

KINGDOM OF THAILAND  
MINISTRY OF TRANSPORT AND COMMUNICATIONS  
DEPARTMENT OF HIGHWAYS

# ROAD DEVELOPMENT STUDY IN THE CENTRAL REGION

## MASTER PLAN STUDY

FINAL REPORT  
MAIN TEXT  
(VOLUME I-1)

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IN THE CENTRAL REGION  
MASTER PLAN STUDY**

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18941

MARCH 1989  
JAPAN INTERNATIONAL COOPERATION AGENCY



## PREFACE

In response to a request from the Government of the Kingdom of Thailand, the Government of Japan decided to conduct the Road Development Study in the Central Region of Thailand and entrusted the study to the Japan International Cooperation Agency (JICA).


JICA sent to Thailand a study team headed by Mr. Masahiko Tohi comprising experts from Katahira & Engineers Inc. and Nippon Koei Co., Ltd. four times from August 25, 1987 to January 28, 1989.

The team held discussions with the officials concerned of the Government of Thailand, and conducted field surveys in the region involved. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the development of the project and to the promotion of friendly relations between our two countries.

I wish to express my sincerest appreciation to the officials concerned of the Government of the Kingdom of Thailand for their close cooperation extended to the team.

March 1989

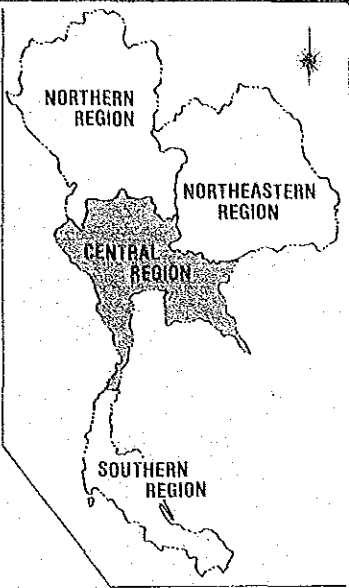
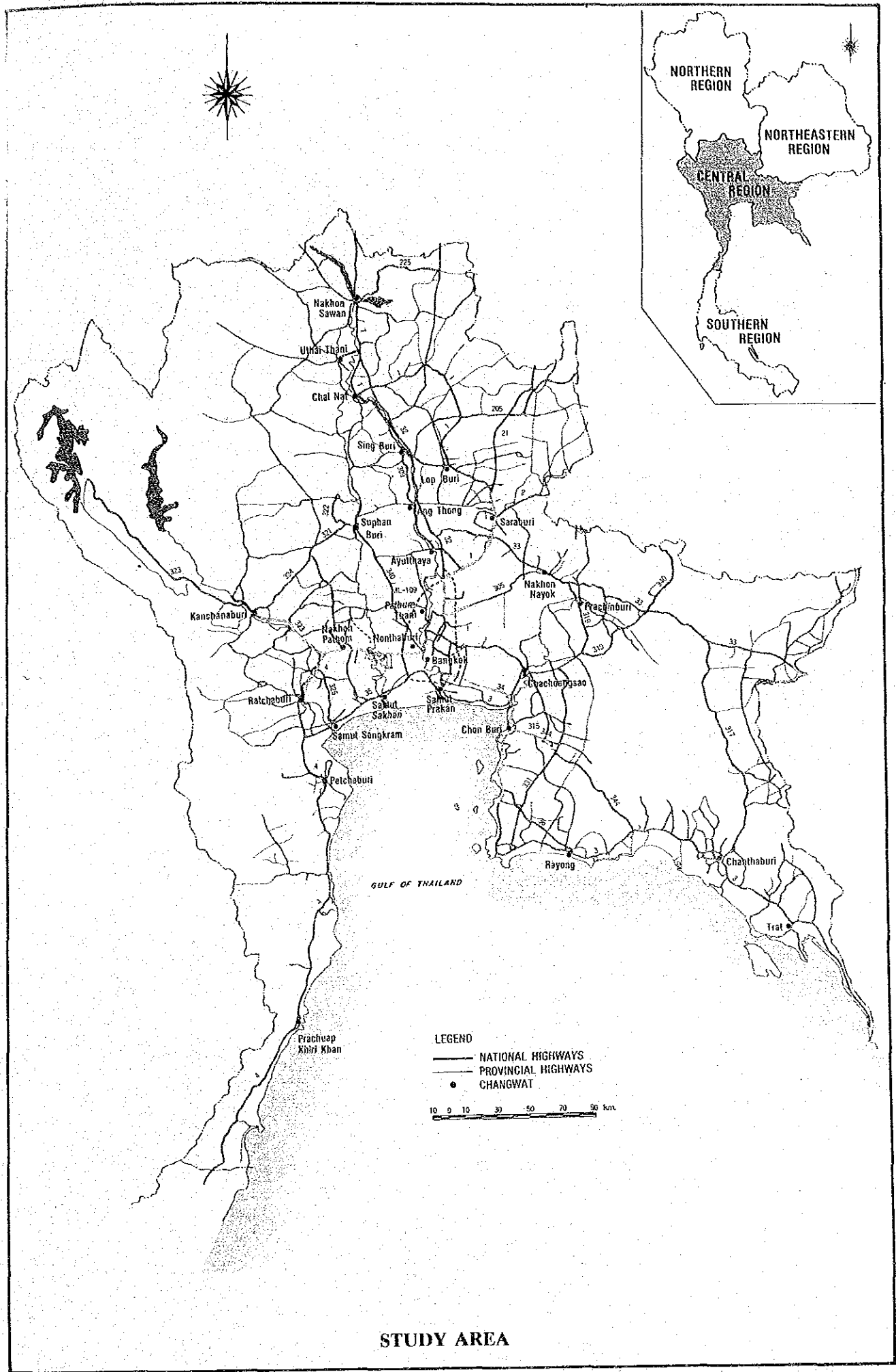


