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SOLOMON ISLANDS

The Study on the Development Project of Henderson International Airport in Solomon Islands

FINAL REPORT
VOLUME II: MAIN REPORT

OCTOBER 1991

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JAPAN INTERNATIONAL COOPERATION AGENCY

PREFACE

In response to a request from the Government of Solomon Islands, the Government of Japan decided to conduct a study on the Development Project of Henderson International Airport and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Solomon Islands a study team headed by Mr. Shota Morita of Pacific Consultants International three times between October 1990 and September 1991.

The team held discussions with the officials concerned of the Government of Solomon Islands, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

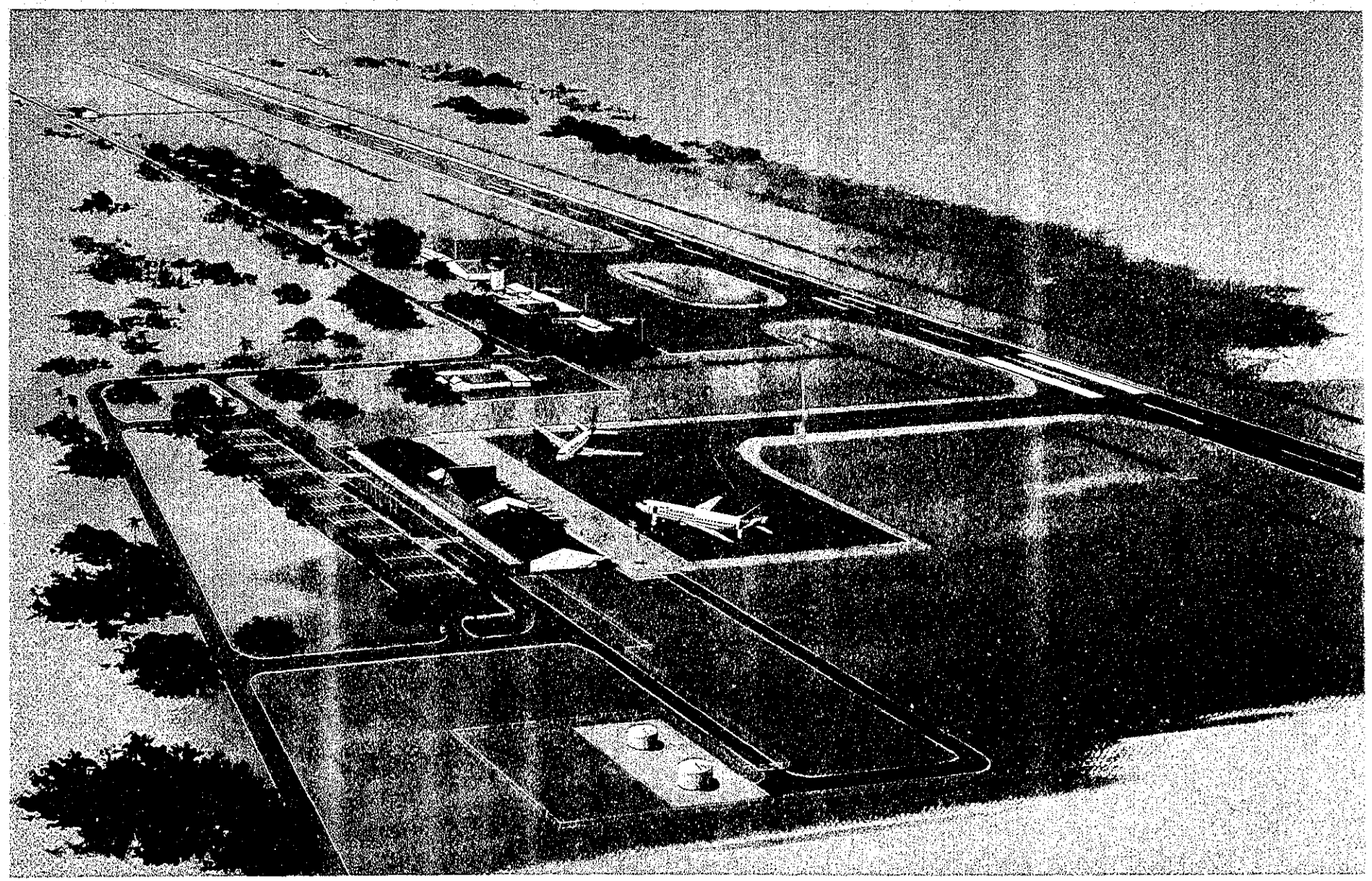
I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Solomon Islands for their close cooperation extended to the team.

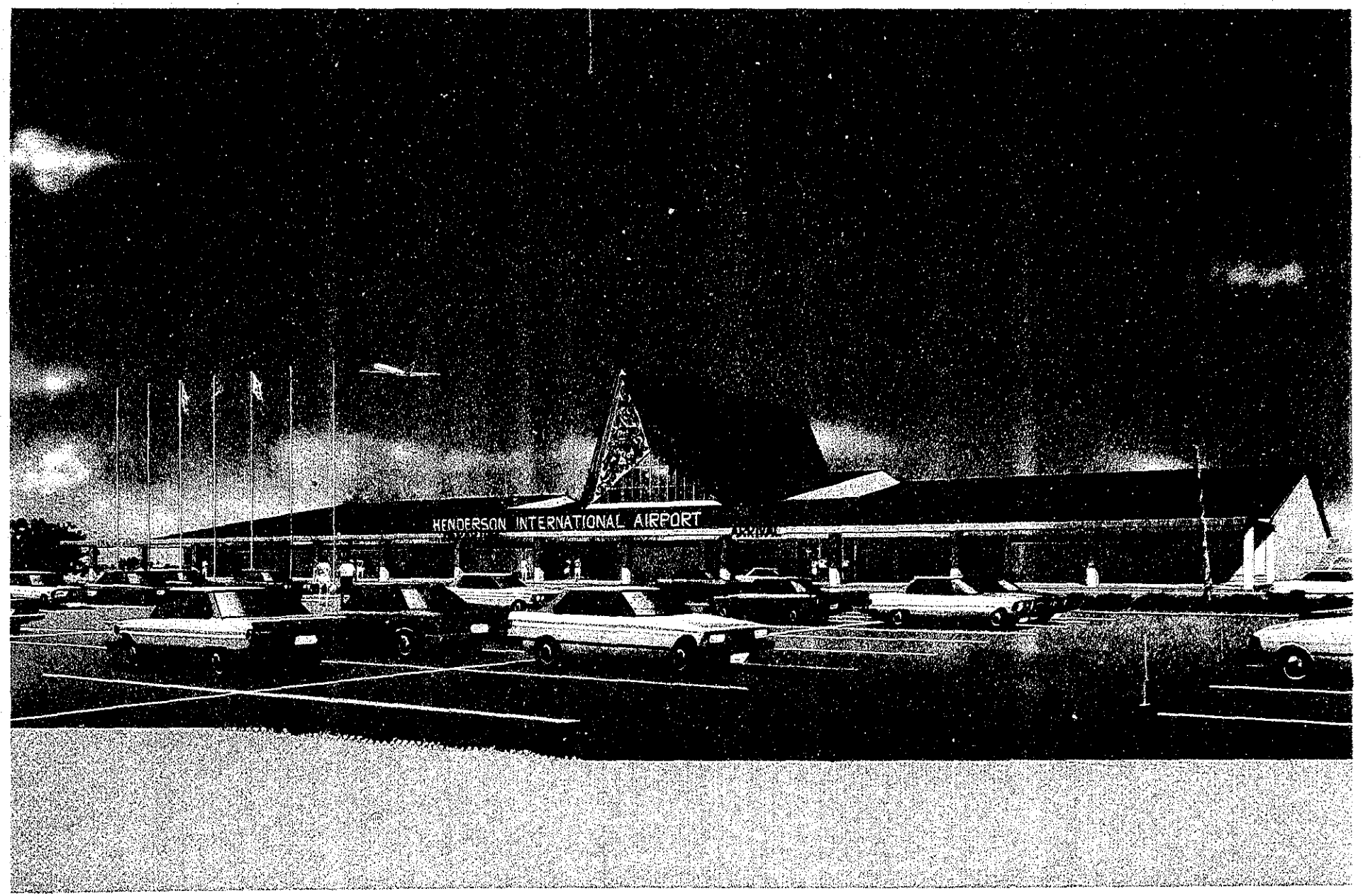
October 1991

Kensuke Yanagiya

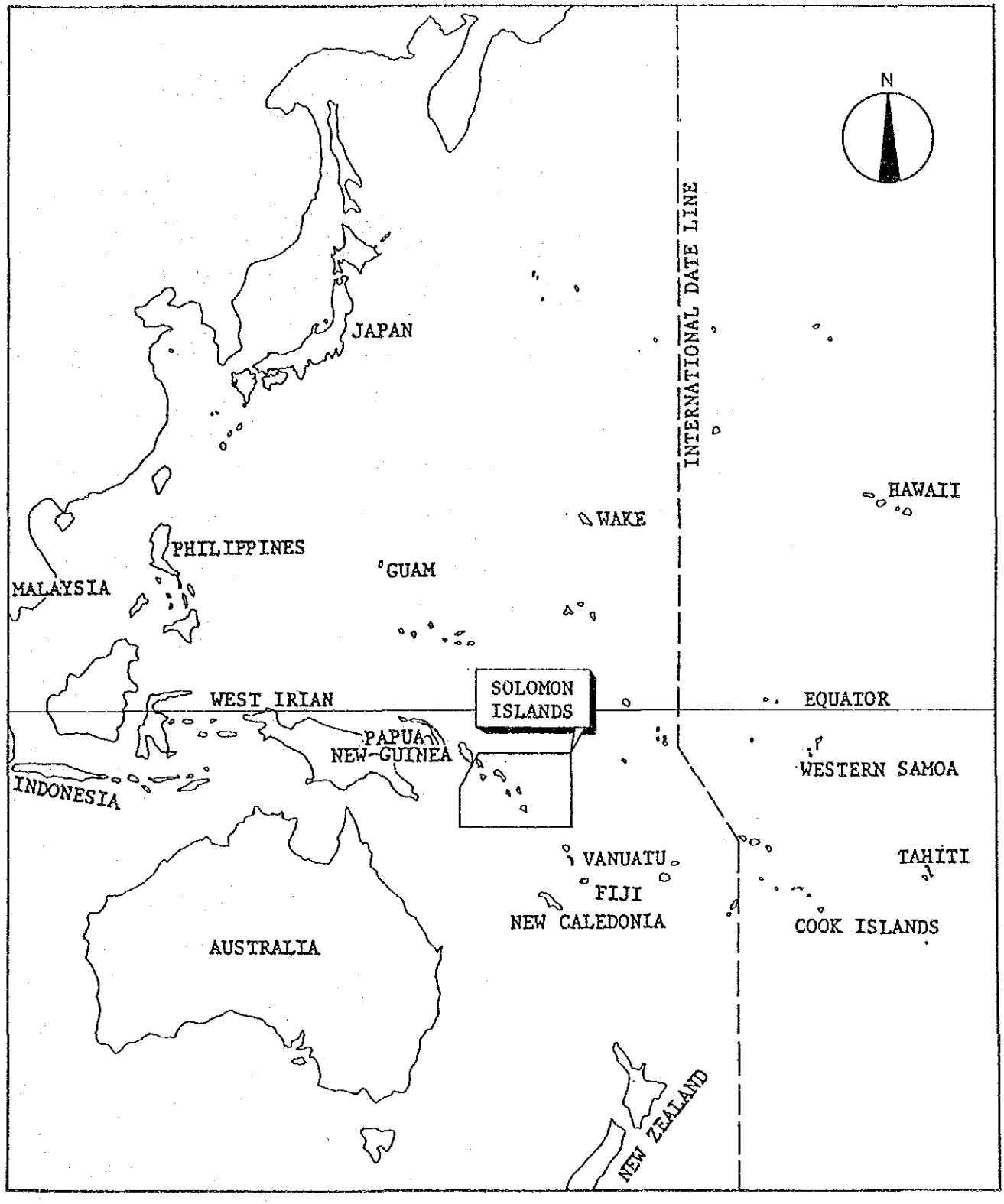
Kensuke Yanagiya
President
Japan International Cooperation Agency



