

第5章 本格調査への提言

5-1 基本方針

本調査の目標は、タイ国の運輸通信交通省（従来の運輸通信省を改称）道路局（DOH）の建設・管理する道路について、交通安全施設、交通管理施設を適切に整備・設置することにより、交通流の円滑化、交通安全の確保を図ることであり、また、このことについて道路局の能力（道路管理能力、道路管理政策の立案・推進能力）の向上を図ることである。

このことは、近年におけるタイ国道路交通の急激な進展と、これに伴う交通混雑の激化（フリクションの増加）及び交通事故の激増を背景として必要と考えられたものである。

交通の円滑化、交通安全の確保は、より根本的には国土の骨格的な道路から、日常生活に密接に関連する足もとの的な道路に至る道路網を体系的に整備することにより、交通の流れを整理することが必要である。

その一方で、既存の道路施設を最大限有効に活用することも重要な施策の1つである。

本調査では、道路局との接衝の中から、道路局の道路管理能力の向上を図るための諸方策の立案、及び具体的な施設整備については、既存道路の有効活用を図ることを主要課題とすることが必要と考えられた。

この場合、本格調査の柱は次の3つとすることが適当と考えられる。

- (1) 道路管理能力を高めるための施策として、道路施設現況及び道路交通データの効果的収集方法、及びその体制、さらに、情報の収集から政策及び具体的方策の立案及び実施・検証にいたる一貫した施策を遂行するための適切な組織体制の整備方策の立案
- (2) 交通安全施設の設置のための仕様書の作成（「タイ国道路交通安全計画調査」ではガイドラインまで提示済みであり、今回はこれを実際の施設整備にむけて補強するものである。）
- (3) 信号機、道路標識・標示等について、交通円滑化の面からの整備ガイドライン及び施設設置の仕様書の作成

この場合、タイ側の強い要請もあり、信号機を中心として実地の施設設置、一部地域（バンコク周辺部及び1～2の地方都市並びに都市間道路）での（ケーススタディとしての）施設整備計画案の立案を行うこととしているが、これは、実際の計画作業を通じて技術移転を図るという点から望ましいものである。

本格調査の基本方針は以上のごとくであり、具体的な内容は次頁以下を参照されたい。

5-2 調査の内容及びスケジュール

本調査は、タイ国におけるDOH所轄の道路に関する効果的な交通運用計画の確立をめざすものである。この目的を達成するためには、本調査の調査フローは図5-1に示す通り、

またそれぞれの作業内容は以下の通りと考えられる。

(1) 国内事前準備

作業① 国内事前準備

事前調査報告書、S/W、既存関連資料等に基づき、調査全体の構成を明らかにするとともに、調査方針、方法、スケジュール、実施体制等を検討し、その内容をIC/Rとして作成する。

(2) 第1次現地調査

作業② 国家社会経済開発計画のレビュー

現在同国で進められている国家経済社会開発計画及び関連開発計画をレビューし、将来の社会経済の動向を検討する。

作業③ 調査対象エリア・要因の特定

本調査の対象地域はタイ全土にわたるが、調査を効率的に進めるため、道路状況、交通状況、社会条件等の検討を行い、調査の代表的なモデル地域を選定し、それぞれの地域における具体的な問題点の抽出、交通運用を考える上での要因（例えば、混雑解消、二輪車対策、交通流円滑化等）を整理する。

作業④ 実験・ケーススタディ実施箇所の選定

作業③の結果を踏まえ、実験及びケーススタディを実施するうえでの問題点、可能性を検討し、具体的な地区、地域を選定する。

作業⑤-1 道路交通状況の把握、課題抽出

現在の道路構造（構造基準、幅員構成、交差点形状、付帯施設等）及び道路交通状況（交通量、車種別運行状況、速度、混雑状況、事故等）を把握し、問題点の整理、分析を行う。

作業⑤-2 Phase I 調査のレビュー

1985年に日本の技術協力で実施した「タイ国道路交通安全計画調査」をレビューし、その実施状況、課題を整理する。

作業⑤-3 DOH 交通安全5カ年計画のレビュー

Phase I 調査を踏まえ、DOHが作成、事業を進めている「交通安全5カ年計画（1987～1991年）」（Highway Accident Prevention Project 2530～2534）をレビューし、その達成度、課題、今後の実施状況を整理、検討する。

作業⑤-4 DOH 交通運用システムのレビュー

現在のDOHにおける道路交通運用システムの状況を整理、分析し、問題点を明瞭にする。

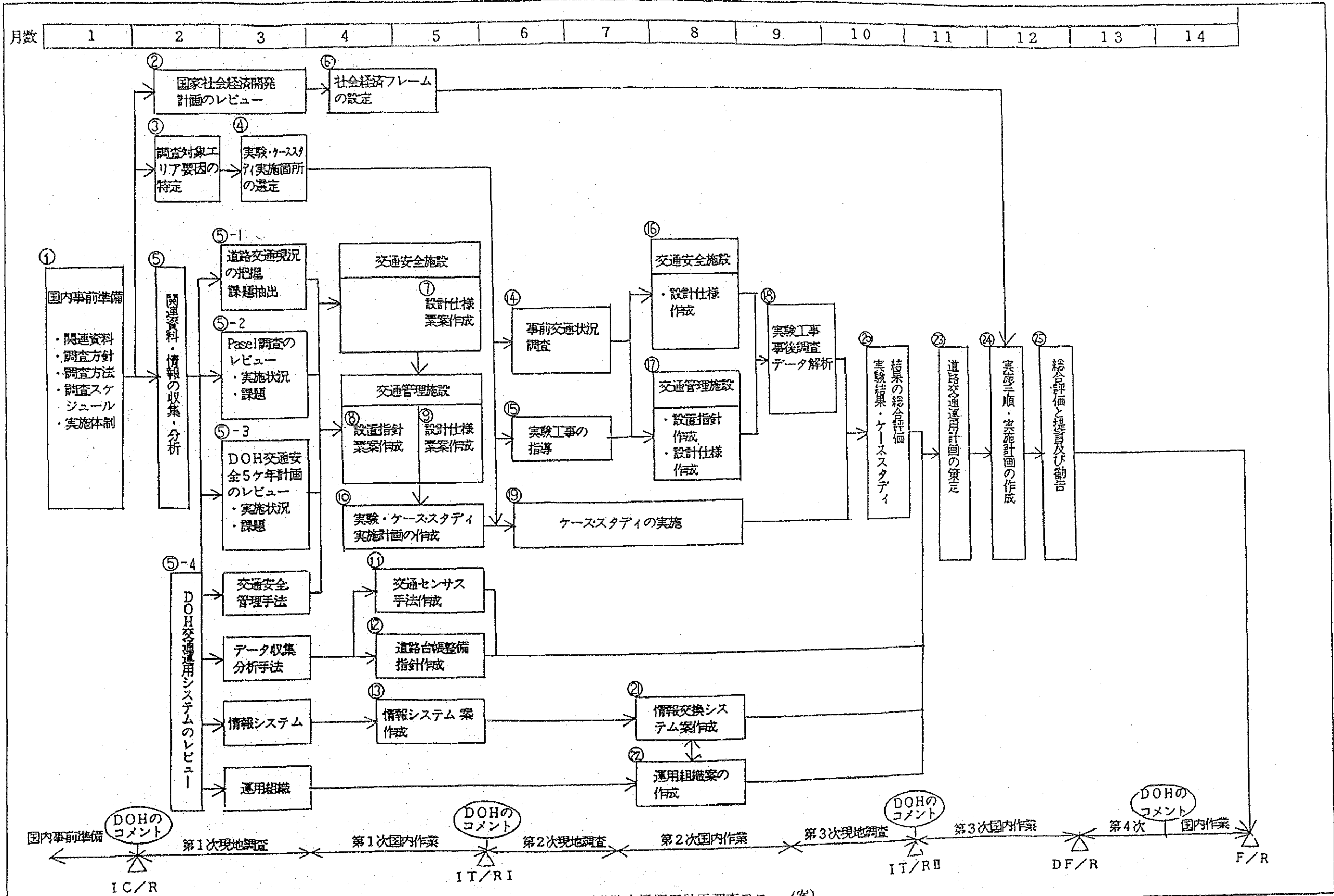


図5-1 タイ国道路交通運用計画調査フロー (案)

具体的な内容としては、交通安全・管理手法（計画，対策選定，実施に至る手順及びそのための技術基準，設計，施工仕様等），交通データ収集・分析手法，交通情報システム及び交通運用組織，行政，制度等を含む。

(3) 第1次国内作業

作業⑥ 社会経済フレームの設定

作業②の結果に基づき，道路交通運用実施計画の策定及びその実施による経済効果を分析するうえでの将来の社会経済フレームを設定する。

作業⑦ 交通安全施設設計仕様素案作成

第1次現地調査の結果に基づき，交通安全施設に関する設計仕様（Specification）の素案を作成する。なお，設置指針（guideline）については，Phase I調査ですでに実施済みであり，本調査では，その後の時間的経過，第1次現地調査の結果を踏まえ，必要な修正を行う。

作業⑧・⑨ 交通管理施設設置指針・設計仕様素案作成

第1次現地調査の結果に基づき，交通管理施設に関する設置指針，設計仕様の素案を作成する。

作業⑩ 実験，ケーススタディ実施計画の作成

作業④で選定された箇所における実験・ケーススタディの実施計画を作成する。

実験については，方針，施設計画，調査項目，実施体制，事前・事後の交通状況調査手法及びそのデータ解析，評価手法を含めた内容とする。

作業⑪ 交通センサ手法作成

作業⑫ 道路台帳整備指針作成

作業⑬ 情報システム案作成

第1次現地調査の結果に基づき，上記手法，指針等の作成を行う。作成に当たっては，タイにおける道路交通運用組織，行政の実態及び今後の動向を十分踏まえたものとする。

(4) 第2次現地調査

作業⑭ 事前交通状況調査

実験実施箇所において実験実施前の交通状況調査を行い，交通現況の把握を行うとともに，実験効果評価のための元データとする。

作業⑮ 実験工事の指導

実験のための諸施設設置工事及び実験実施体制の技術指導を行う。

作業⑯ ケーススタディの実施

ケーススタディ実施箇所の詳細な現地踏査を行い，作業⑩で作成した実施計画の検討を行うとともに，ケーススタディの課題，方針を明確にする。

(5) 第2次国内作業

作業⑩ 交通安全施設設計仕様作成

作業⑪ 交通管理施設設置指針・設計仕様作成

作業⑦, ⑧, ⑨で作成した上記指針, 仕様の深度化を図る。

作業⑫ ケーススタディの実施

選定された箇所に対して, 具体的な交通運用計画の立案, 対策の選定, 選定された対策を行うための諸施設の設計, 施工手法, 実施計画等を内容としたケーススタディを実施する。

