

Chapter 4

**Phuket Additional Lane (AD-2)**

#### 4. Phuket Additional Lane (AD-2)

##### 4.1 Natural Conditions and Land Use

The project intends to construct additional two lanes along the existing Route 402 from near the Sarasin Bridge to near Phuket municipality. The existing highway lies mostly in flatland with some part in rolling terrain. General geology is of granite.

The Phuket Island has two seasons: rainy season during May - October and dry season during November - April. In the rainy season, the south-west monsoon from the Andaman Sea brings heavy rainfall. Mean annual rainfall of the island amounts to 2,300 mm.

Land use along the existing highway can be grouped into two parts: coconut and rubber plantation in the northern part; and urban land use in the southern part. It is estimated that about 10 % of the highway corridor belongs to residential land use.

The right of way of the existing highway is generally wide enough to accommodate additional two lanes. In some part, however, land acquisition is inevitable in the range of 30 - 50 houses. Land price in the project area is substantially higher than the other project areas. Even in the northern part where agricultural land use is prevailing, the land price is as high as B800,000 per rai. In the southern part where urban land use is prevailing, the land price soars in the range of B1,000,000 - 4,000,000 per rai.

AD-2-2: A proposed new highway along the west coast traverses rolling and mountainous areas. Land use along this route is mainly composed of rubber plantation, coconut orchard and forest. Land price in this corridor is in the range of B8,000 - 150,000 per rai.

##### 4.2 Socio-Economic Conditions

Total population of Amphoe Muang and Tha Lang amounted to 146,100 persons in 1989; 97,500 for Amphoe Muang and 48,600 for Amphoe Tha Lang as shown in Table 4.2.1. Population density is calculated at 435 and 193 persons per sq. kilometer, respectively. Population growth rate during the period of 1979 - 1989 was 2.7% per annum for Amphoe Muang and 2.1 % for Tha Lang. The growth rate of Amphoe Muang in the recent years of 1987-89 was hiked to as high as 3.9% per annum, reflecting increasing employment opportunities in rapidly growing tourism sector.

Table 4.2.1 POPULATION IN AD-2 CORRIDOR

	A. Muang Phuket	A. Tha Lang
Area (km <sup>2</sup> )	224	252
Total Pop. (1989)	97,500	48,600
Pop. Density (per./km <sup>2</sup> )	435	193
Pop. Growth Rate (% per annum) 1979-89	2.71	2.10

In the Phuket Island, service sector provides the largest employment opportunity accounting for 49 %, followed by agriculture sector for 45 % and manufacturing sector for 6 %. Large percentage share of the service sector characterizes Phuket as an international tourist destination. In 1988 Phuket attracted 811,000 visitors, 24% higher than in 1987. The rapid expansion of tourism industry has stimulated higher dependence on service sector.

