APPENDIX C

Cost Estimates

APPENDIX C
Cotabato Airport Base Cost Estimate in PhP'000

	Units	Quantity	Unit Cost	Component Cost, PhP
1. External Works				
Description	**Units**	**Quantity**	**Unit Cost PHP**	**Total PHP**
General				
General requirements	ls	1	72,360,344	72,360,344
Demolition of buildings and structures	ls	1	7,070,168	7,070,168
Removal of existing asphalt overlay	m^2	65,000	141	9,191,219
Clearing and Grubbing	m^2	865,000	23	19,570,226
Sub Total				***108,191,957***
Earthworks				
Runway strip widening and grading				
Cut	m^3	250,000	153	38,178,908
Fill, including compaction	m^3	45,000	247	11,135,515
Runway Extension				
Fill, including compaction	m^3	285,000	247	70,524,928
Fill, incl. compaction from imported material	m^3	385,000	404	155,699,245
Earthworks and grading for new pavements				
Cut	m^3	50,000	153	7,635,782
Earthworks and grading for new terminal area				
Cut	m^3	170,000	153	25,961,658
Fill, including compaction	m^3	90,000	247	22,271,030
Grading for new DVOR site				
Cut	m^3	22,000	153	3,359,744
Fill, including compaction	m^3	22,000	247	5,444,030
Sub total				***340,210,840***
New Pavements				
Runway				
Runway extension, aphalt concrete	m^2	4,050	2,333	9,449,280
Runway widening to 45m	m^2	21,900	2,333	51,096,106
Blast pads, asphalt concrete	m^2	7,200	1,018	7,330,350
Turning eaves	m^2	1,430	2,333	3,336,412
Taxiway				
Taxiways, asphalt concrete	m^2	29,000	2,333	67,661,510
Apron				
Apron, concrete	m^2	12,600	2,828	35,633,648
Airside roads				
R&FF roads	m^2	9,000	1,244	11,199,146
Landside pavements				
Landside roads, asphalt concrete	m^2	25,000	1,471	36,764,875
Landside roads, PCC	m^2	9,500	1,471	13,970,652
Miscellaneous concrete works	ls	1	6,221,748	6,221,748
Sub total				***242,663,728***
Rehabilitation of pavements				
Runway overlay incl grooving, asphalt concrete	m^2	65000	2,262	147,059,499
Sub total				***147,059,499***

APPENDIX C
Cotabato Airport Base Cost Estimate in PhP'000

	Units	Quantity	Unit Cost	Component Cost, PhP
Drainage				
Airside drainage				
Ditches	m^1	6,000	9,191	55,147,312
Misc.				
Box Culverts	m^1	350	19,796	6,928,765
Box drain	m^1	170	26,160	4,447,136
Pipes	nr	270	3,818	1,030,831
Other drainage structures				
Drop structure	nr	9	70,702	636,315
Chute spillway	nr	10	240,386	2,403,857
Channel revetment	m^1	880	8,484	7,466,098
U-ditch	m^1	110	4,949	544,403
Sump pit	nr	4	28,281	113,123
Landside drainage				
Culverts, RCP dia.450mm	m^1	480	1,838	882,357
Culverts, RCP dia.610mm	m^1	260	2,616	680,150
Culverts, RCP dia.760mm	m^1	200	3,394	678,736
Culverts, RCP dia.910mm	m^1	180	5,232	941,746
Curb inlets	nr	58	20,079	1,164,598
Catch basin	nr	16	8,484	135,747
Sub total				***83,201,174***
Civil works for Utilities / External Utilities				
Cable ducts	ls	1	13,150,513	13,150,513
External utilities mechanical	ls	1	48,869,003	48,869,003
External utilities electrical	ls	1	12,044,843	12,044,843
Power supply	ls	1	9,348,369	9,348,369
Streetlighting	ls	1	6,046,377	6,046,377
Communication lines	ls	1	5,840,185	5,840,185
Sub total				***95,299,290***
Miscellaneous				
Airfield perimeter fence and gates	m^1	7,400	2,262	16,742,158
Grassing and landscaping				
Topsoiling	m^2	532,000	17	9,027,191
Mulching	m^2	800	102	81,448
Sodding Airside Areas	m^2	27,550	86	2,376,354
Grass Seeding Airside Areas	m^2	504,000	72	36,346,321
Landscaping landside	ls	1	7,918,588	7,918,588
Culvert, double barrel 3m x 3m each	m^1	303	248,870	75,407,586
Marking	m^2	10,000	1,273	12,726,303
Sub total				***160,625,950***
TOTAL for External Works				**1,177,252,438**

APPENDIX C
Cotabato Airport Base Cost Estimate in PhP'000

	Units	Quantity	Unit Cost	Component Cost, PhP
2. Buildings				
Description	Units	Quantity		
New Buildings				
R&FFF	m^2	400	42,421	16,968,404
Power House	m^2	65	57,975	3,768,400
Cargo Terminal	m^2	450	55,147	24,816,291
Pass Terminal Building	m^2	5,000	53,733	268,666,393
Control Tower	ls	1	14,140,336	14,140,336
Administration Bld and AGL substation	m^2	150	45,249	6,787,362
Solid Waste Facility	ls	1	777,719	777,719
Pump room	ls	1	22,624,538	22,624,538
Chiller Pumphouse incl fence & pad	ls	1	28,280,673	28,280,673
Sub total				***386,830,115***
Special Systems				
Security equipment				
X-ray unit for hold baggage screening 1000x1000	nr	2	5,593,289	11,186,579
X-ray unit for hold baggage screening 700x700	nr	2	4,894,127	9,788,255
Metal detector, walk-through gate	nr	3	1,048,742	3,146,226
Access control system, central equipment	nr	1	628,459	628,459
Access control system, door equipment, per door	nr	5	46,663	233,316
Information equipment				
Master Clock	ls	1	798,929	798,929
Signages	ls	1	2,121,050	2,121,050
Public Address System	ls	1	1,534,227	1,534,227
Flight Information Display System	ls	1	10,207,909	10,207,909
Sub total				***39,644,949***
Equipment				
Generators	ls	1	18,444,938	18,444,938
Baggage handling	ls	1	25,452,606	25,452,606
Furniture	ls	-	included	
Sub total				***43,897,543***
TOTAL for Buildings				**470,372,607**
3. Equipment				
Navigational Aids				
Description	Units	Quantity		
DVOR Equipment and antenna	ls	1	24,038,572	24,038,572
DME Equipment and antenna	ls	1	9,544,727	9,544,727
Miscellaneous for DVOR/DME				
Shelter	ls	1	3,535,084	3,535,084
Spareparts/Test Equipment	ls	1	2,121,050	2,121,050
Installation	ls	1	2,828,067	2,828,067
Training/Manual etc.	ls	1	1,414,034	1,414,034
Remote control	ls	1	1,060,525	1,060,525
Power supply				

APPENDIX C
Cotabato Airport Base Cost Estimate in PhP'000

	Units	Quantity	Unit Cost	Component Cost, PhP
Uninteruptable Power Supply	ls	1	707,017	707,017
Removal of existing equipment	ls	1	353,508	353,508
Fight check	ls	1	1,767,542	1,767,542
TOTAL for Navigational Aids				**47,370,127**
ATC & Communication Equipment				
Description	Units	Quantity		
TWR/APP Type II				
ATC Console with 3 Positions	nr	1	1,767,542	1,767,542
VHF Transmitter				
TWR	nr	2	2,121,050	4,242,101
EMR	nr	2	2,121,050	4,242,101
APP	nr	2	2,121,050	4,242,101
GND	nr	2	2,121,050	4,242,101
VHF Receiver				
TWR	nr	2	1,060,525	2,121,050
EMR	nr	2	1,060,525	2,121,050
APP	nr	2	1,060,525	2,121,050
GND	nr	2	1,060,525	2,121,050
VHF Tx/ Rx Antennas	nr	4	63,632	254,526
VHF Transceiver	nr	2	1,626,139	3,252,277
VHF Handheld tranceivers	nr	5	70,702	353,508
VCCS System	nr	1	14,140,336	14,140,336
Voice Recorders	nr	1	3,181,576	3,181,576
Masterclock System	nr	1	1,414,034	1,414,034
UPS System	nr	1	2,121,050	2,121,050
Internal Cabling System	%	10%	49,816,405	4,981,641
Installation	nr	1	5,656,135	5,656,135
Training	nr	1	1,414,034	1,414,034
Miscellaneous Equipment	nr	1	1,414,034	1,414,034
Manuals etc	nr	1	353,508	353,508
Special Tools	nr	1	353,508	353,508
Spare Parts	nr	1	1,767,542	1,767,542
FSS Type IIA				
ATC Console with 2 Positions	nr	1	1,272,630	1,272,630
HF Transceiver	nr	1	4,242,101	4,242,101
HF Antenna	nr	1	3,181,576	3,181,576
Internal Cabling System	nr	1	1,414,034	1,414,034
Installation	%	10%	8,696,307	869,631
Training	nr	1	494,912	494,912
Manuals etc	nr	1	353,508	353,508
Spare Parts	nr	1	707,017	707,017
Meteo Equipment				
Wind Sensor incl Mast, obstruction lights wind sp	nr	1	565,613	565,613
Data collection platform and modern equipment s	nr	1	636,315	636,315
Temperature and Humidity sensor	nr	1	98,982	98,982
Pressure sensor	nr	1	190,895	190,895
Data display tower	nr	1	848,420	848,420
ATIS Workstation	nr	1	565,613	565,613
Cabling etc.	nr	1	1,060,525	1,060,525
Spare parts etc	nr	1	1,060,525	1,060,525
TOTAL for ATC and Communications Equipment				**85,440,155**

APPENDIX C
Cotabato Airport Base Cost Estimate in PhP'000

	Units	Quantity	Unit Cost	Component Cost, PhP
Airfield Ground Lighting				
Description	**Units**	**Quantity**		
Approach Lighting				
Simple Approach Lighting System 28,240 m	nr	53	109,266	5,791,104
Relocation PAPI System, approach 10	nr	4	321,374	1,285,498
Relocation PAPI System, approach 28	nr	4	321,374	1,285,498
Sub Total				***8,362,100***
Runway Lighting				
Runway Edge Lighting System	nr	70	86,770	6,073,911
Runway Threshold Lighting System	nr	36	86,771	3,123,742
Runway Threshold Identification Lights	nr	4	96,419	385,678
Runway End Lighting System	nr	16	86,769	1,388,298
Sub Total				***10,971,628***
Taxiway Lighting				
Taxiway Edge Ilghting System	nr	30	64,275	1,928,247
Signage	nr	10	359,935	3,599,352
Sub Total				***5,527,599***
Support and miscellaneous				
Apron Flood Lighting System	m^2	20000	321	6,427,419
Obstruction lights	nr	5	160,691	803,454
Lighted Windcones	nr	2	1,156,927	2,313,854
External Cabling System	ls	1	4,820,582	4,820,582
Remote Control System	nr	1	5,784,670	5,784,670
Training/Spare parts/Test equipment	ls	1	9,641,164	9,641,164
Dismantling existing installation	ls	1	192,803	192,803
Sub total				***29,983,947***
TOTAL for Airfield Ground Lighting				**54,845,275**
Maintenance Equipment				
Description	**Units**	**Quantity**		
Tractor/mower combination	nr	1	1,484,735	1,484,735
Utility vehicle	nr	1	975,683	975,683
TOTAL for Maintenance Equipment				**2,460,419**
R&FFF Equipment				
Description	**Units**	**Quantity**		
4x4, capacity 6000 l	nr	1	35,350,841	35,350,841
TOTAL for R&FFF Equipment				**35,350,841**
4. Intermodal Components	ls	1	20,000,000	**20,000,000**
5. Environmental Impact Mitigating Measures	ls	1	924,000	**924,000**
TOTAL BASE COST				**1,894,015,862**

APPENDIX D

Proposed Tariff Structure Based on MIAA, MCIAA and SBMA Rates

Appendix D

AIRPORT FEES AND CHARGES FROM MIAA, MCIAA AND SBMA

I. Aeronautical Fees & Charges

1. Landing & Take-Off Fees

Fees are based on the maximum take off weight in the aircraft's certification and per aircraft cycle (landing and take-off)

Aircraft Weight	Rates in U.S. Dollar ($)	Domestic Operations Rates in Phil. Peso
Up to 50,000 kg.	$ 1.84 / 500 kg. or a fraction thereof.	P 26.87 / 500 kg. or fraction thereof
From 50,001 to 100,000 kg.	$ 184 plus $ 1.95 / 500 kg. or fraction thereof in excess of 50,000 kg.	P 2,687 plus P 24 / 500 kg. or fraction thereof in excess of 50,000 kg.
From 100,001 to 150,000 kg.	$ 398.75 plus $ 2.25 / 500 kg or fraction thereof in excess of 100,000 kg.	P 6,039 plus P 24 / 500 kg. or fraction thereof in excess of 100,000 kg
From 150,001 kg. and over	$ 646.25 plus $ 2.40 / 500 kg. Or fraction thereof in excess of 150,000 kg.	P 7,772 plus P 24 / 500 kg. or fraction thereof in excess of 150,000 kg

2. Parking Charges

Fees are based on the maximum take-off weight in the aircraft's certification and the number of hours after the first two (2) hours and one (1) hour free parking period for international and domestic operations, respectively

Aircraft Weight	International Operations Rates in U.S. Dollars ($)	Domestic Operations Rates in Phil. Peso
Up to 50,000 kg.	1st half-hour $ 3.00	1st half-hour P 20.40
	Each additional half hour thereafter or fraction thereof $ 3.00	Each additional half hour thereafter or fraction thereof P 17.00
From 50,001 to 100,000 kg.	1st half-hour $17.00	1st half-hour P195.50
	Each additional half hour thereafter or Fraction thereof $5.00	Each additional half hour thereafter or fraction thereof P45.90
From 100,001 and over	1st half-hour $21.00	1st half-hour P195.50
	Each additional half hour thereafter or fraction thereof $7.00	Each additional half hour thereafter or fraction thereof P59.50

3. Lighting Charges

Fees are based on the maximum take-off weight in the aircraft's certification and the number of hours after the first two (2) hours and one (1) hour free parking period for international and domestic operations, respectively

Landing/Take-off	(Domestic) P300/landing and/or take-off
	(Int'l) $12.00 per landing and/or take-off
Parking	Additional 15% of the rate for daytime parking

II. Air Navigational/Communication Facilities Fees & Charges

1. Operational Charges

Operational charges for the use of the enroute and airport/terminal navigation facilities and services provided exclusive of telecommunication services for Class "B" messages shall be based on each arrival, departure or overflight, regardless of the type of flight or its duration.

1.1 Overflight

A charge of US$100.00 or its equivalent in pesos at the time of payment, shall be imposed for every aircraft utilizing the enroute navigation facilities and services without landing at this airport

1.2. Departing or Arriving International Flight

For each departing or arriving flight at this airport a charge of US$225.00 or its equivalent in pesos at the time of payment, shall be imposed for the use of the enroute and airport/terminal navigation facilities and radar services of this.

1.3. Domestic and General Aviation Flights

For each flight under instrument flight rules at this airport, a charge of P600.00 for domestic and P200.00 for general aviation shall be imposed regardless of the number of air navigational facilities used, type of flight and its duration.

III. Other Airport Fees & Charges

1. Passenger Service Charges

International Passengers	P550.00 or US dollar equivalent per passenger
Domestic Passengers	P200.00 or US dollar equivalent per passenger

The following shall be exempted:

Children of two (2) years & below

Transit passengers

Pilgrims & others with authority from the Office of the President of the Philippines

Refugees

Extra crew of the air carrier

Other passengers authorized by the CAAP Administrator or his duly authorized representative within the guidelines approved by the CAAP Board of Directors

2. Use of CIP Lounge

CIP space rental	Php 250 / sq.m. / month
VIP room rental	P2,500 / hour

3. Check-In & Concession Counters

Check-in Counters	US$10/hour (Intl) and P250/hour (Dom)
Concession Area	P150.00 to 200 / sq.m. / month

4. Concession Privilege Fee

Passenger Service	P1,000 / month
Food Service	P1,000 / month
Transport Service	P500 / month
Other Utilities or Business	P800 / month

5. Rental of Floor Space

Bare floor area	P150 to 250 / sq. m. / month

6. Rental of Land Space

Developed Area	P50 / month
Undeveloped Area	P25 / month

7. Advertising

Lighted signboard or display	P250 / sq. m. / month
Unlighted signboard or display	P100 / sq. m. / month
Circulars and posters	P50 / sq. m. /month

h. Aviation Fuel, Oil and Lubricant Services

Royaly Fee:

Aviation fuel	P0.50 / liter
Oil	P0.50 / liter
Grease	P0.50 / liter

PART IV

Updated Butuan Airport Subproject Feasibility Study

TABLE OF CONTENTS

Page

LIST OF TABLES

Section 8 POVERTY AND SOCIAL IMPACT APPRAISAL

Section 10 PROJECT COSTS

Section 11 PROJECT IMPLEMENTATION AND DISBURSEMENT SCHEDULES

Section 12 FINANCIAL ANALYSIS AND EVALUATION

Section 13 ECONOMIC ANALYSIS AND EVALUATION

LIST OF FIGURES

LIST OF APPENDIXES

SECTION 1

Introduction

1 INTRODUCTION

1.1 Overview Project Description

1.1.1 The Asian Development Bank (ADB) extended technical assistance to the Government through the Department of Transportation and Communications (DOTC) to prepare an intermodal transport development program for Southern Philippines (Mindanao and Palawan). Improving the intermodal transport system of the country is consistent with the development policies and strategies for the transportation sector under the Medium-Term Philippine Development Plan, 2004-2010. The focus on Mindanao and Palawan reflects the government's commitment to pursue a "*peace and development*" agenda for Mindanao, and to revitalize the transport and trade linkages under the Brunei Darussalam, Indonesia, Malaysia, and the Philippines-East ASEAN Growth Area (BIMP-EAGA). The improvement/upgrading of the Butuan Airport is included in the approved priority list of intermodal transport projects for further project preparation under Phase 2 of the Intermodal Transport Development Project (TA No. 4344-PHI).

1.1.2 The Government previously secured capital assistance from the ADB and the European Investment Bank (EIB) to finance the upgrading of the Butuan Airport to international civil aviation standards under the Third Airports Development Project (TADP), which was terminated in 2003 after loan closing. Failing to implement the programmed investment in this airport, the ADB and DOTC carried out the review of the airport master plan and the updating of the airport feasibility study based on a reduced scale of investment in 2004 under the proposed Southern Philippines Airport Development Project (SPADP). However, with the budget deficit problem of the Government, the implementation of improvement works was deferred.

1.1.3 This report on the updating of the feasibility study on Butuan Airport presents the associated traffic forecasts, concept design, scope of work, environmental and social issues, cost estimates, financial and economic analyses, and project risk assessment associated with the proposed airport project. The study recommendations are outlined in Section 16.

1.1.4 The project is located near the northeast coast of Mindanao as shown in **Figure 1.1-1** and the existing and proposed layout plans are presented in **Appendix A**.

1.1.5 Butuan Airport serves Butuan City, which is the capital and commercial center of the province as well as the regional center of the CARAGA Region. The airport's Zone of Influence (ZOI) includes Surigao del Sur, Agusan del Norte, Butuan City, and parts of Agusan del Sur. The population within this ZOI is 1.4 million (2005 Population Forecast). In terms of passenger traffic the airport ranks 8th in the nation, and it has a high passenger growth rate.

1.1.6 Improvements recommended include expansion and rehabilitation of the existing passenger terminal, and widen, overlay and extend the existing runway.

1.1.7 Additional facilities relevant to improving safety, security, access, passenger and cargo movement efficiency, and operational efficiency generally are also provided.

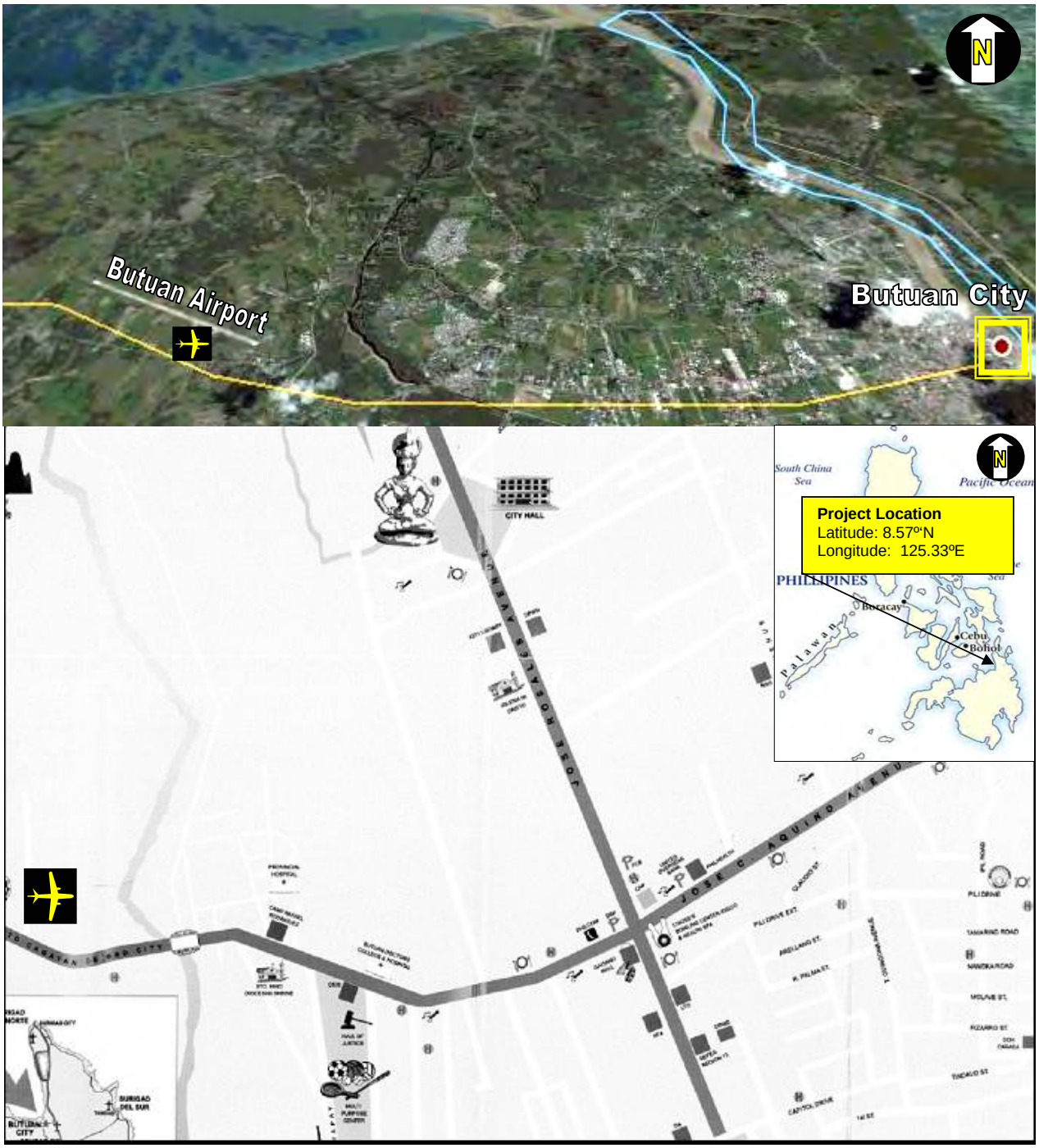


Figure 1.1-1: Location Map of Butuan Airport

1.1.8 The scopes of work of studies for each of the three airport subprojects was agreed to at the Tripartite Meeting following Phase 1 and reconfirmed at the Steering Committee Meeting to review the Phase 2 Inception Report. The scope of work for the update of the Butuan City Feasibility Study can be found in **Table 1.1-1**.

Table 1.1-1: ITDP Airport Subproject and Scope of Work

Subproject	Present Status	Phase 2 SOW: Technical Studies	Phase 2 SOW: Environmental / Social Safeguards	
			Environmental Safeguards	Social Safeguards
Butuan	Feasibility Study	• Updated Feasibility Study • Due Diligence Review	• Due Diligence Review of Designs • Assist DOTC to Extend Issued ECC	• Due Diligence Review of Designs • External RAP Monitoring by DOTC • Analyze Cargo for Inputs to PSA • Supplementary LARP

DOTC - Department of Transportation and Communications
ECC - Environmental Compliance Certificate
PSA - Poverty and Social Analysis
RAP - Resettlement Action Plan

1.2 Study Process

1.2.1 As Butuan Airport had previously been scheduled for upgrading based on earlier master planning, feasibility studies, and detailed design work, the feasibility study process covered the review and limited updating of the previous TADP and SPADP works.

1.2.2 The study process has followed the following basic steps:

- Data gathering of actual passenger, aircraft and cargo statistics;
- Review of previous plans, designs and reports prepared under the TADP and SPADP. Review of the recent 2006 Japan International Cooperation Agency (JICA) sponsored National Airports Master Plan Study;
- Assessment and comparison of previous forecasts and preparation or adoption of new forecasts;
- Site inspections and determination of site and implementation issues;
- Review of the status of land acquisition, environmental issues, environmental approvals, affected persons and properties;
- Preparation of planning and design parameters, including target design capacity;
- Assessment of the project (first phase development) demand requirements in terms of scope of the project and comparison of the capacity of the major airport elements (passenger terminal, cargo terminal, parking aprons) as previously designed under the TADP and SPADP, and adjustment of the previous designs in such a way as to preserve the integrity of the earlier designs and minimize any redesign impacts/costs;
- Assessment of future implementation issues relating to any second phase development leading towards the master plan design;

- Assessment of institutional strengthening proposals and the potential incorporation of Private Sector Participation (PSP) components;
- Reassessment of costs and schedules using up-to-date financial assumptions and unit rates;
- Reassessment of financial and economic impacts and evaluation results; and
- Assessment of risks and other factors relating to successful project implementation.

1.3 Limitations of the Study

1.3.1 As outlined above, this Study is essentially an update of previous studies. As such, available resources have been limited with the expectation that there would be fee significant changes to the scope and layout of earlier designs.

1.3.2 There are limited recent air passenger profile surveys, cargo profile surveys, topographic surveys, geotechnical surveys, pavement condition surveys, pavement strength testing, instrument testing, and surveys of the condition of existing airport equipment and facilities; although data records were accessed from relevant agencies and observations and notations were made during airport site inspections.

1.3.3 Following agreements with land owners, including the Philippine Air Force (PAF), significant land acquisition and relocation of affected persons and buildings have already occurred under the TADP. This tended to define the basic configuration of the design concepts in line with the master plan as it delineates the available land area for development.

1.3.4 With the detailed airside, terminal area and passenger terminal layouts and designs, the Project Team's approach also involved preserving the integrity and details contained within the previous designs. However, it should be recognized that some of the previous designs required some modification. In addition, further modifications may be recommended as the ITDP sector loan project progresses to subsequent implementation phases. Previous designs prepared by the TADP consultant would need to be reworked to establish design liability under the new loan project.

1.3.5 Updated design demand parameters (such as updated busy hour passengers) were calculated and applied, and resulted in some modifications to concept designs, particularly for the passenger terminal building. These modifications are described in the following sections of this Report. Otherwise, there has been no "detailed" critique of the previous designs, although overall capacity needs and operational integrity were noted as being adequate.

1.3.6 It should also be noted that traffic levels are relatively low and schedules are relatively undeveloped compared to regional domestic airports in many other countries. As a result, the forecast traffic levels and forecast busy hour demand (both passengers and also aircraft stand demand) are difficult to predict and actual future traffic levels and busy hour demand may vary significantly from the results of the analysis in the Study. For example, it should be noted that Butuan has realized erratic growth over the last 10 years and future growth may also not be steady. However, if future growth is not smooth, the basic fundamentals relating to Butuan as an airport destination should be noted and airport capacity should be available for the "rapid rebounds" that do often occur in aviation.

1.3.7 On environmental conditions, it is noted that a valid ECC exists for Butuan Airport. The project for Butuan as defined in this Study includes minor modifications from the original proposals under TADP, and none of these affected the findings or the recommendations of the Environmental Impact Statement (EIS). Therefore, no additional environmental studies are required. Dialogue with the community regarding land acquisition issues has been on-going.

1.3.8 Experienced judgment was applied by the Project Team to provide conservative estimates of subproject benefits and impacts as part of the poverty and social impact appraisal. Estimates of direct poverty benefits are based on typical construction labor shares, costs and composition from similar types of projects. Estimates of indirect poverty benefits involved relative weightings of air cargo that may have been produced by poor population as well as 2004 survey results of Butuan air passenger expenditures while in CARAGA.

1.3.9 Summaries of the need and status for land acquisition and resettlement were based largely on information originally provided in the Resettlement Action Plans (RAPs) prepared in 2002 for the Third Airport Development Project (TADP), supplemented by ITDP site visits and meetings with the TADP Project Management Office (PMO).

1.3.10 The Project Team has recommended that the Butuan Airport master plan be updated as part of the detailed design services and a budget has been provided for this in the proposed project investment.

1.4 Organization of this Report

1.4.1 The remainder of this Feasibility Study Report is organized to contain:

- Section 2, which contains the air traffic profile, including traffic statistics, airlines and route schedules, and current aircraft utilization;
- Section3, which presents the air cargo trends, airlift capacities and existing facilities;
- Section 4, which highlights the air transport forecasts, including the busy hour and aircraft stand demand analysis;
- Section 5, which indicates the airport project planning parameters, particularly the standards and design guidelines;
- Section 6, which introduces the airport development concepts, the detailed project scope and recommended implementation phasing;
- Section 7, which identifies the potential environmental impacts with the proposed Phase 1 investment, including the results of the due diligence review of the EIS and the compliance to ECC conditions (additional details can be found in Volume V);
- Section 8, which outlines the poverty and social impact assessments, particularly the land acquisition and resettlement issues (additional details can be found in Volume V);

- Section 9, which summarizes the required airport management philosophy on operations as well as options for private sector participation;
- Section 10, which presents the project investment cost and required operating and maintenance costs;
- Section 11, which discusses the proposed project implementation schedule and financing plan;
- Section 12, which identifies the financial impacts of the project from the view point of the government, including the financial viability indicators;
- Section 13, which indicates the results of the economic evaluation of the project investment, including the economic viability indicators;
- Section 14, which covers the review of existing airport management system and the recommended organizational structure and capacity
- Section 15, which presents the assessment of various implementation risks; and
- Section 16, which summarizes the proposed project scope, impacts, risks, countermeasures, and other Study recommendations.

