Construction work items of the medium-term development project to be provided by the DOTC and other organizations identified in Tables 5 and 6.

Table 5 Construction Work Items of the Medium-Term Development Project

1. Site preparation.
2. Runway with 2,500m length and 45m width.
3. Connecting taxiways with 23m width.
4. Apron to accommodate one (1) DC-10 class, two (2) A300 class and one (1) F50 class aircraft.
5. Connecting taxiway for general aviation.
6. Passenger terminal building with about 16,000 sq.m. floor area including airline office area.
7. Cargo terminal building with about 3,500 sq.m. floor area.
8. Administration building with about 1,600sq.m. floor area and control tower.
9. Fire station with about 500 sq.m. floor area.
10. Car park to accommodate about 310 vehicles.
11. Access road.
12. Relocation of Instrument Landing System (ILS).
13. Air traffic control system.
14. Aeronautical telecommunication system.
15. Meteorological observation system.
16. Airfield lighting system.
17. One (1) ambulance.
18. Power supply system.
19. Telephone system.
20. Water supply system.
21. Sewerage system.
22. Incinerator.
23. Fuel hydrant system at new apron.

Table 6 Construction Work Items of the Medium-Term Development by Other Organizations

Work Items	Organization
1. Fuel tank farm	PAL and/or other oil company
2. Cargo agent building	Cargo agent
3. Aircraft maintenance hangar and incidental facilities (as required)	Airline
4. Canteen at car parking area (as required)	Private sector

4. FEASIBILITY STUDY ON THE MEDIUM-TERM DEVELOPMENT PROJECT

4. Feasibility Study on the Medium-Term Development Project

4.1 Preliminary Design

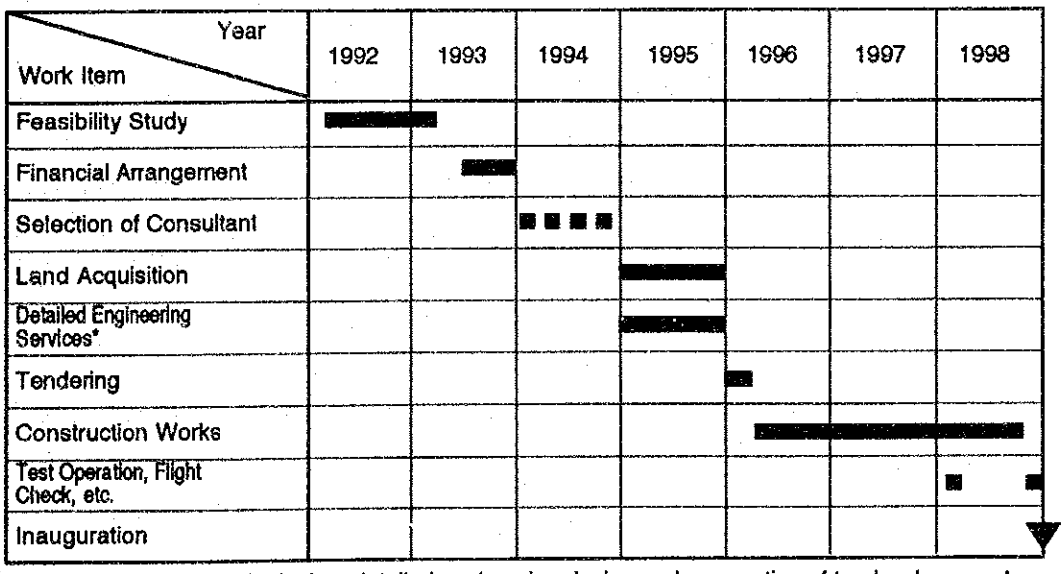
The preliminary design for the facilities to be constructed in the medium-term development project has been prepared in accordance with the technical requirements including the requirements for the safety of aircraft operations.

4.2 Project Implementation Schedule and Cost Estimates

The project implementation schedule is estimated as shown in Table 7.