Kensuke Yanagiya  
President

Japan International Cooperation Agency

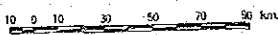






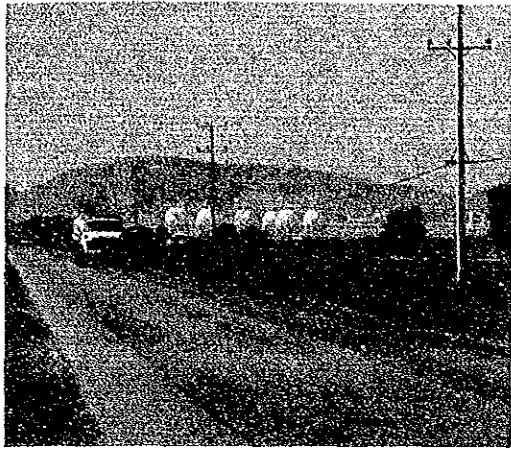
GULF OF THAILAND

LEGEND  
 — NATIONAL HIGHWAYS  
 — PROVINCIAL HIGHWAYS  
 ● CHANGWAT

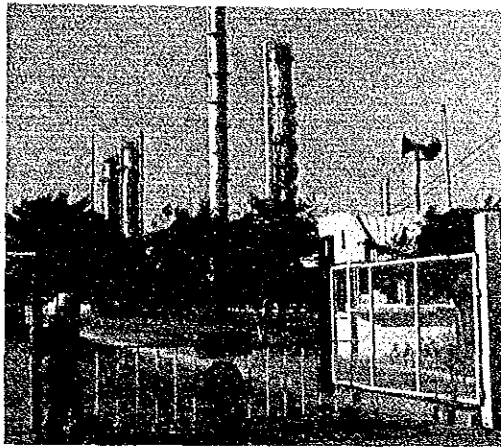


STUDY AREA

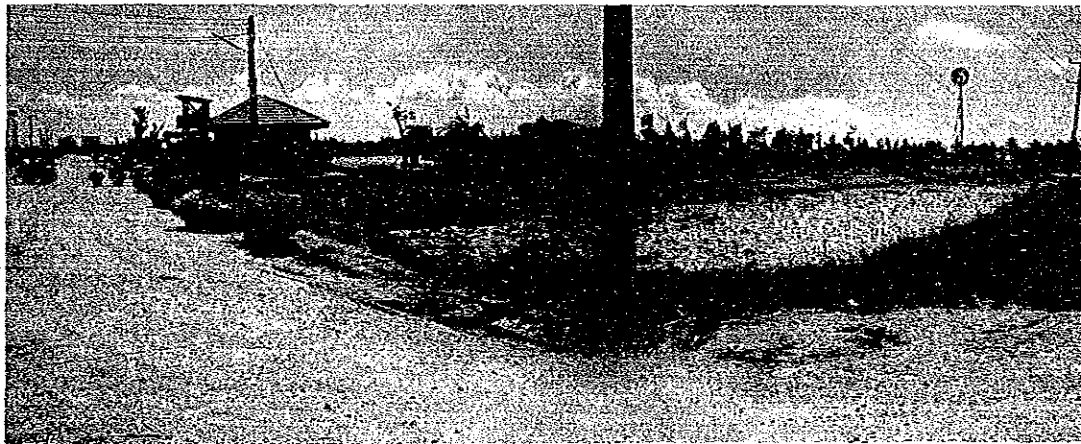




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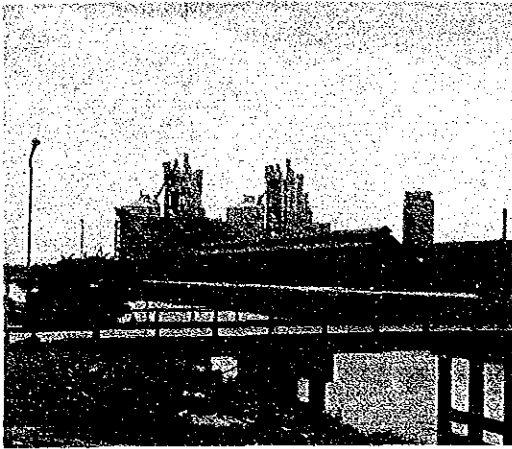


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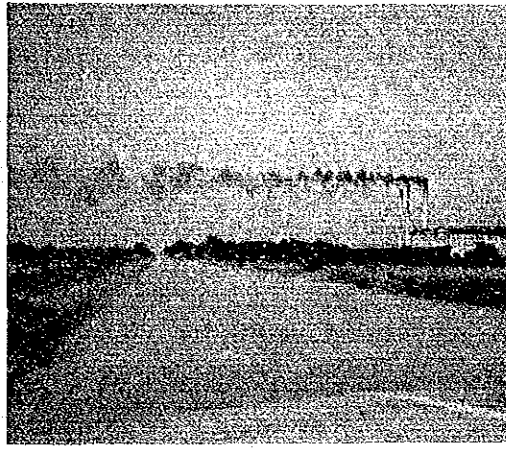


