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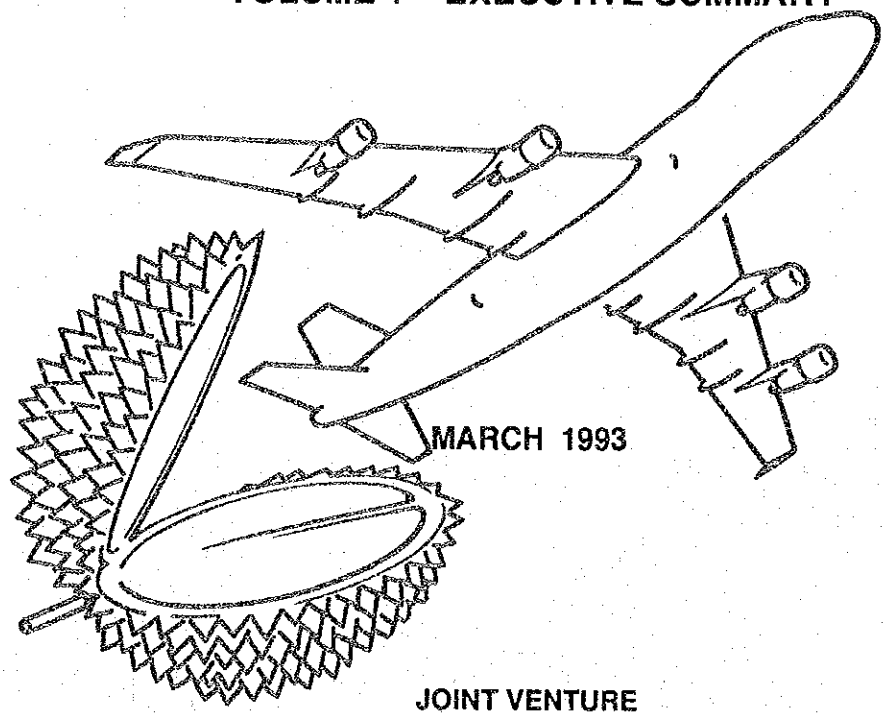
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
REPUBLIC OF THE PHILIPPINES

THE STUDY ON THE DEVELOPMENT PLAN OF DAVAO INTERNATIONAL AIRPORT IN REPUBLIC OF THE PHILIPPINES

FINAL REPORT

VOLUME 1 EXECUTIVE SUMMARY



MARCH 1993

JOINT VENTURE
OF
PACIFIC CONSULTANTS INTERNATIONAL
AND
AERO ASAHI CORPORATION
Tokyo, Japan

NOTE

The following exchange rate was adopted throughout this report:

US$ 1.00 = PHP 25.0 = YEN 125 (September 1992)
PHP 1.0 = YEN 5.0

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PREFACE

In response to a request from the Government of Republic of the Philippines, the Government of Japan decided to conduct a Study on the Development Plan of Davao International Airport in the Republic of the Philippines and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Philippines a study team headed by Mr. Hideki Murata, Pacific Consultants International, three times between March 1992 and March 1993.

The team held discussions with the officials concerned of the Government of the Philippines, 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.

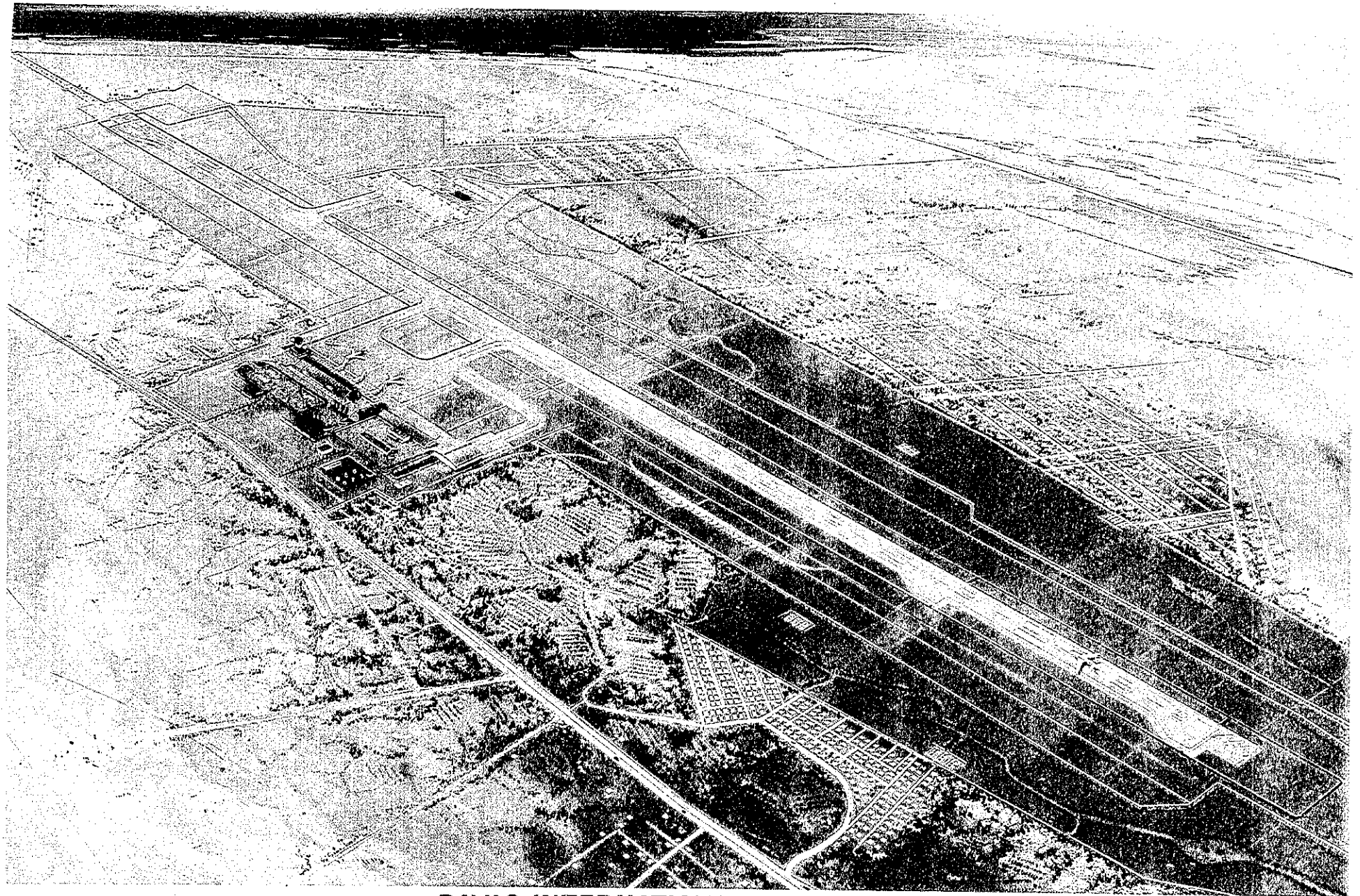
I wish to express my sincere appreciation to the officials concerned of the Government of Republic of the Philippines for their close cooperation extended to the team.