It should be noted here that the duration of selection of consultant shown by the dotted line in the table indicates uncertainty of time required to process necessary formalities until the final selection of the consultant is made. In general it would take almost one year due to the loss time during the selection process, however, it may be shortened some six months if processing formalities are accelerated.

Table 7 Project Implementation Schedule for the Medium-Term Development



Note*: Including basic design, detailed engineering design and preparation of tender documents.

The next stage of the project implementation to this study is the financial arrangement for the project. The selection of a consultant, land acquisition, the detailed engineering services, and tendering will follow the financial arrangement prior to the commencement of the construction work.

The construction work will take approximately 33 months to complete based on the procedures of switching the runway operations from the existing runway to the new one without interruption of aircraft operations.

The construction works are expected to commence in the second quarter of 1996 and to be completed at the end of 1998 as shown in Table 6. While Table 7 indicates the practical schedule, the schedule could be reduced by one-half year in the optimistic case as mentioned above.

The cost of the medium-term development project is shown in Table 8 based on 1992 prices. The estimated costs are 136 million PHP for land acquisition and compensation, 2,246 million PHP for the construction, 330 million PHP for engineering services and 2,712 million PHP in total.

Table 8 Project Cost for the Medium-Term Development

Based on 1992 price

Unit : PHP 1,000

ITEM	LOCAL PORTION	FOREIGN PORTION	TOTAL
I. LAND ACQUISITION AND COMPENSATION COST			
LAND ACQUISITION AND RELOCATION OF HOUSES	123,846	0	123,846
CONTINGENCY (APPROX. 10%)	12,154	0	12,154
TOTAL OF I.	**136,000**	**0**	**136,000**
II. CONSTRUCTION COST			
1. MOBILIZATION/DEMOBILIZATION & TEMP. WORKS	66,000	125,000	191,000
2. CIVIL WORKS	326,564	344,115	670,679
3. ARCHITECTURAL WORKS	229,693	474,977	704,670
4. AIRPORT UTILITIES	21,720	82,320	104,040
5. AIR NAVIGATION SYSTEMS	59,805	245,283	305,088
6. RESCUE AND FIRE FIGHTING SYSTEM	300	5,700	6,000
7. FUEL SUPPLY SYSTEM	15,000	45,000	60,000
SUBTOTAL	719,082	1,322,395	2,041,477
CONTINGENCY (APPROX. 10%)	71,918	132,605	204,523
TOTAL OF II.	**791,000**	**1,455,000**	**2,246,000**
III. ENGINEERING SERVICES COST			
ENGINEERING SERVICES	30,000	270,000	300,000
CONTINGENCY (APPROX. 10%)	3,000	27,000	30,000
TOTAL OF III.	**33,000**	**297,000**	**330,000**
TOTAL PROJECT COST (I.+II.+III.)	**960,000**	**1,752,000**	**2,712,000**

Note: Exchange rates US$1.00 = PHP25 = Yen 125 (PHP 1.0 = Yen 5)

4.3 Airport Management Study

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

4.4 Economic and Financial Analyses

The economic analysis was carried out to judge whether or not the medium-term development project of Davao International Airport is feasible from the viewpoint of national economy.

The tangible benefits to be generated by the project include the following :

a) Benefit of time saving and cost saving for domestic and international passengers and cargo

b) Benefit of increase in foreign exchange spent by foreign visitors

c) Benefit of increase in airport revenues

d) Benefit of increase in airlines' revenues

e) Benefit of increase in revenues by selling aircraft fuel

Construction costs and additional operations and maintenance costs are counted for the project implementation.

The benefits and cost are compared using evaluation indicators such as the economic internal rate of return (EIRR), net present value (NPV) and benefit cost (B/C) ratio. The results of the evaluation are shown in Table 9.

Table 9 Evaluation Indicators for Economic Analysis

EIRR (%)	17.74
B/C Ratio (%)*	1.20
NPV(Million PHP)*	412

Note : At discount rate of 15%

The results of the economic analysis show that the medium-term development project of Davao International Airport is feasible from the national economic viewpoint since the EIRR is greater than the "opportunity cost of capital" of 15% which is used as a criterion for economically viable projects by National Economic and Development Authority (NEDA) in the Philippines.