SECTION 2

Air Traffic Profile

2 AIR TRAFFIC PROFILE

2.1 Air Traffic Statistics

2.1.1 Domestic Passengers

2.1.1 Statistics on air passenger movements at the Butuan Airport for the period from 1995 to 2004 were based on the figures contained in the "*The Master Plan Study on the Strategy for the Improvement of National Airports in the Republic of the Philippines*" that was conducted and prepared in 2006 by ASCO Aviation Systems Consultants for the DOTC and JICA. The most recent data for 2005 was taken directly from Air Transportation Office (ATO) and the airlines during ITDP survey and site inspection activities.These are summarized in **Table 2.1.1-1** below.

Table 2.1.1-1: Domestic Passenger Movements Butuan 1995-2005

Year	No. of Passenger Movements	Annual Growth Rate (%)	Comments
1995	38,742		
1996	43,894	13.30%	
1997	151,526	245.21%	
1998	179,982	18.78%	Stoppage of PAL services
1999	57,773	-67.90%	Stoppage of PAL services
2000	72,337	25.21%	
2001	98,334	35.94%	
2002	101,487	3.21%	
2003	121,117	19.34%	
2004	136,066	12.34%	
2005	117,913	-13.34%	Cebu Pacific Air stopped operating CEB-BXU-CEB

Note 1: Data Sources: The Master Plan Study on the Strategy for the Development of National Airports in the Republic of the Philippines (DOTC / JICA, 2006) and ATO
Note 2: Domestic excluding General Aviation (GA) and Military.

2.1.2 The statistical data shows that the trend in air passenger movements at Butuan Airport is erratic, although there has been a net increase in annual passengers of 11.8% p.a. over the period 1995 to 2005. The growth trend dropped in 1998, with passenger traffic falling 68% from the previous year. The negative growth rate was a result of disruptions in the operations of Philippine Airlines (PAL) that was triggered by the series of protests held by PAL employees against management, and which eventually culminated in the stoppage of the airline's services in September 1998.

2.1.3 The subsequent resumption of PAL's operations and the additional Manila-Butuan and Cebu-Butuan flights of Cebu Pacific Air at the airport caused a rebound in passenger growth in 2000 up to 2004, with traffic growing by an average annual rate of 8.5% during the period. The negative growth noted in 2005 was the result of the withdrawal of Cebu-Butuan air services of Cebu Pacific Air.

2.1.2 International Passengers

2.1.4 Historical data show that no international passenger movement has ever been recorded at the Butuan Airport. Moreover, an examination of the prevailing socio-economic conditions of the airport's influence area, as well as the proposed development support initiatives as laid out in the CARAGA Region's Medium-Term Regional Development Plan, 2004-2010, do not appear to support the possibility of any demand for direct international flights at the Butuan Airport in the future.

2.1.3 Aircraft Movements

2.15 Statistics on aircraft movements at the Butuan Airport for the period from 1995 to 2004 were based on the figures contained in the JICA-assisted "*The Master Plan Study on the Strategy for the Improvement of National Airports in the Republic of the Philippines.*" The 2005 traffic data for was taken directly from ATO and the airlines during ITDP survey and site inspection activities. These are summarized in **Table 2.1.3-1** below.

Table 2.1.3-1: Aircraft Movements Butuan Airport, 1995 to 2005

Year	No. of Aircraft Movements[1]	Annual Growth Rate (%)	Comments
1995	1,054		
1996	1,012	-3.98%	There is however a 13.3% increase in passenger movements from previous year
1997	678	-33.00%	There is however a 245.2% increase in passenger movements from previous year
1998	352	-48.08%	There is however a 18.8% increase in passenger movements from previous year
1999	1,078	206.25%	There is however a 67.9% decrease in passenger movements from previous year
2000	1,308	21.34%	
2001	2,066	57.95%	
2002	2,342	13.36%	
2003	2,060	-12.04%	There is however a 19.3% increase in passenger movements from previous year
2004	1,876	-8.93%	There is however a 12.34% increase in passenger movements from previous year
2005	1,740	-7,25%	

Data Sources: *The Master Plan Study on the Strategy for the Development of National Airports in the Republic of the Philippines (DOTC / JICA, 2006) and ATO*
Note 1: *All traffic represents domestic but excludes GA and Military, except in 2005 where 277 international movements were recorded.*

2.1.6 There appears to be no defined correlation between the historical aircraft movements at the Butuan Airport vis-à-vis the recorded passenger movements almost on a year to year basis covering the period from 1995 to 2005. This might suggest that there have been significant changes in the size of aircraft and achieved load factors over the said 10-year period, perhaps coupled with inaccurate recording of flight types.

2.2 Airlines and Aircraft Types

2.2.1 The airlines presently operating at the Butuan Airport, together with the type of aircraft used, frequency of movements per week and seating capacity are shown in **Table 2.2-1** below. A movement represents one aircraft arrival or one departure.

Table 2.2-1: Airline Operators and Aircraft Types (as of March 2006)

Airline Operator	Aircraft Type	Movements Per Week	Seating Capacity
Philippine Airlines	B737	14 (MNL-BXU-MNL)	141
Cebu Pacific Air	DC9	14 (MNL-BXU-MNL)	109

2.2.2 This weekly mix and number of aircraft produce a weekly seat capacity of 3,500 seats. Assuming annual passenger numbers are of the order of 147,000, then the average load factor is about 80% for each airline.

2.3 Route Profile

2.3.1 The route profile for the Butuan Airport showing the frequency of flights per week per airline operator as of March 2006 is given in **Table 2.3-1** below.

Table 2.3-1: Air Traffic Movements at Butuan Airport (March 2006)

Route	Frequency of Flight Per Week		
	PAL	Cebu Pacific	Total
Manila – Butuan	7	7	14
Butuan – Manila	7	7	14
Total Movements			28

2.4 Scheduling Characteristics

2.4.1 Butuan Airport receives most of its traffic in the morning. **Table 2.4-1** shows the morning peak period schedules for this airport.

Table 2.4-1: Morning Schedules (Peak Period)

Route	Airline	Aircraft	Frequency	Departure	
Manila - Butuan	PAL	B737	Daily	10:20 am	11:50 am
	Cebu Pacific	DC9	Daily	8:30 am	9:55 am
Butuan - Manila	PAL	B737	Daily	12:40 pm	2:10 pm
	Cebu Pacific	DC9	Daily	10:35 am	12:00 pm

2.4.2 Although there are only two daily flights, the tendency is for aircraft to cluster as airlines are competing for similar markets.

2.5 Airlines and Aircraft Fleets

2.5.1 Domestic air services are provided by two major air carriers: the Philippine Airlines and Cebu Pacific Air.

2.5.2 Until 1988, PAL was the only airline allowed to operate within the Philippines. PAL also serves the US, Japan, Hong Kong, Korea and the Middle East routes. PAL has no international routes or active international code share agreements from Mindanao or Palawan but PAL is considering reviving direct international routes into only Puerto Princesa subject to demand and the availability of airport facilities.

2.5.3 PAL entered a 10 year financial rehabilitation period in 1999. As part of this process it reduced its fleet from 65 to 31 aircraft and this also resulted in the complete withdrawal of services from a number of airports in Mindanao. It should be noted therefore that the historical fluctuation in passenger and cargo numbers at some Mindanao airports is due to supply problems (lack of an operator) and not just demand, which has also suffered over time due to various impacts such as the 1997 Asian Financial Crisis, the 2000 technology meltdown scare (Y2K), terrorist incidents in Southern Philippines, the events of 9/11, Severe Acute Respiratory Syndrome (SARS), etc.

2.5.4 PAL operates a fleet of 31 wide-bodied and narrow aircraft, including Airbus 300, Airbus 320, Airbus 340, and Boeing 747 and Boeing 737-300. PAL made a decision in 2005 to phase out the B737-300 aircraft and is replacing them with A320 aircraft. PAL is not interested in operating aircraft smaller than A320. This means that airports serviced by PAL, and that would be most of the airports with regular scheduled services, need to be able to accommodate an A320 (International Civil Aviation Organization-ICAO Category C aircraft) and its associated passenger load. This has a significant influence on the minimum design standards for airports in the Philippines.

2.5.5 PAL is currently using the large size A340, A330 and B747 aircraft on some domestic routes such as Manila-Cebu and Manila-Davao. PAL is operating the A330 into Puerto Princesa on a regular basis, about 4 times a week. While these are the larger routes in the Philippines, it should not be construed that large aircraft are needed to meet the demand. Primarily, PAL is deploying these aircraft on the domestic routes in order to enhance utilization of the aircraft when not required for international operations. If the demand for international services was higher, these larger aircraft would be used to meet that demand and PAL would deploy A320 with increased frequency on the Manila-Cebu, Manila-Davao and Puerto Princesa routes. Once PAL emerges from financial rehabilitation it may embark on an expansion strategy, subject to demand and other factors, and adjust its fleet composition and deployment strategy accordingly. This leads again to the conclusion that the A320 is a more appropriate design aircraft for PAL services out of Manila to most destinations in Southern Philippines, except for Puerto Princesa and Davao and possibly Zamboanga (for which the design aircraft might more appropriately be the A330/A340 due also to the international potential).

2.5.6 Air Philippines, the airline with slogan “Fly High Filipino,” was founded in February 13, 1995 and owned by Mr. Lucio Tan. It operates six (older model) Boeing 737-200 aircraft which seats 109-148 passengers. Air Philippines competes with PAL (or perhaps supplements) on some routes, such as Manila-Zamboanga. The B737-200’s are relatively old (and noisy) aircraft and have been phased out of most airline fleets in the world.

2.5.7 Designated as the country's second flag carrier, Cebu Pacific Air started operating domestic scheduled passenger and cargo air transport on August 24, 1995. As the "on-time, great value airline," it operates 12 DC9-32 McDonnell Douglas Aircraft with 110-115 seating capacity and recently introduced an Airbus 757 in local service. In 2005, Cebu Pacific announced that they would phase out the DC9's and upgrade their fleet with 14 new A319's (same size as an A320) and two A320's. This represents an aggressive modernization and expansion strategy within the Philippine domestic market. Cebu Pacific forecasts that it will overtake Philippine Airlines as the top domestic carrier in five years. The carrier currently holds a 38% share in the domestic market.

2.5.8 Under the progressive liberalization policy of the government in the 1990's, other airlines were authorized to serve domestic routes. Two other airlines are providing service mainly on secondary and feeder airports, namely: Asian Spirit and South East Asian Airlines (SEAIR).

2.5.9 Called the "People's Airline," Asian Spirit started its operation on April 4, 1995. It is the country's only airline cooperative, called the Airline Employees Cooperative. Asian Spirit has a total of 10 aircraft, most of them specially designed for short take-off and landing such as the two CN 235-220 (40-seater, manufacturer IPTN Indonesia), two DASH 7 (47-seater, manufacturer DeHavilland, Canada), four Let 410 (19-seater, designed in the former Czechoslovakia),and two twin-engine turbo-propeller YS-11 A (60-seater).

2.5.10 In January 2005, Asian Spirit inaugurated the latest member of its fleet, the British Aerospace (BAe) 146 jet. This is Asian Spirit's first jet aircraft, and is one of four BAe 146s ordered. Asian Spirit has commenced daily Manila-Pagadian services using the Bae146 aircraft. This is also an aggressive expansion strategy by PAL and the use of a modern 70 seat jet aircraft may be a more appropriate jet aircraft size for many routes in the Philippine domestic market.

2.5.11 SEAIR, which started operation in 1994, has a fleet consisting of 13 aircraft, of which 8 are 19-seater Let 410, and the remaining five aircraft are: two Dornier-28 (9 passengers), one Piper Cherokee (3 passengers), one Alouette, and one Citabria, which are available for air charter. SEAIR is flying Let 410 turbo prop aircraft into Manila. This airline has announced recently its intention to procure the 32-seater Dornier 328 aircraft for its future flights, including to and from Butuan Airport.

SECTION 3

Air Cargo Profile

3 AIR CARGO PROFILE

3.1 Cargo Volumes

3.1.1 The statistics on domestic cargo movements at the Butuan Airport for the period from 1995 to 2005 as summarized in **Table 3.1-1** were sourced from "*The JICA Airport Master Plan Study on the Strategy for the Improvement of National Airports in the Republic of the Philippines*." The most recent data for year 2005 was taken directly from ATO and the airlines during ITDP survey and site inspection activities.

Table 3.1-1: Cargo Movements at Butuan Airport

Year	Cargo Movement (Kg)	Annual Growth Rate (%)	Comments
1995	548,490		
1996	479,961	-12.49%	
1997	320,208	-33.28%	
1998	476,812	48.91%	Stoppage of PAL Services
1999	295,542	-38.02%	
2000	1,319,855	346.59%	PAL flights normalized
2001	1,609,190	21.92%	
2002	2,090,753	29.93%	
2003	2,407,450	15.15%	
2004	2,067,447	-14.12%	
2005	2,013,095	-2.63%	

Data Sources: TADP Report and The Master Plan Study on the Strategy for the Development of National Airports in the Republic of the Philippines (DOTC / JICA, 2006) and ATO

3.1.2 Table 3.1-1 shows that the highest annual growth in the historical domestic cargo trend of 10-years period, occurred in year 2000 with a total cargo movement of 1,320 metric tons, or an annual growth of 347% with respect to the preceding year's cargo movement. The resumption of PAL's operations at the airport has enabled a significant rebound in growth of cargo movements in 1999 to 2000. However, from 2000 to 2005, the cargo traffic is increasing at a decreasing rate. The highest recorded air cargo volume was in 2003 with 2,407 tons of annual traffic.

3.2 Cargo Profile

3.2.1 The type of cargo flown from Butuan Airport may be classified as follows:

(i) fresh fish and tuna (aqua marine products);
(ii) fruits and cut-flowers;
(iii) foodstuffs;
(iv) documents; and
(v) other products.

3.2.2 Based on PAL records, close to 92% of the air cargo shipped out of Butuan Airport are high value aqua-culture products, fruits and cut-flowers.

3.2.3 **Table 3.2-1** shows the monthly distribution of cargo volumes in 2005. The highest cargo traffic of mainly fruits and flowers was recorded in November 2005, which corresponded to their peak season.

Table 3.2-1: Cargo Volume at Butuan Airport (Scheduled Flights), 2005

Month	% Share	Total (in Kg)
January	7.6	152,341
February	8.1	163,568
March	7.8	157,298
April	7.2	144,590
May	6.3	127,365
June	7.4	149,078
July	8.6	172,822
August	8.6	172,215
September	8.2	164,979
October	7.9	158,455
November	11.9	238,696
December	10.5	210,408
T O T A L	100.0	**2,001,815**

Source: Butuan Airport, ATO

3.3 Air Lift Capacity

3.3.1 At present, there are two airlines operating in Butuan as noted in Table 2.3-1, namely PAL and Cebu Pacific Air for the Manila-Butuan route.

3.3.2 Based on analysis of the aircraft types and maximum cargo loads determined by the airlines (being subject to route length and fuel loads) the cargo air lift capacity was determined as shown in **Table 3.3-1**.

Table 3.3-1: Scheduled Aircraft by Airline and Weekly Cargo Capacity

Airline Operator	Aircraft Type	Annual Aircraft Movements	Cargo Capacity (Tons)	
			Aircraft	Annual
Philippine Airlines	B737	728 (MNL-Bu-MNL)	6	4,368
Cebu Pacific Air	DC9	728 (MNL-Bu-MNL)	2	1,456
T O T A L				**5,824**

Source: Butuan Airport, ATO

3.3.3 This indicates that only 34.5% of available cargo capacity is being utilized in 2005. However, noting that outbound cargo traffic was about 58.4% of total, then 40.3% of the outbound cargo capacity was being utilized.

3.3.4 The distribution of cargo traffic by airline in 2005 is presented in **Table 3.3-2**.

Table 3.3-2: Distribution of Air Cargo Traffic by Airline Operator, 2005

Airline Operator	Total Cargo Traffic (Kg)	% Share
Philippines Airlines	1,057,414	52.6
Cebu Pacific Air	954,401	47.4
T o t a l	**2,011,815**	**100**

Source: Butuan Airport, ATO

3.4 Cargo Facilities

3.4.1 Only PAL has its owned dedicated cargo facility at Butuan Airport. This facility is adequate for the current operations but would be inadequate for future operations.

3.4.2 Cebu Pacific does not have dedicated cargo facilities. Cebu Pacific is handling cargo within the passenger terminal building. Security checks, re-packaging, clearing, storage, etc. prior to boarding are handled behind the check-in counters within the prescribed time of the airline (at least 2 hours before the flight). In discussions with ATO, it is understood that Cebu Pacific is exploring sites for the development of a separate cargo facility within the airport.

3.4.3 At present, it would appear that there is no need for special cargo facilities such as refrigeration, dangerous good areas, live stock holding areas, bonded goods, etc. within cargo terminal facilities.

3.5 Cargo Growth Prospects/Issues

3.5.1 Air cargo is a worldwide growth industry. On a regional basis, Southeast Asia is projected to be one of the largest growth areas for air freight and the Philippines is expected to continue to contribute in that growth.

3.5.2 Most air cargo out of Butuan to Manila is expected to remain as marine products, fruits and cut-flowers. All airlines flying into Butuan Airport have shown interest in maximizing their opportunities to carry air cargo.

SECTION 4

Air Demand and Capacity

4 AIRPORT DEMAND AND CAPACITY

4.1 Previous Forecasts

4.1.1 Third Airports Development Project (TADP, 2000 Study)

4.1.1 The air passenger and cargo traffic forecasts were estimated based on the relative share of air traffic at the Butuan Airport to the total volume of domestic traffic in the entire Philippines. The forecast of future domestic air traffic for the entire Philippines, on the other hand, was made using regression analysis where the per capita Gross Domestic Product (GDP) was used as a function of the historical annual air traffic demand.

4.1.2 To eliminate the wide fluctuations in air traffic movements and the adverse effects of economic recession that were noted for the period from 1989 to 1992 and the effects of PAL's cessation of service in 1998, the airport's share of the traffic was based on the historical trend observed during the period from 1992 to 1997. The relative traffic share of the airport to the total national air traffic was assumed to be equal to the average of shares for the period from 1992 to 1997.

4.1.3 Using the per capita GDP for 1985 to 1998, the future per capita GDP values were determined by extrapolation using the method of least squares. A projection of the total domestic air traffic was then made by correlating per capita GDP and historical air passenger and cargo traffic for the years 1992 to 1997. Finally, a forecast of air passenger and cargo traffic at Butuan Airport was made by taking the relative traffic share of the airport to the projected total domestic air traffic.

4.1.2 Southern Philippines Airports Development Project (SPADP, 2004 Study)

4.1.4 Projections of air passenger and cargo traffic for the Butuan Airport were initially carried out through regression analysis using appropriate econometric models that are based on various factors such as the Gross National Product (GNP), Gross Regional Domestic Product (GRDP), population, peace and order conditions and relevant government initiatives. Several trial runs based on a number of varying combinations of economic factors were conducted until a statistically acceptable regression result was arrived at.

4.1.5 The air passenger traffic forecasts at the airport were finally based on a regression model where the GNP and the perception of peace and order condition in the area were used as a function of the annual air passenger traffic. The resulting equation was given as follows:

Passengers = (-) 140,575 + 0.354487 * GNP - 77047 * X1

Where: GNP is in constant 1985 prices
X1 is a dummy variable reflecting peace and order perception in the area (0 = favourable, 1= unfavorable)

4.1.6 The results of the regression analysis indicated that 78% of changes in the level of cargo for Butuan Airport were correlated to increases/decreases in the level of the country's GNP. The resulting regression formula was as follows:

Cargo = 4,337,117 + 8.1244 * GNP.

4.1.3 Master Plan Study for the Development of National Airports (JICA, 2006)

4.1.7 The forecasts of air passenger traffic at the different airports were derived based on the historical domestic air sector passenger traffic from the period 1987 to 2003. Model estimation was conducted for the total domestic sector movements and each sector (where the end points of each sector are defined) using the following equations:

DOMPAXt = 5.93 + 1,546,612 x PHLGDPt

SECPAXt = a + b x PHLGDPt

SECPAXt = a + b x GRDP1t

SECPAXt = a + b x GRDP2t

SECPAXt = a + b x GRDP1t + c x GRDP2t

Where: DOMPAXt is the total domestic passenger traffic on all sectors in year t, used as national control total

SECPAXt is the sector passenger traffic in year t

a, b and c are the regression coefficients

PHLGDPt is the GDP in millions of Pesos at 1985 constant prices

GRDP1t is the GRDP of the region where one airport of the city-pairs (sector) is located

GRDP2t is the GRDP of the region where the other airport is located

4.1.8 The following criteria were then used in selecting the best fitting equation, namely: (a) b>0, c>0; and (b) t-value for b exceeding the minimum t-value at 95% confidence.

4.1.9 Based on the above criteria, statistically significant relationships were determined. Using the derived relationships and the projected GDP and GRDP figures, the future sector traffic was estimated. After these sector traffic volumes were projected, the figures were used as the basis for allocating the sector traffic predicted using the national control total passenger traffic model. Adjustments were then made on critical airports to ensure continuity between the start of the yearly forecasts to the base year. Finally, the airport passenger traffic figures were then derived from the final sector traffic values by totaling the sector movements on a per airport basis.

4.1.4 Comparison of Air Passenger Forecasts

4.1.10 A comparison of the air passenger traffic forecasts under the three previous studies mentioned above is provided in **Table 4.1.4-1**. These forecasts represent unconstrained annual passenger forecasts.

Table 4.1.4-1: Comparison of Air Passenger Forecasts

Year	Actual			TADP Forecast (2000 Report)			(SPADP Forecast 2004 Report)			JICA Master Plan Study Forecast (2006 Report)		
	Pass. Mov'ts	Growth Rate (%)		Pass. Mov'ts	Growth Rate (%)		Pass. Mov'ts	Growth Rate (%)		Pass. Mov'ts	Growth Rate (%)	
		Ann. Ave.	5-Yr Ann Ave		Ann Ave	5-Yr AnnAve		Ann Ave	5-Yr AnnAve		AnnAve	5-Yr Ann Ave
1987	*83,435*											
1988	*53,667*	-35.7										
1989	*56,864*	6.0										
1990	*46,951*	-17.4										
1991	*43,422*	-7.5	-3.5									
1992	*42,392*	-2.4										
1993	*69,882*	64.8										
1994	*65,774*	-5.9										
1995	*38,742*	-41.1										
1996	*43,894*	13.3	17.3									
1997	*151,526*	245.2										
1998	*179,982*	18.8										
1999	*57,773*	-67.9										
2000	*72,337*	25.2		57,337								
2001	*98,334*	35.9	20.2	58,122	1.4	1.4						
2002	*101,487*	3.2		58,907	1.4							
2003	*121,117*	19.3		59,691	1.3							
2004	*136,066*	12.3		60,476	1.3		126,501					
2005	*145,291*	6.8		61,261	1.3		132,573	4.8		145,291		
2006				65,030	6.2	6.2	139,202	5.0	5.5	156,881	8.0	8.0
2007				68,799	5.8		146,162	5.0		168,470	7.4	
2008				72,567	5.5		153,470	5.0		180,060	6.9	
2009				76,336	5.2		161,143	5.0		191,649	6.4	
2010				80,105	4.9		169,200	5.0		203,239	6.0	
2011				84,813	5.9	5.9	176,814	4.5	4.9	219,285	7.9	7.9
2012				89,521	5.6		184,771	4.5		235,331	7.3	
2013				94,229	5.3		193,086	4.5		251,376	6.8	
2014				98,937	5.0		201,775	4.5		267,422	6.4	
2015				103,645	4.8		210,855	4.5		283,468	6.0	
2016				109,434	5.6	5.6	220,343	4.5	4.9	304,482	7.4	7.4
2017				115,223	5.3		230,258	4.5		325,496	6.9	
2018				121,013	5.0		240,620	4.5		346,510	6.5	
2019				126,802	4.8		251,448	4.5		367,524	6.1	
2020				132,591	4.6		262,763	4.5		388,538	5.7	
2021				139,487	5.2	5.2	273,274	4.0	4.3	416,178	7.1	7.1
2022				146,382	4.9		284,205	4.0		443,817	6.6	
2023				153,278	4.7		295,573	4.0		471,457	6.2	
2024				160,173	4.5		307,396	4.0		499,096	5.9	
2025				167,069	4.3		319,692	4.0		526,736	5.5	

Note 1: Domestic including GA and Military but excluding International.

4.1.11 The comparison of previous forecasts revealed that the TADP and recent JICA forecasts correlate reasonably well despite the fact the JICA forecast was done five years after the TADP forecast. It also shows that the forecast done under the SPADP has significantly higher growth rates and produces much higher traffic toward the end of the forecast period as compared to the TADP and JICA forecast. The TADP is considered a more robust forecast than the one prepared under the SPADP.

4.1.12 As the JICA forecast was completed in 2006 and has been endorsed by DOTC, and as the JICA forecast also correlates well with the TADP forecast, it was decided to adopt the JICA forecast rather than prepare a new forecast.

4.2 Forecasts – With Project Scenario

4.2.1 Annual Passenger Movements

4.2.1 The 'with project' case scenario assumes that the proposed development works and corresponding investments as defined in Section 6 are made.

4.2.2 The proposed development is expected to address airport security, safety, operational and capacity constraints such that the full air travel demand potential (domestic and international) can be met and be translated into the actual growth of air passenger and aircraft movements as per the unconstrained forecasts.

4.2.3 Hence, the appropriate "With Project" scenario forecasts are the 2006 JICA passenger forecasts shown in Table 4.1.4-1.

4.2.4 **Table 4.2.1-1** provides details the forecast of annual passenger movements under the "With Project" scenario broken down into international, scheduled domestic and general aviation plus military passengers.

Table 4.2.1-1: Forecast of Passenger Movements (With Project)

	Scheduled Domestic	GA + Military	TOTAL
2006	155,087	1,794	156,881
2007	166,637	1,833	168,470
2008	178,188	1,872	180,060
2009	189,738	1,911	191,649
2010	201,289	1,950	203,239
2011	217,298	1,987	219,285
2012	233,307	2,024	235,331
2013	249,315	2,061	251,376
2014	265,324	2,098	267,422
2015	281,333	2,135	283,468
2016	302,311	2,171	304,482
2017	323,289	2,207	325,496
2018	344,266	2,244	346,510

Table 4.2.1-1: Forecast of Passenger Movements (With Project) (Continuation)

	Scheduled Domestic	GA + Military	TOTAL
2019	365,244	2,280	367,524
2020	386,222	2,316	388,538
2021	413,826	2,351	416,178
2022	441,431	2,386	443,817
2023	469,035	2,422	471,457
2024	496,640	2,457	499,096
2025	524,244	2,492	526,736

4.2.2 Annual Aircraft Movements

4.2.5 Forecast annual aircraft movements are based on the forecast passenger demand. Annual aircraft movements can be estimated by comparing current and projected average passenger loads per aircraft with the annual passenger forecasts.

4.2.6 Factors affecting aircraft fleet type and frequency, such as market liberalization and the introduction of new aircraft, are considered and are factored into the projected average passenger loads.

4.2.7 As defined under the 2006 JICA Master Plan Study, the classification of aircraft is as follows:

a. SJ – Small Jets (B373, B757, A320, A319) with typical capacity of 120 to 150 seats;

b. TP – Turbo Prop (CN235, ATP, Ys11, DHC7, Do328, BAe146) with typical capacity of 55 seats; and

c. STOL – Short Takeoff and Landing (Let 410, Do228) with typical capacity of 20 seats.

4.2.8 Under the “With Project” case scenario, the aircraft movement forecast does not consider any operational constraints at the airport and is also an unconstrained forecast. In the forecast of aircraft movements the following assumptions as used in the 2006 JICA Master Plan Study were adopted:

a. For Scheduled Domestic Aircrafts Movements

- STOL class aircraft is used for very thin sectors with annual passenger demand less than 10,000;
- TP class aircraft is used for thin route with annual passenger demand between 10,000 and 29,000; and
- SJ is the most widely used with sector passenger more than 29,000 annually.

b. For International Aircraft Movements

- Average Passenger Load: 49 (based on the aircraft mix); and
- Aircraft Mix: 50% Small Jets; 50% Short Takeoff and Landing

Based on these observations, the following aircraft usage – sector passenger relationship for the purpose of aircraft movement forecast were adopted:

- Small Jets shall be used for 29,000 - 5,000,000 range of annual sector passengers;
- Turbo Prop shall be used for 10,000 - 29,000 range of annual sector passengers; and
- Short Takeoff and Landing shall be used for 10,000 and below range of annual sector passenger.

c. For General Aviation and Military Aircraft Movements

The methodology adopted for forecasting General Aviation and Military Aircraft Movements, which adheres to that used under the 2006 JICA Master Plan Study, is as follows:

- First, an estimate of non-GA and non-military aircraft movements based on data from the Civil Aviation Board (CAB) were prepared from 2004;
- The differences between the ATO data on aircraft movements were calculated, the difference interpreted as being the GA and Military aircraft movements; and
- Applying regional population growth rates, future GA and Military aircraft movements were projected.

4.2.9 The resulting forecast of air passenger and aircraft movements under a "with project" case scenario are summarized in **Table 4.2.2-1** below.