March 1993

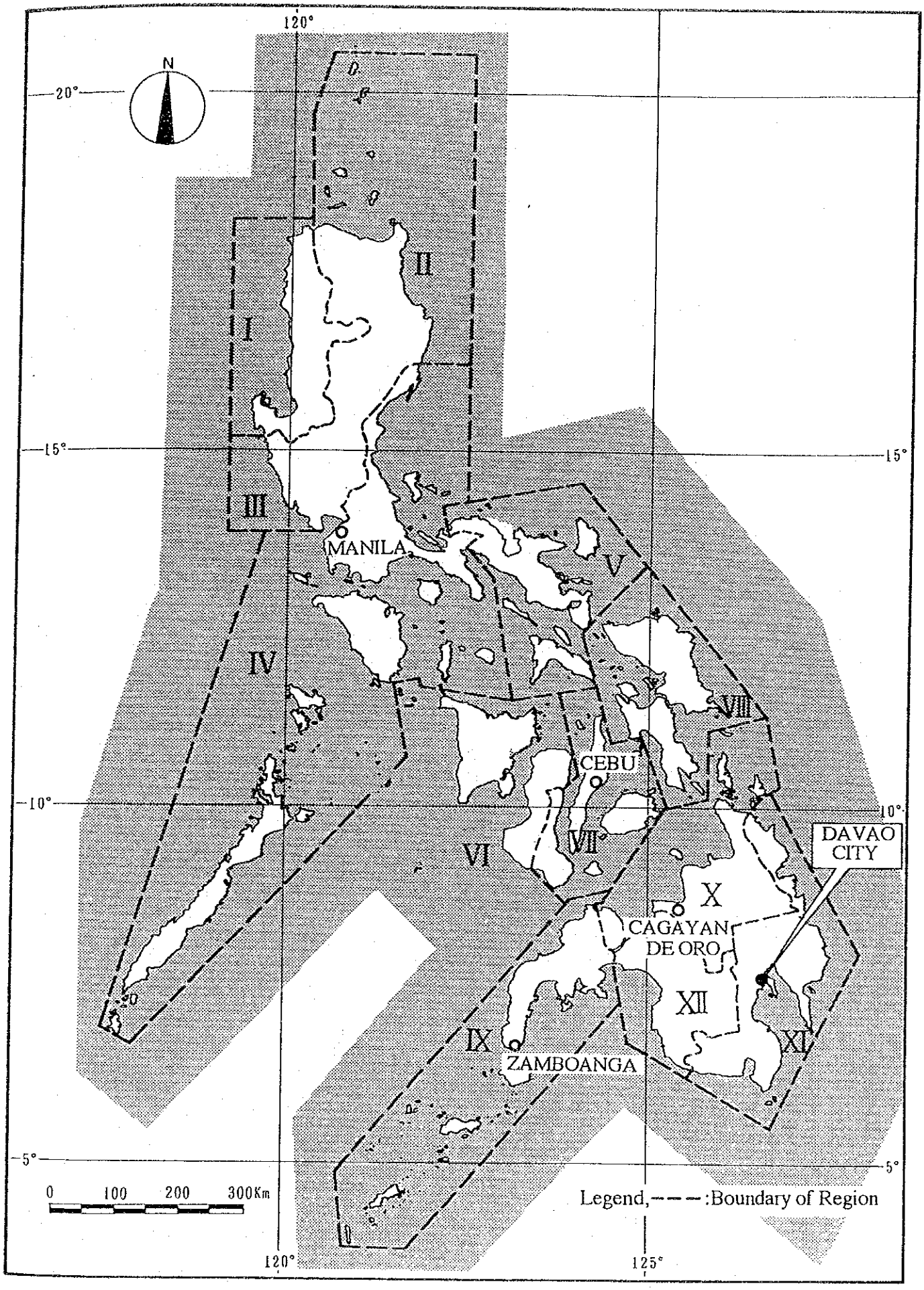
Kensuke Yanagiya

Kensuke Yanagiya

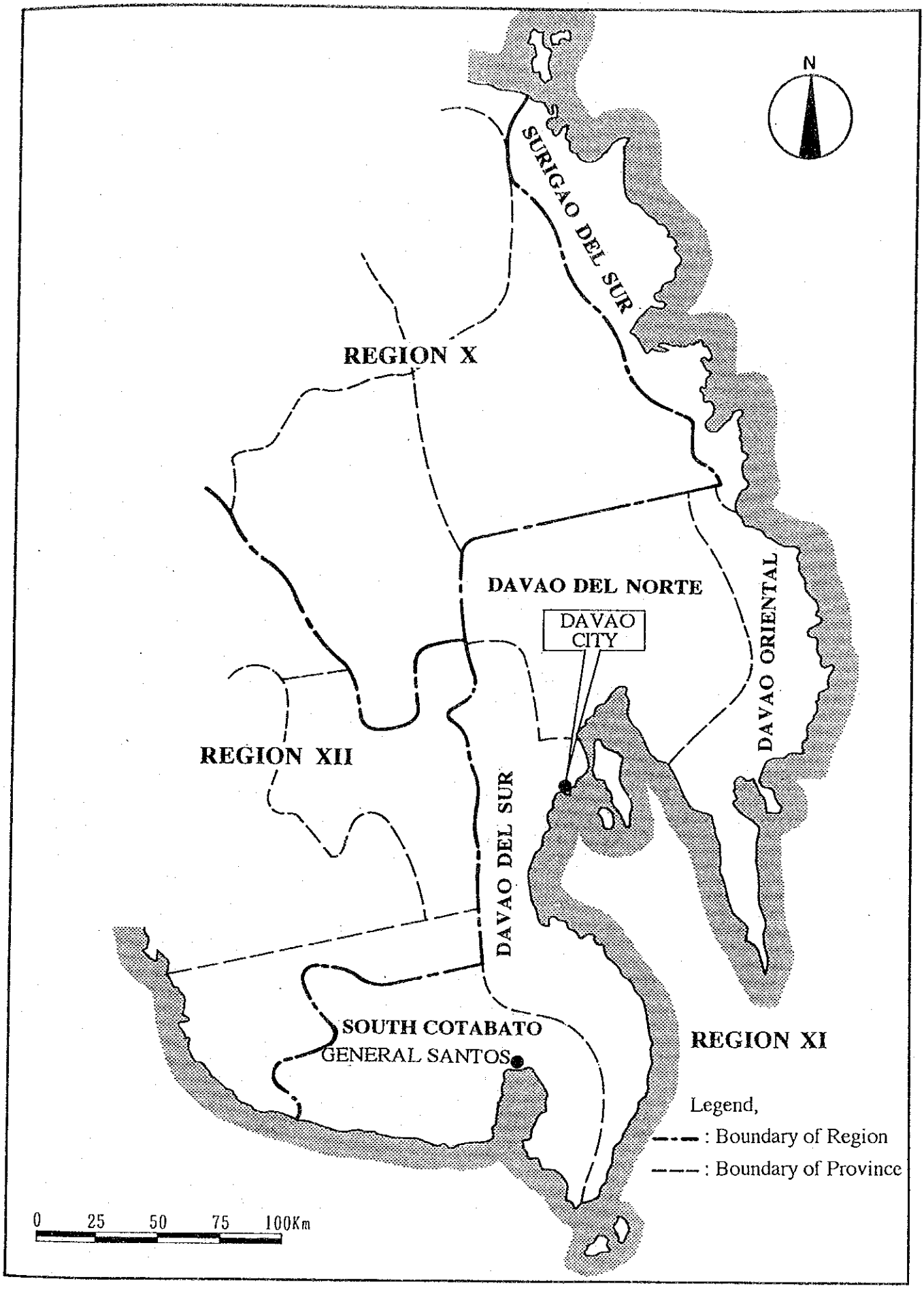
President
Japan International Cooperation Agency



