

Table 20.4.5 Benefits of the Project including the Related Businesses

Unit: million Baht

Benefits from	1998	1999	2000	2001	2002	2003	2004
Passenger service	36.68	50.63	65.55	76.81	88.55	100.75	113.43
Landing & parking	9.28	12.42	15.55	19.34	23.13	26.91	30.70
Aviation bridge	0.77	1.02	1.28	1.53	1.78	2.02	2.27
Tourist expenditures in terminal building	51.35	70.88	91.77	107.53	123.97	141.05	158.80
Other tourist expenditure	29.34	40.50	52.44	61.45	70.84	80.60	90.74
Air fares	83.45	115.18	149.13	174.74	201.45	229.21	258.05
Total	210.87	290.63	375.72	441.40	509.72	580.54	653.99

20.4.3 Economic Costs of the Project

The costs of the Project which have been calculated in the previous section (see **Table 20.2.2** and **Table 20.2.5**) have been converted into the economic costs of the Project as follows.

(1) Elimination of Transfer Payments

"Government land rental expenses" which are paid to Ministry of Finance by AAT have been eliminated in the economic analysis because it is only a transfer payment in Thai economy and the areas which AAT rents from government remain constant "with" and "without the project".

(2) Standard Conversion Factor

All inputs and outputs for the project are evaluated at economic prices in the economic analysis to eliminate the distortions which are created by government interventions in the economy. Some payments both of the inputs and outputs are only the transfer items in the country's economy, such as tax, import and export duties and subsidies. In order to eliminate the distortions in the financial costs of the project "Standard Conversion Factor (SCF)" has been assumed. The SCF has been estimated at 91 % with revision of the SCF studied by World Bank (see **Appendix 20.4.3**).

The construction costs of the Projects are converted into economic costs by using the SCF of 91 % as shown in **Table 20.4.6**.

Table 20.4.6. Economic Construction Costs

	1996	1997	million Baht Total
Construction costs in market prices	178.86	273.35	452.21
Construction costs in economic prices	162.76	248.75	411.51

(3) Opportunity Cost of Capital

Discount rate (opportunity cost of capital) is usually estimated at 10-12 % in the economic analysis of infrastructure development projects. The discount rates applied in the past studies for airport development projects in Thailand are as follows:

- Airport System Master Plan Study,
Airports Authority of Thailand (1991) 12 %
- Bangkok International Airport,
Department of Aviation 10 %

For the economic analysis of the Project a rate of 12 % has been applied as a discount rate with consideration of certainty of the analysis.

20.4.4 Calculation and Evaluation

Table 20.4.7 shows the comparison of benefits and costs of the short-term development plan during the project period.

The Economic Internal Rate of Return (EIRR) and Net Present Value (NPV) have been estimated at 25.96 % and 295.67 million Baht respectively which are high enough to justify the Project.

In addition the EIRR and NPV amount to 54.44 % and 1,177.48 million Baht respectively as shown in Table 20.4.8 when the benefits from related foreign tourist expenditures and international air fares paid to Thai carriers are estimated to be included in the benefits of the Project.

Table 20.4.7 Benefits and Costs of the Project

	Unit: million Baht									
	1996	1997	1998	1999	2000	2001	2002	2003	2004	
BENEFITS										
Passenger Charges			36.68	50.63	65.55	76.81	88.55	100.75	113.43	
Landing & Parking Charges from Foreign Carriers			9.28	12.42	15.55	19.34	23.13	26.91	30.70	
Aviation Bridge Charges from Foreign Carriers			0.77	1.02	1.28	1.53	1.78	2.02	2.27	
Tourist Expenditure in Passenger Terminal Building			51.35	70.88	91.77	107.53	123.97	141.05	158.80	
TOTAL BENEFIT	0.00	0.00	98.08	134.95	174.15	205.21	237.43	270.73	305.20	
COSTS										
CAPITAL COSTS										
Construction Costs (incl. VAT)	(411.51)	162.76	248.75							
Engineering Service(excl. VAT)	(42.26)	16.90	25.36							
VAT for Engineering services	(0.00)	0.00	0.00							
Total Capital Costs	(453.77)	179.66	274.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OPERATING COSTS										
Personnel Expenses			2.93	4.05	5.24	6.14	7.08	8.06	9.07	
Operating & Maintenance Expenses			5.98	5.98	5.98	5.98	5.98	5.98	5.98	
Total Operating Costs	0.00	0.00	8.91	10.03	11.22	12.12	13.06	14.04	15.05	
TOTAL COSTS	179.66	274.11	8.91	10.03	11.22	12.12	13.06	14.04	15.05	
NET BENEFITS	-179.66	-274.11	89.17	124.92	162.93	193.09	224.37	256.69	290.15	
ECONOMIC INTERNAL RATE OF RETURN (EIRR): 25.96%										
NET PRESENT VALUE (NPV): 295.67 million Baht										
(DISCOUNT RATE 12 %)										