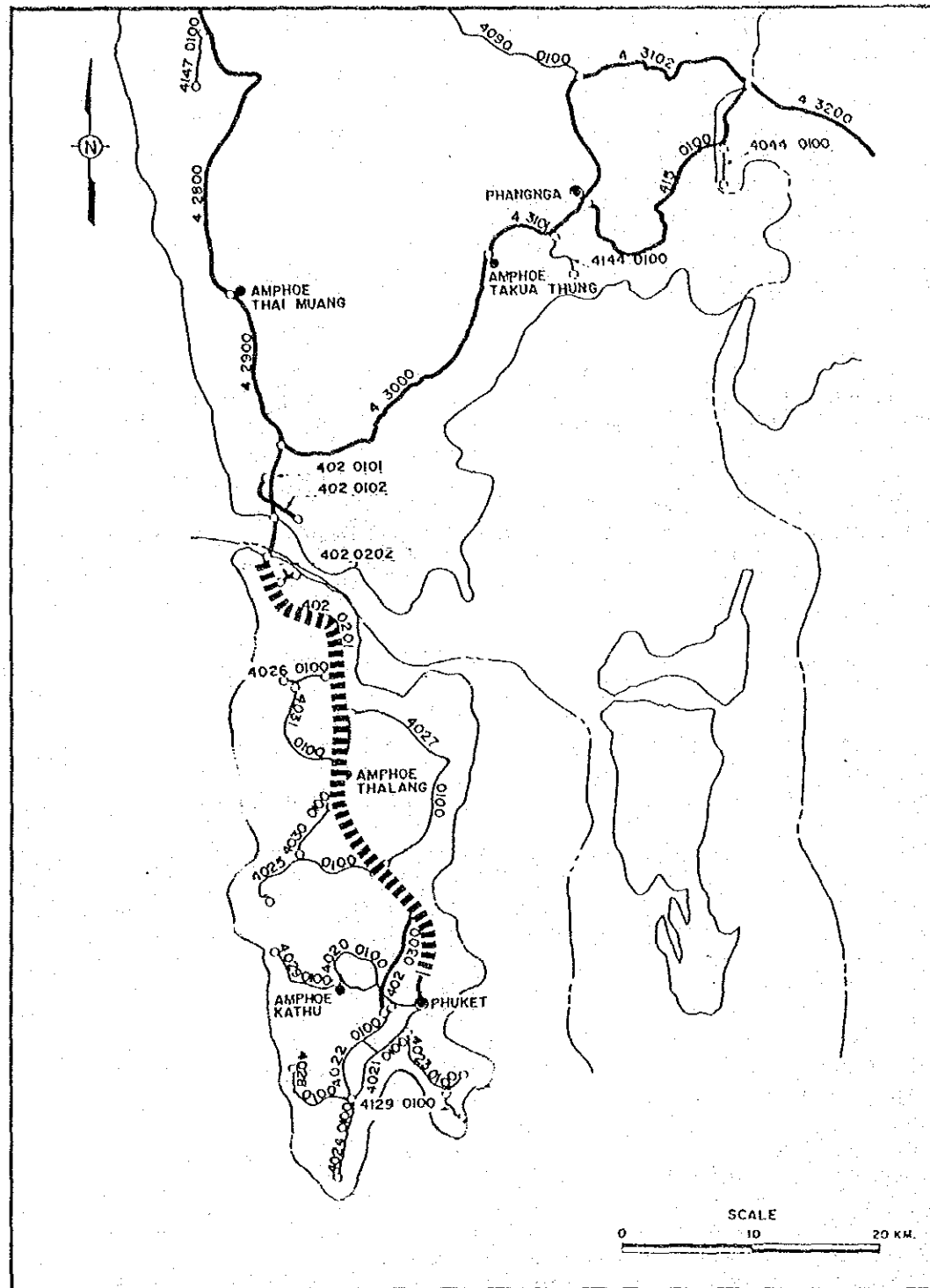
##### 4.3 Traffic Conditions

The project covers a section of about 38 kilometers along Route 402 from the edge of Phuket municipality to the Sarasin Bridge. Route 402 in this section is of S3 standard with asphaltic concrete surface of 6 meter width. Traffic volume in 1989 reached 7,500 AADT which is three - fourfold of the designed traffic volume. The increase of traffic capacity is an urgent issue to be addressed.

The roadside OD survey carried out on Route 402 near Phuket Bypass revealed that 35 % of trucks on the highway carried manufactured products, 22 % construction materials, 10 % fish and 8 % vegetable & fruit. Most of the cargoes excluding construction materials were carried by pickup trucks. Percentage share of agricultural products in the project area is lower than that of the other project areas. As to trip purposes of passengers, high percentage share of tourism purpose trip (22 %) characterizes the project area. Due to this, percentage share of private purpose trip becomes as low as 41 % and work and business trip 35 %.

The project aims to increase traffic capacity by constructing additional two lanes along the existing highway (Project No. AD-2-1). At the same time, this study analyzes the preliminary viability of a new highway along the west coast which comprises a section proposed by the "Seventh Plan Urban and Regional Transport (SPURT)" and another section supplemented by the study team (Project No. AD-2-2). It is conceived that the new highway cannot be an alternative to Route 402 because it would further stimulate tourism development on the west coast, eventually occupied by tourist moving from one tourism spot to another.