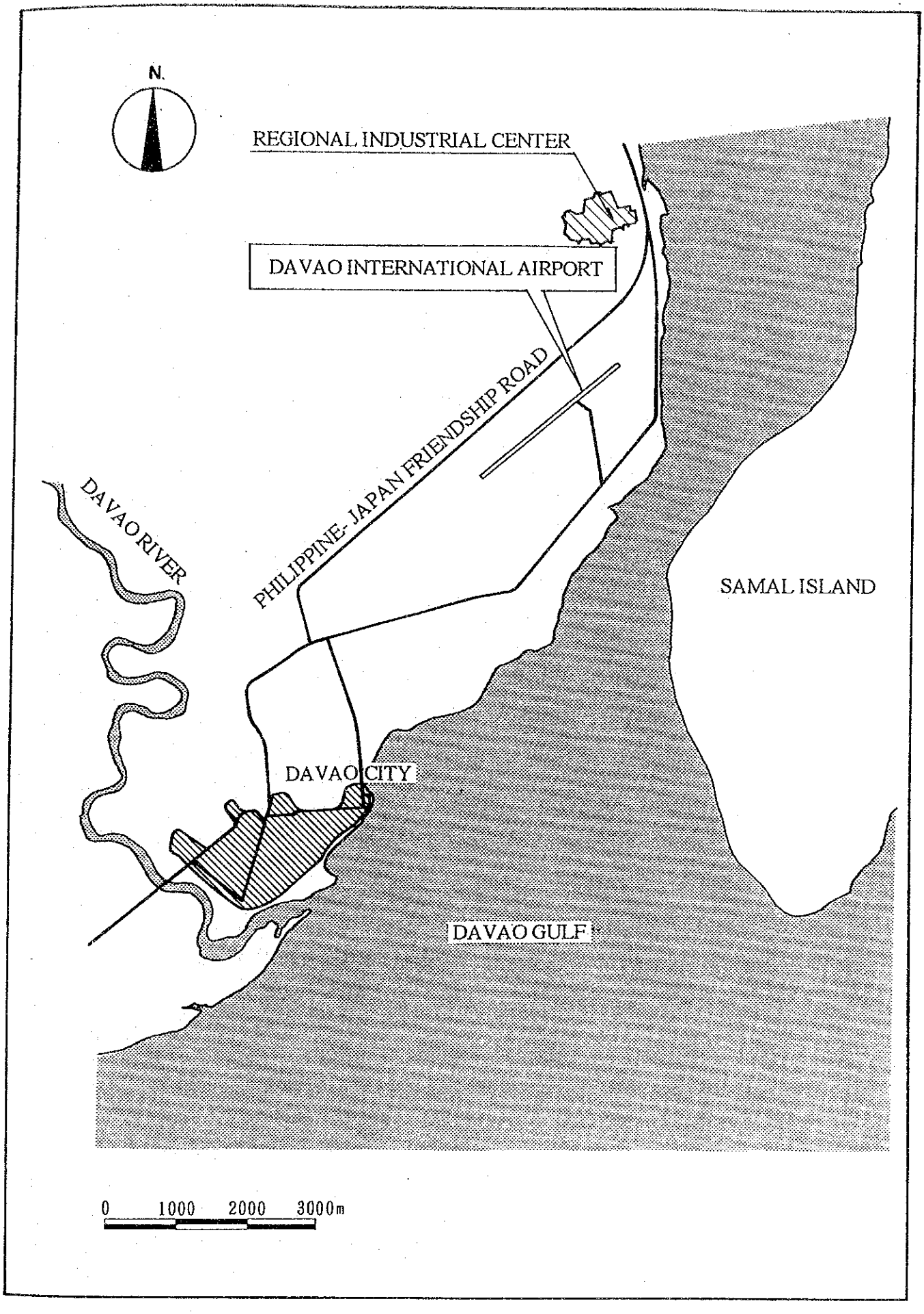
DAVAO INTERNATIONAL AIRPORT LONG-TERM DEVELOPMENT PLAN



PROJECT LOCATION MAP (1)



PROJECT LOCATION MAP (2)



PROJECT LOCATION MAP (3)

THE STUDY ON THE DEVELOPMENT PLAN OF DAVAO INTERNATIONAL AIRPORT IN REPUBLIC OF THE PHILIPPINES

SUMMARY

(1) Design Target Year

Medium-term development plan	:	Year 2000
Long-term development plan	:	Year 2010

(2) Future Air Traffic Demands

	1990	2000	2010
Annual domestic air passengers	454,000	799,000	1,210,000
Annual international air passengers	-	46,500	167,000
Annual domestic air cargo (ton)	19,685	43,800	72,700
Annual international air cargo (ton)	-	1,600	11,900
Longest route of scheduled international flight	-	Hong Kong	Honolulu

(3) Airport Master Plan

Medium-Term Development Plan :

Construction of a new 2,500m long runway located 140m away from, to the north of, in parallel with the existing runway, and construction of new terminal facilities.

Long-Term Development Plan :

500m runway extension toward the west for the 3,000m long runway, and expansion of the terminal facilities.

(4) Scope of the Medium-Term Development Project

Runway (2,500m), connecting taxiways, apron, connecting taxiway for general aviation, passenger terminal building (16,000m^2), cargo terminal building (3,500m^2), administration building and control tower (1,600m^2), fire station (500m^2), car park (310 spaces), access road, relocation of instrument landing system (ILS), air traffic control system, aeronautical telecommunication system, meteorological observation system, airfield lighting system, ambulance (1unit), power supply system, telephone system, water supply system, incinerator, and fuel hydrant system.

(5) Executive Agency for the Medium-Term Development Project

Department of Transportation and Communications (DOTC) of the Republic of the Philippines.

(6) Entity Airport Management and Operation in the Medium-Term Development Project

Air Transportation Office (ATO) of the DOTC.

(7) Implementation Schedule of the Medium-Term Development Project

Financial arrangement	:	Second half of 1993
Selection of consultant	:	1994
Land acquisition and detailed engineering services	:	1995
Tendering	:	First quarter of 1996
Commencement of construction works	:	Second quarter of 1998
Completion of construction works	:	Third quarter of 1998
Flight check	:	Fourth quarter of 1998
Completion of the medium-term development project	:	End of 1998

(8) Project Cost for the Medium-Term Development (based on 1992 prices, including contingency of 10%)

	Local Portion (Million PHP)	Foreign Portion (Million PHP)	Total (Million PHP)
Land acquisition and compensation	136	0	136
Construction	791	1,455	2,246
Engineering services	33	297	330
Total	960	1,752	2,712

Note, Exchange rate is 5 Japanese Yen per 1 Philippine Peso.

(9) Technical Feasibility of the Medium-Term Development Project

The preliminary design for the airport facilities has been prepared in accordance with the technical requirements including the requirements for the safety of aircraft operations. Thus, the project will have no technical problems.

(10) Airport Managerial Feasibility of the Medium-Term Development Project

The airport facilities to be provided by the project can be operated and maintained by the DOTC/ATO more properly with its organizational reform plan and increased number of airport staff.

(11) Economic Feasibility of the Medium-Term Development Project

Economic internal rate of return	:	17.74%
Benefit cost ratio (discount rate of 15%)	:	1.20
Net present value (discount rate of 15%)	:	412 million PHP

The project is feasible from the national economic viewpoint since the EIRR is greater than the "opportunity cost of capital" of 15% used by the National Economic and Development Authority (NEDA) in the Philippines.

(12) Financial Feasibility of the Medium-Term Development Project

It will be difficult to recover the maintenance and operating expenses of the medium-term development plan from the airport revenues under the current charging system of airport tariff. However, if the current low charging rate is raised to a reasonable level, the implementation of the project will improve the financial balance of the airport operation together with the increase in air traffic demand.

(13) Environmental Feasibility of the Medium-Term Development Project

While some 3,300 housing units are presently exposed to aircraft noise of WECPNL 75 and above (a criteria adopted in Japan), some 2,000 housing units are estimated in 2010. This decrease in the number of housing units is due to the shift of the runway to the north and away from the dense residential area on the south of the airport. Aircraft noise influence on the surrounding community is possible to decrease by the specific measures such as keeping the residential area away from the airport by the land use control. On the other hand, the DOTC and the local government agencies have assured that the estimated noise influence will not be a problem due to the larger tolerance to noise by the Philippine nationals than Japanese nationals.

No other environmental problems are foreseen in terms of air, water, vibration, biology and culture by the project.

(14) Social Feasibility of the Medium-Term Development Project

Initially some 290 housing units for the medium-term development and some additional 160 housing units for the long-term development need to be relocated. In November 1992, Davao City council approved the amended official zoning map based on the airport master plan proposed tentatively at that time, and the amendment was issued as a city ordinance. By such legal measures, social impacts to be caused by the housing relocation is expected to be minimal in the future.

(15) Conclusions

The medium-term development project is feasible from the overall aspect, i.e. technical, airport managerial, economical, financial, environmental and social aspects. Consequently, implementation of the project at the earliest possible time is indispensable for the Philippines.

(16) Recommendations

In order to implement the project as scheduled in the Study, the following preparatory and coordination works should be done by the Philippine Government :

a) To obtain a national and regional consensus for the implementation of the project, and to provide a high priority among other national projects.

b) To obtain financial arrangement.

c) To amend the figures of 72 to 80 ha and extent of the reserved area for airport expansion indicated in the city ordinance issued in November 1992 as soon as possible so as to be in accordance with the airport master plan finally selected which requires the expansion area of about 105 ha, and to make the city ordinance well-known.

d) To strictly control land use at the area surrounding the airport from the viewpoint of land acquisition, and prevention of aircraft noise problems.

TABLE OF CONTENTS

1. BACKGROUND AND OBJECTIVES OF THE STUDY

1. Background and Objectives of the Study

The Republic of the Philippines is one of the largest archipelagic countries in the World, consisting of 7,107 islands. Due to the dispersion of the islands over a large area of approximately 300,000 sq.km, air transportation has the vital role in transporting passengers and cargo quickly between the islands.

While Davao International Airport is the third busiest airport next to Manila and Cebu International Airports in the Philippines, and is classified as an alternate international airport by International Civil Aviation Organization (ICAO) Regional Air Navigation Plan for Asia and Pacific, its existing air-side facilities and airspace do not fully meet the specifications adopted by the Council of ICAO for the safety or regularity of international air navigation. The existing airport facility is also facing the problems of the capacity shortage and the deterioration of facilities.

The Government of the Philippines has recognized the necessity for the airport development of the Davao International Airport to solve these problems and also to support the development of Mindanao region.

Based on these circumstances, the Government of the Philippines requested the Government of Japan to conduct a Study on the Development Plan of Davao International Airport. In response to the request, 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 Department of Transportation and Communication (DOTC) , the official Philippine counterpart agency corresponding to JICA.

The objectives of the Study agreed upon between the two parties are as follows :

a) To formulate the Master Plan for the Long-Term (design target year 2010) Development of Davao International Airport at the existing site ; and

b) To evaluate the technical, economic and financial feasibility of the Medium-Term (design target year 2000) Development Plan to be formulated within the framework of the Master Plan.