Table 4.2.2-1: Forecast Aircraft Movements (With Project)

Year	Scheduled Domestic			GA + Military	TOTAL
	SJ	TP	STOL	STOL	
2010	1,669	675	0	178	2,522
2015	2,679	0	0	198	2,877
2020	3,678	0	0	218	3,896
2025	4,993	0	0	238	5,231

Notes: SJ – Small Jets (B373, B757, A320, A319); TP – Turbo Prop (CN235, ATP, Ys11, DHC7, Do328, BAe146); STOL – Short Takeoff and Landing (Let 410, Do228)

4.2.10 It should be noted that the above applies to the estimation of annual aircraft movements. For the peak hour analysis in Section 4.5, the Project Team has made slightly different assumptions based on schedule information and a different approach to the start up of regular international operations.

4.3 Forecasts – Without Project Scenario

4.3.1 The capacity analysis conducted under Section 4.6 indicates that the airport terminal is already running at capacity. This means that, at peak times, the conditions for passengers in the terminal are crowded and uncomfortable and there is little, if any, room for additional passengers. However, although the airport may be deemed to be running at capacity, it does not necessarily mean that passenger and aircraft numbers cannot grow.

4.3.2 Growth can occur at "off-peak times" and on the shoulders of the peak. The extent that airlines will schedule flights at off-peak times is difficult to assess and depends on the airlines assessment of the market conditions and on other constraints associated with the airlines overall route structure/schedule for each aircraft in its fleet and possibly on slot constraints in Ninoy Aquino International Airport (NAIA), particularly as NAIA becomes increasingly constrained and congested.

4.3.3 Under a "without project" case scenario, it is assumed that passengers and aircraft can grow in the off-peak and shoulder period to a maximum traffic equivalent to the 2009 forecast, although, without the project this might not be realized under some later time.

4.4 Air Cargo Forecasts

4.4.1 The erratic nature of the cargo movement statistics are noted in Section 3 and Table 3.1. A linear regression analysis based on the 20 years available data was used as one means of assessing potential cargo demand. The analysis from 1995 to 2005 indicates an average annual growth of 5% despite the generally erratic year on year growth.

4.4.2 **Table 4.4-1** provides the projected cargo movement for the next 20 years (until year 2025) based on the linear regression analysis and compares it to the recently completed JICA forecast.

Table 4.4-1: Air Cargo Forecast

Year	Projected Cargo (kg)	
	JICA	ITDP
2004	2,067,447	2,067,447
2005	2,022,491	2,013,095
2010	3,082,967	2,982,868
2015	4,528,758	4,048,557
2020	6,397,017	5,494,986
2025	8,829,797	7,458,181

4.4.3 The 2006 National Airport Master Plan (JICA) forecast was based on the 10-year historical trend from 1995 to 2004 and correlated against the national and regional gross domestic product. The above methodology utilized by JICA results in an Annual Average Growth Rate (AAGR) of 7.7% for Butuan Airport.

4.4.4 The ITDP linear regression analysis results in an AAGR of 6.3%, which takes into account the new role of Surigao Airport as transfer point for air cargo from CARAGA Region bound for Manila. The following equation was used:

$$Y = 199695X + 845994$$

$$R^2 = 0.76$$

$$AAGR = (CARGO_{(2005)} / CARGO_{(1986)})^{(I/(t2005-t1986))} - 1)$$

4.4.5 As both methodologies produce different results, the JICA forecast was adopted for consistency with passenger traffic forecasts. Moreover, these JICA forecasts were accepted by DOTC.

4.5 Busy Hour and Stand Demand Forecasts

4.5.1 Introduction

4.5.1 This section calculates the current and forecast passenger busy hour demand, which would need to be carried by passenger terminal facilities.

4.5.2 Busy hour passenger demand is then converted into a peak hour stand demand by consideration of existing and projected aircraft mix profiles and apron occupancy times. Busy hour forecasts are particularly important in terms of checking the adequacy of proposed passenger terminal and aircraft parking requirements.

4.5.2 Methodology

4.5.3 The passenger terminal busy hour demand is usually based on detailed examination of the existing flight schedules and aircraft mix. The growth in stand demand is correlated against the growth in passenger numbers and the impacts of aircraft substitution due to expected increases in average passenger loads. Other factors also influence stand demand such as the number of layover aircraft and allowances for off schedule aircraft.

4.5.4 As there are currently no regular international flights for Butuan Airport, the schedule analysis that follows applies to domestic air services only.

4.5.3 Schedule Data Used

4.5.5 The demand analysis was based on aircraft schedules derived provided by ATO, the airlines and by internet research as summarized in Section 2.

4.5.4 Growth Assumptions

4.5.6 In order to forecast future aircraft and passenger busy hours and stand demand, relevant growth forecasts were required. In the absence of specific busy hour forecast growth rates, annual passenger growth rates were used as a base.

4.5.5 Definition of Terms

4.5.7 The following section defines the meaning of some key terms used in this analysis:

- **Busy Hour**

4.5.8 The (arrivals or departure) busy hours refers to the one hour during the day with the greatest number of movements (arrivals or departures). For the purposes of this analysis "Peak" busy hour refers to the busiest hour of the week.

- **Active Stand Demand**

4.5.9 The active stand demand is calculated from the peak busy hour, by taking the sum of the aircraft within that hour.

- **Total Stand Demand**

4.5.10 Total stand demand is a measure of the largest number of aircraft "on-the-ground" at any one time during the day. This includes "layover" or "overnight" aircraft in the peak period that maybe regarded as "non-active".

- **Layover**

4.5.11 A layover refers to an aircraft that stays on the airport overnight before departing the next day.

4.5.6 Conversion of Aircraft Schedules to a Gate Allocation Chart

4.5.12 The current 2006 aircraft schedules were plotted to show each aircraft's arrival and departure time on a timeline as shown in **Figure 4.5.6-1** representing the Gate Allocation Chart. A 15-minute "buffer" was included in the Figure for maneuvering time in the vicinity of the gate and for off-schedule arrival/departure of the aircraft.

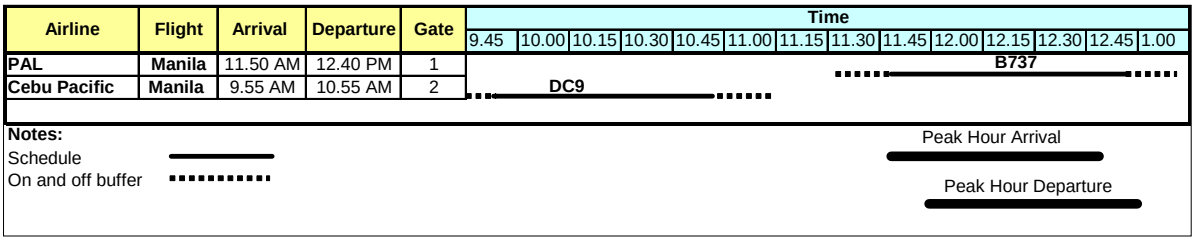


Figure 4.5.6-1: Butuan Gate Allocation Chart

4.5.7 Current Passenger and Aircraft Busy Hour Demand (2006)

4.5.13 The busy hour aircraft arrivals and departures are identified in Figure 4.5.6-1. The busy hour arrival and departure passengers are obtained by multiplying the busy hour aircraft arrivals and departures by the number of seats in each aircraft and an assumed load factor of 70% derived in Section 2.

4.5.14 **Table 4.5.7-1** represents the arrivals and departures busy hour which shows that the busy hour for arrivals and departures is the same each day in the mid to late morning and is in fact represented by the PAL flight only. Currently, the Cebu Pacific flight does not clash with the PAL schedule.

Table 4.5.7-1: Arrivals and Departures, Busy Hour, 2006

Aircraft	Seats	Arrival	Departure
A330	*250*	0	0
A320	*150*	0	0
B737	*150*	1	1
BAE146	*75*	0	0
Let410	*19*	0	0
Total	**A/C**	**1**	**1**
	Seats	150	150
	LF	70%	70%
	Pax	**105**	**105**
	Day	Everyday	Everyday
	Time	11:50 -12:50	11:40-12:40

Note 1: Applies when PAL operates the A330 which is about 4 times a week.

4.5.15 The departure peak also occurs at the same time each day of the week and consists of one aircraft and 150 passengers.

4.5.8 Current "Active Stand" Demand (2006)

4.5.16 To calculate the active stand demand forecasts for the peak busy hour, the following method was used:

- Identify which of the arrivals or departures aircraft numbers are higher. This produces the critical terminal load.
- Group the aircraft types in the busy hours by their aerodrome reference code.

4.5.17 The result is indicated in **Table 4.5.8-1** below.

Table 4.5.8-1: Current Active Stand Demand, 2006

Code	Arrival	Departure
F	0	0
E	1	0
D	0	0
C	1	1
Regional Jet	0	0
Turbo Prop	0	0
Total	**1**	**1**
Day	Everyday	Everyday
Time	11:50 -12:50	11:40-12:40

4.5.9 Total Stand Demand

4.5.18 Since there are currently no "inactive aircraft" in the peak period, the Total Stand Demand is the same as the Active Stand Demand.

4.5.10 JICA Forecast Aircraft Busy Hour

4.5.19 Forecast busy hour aircraft movements at the Butuan Airport for the period from 2005 to 2025 are based on the figures contained in the "The Master Plan Study on the Strategy for the Improvement of National Airports in the Republic of the Philippines" that was conducted and prepared in 2006 by ASCO Aviation Systems Consultants for the DOTC and JICA. These are summarized in **Table 4.5.10-1** below.

Table 4.5.10-1: JICA Forecast Aircraft Busy Hour Movements

Year	International Aircraft Movements	Domestic Aircraft Movements	Total[1]
2005/6			
2010	0	2	2
2015	0	2	2
2020	0	3	3
2025	0	5	5

Data Source: The Master Plan Study on the Strategy for the Development of National Airports in the Republic of the Philippines (DOTC / JICA, 2006)

4.5.20 This forecast was based on applying Busy Day and Peak Hour coefficients to annual aircraft movements. It was not based on an analysis of the current or likely future schedules and may therefore not be accurate. It does not distinguish between arrival and departure peaks. This methodology does however suggest that as traffic volumes increase and schedules mature there will be some peak spreading. It is difficult to estimate the degree of peak spreading but it can be accounted for in a schedule analysis by growing the busy hour to a lesser extent than the forecast annual growth.

4.5.11 Forecast Domestic Passenger and Aircraft Busy Hour

4.5.21 The busy hour passenger forecasts were calculated by applying only "50%" of the median annual passenger growth forecasts to the current passenger busy hour calculated in Table 4.2.2-1.

4.5.22 The "50%" factor is an important yet difficult to assess assumption. Typically, at other airports with higher levels of traffic, it is sometimes assumed as 100% (to be conservative) which would result in a higher busy hour forecast. However, at these other airports, there is often a well defined peak and off peak traffic profile.

4.5.23 In arriving at the 50% peak hour growth rate factor, the following considerations were taken into account:

- It could be expected that as growth continues airlines, particularly PAL and Cebu Pacific would go to two daily Manila flights and it could be argued that this would most likely occur in the afternoon and therefore see the emergence of an afternoon peak.
- However, if other airlines enter the market then they would most likely occur in the morning potentially during the peak hour.

4.5.24 The forecast passenger demand then allows the aircraft busy hour forecasts to be calculated.

4.5.25 In a more mature schedule profile, the average aircraft seats would be grown at an annual rate of 1% for international aircraft and 2% for domestic aircraft. However in this case it is known that PAL and Cebu Pacific have made recent fleet mix decisions based on the A320 aircraft. Air Philippines is using B737's and it is assumed they will not upgrade to an aircraft with significantly more seats. Other airlines may bring in aircraft of the same size (A320/B737) but based on current trends, they are more likely to bring in smaller aircraft up to 70 seats (such as the Bae146).

4.5.26 The forecast aircraft busy hour was determined by adding a mix of aircraft whose seating capacity matches the forecast seats obtained by multiplying the forecast passengers at each year by an assumed load factor. Judgment is exercised to take account of possible future airline fleets as discussed above. The resultant number of aircraft and seats is checked against the average number of seats calculated from the assumed growth rates above.

4.5.27 **Table 4.5.11-1** shows the forecast passenger busy hours for arrivals and departures in five-year increments from 2010 to 2025.

Table 4.5.11-1: Domestic Aircraft Departures Busy Hour Forecast

Reference Code	Example	2006	2010	2015	2020	2025
F	A380	0	0	0	0	0
E	B777, A330	0	0	0	0	0
D	DC10, AB6	0	0	0	0	0
C	B737, A320	1	1	1	1	2
Regional Jet	BAe146	0	0	1	1	0
Turboprop	Let410	0	1	0	1	0
Total Aircraft		1	2	2	3	2
Seats		**150**	**169**	**220**	**239**	**300**
Assumed Load Factor		70%	70%	70%	70%	70%
Pax		**105**	**118**	**154**	**167**	**210**
Forecast Pax		105	127	154	185	220
Forecast Seats		150	182	220	264	300

4.5.28 As discussed above, some judgment has to be used in what additional aircraft are brought into the mix as the growth in peak hour passengers occurs. Growth can be assumed to be Let410, BAe146, A330/B737 size or smaller. Given that Asian Spirit and SEAIR are not yet flying it might be reasonable to assume that these airlines would begin to fly and could fly BAe146 or smaller turbo prop aircraft.

4.5.29 The above busy hour forecast produces a lower aircraft busy hour demand than that predicted by JICA based methodology.

4.5.12 Forecast Domestic Active Stand Demand

4.5.30 **Table 4.5.12-1** provides the forecast active stand demand. This assumes a maximum gate occupancy time of 60 minutes.

Table 4.5.12-1: Forecast Domestic Active Stand Demand

Reference Code	2006	2010	2015	2020	2025
F	0	0	0	0	0
E	0	0	0	0	0
D	0	0	0	0	0
C	1	1	1	1	2
Regional Jet	0	0	1	1	0
Turboprop	0	1	0	1	0
Total Aircraft	1	2	2	3	2

4.5.31 Table 4.5.12-1 clearly reveals that predicting bus hour stand demand is difficult with the low levels of traffic at Butuan Airport coupled with the erratic nature of traffic growth.

4.5.13 Recommended Stand Requirements

4.5.32 The Recommended Stand Demand is provided to account for the following:

- Active Stand Demand (domestic);
- Emergence of International traffic (also as active stands);
- Layover aircraft given also that there are no “tow off” stands available; and
- The risk of an aircraft being delayed or requiring unexpected maintenance.

4.5.33 Generally, inactive stand demand can be assumed at 25% of the active stand demand. This ensures operational flexibility and some capacity for unexpected growth in active and demand given the time lag associated in expanding the number of active stands. However, given that there is no home base carrier, nor any immediate likelihood of overnight stay aircraft, a 15% factor for inactive stands maybe appropriate. This factor may also provide some flexibility to park non scheduled aircraft such as executive jets.

Table 4.5.13-1: Recommended Stands

Reference Code	2006/7	2010	2015	2020	2025
Domestic					
F	0	0	0	0	0
E	0	0	0	0	0
D	0	0	0	0	0
C	1	1	1	1	2
RJ	0	0	1	1	0
TP	0	1	0	1	0
Sub total	1	2	2	3	2
Layover/Stand off					
Assume 15%[1]	*1*	*1*	*1*	*1*	*1*
Total Aircraft stands	2	3	3	4	3

Notes: 1. The stands provided for Layover/stand off should be near the active stands in front of the passenger terminal but do not necessarily have to be contiguous to it. If site constraints exist near the active stands they can be located more remotely, but this does impose a higher operational cost and inconvenience to the users.

SECTION 5

Project Planning Parameters

5 PROJECT PLANNING PARAMETERS

5.1 Introduction

5.1.1 A number of important planning and design parameters were used to underpin the evaluation of the concept and scope of work. These are briefly described as follows.

5.2 Master Planning

5.2.1 The development concept under this Study is based on the Master Plan and Concept prepared under the TADP.

5.2.2 It is noted however that the Master Plan, dated August 2000, was modified with an addendum issued in April 2001. The most significant change was the shift in the passenger terminal area from the mid point of the runway on the northern side, to the western end of the runway on the northern side. This would appear to be as a result of meeting the requirements of the PAF.

5.2.3 The Design Aircraft is an ICAO Code C (A320 and B737) aircraft which is used to set out the airfield including runway widths, strip widths, runway to taxiway separations, taxiway to taxiway separations and taxiway to object separations, apron depths, taxiway fillets, etc. The new runway length is planned for 1,966 m and is suitable for A320/B737 operations out of Manila.

5.3 Standards and Design Guidelines

5.3.1 Mandated by the Republic Act 776 or the Civil Aeronautics Act, the objective of DOTC's line agency Air Transportation Office (ATO) is to ensure safe, reliable, economical, and efficient air transportation, fully integrated with the national transportation system, taking into account the requirements of national interest and local concerns in accordance with the International Civil Aviation Organization Standards and Recommended Practices (ICAO SARP's).

5.3.2 In the absence of any other local/national airport regulations, the concept design outlined in this Study is based on ICAO (Annex 14) requirements for physical design and operation.

5.3.3 International Air Transportation Association (IATA) guidelines are also used with reference to Service Standards.

5.4 Target Demand/Capacity

5.4.1 The original TADP targeted 2010 as the "design year" for the first phase development of facilities based on the "medium" traffic forecast.

5.4.2 Under the SPADP the same detailed designs completed under the TADP were used as the basis to the project with some adjustments to the scope. However, at the time of the SPADP, the 2003/2004 actual traffic levels had not reached the previous forecasts made under the TADP. This effectively pushed out the "design year" to 2015.

5.4.3 Since the completion of the SPADP, there has been a strong rebound in domestic traffic at Butuan and the new forecasts under ITDP (using the JICA Airport Master Plan Study) correlate closely with the original TADP forecasts.

5.4.4 Another factor to consider is the projected time line by which the ITDP would be implemented. As detailed in Section 11 the earliest anticipated date for commissioning and operations is 2012.

5.4.5 On this basis, it is recommended to adopt 2012 as the design capacity target. This means that for the most part, perhaps with some adjustments (refer to Section 6), the original designs prepared under the TADP can be adopted.

5.4.6 With this target design capacity year, it also means that service levels will begin to drop once operations commence and start to grow as there will be little spare capacity. Therefore the flexibility to expand passenger terminal and aircraft parking and other facilities is essential.

5.5 Level of Service

5.5.1 The target Level of Service (LOS) on opening or during the course of the life of the airport facility relates to the degree of passenger comfort. It is more an airport owner's policy decision regarding the target LOS. High LOS generally provides a higher LOS at a higher cost.

5.5.2 IATA has developed a LOS Framework as listed below:

Table 5.5-1: IATA Level of Service Framework

Level	Level Description
A	Excellent level of service; condition of free flow; no delays; excellent level of comfort
B	High level of service; condition of stable flow; very few delays; high level of comfort
C	Good level of service; condition of stable flow; acceptable delays; good level of comfort
D	Adequate level of service; condition of unstable flow; acceptable delays for short periods; adequate level of comfort
E	Inadequate level of service; condition of unstable flow; unacceptable delays for short periods; inadequate level of comfort
F	System breakdown

5.5.3 Normally, a LOS "C" is recommended as the minimum design level for new terminal elements. Key areas are the departures lounge and arrivals areas. For larger terminal with higher capacity processing areas, check-in, security, immigration and quarantine processing zones are also assessed in terms of level of service.

5.5.4 However, where certain constraints may exist, a lower LOS may be acceptable.

5.5.5 In terms of assessing the Level of Service at the end of the project life, a LOS "E" has been adopted.

SECTION 6

Concept and Scope

6 CONCEPT AND SCOPE

6.1 Introduction

6.1.1 The upgrading and expansion of the Butuan Airport was originally included under the coverage of the Third Airports Development Project (TADP) that was funded by the Asian Development Bank (ADB) and the European Investment Bank (EIB) under a parallel co-financing arrangement. The TADP was a part of the Philippine Government's continuing program that aims to develop and improve the domestic aviation sector through the upgrading and rehabilitation of airport equipment and facilities to internationally prescribed standards. Under the parallel co-financing arrangement, all civil works components required for Butuan Airport were to be financed through the EIB loan, while all equipment components will be financed out of the loan granted by ADB.

6.1.2 The Butuan Airport undertaking, like the other airports covered under the TADP, however suffered significant delays as a result of a number of crucial implementation problems and issues. By the time both loans reached expiry (the EIB loan expired on November 2003 without any extension being granted while the ADB loan, after being extended, closed on May 2004), no significant progress was made in terms of the execution and implementation of the equipment, civil works and building components.

6.1.3 Due to its priority status, however, the Butuan Airport, together with the other five airports under the original TADP, were considered anew for possible financial assistance through a new loan from the ADB under the proposed Southern Philippines Airports Development Project (SPADP), albeit at a reduced scope. The reduction in the scope of the works from that as originally envisioned under the TADP was agreed between the ADB and the DOTC apparently in consideration of two main factors, namely: (a) the limited amount of the loan initially programmed to finance the proposed SPADP and (b) the results of the "Re-appraisal Project Scope" prepared in November 2003.

6.1.4 The results of the 2004 ADB Country Programming Review Mission and as subsequently contained in a Memorandum of Agreement (MOA) entered into by the ADB with the National Government as represented by National Economic and Development Authority (NEDA), a total loan amount of US$50 million was programmed to finance the cost requirements of the SPADP. In comparison, the aggregate loan amount under the TADP was about US$122 million (US$97 million under the ADB loan and US$25 million under the EIB loan). The "Re-appraisal Project Scope" study (during the later phases of the TADP), on the other hand, was conducted for the purpose of validating/re-confirming the viability, through economic re-evaluation, of the TADP airport components (a) collectively as one package and (b) individually as stand alone projects.

6.1.5 The findings of the re-appraisal study showed that the Butuan Airport as a stand alone project will yield an Economic Internal Rate of Return (EIRR) of 6%, which was below the government-prescribed and ADB hurdle rate of 15% EIRR. In view thereof, a reduction in the scope of the works and the corresponding required level of investment maybe necessary to render the project economically more attractive.

6.1.6 The SPADP feasibility study that was conducted based on the reduced scope of works, which is required for the processing and approval of the proposed new loan, was completed in October 2004. Based on the results of the study, the project was determined to be

economically viable, with the project yielding an EIRR of 32%. The processing of the proposed loan however never occurred due to the lack of government counterpart funds resulting from the budgetary constraints under which the DOTC was operating at the time. The SPADP was eventually shelved by the ADB and DOTC, but the upgrading and expansion of the Butuan Airport is now being considered under the "Intermodal Transport Development Project".

6.1.7 The scope of the works related to the Butuan Airport is presented in the following Sections.

6.2 Development Concept

6.2.1 Introduction

6.2.1 The airport development concept is modeled on the concepts developed under the TADP and the SPADP.

6.2.2 Due to the time delays in implementing the airport projects identified in the TADP and SPADP, there has been a need under this Study to reassess the latest trends in passenger and aircraft traffic, recheck forecasts and the anticipated demand for the target year for "delivery" to assess whether the existing designs are still appropriate.

6.2.3 Given that the new forecasts in this report and those done under the TADP show rough correlation and given that TADP was targeting 2010 and this project is targeting 2012 for "delivery", there are few significant changes to the development concept except as summarised as follows:

- A marginal increase in the size of the passenger terminal to allow for increased departure lounge areas;
- Increased aircraft parking area; and
- Allowance for a second cargo terminal for Cebu Pacific operations.

6.2.4 In addition to these adjustments, there have also been a few issues emerge that require further more detailed assessment in subsequent phases of this project and these are also summarised below.

6.2.5 Aspects of the development concept that are the same as the TADP are generally not discussed below.

6.2.2 Passenger Terminal Building

6.2.6 Based on experience and investigations at other airports, the required floor area of terminal buildings at airports with the analyzed characteristics of Butuan Airport is generally in the range of 8-12 m²/peak hour passenger.

6.2.7 The total number of design peak hour passengers in two directions will amount to about 264 passengers in 2012.

6.2.8 The total floor area required in the passenger terminal building will be: 8/12 x 264 = 2,112/3,168 m2 for the 2012 target year. The TADP design is the same as the existing terminal which is 868 m2 and would therefore appear to be inadequate for the future. As detailed below,

it is recommended that passenger departures and arrivals areas be adjusted and this has resulted in a revised terminal area of 1,243 m2. This is still below the "above "rule of thumb" estimate, but it should be remembered that ATO and PAL are conducting the bulk of there administration operations outside of the passenger terminal.

6.2.9 It should be noted that the passenger terminal building concept as described in this project does not represent the final development concept. Under the existing Master Plan further building extensions are envisaged.

6.2.10 **Check-in Counters and Layout.** At virtually all domestic airports in the Philippines, the ATO provide dedicated check in counters for each domestic airline. Although most airports have coped reasonably well with this policy since domestic deregulation in 1996, it may not be the most appropriate policy for the future as new entrant airlines fly to an increasing number of destinations and as competition increases.

6.2.11 The concept design allows for the implementation of a common use check in policy with airlines offices located behind the check-in counters, but not connected to the check-in counters. If a common use check in policy is implemented, it means that airlines wishing to use computer reservation systems will need to move them from there offices to the check-in counters for each flight. This is not usually a problem for single daily flights. With this policy, ATO would need to implement a check-in counter allocation system and a charging mechanism (typically time-based). ATO would also need to determine a signage policy for airlines compatible with its own overall terminal signage policy.

6.2.12 For Butuan, there should be eight domestic check-in counters. There should also be at least four airline offices to allow for an increased number of airline operators.

6.2.13 **Departure Lounge/Waiting area – Domestic**. The departure lounge area developed under the TADP/SPADP has an area of approximately 250 m2. However, this area has been increased to approximately 360 m2 under this ITDP to allow more space for peak hour passengers.

6.2.14 If International Air Transport Association (IATA) LOS "C" is adopted for design, a minimum of 2.0 m2 can be allocated to each occupant for the buy hour. The projected departures busy hour in 2012 is approximately 132 passengers. This implies a minimum area requirement of 264 m2. The 360 m2 is appears somewhat higher than 264 m2 and this is because the building has been expanded by increments to match the existing building grid and to maximise site opportunities (a 2x 6 m expansion to the eastern end).

6.2.15 **Arrivals hall/baggage claim – Domestic**. The existing domestic arrivals hall has an area of 190 m2. The projected 2012 arrivals peak hour is approximately 132 passengers. If 1.6m2 (IATA LOS C) is allocated to each occupant the required area is 212 m2. The new design provides approximately 240 m2.

6.2.3 Terminal Parking Apron

6.2.16 There are no adjustments to the existing apron which is 200m wide. An apron of this size could park four Code C (A320/B737) aircraft and one Code B (Let410) aircraft, although this would require push-back operations on all positions.

6.2.4 Airline Cargo Facilities

6.2.17 The PAL cargo facility is considered adequate. A new cargo terminal of up to 150 m2 is planned for Cebu Pacific to the eastern side of the existing PAL facilities with direct access to the aircraft parking apron.

6.2.5 Air Traffic Control (ATC) Complex

6.2.18 The existing ATC complex will be retained and upgraded.

6.2.6 Rescue and Fire Fighting Facilities (R&FFF)

6.2.19 The present R&FFF is well located in relation to the runway. However, because of the condition of the existing facility, it will be renovated and new equipment supplied.

6.3 Summary of Project Scope

6.3.1 In line with the development concept described in Section 6.2 above, a summary of the proposed scope of the works for Butuan Airport that is envisioned under this Study vis-à-vis those as identified under the previous TADP and SPADP studies is presented in the following table. The scope of the works enumerated for the two (2) previous studies were culled from available documents obtained from the DOTC and the Project Implementation Unit (PIU) of the TADP.

Table 6.3-1: Comparison of Project Scope

TADP	SPADP[1]	ITDP
Airside Facilities and Works		
• Runway strip extension, widening and grading • Runway widening from 36m to 45m • Runway extension, 100m • Provision of turning eaves and paved blast pads in the extension of runway ends. • Taxiway shoulders • R&FFF roads • Overlay of existing	• Widening of the runway to 45 m • Extension of the runway with 38 m to the west (Runway 12) and provide for a Runway End Safety Area (RESA) at both runway ends. • Crack repairs and joint resealing on the existing concrete paved runway, taxiway and apron. • Provision of turning eaves and paved blast	• Runway strip extension, widening and grading • Runway widening from 36m to 45m • Runway extension, 100m • Provision of turning eaves and paved blast pads in the extension of runway ends. • Taxiway shoulders • R&FFF roads • Overlay of existing

[1] The upgrading and expansion of the Butuan Airport under the SPADP study was proposed to be carried out in two (2) phases. The first phase development was to be implemented in 2007 and subsequent investments are to be made in 2018. The scope of the works under the SPADP as presented in the table refers to the first phase development works only.

