buildings at different sites (some MCA staff have been working at a temporary office at Ranadi, while others at an office within the terminal,

		which is outdated). This activity will construct a new multi-story aviation complex building for MCA, SIACL, CAASI, and Customs, Immigration and Quarantine at a site which belongs to MCA. This will help reduce terminal occupancy and create more space for passengers.
Honiara and Munda Airports	ATC tower	Honiara has a control tower was damaged by flood and earthquake. To address concern over cracks in two support columns, SIRAP provided temporary measures to the ATC tower, with the upgraded tower being operational since July 2020. As a long-term solution, SIRAP2 will design and build a new ATC tower at a new site that meets line of site and response time requirements. A similar activity will be conducted at Munda to replace the existing containerized ATC services.
Honiara and Munda Airports	Crash alarms	The Audit Report by PASO (2020) for Honiara notes that "there is no crash alarm and notification by phone seems deficient. Rescue Fire should have a more positive alerting system by way of a crash alarm". A similar finding has been provided for Munda. To address these findings, the project will finance the supply and installation of a crash alarm at a new ATC tower both at Honiara and Munda Airports.
Honiara Airport	Perimeter fence	The southern end of the fencing was cut off by intruders during the November 2021 unrest in Honiara, resulting in the damage to 48 runway edge lights. The proposed investments will install a new fence mainly along the area affected by the unrest to meet the ICAO Annex 17 requirements (including to withstand the highly corrosive marine environment). It would also include an automatic gate for aviation security.
Honiara Airport	Equipment support	To support the operation of Honiara Airport, the project will replace and/or acquire essential ground equipment managed by Solomon Airlines, including a pallet loader, a catering truck, two baggage tugs, two passenger aid units, and communications equipment for its operations control center.[71] This activity will contribute to improve the safety of the airport and the country's aviation sector, and thus is considered as a productive use of IDA funds. As the equipment will be a project asset, it needs to be recorded and tracked on the asset register maintained by MCA.[72]
Munda Airport	Car parking	Car parking will be constructed with improved drainage at the terminal, being constructed under SIRAP.
Santa Cruz (Lata) Airfield	Runway upgrading with drainage improvement and seawall construction	The airfield has a single runway of 916 m long by 26 m wide. The existing surface is topsoiled and grassed, and it often becomes saturated with standing water. The northern end of the runway is also exposed to wind-driven ocean swells. This will finance the improvement of drainage, construction of seawalls and base course, and sealing of grass/gravel runway, taxiway, and apron with bituminous surfacing.
Makira-Ulawa, Temotu	ADS-B	ADS-B represents the most advanced technology in aeronautical information available. ADS-B Out exploits an existing satellite-based GPS network, with small avionic equipment installed on aircraft that transmits the aircraft's position to ADS-B ground stations, which are relayed to ATC. ADS-B Out also improves the ability to perform life-saving search and rescue missions.
Makira-Ulawa, Temotu	VSAT Communications System	Reliable communications between airports are vital. PAIP is linking international airports with an integrated regional full-mesh satellite network for dedicated and secure ground-to-ground communication services for air navigation. This work complements an ICAO initiative to connect aeronautical actors in the Asia-Pacific

[71] The World Bank does not consider supporting a state-owned carrier (a) if the carrier was not sustainable before the COVID-19 pandemic, and/or (b) the connectivity could be provided by other carriers. However, it is considered that these were both not the case for Solomon Airlines based on the Solomon Airlines Strategic Options Analysis (2021), which noted that the airline "would be highly financially sustainable over the medium to long-term under the base scenario" and suggested the difficulty for the other four airlines (that operated to Honiara Airport before the pandemic) to provide connectivity that Solomon Airlines used to provide.
[72] The POM will clarify how the assets are to be managed.

		region, and ultimately an exchange of ATC information globally.
Makira-Ulawa, Temotu	Alternative energy source	Alternative energy source will be provided to support the operation of ADS-B and VSAT.