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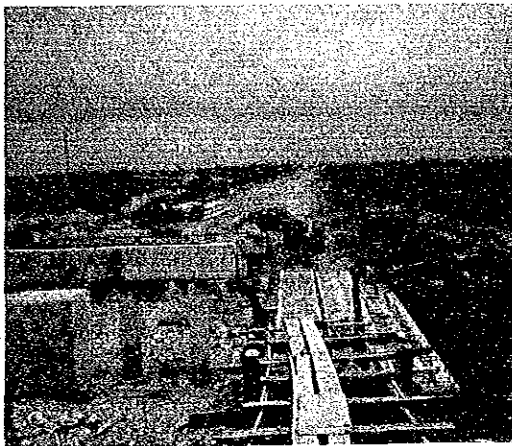




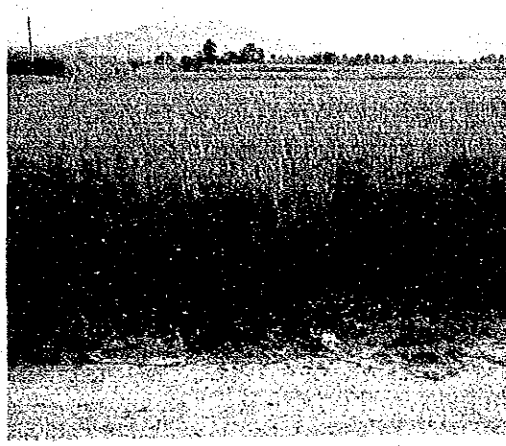
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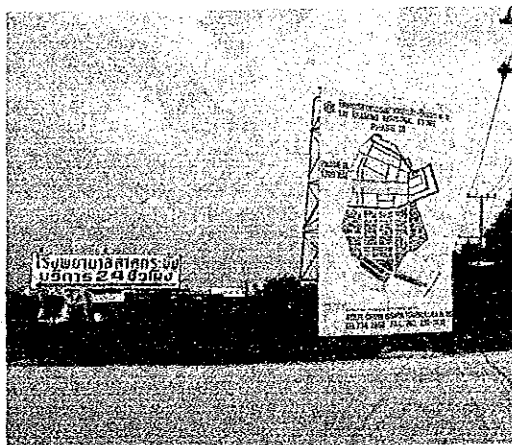
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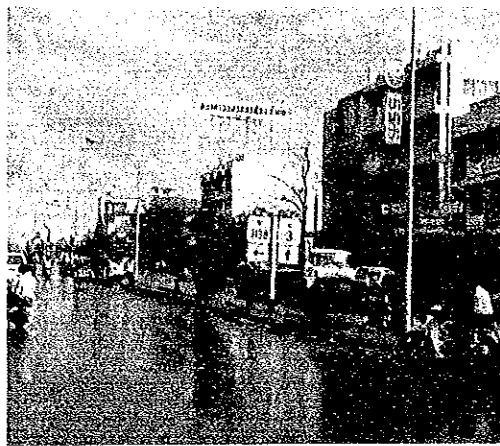




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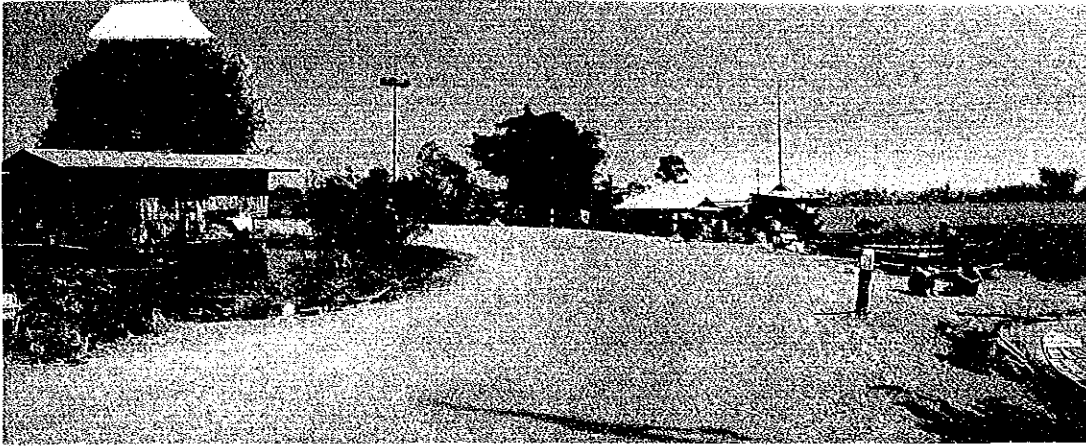
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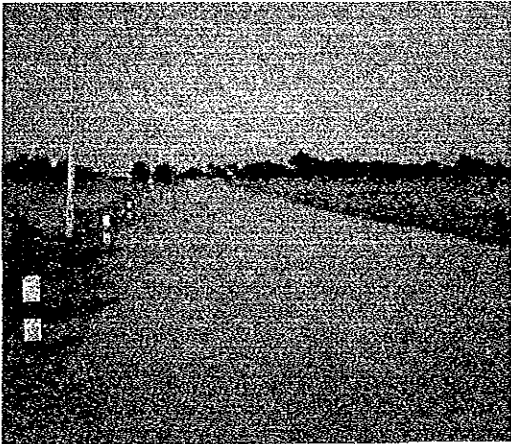
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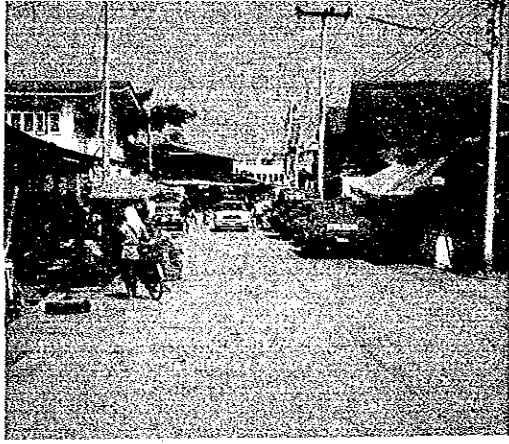