A sensitivity analysis has also been made for probabilistic judgment of the feasibility and its results are shown in Table 10.

Table 10 Results of Sensitivity Analysis for EIRR

Case	EIRR(%)
Base Case	17.7
Case 1 : Cost up by 20 %	15.1
Case 2 : Cost down by 20%	21.3
Case 3 : Traffic up by 20%	20.6
Case 4 : Traffic down by 20%	14.6
Case 5 : Cost up by 20% and traffic down by 20%	12.2

As shown in Table 10, even for the worst case, i.e. cost up by 20% and traffic down by 20%, the EIRR is 12.2% and still satisfies the "opportunity cost of capital" of 10% to 12% which is used by the World Bank and the Asian Development Bank.

In addition to the above tangible benefits, the implementation of the project will have intangible benefits on the socio-economy of the Philippines by:

a) Providing an indispensable and safe means of air transportation for the archipelagic state;

b) Increasing trade and business opportunities;

c) Enhancing foreign investment;

d) Promoting tourism development; and

e) Generating employment opportunities.

These impacts eventually will increase the national income and enhance income distribution.

The financial analysis was carried out to examine the financial impact of the medium-term development project on the operating entity of the Davao International Airport. As a result of the analysis, the following conclusions were obtained:

a) It will be difficult to recover the maintenance and operating expenses of the medium-term development plan from the airport revenues under the current charging system of airport tariff.

b) However, if the current low charging rate is raised to a reasonable level, the implementation of the medium-term development project will increase the airport revenues with the increase in air traffic demand. As a result, it will improve the financial balance of the airport operation.

c) The estimated annual disbursement of the investment is not considered a heavy burden for the Philippine Government since the large-scale air transport projects currently undertaken by DOTC are scheduled to be completed by 1995.

4.5 Impacts of Airport Development on Surrounding Area

(1) Environmental Impact

Some 2,000 housing units are estimated to be exposed to aircraft noise of WECPNL 75 and above in 2010. According to the assurance given by the DOTC and the local government agencies, estimated noise influence will be no problem due to the larger tolerances to noise by the Philippine nationals than Japanese nationals. Aircraft noise influence on the surrounding community is possible to decrease much less by the specific measures, i.e., keeping the residential area away from the airport by the land use control, adopting a preferential runway usage pattern, and introducing new low-noise type of aircraft.

It is deemed that airport development will not create notable adverse impacts on the surrounding community in terms of other environmental qualities such as air, water, vibration, biology and culture.

(2) Social Impact

Initially some 290 housing units for the medium-term development and some additional 160 housing units for the long-term development need to be relocated. Based on the proposed airport master plan, Davao City council has approved the amended official zoning map in November 1992 to secure the future airport development. By the arrangement, it is expected that the social impact to be caused by housing relocation will be minimal in the future.

(3) Future Land Use Plan

Future land use plan shown in Figure 9 is proposed so that the Davao International Airport could be developed in harmony with the surrounding communities over a long period of time.