Table 2.3: Description of Road Investments

Location	Investment	Description
Malaita	Replace four bridges	There are four bridges (Kolofe1, Kolofe2, Su'u Harbor, and Bira Bridges) which have collapsed and are in urgent need for replacement. To address loss of connectivity issues resulting from previous climatic disasters and overloaded logging vehicles, the project will replace them, potentially with modular bridges with scour protection as being done under SIRAP.
Noro	Seal the 4.4 km of gravel sections, and reseal the 5.5 km of sealed sections	Much of the existing road network in Noro is past the end of their service life and is failing. To enhance road resilience and connectivity during rainy seasons, this investment will seal 4.4 km of gravel sections and reseal 5.5 km of sealed sections of Noro Roads. It will also undertake appropriate pothole/edge repairs, surfacing raising, base and subbase courses correction, crossfall correction, culvert/drainage improvement to adopt to the forecasted increase of rainfall volumes and intensities, and road safety improvements (for example, speed humps, rumble strips, shoulders, and pedestrian footpaths).

Table 2.4: Description of Aviation and Road Sectors Technical Assistance Activities

Activity	Description
National airports development plan	This will guide future infrastructure and facility development for 10 airfields at Gizo, Seghe, Suavanao, Choiseul Bay, Santa Cruz, Auki Gwaunaru'u, Rennel, Kirakira, Bellona, and Fera in a logical, sustainable, and cost-efficient manner. The plan will include the guidance on how to prepare for and respond to extreme weather events.
Technical support and training to MCA and Solomon Airlines	A training needs assessment will be done under SIRAP and be used to develop an effective training program to improve technical capacity for MCA, CAASI, SIACL, and/or Solomon Airlines. It is planned that technical support and training to CAASI and SIACL will be provided under SIRAP, while that to MCA (for example, an activity to assess the level of compliance with ICAO SARPs) and/or Solomon Airlines (for example, pilot simulator training, engineers training, and targeted staff training) will be provided under SIRAP2.
Climate resilient road asset management improvement	Following the transition plan prepared under RTSIDS, this activity will continue to improve the existing asset management system, expand the road network criticality and vulnerability assessments, and develop a sustainable transport financing strategy.
Road safety audits	This will conduct a road safety audit for the proposed Noro roads investments during both the design and post-construction phases. A design-phase audit will inform the designs, or lead to localized investments, while a post-construction audit will validate the road safety goals are achieved. This will also include training to MID staff to conduct road safety audits.
Road safety capacity improvement	This will support SIG to establish a National Road Safety Committee and potentially a road safety unit within MID to facilitate coordinated and targeted action to improve road safety outcomes in Solomon Islands.
Activities to address the identified gender gap within MCA and to address GBV	This will (a) assess human resources policies and practices at the different points in the employment relationship, (b) identify appropriate actions to strengthen the recruitment, promotion, and retention of women in the aviation sector, and (c) provide training for women in technical and managerial skills. In addition, GBV training and awareness raising activities are being rolled out under SIRAP for Munda/Noro and Malaita. SIRAP2 will add Santa Cruz to this ongoing initiative.

2. The estimated costs of each component and subcomponent, including the breakdown of IDA credit and grant contributions, are summarized in table 2.5.