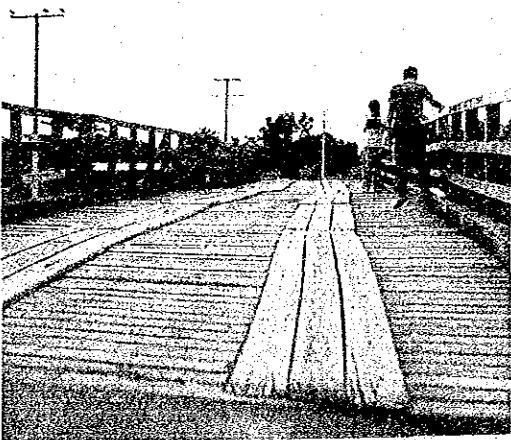
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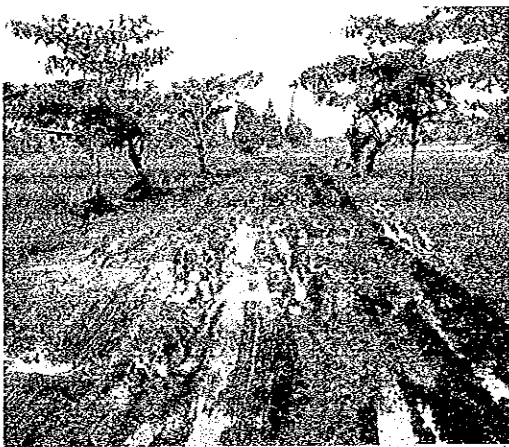
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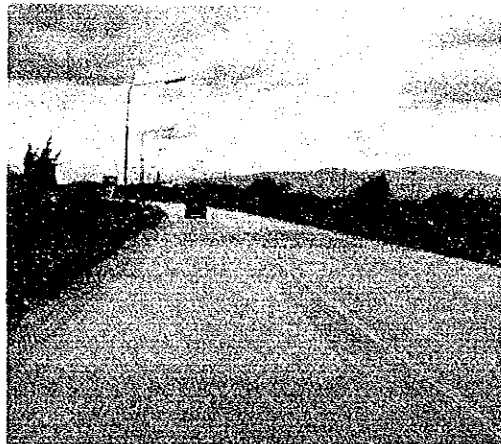


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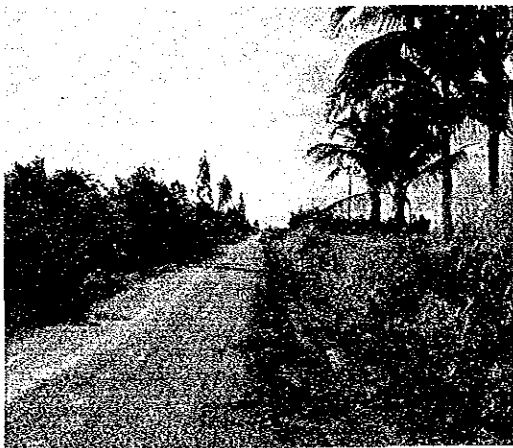




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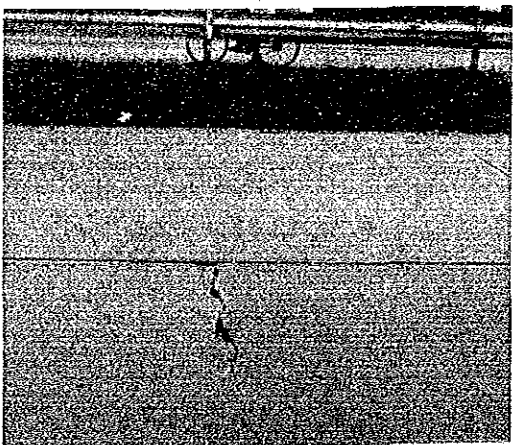
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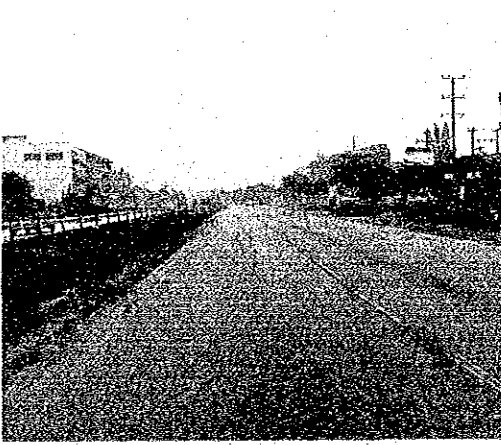
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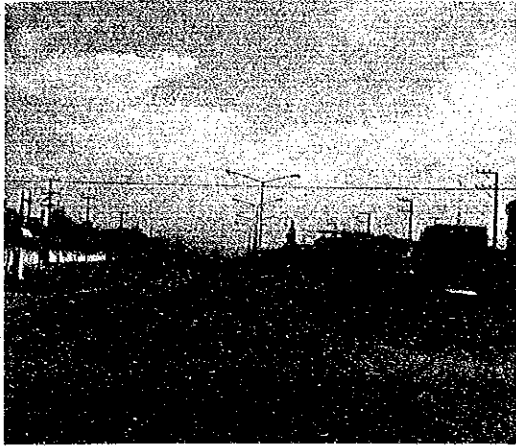


