Table 1.3-3 Present Fleet of Various Airline Companies (May 2002)

Airline Company	Type of Aircraft	No of Aircraft
Philippine Airlines	A330 A320 B737 – 300 B737 - 400 B747 – 400 A340 – 300	8 3 7 4 4 4 Total 30
Air Philippines	B737 - 300 B737 – 200	2 8 Total 10
Cebu Pacific	B757-200 DC9	2 12 Total 14
Grand International Airways	B737	All aircraft grounded/ operation still suspended
Asian Spirit	YS11 DHC7 LET410 LET410UVT CN236	5 1 1 1 2 Total 10
Southeast Asian Airlines (Seair)	LET410UVP-E	2 Total 2
Laoag International Airlines	F27	2 Total 2
Corporate Air	Twin Otter Cessna Caravan	2 2 Total 4
Philippine International Airways		Franchise already granted but still presently applying for permit

Source: Operations Center of Various Airlines

1.4 SURFACE TRANSPORTATION

Region V remains to be highly linked economically with Manila and Cebu. This relationship has evolved into a multi-modal system of transportation, characterized by both complementation and competition.

1.4.1 Sea Transport

The national port facilities under the administrative jurisdiction of the Legaspi Port Management Office located in Albay, handle the bulk of inter-island commodity and passenger flows. **Table 1.4-1** summarizes the facilities of the three (3) important ports that provide the necessary water transport links.

Table 1.4-1 Port Facilities

Description	Legaspi Port	Tabaco Port	Pasacao
1. Location	Albay	Albay	Camarines Sur
2. Total Port Area	4,943 sq. m.	25,400 sq.m.	20,700 sq.m.
3. Description	Reinforced concrete wharf on concrete piles and fill, handling general cargo and passenger	Reinforced concrete pier on concrete piles; handling general cargo and passenger	Reinforced concrete wharf on concrete piles and fill, handling general cargo and passenger
4. Berthing Facilities	339mx30m wharf with 4.5m control depth; 250m east and 130m north breakwaters;1,200m seawall; wood-pile fendering system	289mx20m wharf with 10m control depth; 228m causeway	44mx10m pier with control depth of 4 m; 68m rock causeway
5. Storage Facilities	1,738 sq.m. open storage; 2,520 sq.m. transit shed; 75 sq.m. cargo shed; warehouses	Two 60mx12m transit sheds; three warehouses with combined 7,334 sq.m. coverage and 12,000sq.m. open storage area	750 sq.m. warehouse and open storage area of 3,300 sq.m.
6. Anchorage	About 275 mtrs from the beach; open at eastward and exposed to NE monsoon; poor holding ground	Limited anchorage off the wharf; No adequate anchorage in the bay due to deep water and steep sides	Between Pasacao Pt. And Refugio Is. Cove along shoreline fringed by reef and mud. Anchorage is about 7m mud bottom.

1.4.2 Road Transport

The national road inventory indicates a total length of about 2,160 kms of road in various pavement conditions and types. The basic regional domestic land transport relies on this network of roads, the breakdown of which is shown in **Table 1.4-2,** together with the number of registered vehicles running along the network.

Table 1.4-2 Breakdown of National Roads

Indicators	Province					
	Albay	Cam. Norte	Cam. Sur	Catan-duanes	Masbate	Sorsogon
Motor Vehicles Registered	29,908	11,225	33,180	5,173	6,690	10,166
National Road Length (km)	399.65	200.34	659.42	315.09	380.96	307.72
Road Density (km/sq.km)	0.16	0.09	0.13	0.21	0.09	0.14

Source: Regional Development Plan

The Maharlika Highway and the Quirino Highway are two (2) important trunk roads that connect Region V with the rest of Luzon, and to the Visayas and Mindanao through the ferry port located in Matnog, Sorsogon. The Quirino Highway has reduced the travel time to and from Manila and was observed to have diverted a substantial volume of traffic away from Camarines Norte, which may have a profound effect on the economic activity of the province.

1.4.3 Rail Transport

The rail facilities have been in critical condition since the late 80s when the Main South Line, the only remaining operating line of PNR, began to lose patronage due primarily to the deteriorated equipment and the poor level of service. Efforts to rehabilitate the line were exerted by the Government with foreign financial assistance, but because of the huge amount required to fully rehabilitate the service, the project remains to be completed.

Meanwhile, a proposal to extend the Main South Line to Sorsogon is being considered by DOTC. A feasibility study to determine its viability and impact on the existing transport network was recently concluded. The extension may be justified in terms of its complementary role to the Matnog Ferry Service, if enough patronage is realized along the existing line.

1.5 RELEVANT ENVIRONMENTAL LAWS AND REGULATIONS

1.5.1 Introduction

The concept of environmental impact assessment evolved in response to the pollution and natural resource depletion caused by rapid population growth, urbanization, industrialization, agricultural development and technological progress. EIA reflects the realization that natural resources are finite and incapable of absorbing the ever-increasing demands of human society. The EIA process requires that potential environmental consequences of a proposed development activity be identified and considered before the activity is undertaken. This requires development to proceed in a more thoughtful and deliberate way, taking into account the need to preserve environmental quality, natural resources and biological diversity for future generations. These realizations resulted into the enactment of legislations intended to arrest and prevent further damage to our environment, and or mitigate such impacts.

1.5.2 Legal Framework of the Philippine EIS System

Environmental Impact Assessment (EIA) in the Philippines was adopted in 1977 with the issuance of P.D. No. 1151 known as the "Philippine Environmental Policy". It defined the general state policies on the pursuit of a better quality of life for this generation and the future generations, without degrading the environment. Specifically, it mandated the undertaking of environmental impact assessments for all projects that may have significant impacts on the environment.

In 1978, P.D. No. 1586 formally established the "Philippine Environmental Impact Statement (EIS) System". While P.D. 1151, as a statement of policy, provides for the adoption of EIA as the policy instrument to be used in incorporating environmental considerations in development, P.D. 1586 laid down the framework for its implementation. A major provision of this law is the delineation of developmental activities that would require environmental impact assessment. It declared Environmentally Critical Projects (ECPs) and projects within Environmentally Critical Areas (ECAs) as projects, which require the submission of an EIS.

The EIS system applies to all projects planned by any government agency or instrumentality, including government-owned or controlled corporations, private corporations, firms, individuals or other entities which fall within the definitions of an ECP or which will be located in an ECA.

An ECP is one that has a high potential for negative environmental impacts, including projects, which the President may proclaim as environmentally critical. An ECA on the other hand, is an area that is considered as ecologically sensitive, including areas, which the President may proclaim as environmentally critical. Presidential Proclamation No. 2146 was issued in 1981 to identify three (3) types of ECPs and twelve (12) kinds of ECAs.

The DENR issued Administrative Order No. 21 in 1992 (DAO 92-21) which was basically the Implementing Rules and Regulations (IRR) of P.D. 1586. A revised set of IRR for the EIS system was effected when DENR A.O. 96-37 was issued in 1996, further strengthening the efficacy of the EIS system as a planning, management and regulatory tool. DAO 96-37 incorporated a Procedural Manual, which dealt more on the process rather than on the technical and/or other aspects of the EIA.

1.5.3 Implication to the Project

Before any development can begin, environmental considerations must be taken into account and the necessary permits/clearances be obtained. Being a major infrastructure project, the development of the New Legaspi Airport is considered an environmentally critical project (ECP) and is thus, under the purview of P.D. 1586 or the EIS system.