Table 2.5: Project Cost Breakdown by Component and Subcomponent

Component and Subcomponent	Cost Estimates (US$)	IDA Credit (US$)	IDA Grant (US$)
Component 1: Climate Resilience and Safety Investments in the Aviation Sector	64,430,000	56,430,000	8,000,000
Subcomponent 1.1: Honiara Airport Infrastructure Investments	37,750,000	33,250,000	4,500,000
1.1.1 Runway Resurfacing and Airfield Ground Lighting	19,540,000[73]	19,540,000	—
1.1.2 Rescue Fire Services Station (design and build)	2,300,000	2,300,000	—
1.1.3 AWOS	500,000	500,000	—
1.1.4 Standby Generators	1,200,000	1,200,000	—
1.1.5 Control Tower (design and build)	5,250,000	5,250,000	—
1.1.6 ATC equipment	1,750,000	1,750,000	—
1.1.7 New Aviation Complex Building	4,500,000	—	4,500,000
1.1.8 Crash Alarms	200,000	200,000	—
1.1.9 Perimeter Fence	2,090,000	2,090,000	—
1.1.10 Equipment support	420,000	420,000	—
Subcomponent 1.2: Munda Airport Infrastructure Investments	7,430,000	7,430,000	—
1.2.1 Control Tower (design and build)	5,250,000	5,250,000	—
1.2.2 ATC equipment	1,750,000	1,750,000	—
1.2.3 Car parking with drainage improvement at the terminal	230,000	230,000	—
1.2.4 Crash Alarms	200,000	200,000	—
Subcomponent 1.3: Santa Cruz Airfield Infrastructure Investments	14,200,000	14,200,000	—
1.3.1 Runway upgrading with drainage improvement and seawall construction	14,200,000	14,200,000	—
Subcomponent 1.4: Modernization of Air Navigation Systems	1,550,000	1,550,000	—
1.4.1 ADS-B ground stations	350,000	350,000	—
1.4.2 VSAT	1,000,000	1,000,000	—
1.4.3 Alternative energy source to support ADS-B and VSAT	200,000	200,000	—
Subcomponent 1.5: Regional Airport Maintenance	3,500,000	—	3,500,000
1.5.1 Regional airport asset maintenance contract	3,500,000	—	3,500,000
Component 2: Climate Resilience and Safety Investments in the Road Sector	14,500,000	12,040,000	2,460,000
Subcomponent 2.1: Malaita Bridges Improvement	8,000,000	8,000,000	—
2.1.1 Replacement of Kolofe1 and Kolofe2 Bridges on North Road	4,000,000	4,000,000	—
2.1.2 Replacement of Su'u Harbor and Bira Bridges on South Road	4,000,000	4,000,000	
Subcomponent 2.2: Noro Roads Improvement	6,500,000	4,040,000	2,460,000
2.2.1 Sealing of 4.4 km of gravel roads	3,630,000	2,260,000	1,370,000
2.2.2 Resealing of 5.5 km of sealed roads	2,870,000	1,780,000	1,090,000
Component 3: Institutional Strengthening and Project Management	10,280,000	—	10,280,000
Subcomponent 3.1: Technical Assistance	8,260,000	—	8,260,000
3.1.1 Design and supervision of building and civil works	6,660,000	—	6,660,000
3.1.2 National Airports Development Plan	400,000	—	400,000

[73] Approximately 40 percent of the cost is allocated to airfield lighting works.

3.1.3 Technical support and training to MCA and Solomon Airlines	200,000	—	200,000
3.1.4 Climate resilient road asset management improvement	500,000	—	500,000
3.1.5 Road safety audits	50,000	—	50,000
3.1.6 Road safety capacity improvement	200,000	—	200,000
3.1.7 Activities to address the identified gender gap within MCA and technical support and training to address GBV	250,000	—	250,000
Subcomponent 3.2: Project Implementation Support	2,020,000	—	2,020,000
3.2.1 International Safeguards Specialist	50,000	—	50,000
3.2.2 International Procurement Specialist	280,000	—	280,000
3.2.3 International Project Manager	380,000	—	380,000
3.2.4 National Project Manager	230,000	—	230,000
3.2.5 National Community Liaison Officer	120,000	—	120,000
3.2.6 National Safeguards Specialist	180,000	—	180,000
3.2.7 National Procurement Specialist	80,000	—	80,000
3.2.8 National Finance Manager	110,000	—	110,000
3.2.9 National Project Accountant	60,000	—	60,000
3.2.10 National Environmental and Social Officer	100,000	—	100,000
3.2.11 National Administration Assistant	50,000	—	50,000
3.2.12 National Communications Specialist	30,000	—	30,000
3.2.13 Operating Costs	350,000	—	350,000
Component 4: Contingent Emergency Response	0	0	0
Total	**89,210,000**	**67,690,000**	**21,520,000**

ANNEX 3: Economic Analysis

COUNTRY: Solomon Islands
Second Solomon Islands Roads and Aviation Project

1. **An economic analysis was conducted based on a standard methodology applied for appraisal of transport infrastructure, which demonstrates the overall EIRR of 15.9 percent and the NPV of US$33.0 million.** For aviation, the economic evaluation focuses on Subcomponents 1.1, 1.2, and 1.3. For roads, the analysis focuses on Subcomponents 2.1 and 2.2. The discount rate is assumed to be 6 percent with the standard conversion factor of 0.87. The cost-benefit analysis was conducted to calculate the EIRR and NPV of the project covering the period of 20 years from 2023 to 2042.