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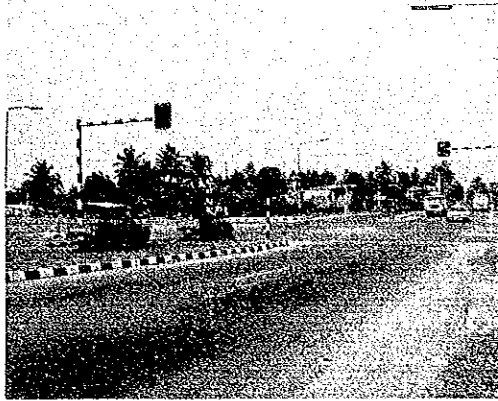


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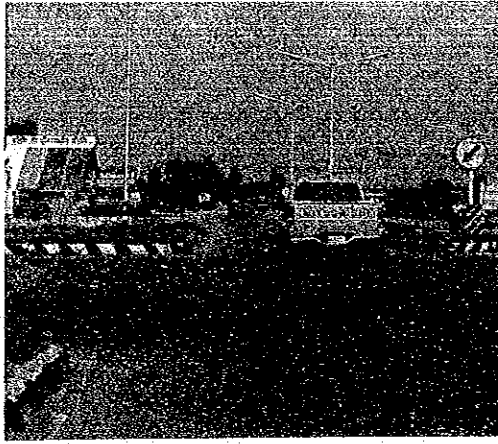
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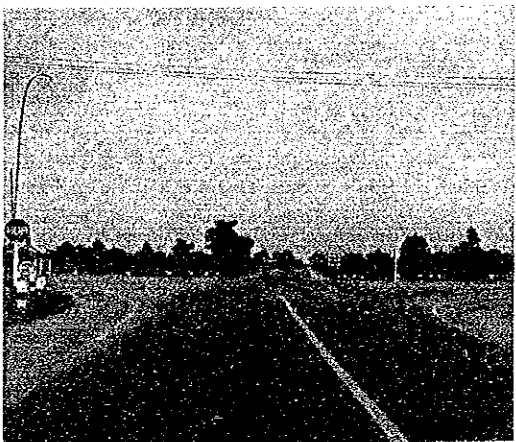
**Four-way Intersection with Channelization and Signal**



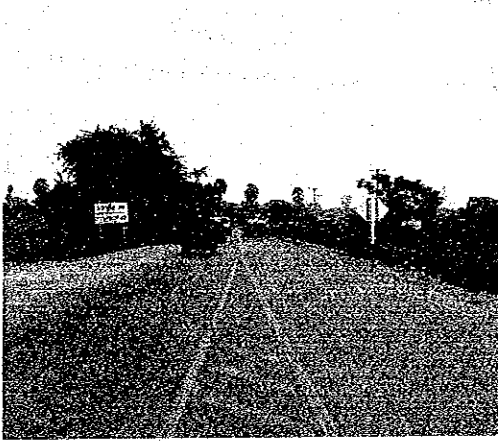
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## ABBREVIATIONS

GRP	:	Gross Regional Product
JICA	:	Japan International Cooperation Agency
GDP	:	Gross Domestic Product
NESDB	:	National Economic and Social Development Board
GPP	:	Gross Provincial Product
GIE	:	General Industrial Estate
EPZ	:	Export Processing Zone
DOH	:	Department of Highways
PSI	:	Present Serviceability Index
PWD	:	Public Works of Department
HCM	:	Highway Capacity Manual
ADT	:	Average Daily Traffic
VOC	:	Vehicle Operating Cost
SVOCT	:	Standardization of Vehicle Operating Costs for Thailand
PSI	:	Present Serviceability Index



**CHAPTER 1**  
**INTRODUCTION**



# CHAPTER 1

## INTRODUCTION

### 1.1 BACKGROUND

The Central Region with an area of 104,000 km<sup>2</sup> and population of 17,319,000 as of 1986 is the most densely populated and the most developed area in the Kingdom of Thailand. Bangkok, a major city in which all kinds of socio-economic activities and facilities in the country are extremely concentrated, is located in the Region.

Sufficient water resources and favorable soil conditions in the wide-spreading Central Plain around the Chao Phya River and its tributaries contribute to the high productivity in the agricultural sector of the Region.

With rapid industrial development within the Central Region, however, the share of the manufacturing sector in Gross Regional Product (GRP) of the Region has exceeded that of the agricultural sector. This tendency will be further promoted after the realization of the Eastern Seaboard and other large scale industrial development plans which are basic targets of the Sixth Five-year National Economic and Social Development Plan (the Sixth Plan).

There are other industrial sectors such as mining and tourism to be developed in the Region. Promotion of the tourism industry is also taken up as one of the targets in the Sixth Plan.

In the past twenty years, the government of Thailand has put primary emphasis on road development to improve the nationwide transportation network system. Although the Region is the most advanced area with a high potential, the road network in the Region however has not sufficiently been developed. The road length per GRP is the lowest among the regions, only half that of the Southern Region and less than half that of the Northern and North-eastern Regions.