Under the EIS system, the proponent is tasked to undertake an environmental impact assessment and to prepare an EIS. The EIS is a written report containing an assessment of the most likely impacts of the project on the environment and on the people in the areas to be affected by the project. This is submitted to the Environmental Management Bureau (EMB) of the DENR for review. The DENR, through its Secretary or the Regional Executive Director (RED) may then approve (or otherwise) the project through the issuance of an "Environmental Compliance Certificate" or ECC. An ECC is a document issued by the DENR Secretary or the RED certifying that, based on the representations of the proponent and the EIS preparers, as reviewed, validated and recommended by the EIA Review Committee (EIARC), the proposed project or undertaking will not cause significant negative environmental impacts, and that the proponent has complied with the requirements of the EIS system.

1.5.4 Requirements of the EIA Study

The conduct of the EIA study for the New Legaspi Airport project shall be in accordance with the requirements incorporated in the revised EIA Manual of DAO 96-37. Scoping meetings will be initiated by the project proponents with the EMB and the stakeholders to define the technical boundaries and the issues and alternatives that need to be closely examined in the EIA study. Depending on the results of the scoping sessions, the following are the general issues/topics that will be considered by the proponents in the study:

1. social acceptability
2. meteorology
3. air quality
4. water quality
5. terrestrial ecology

6. geology
7. socio-economic studies

Baseline conditions of the project site will be established by conducting site investigations to gather primary data on air, water, terrestrial, geological, and other pertinent parameters. Secondary information covering geology, meteorology, hydrology, and demographic characteristics concerning the site will also be obtained from various national and local agencies, including from the Philippine Atmospheric, Geophysical and Astronomical Sciences Administration (PAGASA), Philippine Institute of Volcanology and Seismology (PHIVOLCS), Barangay Health Centers, Municipal Planning and Health Offices. A perception survey and public consultation will also be conducted for the proposed airport development project.

The potential impacts of the project on land, water, air, and people will be identified, predicted and assessed in terms of their negative or positive effects. Based on the impacts predicted and assessed, mitigating and enhancement measures will be recommended accordingly and corresponding Environmental Management and Monitoring Plans will be prepared.

Chapter 2 CONDITION OF THE EXISTING LEGASPI AIRPORT

2.1 GENERAL

Legaspi Airport is located in the city of Legaspi, Albay about 4.4 kilometers northwest of the city proper. Aerodrome reference point is at 13°09'43.1479"N, 123°44'04.4427"E having an ICAO reference code of 4C. Reference elevation is 20M and reference temperature is 28°C. The area is relatively flat but slightly sloping to the south with longitudinal slope of the runway of 0.71% downhill to the southwest. This trunkline domestic airport is supervised and operated by the Air Transportation Office of the Department of Transportation and Communications.

2.2 ENVIRONMENTAL CONDITIONS

2.2.1 Natural Environment

The existing airport is bounded by the Yawa River to the northeast and by the Bagtang River to the southwest. One of the major waterways draining the slopes of Mayon Volcano and passing through Legaspi City, Yawa River has become shallow along its lower reaches due to sedimentation caused by the recent activities of Mayon Volcano. Its quality has been deteriorating due to pollution from industrial activities, solid wastes and debris flow.

Rice paddies are located east of the airport terminal building (outside airport property) and southwest of Rwy 06. Apart from the rice paddies, vegetation around the airport consists of coconut, grass, and fruit bearing trees such as mango, banana and chico.

The Kemantong Range, a hilly terrain located southwest of the airport, protrudes about 40m above ground level and is considered a major hazard to airport operations. While Linion Hill, a smaller hill north of the airport and where a synoptic station of PAGASA is located, rises at least over 30m above ground level.

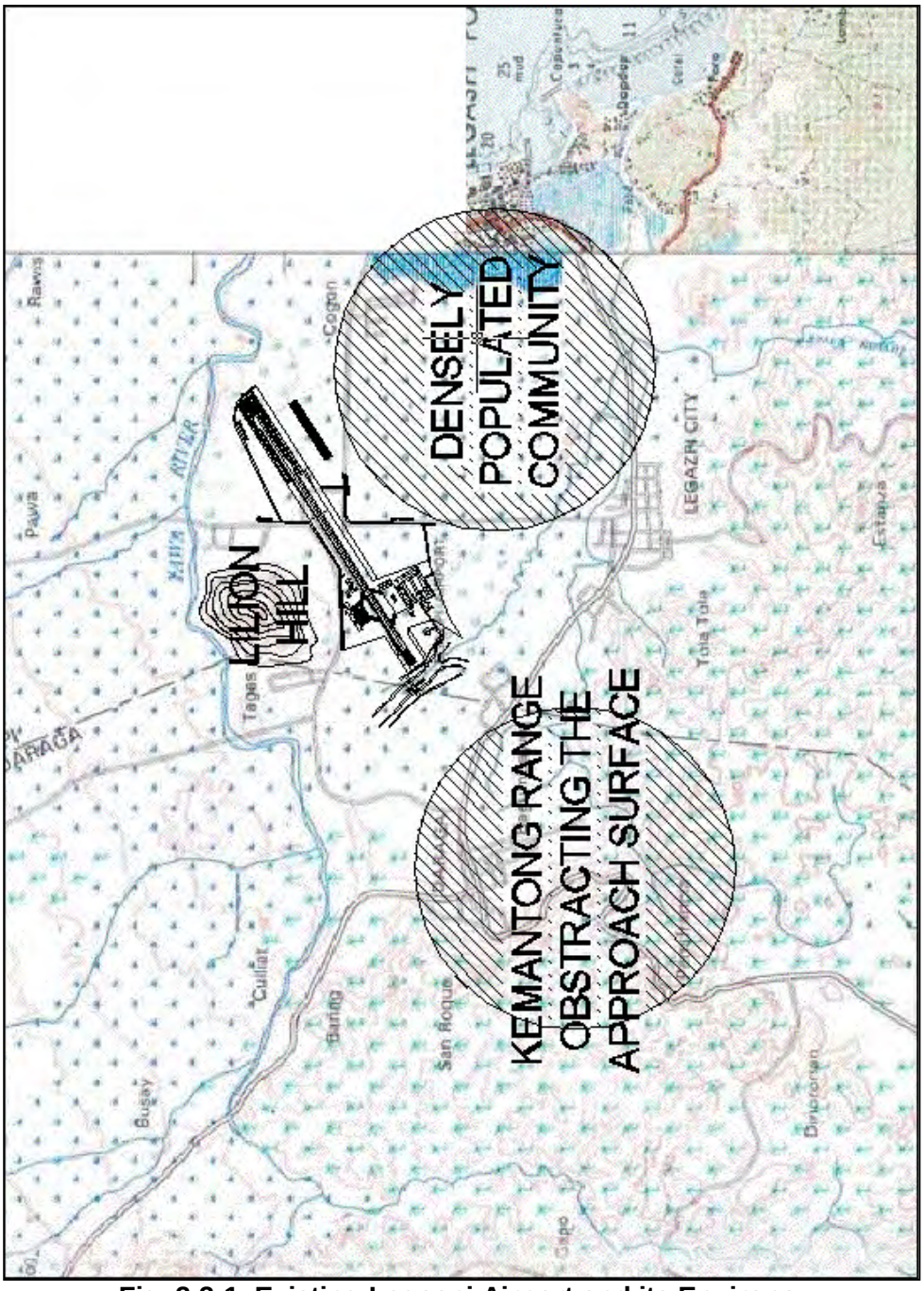

Fig. 2.2-1 Existing Legaspi Airport and its Environs

2.2.2 Social Environment

The existing airport is located in a government-owned property in Brgy. Bagtang (Brgy.41). With a population of 3,239 (May 2000, NSO), the area is experiencing a steadily growing population coupled with industrial growth. Although classified as an industrial area, land use around the airport is a mix of residential, agricultural and industrial. Residential houses are located at the northeast of the terminal building and southwest of the ATO tower, while a cemetery is located near the end of Rwy 24. The houses and the cemetery will be affected in case the existing

airport boundary is shifted. A new recreational center, the Albay Park and Wildlife, is located just behind the ATO tower and about 50m from the runway.