2. FUTURE AIR TRAFFIC DEMANDS AND PROBLEMS OF THE EXISTING AIRPORT

2. Future Air Traffic Demands and Problems of the Existing Airport

2.1 Outline of the Existing Davao International Airport

Davao International Airport is located about 12 km north from the center of Davao City. The airport now consists of a 2,500m long runway, connecting taxiways, apron, passenger terminal building and other supporting facilities. The existing layout plan of the airport is shown in Figure 1.

Seventy (70) domestic scheduled flights (35 arrivals and 35 departures) per week operate between Davao and the four (4) cities, i.e. Manila, Cebu, Cagayan de Oro and Zamboanga. Four (4) international schedule flights per week operate to/from Manado in Indonesia. In addition, non-scheduled international flights were occasionally operated to / from Singapore in 1991 and Hong Kong in 1992.

The airport is managed by the Air Transportation Office (ATO) of the DOTC.

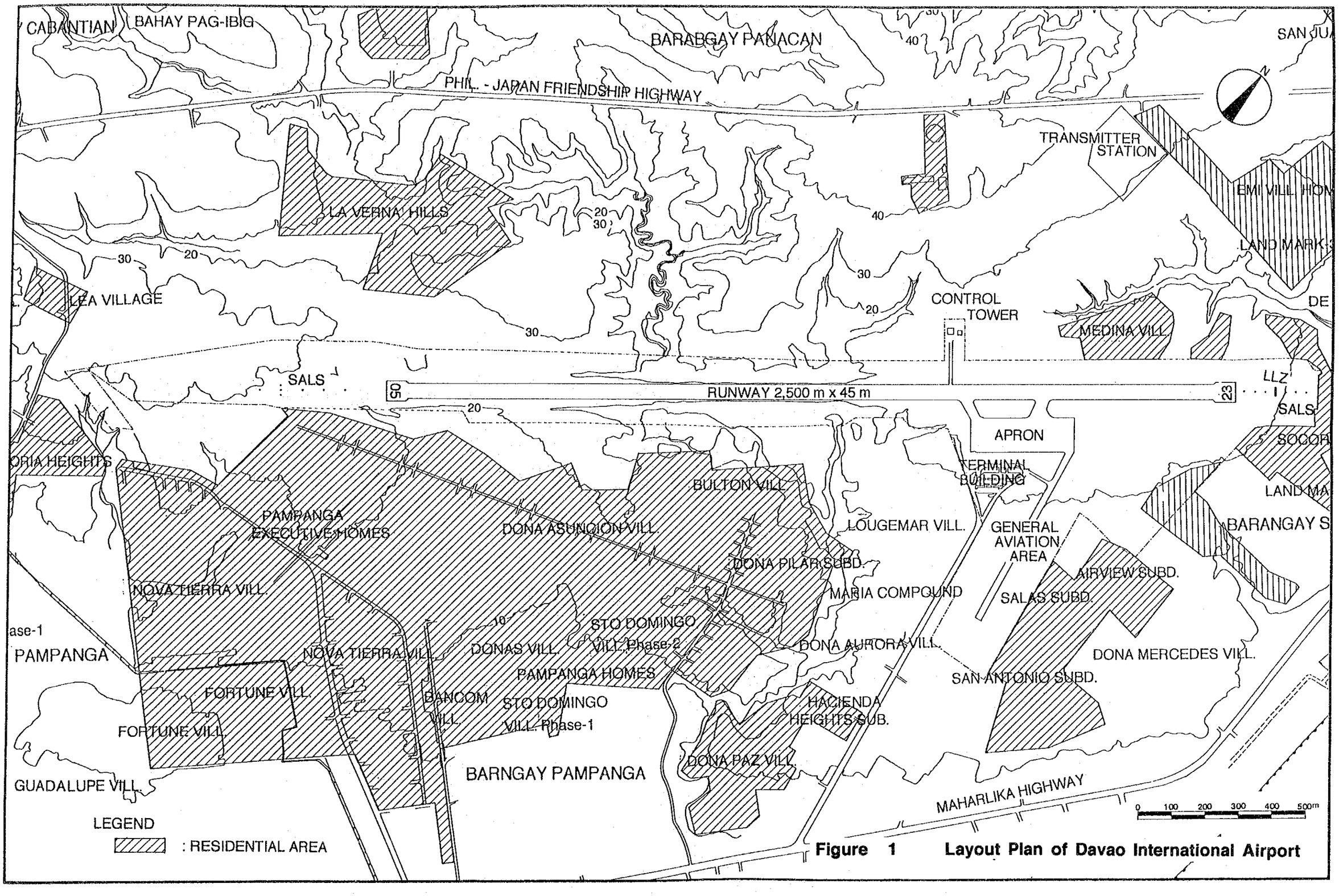


Figure 1 Layout Plan of Davao International Airport

2.2 Air Traffic Demand Forecasts

Future air traffic demands at Davao International Airport are forecast up to the year 2010 by econometric models utilizing various economic indices as explanatory variables.

Future domestic and international air passenger demands are shown in Figures 2 and 3 respectively.

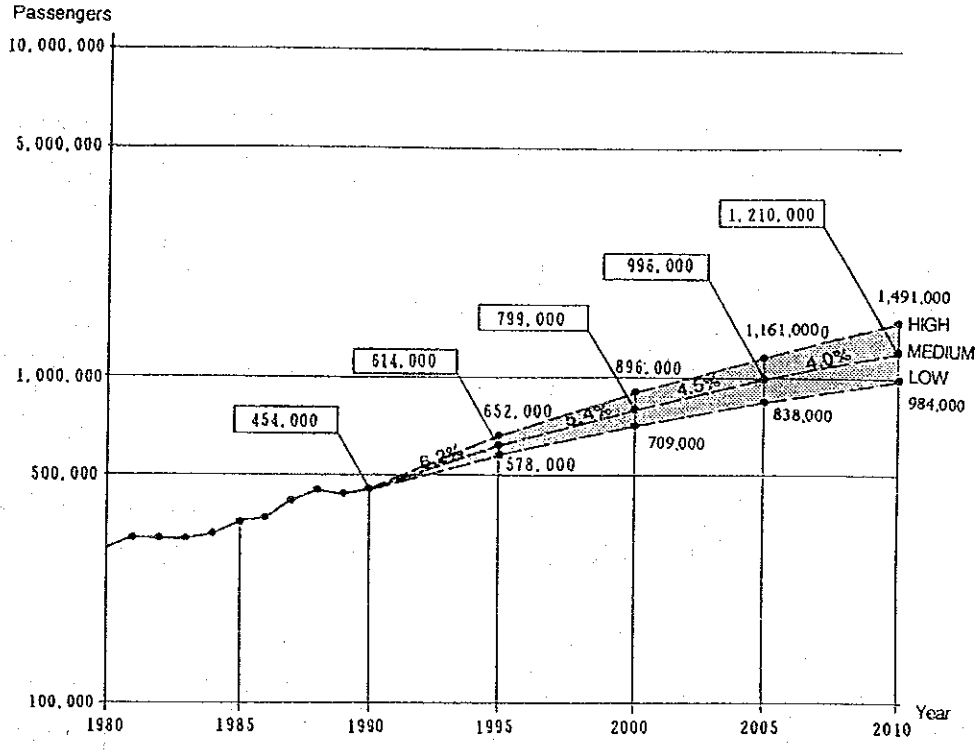


Figure 2 Total Demand of Domestic Air Passenger

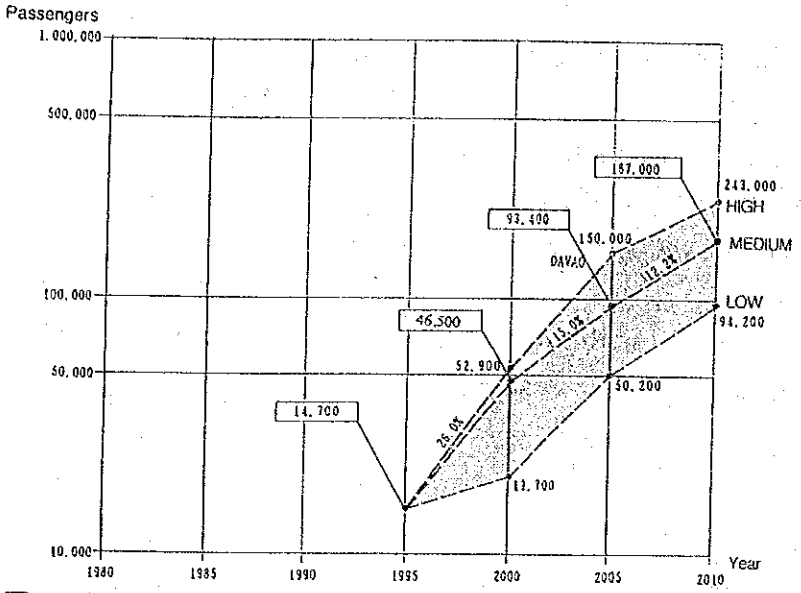


Figure 3 Total Demand of International Air Passengers

In 1990 annual domestic air passengers handled at Davao International Airport was 454,000 as shown in Figure 2. As seen in the figure, future domestic air passenger demand is estimated to grow to 799,000 and 1,210,000 for the year 2000 and 2010 respectively.