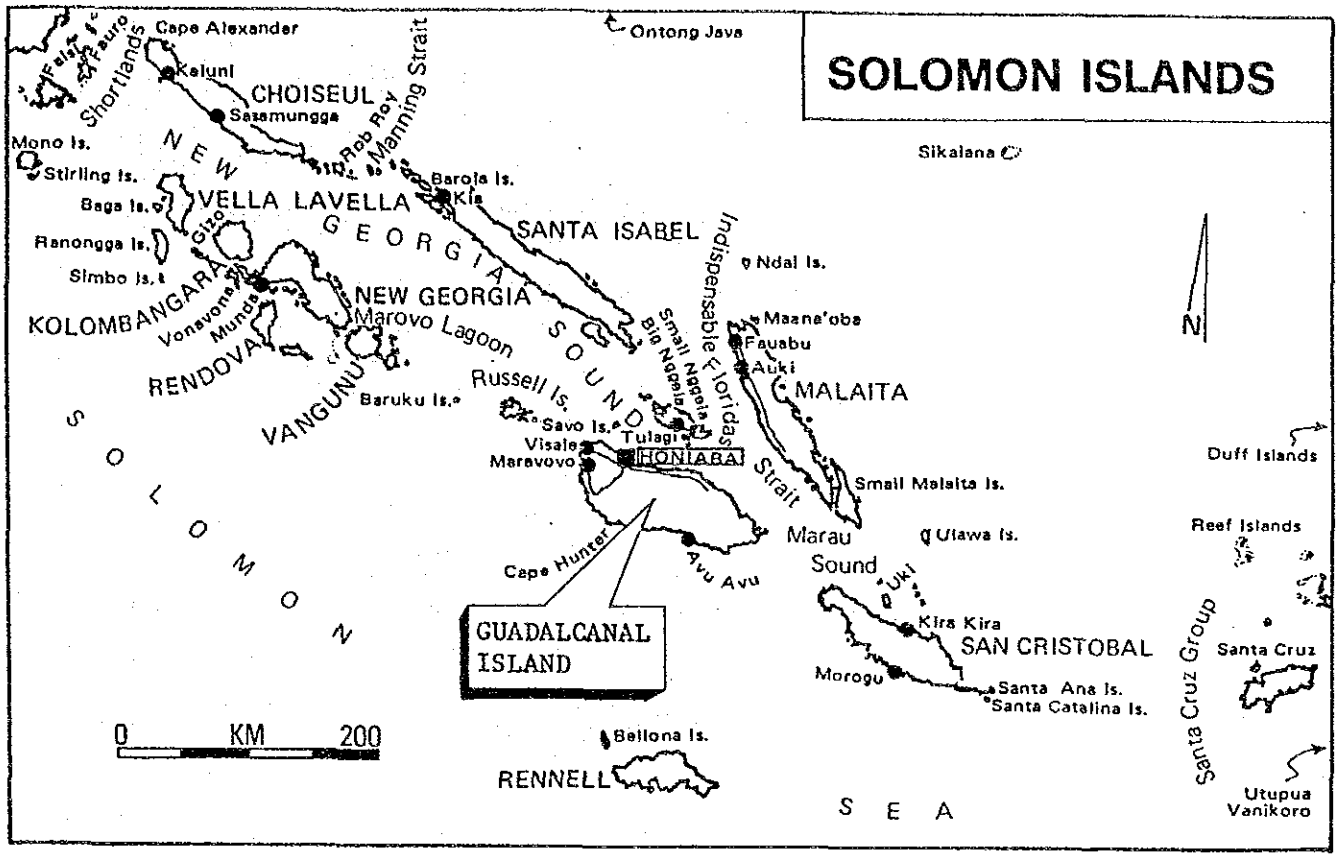
NEW TERMINAL AREA



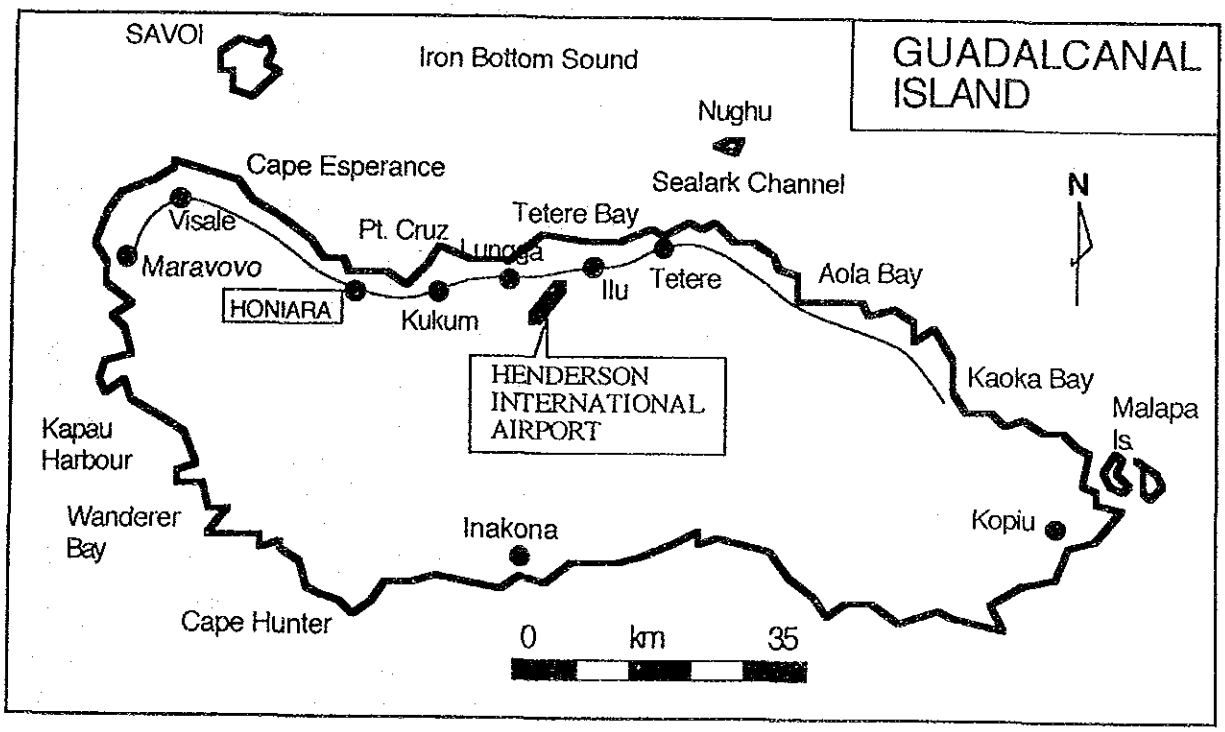
NEW PASSENGER TERMINAL BUILDING



PROJECT LOCATION MAP - 1



PROJECT LOCATION MAP - 2



PROJECT LOCATION MAP - 3

LIST OF ABBREVIATIONS

A310	:	Airbus 310
AFTN	:	Aeronautical Fixed Telecommunication Network
ALS	:	Approach Lighting System
AMSL	:	Above Mean Sea Level
ATR42	:	Avions De Transport Regional 42
ATC	:	Air Traffic Control
ATS	:	Air Traffic Services
AZ	:	Azimuth Antenna (MLS)
B727	:	Boeing 727
B737	:	Boeing 737
B747	:	Boeing 747
B767	:	Boeing 767
B/C	:	Benefit Cost Ratio
BNI	:	Britain Norman Islander
CAD	:	Civil Aviation Division
CBR	:	California Bearing Ratio
CIP	:	Commercial Important Person
CIQS	:	Customs,Immigration,Quarantine and Security
DHC-6	:	De Havillant Canada 6
DHC-8	:	De Havillant Canada 8
DME	:	Distance Measuring Equipment
DVOR	:	Doppler VHF Omni-Directional Radio Range
EIRR	:	Economic Internal Rate of Return
EL	:	Elevation Antenna(MLS)
F-50	:	Fokker 50
FAA	:	Federal Aviation Administration of the United States
FIC	:	Flight Information Center
FIR	:	Flight Information Region
FIS	:	Flight Information Service
GDA	:	Guadalcanal Development Authority
GDP	:	Gross Domestic Product
GP	:	Glide Path Antenna (ILS)
GRP	:	Gross Regional Product
GSE	:	Ground Service Equipment
HF	:	High Frequency
IATA	:	International Air Transport Association
ICAO	:	International Civil Aviation Organization
ILS	:	Instrument Landing System
IMC	:	Instrument Meteorological Condition
JCAB	:	Japan Civil Aviation Bureau
JICA	:	Japan International Cooperation Agency
KHz	:	Kilo Hertz
LLZ	:	Localizer Antenna (ILS)
MD-11	:	McDonnell Dougras 11
MHz	:	Mega Hertz
MLS	:	Microwave Landing System
MTA	:	Ministry of Tourism Aviation
MTWU	:	Ministry of Transport, Works and Utilities
NDB	:	Non Directional Radio Beacon
n.m.	:	Nautical Mile
NPF	:	National Provident Fund
NPV	:	Net Present Value
OAS	:	Obstacle Assessment Surface
OIS	:	Obstacle Identification Surface

OLS	:	Obstacle Limitation Surface
PA-23	:	Piper 23
PAPI	:	Precision Approach Path Indicator
P-DME	:	Precision Distance Measuring Equipment
SALS	:	Simple Approach Lighting System
SID	:	Standard Instrument Departure
TCSP	:	Tourism Council of the South Pacific
VHF	:	Very High Frequency
VIP	:	Very Important Person
VMC	:	Visual Meteorological Condition
WECPNL	:	Weighted Equivalent Continuous Perceived Noise Level
WPAS	:	Western Pacific Air Service

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CHAPTER 1 INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Background

Recognizing the importance of the development of tourism industries for its economy, the Government of Solomon Islands promulgated a national tourism policy in 1989. In order to promote the policy, the need was acknowledged by the Government to improve its national gateway for traveling abroad, i.e., Henderson International Airport. Thus, the Government of Solomon Islands requested the Government of Japan to assist in developing the airport.

In response to the request, the Government of Japan decided to implement the Study on the Development Project of Henderson International Airport in Solomon Islands (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan. Based on this decision, the Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, was entrusted to undertake the Study in close coordination with the Government of Solomon Islands.

1.2 Objectives of the Study

In the Solomon Islands, there are 32 airports of which Henderson International Airport located 13km east of Honiara, the national capital, is the country's sole international airport.

At present, this airport serves as the national air-gateway for international scheduled flights from/to Australia, Fiji, Nauru, New Zealand, Papua New Guinea, Vanuatu, as well as a center for domestic operations.

In the light of importance of this airport, the master plan was established in Honiara Airport Development Study under Australian aid in 1981. Based on the short-term development of this master plan, though several alterations were made thereafter, the displacement of runway threshold, extension of the runway, addition of a new taxiway, expansion of the apron, strengthening of the pavement, construction of the control tower and provision of air navigation systems were implemented by the assistance from Australia, Kuwait, West

Germany and the United Kingdom during a period from 1985 to 1987.

With this short-term development made, most of the airport facilities, except the terminal building, are now capable of handling B737 size aircraft. The existing passenger terminal building, however, is too small to cater to passengers of a single B737 movement, resulting in heavily congested peak hours. Therefore, the total handling capacity of Henderson International Airport remains insufficient even for present traffic needs. This situation would constitute serious barrier to the socio-economic development of the country if necessary improvements were not implemented immediately.

Although the construction of a new passenger terminal building is of urgent necessity to eliminate the above bottleneck situation, it is essential firstly to establish a new master plan covering a long-term and then to formulate a short-term development plan which includes the construction of the new passenger terminal building. This will require the following tasks:

(a) Review the previous master plan including the air traffic demand forecast, evaluate existing facilities and prepare a long-term master plan since there is a 10-year lapse of time and aircraft replacement from B737 or B727 to B767 is the recent trend in the South Pacific region;

(b) Determine the location, layout and size of the terminal area as well as those of passenger terminal building as a part of the airport master planning; and

(c) Evaluate the economic and financial feasibility for the investment.

Therefore, the objectives of the Study can be stated as follows:

(a) To prepare a master plan of Henderson International Airport; and

(b) To examine the technical, economic and financial feasibility of the short-term development plan to be formulated within the framework of the master plan.

1.3 Scope of the Study

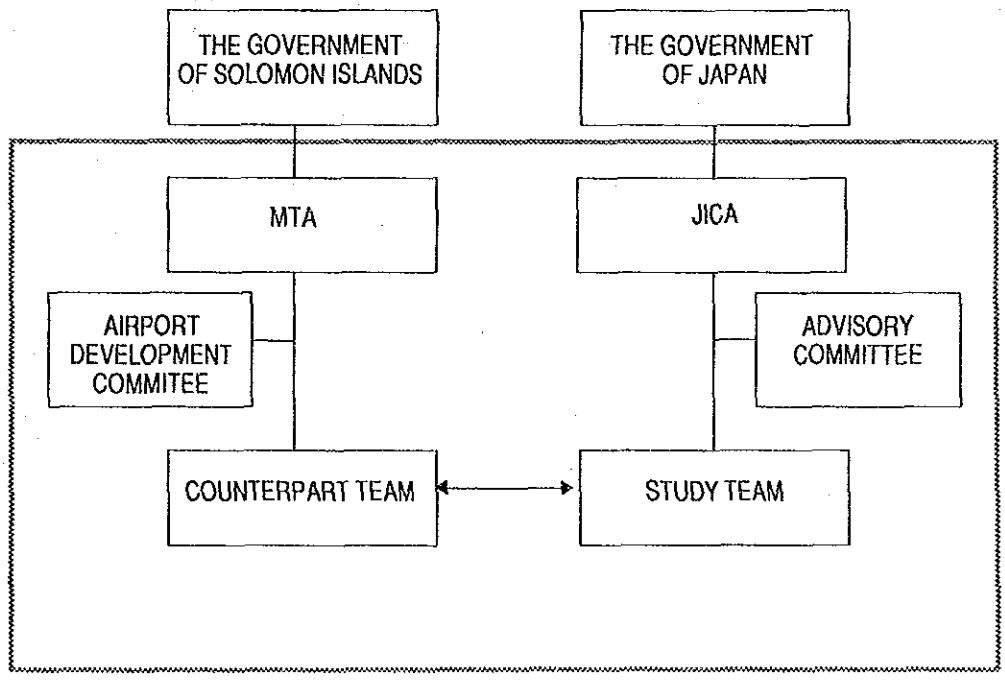
The Study comprises 32 major work items which fully cover "Scope of the Study" in the Scope of Work agreed upon between the Government of Solomon Islands and JICA on March 27, 1990. The above agreed scope is shown in Appendix-1.3.1. The main work flow of the Study with the 32 work items is shown in Figure 1.3.1.

1.4 Study Organization

The Study was carried out by the JICA Study Team under the direction of the Advisory Committee which has also been organized by JICA. The Study was conducted in close coordination with concerned authorities of the Government of Solomon Islands.