Adjacent barangays are Brgy. Cruzada (Brgy.40) to the south with a population count of 3,837 (May 2000, NSO), Brgy. Gogon (Brgy.38) to the east with 4,699, and Brgy. Rawis (Brgy. 42) to the northeast with 7,477 inhabitants.

2.2.3 Pollution

Noise Pollution. Noise levels are generally higher during flight hours. These are especially higher near the runway ends (Rwy 02 and 06) due to the noise contributed by passing vehicles. Commercial activities near the airport, such as a crushing plant just after the national highway at the end of Rwy 02, also add to noise levels that would exceed prescribed DENR noise level standards.

Air Pollution. Apart from aircraft emissions, air quality around the area is greatly affected by emissions from vehicles passing through the national highway running along the northeast end of the runway (Rwy 02) and along its southwest end (Rwy 06). Commercial activities near the airport also affect ambient air quality

Considering the present state of aircraft engines, an increase in air traffic will consequently increase air pollution levels in the area. However, because the aviation industry continually improves the performance, efficiency and emissions of aircraft engines, it is anticipated that future aircraft will significantly emit lower levels of pollutants such as TSP, SO_2 and NO_2.

The odor from the exhaust of aircraft engines will also increase as air traffic increases. This could very well be addressed by adequate wind dispersion of any obnoxious gases, as well as technological advancements in engine development and improvements in fuel quality.

Water Pollution. Unless there are major oil or fuel spills, the airport is not considered as a significant source of water pollution to the Yawa and Bagtang rivers, which are the surface waters nearest the airport and hence, the recipient of runoff from the latter. Domestic wastewater from the airport terminal building is treated in septic tanks prior to discharge to the city sewerage system.

2.3 AIR TRAFFIC VOLUME AND SERVICES

2.3.1 Historical Data

The total passenger volumes for the entire domestic network and that of NCR are shown in **Figure 2.3-1**. A generally increasing trend is seen over a period of 20 years, reaching a highest value before the onset of the Asian economic crises in 1997. Thereafter, a moderate recovery characterized by a slower growth is shown.

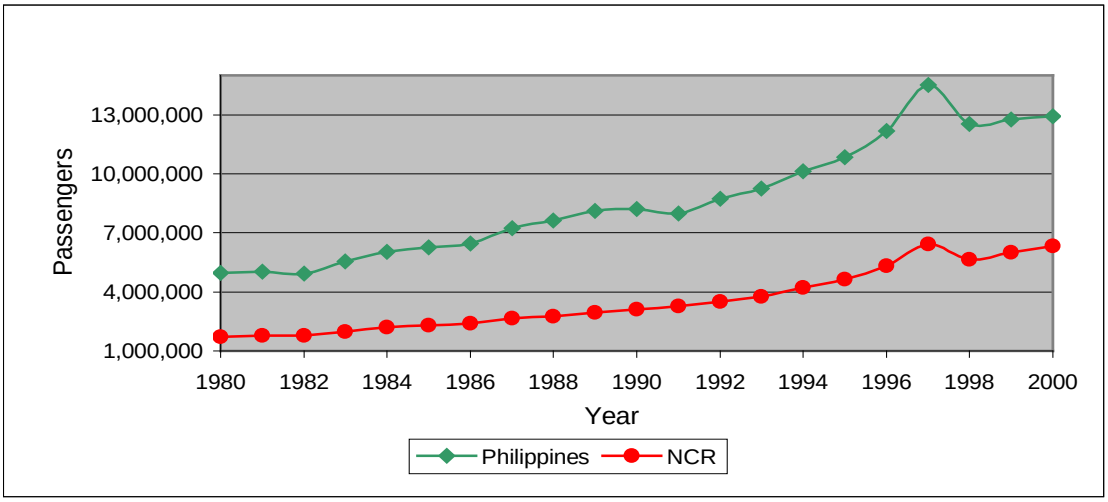

Fig. 2.3-1 Air Passenger Traffic Volumes (Philippines, NCR)

Figure 2.3-2 shows the trend in passenger volumes in the airports located in Region V. Air passenger movement in the region is dominated by Legaspi, indicating its primacy in terms of passenger movements and, possibly, in terms of economic activities. Naga Airport, Virac, Catanduanes and Masbate have almost similar volumes of air passenger traffic. Compared with all the other airports in the Region, Daet Airport located in the northernmost part of Region V posted an insignificant volume of air passenger movement.

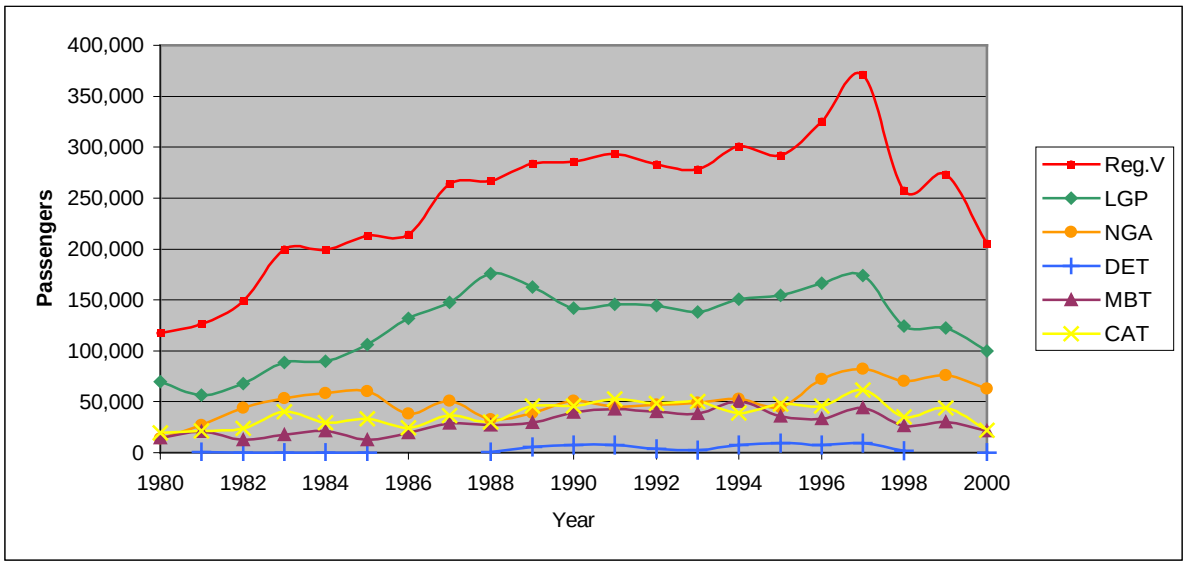

Fig. 2.3-2 Air Passenger Traffic Volume in Region V Per Province

Legaspi Airport's historical share of the regional passenger volume, shown in **Figure 2.3-3**, has remained fairly stable over the last decade, averaging at about 50 % of the total volume.