TADP	SPADP[1]	ITDP
runway, cracking and seating and grooving • Perimeter fence and perimeter security roads, 5,000m • Demolition of existing obstacles	pads in the extension of runway ends. • Provision of a 2,120 x 150 m runway strip, including grading and landscaping. • Perimeter fencing along the airside/landside border • Crash, fire and rescue road system	runway, cracking and seating and grooving • Perimeter fence and perimeter security roads, 5,000m • Demolition of existing obstacles
Landside Facilities and Works		
• Expansion and refurbishing of existing passenger terminal bldg • Refurbishing of existing control tower • Expansion and refurbishing of existing CFR bldg • Expansion and refurbishing of existing CFR bldg • Expansion of water supply system and upgrading of sewage treatment facilities • Drainage (runway strip, runway, road, parking and taxiways) • Landside roads and walkways	• Refurbishment of the existing passenger terminal to cope with forecast traffic in 2015. • Refurbishment of the existing control tower, rescue and fire station and power house and provision for a new water storage facility. • New drainage along the runway outside the runway strip	• Expansion and refurbishing of existing passenger terminal bldg • Refurbishing of existing control tower • Expansion and refurbishing of existing CFR bldg • Expansion and refurbishing of existing CFR bldg • Expansion of water supply system and upgrading of sewage treatment facilities • Drainage (runway strip, runway, road, parking and taxiways) • Landside roads and walkways
Equipment		
• Navigational Aids (DVOR; DME; Remote control; Power supply) • ATC & Communications (VHF system; Voice switch control system; recording equipment, HF communication and UPS. • Airfield Ground Lighting (High intensity simple approach lighting	• Navigational Aids (DVOR; DME; Remote control; Power supply) • ATC & Communications (VHF system; Voice switch control system; recording equipment, and UPS. • Airfield Ground Lighting (High intensity simple approach lighting	• Navigational Aids (DVOR; DME; Remote control; Power supply) • ATC & Communications (VHF system; Voice switch control system; recording equipment, and UPS. • Airfield Ground Lighting (High intensity simple approach lighting

TADP	SPADP[1]	ITDP
system for RWY 30 and 12; High intensity runway edge lighting; High intensity runway end lighting; High intensity runway threshold lighting; Medium intensity taxiway edge lighting; Apron flood lighting; Obstacle lighting; Illuminated wind cones; Aerodrome beacon)	system for RWY 28 and 10; High intensity runway edge lighting; High intensity runway end lighting; High intensity runway threshold lighting; Medium intensity taxiway edge lighting; Apron flood lighting; Obstacle lighting; Illuminated wind cones; Aerodrome beacon)	system for RWY 30 and 12; High intensity runway edge lighting; High intensity runway end lighting; High intensity runway threshold lighting; Medium intensity taxiway edge lighting; Apron flood lighting; Obstacle lighting; Illuminated wind cones; Aerodrome beacon)
• Airfield Maintenance (Tractor; Grass mower; Utility vehicle)	• Airfield Maintenance (Tractor; Grass mower; Utility vehicle)	• Airfield Maintenance (Tractor; Grass mower; Utility vehicle)
• One fire fighting vehicle	• One fire fighting vehicle	• One fire fighting vehicle

6.3.1 Intermodal Components

6.3.2 The potential to improve intermodal components of the project were investigated and the most appropriate scope for incorporating or upgrading intermodality is summarized as follows:

6.3.3 Road signage from city and outside areas to the airport. This would need to be coordinated with Department of Public Works and Highways (DPWH) and the city government.

6.3.4 Development of a Traffic Management Plan controlling access of various modes of transport to the airport and airport vehicle parking and kerbside areas. A key objective of this plan would be to ensure the "convenient" movement of people and baggage from land based vehicles (including public transport modes) to the terminal frontage. This objective would need to be at the forefront of the Plan while still managing security issues and other traffic engineering principles. Solutions could include attention to:

- Designated parking areas and drop off/pick up zones.
- Ensuring pavements/footways between the terminal kerbside and vehicle parking areas are "friendly" to the use of trolleys, with consideration also given to the location of trolley storage areas.
- Construction of covered walkways.
- Adequate signage.

6.3.5 Consideration was given to the development of truck docks for cargo at cargo terminals but this did not seem to be a priority.

6.3.6 Budgets exist within the cost plan for implementing the various intermodal project components.

6.4 Project Phasing

6.4.1 The project as described in this Study represents the first phase implementation of the Master Plan. The capacity of this first phase is further discussed in Section 6.5. Subsequent development phases will include:

- Extensions to the passenger terminal building.
- Expansion of the aircraft parking apron to the east and/or west.
- Expansion of landside vehicle parking areas, administration and other facilities.
- Expansion of cargo terminals and the potential development of additional terminals.
- Potential addition of Instrument Landing System (ILS) facilities.
- Potential development of a fuel farm and perhaps even small catering and other support facilities.

6.5 Airport Capacity Estimate

6.5.1 An airport is a system of components that function together. From a capacity and operational perspective, these components are usually divided into two areas, landside and airside. The landside component is sometimes subdivided into passenger terminal area and access road/car park/kerbside areas. The effective use of capital should ensure that these components are in balance from a capacity perspective.

6.5.2 For Butuan Airport, the critical capacity component for both the “With Project” and Without Project” scenarios are considered to be the passenger terminal.

6.5.1 With Project

6.5.3 The project essentially delivers additional passenger terminal and cargo terminal capacity. The lengthening of the runway improves the viability of A320 and B737 operations. Other project components address maintenance and improve operational efficiency, safety and/or security.

6.5.4 The dedicated domestic departure lounge is approximately 360 m2. If maximum capacity is based on IATA Level of Service “E”, which is a very low level of service, approximately 1.6 m2 can be allocated to one person. This provides a capacity of 225 people.

6.5.5 The new baggage reclaim hall is 240m2. Based on IATA Level of Service “E”, which is a very low level of service, approximately 1.2 m2 can be allocated to one person. This provides a capacity of 200 people.

6.5.6 Based on the forecast departure peak hour demand (Section 4.6), this should provide a design life through to approximately 2022.

6.5.2 Without Project

6.5.7 The existing departure lounge is approximately 160 m2. Based on IATA Level of Service “E”, which is a very low level of service, approximately 1.6 m2 can be allocated to one

person. This provides a capacity of 100 people, which is less than a single load of an A320/B737 aircraft.

6.5.8 The existing baggage reclaim hall is 190m2. Based on IATA Level of Service "E", which is a very low level of service, approximately 1.2 m2 can be allocated to one person. This provides a capacity of 158 people.

6.5.9 As discussed in Section 4.5, the existing arrival and departures busy hour is 105 people.

6.5.10 On this basis, at peak times, the airport is already running over capacity on departure and in need of expansion, particularly if any other aircraft join the current departures peak.

6.5.11 Recent site inspections confirm that the passenger terminal is highly congested and uncomfortable at peak times. People have to stand in the departures lounges and people find difficulty in getting near the baggage reclaim belt on arrival and need to stand away.

SECTION 7

Environmental Impact Appraisal

7 ENVIRONMENTAL IMPACT APPRAISAL

7.1 Environmental Categorization

7.1.1 Department of Environment and Natural Resources (DENR) System of Categorization

7.1.1 The Philippine Environmental Impact Statement (EIS) system is mandated by Presidential Decree No. 1586 (1978). DENR's Administrative Order No. 30 establishes quantitative thresholds for project categorization. The EIS system is based on a four-level categorization of projects:

- Category A – Environmentally Critical Projects (ECPs) with significant potential to cause adverse environmental impacts. ECPs include projects in the heavy or resource extractive industries as well as some infrastructure projects and golf course projects;
- Category B – projects that are not environmentally critical in nature, but which may cause negative effects because they are located in Environmentally Critical Areas (ECAs);
- Category C – projects intended to enhance environmental quality or address existing environmental problems; and
- Category D – projects that were operational prior to 1982, projects not falling under other categories or projects unlikely to cause adverse environmental impacts.

7.1.2 Under Administrative Order No. 42, all projects categorized as A or B require the issuance of an 'Environmental Compliance Certificate' (ECC) prior to implementation while Category C and D projects require the issuance of Certificate of Non-Coverage (CNC).

7.1.2 Asian Development Bank (ADB) System of Categorization

7.1.3 The ADB has a threefold categorization based on generic "locational" characteristics and magnitude of impacts of projects:

- Category A – projects with likely significant adverse impacts that are located in or near sensitive environments; cultural heritage sites; densely populated areas; regions subject to heavy development or create conflicts with natural resource allocation; and lands or waters containing valuable resources;
- Category B – projects that will have impacts on environmentally important areas or people that are less adverse than Category A and mitigation measures can be designed more easily than for Category A projects. Category B deemed environmentally sensitive are subject to the same disclosure requirements as Category A projects; and
- Category C – projects that are likely to have minimal or no adverse environmental impacts. Category C projects need to be reviewed for identification of mitigation measures that can be incorporated directly into project design or could be subject to an environmental management plan.

7.1.4 It should be noted that if a project with many components or subprojects has one component that is categorized as A, the entire project becomes a Category A project and an EIA must be prepared, full disclosure of which is required at least 120 days before ADB Board consideration. If a subproject will result in significant resettlement, this will mean the project is treated as a 'Category B Sensitive' project and is also subject to the disclosure requirements.

7.1.3 Recommended Categorization of ITDP

7.1.5 For both DENR and ADB systems of environmental assessment, the environmental category is determined according to the likelihood and magnitude of risk associated with a project (and subprojects) either being located in an ECA, and/or posing potentially significant adverse environmental impacts when implemented without mitigation.

7.1.6 The overall risks associated with ITDP are considered low because the project does not include any new development, rather it is focused on improving and rehabilitating existing facilities.

7.1.7 Activities envisaged by the ITDP for airport improvements include construction of new, or extension of existing, access roads to existing airports, extension of airport runways, widening of aprons, passenger terminal expansions, and provision of safety facilities.

7.1.8 The initial screening process determined that all the short-listed subprojects fall under Category B for both DENR and ADB classifications. These subprojects are not located in ECAs but are anticipated to create a range of potentially adverse environmental impacts when implemented without mitigation. Therefore, the recommendation is that the ITDP can have an overall environmental categorization of Category B.

7.1.4 Summary of DENR and ADB Procedural Requirements and Safeguards

7.1.9 According to DENR's Administrative Orders, the level of environmental assessment and documentation should be appropriate for the environmental category to which a proposed subproject is assigned. ADB's reporting process is very similar to that required by DENR with a difference in terminology, rather than document content.

7.1.10 There are no Category A subprojects to be included under ITDP. Category B projects require either an IEE or EIS/EIA - depending on the scale of works proposed - and a short resettlement plan. The level of environmental analysis and reporting differs for major improvement projects vis-à-vis minor airport improvement projects, as shown in the table below.

Table 7.1.4-1: Environmental Analysis and Reporting Requirements for Airport Projects

Project	Components/Activities	Analysis & Reporting Required
Airports	New projects, major improvements (> 50 % extension or widening of runway)	EIS
	Minor improvements (< 50 % extension or widening of runway) or private airstrip	IEE

Source: DENR's Procedural Manual for Administrative Order 30 (2003)

7.1.11 DENR and ADB environmental procedures prescribe preparation of an EIS/IEE for Category B subprojects and submission of an EIS/IEE Report to the Regional DENR-Environment Management Bureau (EMB) Office in the subproject area for review and approval of issuance of an ECC. This process clears the subproject for implementation.

7.1.12 **EIS Preparation & Submission for Butuan Airport Subproject.** The Butuan Airport subproject is one of the four short-listed subprojects with existing ECCs issued by the Regional DENR-EMB offices concerned.

7.1.13 The airport subproject has a currently valid ECC which was issued based on an approved EIS report prepared and submitted by DOTC as part of the feasibility study conducted for the earlier Southern Airports Development Project/Third Airport Development Project funded by ADB.

7.1.14 The ECC for Butuan Airport subproject was issued on 13 February 2004 and is effective for five years from issuance date. The ECC includes a number of conditions for compliance by the implementing agency. A "due diligence" review of the status of compliance by the project proponent has been made to assess whether the ECC conditions have been, are being, or can be, met by the implementing agency (refer to Section 7.5).

7.1.15 The ECC will expire before the project reaches the likely construction starting timeframe of August 2009, therefore application for an extension of ECC validity will need to conform to the prescribed procedural guidelines of DENR's Administrative Order No. 2003-30.

7.1.16 **Process for Butuan Airport EIS Review & Approval.** The EIS for Butuan Airport improvements was reviewed and approved by DENR prior to the issuance of the ECC, following the process prescribed in Department Administrative Order (DAO) 2003-30. As noted above, the Regional Environmental Management Bureau (EMB) Director has granted the issuance of an ECC.

7.1.17 The ADB Environment Specialist to the project has confirmed that an overall project Summary IEE (SIEE) will be required. The SIEE has been prepared according to prescribed ADB content outline and reporting format, the SIEE includes a summary of the main relevant elements of the Butuan Airport EIS and the review of ECC compliance, along with recommendations.

7.1.18 The SIEE will be submitted to ADB for review and approval, and this will include review and sign-off by the Environment Specialist for the ITDP as well as the safeguards division (RSES). During the review period, the project proponent and the PPTA consultant will be available to respond to any review comments or request for additional information by ADB.

7.2 Butuan Airport EIS Report Components

7.2.1 Summary of EIS Process Applied in Accordance with Requirements

7..2.1 The EIS study for the Butuan City Airport subproject closely followed the procedural guidelines prescribed by DAO 96-37 of DENR. Primary and secondary data was gathered complying with a set of studies that were agreed upon at a scoping meeting held at DENR-EMB CARAGA (14 May 2001). A Project Description was submitted to DENR-EMB, and the scope and criteria for the study and subsequent EIS report were agreed at this meeting.

7.2.2 The agreed upon scope for procedural compliance of the EIS included topics on meteorology, air quality, water quality, terrestrial ecology, geology, socio-economic studies and social acceptability. The minutes of the technical scoping meeting and the attendance sheet are included as an appendix to the EIS.

7.2.3 The characterization of baseline conditions is in accordance with the criteria and methods prescribed by DENR's AOs and guidelines.

7.2.4 This was followed by collation of secondary data covering geology, meteorology, hydrology and socio-economic aspects of the subproject site obtained from government, private and academic institutions. The full list of information sources used for compilation of the EIS is provided in the References section of the EIS report. Already published secondary data was supplemented by data gathered from Barangay Health Centers, and Municipal Planning and Health Offices.

7.2.5 During June 2001, a perception survey was conducted as part of the socio-economic module of the study. Respondents were selected and interviewed in order to draw up the social profile of the affected communities and to determine the level of awareness of affected households on the proposed project. The survey also gauged the project's social acceptability. A combination of primary and secondary data was used to characterize the baseline social and environmental conditions.

7.2.6 A second scoping meeting and public consultation was conducted (held at Sto. Rosario Chapel, AFP Camp, Barangay Bancasi, Butuan City, 07 July 2001). This consultation was the first forum for DOTC and its consultants to present the proposed development stakeholders (representatives from the affected barangay), local government officials of Butuan City, and other concerned individuals and agencies. DOTC and its consultants also responded to various questions and requests for clarifications on the project components.

7.2.7 The issues and concerns raised during the meeting were summarized and presented as the Scoping Report (included as an appendix to the EIS).

7.2.8 The direct impact area was estimated to include a 1 km radius around the boundary of the Butuan City airport. The potential impacts of the project on land, water, air and communities were identified, predicted and assessed in terms of their negative or positive effects, significance and severity. Based on the impact assessment and prediction, mitigating and enhancement measures were recommended and the corresponding environmental management and monitoring plans were prepared.

7.2.2 Summary Outline and Description of the EIS Report

7.2.9 The EIS prepared for Butuan City Airport was prepared in February 2002 and contains the following:

- Executive summary – summarizing the project components and anticipated effects, process for EIS preparation, overall assessment approach and results, and requirements for compliance;
- Project description – including a brief description of the project and development phases, and an analysis of alternatives including the "do nothing" option;

- Baseline environmental conditions – describing the existing status of the physical (geology, meteorology and climate, airy quality, noise, and water quality), biological (flora and fauna), and social (demography and socio-economic profile) environments;
- Impact assessment and mitigating measures – sets out the analysis of the impacts for both construction and operation phases of the development and proposed mitigation measures for negative environmental effects;
- Environmental management plan (EMP) – provides the management plan for the construction and operation phases of the subproject for the various environmental components, including worker's health and safety and employment aspects;
- Social development plan – contained the resettlement plan and how rehabilitation assistance would be managed, it included an economic assistance program and procedures for strengthening community relations (consultation plan);
- Contingency emergency response plan – prepared for each phase of subproject development in the event of emergency or disaster. This plan sets out the responsibilities and tasks of emergency tem members and coordinators, response procedures, evacuation routes, and reporting systems;
- Environmental monitoring plan – establishing the parameters and requirements for monitoring the subproject implementation and operation focusing on air quality, noise levels, water quality, and solid and liquid waste;
- Institutional plan – sets out the responsibilities for implementation of the subproject, including compliance with EMP and monitoring plan, and a health and safety program;
- Information and education campaign – includes the communication plan for the subproject, it identifies responsibilities for dissemination of information to the public, methods and avenues for dissemination, and the timeframe; and
- References and appendices - all information sources, people consulted, ancillary reports.

7.3 Summary of Finding of Butuan Airport EIS

7.3.1 Summary of Key Environmental Impact Concerns

7.3.1 The EIS concluded that the majority of adverse impacts on the physical, biological and social environment will be incurred during the construction phase. The construction phase effects are considered to be of low to medium adverse impact and are able to be mitigated, as shown in the table below. The EIS also concluded that there are a number of impacts that will be caused as a result of subproject operation, all of which are already being experienced because the airport is an existing facility and would also be experienced in a "without project" case. The main effects include air quality, noise, water quality, and impacts on the community.

7.3.2 A Gaussian plume model was used to determine the effects on air quality as a result of the access road and expansions of the runway at several downwind measuring points. The results showed that for all emissions tested – CO, HC, NOx, SOx and PM - concentrations fell within the prescribed DENR standards. The operational impact on air quality was therefore considered to be extremely small.

7.3.3 The EIS provided data showing the increase in noise impacts on the area surrounding the airport for the 2010 and Master Plan cases compared with the 2000 case. The 2010 modelling determined that the 65 dB LDN would increase from a lateral distance of 576 m to 594 m and from a longitudinal distance of 2,823 m to 2,944 m thus enclosing an area of 671 ha, compared with 638 ha in 2000. The impact area would increase to 822 ha in the Master Plan. The existing airport has been operating with minimal noise annoyance complaints from residents within the impact zone (65 dB LDN). It should be noted that the impact of noise was not raised as an issue during the scoping or consultation meetings and noise pollution was stated to be a negative effect by only one per cent of the participants in the perception survey, making it the lowest ranked impact identified.

7.3.4 The impact on water quality as a result of the proposed changes in layout and arrangements is negligible. The new apron will be equipped with a separate system for collection of oil or fuel spilled on the runway which will be separated from water before it is discharged to the main drainage system. Mitigation measures are proposed in the EMP to avoid and minimize emissions to adjacent watercourses.

7.3.5 Land acquisition is considered the most significant effect on the community. This will be undertaken in strict accordance with the Land Acquisition and Resettlement Plan (LARP) to ensure that affected households are not left worse off as a result of project implementation.

7.3.6 For some environmental components, the proposed improvements to airport operations will increase the level of these impacts. Mitigation measures have been identified for these impacts, but some depend on the cooperation of other agencies, such as municipal authorities in the case of noise and land use planning. A summary of the impacts is provided in **Table 7.3.1-1**.

Table 7.3.1-1: Summary of Environmental Impacts

Impacts	Magnitude, time-scale and geographic extent of impact	Mitigation and Enhancement Measures
Construction Phase		
Impacts on the geology and topography; increase in soil erosion and change in relief	Insignificant negative, temporary – project site	Diversion of surface run-off flow from exposed soil areas; Construction of soil retaining wall, berm, or temporary interceptor trenches; Provision of secondary containment and lining of fuel/oil storage areas; and Undertake appropriate geotechnical engineering tests

Impacts	Magnitude, time-scale and geographic extent of impact	Mitigation and Enhancement Measures
Impacts on air quality; possible generation of TSP and increase in ambient concentration of NO_2, SO_2 and CO due to emission from construction equipment	Insignificant negative, temporary – project impact area	Water sprinkling of dust generating areas; Cover construction materials with tarpaulin during delivery and storage; and Proper maintenance of construction equipment
Impacts on noise level	Insignificant negative, temporary – project impact area	Maximize daytime period for construction and utilization of excessive noise-producing construction equipment; Night operations noise to be kept within permissible levels; Provision of ear mufflers for workers exposed to excessive noise; and Proper maintenance of equipment
Impact on water quality; increase in dissolved and suspended solids (TSS)	Insignificant negative, temporary – project site	Installation of proper drainage, silt traps, etc.
Sanitary wastewater generation	Insignificant negative, temporary– project site	Provision for sufficient number of proper toilets in the workers' area
Impact on terrestrial ecology	Insignificant negative, temporary – project site	Landscaping and re-vegetation
Generation of construction wastes	Insignificant negative, temporary – project site	Encourage recycling of materials, i.e., use of excess soil as filing materials; Daily collection and delivery of debris to dumpsite; and Establish and enforce solid waste management system
Change in land use	None	No mitigation/enhancement required
Displacement of affected residents/properties	Significant negative, long-term – local level	Strict implementation of resettlement and compensation plans based on proponents Land Acquisition and Resettlement (LARP)
Increase in job business opportunities	Significant positive, short-term - local level	Preference for hiring workers be given to qualified workers within the project site Patronize local goods and services
Additional income and benefits to the local government	Significant positive, short-term - local level	Increased taxes for the local government

Impacts	Magnitude, time-scale and geographic extent of impact	Mitigation and Enhancement Measures
Increase of migrants	Insignificant negative, temporary – local level	Hiring of existing residents first; Hiring of qualified local workers on contract basis for airport project only;
Impact on health and safety	Insignificant negative, temporary – project site	Require workers to use safety equipment; Implementation of health and safety program for workers
Traffic	Insignificant negative, temporary - project site	Traffic enforcement within construction area;
Deterioration of visual or aesthetic quality	None beyond project site	Immediate disposal of excavated materials; Good working layout and cleanliness during construction and operational phases
Operational Phase		
Increase in air emissions	Insignificant negative, long-term, manageable – local level	Proper maintenance of equipment used in operation; Strict implementation of traffic management
Traffic	Insignificant negative, long-term, manageable – local level	Installation of traffic signage and markers; Proper scheduling and provision of parking/waiting areas for vehicles; Implementation of traffic management plan in coordination with City traffic planning
Increase in noise level	**Insignificant negative**, long-term, manageable – local level	Request for zoning ordinance that would prohibit building of new houses and other noise sensitive facilities beyond the 65 dB contour line and construction of any new structures to be in accordance with ATO's regulations (incl. height restrictions in flight paths); Enforcement by ATO of aircraft noise abatement procedures (reduced thrust conditions on take-off and flaps setting on landing) and aircraft operating restrictions (no night operation and redesigned flight paths avoiding noise sensitive uses)

Impacts	Magnitude, time-scale and geographic extent of impact	Mitigation and Enhancement Measures
Generation of additional wastewater effluent	Insignificant negative, long-term, manageable – project site	Construction of centralized sewerage treatment plant
Generation of solid wastes	Insignificant negative, long-term, manageable – project site	Proper collection and disposal of solid wastes; Adherence to the methods of reducing waste generation
Improved airport utilities and facilities	Significant positive, long-term – local and regional site	Device regulations and programs that will further improve and streamline airport services; Proper maintenance of airport facilities to improve services
Increase in economic activities incl. additional income and benefits to local government	Significant positive, long-term – local and regional site	More jobs and livelihood activities Improve and accessibility of services
Increased commercial activities	Significant positive, long-term – local and regional site	More jobs and business in the area Improvement of transportation services shall encourage mobility and improve tourism and other related economic activities Develop tourism industry through development of other support services

7.3.2 Summary of Recommended EMP, Mitigation and Monitoring Measures

7.3.7 The EIS concluded that the environmental effects, as summarized above, can be mitigated and prepared an EMP identifying the actions required and their costs. A summary of the EMP included in the EIS is provided below.

7.3.8 Of the thirteen impacts requiring mitigation, the EIS estimated a cost, over and above the project development cost or costs already included in ongoing programs or activities of government agencies, for eight of the items. The total cost of mitigation, as set out in the EMP was estimated as PhP 350,000. An overall cost for monitoring of PhP 320,000/year was established as the minimum requirement in the EIS. This includes air quality, noise, and water quality monitoring during both the construction and operational phases.

7.3.9 A summary of the EMP is included as **Table 7.3.2-1**.

7.3.3 Summary of Conditions of Environmental Compliance Certificate

7.3.10 The conditions for the three airport subprojects are very similar and include the following items:

- Compliance with the EMP mitigation measures including noise, drainage, waste/sewage treatment and management, spoil handling and storage, traffic management, shore protection, silt and erosion control, and implementation of a safety and risk management plan;
- Memorandum of Agreement between proponent and landowners regarding land acquisition and resettlement, to be approved by EMB prior to any relocation. Livelihood development projects be implemented for all relocating households;
- Preparation and implementation of an information and education campaign on environmental issues and matters related to project construction and operation;
- Establishment of an Environmental Unit (EU) within the proponent/ implementing agency, responsible for environmental management and monitoring;
- Specific monitoring requirements including submission of an updated EMP with revisions of necessary, post-assessment permits are secured, compliance audits prepared every two years, and conducting detailed studies (noise and air quality) annually for the first five years;
- Establishment of an Environmental Monitoring Fund and an Environmental Guarantee Fund; and
- Establishment of a Multipartite Monitoring Team for external monitoring and to oversee compliance.

7.3.11 A copy of the ECC is attached as **Appendix B**.

7.4 Due Diligence Review of Proposed Investment

7.4.1 Purpose of Due Diligence Review

7.4.1 The main objectives of the due diligence review are:

- To determine whether there are any substantial or significant design modifications between the original proposal assessed in the EIS and for which an ECC has been granted and those proposed under ITDP and if so, whether they require additional environmental assessment;
- To determine whether baseline environmental conditions have changed since the preparation of the EIS;
- To review of the status of compliance by DOTC; and
- To assess whether the ECC conditions have been, are being, or can be, met by the implementing agency.

7.4.2 The methodology for the due diligence review included field investigations to verify that baseline environmental conditions have not changed, a reading and clear understanding of the EIS and ECC, undertaking of interviews with key personnel of the TADP Project Management Office of the DOTC and DENR-EMB, review of any monitoring reports, and an understanding of the activities and arrangements as proposed under ITDP for the subproject.

Table 7.3.2-1: Summary Environmental Management Plan

Impacts	Mitigation/ Enhancement Measures	Method of Implementation	Schedule and Frequency of Implementation	Responsible Party	Cost of Mitigation or Enhancement	Guarantee
CONSTRUCTION PHASE						
Generation of excessive particulate matter	Regular sprinkling of bare earth surfaces; Project cover to construction materials during delivery and storage; Excavated soil must be stockpiled to avoid particulate airborne; Proper maintenance of equipment	Provide water for spraying dust-generating areas Regular checking of equipment	Throughout construction phase	DOTC and Contractor	PhP 20,000.00	Compliance with ECC conditions
Increase in TSS/turbidity of surface water	Construction of temporary sediment traps and temporary drainage and diversion canals	Design and construct silt fences and traps	Throughout construction phase	DOTC and Contractor	PhP 80,000.00	Compliance with ECC Conditions
Noise level concentration	Maximize daytime period for construction and utilization of excessive noise-producing construction equipment; Night operations noise to be kept within permissible levels; Provision of ear mufflers for workers exposed to excessive noise; Proper maintenance of equipment	Inspection and regular maintenance of equipment		DOTC and Contractor	PhP 60,000.00	Compliance with ECC Conditions
Sanitary waste generation	Provision of portable toilets for workers at the construction site	Procure and install portable toilets	Throughout construction phase	DOTC and Contractor	PhP 50,000.00	Compliance with ECC Conditions

Impacts	Mitigation/ Enhancement Measures	Method of Implementation	Schedule and Frequency of Implementation	Responsible Party	Cost of Mitigation or Enhancement	Guarantee
Impacts on terrestrial ecology	Landscaping and re-vegetation	Landscaping and re-vegetation	Post-construction	DOTC and Contractor	PhP 10,000.00	Compliance with ECC Conditions
Increase in waste generation	Collection and delivery of debris to dumpsite; Establish and enforce solid waste management system	Design and implement waste management plan that adheres to proper guideline	Pre-construction to construction phase	DOTC and Contractor	PhP 50,000.00	Compliance with ECC conditions
Impact on health and safety	Require workers to use personal protective safety equipment; Implementation of health and safety program for workers Availability of first aid and medical attention in cases of accident or emergency	Personnel inspection, Design and provide guidelines on health and safety	Throughout construction phase	DOTC and Contractor	PhP 50,000.00	Compliance with ECC conditions
Land acquisition	Implementation of LARP; Strict compliance with compensation and rehabilitation measures as set out in Framework and LARP	Compliance with Framework and LARP; Monitoring	Before and during the project implementation	DOTC, Coordinating Committee	Included in the project cost	Compliance with ECC conditions and LARP
Traffic	Strict traffic enforcement within the construction area; Systematic scheduling of delivery of construction materials; Provision for traffic construction signs	Provide and implement traffic rules and regulations	Throughout construction phase	DOTC and Contractor	PhP 20,000.00	Compliance with ECC conditions

Impacts	Mitigation/ Enhancement Measures	Method of Implementation	Schedule and Frequency of Implementation	Responsible Party	Cost of Mitigation or Enhancement	Guarantee
Increase in livelihoods and employment opportunities	Priority hiring of local residents, esp. qualified workers; Include construction phase employment as part of LARP rehabilitation measures Implementation of Social Development Plan	Compliance with LARP	Throughout construction phase	DOTC, LGU, Contractor and Coordinating Committee	Included in DOTC/LGU program or included in Contractor's scope of work	Compliance with ECC conditions
OPERATION PHASE						
Air emissions	Proper maintenance of equipment used in operation; Strict implementation of traffic management; Coverage of cargoes during deliveries; Promote Clean Air Act provisions	Coordinate with the local government agencies to facilitate the implementation	Operational phase	DOTC and LGU	Part of project cost	MOA with local government

Impacts	Mitigation/ Enhancement Measures	Method of Implementation	Schedule and Frequency of Implementation	Responsible Party	Cost of Mitigation or Enhancement	Guarantee
Increase in noise level	Request for zoning ordinance that would prohibit building of new houses and other noise sensitive facilities beyond the 65 dB contour line and construction of any new structures to be in accordance with ATO's regulations; Assist the local government to apply for a land use conversion of the Master Plan impact area into an industrial area to conform with US FAA noise standards	Coordinate with the local government agencies to facilitate the implementation	Operational phase	DOTC and LGU	Part of project cost	MOA with local government
Solid waste generation	Regular collection/disposal of waste; Adoption of waste recycling and minimization program	Periodic inspection of disposal site and amount of waste to be disposed	Operational Phase	DOTC and LGU	PhP 40, 000.00	MOA with local government
Generation of liquid domestic waste	Construction of centralized wastewater treatment facility that shall treat domestic wastes prior to discharge	Incorporate as part of the engineering design	Operational Phase	DOTC and LGU	Part of development cost	Engineering design/Compliance to ECC conditions
Benefits to local economy incl. increase in local revenue	None required	None required	Operational Phase	DOTC and LGU	None	None

7.4.2 Results of the Due Diligence Review

7.4.3 There is one modification to the TADP's design proposed under ITDP; an expansion of the passenger terminal from 868 m2 to 1,332 m2. This is a minor change and has no substantive effect on the original assessment as presented in the EIS.