(1) Overall Concept of Study Organization

The overall organization frame is shown below:



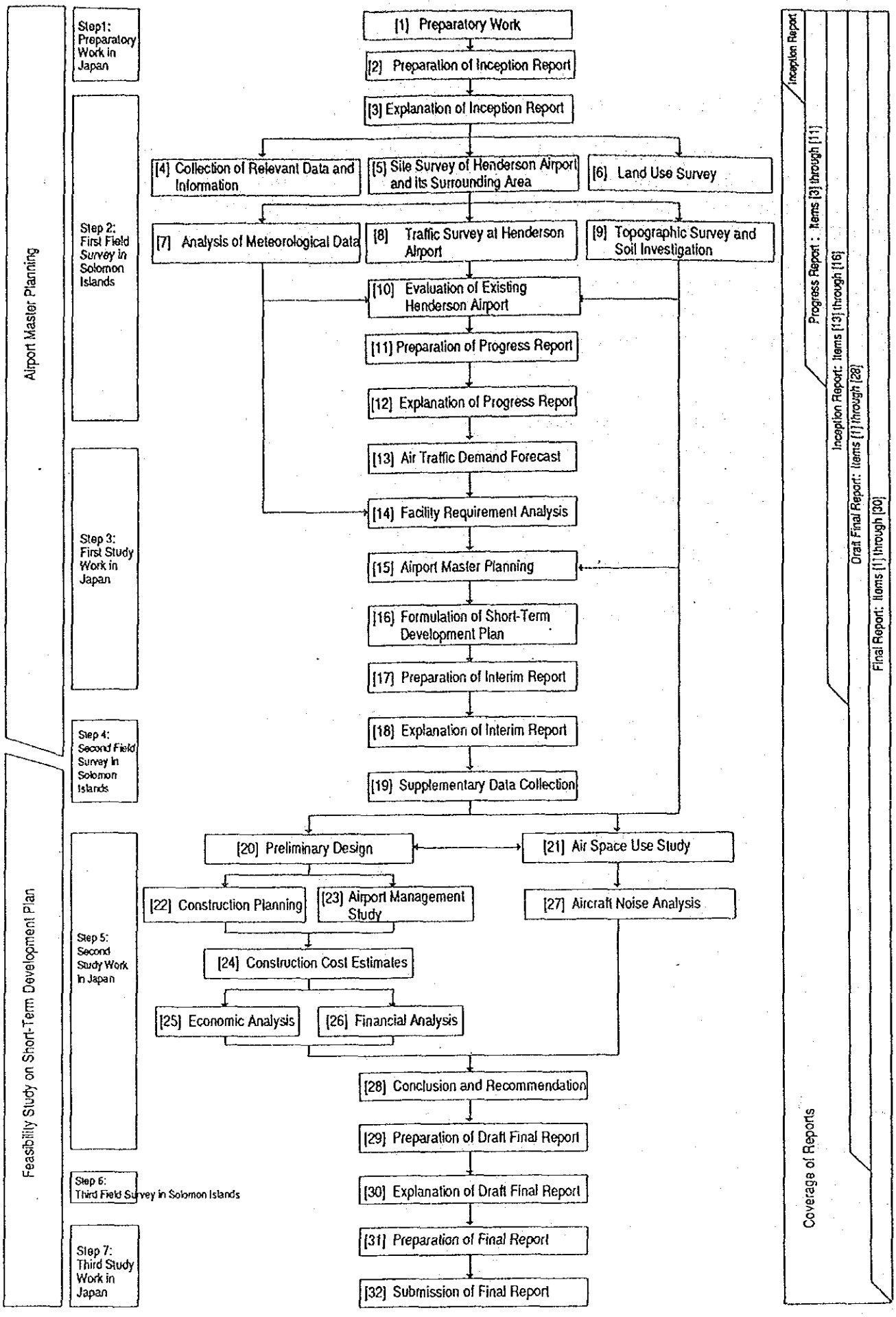


Figure 1.3.1 Main Work Flow Chart

(2) Member of the JICA Study Team

Mr. Shota MORITA	:	Team Leader
Mr. Hideki MURATA	:	Deputy Team Leader/Airport Planner
Mr. Hiroyuki UEDA	:	Airport Civil Engineer
Mr. Tadamitsu ITO	:	Airport Navigation System Engineer/Airport Management Planner
Mr. Isao FUKUWATARI	:	Airport Architect
Mr. Ryujirou YAMAGISHI	:	Traffic Forecaster/Economic Analyst

(3) Member of the Advisory Committee

Mr. Yoshiharu IWAMI (Chairman)	:	Deputy Director, Construction Division, Aerodrome Department, Civil Aviation Bureau, Ministry of Transport
Mr. Masamichi WATANABE (Chairman - predecessor)	:	Deputy Director, Construction Division Aerodrome Department, Civil Aviation Bureau, Ministry of Transport
Mr. Kouji KITAMURA	:	Special Assistant to the Director, Construction Division, Aerodrome Department, Civil Aviation Bureau, Ministry of Transport
Mr. Tatsuya YANAI	:	Chief of Aeronautical Radio Facilities Section, Radio Engineering Division, Air Traffic Services Department, Civil Aviation Bureau, Ministry of Transport

(4) JICA Coordinator

Mr. Fumio ISHIKAWA	:	Project Officer, First Development Study Division, Social Development Study Department, JICA
Ms. Rika INADA (Predecessor)	:	Project Officer, First Development Study Division, Social Development Study Department, JICA

1.5 Activities of the Study Team

(1) First Field Survey in Solomon Islands

On October 7, 1990, the Study Team and its Advisory Committee arrived in Honiara, Solomon Islands to carry out the ten-week long First Field Survey. On 10th October 10, 1990, the JICA Team held a meeting on the Inception Report with the representatives of Ministry of Tourism and Aviation (MTA) and other related agencies. The objectives and the intended procedures of the Study described in the Inception Report were accepted in principle by the Solomon Islands' side. The urgent need to improve the existing passenger terminal was recognized mutually by both parties. The minutes of the meeting on the Inception Report is shown in Appendix-1.5.1. In accordance with the minutes of the meeting, the Government of Solomon Islands organized the Counterpart Team and the Airport Development Committee. The list of members of the Counterpart Team and the Committee is shown in Appendix-1.5.2.

The major activities of the Study Team during the First Field Survey in the Solomon Islands included data collection and analysis, topographic survey, soil investigation and evaluation of existing airport. They were summarized in the Progress Report and explained to the Government in December 1990.

A list of data and information collected during the Study is shown in Appendix-1.5.3..

(2) First Study Work in Japan

Upon arrival from the Solomon Islands, the Study Team immediately proceeded with the First Study Work in Japan which aimed at producing an optimum master plan for Henderson International Airport. The work included air traffic demand forecasts, estimation of facility requirements, evaluation of existing facilities for future requirements and airport master planning up to 2010. The scope of the short-term development project was also determined within the framework of the airport master plan in order to clarify the work items to be covered in the next stage of preliminary design. The Interim Report was prepared to summarize the achievement up to the First Study Work in Japan under the supervision of JICA Advisory Committee.

(3) Second Field Survey in Solomon Islands

The Study Team and Advisory Committee mobilized in Honiara on 24th February 1991 to carry out the four-week long Second Field Survey. They submitted the Interim Report to the Government, and held two meetings for the presentation of the report and discussion and confirmation of major design policies. As a result of the two meetings, the Inception Report was, in principal, accepted and agreed upon by the Solomon Islands' side on 1st March as in the minutes of the meeting in Appendix-1.5.4.

The Study Team also executed supplemental data collection for the succeeding preliminary design during their stay, and confirmed two major design conditions concerning the installation of an instrument landing system and the layout of the passenger terminal building. The minutes of the meeting for the above are respectively shown in Appendices-1.5.5 and -1.5.6.

(4) Second Study Work in Japan

The Study Team proceeded with the Second Study Work in Japan upon arrival from the Solomon Islands. The objective of the Second Study Work was to carry out a feasibility study on the short-term development plan determined by the airport master planning. The work included preliminary design, airspace use study, aircraft noise analysis, airport management study, implementation planning, cost estimate, economic and financial analyses, conclusion of the whole study and recommendation to the Government.

A report substantially compiling all the results of the Study was prepared as the Draft Final Report.

(5) Third Field Survey in Solomon Islands

The Study Team and Advisory Committee mobilized in Honiara on 21st August 1991 to carry out the two-week long Third Field Survey. They submitted the Draft Final Report to the Government, and held four meetings for the presentation of the report, discussion on the report contents and finalization of minutes of meetings. The Draft Final Report was accepted by the Solomon Islands' side with minor modifications recorded in the minutes of the meeting in Appendix-1.5.7.

(6) Third Study Work in Japan

The Study Team upon arrival from the Solomon Islands carried out the Third Study Work in Japan. The Final Report was produced by modifying the Draft Final Report in accordance with the minutes of the meeting agreed upon between the two parties. During this Third Study Work in Japan, Mr. Michel Anita, Airport Manager of Henderson International Airport, was invited to Japan to attend the JICA Individual Training Course for the airport management. He attended various lecture sessions and also visited several Japanese airports including Tottori Airport as an example with similar concept and size to the airport development to Henderson International Airport. Additional discussions on the Study were also made by taking the opportunity of his visit, and the Final Report was completed on October 1991.

1.6 Organization of the Report

The report of the Study on the Development Project of Henderson International Airport in Solomon Islands consists of three volumes; Volume 1 Summary, Volume 2 Main Report and Volume 3 Appendices. This Main Report comprises 15 chapters. Chapter 1 is the introduction. The remaining chapters cover all the work items in Figure 1.3.1 as follows:

a) Chapter 2 Natural and Socio-Economic Environment

This chapter reviews and assesses the natural, socio-economic environment of the Solomon Island including transportation and construction fields based on work item [4].

b) Chapter 3 Existing Airport and Surroundings

This chapter describes very briefly the airport history, inventory and traffic characteristics based on the work items [4] and [5]. Existing and future land use in the airport surroundings, meteorological, topographic and soil conditions which correspond to the work items [6], [7], [8] and [9] are also dealt with in this chapter.

c) Chapter 4 Air Traffic Demand Forecast

Air traffic demand forecasts, work item [13], which provide the design bases of air traffic for the airport master planning are described in this chapter.

d) Chapter 5 Airport Facility Requirements

In this chapter, corresponding to work item [14], the number, concept, type, size and performance necessary for each airport facilities are estimated based on the air traffic demand forecasts.

e) Chapter 6 Evaluation of Existing Henderson International Airport

This chapter evalutates the various aspects of the existing Henderson International Airport corresponding to the work item [10]. The evaluation of the airport is done for both present and future traffic demands. A demand vs capacity analysis clarifies the usable life of each facility against future requirements.

f) Chapter 7 Airport Master Plan

This chapter produces an optimum master plan of the airport up to 2010 based on work item [15]. An extensive alternative study is undertaken and the best alternative is selected as a result of comprehensive evaluation of alternatives.

g) Chapter 8 Scope of the Short-term Development Project

This chapter, corresponding to work item [16], lists the construction work items of the short-term development project which has been determined in the Chapter 7 within the framework of the master plan. The construction work items are prioritized in two categories to clarify their urgency and to facilitate the division of the project in the implementation stage.

h) Chapter 9 Preliminary Design for Airport Facilities

The preliminary design is carried out on the facilities of the short-term development project. This chapter corresponds to work item [20] and designates the size, dimensions, performance and materials to be used for each airport facilities.

i) Chapter 10 Airspace Use Plan

This chapter, work item [21], establishes flight procedures which may be required by the implementation of the shot-term development project.

j) Chapter 11 Airport Management Plan

Based on the evaluation of the present conditions of the airport management, requirements for the operation and maintenance of the developed facilities in the short-term development is described in accordance with work item [23].

k) Chapter 12 Aircraft Noise Analysis

The environmental aspect of the airport development, particularly aircraft noise inference to the surrounding community of the airport, is assessed in this chapter based on work item [27].

l) Chapter 13 Project Implementation Schedule and Cost Estimates

The cost and implementation planning of the short-term development project is described here and corresponds to work items [22] and [24].

m) Chapter 14 Economic and Financial Analyses

This chapter evaluates the economic and financial impacts of the short-term development project repectively on the national economy and the airport management based on work items [25] and [26].

n) Chapter 15 Conclusion and Recommendations

Corresponding to work item [28], the conclusion of the whole study and recommendations on how to best implement the short-term development project are described in this chapter as a final result of the Study.

CHAPTER 2 NATURAL AND SOCIO-ECONOMIC ENVIRONMENT

CHAPTER 2 NATURAL AND SOCIO-ECONOMIC ENVIRONMENT

2.1 General

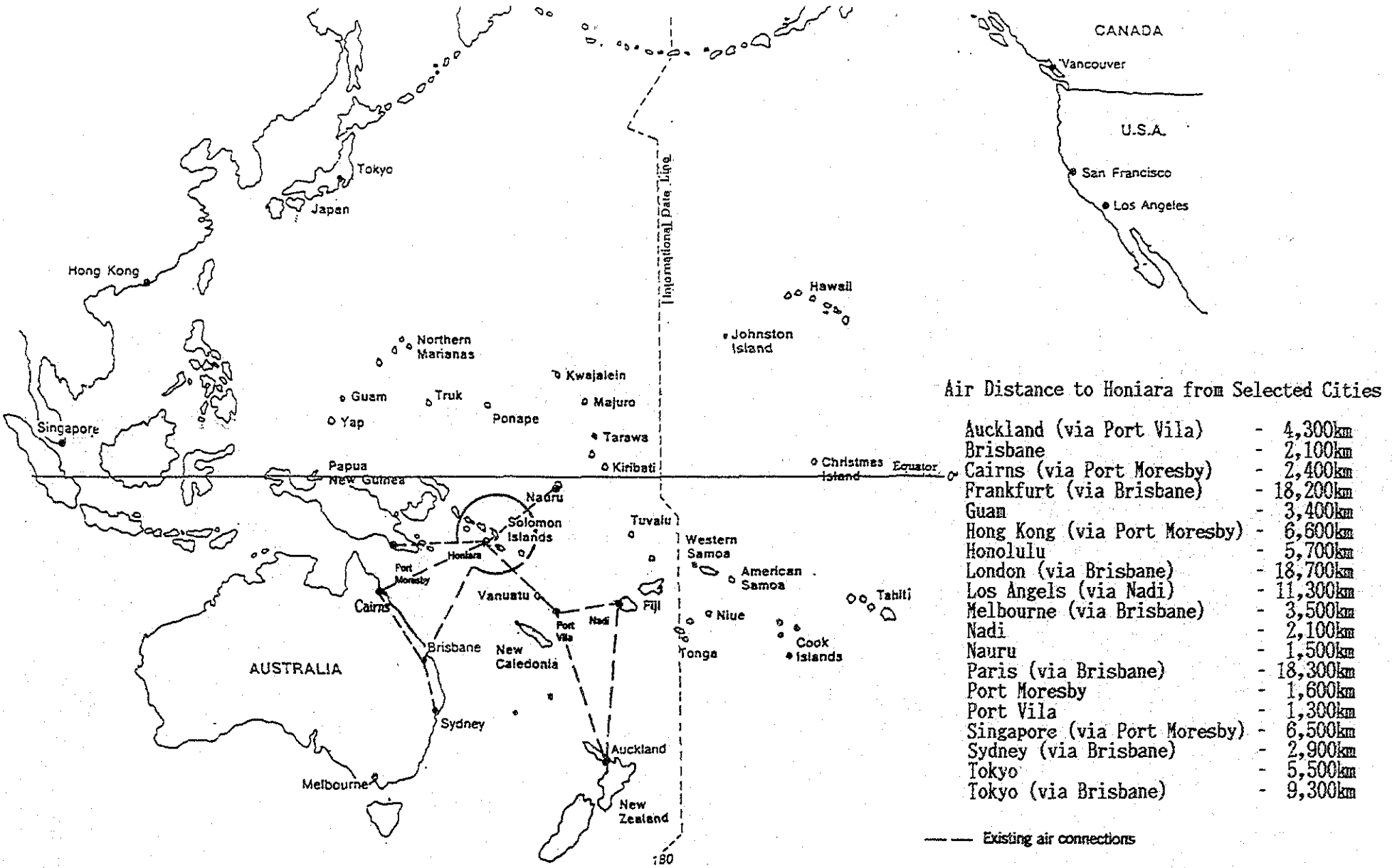
Air transportation plays an important role in the public welfare and socio-economic development of a nation. This is especially true for the Solomon Islands which consists of almost one thousand islands scattered over a vast 800,000 sq. km area of the southwestern corner of the Pacific Ocean calling for the vital need of air connections between cities both domestically and internationally. As Henderson International Airport is the sole international airport of the nation and the center of domestic air services, it is necessary to take into consideration the natural and socio-economic environment of the nation to prepare the optimim master plan of the airport.