作業⑬ 情報交換システム案作成

作業⑬の結果をもとに, 交通運用組織, 行政のあり方(作業⑭)に十分配慮しつつ, 交通運用関係機関の間の効果的な情報交換システム案の作成を行う。

作業⑮ 運用組織案の作成

タイにおける道路交通運用に関する行政, 制度, 組織のあり方について, その案を作成する。

(6) 第3次現地調査

作業⑯ 実験工事事後調査・データ解析

実験に用いた諸施設の設置, 運用に関する調査及び実験実施による交通状況の変化の調査を行い, その問題点, データの整理, 解析を行う。

作業⑰ 実験・ケーススタディ結果の総合評価

実験結果, ケーススタディにおける問題点を総合的に評価し, その結果を作業⑪, ⑫, ⑬, ⑯, ⑰, ⑱, ⑲に反映させ, 必要な追加, 修正を行うとともに, これらの内容をまとめたIT/R IIを作成する。

(7) 第3次国内作業

作業⑳ 道路交通運用計画の策定

以上の作業を集大成し, 道路交通運用に関する全体計画を策定する。

作業㉑ 実施手順・実施計画の作成

作業⑥の結果及び社会経済効果を考慮しつつ, 道路交通運用計画の実施プログラムを作成する。

作業㉒ 総合評価と提言及び勧告

調査全体に対する総合評価及びそれを踏まえた提言, 勧告を行う。

5-3 調査の実施体制

以上に述べた調査の内容, スケジュール等から, 本格調査の調査団の分野構成としては以

下のようなものが考えられる。

	作業分担
総括／組織	<ul style="list-style-type: none"> ・調査業務全体の統括 ・調査方針、調査方法、手順の決定、調査の推進 ・交通運用組織の検討、改正案の作成 ・総合評価 ・提案と勧告
交通運用計画	<ul style="list-style-type: none"> ・関連資料の収集、整理 ・交通状況の分析 (交通量、車種別運行状況、速度、混雑、事故等) ・実験結果の評価 ・交通運用計画の検討 (調査対象エリア、要因、運用計画) ・道路台帳整備指針の作成 ・交通センサシステムの検討及び提案
交通安全計画	<ul style="list-style-type: none"> ・DOH M/Pのレビュー (問題点の抽出) ・JICA Study (Phase I) のレビュー (実施状況の把握、課題の抽出) ・実験の計画、指導、評価
交通管理計画	<ul style="list-style-type: none"> ・既存交通管理手法、情報システムのレビュー ・交通管理施設設置指針の検討 ・実験の計画、指導、評価、ケース・スタディの実施 ・情報システムの検討及び提案
道路計画／設計	<ul style="list-style-type: none"> ・道路状況の分析 ・実験の計画、設計 ・ケース・スタディの実施

基準作成	<ul style="list-style-type: none"> ・交通安全施設設計仕様の作成 ・交通管理施設設置指針の作成 ・交通管理施設設計仕様の作成
交通調査／分析	<ul style="list-style-type: none"> ・実験事前調査の実施 ・実験事前調査データの解析 ・実験事後調査の実施 ・実験事後調査データの解析
経済分析	<ul style="list-style-type: none"> ・国家社会経済開発計画のレビュー ・社会経済フレームの設定 ・経済効果分析

5-4 本格調査の実施に当たっての留意事項

(1) 今回の調査は、道路局の道路管理能力の向上、交通安全・交通管理施設の整備、手法の立案を主目的としており、直接的なカウンターパートとして Traffic Engineering Office を考えているが、その内容からみて、道路局内の他の部署（計画部、設計部等）にまたがるものが多い。

このことから、これら他部署に属する技術者が参加する形を相方で合意しているが、本格調査の実施段階においてもこれらの連絡調整を十分に図る必要がある。

(2) Case-Study として実施する計画案については、実効性をあげるため、少なくともその一部について交通量の実測、事故の把握等具体的データに基づいて設計を行う必要がある。

(3) 先述のように本調査においては、道路交通運用について、組織整備から、具体的な施設整備に至る道路管理に関する多面的かつ一貫した検討が要請されている。このことから、調査団の編成に当たっては、これらに関し豊富な経験を有し、かつ最新の情報を持つ実務家の参加が必須的条件となると考えられる。

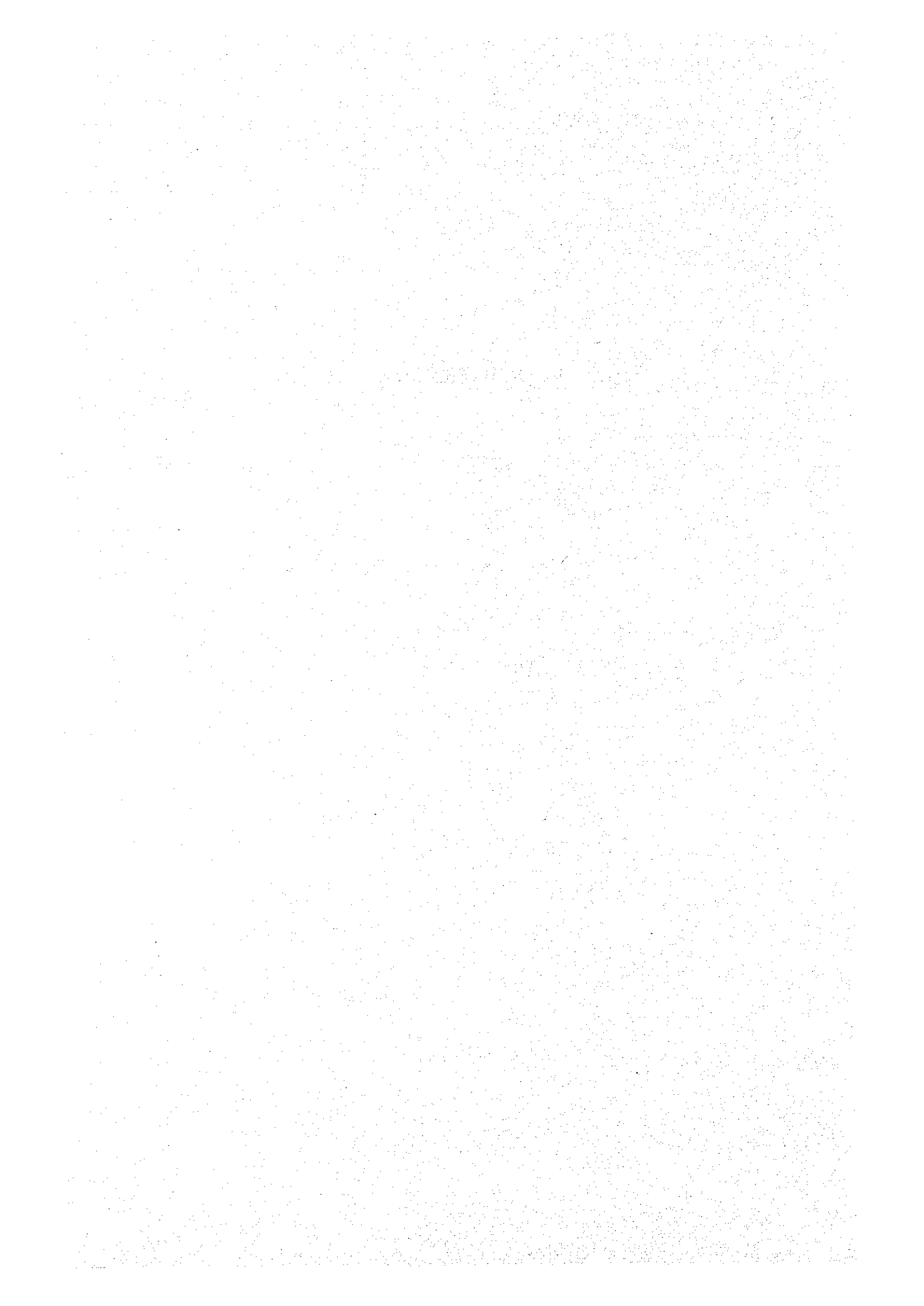
また、道路施設現況、道路交通センサス、組織体制のあり方等具体的調査内容に関する体系的情報は主として行政サイドが有するものであり、これらを適切に反映するための調査実施体制をくむ必要がある。

以上、本格調査を実施するに当たっての留意事項を何点か列挙した。

付 属 資 料

1. S/W及びM/M
2. 質問事項に対する回答
3. 要請書
4. 対処方針
5. S/W(案)
6. 質問事項
7. 面会者リスト
8. 収集資料リスト

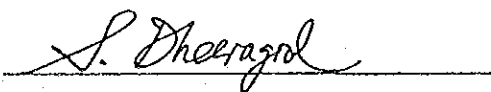
1. S/W 及び M/M



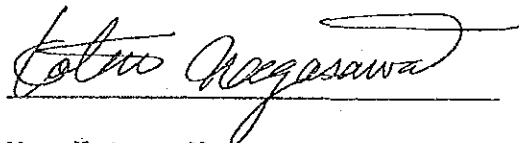
SCOPE OF WORK
FOR
THE STUDY
ON
TRAFFIC OPERATION PLAN FOR ROADS
IN
THE KINGDOM OF THAILAND

AGREED UPON BETWEEN
DEPARTMENT OF HIGHWAYS
MINISTRY OF TRANSPORT AND COMMUNICATIONS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

BANGKOK, SEPTEMBER 30, 1988



Mr. Sukree Dheerakool
Deputy Director General
Department of Highways
Ministry of Transport and
Communications



Mr. Kotaro Nagasawa
Leader of the Japanese
Preliminary Study Team,
Japan International
Cooperation Agency

I. INTRODUCTION

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan has decided to conduct the study on Traffic Operation Plan for Roads (hereinafter referred to as "the Study"), within the general framework of technical cooperation between Japan and the Kingdom of Thailand, which is set forth in the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand, signed on November 5, 1981.

Accordingly, Japan International Cooperation Agency (Hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will carry out the Study, in accordance with the relevant laws and regulations in force in Japan and in close cooperation with the authorities concerned of Thailand.

Department of Highways (hereinafter referred to as "DOH") shall act as counterpart agency to the Japanese Study Team and also as a coordinating body in relation with other relevant organizations for the smooth implementation of the Study.

The present document sets forth the Scope of Work for the Study.

II. OBJECTIVE OF THE STUDY

The objectives of the Study are:

- (1) To establish effective traffic operation plan.
- (2) To perform technology transfer to Thai counterpart personnel in the course of the study.

III. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Study shall cover the following items:

3.1 Review and Preliminary Survey

- (1) Collection of available data and information relevant to the Study.
- (2) Review of existing roads and traffic condition.
- (3) Review of existing DOH traffic operation system.