7.4.4 As noted in Section 7.2, the date of ECC issuance was 17 September 2002.

7.4.5 The ECC is valid until September 2007, after which time the same shall be revoked if construction has not commenced unless an extension from DENR has been sought.

7.4.6 The Butuan Airport subproject has not been implemented. The predicted impacts cannot occur if no preceding construction-related activity has taken place, therefore there are no impacts to mitigate at least in the context of the submitted EMP. In the case of documentary requirements like permits from other government agencies, the same are dependent on the subproject's actual implementation. Similarly, compliance with the ECC conditions is contingent on the construction activities which first have to take place.

7.4.7 The ECC stipulates some eight conditions. Two conditions; condition 4 and condition 5, contain several sub-conditions relating to mitigation and establishment of an Environmental Unit (EU). Two conditions (condition 3 and condition 4.2) will be covered by the LARP. All conditions remain as they stand and will be complied with upon commencement of subproject implementation.

7.4.8 Neither an EU nor a Multi-Partite Monitoring Team (MMT) have been established. This may be construed as a breach of the ECC conditions (condition 5 and condition 5.2) requiring that the DOTC set-up such groups. However, it can be argued that because the TADP was not progressed the EU and MMT have not been required, and therefore this requirement may be deferred until the implementation schedule of the ITDP is determined.

7.4.9 As noted above, the design changes made since the original subproject EIS was prepared and the existing ECC was issued, are minor, therefore the airport subproject does not require any additional environmental assessment for clearance by DENR.

7.4.10 The DOTC will need to inform the Regional DENR Office of the minor design modifications proposed for this subproject under the ITDP, without having to request an amendment to the ECC. As the subproject is to be implemented beyond the ECC validity period, a request for an ECC extension will need to be fielded by DOTC to the Regional DENR Office. Consultation with the DENR in Quezon City has now verified the applicability of the existing ECC and the need to request for an ECC extension for the subproject.

7.4.3 Outline of Procedure for Extension of ECC

7.4.11 In the case of the Butuan Airport subproject, DOTC may apply for relief from ECC commitment due to non-implementation of the TADP. The procedure is set out in the provisions of Chapter 8 of DAO 2003-30 Procedural Manual, which explain that a proponent is given the opportunity to seek relief from the requirement of, or continued compliance with, ECC commitments under the following circumstances:

- A project was not implemented;
- A project was issued ECC but has since been re-classified as Category D; and
- A project has been terminated (including projects that have been abandoned, completed, or decommissioned).

7.4.12 DOTC now wishes to pursue implementation of ITDP and its various subprojects under a new loan package, essentially creating the need for an extension of ECC validity and/or amendments to certain conditions thereof. Section 8.3 of DAO 2003-30 provides the parameters for amending an ECC. There are different levels of approval depending on the nature of the request:

- If modifications are required to the ECC, which is a project and location-specific document, because there are changes to; project location; major changes in process flow or technology to be used that may affect the validity of the EIS findings; or, baseline characteristics have changed significantly that the impact assessment (as embodied in the EMP) are no longer appropriate;
- Major modifications to the original proposal such as; expansion of land/project area; increase in production capacity; or, major change/s in process flow or technology to be used; and
- Minor modifications to the original proposal such as; extension of deadlines for submission of post-ECC requirements; extension of ECC validity; change in company name/ownership; decrease in land/project area or production capacity.

7.4.13 Indicated below is a procedural flow diagram for the processing of a request to amend an ECC.

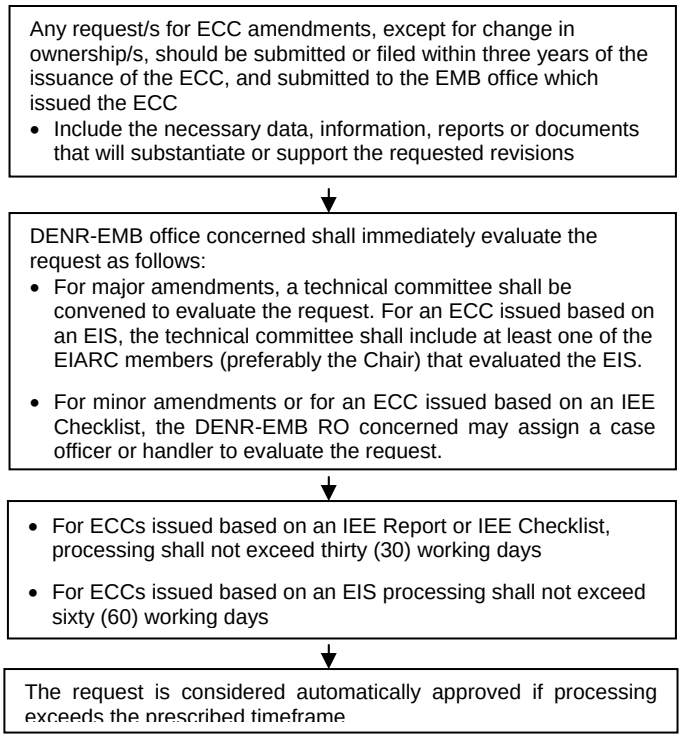


Figure 7.4.3-1: Amendment to ECC Request Procedure

7.4.14 The approximate cost of an amendment to an ECC is PhP 300 for a minor amendment and PhP 1,200 for a major amendment. The requested period of extension of ECC validity should not exceed three years and should be filed at least three months before the expiration of the ECC.

7.4.15 In the case of Butuan City Airport, the ECC was issued in 2002, and therefore the three year period within which extensions may be sought has past. However, there are several valid reasons for requesting a waiver of the foregoing (i) the subproject is an important component of an integrated transport development project, (ii) several ECCs will be sought for various subprojects under the project, and (iii) only one design modification is proposed to the original design for which the ECC was granted and this is minor and does not alter the findings of the already approved EIS or conditions attached to the ECC. It is therefore recommended that DOTC start consulting with DENR as well as DENR-EMB regarding the most appropriate process for requesting a waiver of the three year period for ECC extension request, and the type of documentation required to Support such an Application. Following DENR agreement to the process, Application for an extension of validity can be made in 2008, once the loan conditions have been agreed and the implementation schedule is known with more certainty.

7.4.16 The documentation supporting the request for extension would need to include a statement to the effect that the ECC needs to be valid for a further five years in order that the ECC covers the likely timeframe for commencement and completion of construction (including the possibility of some delay). Approval for ECC extension would need to be gained from DENR prior to start of construction, currently forecast for August 2009.

7.4.4 Recommended Measures to be Applied Under ITDP

7.4.17 The conclusion of the due diligence review is that neither the subproject description nor scope of work have changed substantively, only two minor design modifications are proposed under ITDP.

7.4.18 Based on the results of the due diligence review the following recommendations are made:

1. That DOTC advise DENR-EMB of the two design modifications, stating that these are minor in nature and do not change the impact analysis or conclusions of the EIS already submitted.
2. That DOTC apply for an extension of the validity period of the ECC once the overall timeframe for implementation and actual execution of the projects is determined (including design and construction timeframes).
3. That DOTC request a deferment of compliance with specific ECC conditions that have not been needed thus far because the overall project, and subsequently subproject, is still in the planning stages.
4. That compensation and relocation of the affected residents must be carried out strictly in accordance with the LARP in order to avert potential unrest and unnecessary uncertainty for the affected families.
5. That the DOTC establish the EU immediately upon loan agreement in order that the training and capacity building can be provided prior to the commencement of construction activities when the environmental management capability of DOTC

will be required. The EU should consist of at least four people, including a head of office and three staff. The functions of the EU will be to handle compliance with the ECC and other environment and safety related matters.

6. That DOTC allocate adequate and regular funding and resources required for the function of the EU and MMT. The appropriate budget must also be set aside for the establishment of the Environmental Guarantee Fund (EGF), and all other expenses relating to environmental management and compliance.

7. The total cost of mitigation and implementation of the EMP was estimated as PhP 350,000. The EIS was submitted in February 2002 and mitigation costs were based on 2001 prices. An inflation adjustment of 15 per cent plus a five per cent contingency should be included in the overall budget line for this item. Thus the costs associated with implementing the EMP for Butuan City airport will be in the order of PhP 420,000

8. An overall cost for monitoring of PhP 320,000/year was established as the minimum requirement in the EIS. The EIS was submitted in February 2002 and monitoring costs were based on 2001 prices. An inflation adjustment of 15 per cent plus a five per cent contingency should be included in the overall budget line for this item. Thus monitoring costs associated with Butuan City airport will be in the order of PhP 384,000.

7.5 Consultation, Disclosure and Social Acceptability

7.5.1 Consultation was undertaken during the preparation of the EIS, and has been fully documented in the EIS. Ongoing dialogue with the community, since that time, has focused primarily on land acquisition. As the two design modifications proposed under ITDP do not change the nature of the impacts or the overall conclusions of the EIS, additional consultation has not been required. The EIS includes a communications plan which will be implemented by DOTC upon commencement of subproject design.

7.5.2 The Accountability Statement and project endorsements obtained as part of the EIS consultation are included as an appendix to the report.

7.5.3 Disclosure will conform to the new *Public Communications Policy of the ADB: Disclosure and Exchange of Information (March 2005)* which requires that environmental assessment reports for ADB projects are accessible to interested parties and the general public. The draft IEEs and SIEEs prepared for subprojects will be uploaded on ADB website before appraisal[1].

7.5.4 A detailed description of the consultation, disclosure and social acceptability is contained in Volume V.

[1] The project's Resettlement Policy Framework and any resettlement plans prepared during the PPTA will also go through this process.

SECTION 8

Poverty and Social Impact Appraisal

8 POVERTY AND SOCIAL IMPACT APPRAISAL

8.1 Socio Economic Profile

8.1.1 The Butuan Airport subproject's Zone of Influence (ZOI) includes the entire CARAGA Region, which is composed of four provinces (Agusan del Norte, Agusan del Sur, Surigao del Norte, and Surigao del Sur) and two cities (Butuan City and Surigao City). The CARAGA Region has a total land area of 1,884,697 hectares which represents some 6.3 % of the country's total land area and 18.5 % of Mindanao. Butuan City is a part of the province of Agusan del Norte and serves as the capital and commercial center of the province as well as the regional center of CARAGA.

8.1.1 Population

8.1.2 From 1980 to 2000, the population of the CARAGA Region rose from 1,864,676 to 2,213,901 (**Table 8.1.1-1**) which represents an average annual growth rate of 1.7%.

Table 8.1.1-1: Population of the Philippines and CARAGA by Province and City, 1980 – 2000

Area	1990	1995	2000
Philippines	60,703,000	68,616,536	76,498,735
Caraga	1,864,676	2,047,596	2,213,901
Butuan City	227,829	247,074	267,279
Surigao City	100,379	104,909	118,534
Agusan del Norte	237,629	267,411	285,570
Agusan del Sur	420,763	514,736	559,294
Surigao del Norte	425,978	442,203	481,416
Surigao del Sur	452,098	471,263	501,808

Source of Data: 2002 Philippine Statistical Yearbook

8.1.3 The annual population growth rate of the CARAGA Region during the 1995 – 2000 period was 1.6 %, which is one of the lowest in the country, which had an overall annual population growth of 2.3 % (**Table 8.1.1-2**).

Table 8.1.1-2: Annual Average Growth Rate, Philippines and CARAGA, 1990 – 2000

	1990-1995	1995-2000	2000-2005
Philippines	2.3 %	2.4 %	2.3 %
CARAGA	1.8 %	1.6 %	1.7 %

Source of Data: 2002 Philippine Statistical Yearbook

8.1.2 Socio – Economic Profile

8.1.4 The regional economy is largely dependent on agriculture, fisheries and natural resource - based economic activities, particularly forestry and mining, as summarized in **Table 8.1.2-1**. Tourism plays an increasingly important role in the region's economy and increased at an annual rate of some 14.3 % from 1995 - 2003. Between the periods of 1999 - 2000, the annual gross domestic product of CARAGA increased at a rate of 5.4 % compared to the national average of 4.0.

Table 8.1.2-1: Summary of CARAGA Gross Regional Domestic Product (GRDP; in millions of Philippine pesos at constant 1985 prices)

	1997	1998	1999	2000	2001
1. Agriculture, Fishery and Forestry	5,442	4,334	4,724	5,044	5,091
Agriculture and Fishery		3,812	3,912	4,465	
Forestry		523	812	579	
2. Industry Sector	4,367	4,226	766	4,488	3,898
Mining and Quarrying	713	701	679	715	498
Manufacturing	1,553	1,519	350	1,357	1,333
Construction	1,729	1,041	332	1,978	2,067
Electricity, Gas, and Water	372	393	405	438	na
3. Services Sector	3,921	4,261	4,407	4,525	4,755
Transportation, Communication and Storage		244	255	274	
Trade		2,128	2,265	2,319	
Finance		93	95	97	
Ownership of Dwellings and Real Estate		576	586	596	
Private Services		316	328	340	
Government Services		904	878	899	
Gross Regional Domestic Product	13,730	12,821	12,897	14,057	13,744

Source: National Statistical Coordination Board (NSCB)

8.2 Poverty Issues

8.2.1 Several of the CARAGA provinces are included in the listing of the Philippine's poorest 44 provinces which is a common reference for measuring poverty at the provincial level. The unemployment level of Agusan del Sur province where the airport is located in 2000 was 19.8 % of the population and some 45.3 % of people lived below the year 2000 poverty threshold of PhP 10,575 per year.

8.2.2 As described in the ITDP Initial Poverty and Social Analysis provided in the 2nd Interim Report, it is difficult to derive accurate estimates of poverty benefits from the proposed airport subprojects because such facilities and air travel typically serve better off and higher income people and broader ZOIs. Poverty benefits can, however, be inferred from:

- Direct benefits from construction work provided by poor laborers. As summarized in **Table 8.2-1** these benefits over the estimated 2 year construction period may be in the range of 160 person-years of employment, involving an estimated total of US$ 1.5 million in wage earnings.

Table 8.2-1: Summary of Projected Direct Poverty Benefits from Construction Work Provided by Poor Labourers

Total Cost	US$ 14,967,596
Estimated Labor Share	0.10 %
Estimated Labor Cost	US$ 1,496,760
Estimated Poor Labor Share	0.30 %
Estimated Total Poor Labor Income	US$ 449,028
Average Length of Construction	2.5 years
Average Poor Wage Bill per Year	US$ 224,514
Average Annual Wage	US$ 1,400
Number of Poor Worker Jobs	80 jobs per year
Total Jobs for Poor Workers	160 person-years

- Indirect "multiplier benefits" benefits from the total wage injection into the communities surrounding the Butuan Airport, which are estimated to be 2 to 3 times as large as the initial total wage bill of US$ 1.5 million. At least 30 % of this induced income, or some US$ 450,000, may accrue to poor households based on the population profile of the ZOI.
- Direct benefits from improved / expanded air cargo handling capacities. Based on available data for 2005, over 85 % of the cargo carried out of Butuan Airport involved fresh / live marine fish, of which an estimated 400,000 kilos were shipped out. Air transport to market areas makes this is a high valued commodity, of which an estimated 30 % may be produced by poor fishermen. The value added by air transport to poor fishermen is estimated to be in the range of PhP 50 – 100 per kilo, total 2005 poverty benefits may be in the range of US$ 120,000 – 240,000.

8.2.3 The increased access, direct and indirect economic impact of the airport should help to address the alleviation of poverty, particularly through increased tourism to the province. **Table 8.2-2** summarizes some of the key types of expenditures and possible sources of poverty benefits from travellers and tourists passing through the Butuan Airport, which handled some 135,900 passengers in 2004. Average reported length of stay of non-resident visitors / tourists in CARAGA was 4 - 7 days.

Table 8.2-2: Summary of Key Types of Local Expenditures from April 2004 Surveys of Butuan Airport Users (sample size: 284 respondents)

Type of Reported Expenditure	Average Amount Reportedly Spent (PhP)
Accommodations (per day)	PhP 500 – 1,000
Meals (per day)	PhP 150 – 300
Transportation (per day)	PhP 200 – 500
Souvenirs (per visit)	PhP 500 – 1,000
Average Length of Stay in CARAGA	4 – 7 days

Source: Third Airports Development Project Feasibility Study, Butuan Airport, 2004.

8.3 Possible Interventions

8.3.1 No specific Poverty Alleviation Initiatives (PAIs) were identified for the proposed airport subprojects in accordance with the ITDP Initial Poverty and Social Analysis (IPSA) and the 2nd Interim Report. General consideration should be made to introducing poor farmers and fishermen to the potential benefits of shipping high-value products by air to new markets through project coordination with concerned government agencies, NGOs and other aid providers in these areas. The proposed types of airport subproject improvements are considered to be gender neutral and women were well represented and directly involved in the subproject evaluation and selection bodies and process. Based on passenger records, women are projected to comprise a significant proportion of the transport users and beneficiaries of the completed facilities.

8.4 Need for Land Acquisition and Resettlement

8.4.1 The need and status of land acquisition and resettlement is summarized in **Table 8.4-1**. These land acquisition and resettlement activities were conducted based on the 2002 Resettlement Action Plan (RAP) prepared by the DOTC and approved by the ADB for these previously proposed TADP investments.

8.4.2 In summary, land acquisition and resettlement is well-advanced with the noted exception of the needed re-alignment of an existing gravel road outside of the proposed new perimeter fence. This existing road provides access to a military hospital and adjacent buildings (**Figure 8.4-1**).

8.4.3 In addition to the requirements of the 2002 LARP, the Project Team prepared a Supplemental LARP (refer to Appendix Y of Volume V) to address the relocation of:

- Six structures (1,480 m2 of building area) belonging to the Philippine Army and local government;
- Three residential structures located inside the fence in the DVOR area; and
- 14 other structures which will need to be relocated on AFP property to allow realignment of the gravel barangay road with ample set-back from the perimeter fence.

Table 8.4-1: Summary Need and Status of Land Acquisition and Resettlement – Butuan Airport

1	**Status of Land Acquisition (sq. m.)**	
1.1	Total Land Area Required	74,865 sq. m.
1.2	Area Paid For / Acquired to Date	5,316 sq. m.
1.3	Area under Expropriation Proceedings	69,529 sq. m.
2	**Fencing Works to Protect Acquired Land**	Program of fencing works is 75 % complete and completion of the work is fully funded by the LGU
3	**Status of Structure Acquisition (% complete)**	
3.1	Percent complete - private structures	100 %
4	**Status of Resettlement (number of households)**	
4.1	Total Number of Households to be Resettled	111 households
4.2	Number of Households Resettled to Date	111 households
4.3	Remaining Number of Households to be Resettled	0 households
5	**Status of RAP Expenditures (PhP millions)**	
5.1	Original / Agreed RAP Estimated Budget	PhP 24.50 million
5.2	Actual / Revised Budget	PhP 22.08 million
5.3	RAP Expenditures to Date	PhP 21.08 million
5.4	Estimated Budget to Complete all RAP Activities outside TADP's currently available funds	PhP1.00 million
6	**Summary Results of Supplemental LARP**	
6.1	Additional Land Area to be Acquired (sq. m)	0
6.2	Additional Number of Structures to be Acquired	23
6.3	Additional Number of Households to be Resettled	14
6.4	Estimated Budget to Complete Supplemental LARP	PhP 15.21 million
7	**Summary Total of Remaining LARP Activities**	
7.1	Land Area under Expropriation Proceedings (sq. m)	69,529
7.2	Additional Land Area to be Acquired (sq. m)	0
7.3	Total Number of Structures to be Acquired	23
7.4	Total Number of Households to be Resettled	14
7.5	Estimated Budget to Complete All LARP Activities	PhP 16.21

Source: Third Airports Development Project (TADP) Project Management Office (PMO) and ITDP Supplemental LARPs

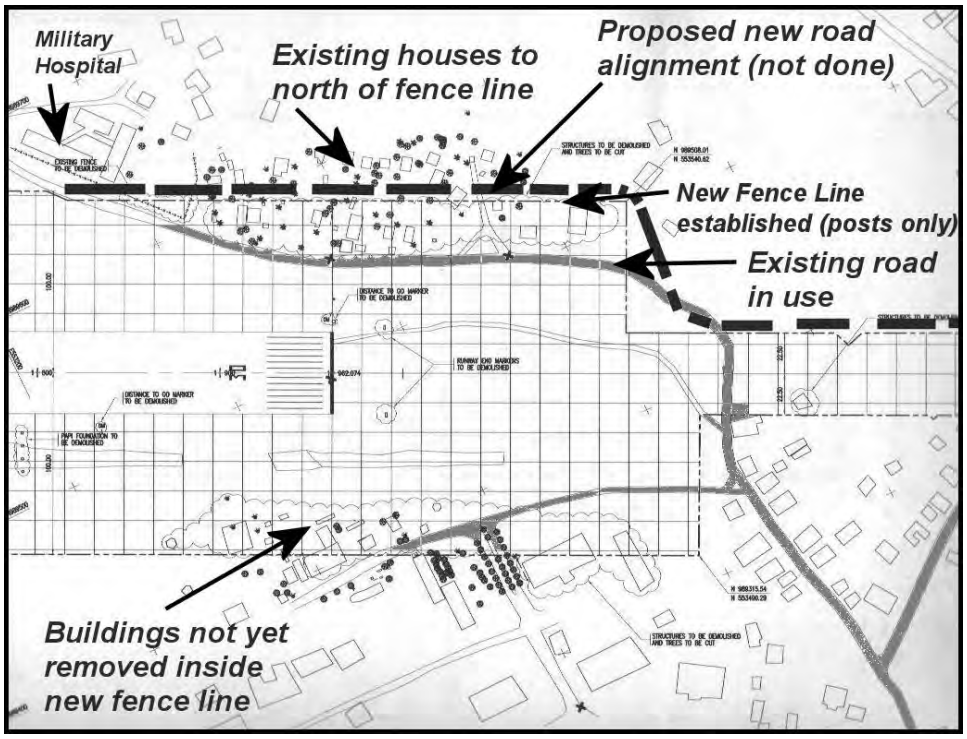


Figure 8.4-1: Location of Remaining Land Areas to be Acquired, Butuan Airport Subproject

8.5 Compensation Policy Framework

8.5.1 The ITDP Land Acquisition and Resettlement Policy Framework and Procedural Guidelines (LARPFPG) are provided in Volume VII, which includes the compensation policy framework. In summary, the objectives of this policy framework are:

- Providing for a proper and humane resettlement of informal settlers.
- Due compensation and other assistance to those families who will be displaced, when their houses will be demolished, or when their land will be acquired.
- Minimizing negative impacts as mush as possible.
- Carrying out the resettlement/compensation so as to improve or at least restore the APs pre-project living standards.
- Informing and consultation with Affected Peoples (APs) on compensation options and RAP design.
- Compensation rates of affected lands and structures in accordance with the ADB's policy and the country's relevant laws.
- Compensation for lost assets and subsidies prior to ground levelling and demolition.

8.5.2 To arrive at a Fair Market Value for land and Replacement Cost for structures, the DOTC had engaged the services of Private Appraiser (Cuervo Appraisers, Inc.) to provide an independent valuation of land and structures affected. Entitlement for compensation and

assistance to different categories of APs, which are defined as those who stand to lose, as a consequence of the project, all or part of their physical and non-physical assets as summarized in **Table 8.5-1**.

Table 8.5-1: Compensation Entitlement Matrix

Type of Loss	Application	Compensation
Residential / Commercial Land	Actual Area needed by the project and the remaining land is still viable for continued used. Remaining residential area not viable for continued used	Cash compensation equivalent to the reproduction / replacement cost ("market value") of the affected area.
Residential and Residential with Shop / Store	Main structure affected and the remaining portion not viable for continued use	Cash compensation equivalent to the reproduction / replacement cost ("market value") and subsistence allowance if business is loss and disturbance allowance equivalent to PhP 15,000
Independent Shops and/or Store	Main structure affected and the remaining portion not viable for continued use	Cash compensation equivalent to the reproduction / replacement cost and subsistence allowance
Other Fixed Structures	Partially or severally affected	Cash compensation equivalent to the reproduction / replacement cost.
Public Infrastructures and Other Assets	Partially or severally affected	Replacement of functional replication on a turnkey basis with temporary facilities during construction works.
Plants / trees	Partially or severally affected	Cash compensation at market value and sufficient time to harvest crops (or a minimum of 30 days notice)

SECTION 9

Management and Operation

9 MANAGEMENT AND OPERATION

9.1 Management and Operational Philosophy

9.1.1 Completed in 1992, the first Civil Aviation Master Plan (CAMP), which was funded by United Nations Development Program (UNDP) with the assistance of ICAO reviewed the then prevailing civil aviation policies and recommended necessary institutional reforms. It also focused on airport physical infrastructure and air traffic services and support facilities. After identifying short and long term investment requirements, it submitted for government consideration investment programs for the aviation sector.

9.1.2 Under TA No. 2559-PHI granted by the ADB, the 1992 Civil Aviation Master Plan (1992 CAMP) was revised and updated. CAMP II discussed the impact of air transport on the economy, analyzed the prevailing organizational and institutional arrangements in the aviation sector, addressed human resources issues, the financial issues and traffic demand, proposed policy and regulatory reforms and considered the potential role of the private sector. The plan also addressed airport development, air services networks and the Communication, Navigation and Surveillance (CNS)/Air Traffic Management (ATM) Systems. On infrastructure and service provision, it proposed the transfer of project planning and implementation functions from the DOTC to the ATO whose corporatization was then recommended as the most essential strategy in the institutional restructuring process. The corporatized ATO was envisioned to perform infrastructure and service functions.

9.1.3 The recently completed JICA *Airport Master Plan Study on the Strategy for the Improvement of National Airports in the Republic of the Philippines* analyzed the structure of the aviation sector in the Philippines, identified the problems of the sector, reviewed past studies and plans and made recommendations to improve the sector. Among the recommendations of the study is the restructuring of the aviation sector through the creation by law of two airport authorities – the Airport Authority of the Philippines (AAP) and the Civil Aviation Authority of the Philippines (CAAP). The restructuring is primarily aimed at ensuring the financial autonomy and financial viability of airport owners/ operators, thereby ensuring a steady and reliable source of funds to defray the costs of airport infrastructure development and construction, operation and maintenance. The proposed restructuring was based on the following criteria: a) financial autonomy; b) separation of regulatory and operation functions; c) financial sustainability of airport operators; d) financial sustainability of the civil aviation regulator; and separation of airport and air navigation services.

9.1.4 The civil aviation policy reform program and the attendant institutional strengthening initiatives are presented in full in Chapter 6 of the Main Report.

9.2 Requirements for Successful Private Sector Participation (PSP)

9.2.1 Most Governments have realized that airports, especially gateway airports, are critical to the attractiveness and the economic development of the country. Any country that wants to compete and be a part of the global economy has to improve the efficiency and effectiveness of the air sector. The development of airports has been identified as a key strategic step. Improving accessibility is the reason why airports are so important.

9.2.2 Airports need high levels of capital investment. This is a common factor for any country. Many countries have identified that they do not have sufficient capital for airport development as they have other demands on their financial resources. Despite this financial constraint, they have not lost sight of the potential benefits of not just developing but in fact "accelerating" their airport development programs, if they want to gain a "competitive edge".

9.2.3 Due to the strategic importance of the airport sector, many national governments have invested significantly in the gateway airports. Other countries have solved the financial constraint problem by inviting the private sector to invest the necessary capital and take out long term leases or other PSP arrangements so that the private sector can enjoy a capital return over time. These governments know they are missing out on certain direct airport revenues by doing this, but they also know that they save capital and it is the Government getting the substantial and accelerated "indirect" benefits that airport development brings.

9.3 Options for PSP

9.3.1 The legal and institutional framework for PSP and Public-Private Partnership (PPP) is provided by Republic Act No. 7718, An Act Amending Certain Sections of Republic Act No. 6957, Entitled An Act Authorizing Financing, Construction, Operation and Maintenance of Infrastructure Projects by the Private Sector, and for other Purposes. The Act's implementing rules and regulations, establishes the legal framework for private sector participation in infrastructure and development projects normally financed and undertaken by the Government.

9.3.2 The eligible types of projects for Build-Operate-Transfer (BOT) include construction, rehabilitation, improvement, betterment, expansion, modernization, operation, financing and maintenance of the many types of projects which are normally financed and operated by the public sector which will now be wholly or partly financed, constructed and operated by the private sector, including transport infrastructure and development projects as may be authorized by the appropriate agencies provided that such projects have a cost recovery component which covers at least 50% of the project cost.

9.3.3 For all such PSP projects, a realistic appreciation of the willingness of the private sector to participate in these subprojects has to be considered. Where private sector participation is initially difficult to implement, it might be possible to take a first step towards privatization through creating a state-owned enterprise or strengthen an existing one. If commercial practices are followed by this organization over a period of time and the revenue streams are good, it could be privatized on a competitive tender basis.

9.3.4 Over the years, the decline in private sector interest is widely observed in many parts of the world. The Public-Private Infrastructure Advisory Facility (PPIAF) of the World Bank reported that the decline is an international trend and is brought about by several underlying factors: the more developed middle-income countries had reached the end of the private participation cycle; the financial crises during the '90s brought about a climate of uncertainty; and controversial transactions highlighted the complex political economy of private involvement in infrastructure. The last explanation for investment decline is particularly relevant to the Philippines.

9.4 Historical PSP

9.4.1 The Philippines has had successes in attracting private sector investment in what had previously been considered public infrastructure, especially in the early 1990s in the power sector. The transportation sector has been spotty in achieving completed infrastructure projects with private participation, although there have been some successes. Such successful arrangements, however, have been structured at the cost of large government subsidies or contingent liabilities.

9.4.2 Because the government has been unable to raise revenues for infrastructure investments, it relied on private sector participation in the sector, especially in the power and energy and transport sectors. The biggest private expenditures on infrastructure were in telecommunications, roads and transport in 1994 and in water resources development and flood control in 1997. The private sector also made substantial investments in power and energy in response to the power crisis in the early 1990s. Unfortunately, private sector participation in infrastructure seems to have waned as an aftermath of the 1997 Asian financial crisis and the lack of confidence in the Philippine economy.