Reflecting the existing configuration of trunk roads intensely converging into Bangkok, traffic congestion is conspicuous in and around the Bangkok Metropolitan area. Some drastic measures such as the installation of new highways including bypasses, widening of roadways and improvement of intersections are required to alleviate the present situation.

Deterioration of pavement will also be a pressing problem due to anticipated future increase in traffic volume and heavy vehicle load.

In consideration of the situation in the Region, the Government of Thailand requested that the Government of Japan carry out a road development study in the Region (the Study). The Government of Japan agreed to conduct the Study and entrusted it to the Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of the technical cooperation programs by the Government of Japan.

JICA organized a study team consisting of experts of Katahira & Engineers Inc. and Nippon Koei Co., Ltd. The Study was commenced at the end of August 1987 and completed at the end of March 1989 with a total duration of 20 months.

## **1.2 OBJECTIVE OF THE STUDY**

The objectives of the Study as referred to in the Scope of Work on the Road Development Study in the Central Region dated February 11, 1987 are:

- i) To establish a master plan for a road network and to identify the needs of road development in the Central Region from the viewpoint of national and regional development.
- ii) To select priority projects and to carry out a feasibility study on the selected projects.
- iii) To perform technology transfer to Thai counterpart personnel in the course of the Study.

The study area covers the whole area of the Central Region and two Changwats in the Northern Region consisting of the following 26 Changwats.

Nakhon Sawan, Uthai Thani, Chai Nat, Sing Buri, Lop Buri, Ang Thong, Saraburi, Suphan Buri, Ayutthaya, Nakhon Nayok, Kanchanaburi, Pathum Thani, Prachinburi, Nakhon Pathom, Nonthaburi, Chachoengsao, Samut Prakan, Samut Sakhon, Ratchaburi, Samut Songkhram, Chon Buri, Rayong, Chanthaburi, Trat, Phetchaburi and Prachuap Khiri Khan.

However, the Bangkok Metropolitan Area, which is defined as the area encircled by the Outer Ring Road, is excluded from the study area.

The road networks to be studied involve national and provincial highways and other agency roads which are or will be under the jurisdiction of DOH in the study area.

### **1.3 STUDY FRAMEWORK**

The Study comprises the following three major items:

i) *Master Plan Study*

Establishment of a master plan for the road development in the Region.

ii) *Study on Consideration of Expressway Development*

Consideration of the need of expressways from the viewpoint of national development.

iii) *Feasibility Study*

Feasibility studies of the proposed projects selected in the Master Plan Study, which were divided into the following two groups:

- Phase I Projects: Proposed projects which were considered to require urgent implementation from the viewpoint of road congestion and present road conditions. Studies for these projects were finished at the end of September 1988.

- Phase II Projects: Other proposed projects.

A schematic study work flow is shown in the Figure 1.3.1.

### **1.4 REPORTING**

The Study was carried out over 20 months following an agreement on approach and methodology.

The Inception Report, which described the proposed work program and schedule, methodology and procedures of the Study, was submitted in the early part of September 1987.

Progress Report (I), which described the results of the Study up to the Project Screening step in which routes subject to the preliminary evaluation were selected, was submitted in the middle of December 1987.

The Interim Report, which described the results of the Study up to the preliminary evaluation step, was submitted at the end of March 1988. The Master Plan Study was completed at this time.