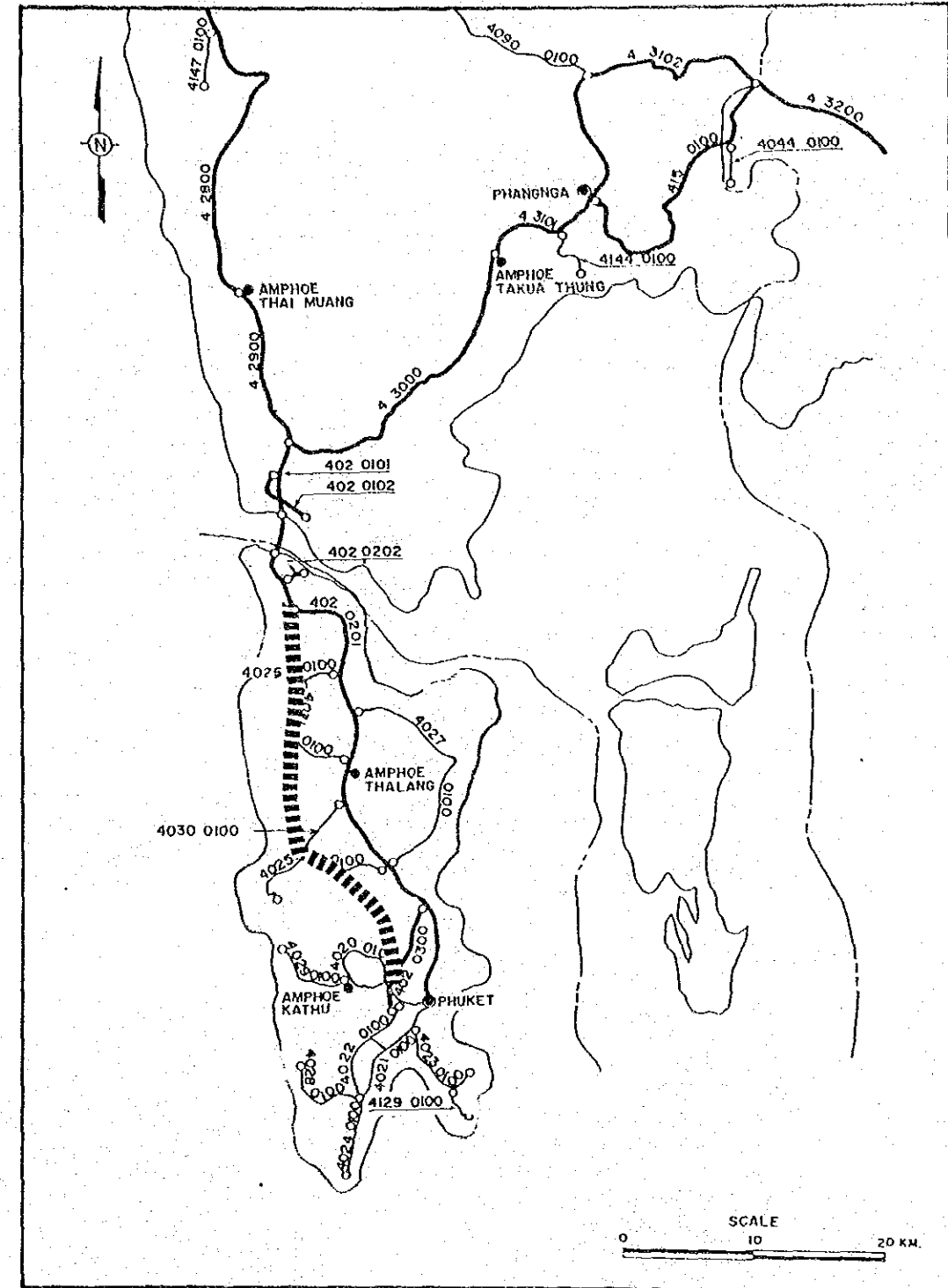
3.4 Phuket Additional Lane (AD-2)



LEGEND :

	PROJECT ROUTE		PROVINCIAL HIGHWAYS
	DIVIDED HIGHWAYS		CHANGWAT, AMPHOE
	NATIONAL HIGHWAYS		

Fig. 4.1.1 PHUKET ADDITIONAL LANE (AD-2-1)



The future traffic volume of AD-2-1 was estimated as shown in Fig. 4.3.1. Traffic volume in 1996 was estimated at 9,100 AADT between the Sarasin Bridge and Phuket Airport, 13,400 - 13,700 AADT between Airport and Route 4030, 17,100-17,700 AADT between Route 4030 and Phuket Bypass, and 14,500 AADT between Bypass and Phuket Municipality.