3.2 Traffic Operation Plan

- (1) Identification of locations and elements for traffic operation plan to be studied.
- (2) Road and road traffic census system

- formulation of road inventory and traffic census system.
- (3) Traffic safety measures
 - setting up of engineering specifications for the installation of traffic safety devices.
- (4) Traffic control measures
 - a. Setting up guidelines used to select effective traffic control strategies.
 - b. Setting up engineering specifications for the installation of traffic control devices
 - c. At-site experimental works to evaluate effect of traffic control devices.
 - d. Case-study for the selected areas
- (5) Information system
 - recommendation for effective road traffic information system and information exchange system between DOH and related road administrators.
- (6) Operation organization
 - recommendation for DOH traffic operation organization.
- (7) Recommendation for traffic operation plan on DOH roads.

IV. STUDY SCHEDULE

The Study will be conducted in accordance with the attached tentative schedule.

V. REPORTS

JICA shall prepare the following reports in English and submit to the Kingdom of Thailand.

5.1 Inception Report (30 copies)

Inception Report will be submitted within 1 month after the beginning of the study.

5.2 Interim Report I (30 copies)

Interim Report I will be submitted within 6 months after the beginning of the study.

5.3 Interim Report II (30 copies)

Interim Report II will be submitted within 10 months after the

beginning of the study.

5.4 Draft Final Report (30 copies)

Draft Final Report will be submitted within 13 months after the beginning of the study.

DOH shall provide JICA with its comments within 1 month after the submission of Draft Final Report.

5.5 Final Report (100 copies)

Final Report will be submitted within 1 month after receipt of the comments on Draft Final Report.

VI. UNDERTAKINGS OF THE GOVERNMENT OF THE KINGDOM OF THAILAND

6.1 In accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand dated November 5, 1981, the Government of the Kingdom of Thailand shall accord benefits to the Japanese Study Team as follows:

- (1) To permit the members of the Japanese Study Team to enter, leave and sojourn in Thailand for the duration of their assignment therein and exempt them from alien registration requirements and consular fees;
- (2) To exempt the members of the Japanese Study Team from taxes, duties and other charges on equipment, machinery and other materials brought into Thailand for the conduct of the Study;
- (3) To exempt the members of the Japanese Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese Study Team for their services in connection with conducting of the Study;
- (4) To bear claims, if any arises against the members of the Japanese Study Team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the conducting of the Study, except when such claims arise from gross negligence or wilful misconduct on the part of the members of the Japanese Study Team.

6.2 To facilitate smooth conduct of the Study, DOH shall take necessary measures in cooperation with other relevant organizations:

- (1) To secure permission for entry into private properties or rest-

stricted areas for the conduct of the Study;

- (2) To secure permission for the Study Team to take all necessary data and documents related to the Study out of Thailand to Japan;
 - (3) To provide the medical services as needed (Its expenses will be chargeable on members of the Japanese Study Team);
 - (4) To ensure the safety of the members of the Japanese Study Team when and as it is required in the course of the Study.
- 6.3 DOH shall, at its own expense, provide the Japanese Study Team with the followings:
- (1) Available data and information related to the Study;
 - (2) Counterpart personnel
 - (3) Suitable office space with office equipment in Bangkok (and the area, if necessary)
 - (4) Credentials or identification cards.

VII. UNDERTAKINGS OF JICA

For the implementation of the Study, JICA shall take the following measures:

- 7.1 To dispatch, at its own expense, the Study Team to the Kingdom of Thailand;
- 7.2 To pursue technology transfer to the Thai counterpart personnel in the course of the Study.

VIII. MUTUAL CONSULTATION

JICA and DOH shall consult with each other in respect of any matter that may arise from or in connection with the Study.

TENTATIVE SCHEDULE

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Work in Thailand		IC/R	IT/RI	IT/RII	DF/R	F/R									
Work in Japan															
Report Presentation	△					△				△			△		△

IC/R : Inception Report
 IT/RI : Interim Report I
 IT/RII : Interim Report II
 DF/R : Draft Final Report
 F/R : Final Report

SUMMARY OF DISCUSSION
OF
TRAFFIC OPERATION PLAN FOR ROADS
IN
THE KINGDOM OF THAILAND

September 30, 1988, Bangkok

The Japanese Preliminary Study Team (the Team), organized by the Japan International cooperation Agency (JICA) and headed by Mr. NAGASAWA, visited the Kingdom of Thailand from September 21st to October 1st, 1988 for the purpose of formulating the Scope of Work for the Study on Traffic Operation Plan for Roads in the Kingdom of Thailand.

During the Team's stay in Thailand, the Team carried out a field survey and had several meetings with officials of the Department of Highways (DOH), the Ministry of Transport and Communications, on the Scope of Work and other related matters.

The main items which were understood by both sides are as follows:

1. The Scope of Work was agreed as attached.
2. As for Study Item 3.1, DOH shall provide necessary data for the conduct of the Study.
3. The principal element, in Study Item 3.2 (1), is the problem of conflict in intersections. Other traffic elements, for example motor cycle problems in or adjacent to local city areas, expected to be identified in this study may possibly be taken up through discussion between DOH and Study Team.
4. Study Item 3.2 (4) c., namely experimental works, should be conducted by DOH in cooperation with Japanese Study Team with DOH budget.
5. The areas to be selected as case study for traffic operation, in Study Item 3.2 (4) d., are (a) Bangkok suburban area, (b) one or two local city areas, and (c) intercity roadways and/or intersections.
6. The Team requested DOH to provide the Study Team with suitable office space and its equipments. DOH promised that they will try to provide the Study Team with them.
7. DOH requested the Team to provide with some traffic counters and other equipments in order to conduct the study efficiently.
8. DOH requested counterpart training in Japan for the counterpart personnel mentioned in Item 6.3 (2).
9. DOH requested the Team to hold a seminar on the outcome of the Study at the time of the presentation of Draft Final Report.

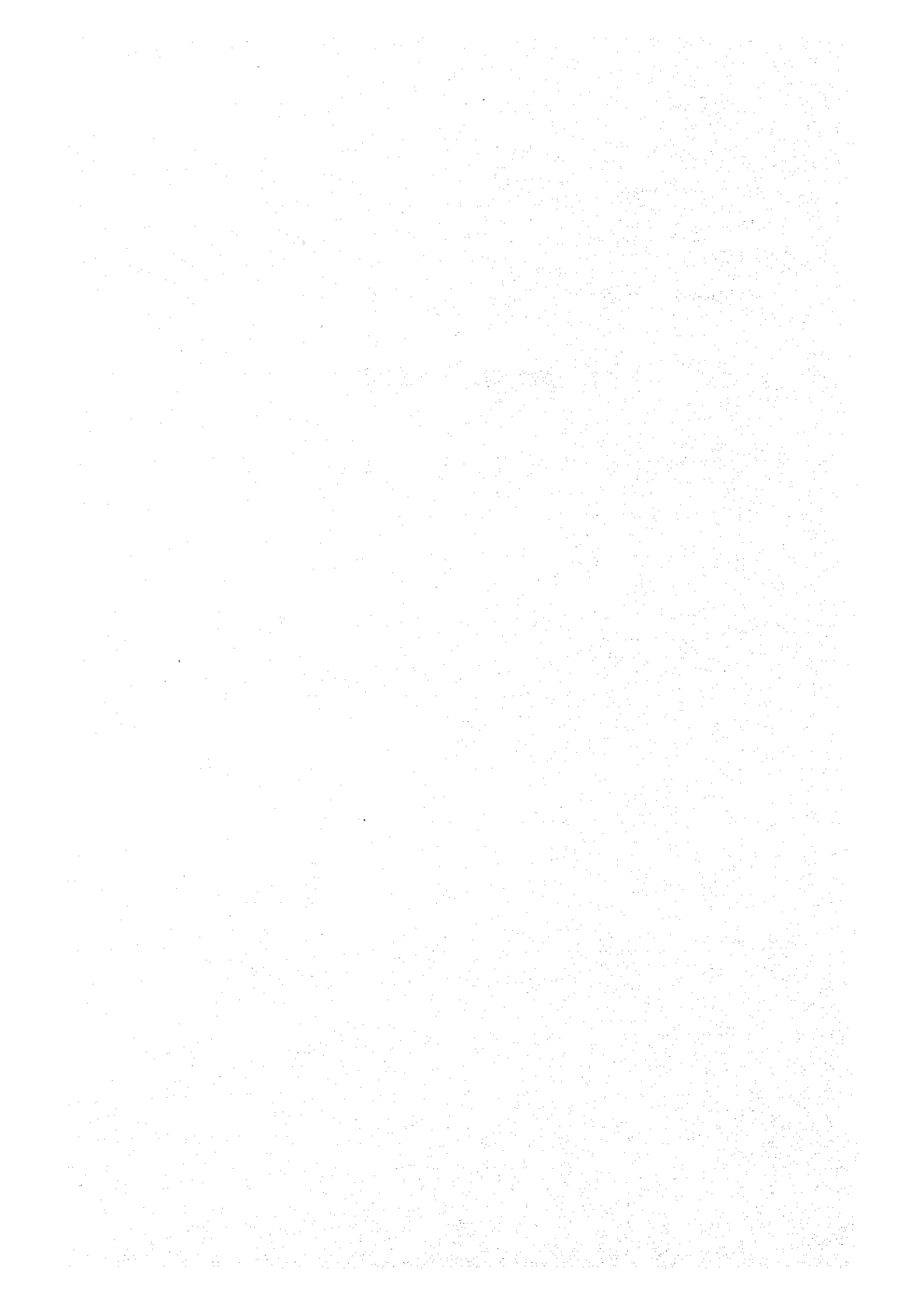
S. Dheeragool

Mr. Sukree Dheerakool
Deputy Director General
Department of Highways
Ministry of Communications

Kotaro Nagasawa

Mr. Kotaro Nagasawa
Leader of the Japanese Preliminary
Study Team
Japan International Cooperation
Agency

2. 質問事項に対する回答



Questionnaire to the study on TRAFFIC OPERATION
FOR ROAD IN THE KINGDOM OF THAILAND (the Study)

I. General

(1) The following is a statement in the T/R : " the proposed study is intended to proceed the basic line shown in the Phase I study to further comprehensive stage".

(a) What is the precise meaning of "comprehensive stage" ?

- "Comprehensive stage means having full details of the planning operation techniques and engineering design specifications.

(b) What topics do you think are needed to complement the Phase I Study ?

- 1) Establishment of the system for traffic data collection and analysis.

2) Advanced identification techniques of hazardous locations necessary for the implementation of highway safety programs, which will be based on accident statistics and by field observations.

3) Preparation of engineering specifications and techniques for the installation of traffic safety facilities and control devices.

4) Engineering criteria for assessing and placing priority on various techniques for the improvement of hazardous location.

(2) What is the content of "guideline and specification", in addition to those provided in the Phase I Study ?

- Detailed engineering specifications and techniques are being required, and especially, the use of computer programs for designing.

(3) In reference to (2), Please state which should be emphasized as the purpose of the Study.