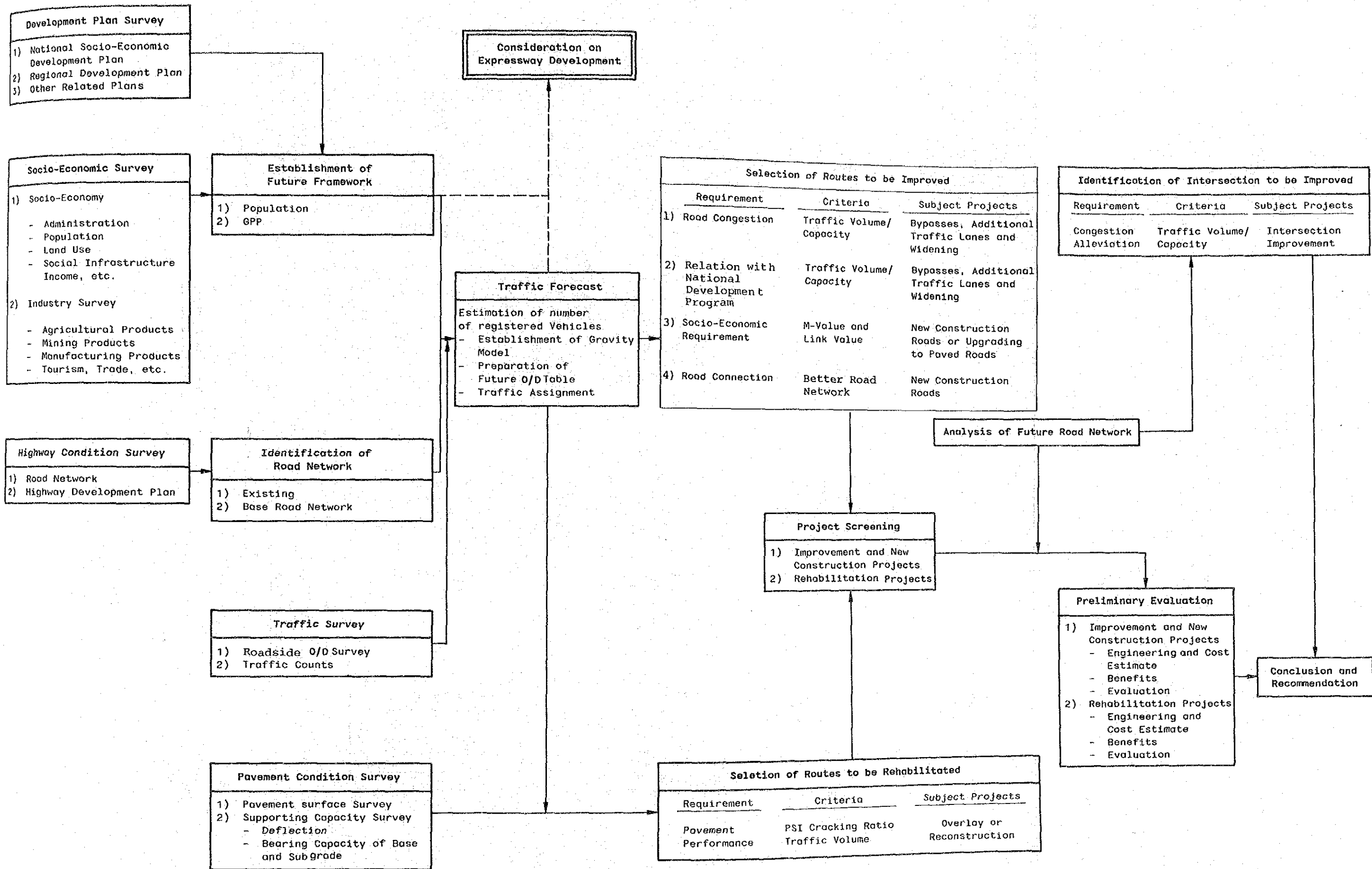


Figure 1.3.1(I) STUDY FLOW DIAGRAM FOR MASTER PLAN

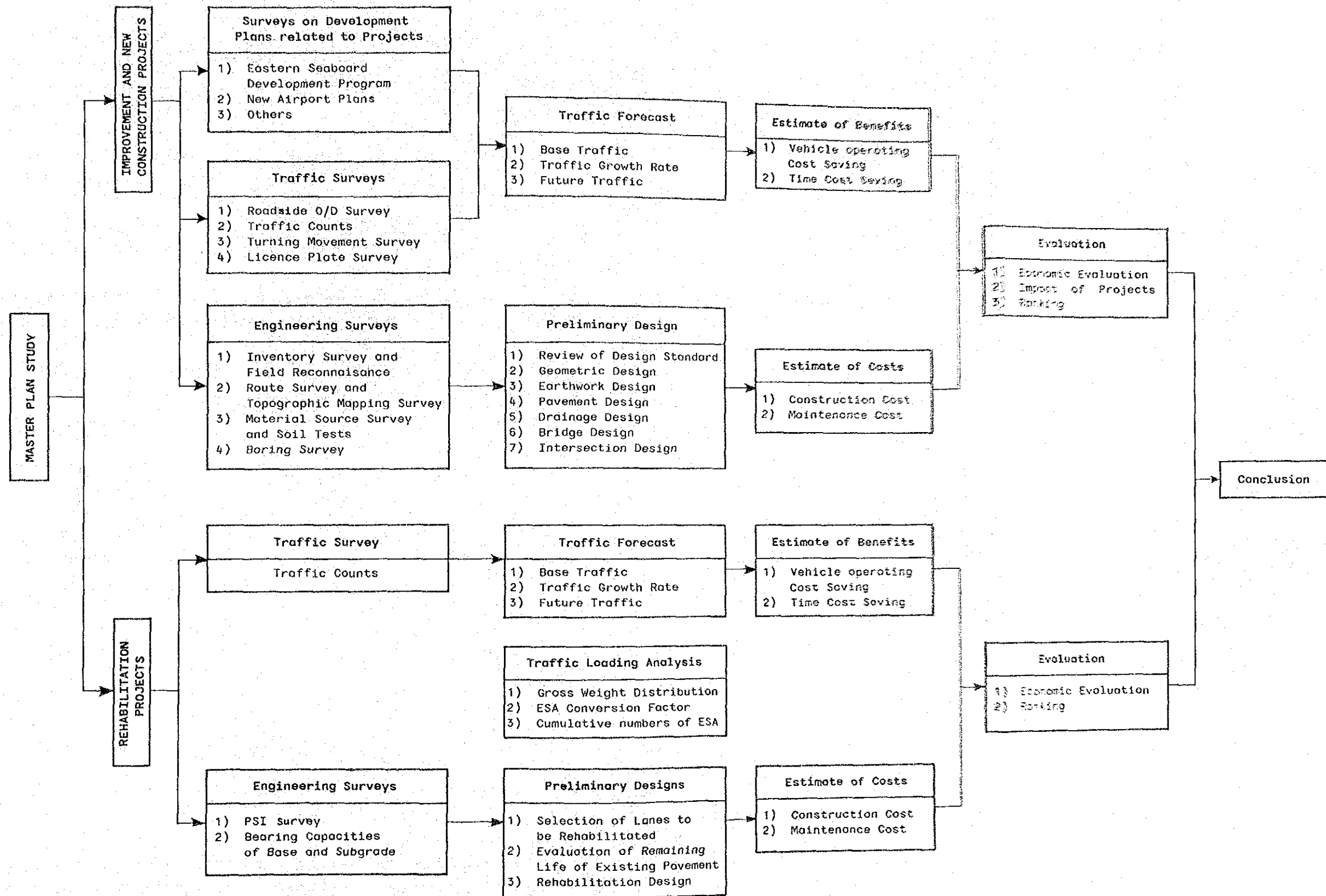


Figure 1.3.1(2) STUDY FLOW DIAGRAM FOR FEASIBILITY STUDY





Report on Consideration of Toll Expressways in the Kingdom of Thailand described the necessity of expressway development in Thailand by contracting a long term prospect of the national and regional development in Thailand with expressway development in other countries. It was submitted at the end of May 1988.