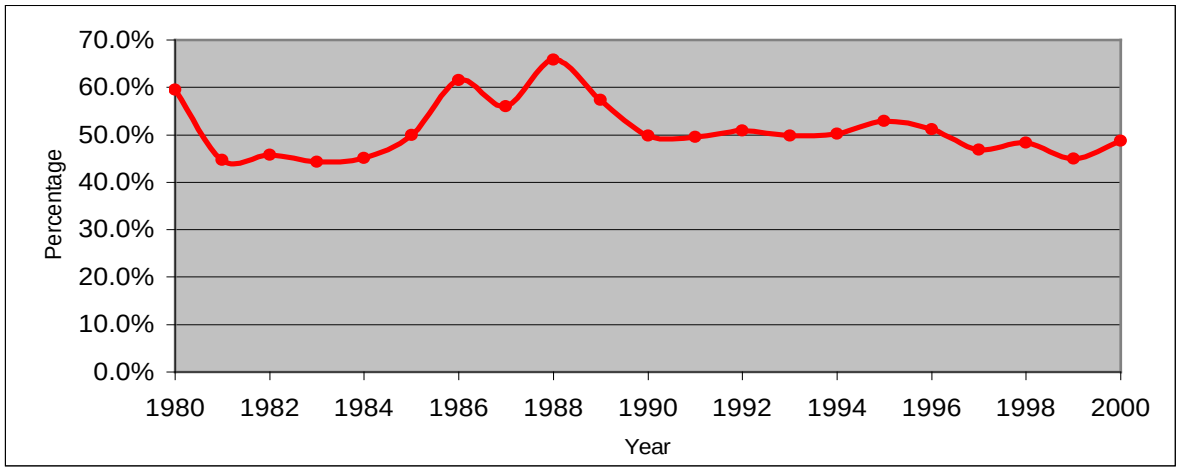

Fig. 2.3-3 Legaspi's Share of Region V Air Passenger Traffic

Region V 's share of the total domestic air passenger traffic, however, has shown a moderately decreasing trend over the last ten (10) years. The share fluctuated over a narrow band of two (2) percentage points (1.5% - 3.5%) over the last 20 years, characterized by cycles of decline and isolated growth (**Figure 2.3-4**).

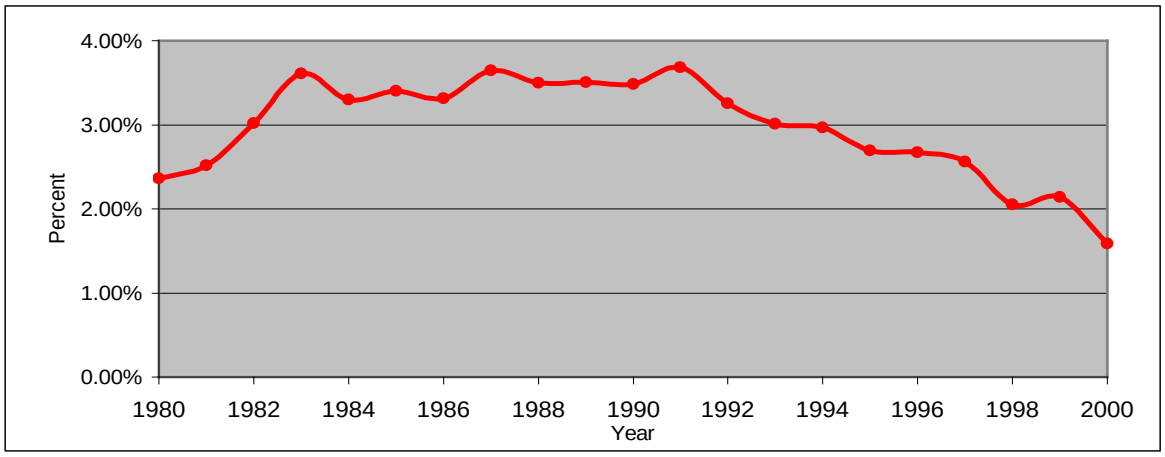

Fig. 2.3-4 Regional Share of Total Domestic Air Passenger Traffic

Legaspi Airport's shares of NCR and total domestic passenger volumes have shown similar trends, fluctuating over a narrow band (1.9% - 6.1% for NCR share and 1.8% - 2.2% for total domestic). These are shown in **Figure 2.3-5** and **Figure 2.3-6** respectively.

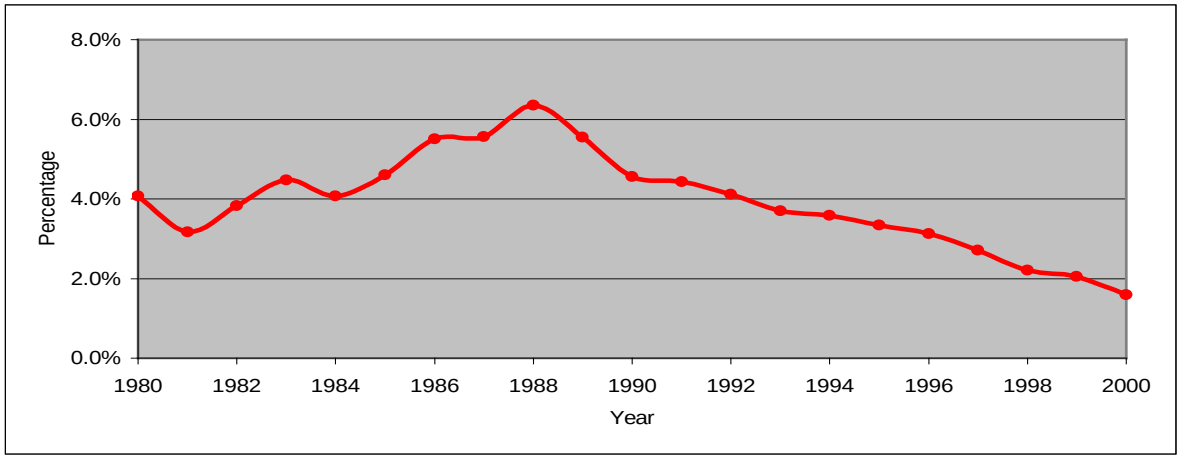

Fig. 2.3-5 Legaspi's Share Of Total NCR Domestic Air Passenger Traffic

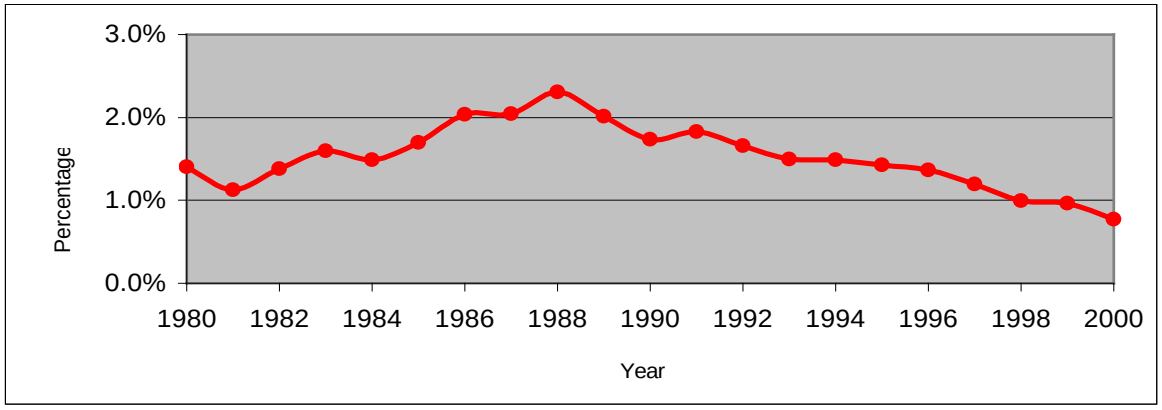

Fig. 2.3-6 Legaspi's Share of Total Domestic Air Passenger Traffic

2.3.2 Weather Cancellations and Delays

The pattern of flight cancellations at the Legaspi Airport covering a two-year period from 2000-2001 was analyzed. **Figure 2.3-7** shows that nine (9) out of the 24 months observed experienced less than three (3) cancellations. Five of the 24 months experienced three (3) to five (5) cancellations. Over the last two (2) years, the expected number of cancellations per month is computed at 4.0 or an average of 48 cancellations per year.

In addition, the airport experiences an averages about four (4) delay incidents per year due to poor weather conditions, each lasting an average of 63.6 minutes.