A. Economic Evaluation Assumptions

Aviation

2. **To ensure that the SIRAP2 aviation investments are economically justified, a cost-benefit analysis was conducted for Honiara and Munda Airports, and Santa Cruz Airfield.** The methodology and key assumptions employed for the analysis are summarized in the following paragraphs.

3. **Honiara and Munda Airports.** The analysis treats Honiara and Munda Airports as international aviation gateways that largely serve international flights, with majority of the investment focusing on Honiara. The economic analysis covering the period of 20 years assumes that if operational safety standards are not met, airlines would cease jet flights to Honiara as early as 2026. This means that 'without the project', higher investment (due to further deterioration) must be made at a later date; and the disruption (that is, lower ability to carry passengers at full capacity) will result in some economic loss. The analysis assumed that 15 percent of passengers would be disrupted during the investment period (assumed to be two years), and that the value of passenger-trip is estimated to be US$500 each. In the 'with-project' case, the investment made with the project will allow jet service to run as normal, and no passenger cost will be lost.

4. **Santa Cruz Airfield.** Similarly, the economic analysis covers the above 20-year period. The 'with project' case assumes the improvement of Santa Cruz Airfield will help save passenger time, lower passenger cost, and induce more passengers to use the airfield. The travel time, including the waiting time at origin due to frequent disruption of the services, is assumed to be shorter by three hours. It is assumed that the average value of time is US$2,076 per year—based on a weighted average wage. The cost of airline ticket from Honiara Airport to Santa Cruz Airfield, currently at around US$300 each, is assumed to be lower by 15 percent. Further, passengers are assumed to double once pavement works are completed.

Roads

5. **To ensure that the road investments generate sufficient economic benefits that warrant the investments, a cost-benefit analysis was conducted for the project roads using the Roads Economic Decision (RED) Model and RSSAT.** RED estimates the annual road agency and user's costs, including vehicle operating costs, travel time costs, road maintenance costs, and CO2 emission costs, while RSSAT estimates the road safety costs. For the RED calculations, the following assumptions were applied:

- The road works will take two years during 2024–2025

- The average daily traffic annual increase rate is 2.5 percent per year for passenger vehicles and trucks over the evaluation period[74]
- Diverted traffic is 0 percent due to the absence of an alternative road along the project roads
- Generated traffic and induced traffic are 0 percent to be analytically conservative
- Social cost of carbon of US$43 per ton equivalent in 2023 increasing to US$65 per ton equivalent in 2042 based on low scenario for the social cost of carbon derived from the World Bank's Guidance Note on Shadow Price of Carbon in Economic Analysis (2017).[75]

6. **The analysis from RSSAT indicates that the project will reduce road fatality by about 16.5 percent, with the Project Safety Impact (PSI) of 0.84.** Most of the fatality reduction will be for pedestrians, which takes a large share (50 percent) of road users. The estimated benefit from improved road safety is about US$1 million for the analysis period of 20 years.

7. **The project roads and bridges to be improved consist of the 4.4 km of gravel sections and the 5.5 km of sealed sections of Noro Roads and the four bridges on Malaita Roads.** The existing roads are in poor condition. The current average annual daily traffic is estimated at 1,642 vehicles on the project roads in Noro[76] and 100 vehicles on the project bridges on Malaita. The roads are surface treatment roads, while the unpaved roads are gravel roads.[77] The sealed sections are surface treatment roads, while the unsealed sections are gravel roads. These roads are two-lane, traversing on a flat terrain on which vehicles are assumed to travel at an average speed of 30 km per hour. After the proposed works, the project roads are expected to be in good condition with vehicles assumed to travel at an average speed of 45 km per hour.[78] The vehicle operating cost improvement is expected to be US$0.1151 per vehicle-km for the sealing section, and US$0.0643 per vehicle-km for the resealing section. In addition, the climate resilient interventions are expected to avoid the annual repair of about US$0.1 million per year for the 9.9 km of the project roads.