(a) to review the Phase I Study and to provide recommendations to overcome problems with view to its implementation.

(b) to formulate new "guideline and specification".

- Formulation of detailed engineering specification and techniques are being requested primarily, regarding item (2).

(4) The topics for the Study are as follows.

1. Traffic control devices.
2. Traffic safety devices.
3. Traffic information system.
4. Traffic operation organization.
5. Traffic census system.

(a) For each topic, please state existing situation, problems, and detailed content for the Study.

- Refer to appendix-1.

(b) What is the priority order of the topics ?

- Priority-1 · Traffic census system
- ditto- · Traffic safety devices
- ditto- · Traffic control devices
- Priority-2 · Traffic information system
- ditto- · Traffic operation organization

(c) What is the difference between "traffic safety devices" mentioned in 2. above and those dealt with in the Phase I Study.

- No difference.

(5) The study area is the whole kingdom of Thailand. Are there specific areas with higher priority for the Study than others ?

- The whole kingdom of Thailand.

(6) In reference to "experimental work", please state your thoughts concerning the following items.

1. Purpose (for example, reduction of traffic accidents, reduction of travel time)

- The purpose of experimental works will be to attain maximum efficiency from existing highway networks (e.g. travel time) and facilities while minimize adverse effect of traffic (e.g. traffic accidents).

2. Term of the experimental work (from planning to evalu-

ation)

- 6 to 8 months

3. Content

- An example of experimental works is to reduce traffic congestion at or nearby intersections which often impedes traffic efficiency in road networks, which may also be effective in reducing traffic accidents. The consistent experiment from designing to construction, post evaluation are now being required.

Other experiments will be dependent upon problems expected to be recognized in the Study.

4. Scale

- The scale of experimental works is dependent upon the study team.

5. Budget and source of funds

- When the candidate locations for these experiments are included in the annual implementation programs of DOH's highway safety plan, the budget for construction will be responsible by DOH.

(7) Please, detail the progress you have made with regards to traffic safety devices and traffic control devices since the 1985 JICA study. Please, include the budget and actual expenses.

(Unit: million Bahts)

Thai Fiscal Year beginning Oct. 1	Budget	Expenditure
1986	80	46
1987	109	52
1988	120	98.6
1989	207 (*)	---

(Note) (*) Traffic Engineering Office now requests this amount, but not approved yet.

(8) What are your future plans, if any, on traffic safety

devices and traffic control devices ?

- DOH plans to proceed the traffic operation activities, following recommendations.

- 1) Development of detailed guidelines and specifications for all necessary categories of traffic management devices.
- 2) Conducting traffic engineering research with emphasis on the application of domestic materials.
- 3) Providing district engineers with technical training by using recommendations.
- 4) Reorganization of concerned offices and divisions for achieving efficient traffic & road management.
- 5) Others

(9) Please, list the counterparts for the Study, and indicate the organizations they belong to.

- One senior engineer from Traffic Engineering Office
- Two junior engineer - ditto -
- Two statistician - ditto -
- One engineer from Location and Design Division
- One engineer from Maintenance Division
- One engineer from Planning Division

II. Data and Maps needed

(1) Road Network Maps covering all Thailand. (Big scale maps are necessary for high priority roads)

- One million scale of highway maps is attached herewith.

(2) Data on traffic volume and traffic congestion for each road.

- One traffic volume data is attached herewith.

(3) Standards, including the following.

(a) Existing installation standards for road facilities.

- Traffic sign manual (Thai version)
- General specification for street lighting (English version)
- General specification for traffic signals and flashing traffic signals
- Road markings manual (Thai version)
- Manual for control traffic in the construction areas (Thai version)

- Construction plan for steel beam guardrail
- (b) Design standards for road facilities.
 - Following AASHTO
 - (4) Organization chart of the DOH. For each section, please state duties of employees, and related organizations.
 - Refer to Appendix-2
 - (5) Statistics on population and income by district.
 - Refer to Appendix-3
 - (6) Statistical data on transportation since 1985.
 - Refer to Appendix-4

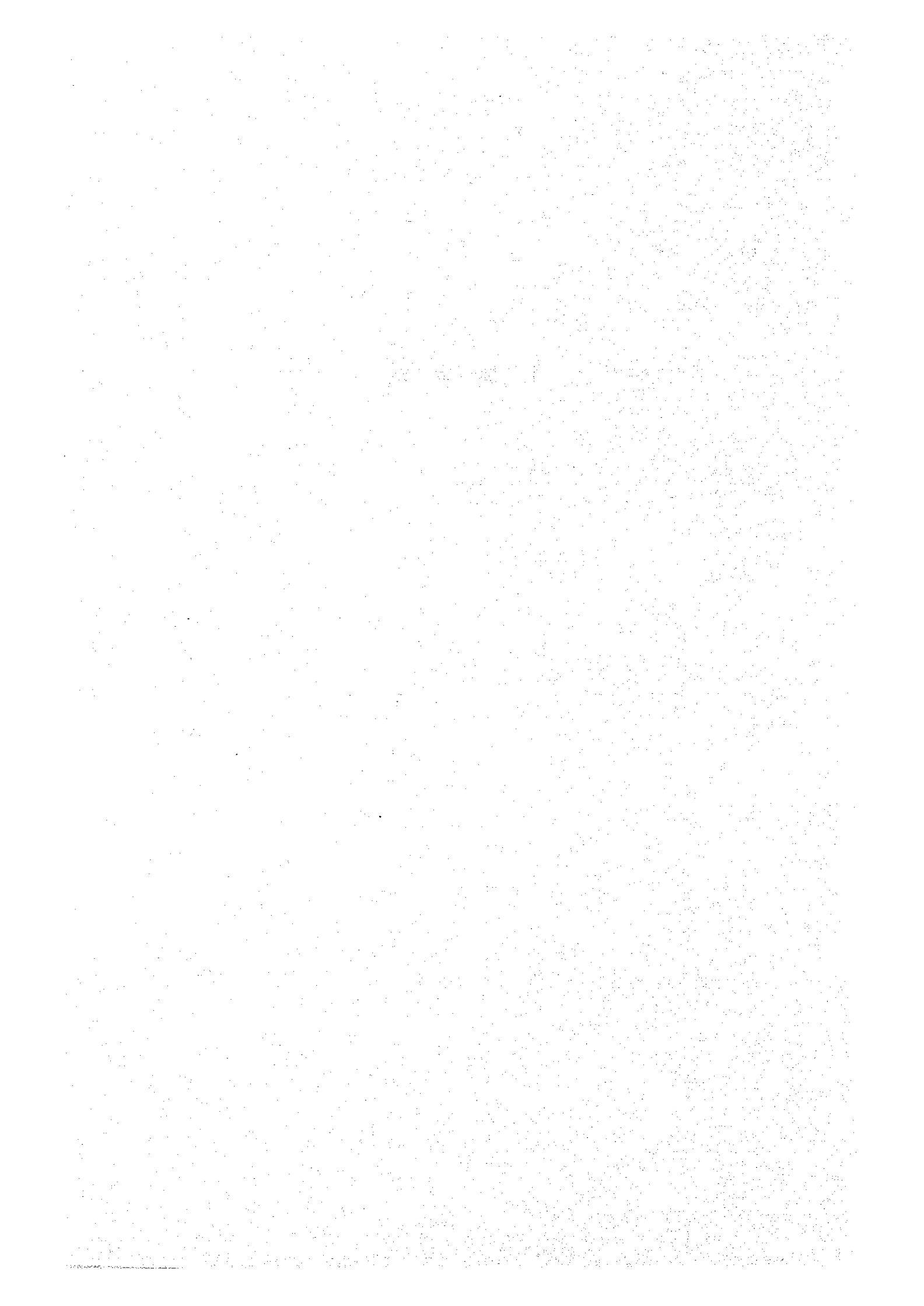
Topic	Existing situation and problem point	detailed content for the present study
<u>Traffic Control Devices</u>		
<u>Traffic Signals</u>	<p>Most of traffic signals are not so efficient because of the capacity of the controllers, their signal-head installation and maintenance.</p>	<ul style="list-style-type: none"> - Guide line in details how to select signal types. - Design specification for controller capacity and signal head installation - Manual for maintenance and updating the cycle time.
<u>Traffic Signs</u>	<p>There are a great many of traffic signs stolen. Now DCH has to use low cost traffic sign made of painted steel plate with glassbead.</p>	<ul style="list-style-type: none"> - Construction manual of glassbeed signs. - Standard of sign support and frame.
<u>Road Markings</u>	<p>The road markings on DCH highways are not so bright and clear. We found that our staffs do not know how to control the painting, and there is not any guide line for painting schedule.</p>	<ul style="list-style-type: none"> - Guide line for selection of painting material and scheduling. - Manual for construction of road markings and control technique.

Topic	Existing situation and problem point	detailed content for the present study
<p><u>Delineator and Road Studs</u></p>	<p>There are some locations have been installed road studs and chatterbar, the results of these installation are not clear.</p>	<p>- Guide line and specification for installation of delineator and road studs</p>
<p><u>Traffic Safety Devices.</u> <u>Pedestrian crossing Facilities</u></p>	<p>There is not clear criteria for choosing the best alternative of pedestrian crossing facilities, pedestrian bridge, traffic signals or markings. Traffic signal are preferable to the pedestrian but it is bother-some to drivers.</p>	<p>- Review the guide line in the Phase I study - Design specification for pedestrian traffic signal.</p>
<p><u>Street lighting</u></p>	<p>The present average illumination is still very high compared to the recommendation in the Phase I study, this reflect high cost. Lighting post hit by motor vehicles were also high records.</p>	<p>- Review the Phase I and provide additional details to be as the design and construction specification. - A computer program for lighting arrangement for uniform illumination is needed</p>

Topic	Existing situation and problem point	detailed content for the present study
<u>Guard Fence</u>	There are a great many of locations needed guard fence installations, amount and types of the facilities are our problems.	<ul style="list-style-type: none">- Review Phase I guide lines to cover the criteria for selection of the guard fence types.- Developing a technique for priority assessment
<u>Traffic Information System</u>	There is not any traffic information for guiding road user for the road and traffic conditions.	<ul style="list-style-type: none">- Recommendation for appropriate and efficient system.- Preparation a proposal for operation the system.
<u>Traffic Operation Organization</u>	The traffic operation organization includes the administration lines and organizational divisions and districts in DOI which are concerning with traffic regulatory measures, traffic control devices and traffic safety facilities.	<ul style="list-style-type: none">- Recommendation for responsibility of the concerned divisions.

Topic	Existing situation and problem point	detailed content for the present study
<u>Traffic Census System</u>	<p>Traffic data are the most important information for traffic planning.</p> <p>Traffic volume and accident data collection had been recommended to be improved in Phase I</p>	<ul style="list-style-type: none">- Establishment of traffic count; accident data collection, and other vehicular characteristics information system.- Computer programs are necessarily required.