Thus, this chapter provides a summary of the natural and socio-economic environment of the Solomon Islands that might influence the Study.

2.2 Geographical Characteristics

The Solomon Islands forms a part of Melanesia. It is situated some 5,500km south of Japan, about 1,800km northeast of Australia and about 900km east of Papua New Guinea. It is the third largest archipelago in the South Pacific and stretches from 154 to 172°E in longitudes (some 1,800km) and from 5 to 13°S in latitudes (some 1,000km). The location of the Solomon Islands in relation to neighboring island nations and continents as well as approximate air distances between Honiara and selected cities are shown in Figure 2.2.1.

The country consists of a double chain of some 990 islands of which six of them, namely Choiseul, New Georgia, Santa Isabel, Guadalcanal, Malaita and San Christobal are large islands, and total land area amounts to 28,400 sq.km. There are a number of volcanoes, both land and submarine, throughout the whole archipelago and some of them are quite active. As a result, earthquakes are common and some of them are said to have reached seven on the Richter scale. However, owing to the relatively low density development of towns as well as the absence of high rise buildings, no serious damages by earthquakes have been experienced in the past. While most of the major islands are rugged, steep and covered with dense



Air Distance to Honiara from Selected Cities

Auckland (via Port Vila)	-	4,300km
Brisbane	-	2,100km
Cairns (via Port Moresby)	-	2,400km
Frankfurt (via Brisbane)	-	18,200km
Guam	-	3,400km
Hong Kong (via Port Moresby)	-	6,600km
Honolulu	-	5,700km
London (via Brisbane)	-	18,700km
Los Angels (via Nadi)	-	11,300km
Melbourne (via Brisbane)	-	3,500km
Nadi	-	2,100km
Nauru	-	1,500km
Paris (via Brisbane)	-	18,300km
Port Moresby	-	1,600km
Port Vila	-	1,300km
Singapore (via Port Moresby)	-	6,500km
Sydney (via Brisbane)	-	2,900km
Tokyo	-	5,500km
Tokyo (via Brisbane)	-	9,300km

—— Existing air connections

Note: Map not to scale

Figure 2.2.1 Location of Solomon Islands

tropical rain forest leaving only small areas for plains, many of the smaller islands are volcanic, often surrounded by reef atolls, and thus possess a great potential for tourism development because of their attractive physical features and marine fauna.

Guadalcanal Island, 160km long by 48km wide (some 6,480 sq. km), is the largest of Solomon Islands. A north-west to southeast mountainous spine with the nation's highest peaks of Mt. Makarakomburu (2,447m) and Mt. Popomanaseu (2,440m) lies close to the southern coast of the island and makes the island's interior inaccessible. Wide alluvial plains spread on the northeast coast of the island are utilized intensively for agricultural purposes.

Honiara has been the nation's capital since 1945, when it was transferred from Tulagi to take advantages of roads, airstrips, wharf facilities, buildings and services established by the Americans during the Second World War. The city, however, appears to face expansion difficulty as it is developed along a narrow 11km coastal strip with its town center at Point Cruz and nearly 60% of total town area of 3,424 ha is either too steep or above water supply level.

Considering the aircraft noise pollution, it is not advisable to develop residential zone near the airport, however, the industrial estate planned at the northwest corner of the airport may serve to absorb a part of Honiara expansion in the future.

2.3 Socio-economy

2.3.1 Population

The population of the Solomon Islands in the 1986 census stood at 285,176 of which the Honiara Town Council area accounted for 30,413 (approximately 11% of the total population). The average annual increase in population during the 1976-1986 period was 3.5%, which was one of the highest in the world. The present rapid growth rate is due to high fertility levels and a sharp decrease in mortality rates. The plausible estimate in the 1986 census study report indicates the total population of the country will reach 882,000 by 2000, implying a 3.2% annual growth from 1986 with moderate decrease in fertility and mortality rates. The past records and future projections of the total population are shown in Table 2.3.1.

Table 2.3.1 Population in Solomon Islands

Year	Population	Annual	Growth Rate
(Past Records)			
1970	160,998		
1976	196,823	3.4%	(1970 - 1976)
1986	285,176	3.5%	(1976 - 1986)
(Projections)			
1990	325,000	3.3%	(1986 - 1990)
1995	380,000	3.2%	(1990 - 1995)
2000	441,000	3.0%	(1995 - 2000)
2005	506,000	2.8%	(2000 - 2005)
2010	575,000	2.6%	(2005 - 2010)

Source: Past records from Solomon Islands 1986 Population Census
Note : Projections are estimated using the growth rate of N.2.F. and N.2.S. cases in the 1986 Census Study Report

Distribution of the population in the country is shown in Table 2.3.2.

Table 2.3.2 Population in 1986, Rate of Annual Increase and Population Density by Province

Province	Population in 1986	Annual Increase 1976-86	Area (sq.km)	Population Density in 1986
Western	55,250	3.0%	9,312	5.9
Isabel	14,616	3.2%	4,136	3.5
Central	18,457	2.9%	1,286	14.4
Guadalcanal	49,831	4.3%	5,336	9.3
Honiara	30,413	6.8%	22	1,382.4
Malaita	80,032	2.7%	4,225	18.9
Makira/Ulawa	21,796	3.6%	3,188	6.8
Temotu	14,781	2.8%	865	17.1
Total	285,176	3.5%	28,370m	10.0

Source: Solomon Islands 1986 Population Census

The Solomon Islands is less urbanized than many other South Pacific countries. However, the progress of population concentration in Honiara is obvious from the highest annual growth which reflects the considerable movements of migrants to the capital.

2.3.2 Production

(1) Growth of GDP

The gross domestic product (GDP) of the Solomon Islands in 1988 was estimated at SI$367 million or US$176 million. Per capita GDP of US$580 classifies this country as a lower middle income country by World Bank definition. GDP of the country increased at an average growth rate of 3.9% from SI$163 to

SI$230 million at 1984 factor costs during a period of 1980 - 1989.

As the population growth for the same period was 3.5% per annum, there has been very slight real gain in per capita income. An erratic growth of GDP has occured partly due to natural disasters such as cyclones and floods.

The past trend of GDP from 1981 to 1989 is shown in Table 2.3.3.

Table 2.3.3 Past Trend of GDP

Year	GDP (SI$million)	Index as 1984=100	GDP/Capita (SI$)	Index as 1984=100
1980	163.4	83	705	96
1981	176.2	90	734	100
1982	174.9	89	704	96
1983	183.0	93	712	97
1984	196.1	100	737	100m
1985	201.6	103	732	99
1986	200.1	102	702	95
1987	204.5	104	693	94
1988	215.4	110	706	96
1989	230.0	117	730	99

Source: Solomon Islands Statistical Bulletin (No.22/89)
Note 1 : GDP in 1984 constant factor costs.
Note 2 : Values for 1989 are preliminary.

(2) Structure of Production

The structure of production in the Solomon Islands is characterized by relatively large non-monetary sector production in the national accounts. Although non-monetary sector production is said to be underestimated due to the extremely weak data on it, it was estimated to account for 17% of the total production in 1989.

The market economy is dominated by production from agriculture, fishery and forestry. These primary industries accounted for 29.9% of the total production.

The industrial structure of domestic production for a period 1980-1990 (Projection) is shown in Table 2.3.4.

Table 2.3.4 Gross Domestic Product by Industrial Origin (at 1984 Constant Factor Cost)

($ thousand 1984) ESTIMATE PROJECTION

Industry	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Agriculture	35,245	41,347	41,285	40,958	48,244	48,684	37,112	35,314	39,935	49,229	49,622
Forestry, Logging, Sawmilling	12,012	12,271	13,653	13,995	13,898	13,496	15,634	11,646	10,807	11,207	16,019
Fishing	9,092	9,647	7,919	12,242	13,018	11,038	15,434	12,134	14,412	13,252	15,554
Mining & Exploration	15	-6	-102	-130	-444	-1,374	-2,455	-2,783	-737	-808	-834
Manufacturing	7,095	6,429	6,608	6,590	6,047	6,811	7,150	8,701	8,743	8,837	9,242
Electricity and Water	1,342	1,443	1,470	1,601	1,688	1,883	2,005	1,824	2,003	2,390	2,087
Construction	5,587	7,738	4,621	5,682	4,872	7,029	7,364	6,515	6,442	7,040	7,709
Retail and Wholesale Trade etc	17,212	18,549	19,084	17,642	21,051	22,061	21,516	22,379	20,184	23,416	23,843
Transport and Communications	8,179	8,680	8,296	8,714	10,324	10,830	11,348	10,240	10,513	12,441	12,496
Finance	3,056	3,487	4,371	4,710	5,516	5,393	6,205	7,119	7,180	7,756	7,756
Other Services	32,654	33,201	33,362	35,485	36,193	39,330	41,799	52,683	56,033	53,963	55,462
GDP AT 1984 PRICES (MONETARY PRODUCTION)	131,489	142,786	140,756	147,489	160,408	165,181	163,111	165,772	175,517	188,723	198,955
Index (1984=1000)	819.7	890.1	877.5	919.5	1,000.0	1,029.8	1,016.9	1,033.4	1,094.2	1,176.5	1,240.3
Annual % movement	N/A	8.6	-1.4	4.8	8.8	3.0	-1.3	1.6	5.9	7.5	5.4
Omitting Mining Exploration	131,645	143,054	141,089	147,934	161,355	167,009	166,296	169,017	176,568	189,774	200,006
Index (1984=1000)	815.9	886.6	874.4	916.8	1,000.0	1,035.0	1,030.6	1,047.5	1,094.3	1,176.1	1,239.5
Annual % movement	N/A	8.7	-1.4	4.9	9.1	3.5	-.4	1.6	4.5	7.5	5.4
Non-Monetary: Food	29,495	30,883	31,545	32,839	32,965	33,659	33,690	35,772	36,908	38199.621	39536.607
Non-Monetary: Construction	2,396	2,491	2,553	2,633	2,715	2,800	3,286	2,934	3,015	3118.1002	3227.2337
GDP AT 1984 PRICES (ALL PRODUCTION)	163,380	176,160	174,854	182,961	196,088	201,640	200,088	204,477	215,437	230,041	241,719
Index (1984=1000)	833.2	898.4	891.7	933.1	1,000.0	1,028.3	1,020.4	1,042.8	1,098.7	1,173.2	1,232.7
Annual % movement	N/A	7.8	-.7	4.6	7.2	2.8	-.8	2.2	5.4	6.8	5.1

2.3.3. External Trade and Balance of Payments

Major export items from the Solomon Islands are fish products, timber and agricultural products such as copra, oil palm products and cocoa. Imports varies over a wide range of commodity groups such as machinery and transport equipment, manufactured goods by materials, food, mineral fuels and related materials. Major trade partners are Australia, Japan and the United Kingdom.

The trade balance was kept in favorable position in the early 1980s. However, it has been worsening due to deteriorating terms of trade. The unit price of imports increased by 82% between a period of 1982-1988, while the unit price of exports increased only 19% for the same period. This indicates that the export diversification is necessary to stabilize the economy and to achieve sustainable growth.

Balance of payments in the Solomon Islands showed deficits in both trade balance and service account balance. These deficits have been financed partly by transfer payments in the form of grant aid. Balance of current account in 1989 is shown in Table 2.3.5.

Table 2.3.5 Balance of Current Account in 1989

(Unit : Million SI$)

Merchandize Trade	- 84.5
(Exports)	(171.3)
(Imports)	(255.8)
Services Account	- 73.1
(Credit)	(77.7)
(Debit)	(150.8)
Transfers	88.3
(Official)	(85.5)
(Private)	(2.8)
Current Balance	- 69.3

Source: Central Bank of Solomon Islands.

2.3.4. Government Revenue and Debt

The government finance in 1989 is shown in Table 2.3.6.

Table 2.3.6 Government Finance in 1989

(Unit : Million SI$)

(1)	Revenue and Grants	129.3
	Current Revenue	103.4
	Tax Revenue	92.3
	Non-Tax Revenue	11.1
	Capital Revenue	0.2
	Grants	25.7
(2)	Expenditure	144.2
	Current Expenditure	121.4
	Capital Expenditure	22.8
(3)	Repayment	0.4
(4)	Deficit (2) - (1) - (3)	14.5
	Financed by Domestic Borrowing	9.1
	by External Borrowing	5.4

Source: Central Bank of Solomon Islands
Note : Preliminary figures for 1989

The Government is heavily dependent on grants from foreign countries and borrowing form domestic and external sources. The current revenue from tax and non-tax sources is insufficient even for the current expenditure.

2.4 Tourism

2.4.1 Visitor Arrivals

(1) Trend of Visitor Arrivals

The annual number of visitor arrivals (including tourists and visitors with business and other purposes) since 1980 is shown in Table 2.4.1.

Table 2.4.1 Visitor Arrivals in Solomon Islands

Year	Visitor Arrivals	Cruise Ship	
		Ships	Passengers
1980	10,517	3	1,202
1981	11,171	5	1,823
1982	11,179	2	1,500
1983	11,113	7	9,956
1984	11,177	8	7,264
1985	11,974	5	2,294
1986	11,522	11	5,829
1987	12,555	11	5,814
1988	10,679	6	4,547
1989	9,860	5	2,981

Source: Statistical Office, Statistical Bulletin (No. 11/90)
Note : The number of visitor arrivals does not include cruise ship passengers.

The number of visitor arrivals showed a static trend around 11,000 annual visitors with a few fluctuations until 1986, but it turned into a gradual decrease since 1988 following a slight increase in 1987.

The visit of cruise ship passengers reached its peak number in 1983, but has been declining since then.

(2) Visitors by Country of Residence and Travel Purpose

Of the total visitors, visitors from Australia, neighboring big country, occupied the overwhelming top share of 37.1% in 1989. Relatively big shares are recorded for Papua New Guinea (11.3%), New Zealand (11.2%) and the United States (10.1%). Changes in visitors share are relatively small over the past five years, but visitors from Australia, New Zealand, Papua New Guinea and Other Pacific Islands have been decreasing, while visitors from the United States, Japan and, Southeast Asia were in an increasing trend as shown in Table 2.4.2.