Future international air passenger demand is estimated to become 46,500 and 167,000 for the year 2000 and 2010 respectively as shown in Figure 3.

Annual air passenger demand by route and aircraft movements of the anticipated aircraft type are shown in Tables 1 and 2 for domestic and international respectively .

Table 1 Domestic Air Passenger Demand by Route and Frequency of Aircraft Movements

Route/Year	Present	1995	2000	2005	2010
Manila Annual Passengers Daily Aircraft Movement	281,000 A300:4	367,000 A300:6	465,000 A300:8	565,000 A300:10	660,000 A300:12
Cebu Annual Passengers Daily Aircraft Movement	120,000 B737:3	167,000 B737:5	223,000 B737:7	283,000 B737:9	357,000 A300:6
Cagayan De Oro Annual Passengers Daily Aircraft Movement	32,000 B737:1	52,000 B737:2	75,000 B737:2	103,000 B737:3	138,000 B737:4
Zamboanga Annual Passengers Daily Aircraft Movement	21,000 F50:2	28,000 F50:2	36,000 F50:3	45,000 F50:3	55,000 F50:4

Table 2 International Air Passenger Demands by Route and Frequency of Aircraft Movements

Route/YEAR	Present	1995	2000	2005	2010
HONG KONG					
Annual Passengers	-	8,200	34,500	48,600	68,000
Aircraft Movement	A300:2/Year	A300:4/Month	A300:4/Week	A300:6/Week	A300:8/Week
TOKYO					
Annual Passengers	-	-	2,000	33,600	48,100
Aircraft Movement	-	-	A300:2/2Month	A300:4/Week	A300:6/Week
HONOLULU					
Annual Passengers	-	-	-	-	37,900
Aircraft Movement	-	-	-	-	DC-10:4/Week
SINGAPORE					
Annual Passengers	-	2,400	2,400	2,400	2,400
Aircraft Movement	B737:2/Year	B737:2/Month	B737:2/Month	B737:2/Month	B737:2/Month
SYDNEY					
MELBOURNE					
Annual Passengers	-	-	2,300	2,300	2,300
Aircraft Movement	-	-	DC-10:2/2Month	DC-10:2/2Month	DC-10:2/2Month
MANADO					
Annual Passengers	-	4,100	5,300	6,500	7,900
Aircraft Movement	HS748:2/Week	HS748:4/Week	HS748:4/Week	HS748:4/Week	HS748:6/Week

Note, ☐ : Non-scheduled ☐ : Scheduled

As shown in Table 1, scheduled domestic flight from/to Manila are four (4) (two arrivals and two departures) every day in 1993. The flights are anticipated to increase to eight (8) in 2000 and twelve (12) in 2010.

As seen in Table 2, current scheduled international flights at Davao International Airport are operated only from / to Manado as of March 1993. The additional scheduled international flights are anticipated to commence from/to Hong Kong in 2000, Tokyo in 2005 and Honolulu in 2010.

The estimated future domestic and international cargo demands are shown in Figures 4 and 5 respectively.

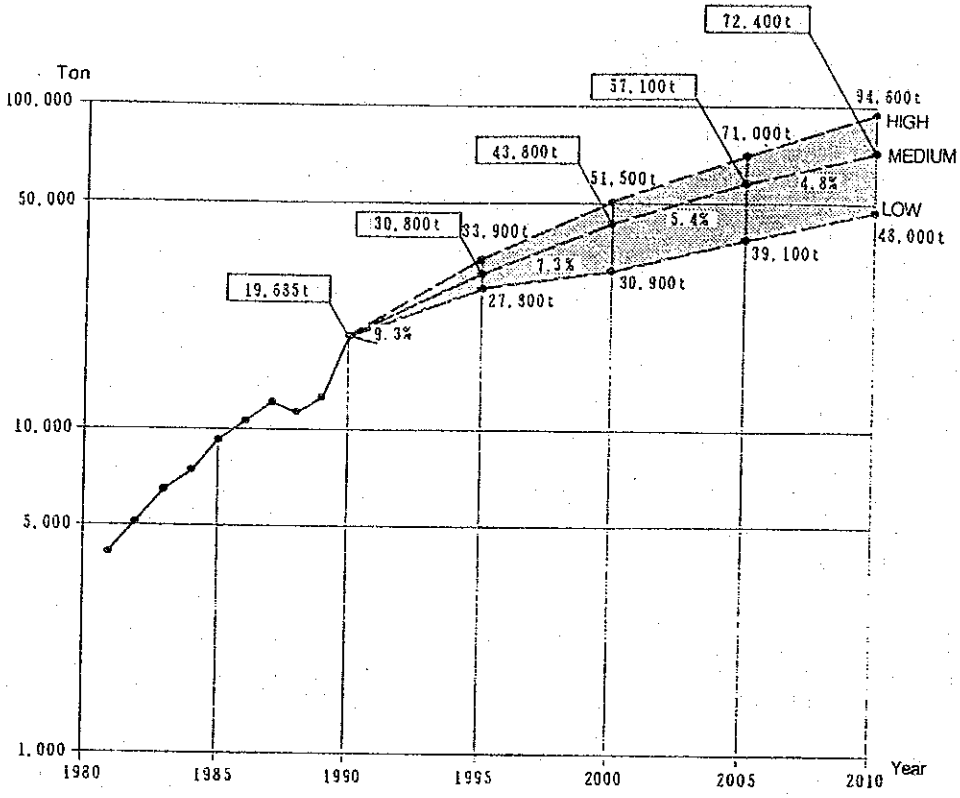


Figure 4 Domestic Air Cargo Demand

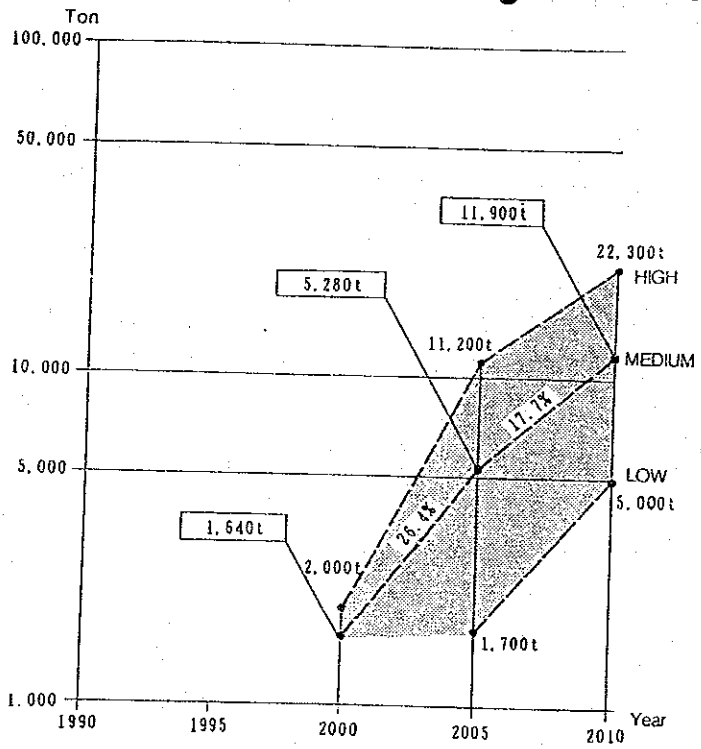


Figure 5 International Air Cargo Demand

Annual domestic cargo volume handled at Davao International airport was about 19,700 tons in 1990. Future cargo demands are expected to increase to 43,800 tons in 2000 and 72,400 tons in 2010 for domestic cargo, and 1,640 tons in 2000 and 11,900 tons in 2010 for international cargo, as shown in Figures 4 and 5.

2.3 Airport Facility Requirements

Table 3 shows the estimated requirements of the major airport facilities based on the air traffic demand forecast and requirements for international standards.