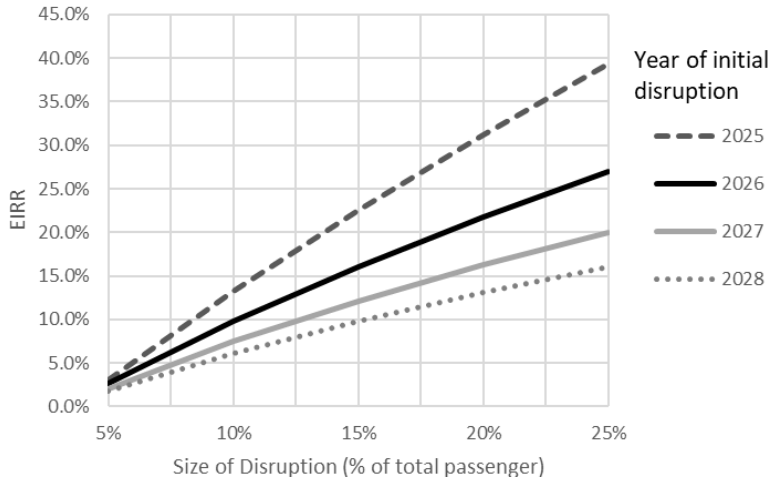
8. **The total financial capital cost for the economic analysis of aviation and road works combined is estimated at US$74.72 million.** The investment cost is estimated at US$37.75 million for Honiara Airport, US$7.43 million for Munda Airport, US$14.20 million for Santa Cruz Airfield, US$8.00 million for Malaita Bridges, and US$6.50 million for Noro Roads.

B. Economic Evaluation Results

9. **The overall EIRR of the Aviation infrastructure investments is 13.6 percent and the NPV is US$15.2 million.** The EIRR of the Honiara and Munda Airports investment is 16.3 percent and the NPV is US$11.6 million, while the EIRR of the Santa Cruz Airfield investments is 9.6 percent and the NPV is US$3.6 million. Additional sensitivity analysis was conducted regarding the timing of Honiara Airport runway failure, and the results are illustrated in figure 3.1.

[74] Based on the estimated GDP growth from 2022 to 2025, which has incorporated the impact of COVID-19 and the November 2021 unrest.
[75] The guidance note presents low and high scenarios of the social cost of carbon over time, from which the high scenario was used due to negative net CO_2 emission of the project.
[76] This is estimated based on the 12-hour traffic of 1,250 on Noro Roads in 2018, adjusted to the 2022 daily traffic using the assumed traffic growth rate of 2.5 percent and the conversion factor of 1.19 from 12-hour to 16-hour traffic, taken from the traffic count on South Santo Road in Vanuatu in 2021.
[77] This is estimated based on the moving traffic count along the project bridge areas on Malaita in 2018 adjusted to the current level.
[78] This is based on the average of the design speed limit for the sealed roads adopted under SIRAP (that is, 50 km per hour for major sealed roads, and 40 km per hour for minor sealed roads).

Figure 3.1: Sensitivity Analysis of Honiara Airport Runway Disruption



10. **The overall EIRR of the road infrastructure investments is 21.2 percent and the NPV is US$17.8 million.** Most of the benefits come from the four collapsed bridges becoming operational again (70 percent) and the vehicle operating cost savings (20 percent), while the remaining benefits are from time saving (4 percent), avoided emergency repairs (3 percent), and road safety (3 percent).

11. **The sensitivity analysis shows that the project is economically justified even if the benefits are 10 percent lower or if the construction cost is 10 percent higher or both.** To examine the impact of changes in key variables on the EIRR and NPV estimate, a sensitivity analysis was conducted (table 3.1). For the overall project, the EIRR is estimated at 11.0 percent and the NPV at US$18.0 million in the low case that the project benefits decrease by 10 percent and the project costs increase by 10 percent, which confirm the robustness of the economic rationale for the project. The switching values analysis shows that the construction costs would have to increase by 57 percent for the NPV to be equal to zero.