**Table 20.4.8 Benefits and Costs of the Project
including the Benefits from Related
Tourist Expenditures and Air Fares**

	Unit: million Baht									
	1996	1997	1998	1999	2000	2001	2002	2003	2004	
BENEFITS										
Passenger Charges			36.68	50.63	65.55	76.81	88.55	100.75	113.43	
Landing & Parking Charges from Foreign Carriers			9.28	12.42	15.55	19.34	23.13	26.91	30.70	
Aviation Bridge Charges from Foreign Carriers			0.77	1.02	1.28	1.53	1.78	2.02	2.27	
Tourist Expenditures in Passenger Terminal Building			51.35	70.88	91.77	107.53	123.97	141.05	158.80	
Other Tourist Expenditures			29.34	40.50	52.44	61.45	70.84	80.60	90.74	
Air Fare Payments to Thai Carriers			83.45	115.18	149.13	174.74	201.45	229.21	258.05	
TOTAL BENEFIT	0.00	0.00	210.87	290.63	375.72	441.40	509.72	580.54	653.99	
COSTS										
CAPITAL COSTS										
Construction Costs (incl. VAT)	(411.51)	162.76	248.75							
Engineering Service(excl. VAT)	(42.26)	16.90	25.36							
VAT for Engineering services	(0.00)	0.00	0.00							
Total Capital Costs	(453.77)	179.66	274.11	0.00	0.00	0.00	0.00	0.00	0.00	
OPERATING COSTS										
Personnel Expenses			2.93	4.05	5.24	6.14	7.08	8.06	9.07	
Operating & Maintenance Expenses			5.98	5.98	5.98	5.98	5.98	5.98	5.98	
Total Operating Costs	0.00	0.00	8.91	10.03	11.22	12.12	13.06	14.04	15.05	
TOTAL COSTS	179.66	274.11	8.91	10.03	11.22	12.12	13.06	14.04	15.05	
NET BENEFITS	-179.66	-274.11	201.96	280.60	364.50	429.28	496.66	566.50	638.94	
ECONOMIC INTERNAL RATE OF RETURN (EIRR):			54.44%							
NET PRESENT VALUE (NPV):			1,177.48 million Baht							
(DISCOUNT RATE 12 %)										

Economic sensitivity has been examined to ensure the feasibility of the Project by considering the following conditions.

- 1) 10 % of costs increase including operating costs
- 2) 10 % of revenue decrease
- 3) A combination of 1) and 2)
- 4) 20 % of costs increase including operating costs
- 5) 20 % of revenue decrease
- 6) A combination of 4) and 5)

The results are expressed by EIRR and NPV corresponding to the above changes in **Table 20.4.9**. The EIRR will remain within a level to reveal the economic feasibility of the Project under the assumption of six cases.