3. 要 請 書



THE KINGDOM OF THAILAND
MINISTRY OF COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

TERMS OF REFERENCE
FOR
TRAFFIC OPERATION FOR ROAD
IN THE KINGDOM OF THAILAND

FEBRUARY 1987

I. INTRODUCTION

The road traffic accident rate in Thailand, is considerably high in comparison with industrialized countries. And accordance with growth of economic activities, traffic congestion and accidents are also increasing.

Awareness of serious socio-economic problems caused by road traffic accidents and congestions, the government of Thailand has given the highest priority to the solution and directed various efforts to be taken by concerned organizations.

The Department of Highways (hereinafter referred to as "DOH"), which is responsible for highways totaling 46,000 km in length and composing trunk highway network in Thailand, has also vital role in reducing traffic accidents and increasing traffic operation capability on its highways that account for thirty one percent of total accident number and eighty two percent of total casualties respectively in 1985.

Traffic Safety Plan for Roads in the Kingdom of Thailand has been carried out since May 1983 to January 1985 by the Japan International Cooperation Agency (hereinafter referred "JICA") and provided useful and important basic line for traffic safety improvement of the highways. The study aimed mainly at: (1) identification of hazardous road locations, (2) demonstration of safety planning, (3) provision of guidelines for various traffic safety devices, and (4) provision of information for Master Plan, and may be categorized as "Phase I study".

In consequence of technology transfer from the Phase I study, DOH has drafted "Traffic Safety Program Master Plan" in 1985. The Plan aims to proceed traffic safety projects for highly hazardous locations for five years plan.

However, administration of traffic safety is nothing but one of essential elements in road traffic operation system. Point improvement of a hazardous location may reduce hazard at the point. But, the effect will be limited to the point. DOH believes that traffic safety can be progressed by increasing traffic operational ability and efficiency through DOH's field-work forces over the country.

DOH is proud that it has constructed and maintained one of the best highway net-

works in ASEAN countries. But, DOH also admits that there are a great many to be improved in traffic operation.

Consequently, the proposed study, closely related with the Phase I study, is intended to proceed the basic line shown in the Phase I study to further comprehensive stage.

II. OBJECTIVES

The objectives of the Study are ;

1. To assist DOH to establish effective traffic operation system.
2. To perform technology transfer to Thai counterparts in the course of the implementation of the Study.

III. SCOPE OF WORK

1. To review guidelines and specifications on traffic control devices in DOH.
2. To review guidelines and specifications on traffic safety devices in DOH.
3. To conduct primary operational research on necessary devices.
4. To review DOH traffic data collecting and processing system.
5. To introduce effective traffic information system for DOH and information exchange system with other related organizations.
6. To review DOH traffic operation organization and system and relation among Planning, construction, Maintenance and Operation.
7. To conduct experimental work and evaluation of introduced methods.
8. To propose a road traffic census system and its management which should be implemented by DOH in future to obtain reliable road and traffic data as a basis for various highway plans.
9. To conduct a seminar on result of this Study.
10. To recommend on related matters which are deemed important for implementing and evaluating the proposal.

IV. STUDY SCHEDULE

The study shall be completed within sixteen (16) months after the commencement of the study. A tentative study schedule is attached hereto.

V. STAFFING

The study shall be undertaken by, but shall not necessarily be limited to, the team of experts covering the following fields ;

1. Project Management
2. Traffic Engineering
3. Highway Planning, Design and Construction
4. Highway maintenance and Operation
5. System Engineering
6. Economical Analyst
7. System Analyst

VI. REPORTS

The following reports on the Study in English will be prepared and submitted to the Government of the Kingdom of Thailand.

1. Inception Report

Inception Report (30 copies) will be submitted within two (2) months of the starting date which will include the study, and a record of works executed.

2. Progress Report

Progress Report (30 copies) will be submitted every fourth month, describing the work performed, the summary of any interim finding during the reporting period and the work scheduled for the next reporting period, etc..

3. Draft Final Report

Draft Final Report (30 copies) will be submitted within fourteen (14) months of starting date of the study.

4. Final Report

Final Report (60 copies) will be submitted within one (1) month after the receipt of the Thai Government's comments on Draft Final Report.

VII. SEMINAR

Seminar on the result of the Study will be organized at the time of Final report presentation. Summary of the seminar text is requested to be translated to Thai language too.

VIII. UNDERTAKING BY THE GOVERNMENT OF THE KINGDOM OF THAILAND

1. Taxes and Duties.

a) To accord the team members with the right of exemption from income taxes and charges of any kind normally imposed on or connected with the living expenses remitted from abroad.

b) To exempt the Study team from taxes and duties on the materials and equipments required for the study and personal effects brought into the Kingdom of Thailand. This is normally applied to the Colombo Plan Experts.

2. Cooperation of the Government Agencies

To provide liaison in connecting with work by the Study team which requires the cooperation of the government, local government and/or other public agencies, and will ensure that the Study Team has access to all information required for the completion of the Study.

3. Counterparts

To assign qualified counterparts (project coordinator / traffic engineer / Transport economist, etc.) and will also be responsible for the payment of their salary, per diem allowances, travel costs and any other similar related costs.

4. Data, Local services and Facilities

a) To make arrangements for the Study Team and provide available data, reports and information related to the Study and within its authority, allow the Team to take back to Japan for the finalization of the Study.

b) To provide within its authority complete access to the study area, and to guarantee to obtain and grant the study team the right of access property as may be required for proper operation in the field.

IX. UNDERTAKINGS BY THE GOVERNMENT OF JAPAN

1. To dispatch, at its own expenses, a Study Team consisting of the Japanese experts.

2. To organize the Japanese Steering Committee for the study.

3. To provide the members of the study Team with the remunerations, subsistence and other allowances as well as costs of their travel necessary for the Study.
4. To conduct on-the-job training and technology transfer to the Thai counterparts during their stay in Thailand.
5. To provide the counterparts with training in Japan with a view to improving their subsequent capability and also be responsible for the payment of their international and local travel costs, and per diem allowances in Japan.
6. To organize a seminar on the result of the Study and to provide necessary expense for the seminar, this includes rent of place and equipments, personal expenses of hired staffs for the seminar, printing cost of texts, and travel cost of Japanese participants. Travel and lodging cost for Thai participants is excluded.

Tentative Study Schedule

	Month																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Data Collection	█																
Analysis & Planning				█													
Experimental Work						█											
Evaluation											█						
Recommendation & Proposal											█						
Seminar															█		

Reporting Schedule

Inception Report																
Progress Report								No. 1		No. 2						
Draft Final Report																
Final Report																
Seminar																

Traffic Operation for Roads In the Kingdom of Thailand

1. Background information and justification for the project

The road traffic accident rate in Thailand, is considerably high in comparison with industrialized countries. And in accordance with growth of economic activities, traffic congestion and accidents are also increasing.

Awareness of serious socio-economic problems caused by road traffic accidents and congestions, the government of Thailand has given the highest priority to the solution and directed various efforts to be taken by concerned organizations.

The Department of Highways (hereinafter referred as "DOR"), which is responsible for highways totaling 46,000 km in length and composing trunk highway network in Thailand, has also vital role in reducing traffic accidents and increasing traffic operation capability on its highways that account for thirty one percent of total accident number and eighty two percent of total casualties respectively in 1985.

Traffic Safety Plan for Roads in the Kingdom of Thailand has been carried out since May 1983 to January 1985 by the Japan International Cooperation Agency (hereinafter referred as "JICA") and provided useful and important basic line for traffic safety improvement of the highways. The study aimed mainly at: (1) identification of hazardous road locations, (2) demonstration of safety planning, (3) provision of guidelines for various traffic safety devices, and (4) provision of information for Master Plan, and may be categorized as "Phase I study".

In consequence of technology transfer from the Phase I study, DOH has drafted "Traffic Safety Program Master Plan" in 1985. The Plan aims to proceed traffic safety projects for highly hazardous locations for The Sixth Five Year DOH Highway Plan. The Cabinet Resolution dated 9th April 1987 has approved DOH Plan, in which the target of highway safety program is to improve 440 hazardous locations.

However, administration of traffic safety is one of essential elements in road traffic operation system. Individual improvement of a hazardous location may reduce hazard at the point. But, the effect will be limited to the point. DOH believes that traffic safety can be progressed by increasing traffic operational ability and efficiency through DOH's field-work forces over the country.

DOH is proud that it has constructed and maintained one of the best highway networks in ASEAN countries. But, DOH also admits that there are a great many to be improved in traffic operation.

Consequently, the proposed study, closely related with the Phase I study, is intended to proceed the basic line shown in the Phase I study to further comprehensive stage.

2. Details of the project

2.1 Program goal

The program goal of this project is aimed at attaining maximum efficiency from existing highway networks and facilities, while minimize adverse impact of traffic. It has proposed to

decrease the usage of high cost imported engineering counter measures and promote the safety facilities which produced locally.

2.2 Objectives

The general objectives of the project are;

(1) To assist DOH to establish effective traffic operation system.

(2) To perform technology transfer to Thai counterparts in the course of training-on-job.

2.3 Condition Expected at Completion of Project

(1) Establishment of guidelines and specifications on traffic control devices in DOH.

(2) Establishment of guidelines and specifications on traffic safety devices in DOH.

(3) Set up an effective traffic information system for DOH and information exchange system with other related organizations.

(4) Recommendations for DOH traffic operation organization and system and relation among planning, construction, maintenance and operation.

(5) Implementation of experimental work and evaluation of introduced methods.

(6) Set up a road traffic census system and its management which should be implemented by DOH in future to obtain reliable road and traffic data as a basis for various highway plans.

(7) Equipments and tools necessary for traffic operation and managements transfered to DOH.

2.4 Recommended sources of information and data related, to the project, necessary for project verification.

(1) DOH's existing guidelines and specifications.

(2) DOH's organizational structure which related to traffic operation.

(3) The Police Department's accident statistical report.

(4) Other necessary data available at DOH.

2.5 Duration of the Project

The project is proposed to be commenced in April 1988 and completed in July 1989.

2.6 Project site

Traffic Engineering Office, Planning Division, Department of Highways, Ministry of Communication.

2.7 Project work plan

2.7.1 Detailed work plan or project activities and scope of work

(a) Data collection

Those data and information considered necessary for the study project will be collected, they are listing as follows:

(1) Traffic accident in the Kingdom.

(2) Traffic volume on the DOH highway.

(3) Existing guidelines and specifications for street lighting, traffic signal, guardrails, traffic sign, road marking, and etc.

(4) Traffic behavior at hazardous locations or accident experience locations.

(5) DOH road design policies.

(6) Traffic survey at sampling locations.

(b) Analysis and Planning

The existing traffic data and information are analysed in order to find out the deficiency of existing guidelines and

specifications, the study includes reviewing the administration organization for traffic operation on the DOH highway system.