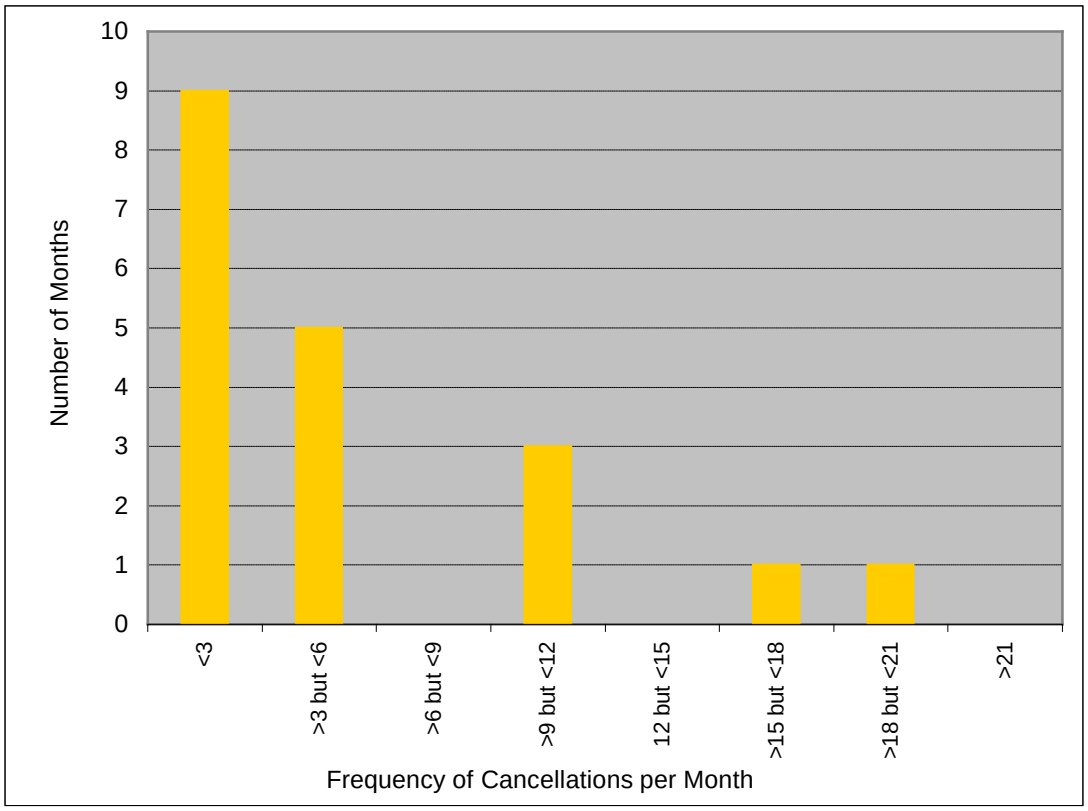

Fig. 2.3-7 Monthly Flight Cancellation Due to Weather (2000-2001)

2.4 EXISTING CONDITIONS OF THE FACILITIES

2.4.1 The Existing Facilities

An inventory of existing facilities is provided in **Table 2.4-1** and existing airport layout shown in **Figure 2.4-1**. The airfield horizontal components are seen to be generally adequate except for limitations on safety, reliability, and operational efficiency.

The varying width of the runway strip violates ICAO's guidelines on obstacle clearance. Hilly terrain on the west to the north of the airport poses severe obstructions to safe aircraft operations. Kemantong range infringes the Runway 06 approach surface by as much as 40m and this is compounded by the presence of numerous trees infringing on the transitional surface. Portions of the nearby Mayon Volcano protrude upon the inner horizontal and conical surface. Within the recommended 150-m runway strip, a road is located at the northern side of the runway.

Table 2.4-1 Existing Facilities at the Legaspi Airport

Components	Details/Specifications
1. AERODROME DATA	
Location	Legaspi City
Classification	Domestic (Trunk line, Area 4, Center)
ICAO Reference Code	4C
Aerodrome Reference Point	13° 09'43"N, 123°44'04"E
Elevation	20m AMSL
Reference Temperature	28 °C
Magnetic Variation	N00°05'W
Operational Hours	Sunrise to sunset (0600-1800 local time)
Seasonal Availability	All seasons
Supervising Authority	Air Transportation Office, DOTC
Transportation Available	Taxi and motor tricycle
2. AIRCRAFT OPERATIONAL DATA	
Operational Category	Non-Instrument Approach
Transition Altitude	10,000 ft
Local Flying Restriction	Left-hand traffic circuit for RWY 24
	Right-hand traffic circuit for RWY 06
3. FACILITIES	
Runway	
Designation	06/24
True Bearing	N56°58'E
Dimension	2,280m x 36m
	-100m displacement for RWY06
	-200m displacement for RWY24
Longitudinal Slope	0.71% uphill to the NE
Stopway	100/100
Clearway	260/100
Runway Strip	Length = 2,380m Width varies from 100 to 150m
Surface	PCCP with Asphalt overlay
Strength	PCN 35R/B/W/T
Taxiway	
Configuration	2 connections with apron (2 x 60m)
Width	21m
Surface	Concrete
Strength	PCN 29.6R/B/W/T
Apron	
Aircraft Stand	B737 x 3
Parking Configuration	Self-Maneuvering
Area	200m x 100m
Surface	Concrete

Components	Details/Specifications
Strength	PCN 29.6R/B/W/T
Terminal Buildings	
Passenger Terminal Structure	Reinforced concrete, 1 story
Floor Area	Departure terminal : 635 sq. m.
	Arrival Terminal : 275 sq. m.
	Total : 910 sq. m.
Cargo Terminal Building	(PAL owned)
Structure	Reinforced concrete, 1 story
Floor Area	210 sq. m. (including ticketing office)
Control Tower Building	
Structure	Reinforced concrete, 4 stories
Floor Area	357 sq. m. (incl. administration office)
Floor Height	11.7 m
Administration Building	
Structure	1st floor of control tower building
Floor Area	190 sq. m.
Fire Station	
Structure	Reinforced concrete, 1 story
Floor Area	370 sq. m.
Vehicle Parking Area	
Area	6,500 sq. m.
Capacity	93 cars
Surface	Asphalt
Access Road	
Number of Lanes	2 lanes
Width	12 m
Surface	Asphalt
Air Navigation System	
Radio Navigation Aids	D-VOR "LP": 112.2MHz
	DME: Ch. 59 X
	NDB "Jovellar": 360KHz
Telecommunication Systems	TWR: 123.3MHz
	FSS: 5,447.5, 3,834, and 8,364KHz
Aeronautical Ground Lighting Systems	Approach Lighting System (RWY06/24)
	Approach Path Indicator (RWY 06/24)
	Runway Edge Lights
	Runway Threshold and End Lights
	Apron/Taxiway Edge Lights
	Aerodrome Beacon
	Apron Flood Lights
Meteorological Observation Systems	Basic items, manual system (PAGASA)
	Wind, temperature and air pressure sensors for control tower
Rescue and Fire Fighting Facilities	
Fire Fighting Vehicles	Two major vehicles:
	- 2,500L water and 300L foam
	- 2,000L water, 120L foam and 300 lb. Dry chemical
	Two RIVs:
	- 1,250L water and 150L foam
	- 20L foam and 250 lb. dry chemical
Level of Protection	Category 4 (Category 6 in AIP)
4. UTILITIES	
Power Supply	
Receiving Voltage	13,200V and 220V (for terminal building)
Capacity of Transformers	50KVA x 3