As for travel purposes classified with tourism, business purpose and other purposes, the share of the tourists accounted for approximately a half of the total visitors (45.3%) in 1989. Visitors on business and other purposes accounted for respectively 33.7% and 21.0% of the total in 1989. The number of tourists has been declining over the past five years, while business visitors were stable and other visitors increased in number during the same period.

Table 2.4.2 Visitors by Country and Purpose

		1985		1986		1987		1988		1989		1990-Q1	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Australia	Tourist	2800	65.3	2402	65.6	2951	59.5	1966	50.8	1617	44.2	325	43.4
	Business	1245	29.1	1140	31.1	1524	30.7	1390	35.9	1318	36.0	254	33.9
	Other	240	5.6	118	3.2	482	9.7	512	13.2	726	19.8	170	22.7
	Total	4285	100.0	3660	100.0	4957	100.0	3868	100.0	3661	100.0	749	100.0
New Zealand	Tourist	653	52.7	1111	69.2	888	60.7	563	43.8	349	31.5	67	28.2
	Business	351	28.3	423	26.3	384	26.2	585	45.5	364	32.9	63	26.5
	Other	235	19.0	72	4.5	191	13.1	137	10.7	394	35.6	108	45.4
	Total	1239	100.0	1606	100.0	1463	100.0	1285	100.0	1107	100.0	238	100.0
Papua New Guinea	Tourist	1418	58.0	1175	75.1	977	74.2	915	68.6	610	54.9	145	56.9
	Business	378	15.5	230	14.7	185	14.1	236	17.7	241	21.7	51	20.0
	Other	648	26.5	159	10.2	154	11.7	183	13 7	260	23.4	59	23.1
	Total	2444	100.0	1564	100.0	1316	100.0	1334	100.0	1111	100.0	255	100.0
Other Pacific	Tourist	539	41.1	577	53.2	529	50.5	412	39.6	250	27.9	116	52.7
	Business	548	41.8	388	35.8	296	28.3	375	36.1	409	45.6	54	24.5
	Other	224	17.1	119	11.0	222	21.2	253	24.3	237	26.5	50	22.7
	Total	1311	100.0	1084	100.0	1047	100.0	1040	100.0	896	100.0	220	100.0
Japan	Tourist	154	39.1	216	46.7	144	26.7	157	26.9	173	32.1	54	40.9
	Business	192	48.7	243	52.5	274	50.7	349	59.8	278	51.6	52	39.4
	Other	48	12.2	4	0.9	122	22.6	78	13.4	88	16.3	26	19.7
	Total	394	100.0	463	100.0	540	100.0	584	100.0	539	100.0	132	100.0
United Kingdom	Tourist	322	54.9	465	53.9	487	55.2	231	40.6	158	35.7	43	41.0
	Business	228	38.8	357	41.4	289	32.7	263	46.2	184	41.5	32	30.5
	Other	37	6.3	41	4.8	107	12.1	75	13.2	101	22.8	30	28.6
	Total	587	100.0	863	100.0	883	100.0	569	100.0	443	100.0	105	100.0
Other Europe	Tourist	105	66.0	131	67.5	155	60.5	119	58.6	151	70.6	13	56.5
	Business	42	26.4	55	28.4	74	28.9	68	33.5	37	17.3	5	21.7
	Other	12	7.5	8	4.1	27	10.5	16	7.9	26	12.1	5	21.7
	Total	159	100.0	194	100.0	256	100.0	203	100.0	214	100.0	23	100.0
United States	Tourist	624	74.8	913	77.6	945	79.2	604	66.4	708	70.9	86	65.2
	Business	168	20.1	228	19.4	173	14.5	203	22.3	184	18.4	18	13.6
	Other	42	5.0	35	3.0	75	6.3	102	11.2	107	10.7	28	21.2
	Total	834	100.0	1176	100.0	1193	100.0	909	100.0	999	100.0	132	100.0
Other	Tourist	314	43.6	513	56.3	467	51.9	400	45.1	452	50.8	96	45.1
	Business	336	46.6	369	40.5	327	36.3	386	43.5	310	34.8	67	31.5
	Other	71	9.8	30	3.3	106	11.8	101	11.4	128	14.4	50	23.5
	Total	721	100.0	912	100.0	900	100.0	887	100.0	890	100.0	213	100.0
Total	Tourist	6929	57.9	7503	65.1	7543	60.1	5367	50.3	4468	45.3	945	45.7
	Business	3488	29.1	3433	29.8	3526	28.1	3855	36.1	3325	33.7	596	28.8
	Other	1557	13.0	586	5.1	1486	11.8	1457	13.6	2067	21.0	526	25.4
	Total	11974	100.0	11522	100.0	12555	100.0	10679	100.0	9860	100.0	2067	100.0

Source : Statistics Office, "STATISTICAL BULLETIN (No. 11/90)

(3) Comparison with Other South Pacific Islands

Visitor arrivals in selected South Pacific islands between 1986 and 1989 are shown in Table 2.4.3.

Table 2.4.3 Visitor Arrivals in Selected South Pacific Islands

Country	1986	1987	1988	1989
American Samoa	35,000	35,000	39,000	40,000
Cook Islands	31,000	32,000	34,000	35,000
Fiji	258,000	190,000	208,000	245,000
Kiribati	3,000	3,000	4,000	4,000
Niue	2,000	2,000	1,000	1,000
Papua New Guinea	32,000	35,000	41,00	42,000
Solomon Islands	12,000	13,000	11,000	10,000
Tahiti	161,000	143,000	135,000	137,000
Tonga	16,000	17,000	19,000	20,000
Tuvalu	1,000	1,000	1,000	1,000
Vanuatu	18,000	15,000	18,000	24,000
Western Samoa	46,000	46,000	46,000	47,000
Total	615,000	532,000	557,000	609,000

Source: World Tourism Organization, WTO Current Travel and Tourism Indicators.

Note : Values in 1989 are estimates by Tourism Council of the South Pacific.

The total number of visitor arrivals in South Pacific islands experienced a sharp drop in 1987, but it turned into an increasing trend since then. Visitors have increased rapidly in Fiji and Vanuatu, and gradually in American Samoa, Cook Islands, Papua New Guinea and Tonga since 1988. While, the Solomon Islands and Tahiti have a static or decreasing trend in recent years.

2.4.2. Accommodation Establishments

As shown in Table 2.4.4, the present registered accommodation capacity in Solomon Islands consists of 270 rooms with a total of 610 beds in 16 establishments. About 60% of the total beds are situated in three hotels in Honiara.

Table 2.4.4 Hotel and Other Accommodation Establishments in Solomon Islands

Location	Establishments	Rooms	Beds
Honiara	3	176	353
Guadalcanal Province	3	29	97
Western Province	7	46	120
Malaita Province	1	6	12
Temotu Province	1	5	2
Live-aboad Dive Boat	1	8	16
Total	16	270	610

Source: Solomon Islands Tourism Authority
Note : As of November 1990

Other than three hotels in Honiara, accommodation establishments in rural areas have generally limited capacity of less than 10 rooms, often with substandard facilities.

The major reason for the stagnant growth of visitor arrivals to the Solomon Islands is considered due to lack of accommodation facilities in both number and quality. Only three hotels in Horiara are relatively of high-grade. Although the average room occupancy rate of accommodation facilities in the Solomon Islands is low at about 50%, this is because sub-standard establishments in rural areas operate at very low occupancy rates. The room occupancy rates of two major hotels in Honiara are presently about 65% on an annual average, however they are often full-booked during peak seasons. This fact apparently indicates that capacity development of accommodation facilities especially of high-grade is necessary for the future increase of visitor arrivals.

There are a number of development plans to increase and upgrade the accommodation establishments with a wide variety of scales. Two hotels in Honiara have expansion plans. Small expansions of existing establishments are being implemented in Western Province. Major resort hotel development is scheduled on the northwest coast of Guadalcanal Islands. A list of accommodation facility developments completed in 1990 and planned for the future is shown in Table 2.4.5.

Table 2.4.5 Accommodation Facility Development Plans

Hotel/Place		Plan
- Mendana Hotel	[Planned]	Construction of an annex to the east of existing hotel.
- Honiara Hotel	[Completed]	New annex with 16 rooms was completed in 1990.
	[Planned]	Another annex is planned.
- Doma (W. Guadalcanal)	[Scheduled]	Hotel construction with 280 rooms. Land has been acquired by Guadalcanal Development Authority. Scheduled time of operation is July 1992 with 116 rooms and additional 164 rooms in 1994.
- Mamara (W. Guadalcanal)	[Planned]	Feasibility study for a large scale resort with 450-600 hotel rooms and 18 hole golf course was completed in April 1990. Land belongs to the Government.
- New Hotel Development (Honiara)	[Scheduled]	New hotel development with 140 rooms. Feasibility study is ongoing. Scheduled time of completion is 1994.
- Vulelua Is. Resort (E. Guadalcanal)	[Scheduled]	Addition of 3 rooms in 1991.
- Anuha Is. Resort (Florida Islands)	[Scheduled]	Reopening in mid 1991 due to setllement of land dispute. 50 rooms.
- Gizo Hotel (W. Province)	[Completed]	New annex with 5 rooms was completed in 1990.
- Agnes Lodge (W. Province)	[Scheduled]	New annex with 7 rooms is under construction. Completion in 1991.
- Diver's Lodge (W. Province)	[Scheduled]	Addition of 4 rooms in 1991. Under construction.
- Hombupeka Is. Resort	[Scheduled]	Inuaguration with 4 rooms in 1991. Under construction.
(W. Province)	[Planned]	It will be expanded up to 20 rooms.
- Velia Is. Resort (W. Province)	[Planned]	High quality resort with 40 room hotel planned by Austrian developer.

The number of total hotel rooms have increased by 19 in 1990. It is estimated to further increase by 443 rooms up to 1994. If all these scheduled development is completed, the number of total hotel rooms in the Solomon Islands will be 2.6 times the existing number in 1990.

2.4.3. Tourism Development Study

A tourism development study named "Solomon Islands Tourism Development Plan 1991-2000" has been prepared for the Government of Solomon Islands by the Tourism Council of the South Pacific (TCSP) under the assistance from the European Community. The final report was available in December 1990. This study was prepared based on the National Tourism Policy of the Solomon Islands promulgated in 1989, and provided market analysis, accommodation and transportation requirements, tourism development plan, environmental, socio-cultural and economic evaluation, and conceptual design and pre-feasibility analysis for two selected and one model resort projects. It also referred institutional framework and human resources for the tourism development.

This study gave three different projections of visitors arrivals up to 2000 as shown in Figure 2.4.1. The accommodation requirements in terms of the number of rooms were estimated as shown in Table 2.4.6.

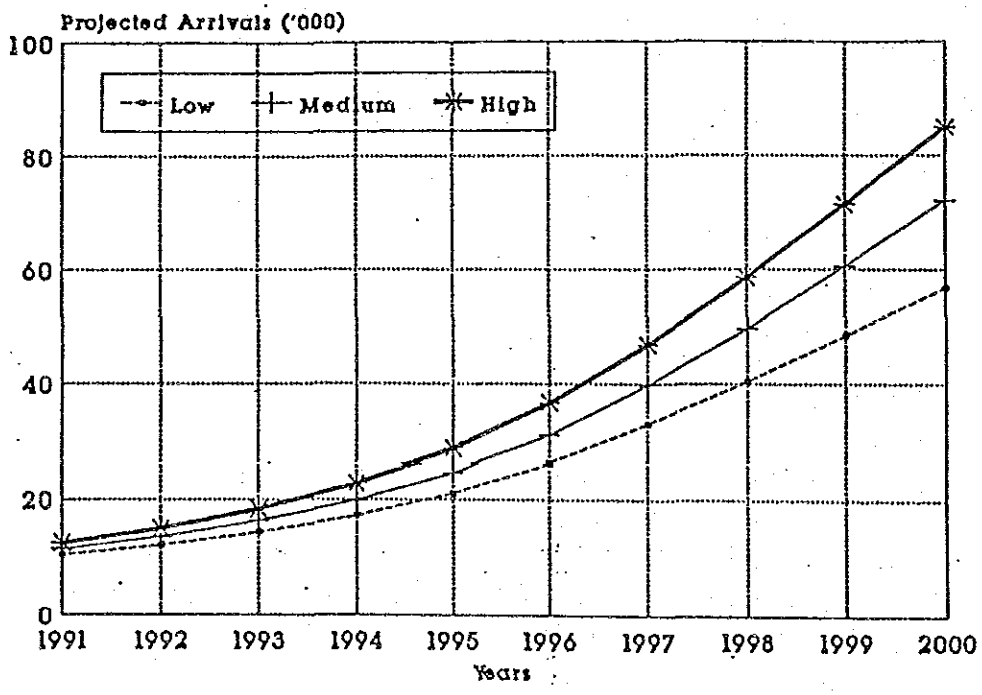


Figure 2.4.1 Visitor Arrival Projections by Solomon Islands Tourism Development Plan 1991-2000

Table 2.4.6 Accommodation Requirements in Tourism Development Plan 1991-2000

Year	Visitor Arrivals (Medium Projections)	Room Requirements
1989	9,800	270
1995	28,000	605
2000	85,000	1,400

Source: Solomon Islands National Tourism Development Plan 1991- 2000
Note : Figures in 1989 are actual

As for international transport requirements, the report mentioned the necessity to introduce larger capacity aircraft of B-767 or equivalent types by 1995.

2.5 Air Transportation

2.5.1 Airports

There are 32 airports in the Solomon Islands of which Henderson International Airport in Honiara is the sole international airport serving regular international flights. Thirty one domestic airports are scattered throughout the country, and provide essential services of inter-island transportation. Distribution of airports in Solomon Islands is tabulated in Table 2.5.1.

Table 2.5.1 Distribution of Airports in Solomon Islands

International Airport	
Honiara	1
Domestic Airports	
Western Province	15
Malaita Province	5
Central Province	4
Guadalcanal Province	3
Isabel Province	2
Makira Province	1
Temotu Province	1
Total	32

Source: AIP Solomon Islands.

Of the 31 domestic airports, 21 are operated by the respective Provincial Governments and the remaining 10 are operated by private organizations which include Western Pacific Air Services (WPAS), a tourist resort, a plantation company and two timber companies (these are unmanned airports).

The Civil Aviation Division (CAD) of Ministry of Tourism and Aviation (MTA) operates Henderson International Airport, and supervise all domestic airports except one that is unlicensed. The Civil Aviation Division has plans to upgrade Munda or Gizo Airport to the second regular international airport and to construct additional domestic airfields.

Western Pacific Air Services owned by the Seventh Day Adventist Church has been expanding their services by constructing new airports. It has constructed five airports, and plans to have three more by 1992.