(c) Experimental Work

The study project will conduct experimental works in order to assure the recommendations for guidelines and specifications of traffic safety devices, i.e. experimentation of traffic signals. In the phase of traffic planning will conduct a sample of traffic census and survey and complete it with traffic assignments.

(d) Evaluation

The results of evaluation will be in financial and economic terms, or other logistic nonmonetary term.

(e) Recommendation and proposal

The recommendation and proposals will be submitted to DOH shall be in English.

(f) Seminar

The study shall include conducting a seminar concerned the recommendations and proposals in order to better the final results and clarifying the arising queries.

2.7.2 Time schedule of project activities

See Annex A.

3. Details of the implementing/operating agency

The Traffic Engineering Office, Department of Highways is the implementing agency of this project.

3.1 Institutional frame work

The Traffic Engineering Office is responsible for traffic

engineering planning, on DOH highways as follows.

- (1) Traffic engineering survey and analysis.
- (2) Traffic safety planning and programming.
- (3) Standardization of traffic control devices.
- (4) Establishment of guideline and specification for implementation of traffic safety facilities.
- (5) Standardization and consideration for permission of access road connecting to DOH highways as well as buildings of public utilities in the highways' right of ways.

3.2 Staff personnel participating in project implementation

	<u>Personnel</u>	<u>Qualification</u>	<u>No.</u>	<u>Operation</u>
(1)	Senior Engineer	Master Degree	1	Co.Project
(2)	Highway Engineer	Bachelor Degree	4	Highway
(3)	Traffic Engineer	Bachelor Degree	4	Traffic
(4)	Statistician/ System Analyst	Bachelor Degree	3	Computer system
(5)	Technician	Technical School	8	Data collection

4. Assistance Requested

4.1 Expert

Field of Operation/activity	Total		1988		1989	
	No.	m/m	No.	m/m	No.	m/m
(1) Project Manager	1	16	(1)	9	(1)	7
(2) Highway Engineer	2	25	(2)	18	(1)	7
(3) Traffic Engineer	2	32	(2)	18	(2)	14
(4) Transport Planner	1	12	(1)	5	(1)	7
(5) Economist	1	7	(1)	3	(1)	4
(6) System Analyst	2	23	(2)	18	(1)	5
Total	9	115	9	71	7	44

4.1.1 Justification for Requesting Experts

Project manager:

The project manager administers the whole study project.

Highway engineer:

Highway engineers inspect practices of installation and operation of traffic control and safety devices in DOH. They are further requested to review related DOH guidelines and specifications. Their duties are to make recommendations for

improving and updating those guidelines and specifications and prepare necessary materials for DOH staff training.

It is difficult that one highway engineer covers whole subjects. Therefore, experts for each specific area are requested.

Highway engineers are also requested to plan, conduct, and evaluate experimental works and to train DOH staff through the procedure. The result and findings of the experimental work are expected to be reflected in final report.

Traffic engineer:

Traffic engineers are requested to review traffic study and analysis system in DOH and to make recommendations for improving and updating them.

Traffic engineers are requested to introduce road traffic census system suitable to DOH and to plan, conduct, and evaluate an experimental study.

Furthermore, they are expected to propose an outline of traffic information systems suitable for urban area and rural area in Thailand. At present it is very difficult to get traffic information around large city, especially in Bangkok. Because, many implementation agencies are equally responsible under each jurisdiction. Effective methods to exchange informations among them are requested to be introduced. On this subject, an conceptual proposal is requested for future technical assistance.

Traffic engineers together with highway engineers are expected to review DOH's documents and activities on traffic control and safety devices and to conduct experimental works.

They are also expected to prepare materials for DOH staff training.

System engineers who are familiar with hardware of equipments are thought to be included in this category.

Transport planner:

Transport planner together with traffic engineers is requested to plan, conduct, and evaluate an experimental study of road traffic census. It is expected to introduce traffic assignment method suitable to DOH for forecasting future traffic demand.

Economist:

Economist is requested to make economic evaluation on improving the available DOH traffic operation system according to the proposal by the study team.

System analyst:

System analyst is requested to review DOH traffic operation organization, system, and relation among planning, construction, maintenance, and operation. It is expected to make a proposal on reorganization of DOH for effective traffic operation and management.

System analyst together with traffic engineers is also requested to make study to set up suitable traffic information system for DOH and to introduce data processing system for road traffic census and other traffic surveys.

4.1.2 Job descriptions

Job descriptions have written in form JD., see Annex B through G.

4.2 Fellowship

Field of study/training	Total		1988		1989	
	No.	m/m	No.	m/m	No.	m/m
(1) Traffic signal planning (training)	2	6	2	6		
(2) Traffic Information system (study/training)	1	6			1	6
(3) Application of traffic (study/training)	1	6			1	6

4.2.1 Justification for requesting fellowship

(1) Traffic signal planning:

Installation of traffic signals on DOH highways is one of the main countermeasures for traffic safety in 6th plan. However, number of experienced officials is very limited in DOH and training engineers for effective implementation of traffic signal is urgent. Also, available specification for traffic signal has to be updated. Therefore, it is very effective that DOH engineers get training on advanced traffic signal control system in Japan.

(2) Traffic information system:

Request for effective traffic information to public is increasing in Thailand, especially at congested highways.

However, there is not enough experience in Thailand. To study and get training of Japanese experience in this field will be very beneficial for DOH.

(3) Application of traffic control/safety devices:

It is necessary for DOH official to learn real practice of application of traffic control/safety devices. Quality control and suitable execution of traffic safety project are requested for DOH. To study and get training in Japan is requested for bringing more effective traffic safety application to DOH. Training of both software and hardware is requested.

4.3 Equipment

As experts consider necessary for the study.

5. Thai Government Counterpart Contributions to The Project

DOH agrees that annual highway safety budget shall be contributed for experimental works where the improvement of the highway locations are in the high priority ranks.

6. Related Project/Activities

An Japanese expert in Traffic Engineering is assigned to Traffic Engineering Office, DOH. The expert's activity is promoting traffic engineering and traffic safety projects in DOH. The expert's term will expire March 9th, 1988. However, DOH needs further continuous technical assistance by an expert in this field. Therefore, DOH requests assignment of another expert in traffic engineering and traffic safety in order to implement safety projects in the 6th plan. The expert works as one of the

coordinators from DOH side for this project.

7. Future Work Plan

After the completion of this study project DOH shall proceed the traffic operation activities following the recommendations through these following steps.

- (1) Training field districts staffs.
- (2) Reorganization of concerned offices and divisions in order to set up the most efficient system of traffic management for DOH highways and relevant networks.
- (3) Establishment of DOH guidelines and specifications for all necessary categories of traffic safety facility and control devices.
- (4) Administration the traffic aids and road safety programmes.
- (5) Conducting traffic engineering research, emphasis on the application of domestic materials.

	Month															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Data Collection	██████████															
Analysis & Planning				██████████												
Experimental Work						██████████										
Evaluation											██████████					
Recommendation & Proposal											██████████					
Seminar														██████████		

Reporting Schedule

Inception Report																
Progress Report						No. 1			No. 2							
Draft Final Report																
Final Report																
Seminar																

4. 对処方針

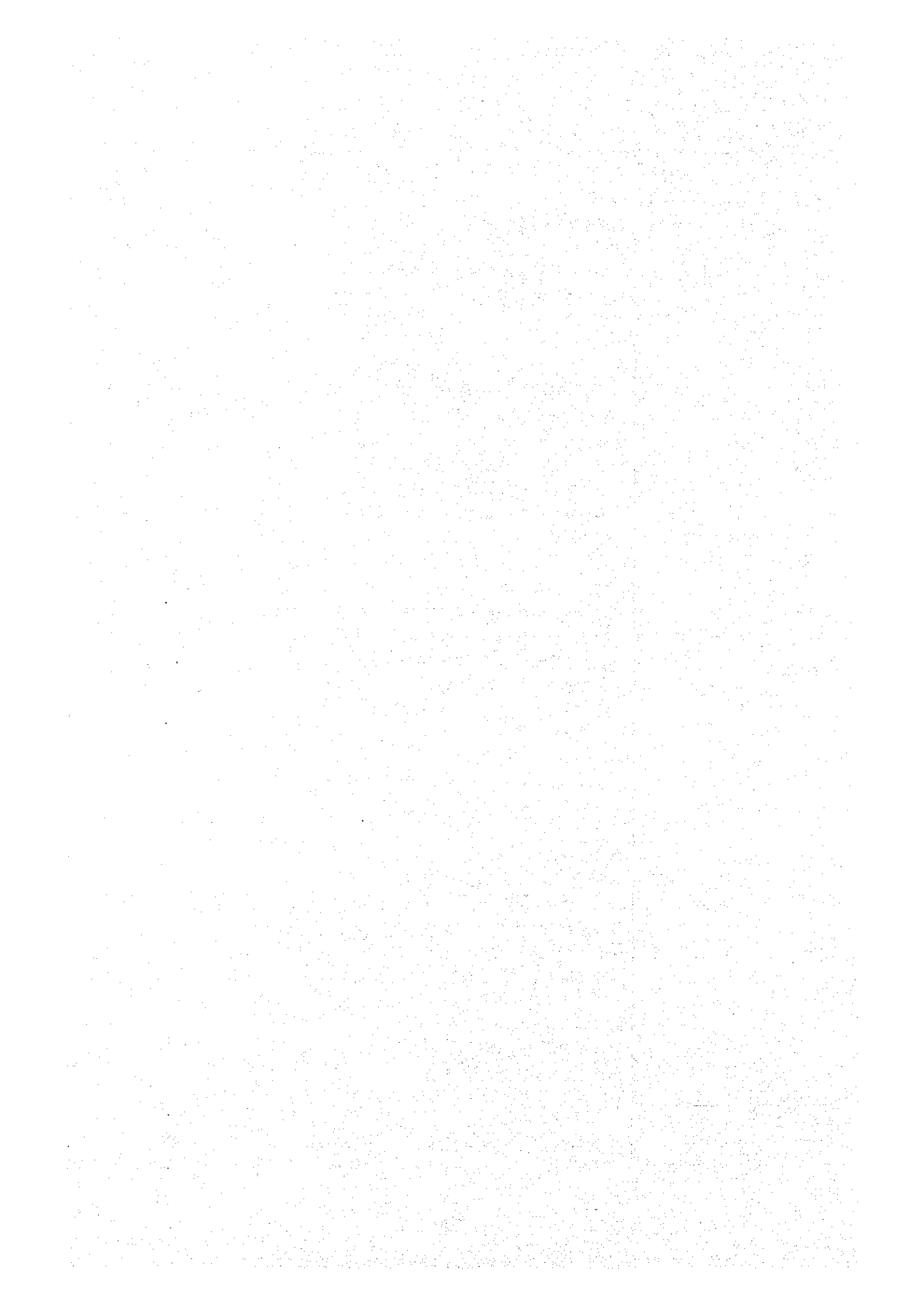
タイ国道路交通運用計画調査（事前調査）
対処方針

項 目	対 処 方 針	備 考
<p>1. 事前調査の目的及び今後の予定</p> <p>(1) 目的</p> <p>(2) 今後の予定</p>	<p>次のとおり整理し、説明する。</p> <p>①先方政府の要請背景・内容及び意向の確認</p> <p>②本格調査の実施方針及びS/Wの協議</p> <p>③先方受入れ体制の確認</p> <ul style="list-style-type: none"> ・先方政府の実施すべき事項 ・先方カウンターパート機関 ・調整等を目的とする委員会（Steering Committee）の必要性の有無 ・その他 <p>概略の予定について確認する。</p> <ul style="list-style-type: none"> ・64年1月 本格調査開始 	
<p>2. 要請内容及び意向の確認</p> <p>(1) 全般</p> <p>(2) 協力範囲</p>	<p>①1985年のJICA調査（道路交通安全計画調査）の実施状況、評価を踏まえ、要請背景・内容を確認する。</p> <p>②当方の本件調査協力に関する考え方を説明する。合意事項については、先方と事前調査団とがS/W、ミニッツに署名し、確認する。</p> <p>DOH所轄の道路を対象に、交通管理、交通安全、交通情報システム等の効率的運用のための指針作成</p> <ol style="list-style-type: none"> ①関連データの収集、分析 ②道路交通運用システムの現況評価 ③効率的道路交通運用計画確立のための指針作成 ④ケーススタディの実施、評価 ⑤総合評価 <p>※指針はDOH道路全体への適用について十</p>	