Components	Details/Specifications
Stand-by Generators	80KVA x 3, and 15KVA x 1
	PAL has a 12KVA set.
Water Supply	
Water Source	3 deep wells for ATO, 1 deep well for PAL
Supply capacity	Data no available
Water tank	Pressure tanks
	Elevated tank (2,000KL), presently not used
Waste Treatment and Disposal	
Liquid Waste Treatment	Septic tanks for individual buildings
Solid Waste Disposal System	Collected by the City Gov't.
Communications	
Telephone System	3 external lines (1 DDD) for ATO
	1 PABX for external/ internal, 1 PABX for internal (for operations only)
	Separate contract with PLDT by other users
	2 telephone booths of MATELCO for public use
5. **OTHER FACILITIES**	
Aviation Fuel Supply System	(PAL owned)
Type of Fuel	Jet-A1
Storage Capacity	2 Tanks (11,000 gal. Capacity each)
Supply System	Hydrant system with 3 pits
Airport Vehicles	2 Units Utility Vehicles
Airport Maintenance Equipment	Handy grass cutters
Airport Staff Housing	1Unit

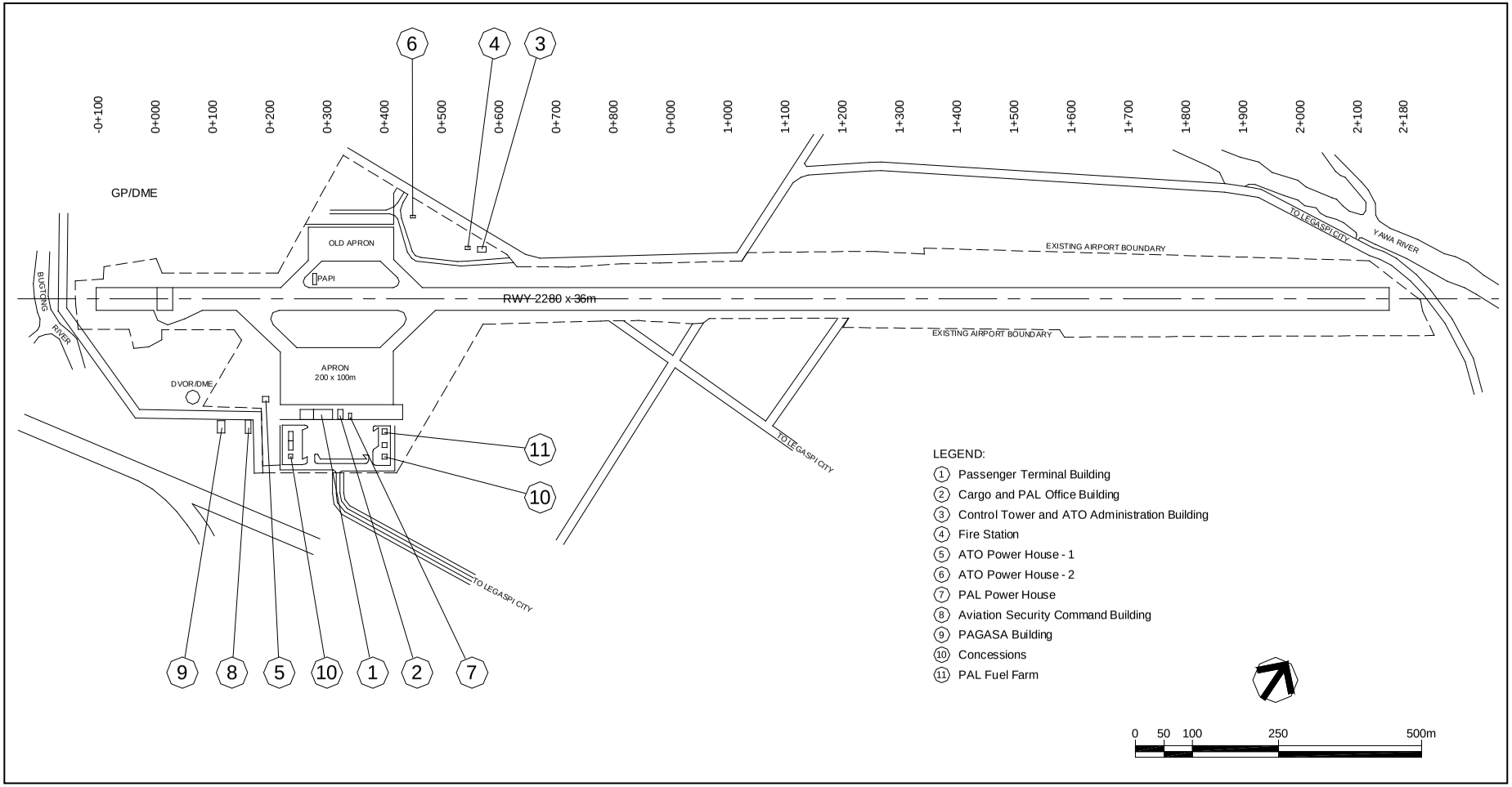

Fig. 2.4-1 Existing Layout of Legaspi Airport

While the 2.28-km length of the runway is adequate for the anticipated domestic operations of B737 and A320, the width of the runway should be widened from its existing 36m to 45m for safety reasons. This is being considered under DOTC's Five-Year Airport Development Plan.

The existing runway consisting of asphalt overlaid PCCP, has shown signs of progressive deterioration and may need resurfacing over the medium-term. A portion of the existing runway located proximate to the apron, covering an area of approximately 10,000 sq.m., requires immediate resurfacing. Special attention should be given to the longitudinal cracks and differential settlement of pavement portions near the apron area which may need a more thorough geotechnical investigation.

The existing apron and taxiway configuration are adequate for the current level of demand. The apron can accommodate from three (3) to four (4) aircraft stands to cater to aircraft in the mold of B737. A brief review of the other components of the airport facilities is summarized in **Table 2.4-2**.

Table 2.4-2 Brief Assessment of Selected Airport Components

Facilities		Remarks
1) Passenger Terminal Building	- Passenger Handling Capacity	• The existing 910 sq. m passenger terminal area is not enough to provide at least 10 sq.m. per peak hour passenger. Additional capacity will be needed accommodate a larger number of peak-hour passengers.
	- Quality of Services	• There are no baggage screening device and baggage claim conveyor. • The check-in lobby and the arrival area not equipped with air conditioning units. • The building is structurally in good condition.
2) Cargo Terminal Building	- Cargo Handling Capacity	• The cargo terminal area has sufficient capacity to handle present level of cargo traffic.
3) Control Tower and Administration Building		• The control tower has good visibility of the entire airport area. It is structurally sound but rainwater leakage is reported. • Existing control tower constitutes an obstacle to transitional surface, and jeopardizes safe aircraft operations. • The administration office has adequate space for daily activity.
4) Vehicle Parking Area	- Vehicle Parking Capacity	• The vehicle parking area has sufficient capacity for the observed peak-hour vehicular traffic volume and vehicular traffic is well regulated. • Nearby open spaces provide additional back-up areas for parking.

Facilities	Remarks
5) Radio Navigation Aids	• There is no ILS, which is a standard equipment for modern jet aircraft. • It is, however, doubtful if an ILS can work effectively given the prevailing topography of the area.
6) ATC and Communication Systems	• The existing systems are renewed recently by USAID. PC/Fax machine, VSAT, etc. are planned to be installed under Nationwide Air Navigation Facility Modernization Project – Phase III.
7) Airfield Lighting Systems	• The existing approach lights do not comply with the ICAO's requirements for precision Category- I approach operations.
8) Meteorological Observation System	• PAGASA station is located in Legaspi City. However, observation sensors are not adequately located for civil aviation purpose.
9) Rescue and Fire Fighting	• The existing category 4 level of protection is insufficient for the present requirements of category 5. An increase of CRF capability is required. The replacement of an old major vehicle needs to be considered.
10) Power Supply System	• The existing back-up generators have enough capacity for the present demand and in good working condition
11) Telephone System	• The existing telephone system at the airport is adequate for present needs. However, a greater capacity may be needed for more efficient airport operation and better service for passengers.
12) Water Supply System	• The airport uses deep wells. The capacity is enough but water quality is poor.
13) Sewage Disposal System	• The septic tanks used at the airport are working in good condition. However, increasing effluent will require more sophisticated treatment system.
14) Aviation Fuel Supply System	• PAL has its own fuel supply system with hydrants pit at the apron. The existing system is working in normal condition.