Table 3 Airport Facility Requirements

Phase	Present (1992)	Medium-Term (2000)	Long-Term (2010)
Runway Length (m)	2,500	2,500	3,000
Aerodrome Reference Code	4D	4D	4D
Runway Type	Non-precision approach	Precision approach Category-I	Precision approach Category-I
Runway Strip Width (m)	200	300	300
Apron Number of Aircraft Stands by Aircraft Type	A300:2 Total:2	DC10 class:1 A300 class:2 B737 class:1 Total:4	DC10 class:1 A300 class:2 B737 class:1 Total:4
Passenger Terminal Building (m^2)			
Domestic	3,250	6,200	7,400
International	-	4,000	5,000
Total	3,250	10,200	12,400
Cargo Terminal building (m^2)	625	3,500	7,200

With regards to the width of runway strip, it is planned as a practical and economical solution that the width be 200m the same as the existing strip in the medium-term development plan and 300m in the long-term development plan.

Allowable payloads for four different destinations and for the runway lengths of 2,500m and 3,000m are estimated as shown in Table 4.

Table 4 Allowable Payload

Destination	Distance (NM)	Aircraft Type	Allowable Payload	
			2,500m Long Runway	3,000m Long Runway
Hong Kong	1,128	A300	Full Pax, Full Cargo	Full Pax, Full Cargo
Tokyo	1,974	A300	Full Pax, 77% Cargo	Full Pax, Full Cargo
Sydney	2,861	DC10	Full Pax, 67% Cargo	Full Pax, Full Cargo
Honolulu	4,599	MD11	-	Full Pax, 77% Cargo

Weight restrictions which may be imposed on cargo shown in Table 4 are of no serious problem in practice since targeted annual average load factor by the airlines is some 70% and fully loaded conditions rarely take place in the actual world.

2.4 Evaluation of the Existing Airport Facilities

Problems of the existing Davao International Airport are listed as follows:

(1) Problems in terms of Safety.

a) Obstacles for approach and transitional surfaces

There are many obstacles such as the existing control tower, aircraft parked on the apron, passenger terminal building, and the hills adjacent to the runway which infringe above the required obstacle free transitional surface defined by ICAO.

b) Runway longitudinal slope

As seen in Figure 6 below, a part of the longitudinal slope of the existing runway is 1.28% which exceeds 1.25% of the allowable maximum slope recommended by ICAO. This steep slope is not desirable from the view point of safe aircraft operations.

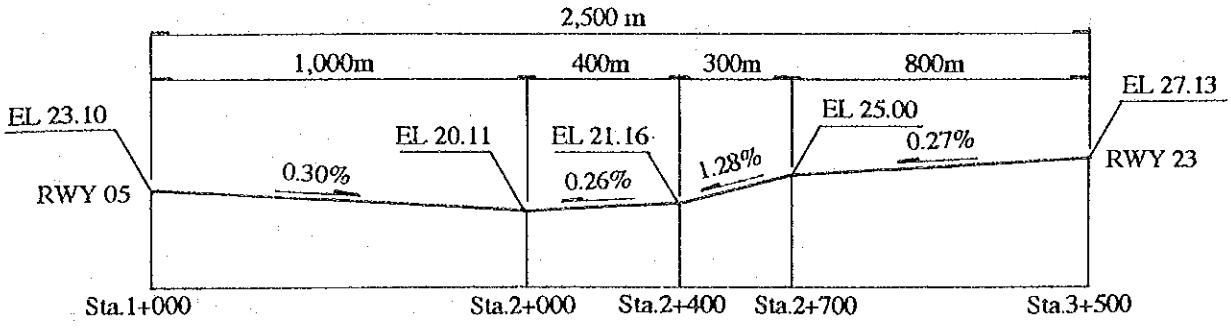


Figure 6 Runway Profile

c) Width of runway strip

The width of the existing runway strip is indicated to be 200m in Aeronautical Information Publication (AIP) which is much less than 300m recommended by ICAO for a non-precision approach. The width of the existing graded area in the runway strip is about 80m at the narrowest section which is much less than 150m recommended by ICAO for a non-precision approach.

These shortages in the width need to be rectified for safe aircraft operations.

d) Airfield pavement

The strength of the existing airfield pavement is not adequate to accommodate A300 class aircraft currently operating at the airport.

e) Air navigation systems

The air navigation systems to be provided at an international airport, such as Instrument Landing System (ILS) and precision Approach Lighting System (ALS) are not provided.

Some of the existing radio navigational aids such as Non-Directional Beacon (NDB) is deteriorated but also suffers from the lack of spare parts.

Some of the existing airfield lighting system such as runway edge lights, Simple Approach Lighting System (SALS) and aerodrome beacon are broken and out of order due to the lack of spare parts.

f) Security fencing

The existing fences are broken at some locations and do not completely enclose the airport property area. As a result, many trespassers across the runway are taking place. These trespassings must be banned as soon as possible for the safe aircraft operations.

g) Security inspection equipment

Security inspection equipment to screen checked-in luggage is not available at the airport.

h) Rescue and fire fighting vehicles

As of March 1993, there is no ambulance car at the airport. Two-way communication transceivers between each vehicle and the agencies concerned also need to be provided.

(2) Problems in terms of Capacity

a) Number of aircraft stands for airlines

The existing apron has three (3) stands for aircraft parking which are all occupied by aircraft at peak hours. There is no space stand to cope with unexpected situations i.e. delay of departure and engine trouble of aircraft.

b) Passenger terminal building

Total floor area of the existing passenger terminal building is about 3,200 m^2. It is too small for the current demand, especially departure concourse and arrival baggage claim area because the required area for the current demand is about 3,700 m^2. Baggage

claim conveyor for domestic arrival passenger is not provided. The airport facilities such as check-in counters, passport controls, customs inspections and quarantines office are not sufficient to handle international air passengers.

c) Cargo terminal building

Total floor area is about 630 m^2. It is not enough to handle the present cargo demand that requires the floor area of about 1,500 m^2.

d) Power supply system

The existing electrical equipment is deteriorated, and its capacity will be saturated by the demand soon.

3. AIRPORT MASTER PLAN AND SCOPE OF THE MEDIUM-TERM DEVELOPMENT PROJECT

3. Airport Master Plan and Scope of the Medium-Term Development Project

3.1 Phases of the Airport Development

The development of Davao International Airport is planned to be implemented in two phases for cost-effective development. The phases of the airport development are set forth as follows :

Medium-Term Development Plan	:	Design Target Year 2000
Long-Term Development Plan	:	Design Target Year 2010

3.2 Development Policy

The development policy for the airport master plan was established based on the target years of the phased airport development, air traffic demand forecasts and evaluation of existing airport facilities, as summarized below:

(1) Runway and Runway strip

a) Runway length will be 2,500m in the medium-term and 3,000m in the long-term development.

b) Width of runway strip will be 200m in the medium-term and 300m in the long-term development.

(2) Air Navigation Systems

a) Air navigation system for the precision approach runway category-I will be installed in the medium-term development.

(3) Terminal Area Development

a) Terminal area is planned to accommodate the terminal facilities to meet the requirements shown in Table 3.

3.3 Alternative Study on Airport Master Plan

The optimum airport master plan has been selected among the following four alternative airport master plans.

Alternative-AS : Existing runway with a new terminal area on the south side of the runway.

Alternative-AN : Existing runway with a new terminal area on the north side of the runway.

Alternative-BS : New runway with a terminal area to be redeveloped at the existing terminal area.

Alternative-BN : New runway with a new terminal area on the north side of the runway.

Each of the alternatives were prepared taking into account the following control factors :

a) Existing topographical conditions at and around the airport;

b) Existing residential area surrounding the airport; and

c) No interruption of aircraft operations during the construction period.

Comparative evaluation of the four alternatives is tabulated in Table 4. As a result of the comparative evaluation, Alternative-BN has been selected as the most optimum plan among the four alternatives for the following reasons :

a) Alternative-BN has more expansibility of the new terminal area than the Alternatives-AS and BS since the northern area of the existing airport is still an open area.