Fig. 4.3.2 shows future traffic volume of AD-2-2 under the same development framework with that of AD-2-1. Due to demolition of the existing access link to Phuket Airport, airport related traffic would be forced to divert from Route 402 to the new highway. Traffic volume was estimated at 3,500 - 6,000 AADT between Airport and Route 4025 and at 1,200 - 1,600 AADT on the remaining sections.

#### 4.4 Project Evaluation

##### 1) AD-2-1

The EIRR was calculated at 69.2 % though it was as high as 77.6 % in the pre-feasibility study. The reason of this fall can be attributable to the combined effects of higher traffic volume and cost increase, increase of land acquisition cost for realignment section in particular. The EIRR will be lowered to 55.3 % in the combination of 20 % cost up and 20 % benefit down. In a case of 30 % down of the estimated traffic demand, however, the EIRR will still remain at as high as 63.6 %. The results of the sensitivity tests infers that the existing highway of Route 402 (S3 Standard) has not enough capacity to cope with the increasing traffic demand in the Phuket Island.

It is likely that the EIRR would constantly be lowered for the future due to the rapidly rising land price along the highway if the project implementation delays.

No significant effects on environment is envisaged even in the new construction section of 3 kilometers. Attention should be paid to traffic safety, safety of motorcycle traffic in particular. It is most likely that establishment of motorcycle lane on both sides of the carriageway over a distance of 33.5 kilometer contributes to reduce traffic accidents.

##### 2) AD-2-2

The EIRR was calculated at 27.4 %, extremely lower than that of AD-2-1. This is due to the high construction cost of a new highway on the west coast including an airport tunnel of 1,150 meters and a mountain tunnel of 600 meters.

It is envisaged that this project would have moderate effects on environment in the mountainous area near Khatu in particular. The mountainous area belongs to the natural reserve forest. Environment impact assessment should be carried out in more detail if this alternative highway is to be implemented.