Table 20.4.9 Result of Economic Sensitivity Analysis

	EIRR	NPV
Base Case	25.96 %	295.67 million Baht
1) 10 % of costs increase	23.03 %	248.50 million Baht
2) 10 % of revenue decrease	22.73 %	218.94 million Baht
3) A combination of 1) and 2)	19.91 %	171.76 million Baht
4) 20 % of costs increase	20.44 %	201.34 million Baht
5) 20 % of revenue decrease	19.26 %	142.20 million Baht
6) A combination of 4) and 5)	14.17 %	47.86 million Baht
Case including the benefits from other tourist expenditures and air fares to Thai Carriers	54.44 %	1,177.48 million Baht

Note: The details are shown in **Appendix 20.4.4**

20.5 CONCLUSION OF FINANCIAL AND ECONOMIC ANALYSIS

The results of financial and economic analysis for the short-term development plan for Phuket International Airport are summarized as follows:

- (1) The FIRR of the Project for AAT's Phuket International Airport has been estimated at 12.03 % which indicates the minimum rate to justify the Project from the financial point of view.
- (2) For this project the increase in revenues by project implementation is satisfactory as it covers the capital costs of the Project and the incremental costs for operation and maintenance, if some portion of the capital costs is financed by the loan at subsidized conditions. The financing arrangements of the capital costs are the crucial point for the financial feasibility of the Project.
- (3) The EIRR and NPV of the Project have been estimated at 25.96 % and 295.67 million Baht respectively for the national economy of Thailand which are high enough to justify the Project. The EIRR will remain within a level to reveal the economic feasibility of the Project under the assumption of a combination of 20 % increase in costs and 20 % decrease in benefits.
- (4) In addition the EIRR and NPV of the Project are projected to amount to 54.44 % and 1,177.48 million Baht respectively when the benefits from other related tourist expenditures and international air fares paid to Thai carriers included in the benefits of the Project.
- (5) Increase in regional incomes through the tourist expenditures by the incremental international passengers will promote the continuous development of tourism sector in Phuket.

CHAPTER 21

CONCLUSIONS AND RECOMMENDATIONS

21.1 CONCLUSIONS

The report studied the Master Plan for the long-term development of Phuket International Airport and the Feasibility Study on the short-term development of existing Phuket International Airport within the framework of the Master Plan.

It is concluded that a new airport will be developed for long-term development plan of the target year 2010, and that the existing airport will be developed on a minimum scale only to meet the demand of the target year 2000 until completion of the new airport as the short-term development.

It should be noted that the new airport site determined in this Study was selected from the possible sites mainly in Phuket Island and they are not fully in compliance with international standards of ICAO in respect of obstacle limitation surfaces. Therefore, a separate detailed study for site selection is required for a new airport construction in Phuket Island including in the sea or on the adjacent mainland.

Major work items to be covered for the short-term development are as follows:

- Runway overlay
- Expansion of the car park
- Expansion of passenger terminal building
- Installation of power generator, deep well, incinerator and telephone exchange
- Additional security fence

The conclusions of the Feasibility Study were summarized as follows;

- (1) The project cost is estimated to be 497 million Baht.

Construction period for short-term development is estimated to be 24 months.

- (2) The FIRR of this Project is estimated at 12.03 % which indicates the minimum rate to justify the project from the financial point of view.

The EIRR and NPV are estimated at 25.96 % and 295.67 million Baht respectively for the national economy of Thailand. Furthermore, the EIRRs will remain within a level to reveal the economic feasibility of the project under the assumption of combination of 20 % increase in costs and 20 % decrease in benefits.

- (3) The environmental impact assessment for the short-term development indicates that there will not be so much influence expected as a whole.
- (4) Consequently, it is confirmed that short-term development plan is feasible from technical, environmental, economic and financial aspects.

Therefore, the existing airport will be expanded for the target year 2000 in order to cope with increasing demand along the implementation schedule established in this Study.

21.2 recommendations

In order to implement the project as scheduled in this Study, following measures are recommended.

- (1) National and regional consensus for the project implementation should be obtained.
- (2) The preparatory and coordination works are advisable to be undertaken as soon as possible.
- (3) Financial arrangement for project implementation should be prepared.
- (4) The separate study should be carried out for selection of a new airport site fully in compliance with ICAO standards in Phuket Island including in the sea or on the adjacent mainland. Especially in case of a new site in the sea, following items should be studied in detail:
 - Meteorological conditions such as wind direction and velocity
 - Marine conditions such as tidal current, wave height, etc.
 - Environmental conditions in the reclamation area

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