2.5.2 Air Services

(1) International Air Services

Henderson International Airport is presently served by international scheduled flights from/to Australia, Fiji, Nauru, New Zealand, Papua New Guinea and Vanuatu. The existing air routes from/to Honiara are shown in Figure 2.5.1.

Scheduled international flights are operated by the national flag carrier, i.e. Solomon Airlines, and Qantas, Air Niugini and Air Nauru. Solomon Airlines has a joint operation agreement with Air Pacific on its route between Honiara and Nadi. International flight services from/to Honiara are shown in Table 2.5.2.

Table 2.5.2 International Air Services from/to Honiara

Route	Airline	Aircraft	Flights/Weeks
Honiara-Brisbane	IE	B737	2
	QF	B737	2
Honiara-Cairns-Brisbane	IE	B737	2
Honiara-Port Vila -Nadi-Auckland	IE	B737	2
Honiara-Port Vila -Auckland	IE	B737	2
Honiara-Port Vila -Nadi	IE	B737	2
Honiara-Port Moresby	IE	B737	2
	PX	F28	2
Honiara-Nauru	ON	B737	2
(Honiara)-(Sidney)	ON	B737	2
Total			20

Note 1: As of November 30, 1990
2: IE: Solomon Airlines, QF: Qantas, PX: Air Niugini, ON: Air Nauru
3: B737: 100 seats, F28: 85 seats
4: Air Nauru has no traffic rights at Honiara for Honiara - Sydney sector.

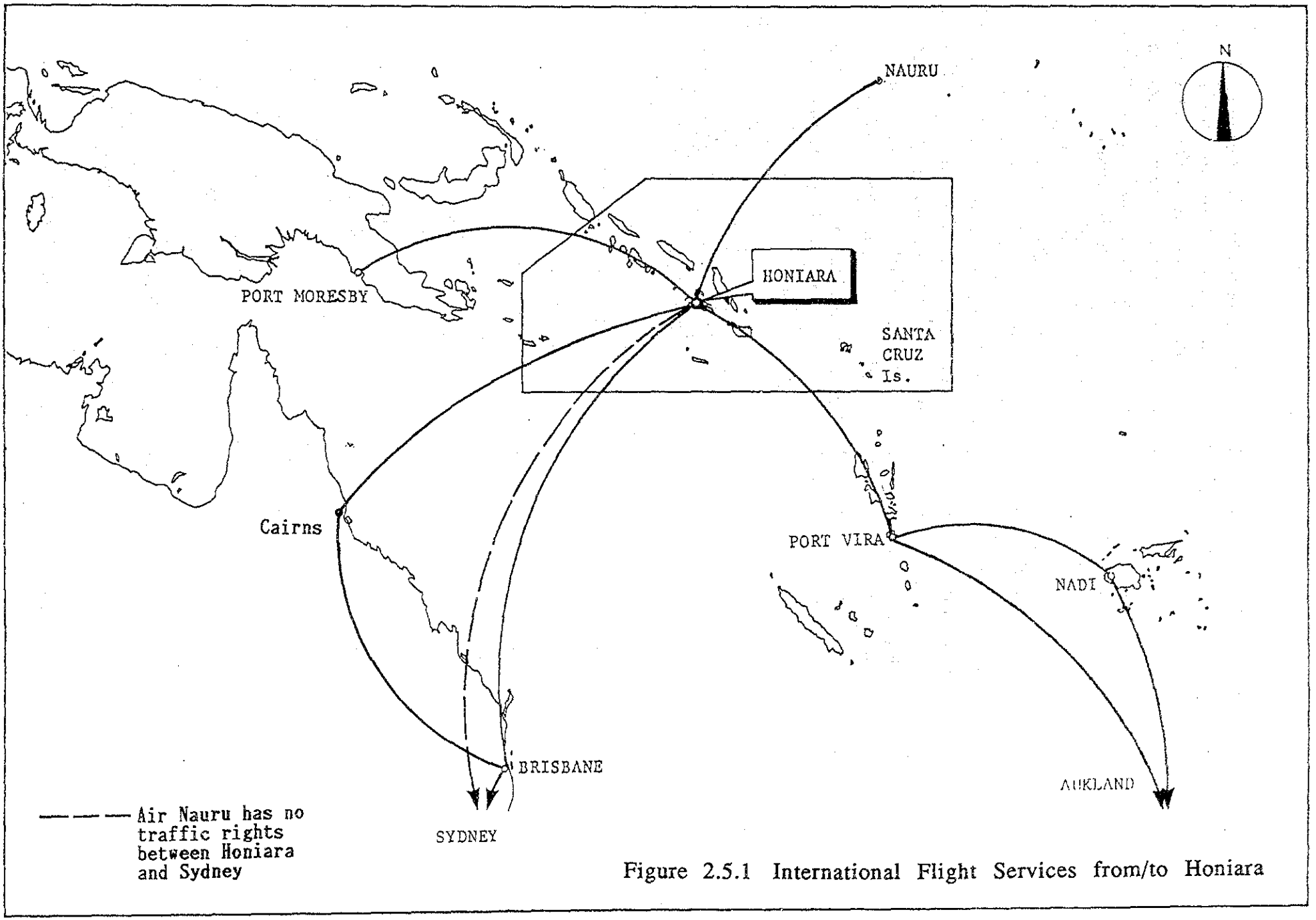


Figure 2.5.1 International Flight Services from/to Honiara

Solomon Airlines uses one leased B737-200 (100 seater) for its international services. It plans to replace the existing B737-200 with a B737-400 (140 seater) in 1992 and to acquire a second B737-400 within five years. Over a longer term, Solomon Airlines plans to introduce a 200 seater wide body aircraft to its international fleet within 10 years.

(2) Domestic Air Services.

The Solomon Islands has a domestic air network connecting all the important provincial centers with Honiara although this network is not sufficient to cover its scattered population distribution. Domestic flight services in the Solomon Islands are shown in Figure 2.5.2. Henderson International Airport is a beam center of domestic operations with 126 weekly scheduled flights. Domestic flight services from/to Honiara are shown in Table 2.5.3.

Table 2.5.3 Domestic Air Services from/to Honiara

Route	Airlines	Aircraft and Flights/Week			
		DHC-6	BNI	PA-23	Total
Auki	IE		24		24
Afutara	WPAS		6		6
Atoifi	WPAS		6		6
Avu Avu	IE		6		6
Batuna	WPAS		2		2
Bellona	IE		4		4
Fera Island	IE		6		6
Gatokai	WPAS		6		6
Gizo	IE	1			1
Kirakira	IE	8	2		10
Kwalibesi	WPAS		12		12
Marau Islands	IE		4		4
Mbambanakira	IE		4		4
Munda	IE	9	4	1	14
	WPAS		6		6
Parasi	IE		6		6
Ringi Cove	WPAS			1	1
Seghe	IE	4	2		6
Yandina	IE		6		6
Total		22	102	2	126

Note 1: As of November 30, 1990
Note 2: Flights /Week indicates only direct connections.
Note 3: IE: Solomon Airlines, WPAS: Western Pacific Air Services
Note 4: DHC-6: 19 seats, BNI: 9 seats, PA-23: 5 seats

Aircraft owned by Solomon Airlines and Western Pacific Air Services used for domestic services are as shown in Table 2.5.4.

Table 2.5.4 Aircraft for Domestic Air Services

Solomon Airlines		
DHC-6	:	2 (One is under major overhaul)
BNI	:	2
PA-23	:	1 (For charters/non-scheduled flights)
Western Pacific Air Services		
BNI	:	1 (Another BNI is available in December 1990)
PA-23	:	2 (Mainly for charter/non-scheduled flights)

Note : As of November 1990

Solomon Airlines plans to acquire the third DHC-6 and to phase out BNI and PA-23 aircraft within two years. It also plans to introduce a bigger turbo-prop aircraft with 30 to 40 seats in five years, and another 30-40 seater in 10 years. Western Pacific Air Service considers DHC-6 as future aircraft.

2.5.3 Air Traffic

(1) International Traffic

The past record of international traffic at Henderson International Airport is summarized in Table 2.5.5.

Table 2.5.5 International Air Traffic Movements at Henderson International Airport

Year	Aircraft Movements	Passengers	Cargo (ton)	
			Inbound	Outbound
1980	682	28,956	273	73
1981	719	32,770	239	68
1982	903	30,945	262	106
1983	810	30,764	269	62
1984	777	31,924	358	68
1985	749	35,024	346	65
1986	689	35,353	612	47

Note : Figures for 1987 to 1989 are not available.

Other than Henderson International Airport, Munda Airport served international flights from/to Kieta, Papua New Guinea, and a few other domestic airports had occasional international flights in the past. However, passenger and cargo traffic at such airports were very limited.

The number of international passengers at Henderson Airport increased at an average growth rate of 3.4% for during the

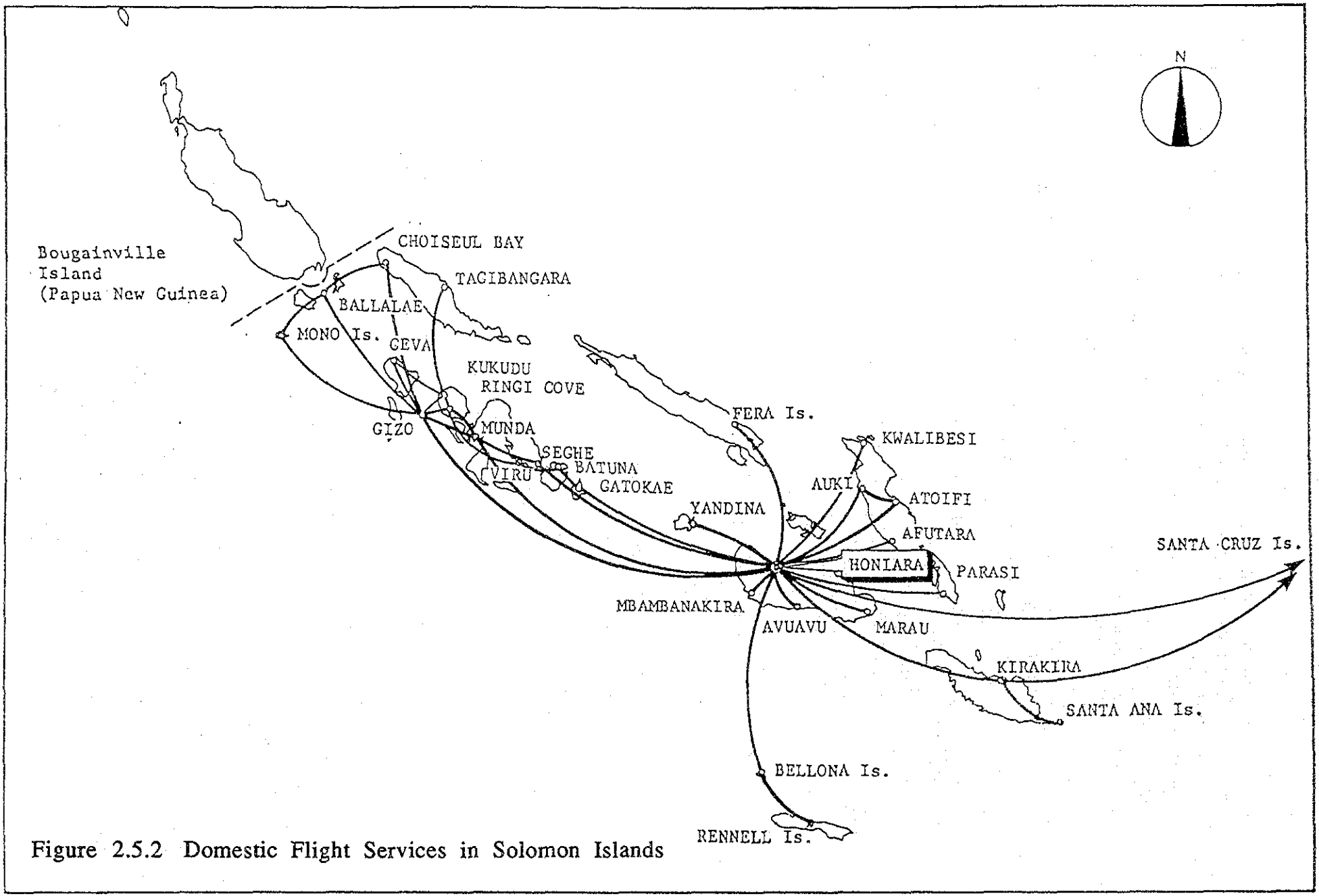


Figure 2.5.2 Domestic Flight Services in Solomon Islands

1980 to 1986 period and reached 35,000 in 1986. Although the actual traffic record since 1987 is not available, the number of international passengers seems to have declined to 33,600 in 1989 based on an estimation from immigration data. Cargo volume increased rapidly reflecting the increase of imports from foreign countries for the same period. The number of international aircraft movements gradually declined from 1982 to 1986 despite of the increase in passenger and cargo volumes during the same period due to the introduction of higher capacity aircraft.

The present share of international passenger by each route is estimated based on immigration data as shown in Table 2.5.6.

Table 2.5.6 Passenger Share by International Route

Route	Share
Honiara-Brisbane	53.6%
Honiara-Port Vila/Nadi/Auckland	21.9%
Honiara-Port Moresby	19.3%
Honiara-Nauru	5.2%
Total	100.0%

Note : Estimated based on immigration data from July-September 1990.

(2) Domestic Traffic

The number of passengers and cargo volume carried by Solomon Airlines and Western Pacific Air Services in the Solomon Islands are shown in Table 2.5.7.

Table 2.5.7 Passengers and Cargo carried by Domestic Flights Solomon Islands

Years	Solomon Airlines		Western Pacific	
	Passengers	Cargo(ton)	Passengers	Cargo(ton)
1982	51,114	161	n.a.	n.a.
1983	54,556	174	n.a.	n.a.
1984	63,782	212	n.a.	n.a.
1985	59,982	215	n.a.	n.a.
1986	49,796	193	2,521	n.a.
1987	n.a.	n.a.	4,592	n.a.
1988	35,583	n.a.	5,248	n.a.
1989	41,339	207	7,730	140

Note : n.a. data not available.

The number of domestic passengers fluctuated over a static trend, while cargo traffic increased due to participation of Western Pacific Air Services in scheduled services since 1986.

The domestic air traffic movements at Henderson International Airport in 1989 were as shown in Table 2.5.8.