2.5 PROBLEMS OF THE EXISTING AIRPORT

2.5.1 Compliance with International Standards of Safety and Reliability

The existing runway of Legaspi Airport is classified as non-instrument and the applicable reference code under ICAO Annex 14 is 4C. Except for runway width and obstacle clearances, the existing Legaspi Airport generally meets the minimum requirements applicable for non-instrument runway. However, in order to meet the desired level of service for Legaspi Airport, the existing facilities should be improved to satisfy the standards and recommendations for a Precision

Approach Runway Code 4C, of which the major differences with non-instrument runway is indicated in **Table 2.5-1**.

Table 2.5-1 Comparison between Precision and Non-Instrument Runway

Criteria	Non-Instrument	Precision
Total width of runway strip	150m	300m
Separation Distance between runway and taxiway (code E)	107.5m	182.5m

On the basis of the foregoing, the width of the runway strip should be doubled and the aircraft parking apron together with the terminal facilities should be set-back accordingly to satisfy the requirements for the precision approach runway, while keeping the airport operational. In addition, critical areas for localizer and glide path should be provided and properly graded in order to assure adequate signal performance. While physically feasible, these requirements will involve the following:

a) Acquisition of prime urban land;

b) Relocation of residents and built-up structures; and

c) Diversion of a river and roads.

In addition to the trees and housing structures located just beside the existing runway strip, there are hilly terrains that penetrate obstacle limitation surfaces of even non-instrument approach runway. These include the rolling hills located south of the runway penetrating the approach surface of Rwy 06 and Mt. Linguion located close to the northern part of the airport, penetrating the transitional and horizontal surfaces. Removal of these obstacle clearances is more imperative under a precision approach runway and the estimated volume of excavation for obstruction removal will involve about 22 million cu.m. at a preliminary cost estimate of PhP 2.2 Billion.

2.5.2 Environmental Hazards from Mayon Volcano

The hazards posed by the Mayon Volcano to the existing Legaspi Airport are mainly pyroclastic flow and lahar hazards. According to PHIVOLCS, the Mabinit, Bonga and Buyuan Channels located southeast of the volcano are the major conduits of pyroclastic and lava flows whenever it erupts. Secondary threats are

also posed by ashfall. **Figures 2.5-1** to **2.5-3** show the major threat envelopes around the Mayon Volcano.

The Mabinit Channel, which drains into the Yawa River, has become the Mayon's most active lahar conduit since its formation during the 1984 eruption. Forty one (41) lahar events were recorded in 1984, followed by repeated incidents in subsequent eruptions. With an average of at least two (2) typhoons per year in Legaspi City, the phenomenon is expected to persist, resulting in potentially adverse impact on the existing airport as the Mabinit Channel is expected to guide future pyroclastic flows and lahar towards Legaspi City and its adjacent areas (**Figure 2.5-4**).

While Legaspi City is currently included under the area "least prone to lahar", there are indications that the trajectory of existing hazard may expand to include the area of the airport. This can be exemplified by the extension of the Southeast Danger Zone by PHIVOLCS from 7 kms to 8 kms after the February-March eruption. There is an estimated 30 million cubic meters of pyroclastic deposits remaining on the slopes of the volcano, which remain unstable and are likely to experience remobilization and subsequent deposition into lower slopes.

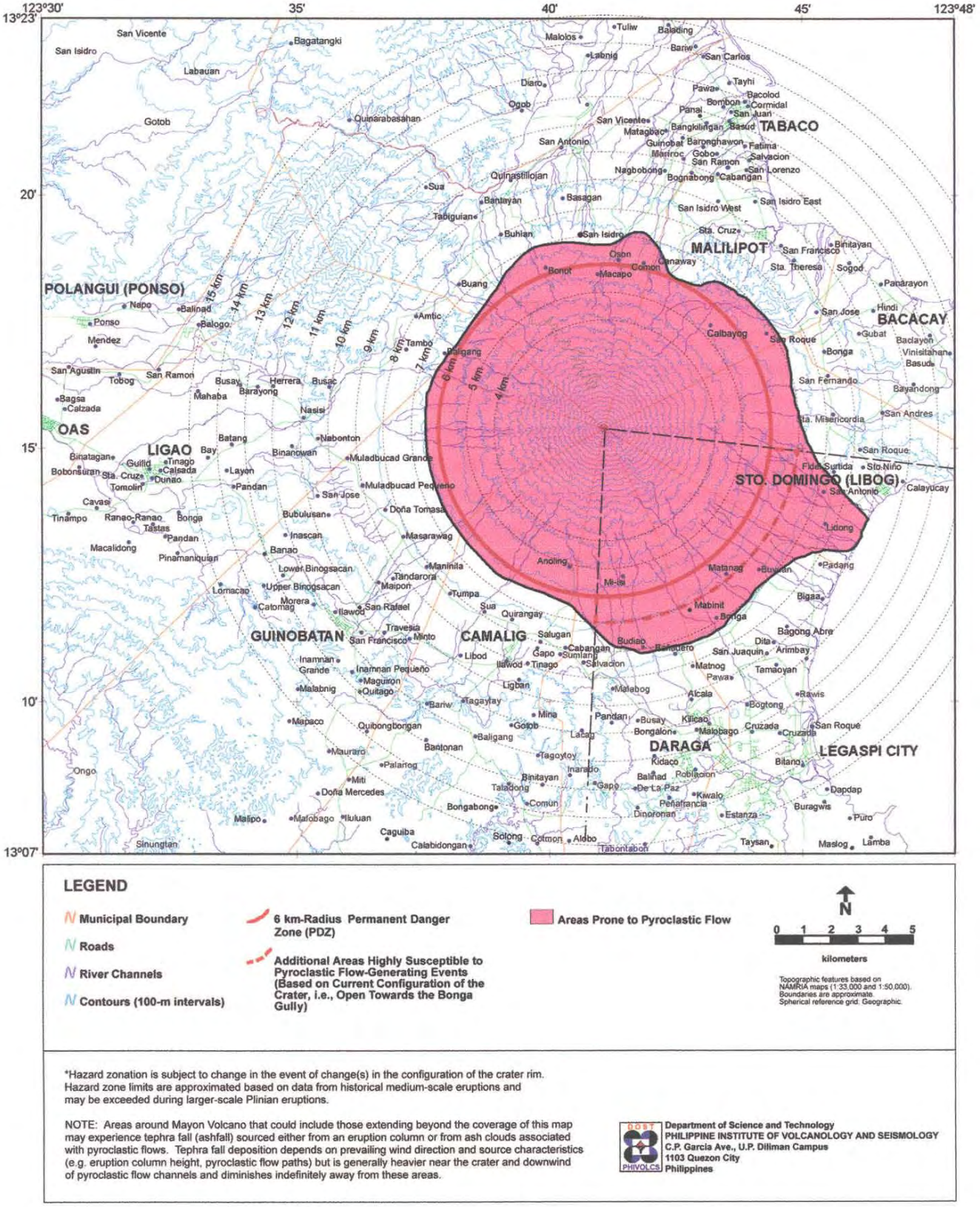

Fig. 2.5-1 Mayon Volcano Pyroclastic Flow Hazard Map (January 2000)