項 目	対 処 方 針	備 考
<p>4. 先方受入れ体制の確認</p> <p>(1) 先方の実施すべき事項</p> <p>(2) 先方カウンターパート機関</p> <p>5. 事前調査団の各メンバーの担当事項</p> <p>(1) 総括</p> <p>(2) 交通管理計画</p>	<p>② インテリムレポートⅠ (IT/RⅠ)</p> <ul style="list-style-type: none"> ・ 本格調査開始後6ヶ月 ・ 現地調査の結果(データ分析及び現況評価) ・ 指針素案 <p>③ インテリムレポートⅡ (IT/RⅡ)</p> <ul style="list-style-type: none"> ・ 本格調査開始後10ヶ月 ・ (ケーススタディの結果) ・ 指針素案修正方針 <p>④ ドラフトファイナルレポート (DF/R)</p> <ul style="list-style-type: none"> ・ 本格調査開始後12ヶ月 ・ 指針最終案 ・ 総合評価、勧告 <p>⑤ ファイナルレポート (F/R)</p> <ul style="list-style-type: none"> ・ ④に対するコメント受領後2ヶ月 <p>タイ国の既存のS/Wにもとづいて作成した本件S/W案をもとに協議する。</p> <p>① 道路行政機構の中でのカウンターパート機関の確認</p> <p>② 関連機関の協力体制の確認</p> <p>③ 調整等を目的とする委員会の設置の必要性の有無とその役割の確認</p> <ul style="list-style-type: none"> ・ 調査団の業務全般の統括 ・ 本格調査実施における調査内容、調査実施体制、調査スケジュール等の基本方針のとりまとめ ・ 調査団を代表して相手国関係機関代表者との間でS/W、ミニッツ等確認文書への署名 ・ 交通管理施設、交通管理行政、交通情報システム等の現況及び問題点の把握 	

項 目	対 処 方 針	備 考
(3) 交通安全計画	<ul style="list-style-type: none"> ・ 交通管理面から見た効果的交差運用計画確立の方向付け ・ ケーススタディの規模、概略内容の検討 ・ 交通安全施設、交通安全行政等の現況及び問題点の把握 	
(4) 道路施設整備	<ul style="list-style-type: none"> ・ 交通管理面から見た効果的交差運用計画確立の方向付け ・ ケーススタディの規模、概略内容の検討 ・ 道路構造、施設の設計上の問題点の把握 ・ 効果的交差運用計画確立のための道路構造、施設改善の可能性の検討 	
(5) 調査企画	<ul style="list-style-type: none"> ・ 関連資料、情報の収集、整理、分析 ・ 調査実施にあたっての全体計画の作成及びその統合的な調整 	
6. 議事録等	<ul style="list-style-type: none"> ① あらかじめ作成したS/W案をもとに説明、協議し、合意の後、双方の代表者が署名する ② S/W及び調査の実施に関する協議内容を議事録としてとりまとめ、双方の代表者が署名、確認する。 	
7. その他	<ul style="list-style-type: none"> ① " guidelines and specification " の具体的なイメージ、前回調査との関連及び先方の要請内容等を明確にしたうえで、S/W案3. 2の表現を検討する。 ② " experimental work " については、協議を通じて前回調査との違いを明らかにする。その結果、必要性が認められたならば、その内容、期間、規模及び費用負担区分等についてM/Mに記録する。ただし、その場合、資機材、施工費負担はタイ側とすることとし、その旨M/Mに記録する。 ③ " experimental work " の検証、評価に要する期間が長期となることが予想される場合は、これをフォローアップ調査で対応することも考えておく。 	
7. 報告書	目次案に従って、各担当者により作成する。	

5. S/W (案)



SCOPE OF WORK
FOR
THE STUDY
ON
TRAFFIC OPERATION PLAN FOR ROADS
IN
THE KINGDOM OF THAILAND

AGREED UPON BETWEEN
MINISTRY OF COMMUNICATIONS
DEPARTMENT OF HIGHWAYS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

BANGKOK, SEPTEMBER th, 1988

Mr.
Director General
Department of Highways
Ministry of Communication

Mr.
Leader of the Japanese
Preliminary Study Team,
Japan International
Cooperation Agency

I. INTRODUCTION

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan has decided to conduct the study on Traffic Operation Plan for Roads (hereinafter referred to as "the Study"), within the general framework of technical cooperation between Japan and the Kingdom of Thailand, which is set forth in the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand, signed on November 5, 1981.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will carry out the Study, in accordance with the relevant laws and regulations in force in Japan and in close cooperation with the authorities concerned of Thailand.

Department of Highways (hereinafter referred to as "DOH") shall act as counterpart agency to the Japanese Study Team and also as a coordinating body in relation with other relevant organizations for the smooth implementation of the Study.

The present document sets forth the Scope of Works for the Study.

II. OBJECTIVE OF THE STUDY

The objectives of the Study are:

- (1) to establish guidelines and specifications for effective traffic operation system.
- (2) to perform technology transfer to Thai counterpart personnel in the course of the study.

III. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Study shall cover the following items:

3.1 Review and Field Survey

- (1) collection of available data and information relevant to the Study.
- (2) study on existing road and traffic condition.
- (3) review of DOH traffic operation system including traffic control, traffic safety, traffic information and traffic operation organization.

3.2 Establishment of Guidelines and Specifications

- (1) establishment of guidelines and specifications on traffic control devices in DOH.
- (2) establishment of guidelines and specifications on traffic safety devices in DOH.
- (3) setting up an effective traffic information system for DOH and information exchange system with other related organization.
- (4) setting up a road traffic census system and its management which should be implemented by DOH in future to obtain reliable road and traffic data as a basis for various highway plans.
- (5) recommendation for DOH traffic operation organization and system and relation among planning, construction, maintenance and operation.

3.3 Execution of Experimental Work

- (1) planning for experimental work.
- (2) implementation of experimental work.
- (3) evaluation of introduced methods.

IV. STUDY SCHEDULE

The Study will be conducted in accordance with the attached tentative schedule.

V. REPORTS

JICA shall prepare the following reports in English and submit them to the Kingdom of Thailand.

5.1 Inception Report (30 copies)

Inception Report will be submitted within 1 month after the beginning of the study.

5.2 Interim Report I (30 copies)

Interim Report I will be submitted within 6 months after the beginning of the study.

5.3 Interim Report II (30 copies)

Interim Report II will be submitted within 10 months after the beginning of the study.

5.4 Draft Final Report (30 copies)

Draft Final Report will be submitted within 12 months after the beginning of the study.

DOH shall provide JICA with its comments within 1 month after the submission of Draft Final Report.

5.5 Final Report (50 copies)

Final Report will be submitted within 1 months after receipt of the comments on Draft Final Report.

VI. UNDERTAKINGS OF THE GOVERNMENT OF KINGDOM OF THAILAND

6.1 In accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand dated November 5, 1981, the Government of the Kingdom of Thailand shall accord benefits to the Japanese Study Team as follows:

- (1) To permit the members of the Japanese Study Team to enter, leave and sojourn in Thailand for the duration of their assignment therein and exempt them from alien registration requirements and consular fees;
- (2) To exempt the members of the Japanese Study Team from taxes, duties and other charges on equipment, machinery and other materials brought into Thailand for the conduct of the Study;
- (3) To exempt the members of the Japanese Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese Study Team for their services in connection with conducting of the Study;
- (4) To bear claims, if any arises against the members of the Japanese Study Team resulting from, occurring in the course of,

or otherwise connected with the discharge of their duties in the conducting of the Study, except when such claims arise from gross negligence or wilful misconduct on the part of the members of the Japanese Study Team.

6.2 To facilitate smooth conduct of the Study, DOH shall take necessary measures in cooperation with other relevant organizations:

- (1) to secure permission for entry into private properties or restricted areas for the conduct of the Study;
- (2) to secure permission for the Study Team to take all necessary data and documents related to the Study out of Thailand to Japan;
- (3) to provide the medical services as needed (Its expenses will be chargeable on members of the Japanese Study Team);
- (4) to ensure the safety of the members of the Japanese Study Team when and as it is required in the courses of the Study.

6.3 DOH shall, at its own expense, provide the Japanese Study Team with the followings:

- (1) available data and information related to the Study;
- (2) counterpart personnel;
- (3) suitable office space with office equipment in Bangkok (and the area, if necessary);
- (4) credentials or identification cards.