Table 2.5.8 Domestic Traffic Movements at Henderson International Airport in 1989

Aircraft Movements		
Solomon Airlines	:	4,920
Western Pacific Air Services	:	1,520
Total	:	6,440
Passengers		
Solomon Airlines	:	41,339
Western Pacific Air Services	:	7,730
Total	:	49,069
Cargo		
Solomon Airlines	:	99 ton
Western Pacific Air Services	:	140 ton
Total	:	239 ton

2.6 Other Transportation

2.6.1 Sea Transportation

The Marine Division of the Ministry of Transport, Works and Utilities provides extensive regular services of inter-island transportation using six 250 ton boats. They can carry 80 passengers on the deck and 14 passengers in cabins.

The annual number of passengers carried on all 1989 voyages was about 350,000. This was seven times the number of passengers carried by air transportation. Although major role of sea transportation for inter-island passengers is evident at present, it is considered that sea transportation will gradually be replaced by air transportation, especially for passengers, with the rise of income level in the future.

2.6.2 Road Transportation

Road transportation is an underdeveloped mode of internal transportation for the archipelago state with rugged mountainous terrain. Main roads on Guadalcanal Islands extends 145 km from the east to west locating Honiara in its center. Regular bus services by private companies are only available within Honiara Town Council area and its suburbs.

Any competitive condition between air and road transportation does not exist at present and is expected to remain so in the future because of its archipelagic situation.

2.7 Engineering and Construction

2.7.1 General

Availability of labor and construction material/ equipment as well as engineers/architects and contractors at Guadalcanal would affect greatly the design concept of the airport development and the cost/schedule of the construction. Renovation of Honiara port facilities executed by the Port Authority of the Solomon Islands with the ADB fund and the two multistory office buildings of the National Provident Fund (NPF, Anthony Saru Building, six stories) and the Solomon Islands National Bank (SINB, five stories) were the major construction projects in the very recent years. A two-lane 126m long bridge construction to replace the aged single-lane Lungga Bridge has started by the Japanese Grant Aid. Unfortunately, however, there is no ongoing large scale construction in Honiara area except construction of the Selwyn College Campus complex nearly complete at Maravovo, southwest of Tambea. As a result of the very low activity level of the large scale construction, it appeared that construction cost should be estimated by a project basis and its execution timing. Nevertheless, this section briefly summarizes several important aspects of engineering and construction conditions in Honiara area obtained through data collection activities.

2.7.2 Engineering and Architecture Firms

The following two foreign affiliated engineering firms are active in the Solomon Islands:

a) Kinhill Cameron McNamara Limited (Australia)

b) Murray North (SI) Limited (New Zealand)

Kinhill Carmeron McNamara designed the Matanico and Ngalimbiu Bridges, Central Bank of Solomon Islands and NPF Plaza, while Murry North designed the SINB building. There are several architecture firms besides the above, but, they all are of very small scale.

Sanders O'Conner & Partners based in New Zealand is the only quantity surveyor who has a small office in Honiara with two registered quantity surveyors.

2.7.3 General Contractors

Several large general contractors, most of them being foreign affiliated, are active in Solomon Islands are as follows:

a) Donsan Construction Co., Ltd. (Korea, Republic of)

b) Earth Movers Solomons Ltd. (Solomon Islands)

c) Fletcher Kwaimani Joint Venture (New Zealand/ Solomon Islands)

d) John Lee Construction Co., Ltd. (Solomon Islands)

e) Kitano Construction Company Ltd. (Japan)

f) Shorncliff Ltd, (Papua New Guinea)

g) Tongs Corporation (Solomon Islands)

The firms listed above are in an alphabetical order and not by business amount or capital ranking. Donsan Construction worked for the runway extension project at Henderson International Airport in 1985 to 1987 and is completing construction of Selwyn College compus near Tambea. Earth Movers Solomons is specialized in earthworks besides its timber business. Fletcher Kwaimani is a joint venture of Fletcher Construction Co., Ltd. of New Zealand active in Pacific rim nations and local contractor Kwaimani. It has worked for Honiara Port Project and just finished in August 1990. John Lee has completed the SINB building. Kitano working in the Solomon Islands since 1982 has completed Fishery Development Projects (Japanese Grant Aid), Malaria Training and Research Center (Japanese Grant Aid), Noro Infrastructure Development Project (Japanese Grant Aid) and Tuna Canary Complex for Solomon Taiyo Ltd. Shorncliffe, based at Port Moresby, has experience in asphalt pavement as a subcontractor. Tongs Corporation works mainly for fabrication and erection of steel structures.

2.7.4 Construction Material Supplier

There are four firms which mainly deal with construction material and hardware as follows:

a) Bowmans

b) L.K.P Hardware

c) Solomon Islands Investment Co., Ltd.

d) Tongs Trading

Bowmans, based in Australia, deals with building materials, hardware and furniture. Solomon Islands Investment Co., Ltd., also based in Australia, deals with construction and building materials as well as hardware and vehicle/equipment parts. Its subsidiary company called Concrete Industries Limited has own batching plant and supplies ready mixed concrete (capacity 15 cu.m/hr) and concrete blocks. Detailed information about prices of concrete products, aggregates and sand is shown in Appendix-2.7.1. L.K.P Hardware and Tongs Trading are both local firms and mainly deal with hardware and vehicle parts respectively.

Because of the fact that there is no constant demands for construction/building materials in Honiara area, these suppliers do not have stocks except minor hardwares for domestic dwellings. As a result of this and also due to the fact that most construction/building materials other than timber, sand and stones must be imported from abroad, there is no definite local market prices for them.

Thus, it is the normal practice to estimate the material costs project by project considering the foreign market prices of materials are to be procured. Lead time to be required for quotation and procurement before the material delivery at the site will become an important factor to be taken into consideration. In connection to the above, whether or not the development project of the airport would be regarded as "Duty Free Project" by the Government is another important factor to gain exempt of levy for materials to be imported.

2.7.5 Construction Equipment

Ministry of Transport, Works and Utilities (MTWU) owns some fifty units of construction equipment as shown in Appendix-2.7.2. As seen in Appendix-2.7.2, most equipment are for concrete and earth works. There was no pile driving equipment nor hot-mix asphalt plant in Honiara area when the Study Team stayed in Honiara in November 1990. These facts require close attention when planning the passenger terminal building or runway overlay. November 1990 hire rates for construction equipment are shown in Appendix-2.7.3.

2.7.6 Labour

Due to the fact that there have only been a few large scale construction projects in Honiara area, no definite classification of construction job/labor skills or labor exists except for journeyman-type skilled labor, such as electrician, welder or heavy machine operators to be employed by project bases.

2.8 Environment

2.8.1 General

Nearly 85% of the 305,000 total population in the Solomon Islands live in rural villages comfortably in traditional way that is often referred to as "Live in a happy state of subsistence affluence." Owing to this dispersed small population over a vast number of islands, there is no large concentrated population except for the 30,000 inhabitants of Honiara. In addition, the development of mining and manufacturing industries are both in small scale. Thus, unlike other developed industrial nations, the Solomon Islands does not face any serious urban environmental problems.

Reflecting the facts mentioned above, no stringent environmental regulations exist in the Solomon Islands except Public Health Ordinance (1970) and Public Health Bill (1990) both aim to control mainly sanitation aspects. The latter still needs Parliament approval before becoming legitimate. Legislations to control air pollution by cars, factories and other sources and water pollution by sewage must come in force in the future.

With regard to the conservation of natural resources, one of the important aspects of environmental control, the Government of Solomon Islands has realized of its significance. It is said that the Government is making an integrated approach toward the developments of fisheries, forestry and tourism considering natural ecosystem to avoid indiscriminate exploitation of them.

2.8.2 Airport Environment

In general, development of a new airport or expansion of an existing one could create a significant impact on the airport and surrounding community in areas of air and water quality, noise pollution and ecosystem. Fortunately, the development of Henderson International Airport seems to be free from traditional environmental problems because of the following reasons:

a) The number of jet aircraft operations, which is the major source of aircraft noise pollution, is at a minimum at present and does not appear that it will reach at a considerable level for a while; and

b) The present land use surrounding the airport is basically agricultural which suffers the least impact from the airport development except for the Mbetikama Secondary School located at the southwest of the airport and the runway center line extended areas.

In order to confirm the above estimates, aircraft noise influence will be quantitatively evaluated in Chapter 12.

CHAPTER 3 EXISTING AIRPORT AND SURROUNDINGS

CHAPTER 3 EXISTING AIRPORT AND SURROUNDINGS

3.1 General

This chapter describes the history of the airport, outlines the airport facilities, characteristics of the airport traffic, existing and planned land use surrounding the airport and meteorological conditions particular to Henderson International Airport. The results of the topographic survey and soil investigations executed during the first visit of the Study Team are also mentioned.

Layout plans of the existing Henderson International Aiport and its terminal area are shown in Figures 3.1.1 and 3.1.2.

3.2 Airport History

The construction of Henderson International Airport was initiated by Japanese military during World War II in July 1942. Nearing the completion of its 1,100m long runway, the airfield was occupied by US Marines in August 1942. After World War II, the new capital was constructed in Honiara in 1945 taking advantage of airfields in Honiara which provided indispensable service with the archipelago state. Kukum Airfield located 7km from Honiara on the way to Henderson International Airport was used for civil aviation in a decade following World War II because of its easy access.

In the late 1960s, the British Protectorate Government carried out development work, including the runway extension on Henderson International Airport, and started to use it for civil aviation. Kukum Airfield was closed and used for industrial estates.

The terminal building initially constructed in the 1950s was expanded in 1980 by adding an existing international departure concourse, arrival area and VIP lounge. Flight Information Service and Meteorological Service offices were also added in the early 1980s.

In parallel with these minor and piecemeal developments, a full-scale master plan for Henderson International Airport was prepared by Australian consultants under the aid of Australian Government. This study named "Honiara Airport Development Study" was completed in 1981. The short-term development plan in this study was reviewed in 1984 by