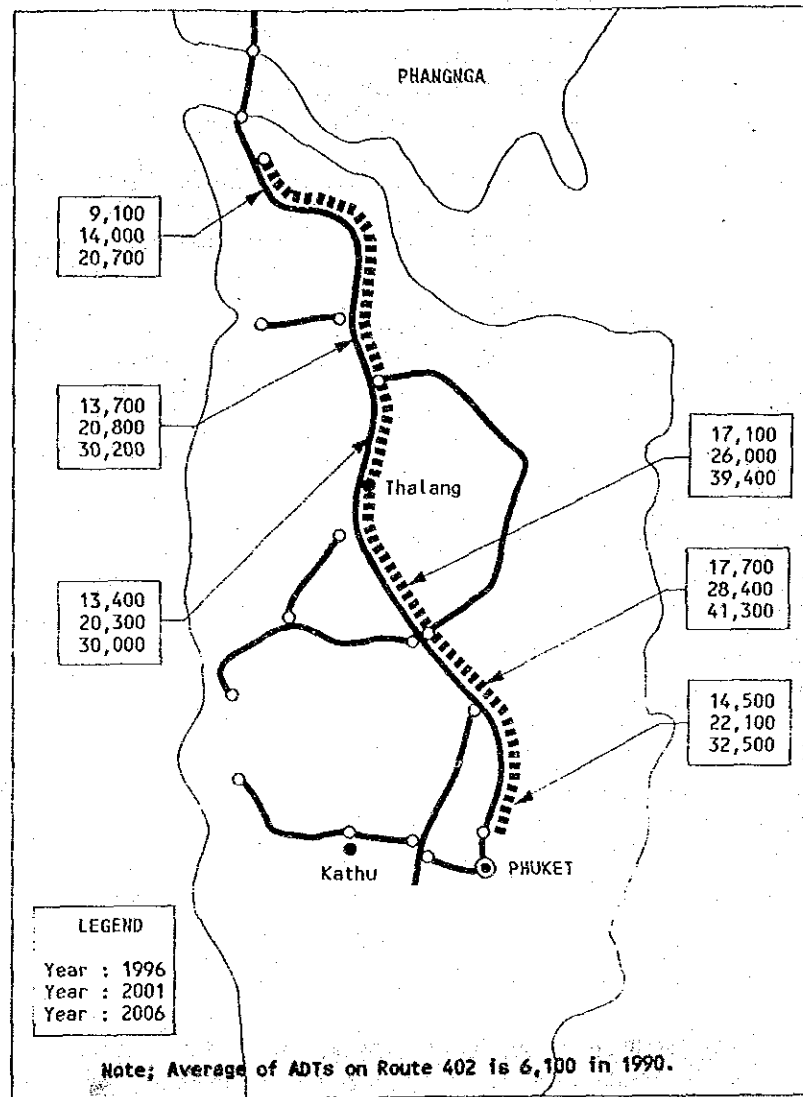


Fig. 4.3.1 TRAFFIC VOLUME ON AD-2-1

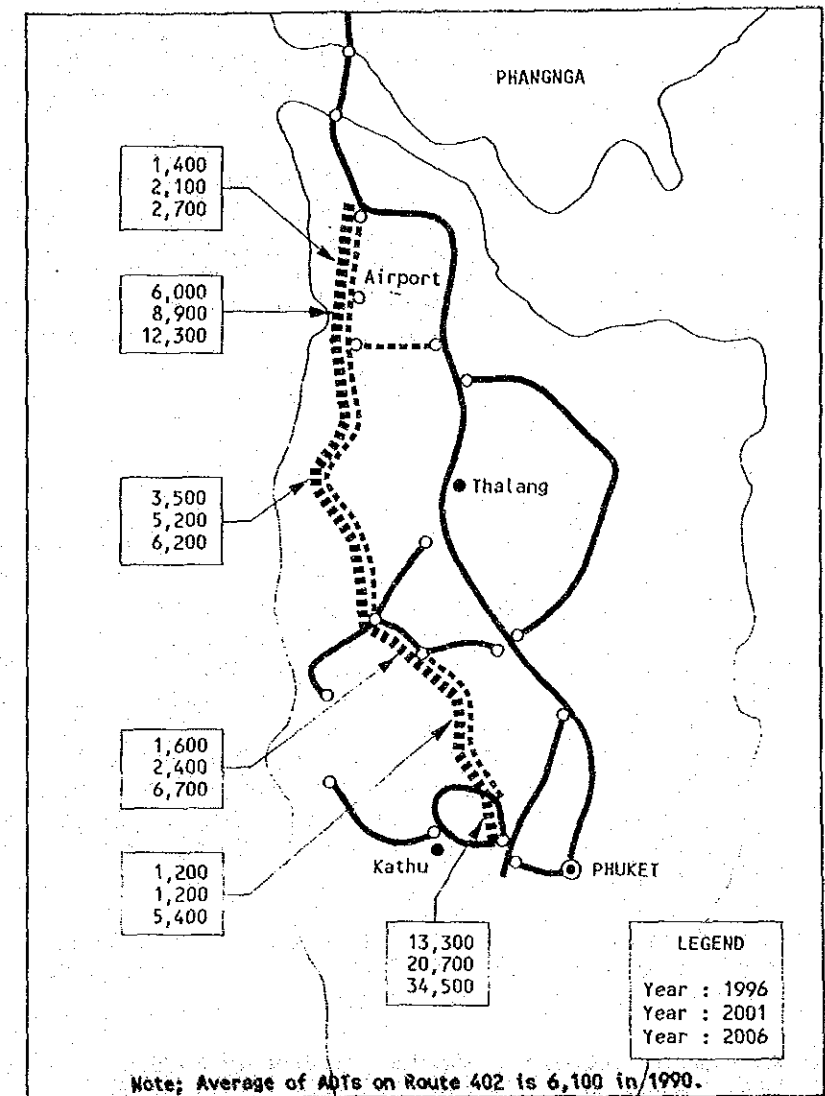


Fig. 4.3.2 TRAFFIC VOLUME ON AD-2-2