Progress Report (II), which described the results of the Feasibility Study for the Phase I Projects, was submitted at the end of October 1988.

The Draft Final Report, which incorporated all results of the Study including the results of the Feasibility Study for Phase II Projects, was submitted at the end of January 1989.

The Final Report was prepared in Japan, incorporating DOH comments on the Draft Final Report, and was submitted at the end of March 1989.

The Final Report consists of the following volumes:

Summary Report

Volume I Master Plan Study

Volume I-1 Main Text

Volume I-2 Appendices

Volume I-3 Route Report

Volume II Feasibility Study

Volume II-1 Main Text

Volume II-2 Appendices

Volume II-3 Route Report

Report on Consideration of Toll Expressways in the Kingdom of Thailand.

## **1.5 ORGANIZATION**

The Study was carried out by the Study Team under the guidance of the Advisory Committee, consisting of Japanese government officials, organized by JICA. In carrying out the Study, the Study Team kept close collaboration with the Counterpart Team organized by DOH. The organization is shown in Figure 1.5.1.

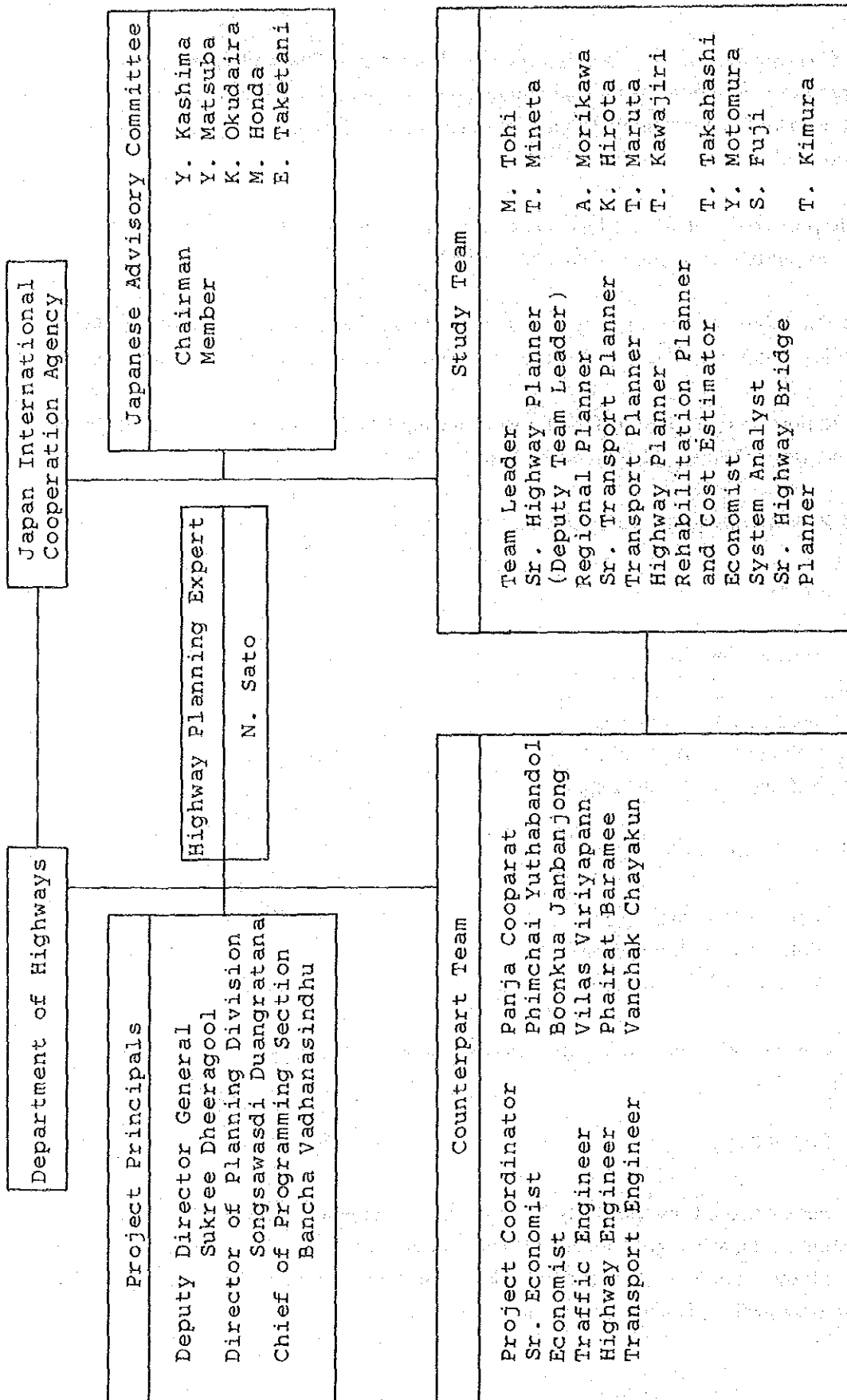


Figure 1.5.1 ORGANIZATION FOR THE STUDY