9.4.3 Some progress has been achieved in setting new procedures to facilitate transactions and establishing acceptable criteria for risk allocation. However, the recent judicial interventions on power projects and the pure BOT arrangement for the NAIA International Passenger Terminal 3 Project has severely discouraged infrastructure investors, and posed a major challenge to the Government in creating a rational environment to promote successful PPP initiatives.

9.4 Recommended PSP Components

9.5.1 Based on recent experience in the Philippines, and considering the perceived investment climate in Mindanao due to peace and order "problems", the investment by the private sector in basic infrastructure such as a runway and air navigational facilities for an airport is not a realistic assumption to make. Importantly, the relatively low volumes of traffic that exist at most of the subproject airports do not justify the investment and the user charges that would have to be collected fall far short of the amount needed to obtain a reasonable rate of return, say, 20 percent for the private sector.

9.5.2 Therefore, no new PSP components are expected for the Cotabato Airport, except the continued concessioning of commercial areas within the airport complex and mainly within the passenger and cargo terminal buildings.

SECTION 10

Project Costs

10 PROJECT COSTS

10.1 Introduction

10.1.1 The Project cost estimates include all categories of expenditures that are expected to be incurred in connection with the implementation of a project. These are (a) the investment or development costs and (b) the operating and maintenance (O&M) costs. The investment or development costs refer to expenditure requirements that attend the investment phase of the project while O&M costs are expenses that accompany the operation of the project facility after its completion.

10.1.2 The detailed description and the derivation of the related estimates of the various expenditure items that comprise the project investment costs corresponding to the scope of the works as identified in Section 6 above, including the subsequent O&M cost requirements for the operation of the facility are presented and discussed in the following sections.

10.2 Investment Costs

10.2.1 Investment or development costs cover all project development related expenses and include costs for the following:

(a) The cost of construction of all civil works, building components and equipment identified earlier in Section 6 as part of the scope of the proposed development works, including the supply and installation costs of airfield lighting, navigational facilities and air traffic control systems. This will include the cost of construction materials, equipment, labor and other related inputs required for the execution of the works and will involve both local and foreign currency costs.

(b) The cost of the procurement and installation of airport equipment identified as part of the scope of the development works under Section 6 above. This cost mostly consists of foreign currency costs (90%). Together, the civil works and equipment costs are the base costs.

(c) The cost of consulting services for the preparation of the detailed engineering design, specifications and tender documents, assistance in tendering and construction management and supervision.

(d) The cost of additional land acquisition and resettlement representing the remaining land to be expropriated, relocation/replacement of structures since the TADP and other payments to affected persons as detailed in Section 8.4;

(e) The cost of project administration expenses of the Government, which covers the operation and maintenance of the project management office, created to supervise the day-to-day management of the project.

(f) The cost of taxes and duties prescribed under applicable local revenue regulations that are expected to be imposed during the implementation of the Project, which include the Expanded Value-Added-Tax (EVAT) and duties on imported items. These are denominated solely in local currency; and

(g) The cost of physical contingencies to cover possible upward adjustments in the quantities and unit costs of local and foreign currency costs.

10.2.2 In the estimation of the costs corresponding to each of the expenditure items described in the foregoing, the following parameters and assumptions were adopted:

(a) The unit costs used to estimate the base costs for the civil works and building components, as well as the acquisition of all related airport equipment were estimated by using the unit rates and prices of work items as derived under the SPADP feasibility study report (2004 price levels) and adjusted to March 2006 prices using the General Construction Price Indexes published by the National Statistics and Coordination Board (NSCB). The resulting unit rates and prices were then applied to the items of work that comprise the scope of the developmental works for civil works and buildings, as well as airport equipment identified in this Study. Relevant equipment required for incorporation in the permanent works includes related Airfield Ground Lighting (AGL) facilities, Navigational Aids (NavAids) and Air Traffic Control (ATC), communications and meteorological facilities. Labour cost is taken to be 30% of the estimated total cost of the works, and with unskilled and skilled labour having share of 20% and 10% of the total cost of the works, respectively. Moreover, owing to the fact that detailed engineering design plans and specification have already been prepared under the TADP, the breakdown of the local and foreign currency requirements of the base costs of construction that were arrived at under the TADP shall be adopted for the purpose of this Study. In accordance with the latest version of the "Master Budget" prepared under the TADP in August 2001, the breakdown of the local and foreign currency costs for the base cost of construction is taken at 45% and 55% on the average of the total cost of the works, respectively. On the other hand, all related airport equipment (i.e., AGL facilities, NavAids, ATC, communications and meteorological facilities, airfield maintenance equipment and crash, fire fighting and rescue vehicles) are assumed to be 90% imported abroad.

(b) The costs of consulting services, for purposes of budgetary estimates, shall not exceed the maximum allowable fee prescribed under the NEDA "Guidelines on the Procurement of Consulting Services for Government Projects", which are six percent (6%) for detailed engineering design and ten percent (10%) for construction management and supervision. The costs of consulting services were derived separately as a package for all subprojects and described in the main volume. The local and foreign currency requirements are taken at fifty percent (50%) and fifty percent (50%) of the cost of detailed engineering services and cost of management and supervision services.

(c) The cost of project administration is estimated at three-and-a-half percent (3.5%) of the estimated total base cost, and shall be paid purely in local currency.

(d) A twelve percent (12%) EVAT was applied to all expenditure items (except the land acquisition and resettlement costs and project administration cost). An additional three percent (3%) duties/tariff on all imported items was added. All taxes and duties are to be paid in local currency.

(e) The cost of physical contingencies is valued at seven percent (7%) of all costs associated with the project.

10.2.3 A summary estimate of the total investment cost requirements for the proposed project in terms of the expenditure items earlier discussed based on the foregoing parameters and assumptions is presented in **Table 10.2-1** below. A more detailed presentation of the estimates of the base cost of civil works and building construction and the acquisition of airport equipment is provided in **Appendix C**.

Table 10.2-1: Estimated Total Project Cost - Butuan Airport (PhP'000)

Project Component			Project Cost, PhP'000		
			Local Cost	Forex Cost	Total
1.	**Civil Works, Buildings & Intermodal**		**275,878**	**500,690**	**776,568**
	a.	Materials	193,115	500,690	693,805
	b	Labor	82,763	0	82,763
		i. Skilled	27,588	0	27,588
		ii. Unskilled	55,176	0	55,176
2.	**Airport Equipment Packages**		**3,781**	**34,030**	**37,811**
	a.	Maintenance	246	2,214	2,460
	b.	Crash, Fire Fighting and Rescue	3,535	31,816	35,351
3.	**Consulting Services**		**20,111**	**20,111**	**40,221**
4.	**Land Acquisition & Resettlement**		**16,210**	**0**	**16,210**
5.	**Project Administration (DOTC/ATO)**		**22,802**	**5,701**	**28,503**
6.	**Taxes and Duties**		**103,686**	**0**	**103,686**
5.	**Physical Contingencies**		**30,973**	**39,237**	**70,210**
Total			**473,441**	**599,768**	**1,073,209**

10.3 Operating and Maintenance Costs

10.3.1 In the estimation of the O&M cost requirements that are expected to ensue during the operation of the project, the following assumptions that were considered under the feasibility study conducted for the SPADP, which were arrived at in consultation with the concerned airport management, shall be adopted for the purpose of this Study:

(a) Additional personnel shall be required for the operation of the improved airport, which will result to a fifty percent (50%) increase in the cost of personnel services from the 2006 level of PhP 11,769,000. The annual increase in personnel services cost is estimated at 2% p.a., which is about 25% of the annual passenger growth rate of 7.0% for Butuan Airport. However, no increases in annual personnel costs starting 2020 are assumed when the apron and terminal capacities would have been reached;

(b) Other operating expenses, such as the cost of utilities, office supplies, etc., are taken collectively to be equal to twenty percent (20%) of the cost of personnel services at the start of project operation. These are based on earlier estimates under the TADP; and

(c) The cost of maintenance for buildings, other civil work components and equipment is estimated at 1% of the total project cost of PhP 1.08 billion, which is based on ICAO airport planning guidelines. These are expected to increase by 2% every year following historical trends for ATO-operated airports until 2020 when the apron and terminal capacities would have been reached.

10.3.2 **Table 10.3-1** below shows a summary of the total O&M cost requirements with the project starting its operational stage (Year 2012) based on the above parameters and assumptions. Note that the years when airport apron and terminal congestion without and with the Project were forecasted to be 2009 and 2020, respectively.

Table 10.3-1: Estimated Airport Operating and Maintenance Costs (PhP'000)

Year	Incremental O&M Costs with Project				Projected O&M Cost without Project	Total O&M Cost with Project
	Personal Services	Other Operating Costs	Maintenance	Total		
2012	4,350	870	10,732	15,952	12,449	28,401
2013	4,437	887	10,947	16,271	12,449	28,720
2014	4,526	905	11,166	16,597	12,449	29,045
2015	4,616	923	11,389	16,928	12,449	29,377
2016	4,709	942	11,617	17,267	12,449	29,716
2017	4,803	961	11,849	17,612	12,449	30,061
2018	4,899	980	12,086	17,965	12,449	30,413
2019	4,997	999	12,328	18,324	12,449	30,773
2020	5,097	1,019	12,574	18,690	12,449	31,139
2021	5,097	1,019	12,574	18,690	12,449	31,139
2022	5,097	1,019	12,574	18,690	12,449	31,139
2023	5,097	1,019	12,574	18,690	12,449	31,139
2024	5,097	1,019	12,574	18,690	12,449	31,139
2025	5,097	1,019	12,574	18,690	12,449	31,139
2026	5,097	1,019	12,574	18,690	12,449	31,139
2027	5,097	1,019	12,574	18,690	12,449	31,139
2028	5,097	1,019	12,574	18,690	12,449	31,139
2029	5,097	1,019	12,574	18,690	12,449	31,139
2030	5,097	1,019	12,574	18,690	12,449	31,139
2031	5,097	1,019	12,574	18,690	12,449	31,139

10.3.3 The operation and maintenance cost without the Project is estimated at PhP 12.4 million, which is the escalated 2009 figure using the historical average annual growth rate of 1.8% from 2006 (PhP 11.8 million). As noted in Sections 4.3 and 6.7, the maximum passenger and aircraft traffic that could be served are equivalent to the 2009 forecasted traffic. With the Butuan Airport reaching capacity limits by 2009, there would be no additional air traffic, even during the off-peak times.

10.3.4 With the Butuan Airport improvement, the operation and maintenance cost will increase from PhP 11.8 million in 2006 to PhP 28.4 million in 2012 when the Project is completed. The incremental O&M cost would increase from PhP 16.0 million in 2012 to PhP 18.7 million in 2020. Thereafter, since the airport would have reached its revised design capacity (Section 6.7), the O&M cost would be held constant until further improvements and capacity upgrades are undertaken outside of the proposed ITDP loan.

SECTION 11

Project Implementation and Disbursement Schedules

11 PROJECT IMPLEMENTATION AND DISBURSEMENT SCHEDULES

11.1 Project Implementation Schedule

11.1.1 The various works that comprise the scope of the project shall be implemented under three (3) contact packages, as follows:

(a) Consulting Services;

(b) Civil Works and Buildings; and

(c) Airport Maintenance and Rescue and Fire Fighting Equipment.

11.1.2 The relevant equipment required for incorporation in the permanent works consisting of related Airfield Ground Lighting (AGL), Navigational Aids (NavAids) and Air Traffic Control (ATC), communications and meteorological facilities shall be included and form part of the civil works and buildings contract package.

11.1.3 The Project will be implemented over a period of four (4) years and six (6) months starting from the sector loan date of effectivity. The estimated time durations for each milestone activities relative to the implementation of the project are given in the table below:

Table 11.1-1: Estimated Time Durations per Milestone Activity

Milestone Activity	Estimated Time Duration
• Detailed Engineering Design Works	9.2 months
• Tendering and Contract Award	10.7 months
• Contract Execution/Completion	24.4 months

11.1.4 The detailed engineering design works is expected to commence by May 2008 and the completion of the works is targeted by the end of April 2012.

11.1.5 The project implementation schedule in the form of a bar chart is given in **Figure 11.1-1** below:

Figure 11.1-1: Implementation Schedule for Butuan Airport

Activity	Timeline Schedule
1. Engineering Design	→ (9.2 mos., May 2008 – February 2009)
2. Tender & Award	→ (10.7 mos., February 2009 – January 2010)
3. Contract Execution	
a. Civil Works & Bldgs.	→ (24 mos., Jan 2010 – Jan 2012)
b. Rescue & Fire Fighting	→ (10 mos., March – December 2011)
c. Maintenance Equip't	→ (6 mos., July – December 2011)

11.2 Project Financing Plan

11.2.1 The estimated total investment cost amounting to PhP1.08 billion, excluding price contingencies and financial charges during construction, is proposed to be financed through a mixture of local/Government funds and loan assistance from the Asian Development Bank (ADB).

11.2.2 Under the proposed arrangement, the Government of the Philippines, through the Department of Transportation and Communications/Air Transportation Office (DOTC/ATO) as the lead Executing Agency, shall finance only the costs of project administration and all applicable duties and taxes. ADB on the other hand is expected to provide financing for all the identified developmental works, as follows:

(a) Cost of consulting services for engineering design and construction supervision works;

(b) Cost of the civil works and buildings components, which includes airport equipment for incorporation into the permanent works consisting of related AGL, NavAids and ATC, communications and meteorological facilities; and

(c) Cost of airport equipment consisting of maintenance equipment and Rescue and Fire Fighting vehicles.

11.2.3 Overall, ADB will be financing 65% of the estimated total project investment cost. This will mean that the proposed ADB loan will likewise be used to finance the local currency cost requirements of the project, except the costs of project administration and applicable duties and taxes.

11.2.4 The proposed financing plan with a breakdown of the estimated total project investment cost by funding source following the arrangement cited in the above is shown in **Table 11.3-1**.

11.3 Annual Project Cash Disbursement Schedule

11.3.1 The estimated annual cash disbursement requirements of the Project consistent with the proposed implementation schedule and broken down by local and foreign currency components are provided in **Table 11.3-1**.

Table 11.3-1: Cash Disbursement Schedule (PhP'000)

Cost Component	2007		2008		2009		2010		2011		Total	
	Local	Forex	Local	Forex	Local	Forex	Local	Forex	Local	Forex	Local	Forex
1. Land Acquisition / Resettlement	16, 210	0									16, 210	0
2. Consulting Services			5,028	5,028	5,028	5,028	5,028	5,028	5,028	5,028	20,111	20,111
3. Civil Works and Bldgs							400,242	489,185	600,363	733,777	350,242	428,073
4. Airport Equipment									3,781	34,030	3,781	34,030
5. Project Administration			5,713	1,428	5,713	1,428	5,713	1,428	5,713	1,428	22,851	5,713
6. Taxes & Duties			1,207	0	1,207	0	40,593	0	60,890	0	103,896	0
7. Physical Contingencies	1,135	0	836	452	836	452	13,400	12,438	19,989	20,813	36,196	34,155
Total	17,345	0	12,783	6,908	12,783	6,908	204,830	190,123	305,545	318,143	553,287	522,081
Total Project Cost											**1,075,368**	

SECTION 12

Financial Analysis and Evaluation

12 FINANCIAL ANALYSIS AND EVALUATION

12.1 Methodology and Approach

12.1.1 Financial analysis, as one of the criteria for decision-making, determines the revenues to be generated to cover the capital cost and operation and maintenance costs to be incurred by the project. Financial analysis is undertaken on the total project/investment point-of-view (all-capital/cost approach) as well as from the viewpoint of the government agency concerned. The total project/investment point-of-view examines the returns on the total invested capital and from the amount of funds (equity) invested by the agency or Government itself. It evaluates whether or not financial receipts generated from the Cotabato Airport operations are adequate to cover the investment and operational and maintenance expenditures.

12.1.2 The Financial Internal Rate of Return (FIRR) is estimated using the "with" and "without" subproject comparison. The major assumptions are:

- financial analysis to cover a period of 20 years from the start of operation is based on costs and revenues at constant March 2006 prices;
- capital costs include all incremental capital expenditures associated with the airport, including taxes and physical contingencies, but not interest during construction and price escalation;
- projected traffic growth attributable to the subproject is as presented in Section 4; and
- airport tariffs and charges are based on the prevailing fee structure of Manila International Airport Authority (MIAA) and Subic Bay Metropolitan Authority (SBMA).

12.1.3 The main indicator of financial viability for this airport project is the FIRR. This indicator is computed by considering only the incremental costs and revenues due to the implementation and operation of the project. For purposes of the financial analysis, the prevailing MIAA/ Mactan Cebu International Airport Authority (MCIAA)/ SBMA tariff rates as applied to the total expected traffic were taken to estimate the incremental revenues. The project will be viable if the computed FIRR is at least equal to the Weighted Average Cost of Capital (WACC) of 7.4% as determined for the project (refer to Section 12.4.1). Capital costs will be financed by an ADB sector loan (65%) carrying an interest rate of 6% p.a. and the Government counterpart funds with cost of capital of about 10% p.a.

12.1.4 At the present tariff levels, even those of international airport authorities, airport projects are not financially viable. The sensitivity analysis is undertaken to test the effects of possible unfavourable scenarios with respect to changes in the main parameters that determine subproject costs and revenues. These scenarios include the levels of tariff increase to cover the capital cost and the operating and maintenance costs (break-even analysis).

12.2 Present Financial Performance of the Airport

12.2.1 Existing Level of Airport Charges

12.2.1 The prevailing level of airport charges is as prescribed by Department Order (DO) 99E-002 effective January 1, 1999 for air navigation facilities and D.O. 98-1178 effective 1997 for other fees and charges (**Table 12.2.1-1**). As noted by the JICA National Airport Master Plan, airport tariffs would need to be revised to achieve full cost recovery for provision of airport services. For purposes of the financial evaluation, the higher tariff charged at MIAA, MCIAA and SBMA are assumed to be allowed by a corporatized ATO (**Appendix E**).

Table 12.2.1-1: ATO and Assumed Schedule of Fees and Charges

Fees and Charges	ATO Charges	Based on MIAA, MCIAA and SBMA Charges
1. Air Navigational Charges	½ of the charge in US$ or its peso equivalent is equal to the distance flown by an aircraft in km divided by 100 and multiplied by the aircraft weight factor Ave. PhP P600/arrival or departure	Foreign aircraft-$225/arrival or departure Domestic aircraft-PhP1000/arrival or departure
2. Landing and Take-off Fees	For Alternate International Airports: PhP 70.00/1,000 kgs. or a fraction thereof upto160,000 kgs and PhP 50.00/1,000 kgs or a fraction thereof in excess of 100,000 kgs For National Airports: PhP 55.00/1,000 kgs, (PCC paved runway) PhP 45.00/1,000 kgs (AC paved runway)	Foreign aircraft – Ave. $4/ton or PhP 208/ton Domestic aircraft – PhP 53.74-PhP 101.72/ton
3. Aircraft Parking Charges	First hour free of charge, additional fee of 10% of landing fees for every additional 15 minutes	Beyond one hour free period: Foreign aircraft-$3-21 per 30min Domestic-Ave. PhP 195.5 per 30min
4. Passenger Service Charge	PhP P40 per departing passenger	Foreign- PhP 550/passenger Domestic- PhP 200/passenger
5. Rental of Floor Space	P50/sqm/month	PhP 150-250/sqm/month
6. Rental of Land Space	Developed area – PhP 10.00/sq.m./month Undeveloped area – PhP 5.00/sq.m./month	Developed area – PhP 50/sqm/mo Undeveloped area – PhP 25/sqm/mo

Table 12.2.1-1: ATO and Assumed Schedule of Fees and Charges (Continuation)

Fees and Charges	ATO Charges	Based on MIAA, MCIAA and SBMA Charges
7. Concession Privilege Fee	Passenger service – PhP P200.00 to PhP 600.00/month Food service – PhP 100.00 to PhP 450.00/month Transportation utilities – PhP 150.00/month Miscellaneous business – PhP 50.00 to PhP P300.00/month	Passenger service – PhP 1000/mo Food service – PhP 1,000/mo Transport service – PhP 500/mo Other business – PhP 800/mo
8. Advertising	Lighted signboards or displays – PhP 60.00/sq.m./month Unlighted signboards or displays – PhP 40.00/sq.m./month Circulars and posters – PhP 30.00/sq.m./month	PhP 250/sqm/mo PhP 100/sqm/mo PhP 50/sqm/mo
9. Aviation, Fuel, Oil and Lubricant Services	Royalty fee: Aviation fuel – PhP 0.03/liter Oil – PhP P0.07/liter Grease – PhP 0.06/100 gram	PhP 0.50/liter
10. Other Fees and Charges	Utilities and other services: Average – PhP 100.00/month/concessionaire	PhP 500/month/concessionaire

12.2.2 Historical Level of Incomes and Expenditures

12.2.2 Airport revenues at Butuan Airport for the past six (6) years have declined by about 30% from P8.4 million in 2000 to PhP 5.86 million in 2006 with an average negative growth rate of 6.2% per year (**Table 12.2.2-1**). On the other hand, operating expenditures increased from PhP 8.88 million to PhP 11.77 million for the same period or an average annual growth rate of 4.8%. In 2005, personal services accounted for 78.8% of total expenditures, with the rest comprised of repair and maintenance costs and other operating expenses (supplies, utilities, and miscellaneous expenses).

12.2.3 Butuan Airport's financial performance has been deteriorating since 2000. For 2005, the national government provided operating subsidy of about PhP 5.7 million.

Table 12.2.2-1: Income and Expenditure Statement, Butuan Airport, 2000-2006

Income and Expenditure Statement, Butuan Airport (2000-2006), '000 Pesos

	2000 Actual	2001 Actual	2002 Actual	2003 Actual	2004 Actual	2005 Estimated	2006 Proposed
1. Airport Revenue							
Aeronautical Charges							
Landing and Takeoff Fees	5,319.00	6,100.00	3,582.00	1,618.21	2,053.15	2,161.97	2,659.22
Terminal Parking Fees	366.00	792.00	219.00	63.62	0.00	0.00	0.00
Lighting Charges							
Air Navigational Charges	623.00	3,789.00	2,751.00	989.68	1,317.37	1,387.19	1,347.67
Sub-Total	6,308.00	10,681.00	6,552.00	2,671.51	3,370.52	3,549.16	4,006.89
Passenger Service Charges							
Passenger Terminal Fees	2,087.00	1,894.00	1,480.00	1,816.76	2,040.99	1,768.70	1,857.12
Aviation Security Fees[(1)]							
Sub-Total	2,087.00	1,894.00	1,480.00	1,816.76	2,040.99	1,768.70	1,857.12
Airport Business Revenues							
Water/Electric/Telephone							
Rental of Floor Areas							
Rental of Land Area							
Concession Privilege Fees							
Vehicle Parking Fees							
Royalties for Aviation Fuel							
Advertising Fees							
Sub-Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Airport Revenues	8,395.00	12,575.00	8,032.00	4,488.26	5,411.51	5,317.85	5,864.01
2. Airport Expenditure							
Personal Services	7,879.41	7,234.08	7,883.19	9,131.13	9,794.72	8,666.01	8,666.01
Maintenance and Other Operating Expenses	1,003.00	1,003.00	2,817.40	3,117.21	3,552.10	2,333.21	3,103.17
Total	8,882.41	8,237.08	10,700.59	12,248.34	13,346.83	10,999.21	11,769.17
3. Profit (Loss)	(487.41)	4,337.92	(2,668.59)	(7,760.07)	(7,935.32)	(5,681.36)	(5,905.16)

12.3 Impact of the Project on the Finances of the Airport

12.3.1 Capital Investment

12.3.1 The project's main investment components are the civil works, buildings, airport equipment, engineering studies, construction supervision, physical and price contingencies, financing charges during construction, taxes, additional land acquisition/ resettlement and project administration. The estimated total investment cost amounted to PhP 1.075 billion (Table 10.2-1), excluding financial charges and price contingencies, will be financed through a mixture of foreign loan and government equity as presented in Section 10.2.

12.3.2 Projected Incremental Expenditures

12.3.2 Personnel expenses and other operating expenses, such as repair and maintenance, supplies and utilities, dominate the Airport's cost structure. The cost of personal services in the "with project" scenario will increase due to the additional airport personnel needed for the expanded facilities. This would result to an increase in personnel cost by about 50% from the 2006 cost for personal services. The incremental operation and repair and other O&M costs were earlier presented in Table 10.3-1.

12.4 Financial Viability of the Project

12.4.1 Weighted Average Cost of Capital

12.4.1 Based on current borrowings and loan interest rates of ADB (6% p.a), the coupon rates of the 10-year Philippine treasury bonds issued in February 2006 (10% p.a.) and financing ratio of 65:35, the weighted average cost of capital is estimated at 7.4% p.a.

12.4.2 Airport Revenues

12.4.2 Incremental airport revenues were calculated based on the incremental forecasted traffic (passengers, cargo flows, aircraft movements) and the prevailing schedule of airport fees of MIAA, MCIAA and SBMA (Table 12.2.1-1 and detailed in **Appendix D**). These rates are higher than those currently charged at ATO-operated airports. The airport operating data during the evaluation period of 2012 to 2031 are presented in **Table 12.4.2-1** below.

Table 12.4.2-1: Projected Operating Performance, 2012-2031

	2012	2015	2020	2025	2031
Incremental Aircraft Movements					
Domestic (Refer to Annex 1)-Departures only	364	728	1,300	1300	1300
A330 (PAL)	0	0	0	0	0
A320 (PAL)	364	364	728	728	728
A319 (CPAir)	0	0	364	364	364
B737 (Air Phils)	0	0	-156	-156	-156
Bae 146 (Asian Spirit)	0	364	364	364	364
Dornier 328	364	364	0	0	0
LET 410	-364	-364	0	0	0
General Aviation	50	87	147	147	147
Incremental No. of Aircraft Parking					
Domestic					
A330 (PAL)	0	0	0	0	0
A320 (PAL)	73	73	146	73	73
A319 (CPAir)	0	0	73	73	73
B737 (Air Phils)	0	0	-31	0	0
Bae 146 (Asian Spirit)	0	73	73	73	73
Dornier 328	73	73	0	73	73
LET 410	-73	-73	0	73	73
Incremental No. of Aircraft (Night Operations)					
Off-peak A320 flight	364	364	364	364	364
Incremental Passenger Traffic					
International	0	0	0	0	0
Domestic	43,569	91,595	196,484	196,484	196,484
General Aviation	150	260	440	124	124
Departing Passengers					
Domestic (50% departures)	21,784	45,798	98,242	98,242	98,242
GA (46.2% departures)	69	120	203	57	57

12.4.3 **Table 12.4.2-2** indicates the estimates of airport revenues associated with the Butuan Airport improvement (with Project scenario).

Table 12.4.2-2: Projected Airport Revenues for Butuan Airport

Income and Expenditure Statement, Butuan Airport (2012-2031), '000 Pesos

Revenue Source	2012	2015	2020	2025	2031
1. Incremental Airport Revenues					
Aeronautical Charges	2,117.87	2,524.39	6,192.99	6,192.99	6,192.99
Landing and Takeoff Fees (Refer to Annex E)					
Domestic	159.73	599.53	3,540.67	3,540.67	3,540.67
General Aviation	2.69	9.32	15.77	15.77	15.77
Terminal Parking Fees (Refer to Annex E)					
Domestic	189.66	765.46	899.47	899.47	899.47
Lighting Charges (Refer to Annex E)	1,425.70	109.20	109.20	109.20	109.20
Air Navigational Charges (Refer to Annex E)					
Domestic	327.60	1,019.20	1,591.20	1,591.20	1,591.20
General Aviation	12.50	21.68	36.68	36.68	36.68
Passenger Service Charges (P200/pax)	10,330.44	25,473.71	35,979.24	35,979.24	35,979.24
Domestic	10,242.30	25,287.23	35,776.13	35,776.13	35,776.13
General Aviation	88.15	186.48	203.11	203.11	203.11
Airport Business Revenues	6,695.15	14,846.67	17,429.18	17,429.18	17,429.18
Water/Electric/Telephone	1,375.20	2,750.40	2,750.40	2,750.40	2,750.40
Rental of Floor Areas					
CIP Lounge Rental (30 sqm)	3,762	7,524	7,524	7,524	7,524
Ticket Counters (8 non-dedicated)	546.00	2,184.00	3,900.00	3,900.00	3,900.00
Airline Offices (3)	37.80	75.60	75.60	75.60	75.60
VIP Lounge (40 sqm)	187.50	375.00	375.00	375.00	375.00
Concession Areas (50 sqm)	60.00	60.00	60.00	60.00	60.00
Cargo Terminal	0.00	0.00	0.00	0.00	0.00
Concession Privilege Fees					
Porterage	31.47	132.31	283.82	283.82	283.82
Banks/hotels/Insurance/etc.	30.00	60.00	60.00	60.00	60.00
Taxi/car rentals/travel agencies, etc	22.50	45.00	45.00	45.00	45.00
Shops/coffee & snack bars/etc.	30.00	60.00	60.00	60.00	60.00
Aviation fuel, oil, and lubricants	227.50	910.00	1,625.00	1,625.00	1,625.00
Rental of developed land area (1,000 sqm)	210.00	420.00	420.00	420.00	420.00
Advertising fees and other income	175.00	250.00	250.00	250.00	250.00
Total Airport Revenues	**19,143.46**	**42,844.77**	**59,601.41**	**59,601.41**	**59,601.41**

12.4.3 Financial Viability Indicators

12.4.4 **Table 12.4.3-1** presents the financial analysis for the base case. Using the all-capital approach, the Butuan Airport Project is not financially viable with a NPV of negative PhP 535.7 million at a WACC of 7.4% per annum.

12.4.5 Taking the DOTC/ ATO point-of-view, the computed NPV is negative PhP 215.2 million. This means that DOTC/ ATO will lose on its equity for the project with cost of capital of 10%.