VII. UNDERTAKINGS OF JICA

For the Implementation of the Study, JICA shall take the following measures:

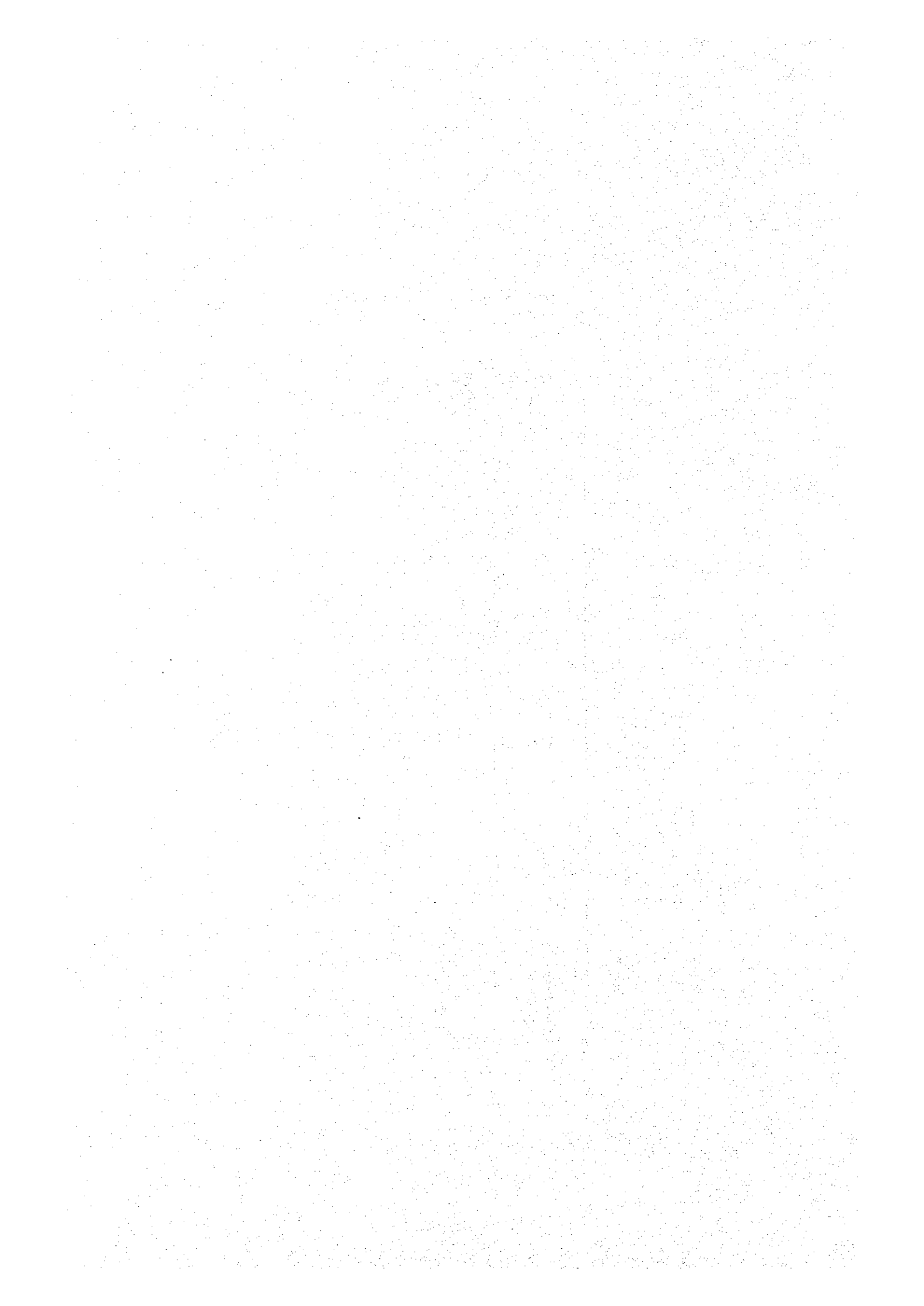
7.1 to dispatch, at its own expense, the Study Team to the Kingdom of Thailand;

7.2 to pursue technology transfer to the Thai counterpart personnel in the course of the Study.

VIII. MUTUAL CONSULTATION

JICA and DOH shall consult with each other in respect of any matter that may arise from or in connection with the Study.

6. 質問事項



The Study on Traffic Operation Plan for Roads(the Study)

Questionnaire

I General

- (1)The following is a statement in the T/R : "the proposed study is intended to proceed the basic line shown in the Phase I study to further comprehensive stage".
- (a) what is the precise meaning of "comprehensive stage"?
- (b) what topics do you think are needed to complement the Phase I Study?
- (2)What is the content of "guideline and specification". in addition to those provided in the Phase I Study?
- (3)In reference to (2),please state which should be emphasized as the purpose of the Study.
- (a) to review the Phase I Study and to provide recommendations to overcome problems with view to its implementaition.
- (b) to formulate new "guideline and specification".
- (4)The topics for the Study are as follows.
- 1.traffic control devices.
 - 2.traffic safety devices.
 - 3.traffic information system.
 - 4.traffic operation organization.
 - 5.traffic census system.
- (a) For each topic,please state existing situation,problems,and detailed content for the Study.
- (b) what is the priority order of the topics?
- (c) what is the difference between "traffic safety devices "mentioned in 2.above and those dealt with in the Phase I Study.
- (5)The study area is the whole kingdom of Thailand.Are there specific areas with higher priority for the Study than others?
- (6)In reference to "experimental work",please state your thoughts concerning the following items.

1. Purpose (for example, reduction of traffic accidents, reduction of travel time)
 2. Term of the experimental work (from planning to evaluation)
 3. Content
 4. Scale
 5. Budget and source of funds
- (7) Please, detail the progress you have made with regards to traffic safety devices and traffic control devices since the 1985 JICA study. Please, include the budget and actual expenses.
- (8) What are your future plans, if any, on traffic safety devices and traffic control devices?
- (9) Please, list the counterparts for the Study, and indicate the organizations they belong to.

II Data and Maps needed.

- (1) Road Network Maps covering all Thailand. (Big scale maps are necessary for high priority roads)
- (2) Data on traffic volume and traffic congestion for each road.
- (3) Standards, including the following.
 - (a) Existing installation standards for road facilities.
 - (b) Design standards for road facilities.
- (4) Organization chart of the DOH. for each section, please state duties, number of employees, and related organizations.
- (5) Statistics on population and income by district.
- (6) Statistical data on transportation since 1985.

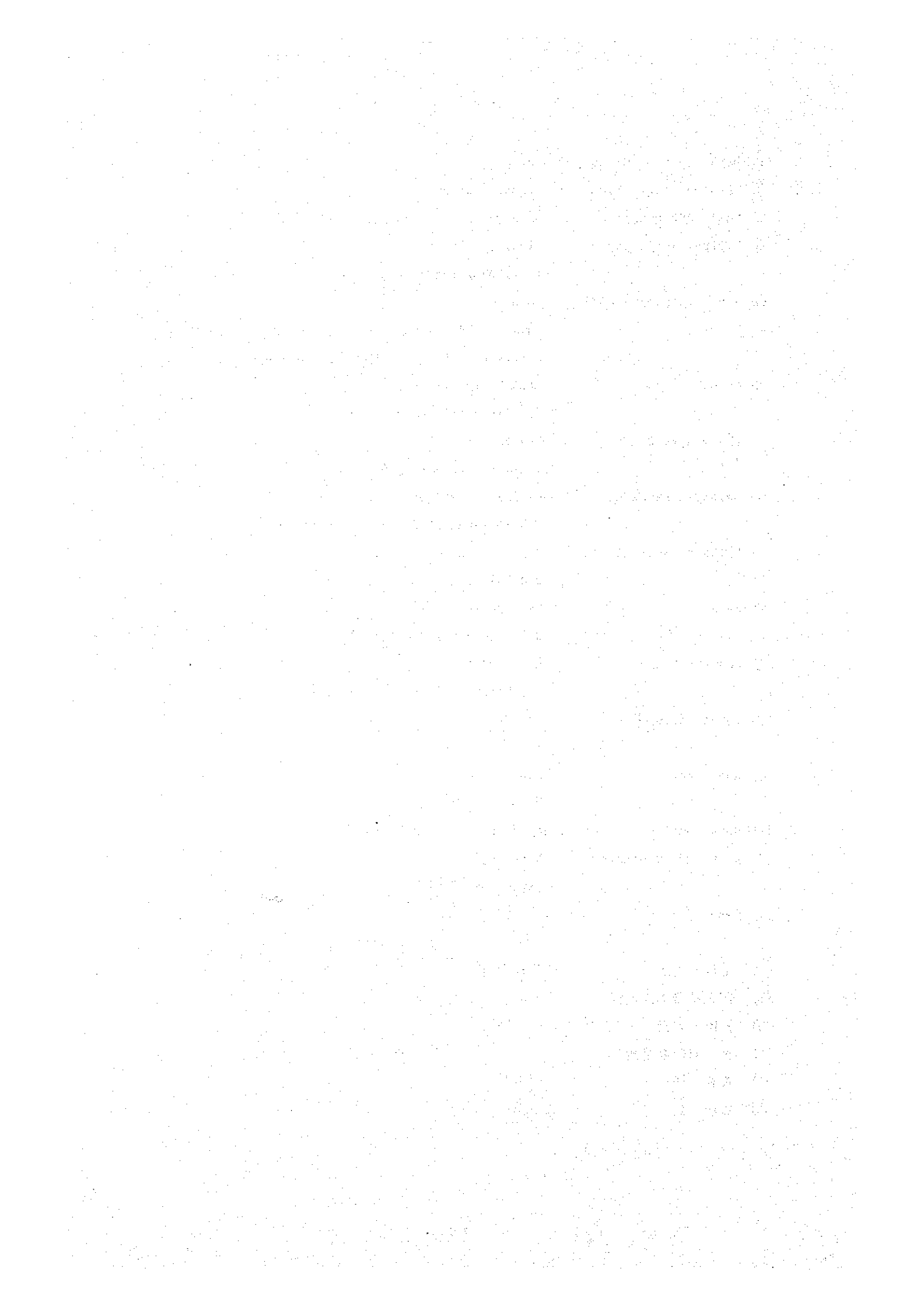
7. 面会者リスト

(1) Department of Highways (DOH)

- ① Sathien Vongvichien Director General
- ② Sukree Dheerakool Deputy Director General for Engineering
- ③ Kitipol Asaparporn Director.
Traffic Engineering Office
- ④ Jinda Mongkolsawasdi Chief.
Traffic Survey and Analysis Section, and Traffic
Safety Planning Section, Thaffic Engineering Office
- ⑤ Prany Staff (statistics).
Traffic Engineering Office
- ⑥ Chatmongkorn Staff.
Traffic Engineering Office.
- ⑦ Chinchai Mahasaen Division Engineer.
DOH Phitsanulok Division Office
- ⑧ Vicharn Danvivathama Deputy Division Engineer.
DOH Phitsanulok Division Office
- ⑨ Samar Deputy Director,
DOH Chiang Mai Division Office
- ⑩ Lon Par Son Engineer.
DOH Chiang Mai District Office
- ⑪ Tsunee Kato Expert.
Traffic Engineering
- ⑫ Naoki Sato Expert.
Highway Planning

(2) Department of Technical and Economic Cooperation (DTEC)

- ① Krisda Piawongsant Director.
Japan sub. Division
- ② Gesha Chaechai Staff.
Japan sub. Division
- ③ 上月 秀高 派遣専門家
- (3) 在タイ日本大使館
- ① 松田 秀夫 一等書記官
- (4) タイJICA事務所
- ① 齊藤 勉 所長
- ② 吉田 丘 所員



8. 収集資料リスト

JICA