Table 3.1: Sensitivity Analysis Results

	Aviation		Roads		Total	
	EIRR (%)	NPV	EIRR (%)	NPV	EIRR (%)	NPV
Base case	13.6	15.2	21.2	17.8	15.9	33.0
(A) Benefits lower by 10%	10.5	8.9	19.2	15.0	13.2	23.9
(B) Cost higher by 10%	10.8	10.4	19.4	16.7	13.5	27.2
(A)+(B)	8.0	4.2	17.4	13.9	11.0	18.0

12. **An analysis of GHG emissions was undertaken based on fuel consumption rates at different speeds under 'with project' and 'without project' scenarios.** Without the project, the deteriorated condition of the roads limits vehicle speed and leads to higher fuel consumption per vehicle-km compared to the with-project scenario. With the project, improved road condition leads to improved speed and hence lower fuel consumption. Gross GHG emission in the with-project scenario is 140.5 tCO_2e. Total net GHG emission is estimated to be −58.6 tCO_2e—a net reduction over the evaluation period (20 years). The annual average net GHG emission is −2.9 tCO_2e per year. The social benefit from GHG reduction is estimated to be US$3,268, based on social cost of emission reduction from the World Bank's Guidance Note on Shadow Price of Carbon in Economic Analysis (2017).

ANNEX 4: Regional Approach and Benefits

COUNTRY: Solomon Islands
Second Solomon Islands Roads and Aviation Project

1. **The World Bank will support a series of aviation activities under the three transport projects (table 4.1) in the Pacific to effectively address the most common regional challenges, such as operational safety and resilience to natural disasters that limit regional air transport connectivity.** These activities, collectively called SOARR, aim at enhancing resilience, safety, and asset management of airport infrastructure in the region. It is critical to ensure aviation safety through these activities, particularly when international flights resume after many aircraft have been grounded and airports have not been fully in operation during the COVID-19 pandemic.

Table 4.1: Approval and Closing Dates and PDO of Each Project with Regional Airport Asset Maintenance

Project	Approval Date	Closing Date	PDO
TCRTP II (P176208)	December 10, 2021	June 30, 2029	To improve the climate resilience and safety of the Recipient's transport sector, and in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.
SARIP (P176272)	June 1, 2022 (tentative)	August 30, 2029	To improve the climate resilience and safety of the Recipient's aviation and road sectors, and in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.
SIRAP2 (P176548)	June 1, 2022 (tentative)	June 30, 2029	To improve the climate resilience and safety of the Recipient's road and aviation sectors, and in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.

2. **SOARR has been structured to allow each participating country to address its unique situation using appropriately customized delivery/contractual mechanisms.** While each country participating in SOARR has its own unique challenges and priorities, given the inherently regional nature of air transport and the similar characteristics of PICs, there are many common problems and goals across the countries.

3. **As a core activity of SOARR, the regional airport asset maintenance will be implemented.** This is a multiyear, performance-based maintenance contract for regional airports, aiming at establishing a preventative maintenance culture for the aviation sector in the target countries and enhancing safety and climate resilience of airport operations. The contract will cover mechanical and electronic equipment of the target international airports as most of the equipment is common in all airports.

4. **SOARR includes climate resilience and safety improvement activities at regional airports**, such as airport infrastructure improvement, acquisition of safety equipment and facilities, and development of resilient infrastructure. Each project will define the scope of the activities based on specific needs of the country. Concretely, SOARR could include, among others, the following activities:

(a) **Airport infrastructure improvement with enhanced resilience.** These include runway rehabilitation, upgrade of seawalls around airports, airfield drainage improvements, and installation of a boundary fence.

(b) **Equipment and facility for enhancing operational safety and climate and disaster resilience.** These include installation of ground and approach lighting and PAPI; acquisition of rescue fire service vehicles, automatic weather observation station, standby generators, alternative energy source, bird strike risk mitigation equipment, and crash alarms; construction of traffic control towers; and installation of new navigation

systems, including Doppler Very High Frequency Omni-directional Radio, Distance Measuring Equipment, Instrument Landing system, ADS-B, and VSAT communication system.