Table 4 Comparison of Alternatives

Legend "A" : Advantageous
"D" : Disadvantageous

Item \ Alternative		AS		AN		BS		BN
Illustration		Existing RWY		Existing RWY		NEW RWY		NEW RWY
1. Aircraft Operations	D	Improvement of runway profile to meet ICAO recommedation is costly and not practical.	D	Same as Alt.- AS	A	Runway profile meets ICAO recommendation.	A	Same as Alt.- BS
2. Airport Accessibility			A	Easy access from/to RIC			A	Same as Alt.- AN
3. Expansibility for the Remote Future Airport Development			A	Good expansibility			A	Same as Alt.- AN
4. Number of Housing Units Exposed to Aircraft Noise More than WECPNL 70								
1992		7,670		7,670		7,670		7,670
2010		7,110		7,210		6,280		6,240
Increase		560		560		3,910		3,910
Decrease		1,120		1,020		5,300		5,340
Balance		-560		-460		-1,390		-1,430
5. Social Considerations								
5.1 Land Acquisition for Phases I and II		82 ha	D	92 ha		77 ha	D	105ha
5.2 Removal of Existing Houses for Phases I and II	D	540	D	490		460		460
6. Construction	D	Runway overlay requires night-time work.	D	Same as Alt.-AS	D	Apron pavement work and building work have to proceed step by step.	A	Most of work can be carried out in the daytime at a virgin site.
7. Project Cost for Phases I and II *1								
7.1.Land Acquisition and Compensation		130		130		120		140
7.2. Construction and Eng. Services	D	3,610	D	3,750	A	3,090	A	3,180
7.3. Total Project Cost		3,740		3,880		3,210		3,320

Note, *1 : Including contingency of 10%

b) Construction of a new runway with its profile fully meeting ICAO recommendation and the required pavement strength, i.e., Alternatives-BN and BS is less expensive than overlaying the existing runway to rectify its profile defects and strengthen the pavement i.e., Alternatives-AS and AN.
Construction of the new runway also can avoid troublesome night-time overlay work.

c) In the alternative-BN, the runway and the terminal facilities will be newly constructed at a virgin site away from the existing runway. Thus, the construction works and the quality control will be the easiest and its disturbance on the airport operations will be the least among all alternatives.

d) Alternatives-AN and BN have better accessibility to the proposed Davao Regional Industrial Center (RIC) than Alternatives-AS and BS.

The selection of Alternative-BN is also based on the following assurance made by the DOTC and the local government agencies in Davao :

a) House Relocation

Initially some 290 housing units for the medium-term development and an additional 160 housing units for the long-term development need to be relocated. Local government agencies will support the DOTC to achieve the housing relocation by taking specific measures such as strict land use control.

b) Aircraft Noise Influence

While some 3,300 housing units are presently exposed to aircraft noise of WECPNL 75 and above, some 2,000 housing units are estimated to be exposed to aircraft noise of WECPNL 75 and above in 2010. This decrease in the number of housing units is due to the shift of the runway to the north and away from the

dense residential area on the south of the airport. Despite the concerns raised by the Study Team about this noise problem, DOTC and the local agencies assured that it would be no problem in the future due to the larger tolerances on noise by Philippine nationals than Japanese nationals.

3.4 Airport Master Plan

Selected airport master plan is shown in Figure 6.

The outline of the master plan is as follows :

a) Medium-Term Development Plan (Target Year 2000)

   i) Construction of a new 2,500m long runway located 140m away from and to the north of the existing runway.

   ii) Construction of new terminal facilities, including an apron, a passenger terminal building, a cargo terminal building, an administration building with a control tower, a fire station and a car park, on the north side of the new runway.

b) Long-Term Development Plan (Target Year 2010)

   i) 500m runway extension toward the west.

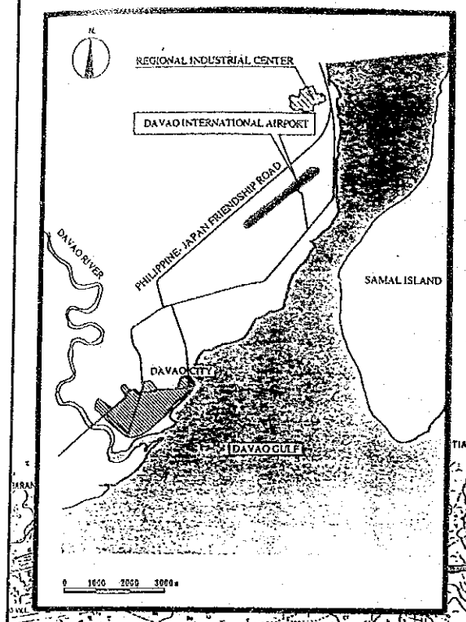
   ii) Expansion of the terminal facilities.

c) Future Provision (After Year 2010)

   i) Construction of a parallel taxiway when required.

3.5 Scope of the Medium-Term Development Project

Layout plans of the whole airport and terminal area for the medium-term development are shown in Figures 7 and 8 respectively.



	BUILDING
1	PASSENGER TERMINAL BUILDING
2	CARGO TERMINAL BUILDING
3	ADMINISTRATION BUILDING WITH CONTROL TOWER
4	MAIN POWER HOUSE
5	FIRE STATION
6	CAR PARK
7	TAXI POOL
8	WATER SUPPLY STATION
9	SEWAGE TREATMENT PLANT AND INCINERATOR
10	RESERVED AREA FOR CARGO AGENTS BUILDING
11	RESERVED AREA FOR FUEL FARM
12	RESERVED AREA FOR AIRCRAFT MAINTENANCE HANGAR
13	RESERVED AREA FOR AIRCRAFT MAINTENANCE APRON
14	RESERVED AREA FOR CANTEENS

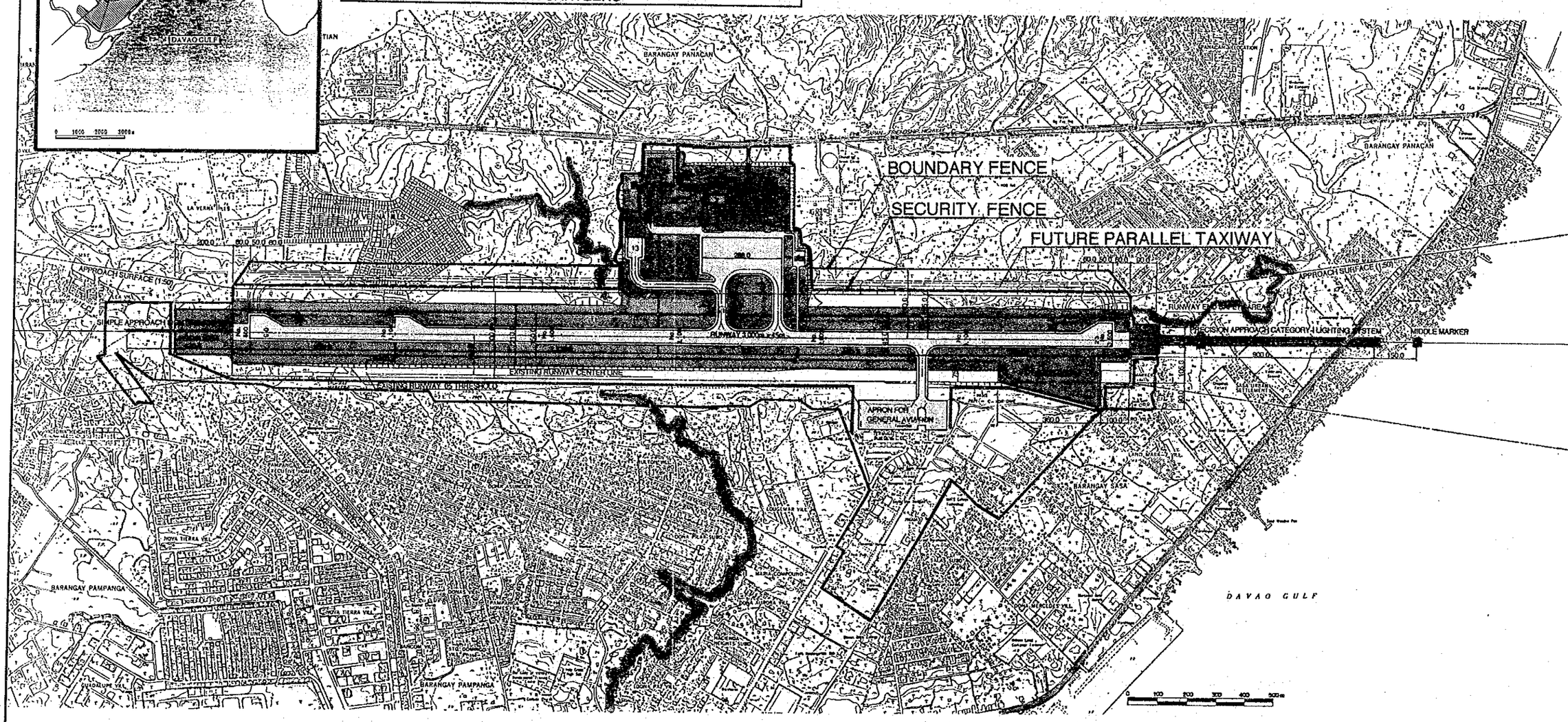
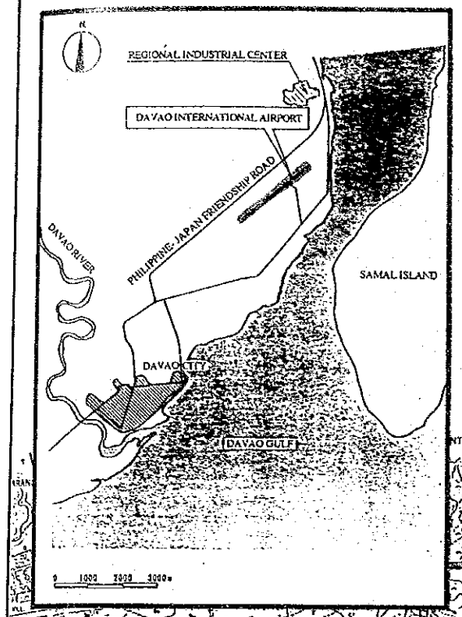