12.4.6 It is noted, however, that the net present value (2006) of all airport fees and charges (based on MIAA, MCIAA and SBMA fee structure) more than cover the incremental operation and maintenance costs. The net operating ratio, excluding capital cost recovery, is about 2.6 over the analysis period.

Table 12.4.3-1: Financial Evaluation of Butuan Airport Project: Base Case, PhP'000

Year	Capital Cost	O & M Cost	Aeronautical Fees	Passenger Service Charges	Airport Business Incomes	Net Financial Benefits
2007	17,345					-17,345
2008	19,675					-19,675
2009	19,675					-19,675
2010	394,100					-394,100
2011	622,415					-622,415
2012		15,952	2,470	20,661	13,290	20,469
2013		16,271	2,800	22,265	13,716	22,509
2014		16,597	3,242	23,869	14,245	24,761
2015		16,928	3,841	25,474	14,907	27,293
2016		17,267	4,221	27,575	15,317	29,846
2017		17,612	4,720	29,676	15,775	32,558
2018		17,965	5,384	31,777	16,285	35,482
2019		18,324	6,283	33,878	16,854	38,691
2020		18,690	7,509	35,979	17,489	42,287
2021		18,690	7,509	35,979	17,489	42,287
2022		18,690	7,509	35,979	17,489	42,287
2023		18,690	7,509	35,979	17,489	42,287
2024		18,690	7,509	35,979	17,489	42,287
2025		18,690	7,509	35,979	17,489	42,287
2026		18,690	7,509	35,979	17,489	42,287
2027		18,690	7,509	35,979	17,489	42,287
2028		18,690	7,509	35,979	17,489	42,287
2029		18,690	7,509	35,979	17,489	42,287
2030		18,690	7,509	35,979	17,489	42,287
2031		18,690	7,509	35,979	17,489	42,287
	1,073,209				NPV (7.4%)=	-535,711

12.4.4 Sensitivity Analyses

12.4.7 As noted earlier, the operational and financial performance of domestic airports in the Philippines, except for the capital airport at Manila, tend to result in unprofitable operations. National government capital subsidies are required to maintain their vital role in the socio-economic development of the country. As can be seen from Table 12.4.3-1, generated revenues more than cover the marginal O&M costs. As such, the proposed fee structure does not contribute to covering most of the investment. The national capital subsidy level can be reduced if the airport tariff levels are adjusted to account for the real cost of operations and recoup the proposed airport investments, including future investments in capacity expansion.

12.4.8 For the Butuan Airport, the break-even analysis indicated positive prospects for financial sustainability with the proposed investments if the prevailing MIAA, MCIAA, SBMA-based airport fees and charges are to be increased by 150% (FIRR of 7.6% and NPV of PhP 11.6 million).

12.4.9 To cover at least the airport operation and maintenance expenses, an increase in airport fees up to about 100% is recommended and appears feasible to implement, noting the previous commitment of the Government to the ADB for the Davao International Airport Development Project (Loan 1333-PHI) to increase these fees in the range of 100-250 percent for various categories by January 1998. To this date, the next round of tariff increases has never been implemented by the DOTC/ ATO.

SECTION 13

Economic Analysis and Evaluation

13 ECONOMIC ANALYSIS AND EVALUATION

13.1 Methodology and Approach

13.1.1 Methodology

13.1.1 The economic analysis of this subproject compares the incremental costs (capital and operation and maintenance costs) and benefits under the "with" and "without" project scenario basis. The "without" subproject scenario refers to the continued operation of the existing facility with only minor physical improvements. The "with" project scenario assumes the implementation of the project resulting in improvements in airport operational efficiency, safety and security. The Puerto Princesa Airport Project was evaluated over a period of 20 years after completion of construction from the estimated opening date of April 2012 to the year 2031. The difference in the projected operation and maintenance cost in the "with" and "without" project scenarios (incremental O&M costs) were included in the evaluation.

13.1.2 All financial costs and revenues were converted to economic costs and revenues by excluding taxes and duties, and by applying shadow pricing for foreign exchange and local unskilled labor. Taxes and fees (representing user charges) imposed on foreign tourists were included as they represent net gain to the Philippine economy. Price escalation contingencies and interest during construction were also excluded from the project costs.

13.1.2 Economic Costs

13.1.3 The economic costs of implementing the Project included airside and landside civil works, maintenance and other related equipment for air traffic control and navigation, land acquisition/relocation and consulting services. Price escalation components, interest during construction, and taxes and duties were deducted from the financial costs derived in Section 12.3.

13.1.3 Economic Benefits

13.1.4 For this airport subproject, the improvement of the airport facilities will directly lead to improved aircraft utilization, reduced incidence of cancellations and diversions and travel-time savings. Through the improvement of facilities to accommodate increased traffic volume and more advanced aircraft, the airport subproject will generate incremental aircraft operating cost savings. The airport subproject at Butuan will also produce economic benefits by attracting more tourists, whose net expenditure will be treated as a benefit. With the improved airport facilities, higher safety and security levels, and better passenger handling services are realized.

13.2 Economic Investment and Operating and Maintenance Costs

13.2.1 Investment Costs

13.2.1 The Project economic costs were derived by eliminating transfer payments (taxes and duties) and applying the following factors:

- Shadow exchange rate of 1.2 for foreign currency costs; and
- Shadow labor rate of 0.6 for unskilled labor used during construction.

13.2.2 The conversion factors used in the economic evaluation is presented as **Table 13.2.1-1**. The resulting Project economic costs are indicated in **Table 13.2.1-2**.

Table 13.2.1-1: Conversion Factors to Economic Values

Cost Components	Economic Cost Elements for Airport Facilities				
	Civil works	Equipment	Consulting Services	Maintenance	Operation
Foreign Currency Goods/Services	55%	90%	50%	20%	5%
Local Currency Goods/Services	45%	10%	50%	80%	30%
Material	70%	50%	50%	35%	35%
Skilled labor	10%	50%	50%	5%	5%
Unskilled labor	20%	0%	0%	60%	60%
Conversion Factor	**1.07**	**1.18**	**1.10**	**0.85**	**0.85**
Taxes and Duties	Deduct from Costs				

Table 13.2.1-2: Project Economic Costs, PhP'000

	Project Components	Economic Cost, PhP'000					
		Total Investment Cost	2007	2008	2009	2010	2011
1.	Civil Works, Buildings & Intermodal	835,910				334,364	501,546
2.	Airport Equipment Packages	44,617					44,617
3.	Consulting Services	44,243		11,061	11,061	11,061	11,061
4.	Land Acquisition and Resettlement	13,746	13,746				
5.	Project Administration	24,279	0	6,070	6,070	6,070	6,070
6.	Taxes and Duties	0	0	0	0	0	0
7.	Physical Contingencies	75,557	1,219	1,384	1,384	27,750	43,821
	Total	1,038,353	14,965	18,514	18,514	379,245	607,115

13.2.2 Operating and Maintenance Costs

13.2.3 The O&M costs in Table 12.4.3-1 were also converted into economic values using a conversion factor of 0.85 as shown in **Table 13.2.2-1**.

13.3 Project Benefits

13.3.1 Economic Benefits

13.3.1 The Butuan Airport Project aims at improving aviation operational and safety standards by upgrading the facilities to comply with ICAO safety standards. The airport improvements will expand the capacity of the airport in order to serve future air travel demand to Butuan City in particular and to the CARAGA Region, in general. As cited in Sections 4.3 and 6.7, without these improvements, the airport capacity limits will be reached by 2009 and there would be no additional air traffic, even during the off-peak times. For air passengers, they will have to experience delays at check-in counters, security inspection at the airport entrance and pre-departure areas, and at the baggage reclaim area for arriving passengers. On the other hand, with no additional aircraft stands for peak-hour arrivals and departures, airlines would have to defer offering new flight schedules.

Table 13.2.2-1: Economic O&M Costs, PhP'000

Year	Incremental Financial O+M Cost	Incremental Economic O+M Cost
2012	15,952	13,527
2013	16,271	13,798
2014	16,597	14,074
2015	16,928	14,355
2016	17,267	14,642
2017	17,612	14,935
2018	17,965	15,234
2019	18,324	15,539
2020	18,690	15,849
2021	18,690	15,849
2022	18,690	15,849
2023	18,690	15,849
2024	18,690	15,849
2025	18,690	15,849
2026	18,690	15,849
2027	18,690	15,849
2028	18,690	15,849
2029	18,690	15,849
2030	18,690	15,849
2031	18,690	15,849

13.3.2 There are, in general, five categories of economic benefits generated from the airport investments. These are:

- Benefits associated with aviation safety and security;
- Aircraft operating cost savings resulting from direct international flights, quicker turnaround times, and the use of larger and more economical aircraft;
- Passenger service improvement benefits;
- Passenger travel cost savings; and
- Airfreight cost savings.

13.3.3 **Benefits associated with aviation safety and security**. One of the most important project benefits would be those associated with improved aviation safety and enhanced airport security. As there is no established methodology to directly quantify and measure safety and security benefits, the "willingness to pay" approach was applied using the air navigational charges and landing/ take-off fees to estimate airline benefits and the passenger terminal fees to estimate passenger convenience, safety and security benefits of passengers. To avoid double counting, the "willingness to pay" approach was used only for those domestic passengers and aircraft traffic which will not divert or be affected by the airport congestion by 2009. Based on traffic estimates, this consists of 191,649 scheduled and general aviation passengers, of which half are departing from Butuan Airport and 1,729 aircraft movements for scheduled flights.

13.3.4 The estimated annual incremental revenues are presented below:

- Annual Passenger Terminal Fees = 191,649 x 0.5 x (PhP 200-PhP 30) x 0.88 (EVAT) or PhP 14,335,345
- Annual Aeronautical Fees = 1,729 x (PhP 1,000-PhP 600) x 0.88 (EVAT) + 1,349/2 x (PhP 3,424-PhP 3,118) x 0.88 or PhP 797,277

13.3.5 **Aircraft operating cost savings**. The benefits from Aircraft Operating Cost (AOC) savings accrue mainly from the introduction of larger and more fuel-efficient aircraft for domestic operations. The AOC savings were taken to be the difference in the operating expenses in economic terms between A320 (PAL) and A319 (Cebu Pacific) to be used with the Project and the current B737 of PAL and DC9 of Cebu Pacific for domestic services. The difference in AOCs is estimated at an average of PhP 886.3/ passenger (economic terms). **Table 13.3.1-1** shows the AOC savings during the 20-year evaluation period.

Table 13.3.1-1: Annual Aircraft Operating Cost Savings, PhP'000

Year	Air Passengers with Project	AOC Savings, PhP'000
2012	233,307	206,775
2013	249,315	220,963
2014	265,324	235,151
2015	281,333	249,340
2016	302,311	267,932
2017	323,289	286,524
2018	344,266	305,116
2019	365,244	323,708
2020	386,222	342,300
2021	386,222	342,300
2022	386,222	342,300
2023	386,222	342,300
2024	386,222	342,300
2025	386,222	342,300
2026	386,222	342,300
2027	386,222	342,300
2028	386,222	342,300
2029	386,222	342,300
2030	386,222	342,300
2031	386,222	342,300

13.3.6 **Passenger service time benefits**. The passenger service improvement benefits are the time cost savings resulting from shorter queuing times at counters and security checks as well as shorter waiting times in baggage retrieval upon passenger arrival. In the absence of a willingness-to-pay survey, the valuation of passenger waiting time of about PhP 120/ hour for Cotabato Airport passengers was used. It is noted, however, that recent interview of passengers of departing at Zamboanga Airport revealed a "willingness-to-pay" value of PhP 200/ trip due to increased comfort and convenience from improved airport terminal facilities.

13.3.7 Based on the airport facilities to be installed at the airport "with the Project", it was estimated that "savings in time" for departing passenger queuing for check-in/ security check is 30 minutes, while "savings in time" for arriving passenger waiting for baggage retrieval is 45 minutes. **Table 13.3.1-2** presents the estimate of passenger service improvement benefits.

Table 13.3.1-2: Passenger Service Improvement Benefits

Year	Incremental Air Passengers	Annual Passenger Travel Cost Savings, PhP'000		
		Arrival	Departure	Total
2012	43,569	752	752	1,505
2013	59,577	1,029	1,029	2,057
2014	75,586	1,305	1,305	2,610
2015	91,595	1,582	1,582	3,163
2016	112,573	1,944	1,944	3,888
2017	133,551	2,306	2,306	4,612
2018	154,528	2,668	2,668	5,336
2019	175,506	3,030	3,030	6,061
2020	196,484	3,393	3,393	6,785
2021	196,484	3,393	3,393	6,785
2022	196,484	3,393	3,393	6,785
2023	196,484	3,393	3,393	6,785
2024	196,484	3,393	3,393	6,785
2025	196,484	3,393	3,393	6,785
2026	196,484	3,393	3,393	6,785
2027	196,484	3,393	3,393	6,785
2028	196,484	3,393	3,393	6,785
2029	196,484	3,393	3,393	6,785
2030	196,484	3,393	3,393	6,785
2031	196,484	3,393	3,393	6,785

13.3.8 **Passenger travel cost savings**. The domestic passenger travel cost savings were estimated as the savings in travel cost (economic terms) for incremental passengers with the Project who have to travel to Cagayan de Oro Airport due to airport congestion (terminal and apron capacity limits have been reached). Diverted air passengers due to airport congestion will travel to this alternate airport using private car (average of two passengers per car). The road distance from Butuan Airport to Cagayan de Oro Airport is 189 kilometers. The estimate of additional road transport costs is PhP 1,630 per passenger, inclusive of the travel time value for Butuan air passengers of PhP 138 per person. **Table 13.3.1-3** indicates the computed travel cost savings.

13.3.9 **Savings in Air Freight Cost**. The savings in airfreight costs were estimated on the assumption that the incremental high-value air cargo volumes, principally fish and other aquatic products, will have to be shipped at Cagayan de Oro Airport, which is 189 kilometers from Butuan Airport (note that Surigao Airport is not an alternative due to limited flights of low load capacity aircraft). This alternate airport for air cargo at Cagayan de Oro offers higher air service frequencies.

13.3.10 The estimated savings in truck cost is about PhP 35 per kg for the 189-kilometer road distance between Butuan and Cagayan de Oro. **Table 13.3.1-4** presents the annual airfreight cost savings.

Table 13.3.1-3: Annual Domestic Passenger Travel Cost Savings, PhP'000

Year	Incremental Air Passengers	Annual Passenger Travel Cost Savings, PhP'000
2012	43,569	71,030
2013	59,577	97,129
2014	75,586	123,228
2015	91,595	149,327
2016	112,573	183,528
2017	133,551	217,728
2018	154,528	251,928
2019	175,506	286,128
2020	196,484	320,328
2021	196,484	320,328
2022	196,484	320,328
2023	196,484	320,328
2024	196,484	320,328
2025	196,484	320,328
2026	196,484	320,328
2027	196,484	320,328
2028	196,484	320,328
2029	196,484	320,328
2030	196,484	320,328
2031	196,484	320,328

Table 13.3.1-4: Annual Air Freight Cost Savings, P'000

Year	Incremental Air Cargo, tons	Savings in Truck Shipment Cost, PhP'000
2012	790	27,660
2013	1,079	37,780
2014	1,369	47,901
2015	1,658	58,022
2016	2,031	71,099
2017	2,405	84,177
2018	2,779	97,255
2019	3,152	110,333
2020	3,526	123,411
2021	3,526	123,411
2022	3,526	123,411
2023	3,526	123,411
2024	3,526	123,411
2025	3,526	123,411
2026	3,526	123,411
2027	3,526	123,411
2028	3,526	123,411
2029	3,526	123,411
2030	3,526	123,411
2031	3,526	123,411

13.3.2 Economic Viability of the Project

13.3.11 The EIRR has been estimated for the overall Project at 35.9% and NPV of PhP1.17 billion based on the NEDA-prescribed opportunity cost of capital of 15% (**Table 13.3.2-1**). The results indicate that aircraft operating cost savings and passenger travel cost savings are the main benefits. This reinforced the earlier view that airport development improves airline efficiency and benefits directly the air passengers.

Table 13.3.2-1: Economic Evaluation of the Project, PhP'000

Year	Capital Cost	O & M Cost	Aviation Safety and Security Benefits	Aircraft Operating Cost Savings	Passenger Service Improvement	Passenger Travel Cost Savings	Cargo Shipment Cost Savings	Net Economic Benefits
2007	14,965							-14,965
2008	18,500							-18,500
2009	18,500							-18,500
2010	378,421							-378,421
2011	605,887							-605,887
2012		13,527	15,134	206,775	1,505	71,030	27,660	308,575
2013		13,798	15,134	220,963	2,057	97,129	37,780	359,266
2014		14,074	15,134	235,151	2,610	123,228	47,901	409,951
2015		14,355	15,134	249,340	3,163	149,327	58,022	460,630
2016		14,642	15,134	267,932	3,888	183,528	71,099	526,937
2017		14,935	15,134	286,524	4,612	217,728	84,177	593,239
2018		15,234	15,134	305,116	5,336	251,928	97,255	659,535
2019		15,539	15,134	323,708	6,061	286,128	110,333	725,825
2020		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2021		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2022		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2023		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2024		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2025		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2026		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2027		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2028		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2029		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2030		15,849	15,134	342,300	6,785	320,328	123,411	792,109
2031		15,849	15,134	342,300	6,785	320,328	123,411	792,109
							EIRR =	35.91%
	1,036,273						NPV(15%)=	1,173,510

13.3.3 Sensitivity Analyses

13.3.12 Sensitivity analysis was carried out to test the effects of possible unfavourable scenarios with respect to changes in the cost and benefit parameters (**Table 13.3.3-1**). These analyses indicated that the Projectwould continue to be economically viable even under the severe conditions involving a 10% cost increase and 10% decrease in benefits with an EIRR of 31.0%.

Table 13.3.3-1: Sensitivity Analysis Results

Scenario	EIRR, %	NPV, PhP million
Base Case	35.9	1,173.5
10% Increase in Costs	33.5	1,113.2
10% Decrease in Benefits	33.3	995.9
10% Increase in Costs and -10% in Benefits	31.0	935.6

SECTION 14

Institutional Capacity

14 INSTITUTIONAL CAPACITY

14.1 Review of Institutional Capacity

14.1.1 Weak institutions have often been cited as a principal cause of failures in the development programs in the Philippines. Strengthening these weak institutions would entail improving organizational structures, streamlining procedures, reforming incentive systems, and staff training.

14.1.2 The institutional framework of the civil aviation sector is defined under the Civil Aeronautics Act which gives the DOTC the overall responsibility for policy, planning and implementation of airport development projects. Under the DOTC, the ATO is held responsible for safety regulations, providing air traffic control and navigational services, and managing the 86 national airports of the country. With the weak linkages at the airport level due to the bureaucratic layers of decision-making, the planning, development, operation and maintenance of the national airports are not integrated. For instance, investment decisions are not matched by increases in manpower complement as experienced in the New Davao International Airport where the counterpart project management team, who have been trained to handle the more modern airport equipment, have yet to be integrated into the airport personnel plantilla after more than three years of operation.

14.1.3 Moreover, the separation of the airport planning and operation functions within ATO resulted in the airports being considered as merely cost centers. The airport managers, with limited responsibility on the business/commercial aspects of airport management and no responsibility on the planning airport improvements, are not motivated to transform their respective airports into revenue and cost centers.

14.1.4 The proposed establishment of the Civil Aviation Authority of the Philippines (corporatized ATO) is viewed in the past as well as in this ITDP work as extremely necessary as the anchor initiative to reform the civil aviation sector of the Philippines and align its structure and performance to internationally accepted practices.

14.1.5 The effectiveness of the DOTC and ATO in policy and planning implementation impacts on the long-term capacity and responsiveness of the aviation sector to changing markets and demands. The JICA National Airport Master Plan has identified key areas to strengthen institutional capacity under the proposed CAAP organizational set-up, notably:

- Airport Safety Standards and Certification System, including the preparation of the Aerodrome Manual for Airports;
- Establishment of rational airport pricing regulations;
- Further establishment of airport security programmes;
- Improvement in airport data quality and management; and
- Training programs focusing on aerodrome safety and aviation security.

14.1.6 More importantly, further training and technical assistance need to be extended to ATO as a new corporation in the fields of:

- Asset management (investment planning and budgeting, procurement procedures, project management, asset evaluation, preparing for asset maintenance and replacement, airport land management, and financial reporting on assets);
- Financial management (records keeping, accrual accounting and activity-based costing, charging mechanisms and structure, financial reporting, budgeting principles as a corporation and balance sheet preparation);
- Business planning (corporate vision/goals/objectives, organizational structures, budgeting for airport operations and airport investments, development of performance indicators and target setting and measurements);
- Airport management (aeronautical services, airport business and other user services, airport tariff setting and community relations);
- Human resources management (assessment of staffing patterns, staff selection and promotion, staff remuneration and other benefits, staff training and career development process, and staff communications); and
- Management information systems (operation and financial reporting systems, maintenance planning systems and personnel deployment systems).

14.2 Recommended Capacity Building Program

14.2.1 As part of the institutional strengthening component of the proposed ITDP sector loan, airport personnel of Butuan Airport should be direct participants in the training programs and systems and procedures development. Based on the above, the main areas for intervention include: airport security and aeronautical safety, airport finance and management planning, airport maintenance and improvement planning and budgeting, database management and reporting, and staff training and development.

SECTION 15

Risk Analysis

15 RISK ANALYSIS

15.1 Risk Types and Countermeasures

15.1.1 From the economic perspective, project risks can adversely impact costs and benefits. In the case of costs, this can mean unanticipated increases during the implementation and the operation of the project. Likewise, benefits may be reduced because of a reduction in traffic due to poor security or adverse economic conditions affecting the hinterland of the airport. Delays in the implementation are also a project risk and affect costs by increasing them and retard or reduce benefit.

15.1.2 During the implementation of the project, the following could occur.

Risks / Impacts	Mitigation Measures
Lack of accurate geotechnical (Particularly off-shore) data increasing risks of higher cost and delays.	Employment of a qualified consultant to oversee the final designs including adequate funding for geotechnical investigations.
Not having the right of way available before construction commences delays implementation and increases costs.	Thorough investigation during the DE stage to identify further right of way issues. All of the construction is within the airport itself requiring no new right of way for construction activities.
Unanticipated delays and/or increase in costs and due to sizable exchange rate fluctuations, *force majeur*, construction accidents, etc,	Employment of a qualified construction supervision consultant to mitigate these issues by minimizing their impact on cost and schedule. Maintain secure and safe working conditions on site.
Security concerns against persons and equipment can result in higher costs and delays in project implementation.	Airports have been relatively free of these risks by having vigilant security personnel and maintaining adequate security procedures.

15.1.3 During the operation of the project, the following could occur.

Risks	Mitigation Measures
Lack of experience operating modern airport equipment and facilities	Training of airport personnel by the civil works contractor and equipment supplier by incorporating these requirements in the contract documents
Lack of maintenance: This reduces the life of the facilities.	DOTC/ATO must provide adequate funding for maintenance to assure sustainability and functionality of the facilities.
Security concerns against persons and equipment increases costs and decreases traffic (benefits).	Airports have been relatively free of these risks by having vigilant security personnel and maintaining adequate security procedures.

15.2 Risk Assessment for the Airport Project

15.2.1 The Butuan Airport Project has been the subject of previous studies and extensive project evaluation and stakeholder consultation over the last 10 years. In many ways, while this represents unwanted delays, it does help reinforce the continued demand and support for the project and therefore reduce political and institutional risks.

15.2.2 The following are a summary of the identified project risks that may impact on the successful completion of the project:

15.2.3 **Stakeholder Risks.** The project requires the completion of the land swap and facility replication agreement between the AFP and DOTC/ATO. Although advanced, it appears that provision for relocation of the road around the northern side of runway strip at the eastern end has been overlooked and this does impact on access to military facilities, military land and dwellings.

15.2.4 **Readiness Risks.** The fact that existing dwellings and buildings on military land to the northern and southern side of the runway at the eastern end need to be removed, but haven't, may impact on the project going forward.

15.2.5 **Funding Risks.** The DOTC annual infrastructure budget has remained at the PhP3.1 billion level from 2002-2005. The budget deficit problem of the national government required the imposition of new tax measures and the stringent controls on the expenditure program. With the budget deficit expected to be within manageable limits by 2009, the funding risk may have diminished, but the ability of the Government to meet counterpart funding requirements needs further commitment during the loan appraisal stage.

15.2.6 **Revenue or Market Risk.** The project is scheduled to come on line and be operational by 2012, or 6 years after this feasibility Study. To date, the traffic growth at Butuan Airport has been erratic with relatively dramatic decreases and increases in traffic volumes over various two to three year periods due to a variety of reasons ranging from general economic conditions, airline withdrawal, peace and order conditions (kidnapping). The forecasts, while not considered aggressive or optimistic, do account for long term trends although it is possible that there could be any number of future developments or events that could interrupt continued growth.

15.2.7 **Operational Risks.** Small regional airports, such as Butuan Airport, can be subject to dramatic increases or decreases in passenger and aircraft traffic within short periods of time as they are more sensitive to external economic or other "shocks" that impact on the industry. The history of traffic at Butuan has been erratic and it reinforces this point. However, if there is underlying confidence in the nature of the destination and its primary markets, airports such as Butuan should be prepared for the "upside swings" that do often occur. The key in planning and design is the retention of flexibility to adapt the airport facilities and operation if required. The concept design under this Study is considered flexible.

SECTION 16

Conclusions and Recommendations

16 CONCLUSIONS AND RECOMMENDATIONS

16.1 The Proposed Project

16.1 The Project maybe briefly described as follows:

- A completely refurbished and expanded passenger terminal;
- Extended runway (100m), establishment of 150 m wide runway strip;
- Refurbished support facilities including ATC, RFFS; and
- New security fencing and removal of remaining obstacles.

16.2 The project depends on the successful completion of the agreement with the Armed Forces of the Philippines (AFP) and any actions by DOTC such as replication of AFP facilities and relocation of AFP operations to be done separately prior to the commencement of this project.

16.2 Project Risks and Sensitivities

16.2.1 Section 15 summaries various risks associated with the project. The major risks to the successful implementation of the project are summarised as follows:

- Successful and timely replication of AFP/ PAF facilities to the satisfaction of the AFP/ PAF prior to the commencement of this project;
- The successful relocation of the remaining affected persons and buildings still within the project site area prior to the commencement of this project;
- The ability for the Government to allocate and approve the required 35% counterpart funding in accordance with the project schedule; and
- Timely procurement of the design and construction supervision consultant to complete the project preparation and bid preparation works.

16.3 Financial Viability

16.3.1 In common, with other national airports in the country, full financial viability of operations with increasing demands of operational and safety improvements cannot be assured at Butuan Airport. The Project has greater potential for financial sustainability even with the proposed investment, if the assumed prevailing tariff rates of MIAA, MCIAA and SBMA for the corporatized ATO could be increased by at least 150%. As presented in Section 12, this will entail the upward adjustment in aeronautical charges aiming at full cost recovery.

16.4 Economic Viability

16.4.1 From the point of view of the Philippine economy, the Project has demonstrated economic feasibility with base case EIRR of 35.9% (NPV of PhP 1.17 billion at 15% opportunity cost of capital) and with extreme case (10% increase in costs and 10% decrease in benefits) EIRR of 31.0% (NPV of PhP935.6 million).

16.5 Immediate Project Implementation Steps

16.5.1 Noting the above project risks, mainly on the replication of AFP/ PAF facilities and land acquisition/ resettlement, the DOTC and ATO has to address these immediately to demonstrate its clear resolve to pursue the Butuan Airport Project through the proposed ADB intermodal transport sector loan.

16.5.2 The civil aviation policy reform agenda, which is discussed in Chapter 6 of the Main Report, has to be approved by the NEDA Board upon the recommendation of DOTC prior to loan application.

16.6 Recommendations

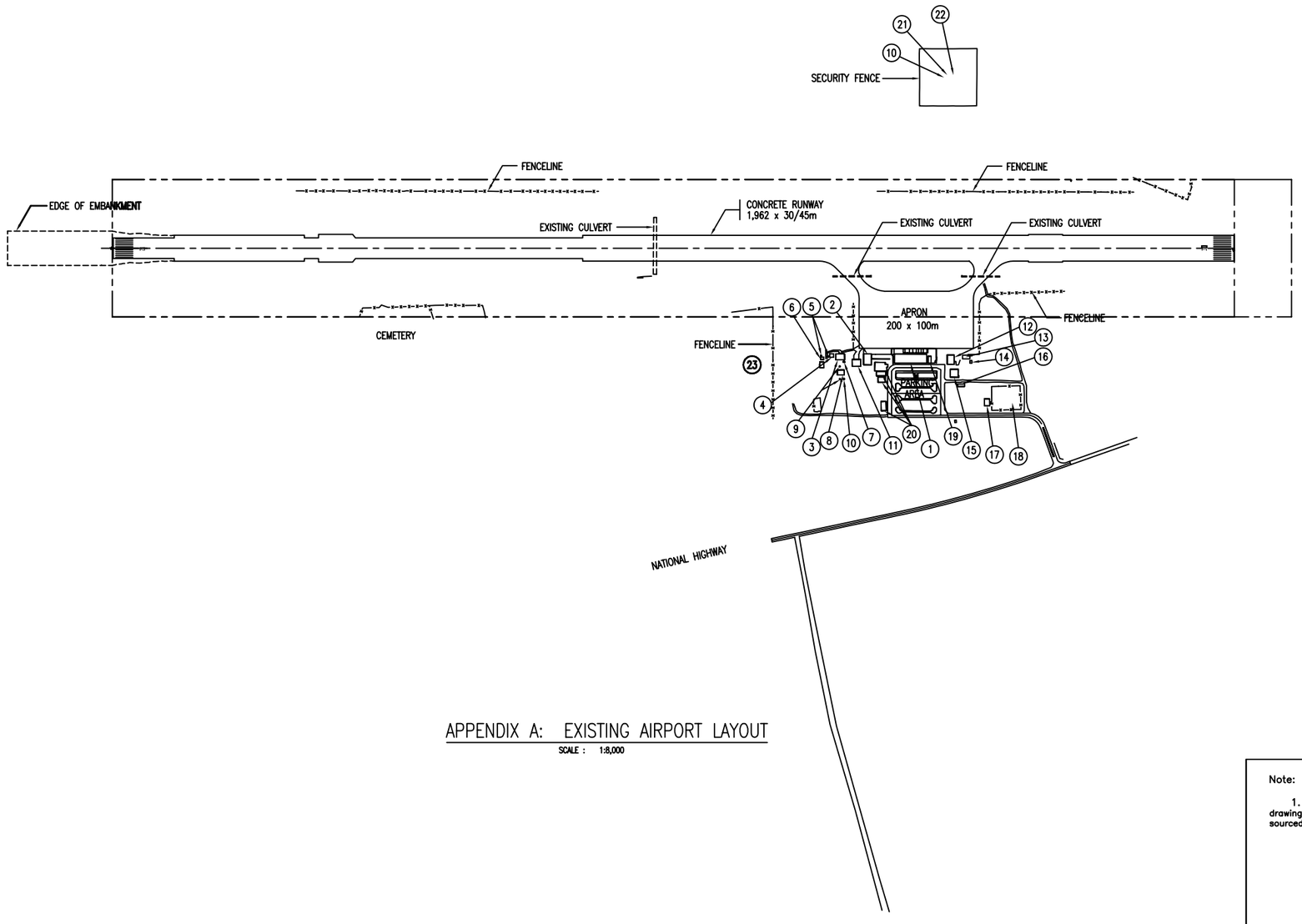
16.6.1 The following recommendations are made based on the outcomes of this Feasibility Study:

- The project, as defined in the Study, should be carried forward for approval to carry out the detailed design and construction on the basis of favourable economic benefits that exceed minimum hurdle rates as lay down by the ADB and NEDA; and
- The next phase of the project should be initiated as soon as practical, noting the capacity constraint starting in 2020 and becoming serious until 2023, in order to minimize the various risks associated with the project, many of which are time dependant.