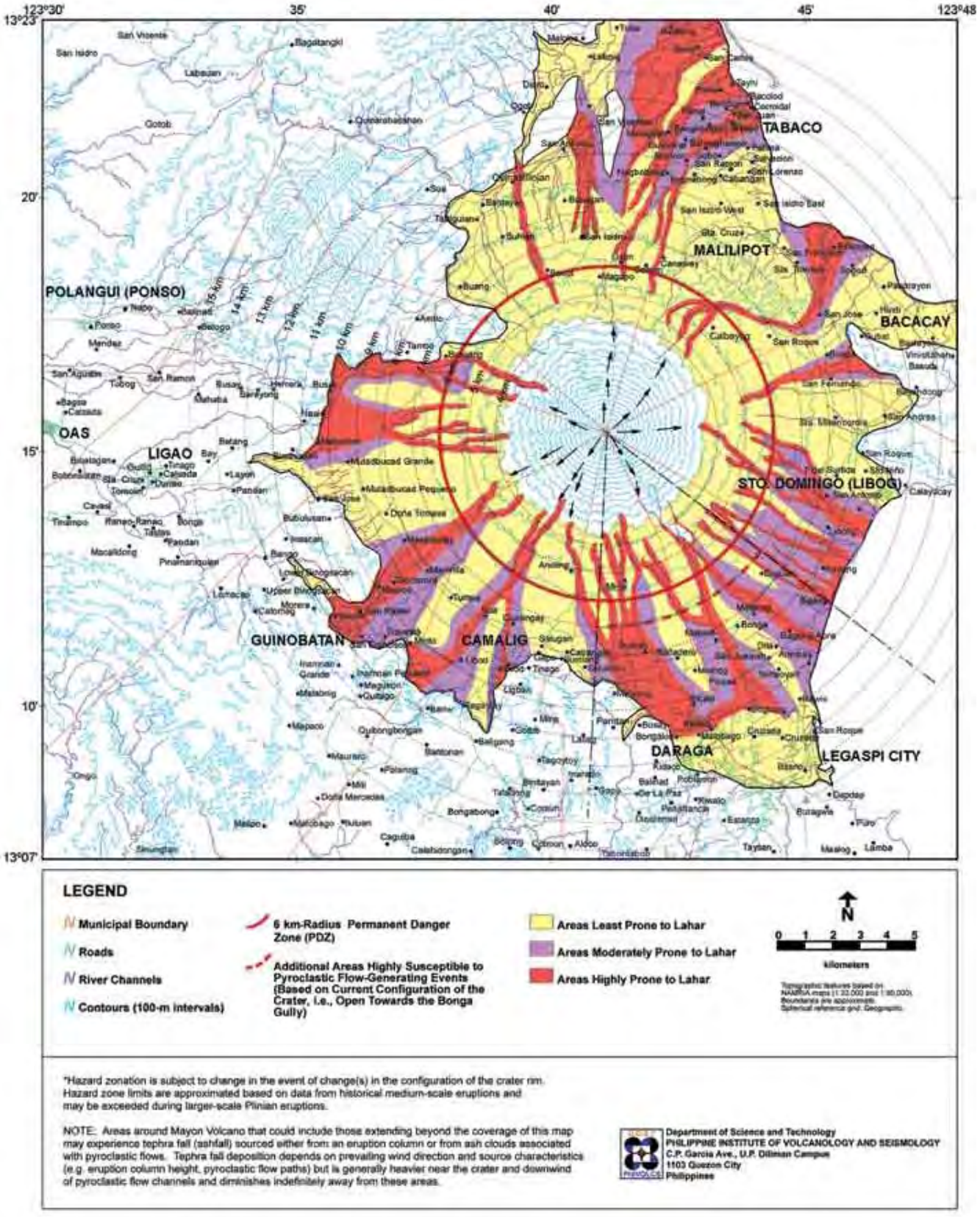

Fig. 2.5-2 Mayon Volcano Lahar Hazard Map (March 2000)

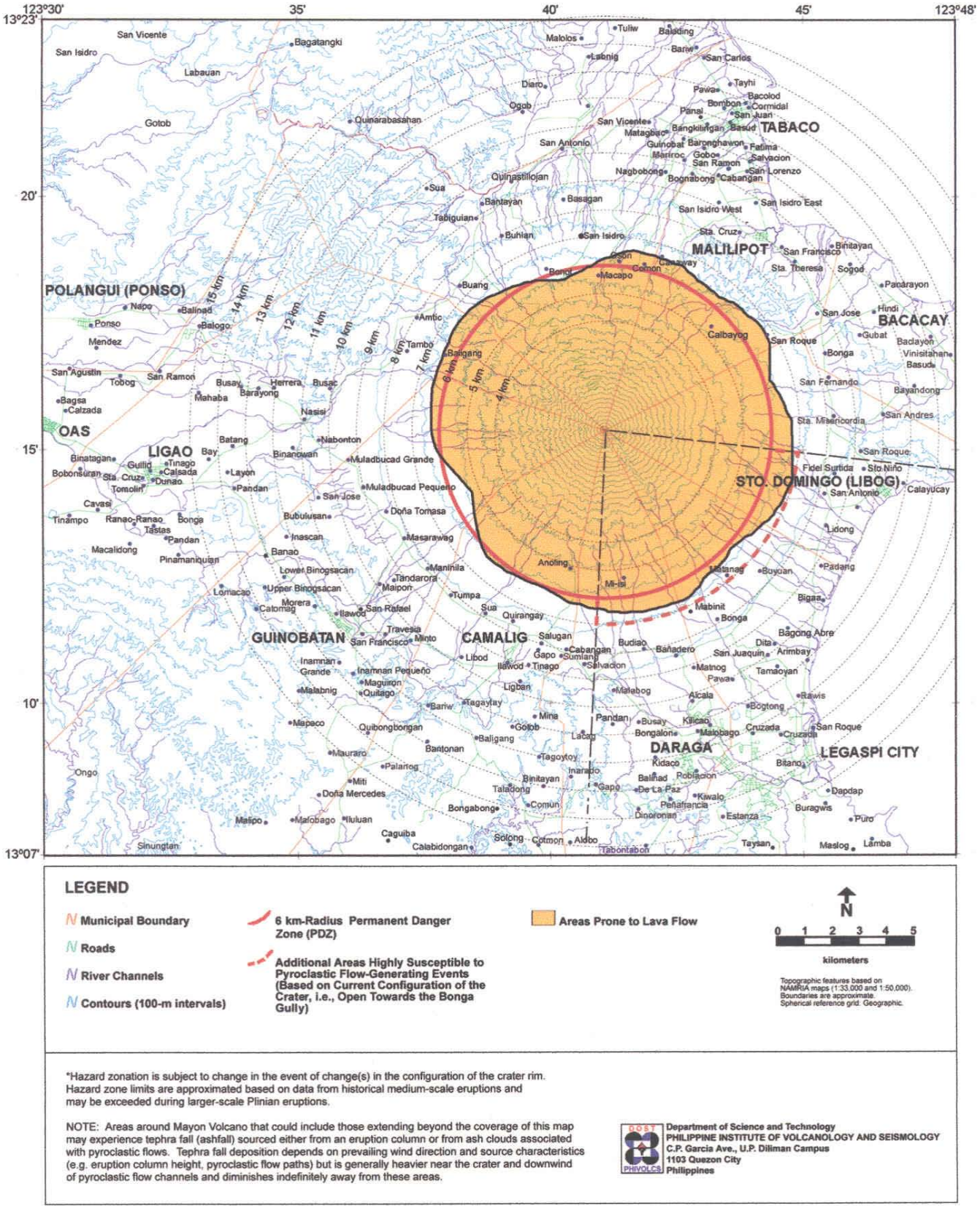

Fig. 2.5-3 Mayon Volcano Lava Flow Hazard Map (January 2000)