Figure 6 Airport Master Plan



	BUILDING
1	PASSENGER TERMINAL BUILDING
2	CARGO TERMINAL BUILDING
3	ADMINISTRATION BUILDING WITH CONTROL TOWER
4	MAIN POWER HOUSE
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13	RESERVED AREA FOR AIRCRAFT MAINTENANCE APRON
14	RESERVED AREA FOR CANTEENS

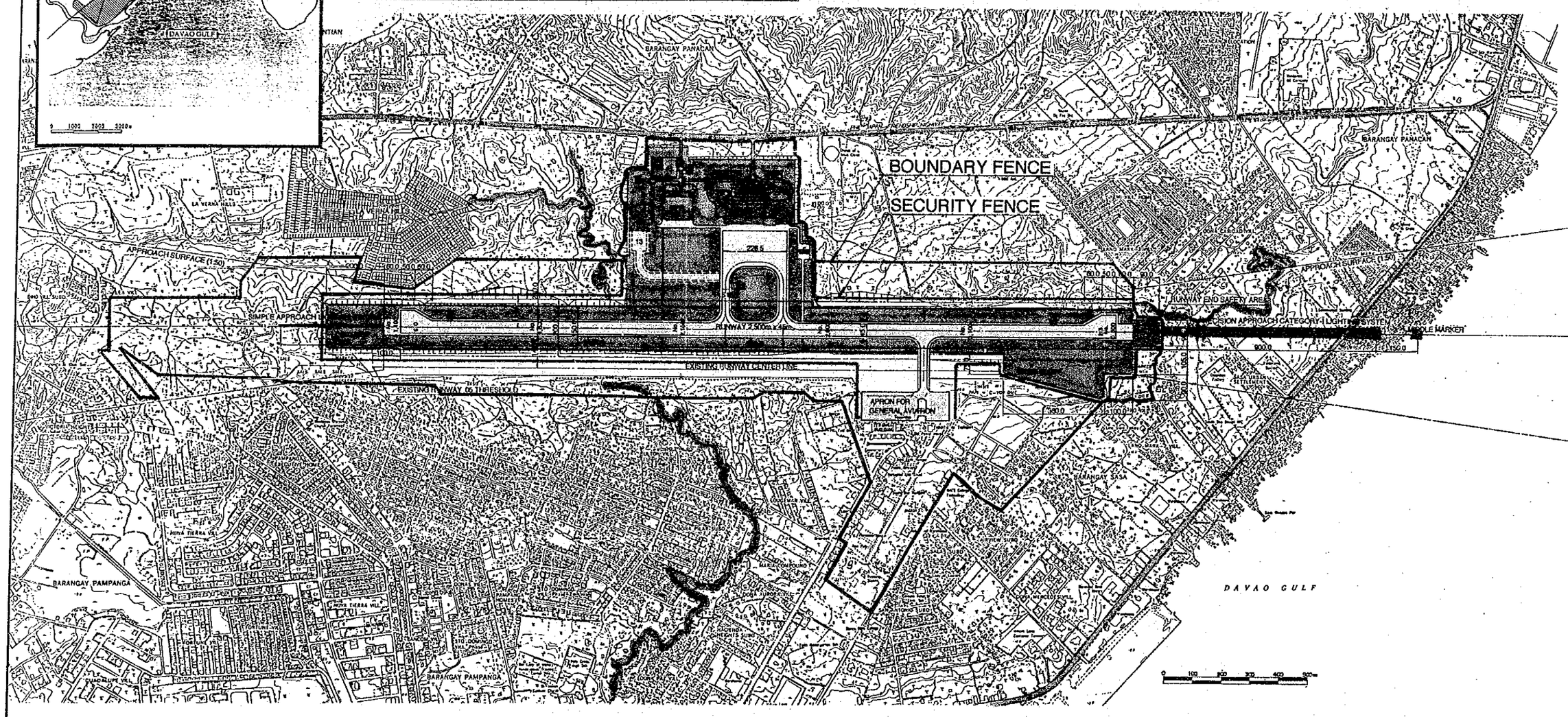

Figure 7 Airport Layout Plan of Medium-Term Development Plan

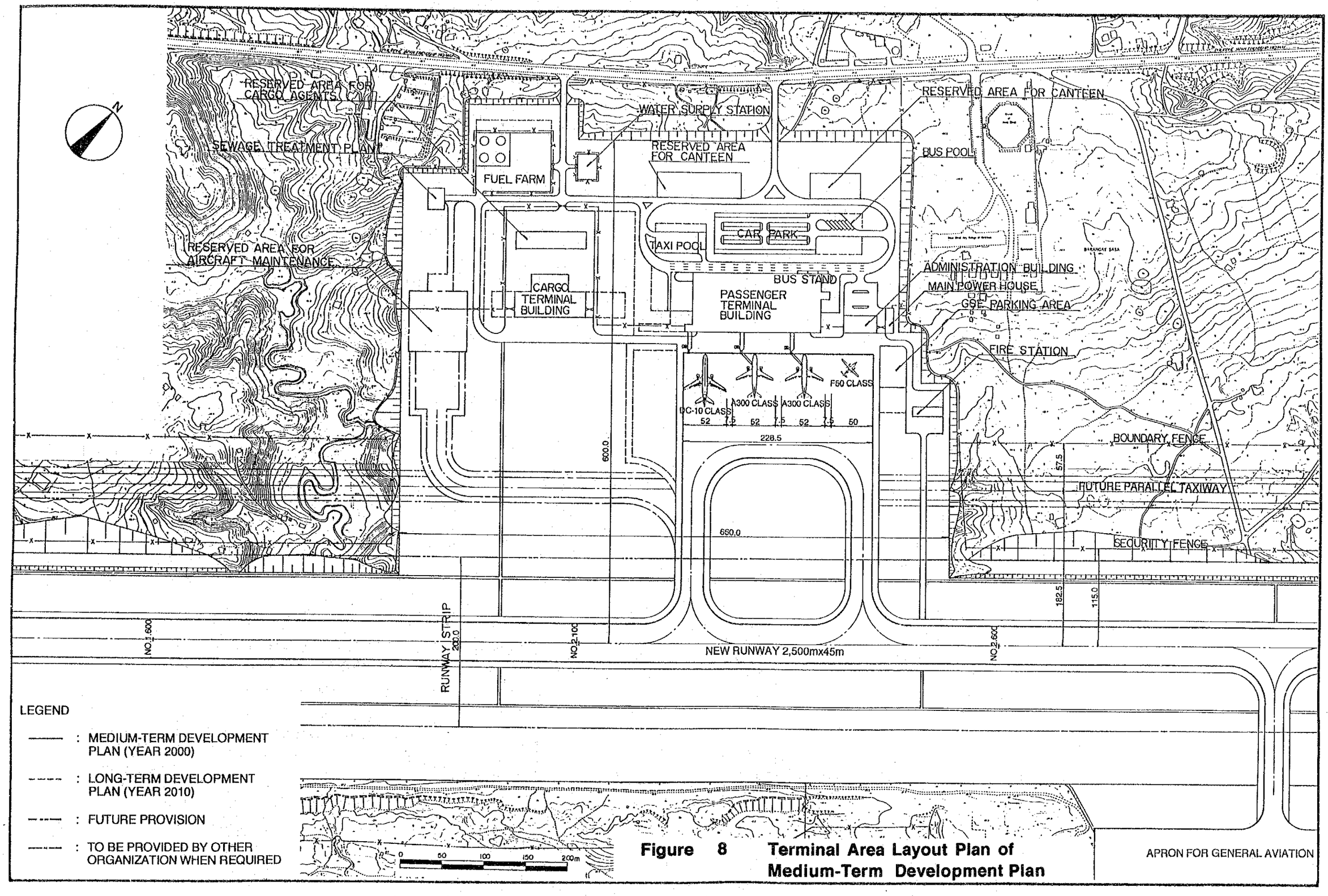

Figure 8 Terminal Area Layout Plan of Medium-Term Development Plan