APPENDIXES

APPENDIX A

Layout Plans



NOTE:

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

LEGEND:

1. TERMINAL BUILDING
2. R&FFF
3. CONTROL TOWER
4. POWER HOUSE
5. FUEL TANK
6. OLD POWERHOUSE
7. PUMP HOUSE
8. WAREHOUSE
9. ANTENNAE
10. WATER TANK
11. MAINTENANCE HANGAR
12. PAL CARGO BUILDING
13. PAL WAREHOUSE/HANGAR
14. GENSET HOUSE
15. ATO ADMINISTRATION BUILDING
16. STORE
17. NATIONAL POLICE COMMISSION STATION
18. PAGASA
19. AP WAREHOUSE
20. COMMERCIAL ESTABLISHMENTS
21. VOR/DME BUILDING
22. STEP-DOWN TRANSFORMER
23. PMS OFFICE & STAFF HOUSE

APPENDIX A: EXISTING AIRPORT LAYOUT

SCALE : 1:8,000

Note:

1. The existing airport layout is based on the detailed design drawings prepared under the Third Airports Development Project as sourced from DOTC.

Republic of the Philippines
DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

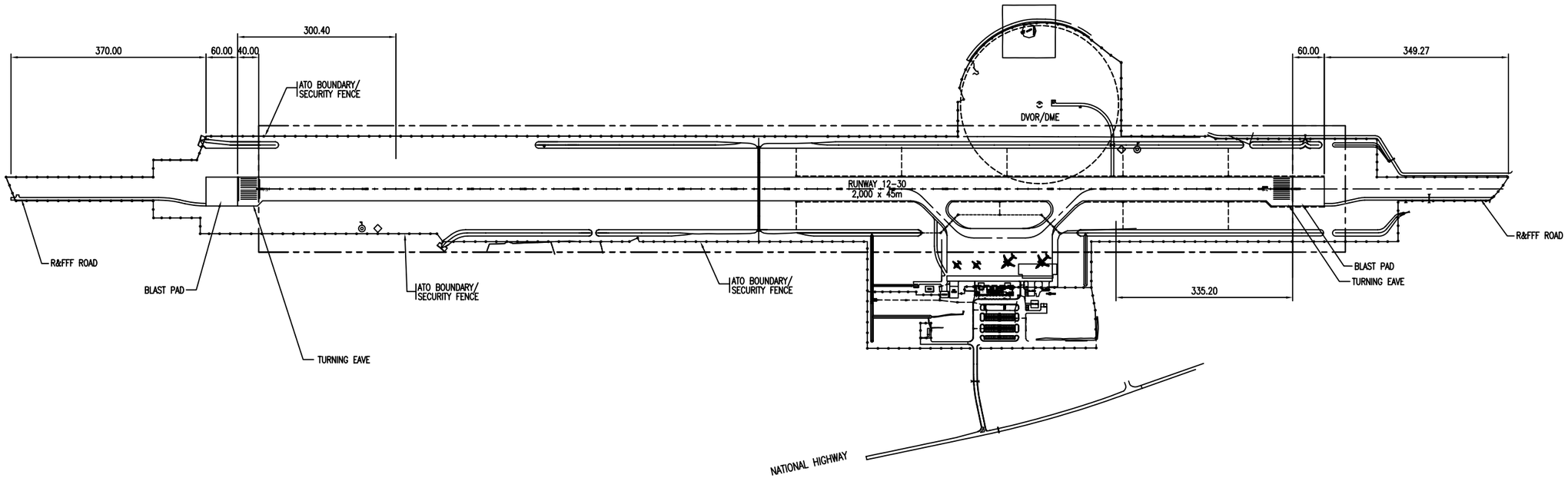
ASIAN DEVELOPMENT BANK

The Louis Berger Group Phils., Inc.
ENGINEERS · PLANNERS · SCIENTIST · ECONOMISTS

In association with:
PACIFIC CONSULTANTS INTERNATIONAL

Project Name:	Design Concept:	Sheet Contents:	Graphic Scale:	Page No.
Intermodal Transport Development Project	**BUTUAN AIRPORT**	EXISTING AIRPORT LAYOUT	0 50 100 200 300 400m GRAPHIC SCALE 1:8,000	**A-1** Date

A4



Note:

1. The concept layout is based on the detailed design drawings prepared under the Third Airports Development Project as sourced from DOTC.

APPENDIX A: PROPOSED DEVELOPMENT PLAN

SCALE : 1:8,000

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Project Name:	Design Concept:	Sheet Contents:	Graphic Scale:	Sheet No.
Intermodal Transport Development Project	**BUTUAN AIRPORT**	PROPOSED DEVELOPMENT PLAN	0 50 100 200 300 400m GRAPHIC SCALE 1:8,000	**A-2** Date DD/MM/YY

A4

APPENDIX B

Copy of Environmental Compliance Certificate (ECC)

Republic of the Philippines
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
Office of the Regional Executive Director
Ambago, Butuan City

REGION - 13 CARAGA
RELEASED
DATE 17 SEP 2002

Environmental Compliance Certificate

(1302-2002-0917 - 103 - Airport Development)

The Department of Environment and Natural Resources (DENR) Regional Office XIII, Ambago, Butuan City hereby grants this **Environmental Compliance Certificate (ECC)** to the **Department of Transportation and Communications (DOTC)** represented by its **Project Director, Mr. Rodolfo P. Sanico** for its proposed **Rehabilitation and Upgrading of Bancasi Airport** located at **Barangay Bancasi, Butuan City** after complying with the **Environmental Impact Assessment (EIA)** requirements as prescribed in the promulgated guidelines of **P.D. 1151 and 1586,** respectively.

This **Certificate** is being issued subject to the conditions stated hereunder. **Non-compliance** with any of the said stipulations will be sufficient ground for the cancellation or suspension of this Certificate and/or a fine of not more than **Fifty Thousand Pesos (~~Php~~ 50,000.00)** for every violation thereof, at the discretion of this Office **(Section 9 of PD 1586).**

A. GENERAL PROVISIONS

1. That this ECC should not in any manner be construed as a permit. Pertinent permits shall be secured prior to project implementation from other concerned government agencies and copies thereof shall be regularly furnished to EMB-13. Should these permits are denied or no longer renewed by the concerned offices, this ECC is considered automatically cancelled/revoked;

2. That the DENR-EMB is not accountable to any untoward incident that may happen to the project caused by force majeure, structural defects or use of sub-standard materials;

3. That any false information, misrepresentation or omission of material facts in the submitted documents which lead to the issuance of this Certificate that will be discovered later shall cause the automatic revocation of this Certificate and/or imposition of appropriate fines;

4. That any expansion in terms of the structure, area, transfer of location or any modification/deviation from approved scope/components shall be covered by another EIA requirements;

5. That the proponent and the contractor shall be jointly and severally liable to whatever environmental damage that the project may cause during the project implementation;

6. That if the project has not started within five (5) years from the issuance of this ECC, the same ECC is considered automatically revoked;

7. That transfer of ownership of the project carries the same conditions in this ECC of which written notification shall be made to the DENR-EMB-13 within fifteen (15) days from such transfer;

8. That the project shall exit from the coverage of the EIA System once all the herein conditions have been complied with, hence, all regulatory activities shall be conducted by the regulatory agencies/office and LGU concerned. However, this office reserves its right to re-acquire jurisdiction once national interest, public welfare and safety so requires;

9. That additional ECC condition(s) shall be imposed if findings to further protect the environment warrant.

B. PRE-CONSTRUCTION PHASE

10. That the 11 hectares land expansion area should not be touched without the consent of landowners or appropriate court proceedings;

11. That the relocation site should be ready for occupancy prior to the demolition of the affected houses and the same should be provided with basic utilities such as water and electricity, among others. A separate ECC shall be secured for the relocation site;

12. That a Disposal Plan for the excess excavated soil and other debris shall be submitted three (3) months after the issuance of ECC. The designated site shall be indicated in a map.

13. That an organizational structure showing the concerned offices/individuals responsible for the implementation of planning, design, construction, operation and decommissioning stages shall be submitted within three (3) months after the issuance of the ECC to pinpoint responsibilities;

C. DEVELOPMENT/CONSTRUCTION PHASE

14. That this Certificate is valid only for the proposed rehabilitation and upgrading of Butuan City Airport which scope of works consists of the following:

    a. Extension, widening and upgrading of the runway and its strip; upgrading of the apron and connecting taxiways; upgrading of the drainage system; removal of obstacles; upgrading and expansion of the landslide road system, and construction of fences;
    b. Upgrading of the terminal building; renovation of the control tower complex and rescue and fire fighting building; and extension of the powerhouse;
    c. Installation of a new Doppler Very High Frequency Omnirange (DVOR) and airfield ground lighting systems; and
    d. Replacement of tower equipment.

15. That appropriate and a well-designed drainage system should be constructed in the project area to address flooding caused by concentrated surface run-off, soil erosion and siltation. The same should be maintained properly with periodic cleaning and declogging to prevent flooding in the site as well as the adjacent areas;

16. That handling, transport and storage of construction materials shall not cause nuisance to the immediate surroundings. Likewise solid waste materials generated during construction stage shall be properly disposed of in designated areas and open burning should not be resorted to pursuant to the Clean Air Act of 1999;

17. That all equipment/machineries which are potential sources of pollution shall be provided with adequate pollution control devices;

18. That traffic signs and other early warning devices shall be installed on strategic areas for precautionary measures and for public information;

19. That construction materials (e.g. sand and gravel, etc.) should come from legal sources only;

20. That the location of the temporary facilities such as the stockyard of construction materials and equipment should be designated in an area where the normal flow of the airport's operation shall not be hampered;

21. That if overtime work during nighttime shall be resorted to, to fastrack the implementation of the project, equipments with loud sound emission should not be used to avoid disturbance of the surrounding community;

22. That all mitigating measures indicated in the submitted documents and other form of mitigation and preventive measures be implemented throughout the construction and operation phase;

D. MONITORING MECHANICS:

23. That on the spot monitoring and inspection can be initiated anytime by DENR-EMB CARAGA in coordination with concerned group(s);

24. That the proponent must set up the following:

a. A Multipartite Monitoring Team (MMT) composed of representatives from the proponent, the DENR, EMB, City ENRO, DOLE-13, Barangay concerned and one of the members of the REVCOM to monitor the proponent's compliance with the Environmental Management Plan (EMP), the conditions stipulated in the ECC, and all applicable rules and regulations;

b. A replenishable Environmental Monitoring Fund (EMF) to cover all costs attendant to the operation of the MMT such as monitoring, sampling and analysis, meals, accommodations and transportation;

The amount and mechanics of the EMF and the establishment of the MMT must be determined by the DENR and the proponent through an integrated MOA which must be submitted within thirty (30) days upon issuance of this Certificate;

E. ABANDONMENT PHASE

25. That a three (3) –year abandonment plan shall be submitted within one (1) year in advance prior to actual decommissioning.

Given this SEP 17 2007

Approved:

BENJAMIN T. TUMALIUAN, CESO IV
Regional Executive Director

Recommending Approval:

REYNALDO R. VILLAFUERTE
Regional Director

Conforme:

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
By:

MR. RODOLFO P. SANICO
Project Director

Procedural Screening Fee.... P 600.00
Filing Fee 1,560.00
Processing Fee 3,600.00
LRF 240.00
OR No.6704114 issued on 03/08/2002

APPENDIX C

Cost Estimates

APPENDIX C
Butuan Airport Base Cost Estimate in PhP'000

	Units	Quantity	Unit Cost	Component Cost, PhP
1. External Works				
Description	**Units**	**Quantity**	**Unit Cost PHP**	**Total PHP**
General				
General requirements	ls	1	55,439,143	55,439,143
Demolition of structures	ls	1	667,939	667,939
Removal of facilities				
Removal of PAPI 12 & 30	nr	2	3,446	6,892
Removal of Windcone	nr	2	9,922	19,845
Removal of ATO Boundary Fence	m^1	2,773	98	271,239
Removal of Distance Marker / Runway End Markers	nr	18	435	7,824
Demolition of DME/VOR	ls	1	102,243	102,243
Removal of misc items	ls	1	111,222	111,222
Demolition of Structures (Headwalls, Manholes)	ls	1	108,599	108,599
Removal of pavements				
Demolition of Concrete Pavement	ls	1	202,747	202,747
Clearing and Grubbing				
Clearing	ls	1	21,930	21,930
Clearing and Grubbing	ha	34	203,677	6,925,018
Sub Total				***63,884,640***
Earthworks				
Excavation of Top Soil (For Re-use)	m^3	36,113	128	4,619,419
Excavation of Top Soil (For Spoil)	m^3	5,425	191	1,033,871
Unclassified excavation	m^3	2,261	192	433,729
Muck excavation	m^3	904	192	173,492
Drainage excavation	m^3	25,081	163	4,092,175
Fill from Excavation	m^3	180,831	292	52,871,182
Fill from Borrow Pits, Category A	m^3	20,460	453	9,266,862
Subgrade Preparation for Airside Pavements	m^2	24,254	40	981,389
Subgrade Preparation for Landside Pavements	m^2	16,929	38	640,806
Rock Excavation	m^3	400	898	359,208
Structural excavation	m^3	580	162	93,875
Structural Backfill	m^3	375	196	73,421
Trenching	ls	1	1,996,435	1,996,435
Sub total				***76,635,864***
New Pavements				
Runway				
Blast pads at both runway ends, asphalt concrete	m^2	7,300	884	6,453,593
Runway widening to 45m	m^2	5,300	2,025	10,731,763
Runway extension	m^2	2,000	2,025	4,049,722
Turning eaves at both runway ends	m^2	990	2,025	2,004,647
Taxiway				
Taxiway shoulders	m^2	1,300	884	1,149,270
Taxiway transitions	m^2	2,900	566	1,640,279
Airside roads				
R&FF roads	m^2	4,200	1,081	4,541,211
Access road airside	m^2	690	1,081	746,057
Landside pavements				
Main Loop road and access road	m^2	4,800	1,749	8,395,966
Gravel road relocation	m^2	6,500	192	1,250,465
Walkways, concrete	m^2	880	643	566,179
Curb and Gutter	ls	1	911,957	911,957
Rehabilitation PCC pavement	m^2	180	1,749	314,849
Sub Total				***42,755,959***

Rehabilitation of pavements				
Runway overlay, asphalt concrete	m^2	91900	1,169	107,468,395
Cracking and seating	m^2	91900	147	13,514,768
Grooving	m^2	88,000	607	53,382,598
Sub total				***174,365,762***
Drainage				
Drainage Channels	ls	1	4,373,947	4,373,947
450mm dia. RCPC with Granular Bedding, Class C	m^1	318	1,336	424,902
610mm dia. RCPC with Granular Bedding, Class C	m^1	210	2,097	440,422
760mm dia. RCPC with Granular Bedding, Class C	m^1	52	2,755	143,264
910mm dia. RCPC with Granular Bedding, Class C	m^1	165	4,123	680,348
1070mm dia. RCPC with Granular Bedding, Class C	m^1	7	4,539	31,771
1-1220mm dia. RCPC with Granular Bedding, Class C	m^1	341	6,667	2,273,541
2-1220mm dia. RCPC with Granular Bedding, Class C	m^1	62	11,993	743,578
Excavation, backfill and Class B bedding	ls	1	854,460	854,460
Subsurface Drainage	ls	1	3,893,113	3,893,113
Box culvert	ls	1	898,620	898,620
Other Drain Structures	ls	1	530,315	530,315
Manhole, Inlets and Catch Basins	ls	1	826,248	826,248
Sub total				***16,114,528***
Civil works for Utilities / External Utilities				
Cable ducts	ls	1	3,050,332	3,050,332
Manholes	nr	12	20,211	242,528
Bases for airfield ground lighting	ls	1	1,340,437	1,340,437
External utilities mechanical	ls	1	5,190,175	5,190,175
External utilities electrical	ls	1	8,174,939	8,174,939
Power supply	ls	1	9,222,882	9,222,882
Streetlighting	ls	1	1,043,578	1,043,578
Communication lines	ls	1	2,473,923	2,473,923
Sub total				***30,738,794***
Miscellaneous				
Airfield perimeter fence and gates	m^1	7,891	2,033	16,043,947
Guard Rail	m^1	330	1,753	578,478
Grassing and landscaping				
Topsoiling	m^2	710,100	16	11,122,397
Mulching	m^2	1,390	94	130,631
Sodding	m^2	154,879	78	12,129,459
Hydroseeding	m^2	300,000	67	19,970,506
Landscaping landside	ls	1	429,887	429,887
Marking				
Runway markings	m^2	7,976	950	7,578,850
Taxiway markings	m^2	410	564	231,441
Apron markings	m^2	575	566	325,204
Road markings	m^2	195	952	185,581
Temporary Markings for Runway	ls	1	1,489,021	1,489,021
Signage	nr	9	8,030	72,266
Sub Total				***70,287,667***
TOTAL for External Works				**474,783,214**
2. Buildings				
New Buildings				
Pump House, water tank	m^2	67	123,595	8,280,862
Maintenance Storage Building	m^2	65	12,180	791,727
Sub total				***9,072,590***

Expansion & Refurbishing of Existing Buildings				
Expansion and Refurbishing of Terminal Building	m^2	1334	34,176	45,590,423
Refurbishing of existing Control Tower	m^2	275	2,606	716,726
Expansion and Refurbishing of R&FFF	m^2	389	28,152	10,951,172
Expansion and refurbishing of Power House	m^2	35	106,993	3,744,753
Sub total				***61,003,073***
Special Systems				
Security equipment				
X-ray unit for hold baggage screening 1000x1000	nr	1	4,915,534	4,915,534
X-ray unit for cabin baggage screening 700x700	nr	1	4,551,421	4,551,421
Metal detectors	ls	1	5,744,512	5,744,512
Information equipment				
Master Clock	ls	1	282,542	282,542
Public Address System	ls	1	768,392	768,392
Sub Total				***16,262,401***
Equipment				
Generators	nr	1	17,082,601	17,082,601
Baggage handling	nr	1	6,193,467	6,193,467
Furniture	-		included	
Sub total				***23,276,069***
TOTAL for Buildings				**109,614,132**
3. Equipment				
Navigational Aids				
DVOR Equipment and antenna	ls	1	24,745,589	24,745,589
DME Equipment and antenna	ls	1	9,544,727	9,544,727
Miscellaneous for DVOR/DME				
Spareparts/Test Equipment	ls	1	2,121,050	2,121,050
Installation	ls	1	2,828,067	2,828,067
Training/Manual	ls	1	1,414,034	1,414,034
Remote control	ls	1	1,060,525	1,060,525
Power supply				
Uninteruptable Power Supply	ls	1	1,414,034	1,414,034
Removal of existing equipment	ls	1	353,508	353,508
Fight check	ls	1	1,767,542	1,767,542
TOTAL for Navigational Aids				**45,249,077**

ATC & Communication Equipment

TWR/APP Type II				
ATC Console with 3 Positions	nr	1	1,767,542	1,767,542
VHF Transmitter				
TWR	nr	1	2,121,050	2,121,050
EMR	nr	1	2,121,050	2,121,050
APP	nr	1	2,121,050	2,121,050
GND	nr	1	2,121,050	2,121,050
VHF Receiver				
TWR	nr	1	1,060,525	1,060,525
EMR	nr	1	1,060,525	1,060,525
APP	nr	1	1,060,525	1,060,525
GND	nr	1	1,060,525	1,060,525
VHF Tx/ Rx Antennas	nr	2	63,632	127,263
VHF Transceiver	nr	1	1,626,139	1,626,139
VHF Handheld tranceivers	nr	5	70,702	353,508
VCCS System	nr	0.8	14,140,336	11,312,269
Voice Recorders	nr	1	3,181,576	3,181,576
Masterclock System	nr	1	1,414,034	1,414,034
UPS System	nr	1	2,121,050	2,121,050
Internal Cabling System	%	10%	32,508,634	3,250,863
Training	nr	1	1,414,034	1,414,034
Miscellaneous Equipment	nr	1	1,414,034	1,414,034
Manuals etc	nr	1	353,508	353,508
Special Tools	nr	1	353,508	353,508
Spare Parts	nr	1	1,767,542	1,767,542
FSS Type IIA				
ATC Console with 2 Positions	nr	1	1,272,630	1,272,630
HF Transceiver	nr	1	4,242,101	4,242,101
HF Antenna	nr	1	3,181,576	3,181,576
Internal Cabling System	nr	1	1,414,034	1,414,034
Installation	%	10%	8,696,307	869,631
Training	nr	0.8	1,060,525	848,420
Manuals etc	nr	1	353,508	353,508
Spare Parts	nr	1	353,508	353,508
Meteo Equipment				
Wind Sensor incl Mast, obstruction lights wind spee	nr	1	565,613	565,613
Data collection platform and modern equipment she	nr	1	636,315	636,315
Temperature and Humidity sensor	nr	1	98,982	98,982
Pressure sensor	nr	1	190,895	190,895
Data display tower	nr	1	848,420	848,420
ATIS Workstation	nr	1	565,613	565,613
Cabling etc.	nr	1	1,060,525	1,060,525
Spare parts etc	nr	1	1,060,525	1,060,525
TOTAL for ATC and Communications Equipment				**60,745,471**

Airfield Ground Lighting

Approach Lighting				
Simple Approach Lighting System 30	nr	53	126,879	6,724,578
Simple Approach Lighting System 12	nr	53	126,879	6,724,578
Relocation PAPI System, approach 30	nr	4	317,203	1,268,812
Relocation PAPI System, approach 12	nr	4	317,203	1,268,812
Sub Total				***15,986,782***
Runway Lighting				
Runway Edge Lighting System	nr	70	85,644	5,995,078
Runway Threshold Lighting System	nr	36	85,643	3,083,159
Runway End Lighting System	nr	13	105,405	1,370,269
Sub Total				***10,448,507***
Taxiway Lighting				
Taxiway Edge Ilghting System	nr	30	63,441	1,903,219
Signage	nr	10	355,262	3,552,618
Sub Total				***5,455,837***
Support and miscellaneous				
Apron Flood Lighting System	m^2	20000	317	6,343,991
Obstruction lights	nr	5	158,598	792,990
Rotating Beacon	nr	1	761,245	761,245
Lighted Windcones	nr	2	1,141,903	2,283,806
External Cabling System	ls	1	4,757,940	4,757,940
Remote Control System	nr	1	5,709,585	5,709,585
Training/Spare parts/Test equipment	ls	1	9,515,952	9,515,952
Dismantling existing installation	ls	1	3,171,960	3,171,960
Sub total				***33,337,469***
TOTAL for Airfield Ground Lighting				**65,228,594**
Maintenance Equipment				
Tractor/mower combination	nr	1	1,484,735	1,484,735
Utility vehicle	nr	1	975,683	975,683
TOTAL for Maintenance Equipment				**2,460,419**
R&FFF Equipment				
4x4, capacity 6000 l	nr	1	35,350,841	35,350,841
TOTAL for R&FFF Equipment				**35,350,841**
4. Intermodal Components	ls	1	**20,000,000**	**20,000,000**
5. Environmental Impact Mitigating Measures			**948,000**	**948,000**
TOTAL BASE COST				**814,379,749**

APPENDIX D

Proposed Tariff Structure Based on MIAA, MCIAA and SBMA Rates

Appendix D

AIRPORT FEES AND CHARGES FROM MIAA, MCIAA AND SBMA

I. Aeronautical Fees & Charges

1. Landing & Take-Off Fees

Fees are based on the maximum take off weight in the aircraft's certification and per aircraft cycle (landing and take-off)

Aircraft Weight	Rates in U.S. Dollar ($)	Domestic Operations Rates in Phil. Peso
Up to 50,000 kg.	$ 1.84 / 500 kg. or a fraction thereof.	P 26.87 / 500 kg. or fraction thereof
From 50,001 to 100,000 kg.	$ 184 plus $ 1.95 / 500 kg. or fraction thereof in excess of 50,000 kg.	P 2,687 plus P 24 / 500 kg. or fraction thereof in excess of 50,000 kg.
From 100,001 to 150,000 kg.	$ 398.75 plus $ 2.25 / 500 kg or fraction thereof in excess of 100,000 kg.	P 6,039 plus P 24 / 500 kg. or fraction thereof in excess of 100,000 kg
From 150,001 kg. and over	$ 646.25 plus $ 2.40 / 500 kg. Or fraction thereof in excess of 150,000 kg.	P 7,772 plus P 24 / 500 kg. or fraction thereof in excess of 150,000 kg

2. Parking Charges

Fees are based on the maximum take-off weight in the aircraft's certification and the number of hours after the first two (2) hours and one (1) hour free parking period for international and domestic operations, respectively

Aircraft Weight	International Operations Rates in U.S. Dollars ($)	Domestic Operations Rates in Phil. Peso
Up to 50,000 kg.	1st half-hour $ 3.00	1st half-hour P 20.40
	Each additional half hour thereafter or fraction thereof $ 3.00	Each additional half hour thereafter or fraction thereof P 17.00
From 50,001 to 100,000 kg.	1st half-hour $17.00	1st half-hour P195.50
	Each additional half hour thereafter or Fraction thereof $5.00	Each additional half hour thereafter or fraction thereof P45.90
From 100,001 and over	1st half-hour $21.00	1st half-hour P195.50
	Each additional half hour thereafter or fraction thereof $7.00	Each additional half hour thereafter or fraction thereof P59.50

3. Lighting Charges

Fees are based on the maximum take-off weight in the aircraft's certification and the number of hours after the first two (2) hours and one (1) hour free parking period for international and domestic operations, respectively

Landing/Take-off	(Domestic) P300/landing and/or take-off
	(Int'l) $12.00 per landing and/or take-off
Parking	Additional 15% of the rate for daytime parking

II. Air Navigational/Communication Facilities Fees & Charges

1. Operational Charges

Operational charges for the use of the enroute and airport/terminal navigation facilities and services provided exclusive of telecommunication services for Class "B" messages shall be based on each arrival, departure or overflight, regardless of the type of flight or its duration.

1.1 Overflight

A charge of US$100.00 or its equivalent in pesos at the time of payment, shall be imposed for every aircraft utilizing the enroute navigation facilities and services without landing at this airport

1.2. Departing or Arriving International Flight

For each departing or arriving flight at this airport a charge of US$225.00 or its equivalent in pesos at the time of payment, shall be imposed for the use of the enroute and airport/terminal navigation facilities and radar services of this.

1.3. Domestic and General Aviation Flights

For each flight under instrument flight rules at this airport, a charge of P600.00 for domestic and P200.00 for general aviation shall be imposed regardless of the number of air navigational facilities used, type of flight and its duration.

III. Other Airport Fees & Charges

1. Passenger Service Charges

International Passengers	P550.00 or US dollar equivalent per passenger
Domestic Passengers	P200.00 or US dollar equivalent per passenger

The following shall be exempted:

Children of two (2) years & below

Transit passengers

Pilgrims & others with authority from the Office of the President of the Philippines

Refugees

Extra crew of the air carrier

Other passengers authorized by the CAAP Administrator or his duly authorized representative within the guidelines approved by the CAAP Board of Directors

2. Use of CIP Lounge

CIP space rental	Php 250 / sq.m. / month
VIP room rental	P2,500 / hour

3. Check-In & Concession Counters

Check-in Counters	US$10/hour (Intl) and P250/hour (Dom)
Concession Area	P150.00 to 200 / sq.m. / month

4. Concession Privilege Fee

Passenger Service	P1,000 / month
Food Service	P1,000 / month
Transport Service	P500 / month
Other Utilities or Business	P800 / month

5. Rental of Floor Space

Bare floor area	P150 to 250 / sq. m. / month

6. Rental of Land Space

Developed Area	P50 / month
Undeveloped Area	P25 / month

7. Advertising

Lighted signboard or display	P250 / sq. m. / month
Unlighted signboard or display	P100 / sq. m. / month
Circulars and posters	P50 / sq. m. /month

h. Aviation Fuel, Oil and Lubricant Services

Royaly Fee:

Aviation fuel	P0.50 / liter
Oil	P0.50 / liter
Grease	P0.50 / liter