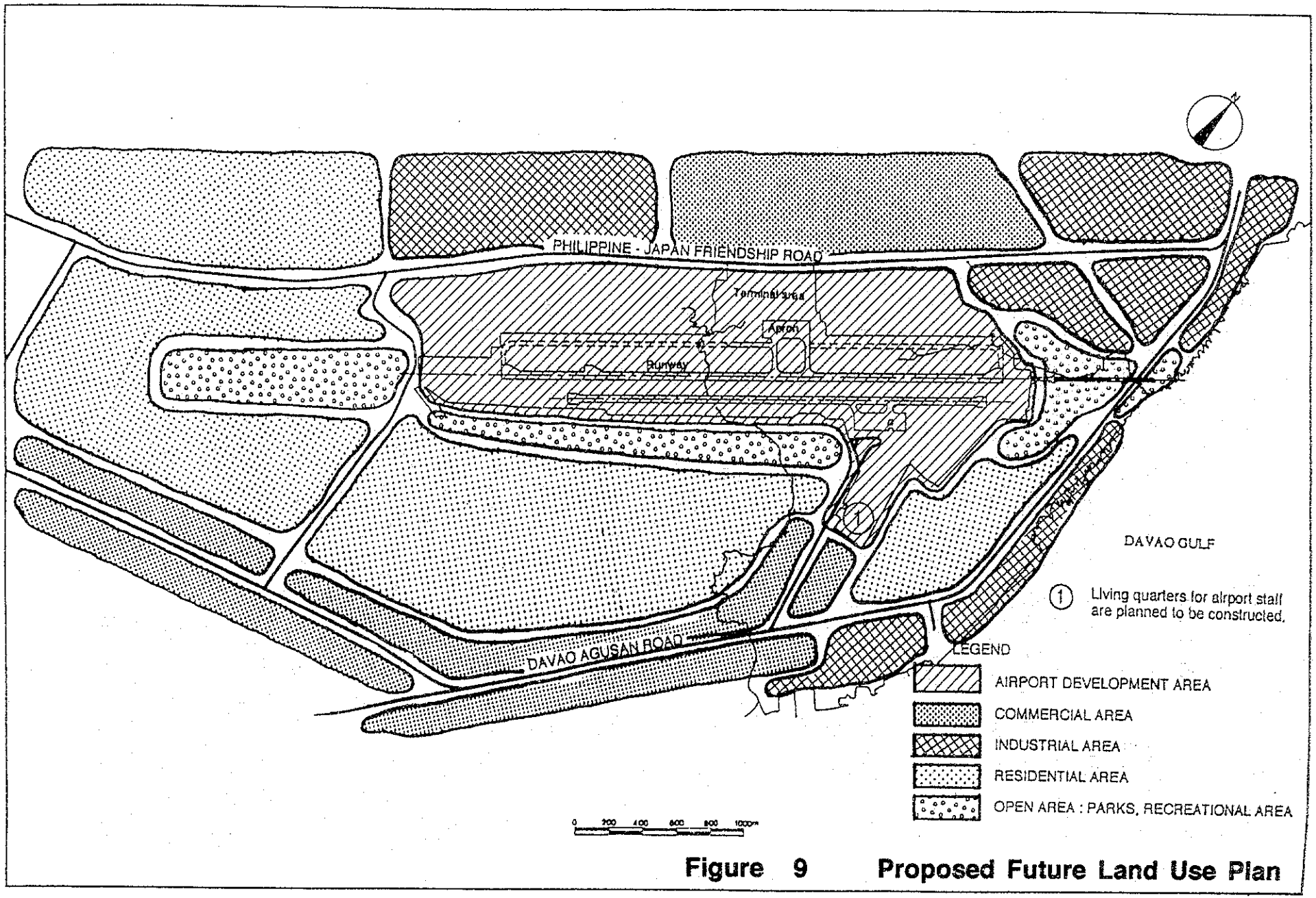


Figure 9 Proposed Future Land Use Plan

5. CONCLUSIONS AND RECOMMENDATIONS

5. Conclusions and Recommendations

5.1 Conclusions

The Study concludes as follows :

(1) The Medium-Term Development Project is feasible from the overall aspect, i.e. technical, airport managerial, economical, financial, environmental and social aspects.

(2) The project will provide the following effects:

a) Improvement of air transport safety.
b) Provision of unrestricted and efficient air transport services.
c) Contribution to the agro-industrial development in Southern Mindanao to be established at the Davao City Regional Industrial Center.
d) Contribution to tourism development in Davao, particularly in Samal Island.
e) Increase in trade and business opportunities.
f) Increase in employment opportunities.

(3) Eventually the project will contribute to the achievement of the following goals of the national development plan:

a) Development of Davao City as well as Mindanao
b) Decentralization of National Development

(4) Consequently, implementation of the project at the earliest possible time is indispensable for the Philippines.

5.2 Recommendations

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

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

(2) To prepare financial arrangement.

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

(4) To strictly control land use at the area surrounding the airport considering the future aircraft noise influence and the height restriction for safe aircraft operations.

JICA