5. **Broader regional benefits of SOARR.** While participating countries would directly benefit the most from SOARR activities, given the nature of air transport and the planned improvements, there would be broader benefits for the entire region including the following:

(a) Regional airport asset maintenance will use common specifications and will be jointly advertised, which could maximize economy of scale and attract private sector interests so that the participating countries could benefit from the lower cost owing to a high level of competition.
(b) Improved capability of PICs to accommodate diverted flights and emergency landings due to airport safety and capability upgrades. This would provide pilots, air traffic controllers, and airlines more options when dealing with challenging weather or any type of emergency situation.
(c) Enhanced situational awareness for pilots of any ADS-B-equipped aircraft flying in the vicinity, even those not landing or taking off in the country, due to ADS-B receiver antenna installations in Solomon Islands.
(d) Improved capability of the countries to support post-disaster relief flights. This would be relevant for the neighboring islands in a natural disaster disabling its airports.
(e) Improved operating environment for regionally based airlines due to improved safety and capability at the target international airports.

6. Other countries in the Pacific region could join SOARR activities with the following criteria: (a) a country agrees on the common objective to improve climate resilience and safety of the aviation sector, (b) a country invests safety and climate resilience improvement activities for its regional (international) airports, and (c) preferably a country implements the regional airport asset maintenance contract for its international airport(s) using the harmonized specification.

ANNEX 5: Contingent Emergency Response Component

COUNTRY: Solomon Islands
Second Solomon Islands Roads and Aviation Project

1. The CERC is a contingent financing mechanism available to gain rapid access to financing to respond to a crisis or emergency and provides for immediate response needs without needing to first restructure the original project; thus, facilitating rapid implementation. The CERC minimizes time and effort needed to make available uncommitted funds from an IPF to finance urgent needs. Following an eligible crisis or emergency, the Borrower may request the World Bank to re-allocate project funds to support emergency response and reconstruction. This component would draw from the uncommitted credit and grant resources under the project from other project components to cover emergency response. Consistent with OP/BP 8.0, the CERC does not finance humanitarian assistance or relief.

2. Key principles relevant to CERCs include (a) focus on activities that can readily be implemented on the ground considering the circumstances; (b) favor smaller-scale, local activities that generate buy-in and goodwill; (c) keep the scope simple and realistic, especially where local conditions do not allow much situational analysis; and (d) take advantage of working with and completing the activities of development partners to maximize impacts.

3. **Activation criteria.** The project specific CERC will be funded under the SIRAP2 budget. Following an eligible crisis or emergency, the CERC would be implemented in accordance with the rapid response procedures governed by the World Bank under OP/BP 8.0 *Rapid Response to Crises and Emergencies.* In addition, the provisions of the IPF Policy, paragraph 12, regarding 'Projects in Situations of Urgent Need of Assistance or Capacity Constraints' apply to CERCs when they are triggered. The funding provision for the CERC is SDR 0.00 million; however, this can be increased by drawing down against uncommitted IDA funds under other components, if necessary. Disbursement conditions would define the circumstances under which the CERC funds would become available.

4. The request to trigger the CERC and seek approval of activities to be eligible expenditures for financing under Disbursement Category 2 will be communicated to the World Bank by Solomon Islands in a letter. The letter should include information pertaining to (a) the nature of the emergency, its impacts and confirmation of causal relationship between the event and the need to access the financing allocated to Disbursement Category 2; (b) the nature of emergency activities (brief description); and (c) the CERC action plan of activities.

5. The Financing Agreement stipulates the establishment of adequate implementation arrangements, satisfactory to the World Bank, including staff and resources for implementation of activities under Component 4, to the World Bank for its review and approval. A CERC Manual and associated Environmental and Social Management Framework were prepared under SIRAP and disclosed on the SIRAP's website on November 12, 2020. These instruments will be updated under SIRAP2 within six months after the effective date to ensure that they are aligned with the ESF requirements.

ANNEX 6: Map of Solomon Islands with Project Sites

COUNTRY: Solomon Islands
Second Solomon Islands Roads and Aviation Project