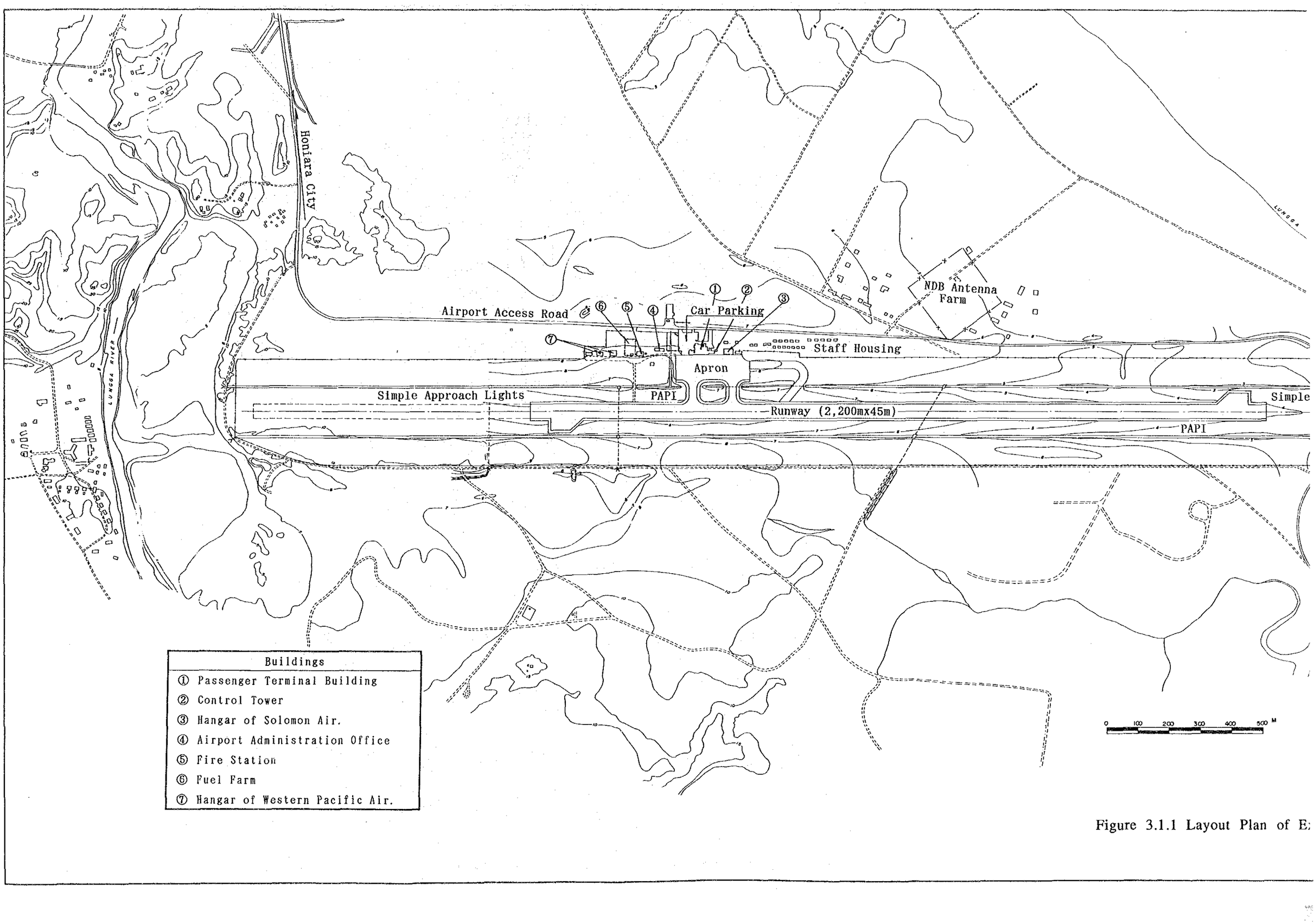


Figure 3.1.1 Layout Plan of E

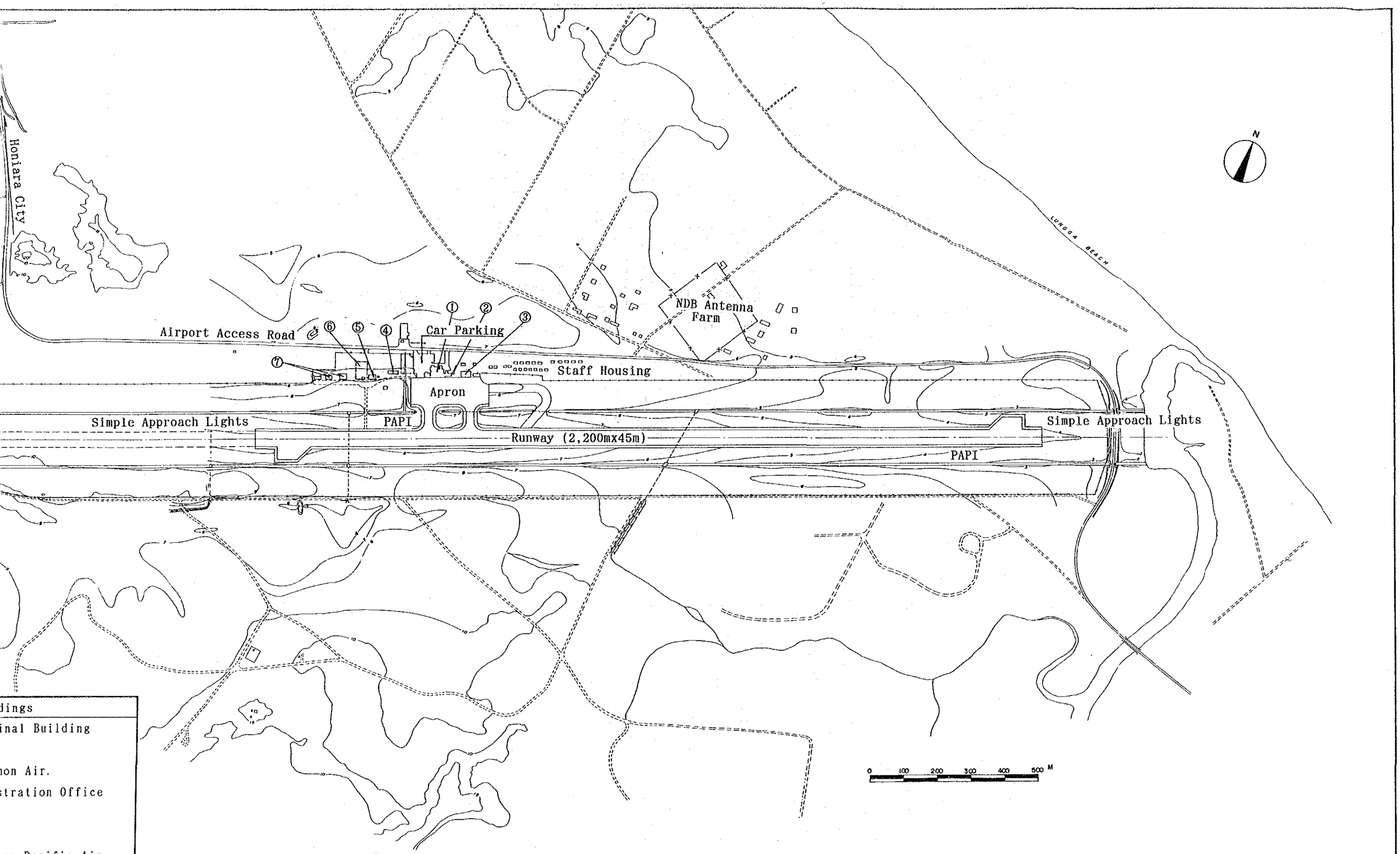


Figure 3.1.1 Layout Plan of Existing Henderson International Airport

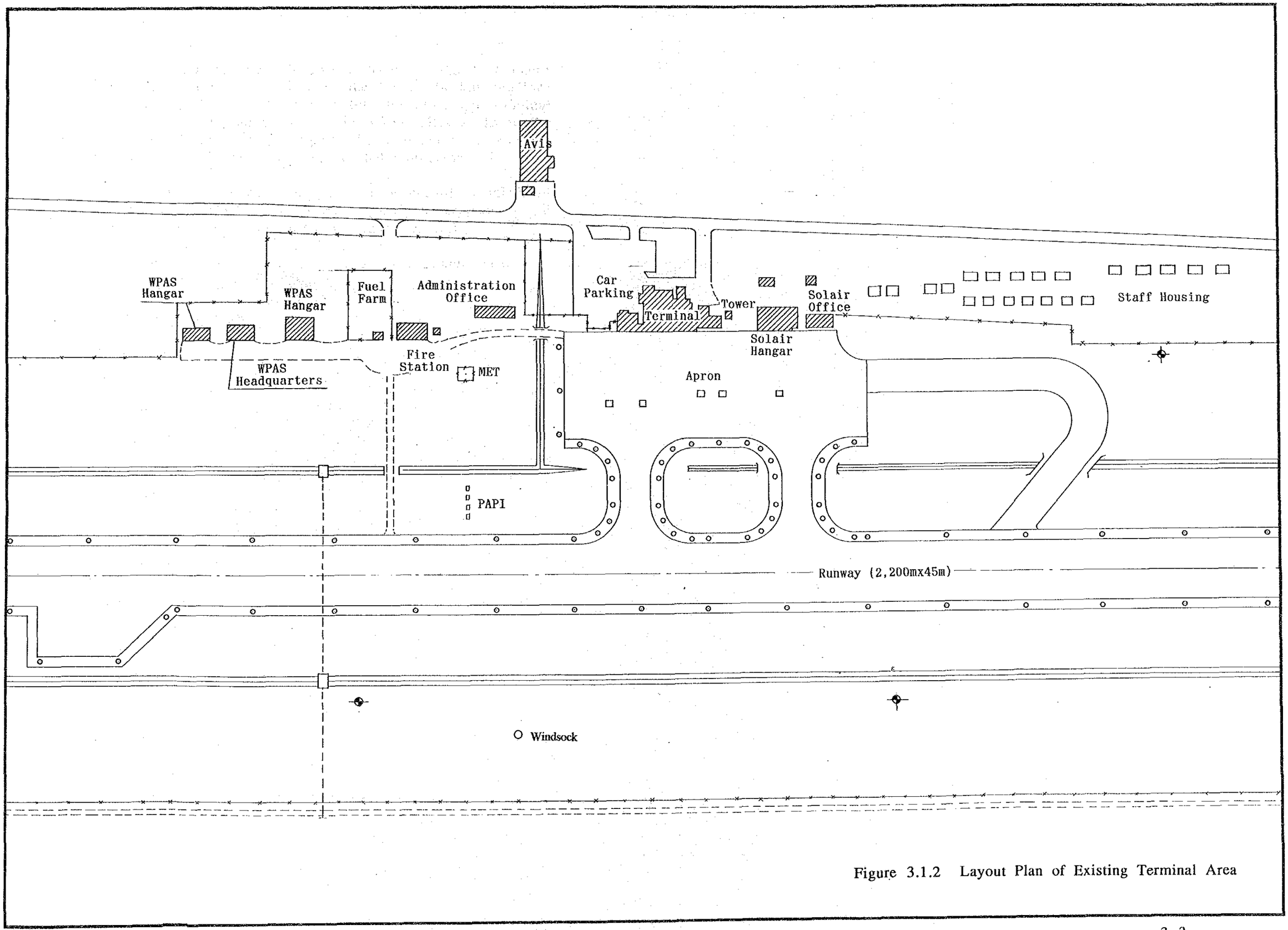


Figure 3.1.2 Layout Plan of Existing Terminal Area

German consultants, and became a basis of the first major development in the latter half of the 1980s. In this previous development, the airport, except for the passenger terminal building, was upgraded to handle B737 aircraft from the former BAC1-11 standard under the assistance of Kuwait, Australia, West Germany and the United Kingdom.

A summary of previous short-term development is tabulated in Table 3.2.1. The outline of the original master plan by the Australian consultants is shown in Appendix-3.2.1.

Table 3.2.1 Summary of the Previous Short-Term Development

Design Aircraft: B737

1) Runway

- Displacement of runway 06 threshold toward northeast so that its 1:50 slope approach surface could be free from hills in the southwest. (Kuwait, 1985-86).
- Extension of the runway by 1,160m toward northeast in order to secure 2,200m long runway necessary for B737 operations to Brisbane (1,920m to 2,200m) (Kuwait, 1985 - 86).
- Pavement strengthening for unrestricted B737 operations (Kuwait, 1985-86).

2) Taxiway

- Pavement strengthening of Taxiway-A (Kuwait, 1985-86).
- Addition of Taxiway-B (Australia, 1986-87).

3) Apron

- Extension of apron to accommodate three B737s (Australia, 1986-87).

4) Passenger Terminal Building

- Minor rearrangement of international arrival area.

to be continued

5) Air Navigation Systems

- Control Tower (structure - Kuwait, 1985-86, control console and communication equipment - West Germany, 1986).
- Doppler - VOR (United Kingdom, 1987).
- VHF Direction Finder (West Germany, 1986).
- SALS (West Germany, 1987)
- PAPI (United Kingdom, 1987).
- Runway Threshold/End Lights (West Germany, 1987).
- Runway Edge Lights (West Germany, 1981).
- Apron Floodlights, Aerodrome Beacon, Obstacle Lights, Wind Direction Indicator Lights (West Germany 1987).
- Emergency power supply (West Germany, 1987).
- Meteorological system (West Germany, 1987).

6) Rescue and Fire Fighting Facilities

- Addition of RIV (United Kingdom, 1987).

7) Others

- Baggage Conveyor (Kuwait, 1986).
- X-ray Baggage Detector (United Kingdom, 1987).

Note : ( ) indicates name of lending or donor country and year of construction/installation.

As for the passenger terminal building, substantial improvement has not been undertaken since its expansion in 1980 although it was partially remodeled from time to time. Thus, the processing capacity of the building still remains below the requirements for a single B737 movement at present.

3.3 Airport Inventory

An inventory of Henderson International Airport is shown in Table 3.3.1.

Table 3.3.1 Inventory of Henderson International Airport

Item	Description
Aerodrome Data	
- City/Aerodrome	Honiara/Henderson
- International/Domestic	International and Domestic
- ICAO Reference Code	4C
- Aerodrome Reference Point	S09°25'17", E16°03'13" (center of the runway)
- Distance and Direction from City	11km east of Honiara (13km by road)
- Elevation	28ft (8.5m)
- Reference Temperature	31C
- Magnetic Variation	9° east (1975) Annual charge 2' east
- Operational Hours	24 hours
- Seasonal Availability	All seasons
- Aerodrome Operator	Civil Aviation Division Ministry of Tourism and Aviation
- Transportation Available	Taxi, bus and hire car
Aircraft Operational Data	
- Runway Usability	
- Crosswind component not exceeding 13kt	99.5% (1975-86)
- Crosswind component not exceeding 20kt	99.8% (1975-86)
- Operational Category	Non-precision Instrument Approach
- Established Procedures	- VOR for RWY24/06 - NDB or NDB/DME for RWY24
- Transition Altitude	11,000ft
- Local Flying Restrictions	- Right hand circuit for RWY24 - After take-off RWY24 turn right to avoid high terrain to W and SW
- Pre-flight Altimeter Check point	Arpon, elevation 28ft.

to be continued

continued Table 3.3.1

Item	Description
Runway	
- Designation	06/24
- True Bearing	068/248
- Dimension	2,200m x 45m
- Shoulders	7.5m on each side
- Longitudinal Slope	0.2%
- Stopway	Nil
- Clearway	60m/940m
- Surface	Asphalt concrete
- Strength	29/F/C/W/T
Taxiway	
- Configuration	2 connections with apron
- Dimension	78.5m x 25m
- Surface	Asphalt concrete
- Strength	29/F/C/W/T
Apron	
- Aircraft Stands	B737 x 3
- Parking Configuration	Self-maneuvering
- Area	230m x 72m
- Surface	Asphalt concrete
- Strength	29/F/C/W/T
Passenger Terminal Building	
- Total Floor Area	850 sq.m (passenger/baggage processing area only)
- International Departure Area	327 sq.m
- International Arrival Area	235 sq.m
- Domestic Area	35 sq.m
- Entrance Hall	73 sq.m
- Structure	Concrete block/timber frame

to be continued

continued Table 3.3.1

Item	Description
VIP Building	
- Floor Area	103 sq.m
- Structure	Timber frame
Cargo Terminal Building	
- Nil	4 sq.m customs storage available in the passenger terminal building
Airport Operations and Meteorological Services Office (Eastern portion of Passenger Terminal Building)	
- Floor Area	150 sq.m
- Structure	Concrete block/timber frame
Control Tower	
- Floor Area (VFR room)	26 sq.m
- Structure	Reinforced concrete/steel frame
- Height	19.7m (elevation)
- Operators Eye Level	17.7m (elevation)
- Ground Level	7.7m (elevation)
- Sight Angle to threshold	RWY 06: 24' RWY 24: 37'
Administration Office Building	
- Floor Area	284 sq.m
- Structure	Prefabricated steel frame
Car Parking	
- Area	2,300 sq.m
- Capacity	70 cars

to be continued

continued Table 3.3.1

Item		Description
Access Road (Henderson Road)		
-	Width	7.5m
-	Surface	Asphalt concrete
Air Navigation Systems		
-	Radio Navigation System	- D-VOR/DME - NDB
-	Telecommunication System	- Air Ground VHF Communications (2 freq.) with Control Consoles - Air Ground HF Communications (8 freq.) - AFTN Message Exchange and Teletype Writers
-	Aeronautical Group Lighting System	- Simple Approach Lights (RWY06/24) - PAPI (RWY 06/24) - Runway Threshold/End Lights - Runway Edge Lights - Taxiway Edge Lights - Apron Floodlights - Aerodrome Beacon - Obstacle Lights - Wind Direction Indicator Lights
-	Meteorological System	- Observation Sensors - Weather Facsimile - Weather Teletypewriter - Laser Ceidograph - Ground/Ground HF - Communications
-	Emergency Power Supply System	Emergency Generators (80 KVA x 2)

to be continued

continued Table 3.3.1

Item	Description
Rescue and Fire Fighting Facilities	
- Fire Vehicles	- 1 medium tender vehicle, 1 RIV - Water tank capacity: 4,100L - Type of agents: Flourprotein foam and aqueous film forming - Amount of agents: 800L
- Fire Station	280 sq.m (garage for 3 vehicles)
- Level of Protection	Category - 4
- Trained Personnel	15 persons
Airport Utilities	
- Power Supply System	300 KVA capacity
- Water Supply System	Supplied by 6-inch main pipe from town
- Sewage Disposal System	Natural infiltration at reservoirs
- Telephone System	12 exchange lines with 17 extensions
Other Facilities	
- Aviation Fuel Supply System	- Fuel depot capacity: 27KL (JET-A1), 35KL (JET-A1), 25.4KL (Avgas) - Hydrant system (3pits on the apron) for JET-A1 supply.
- Airport Vehicles	2 pickups
- Aircraft Maintenance Hangar	- Solomon Airlines (BNIx2) - Western Pacific Air Services (BNIx2)
- Airport Maintenance Equipment	2 tractor/slashers, 1 manual lawn mower
- Airport Housing	23 houses 90 people