

— 参 考 资 料 —



## 7. 参 考 資 料

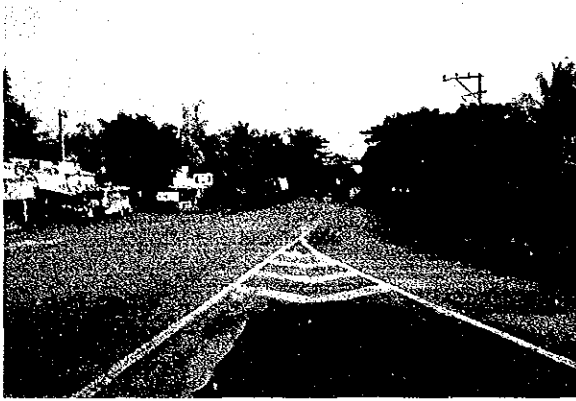
### 7-1 入手資料一覽表 (道路計画関係)

1. 1986 MPWH Infrastructure Program
2. 地形図 (1/5万, 1/25万, 1/100万), 地質図
3. Journal of Philippine Statistics
4. General Specification for Roads and Bridges
5. I.B.R.D. assisted Pavement and AXle Load Study Final Report Vol.1~Vol.3



7-2 写真集

①



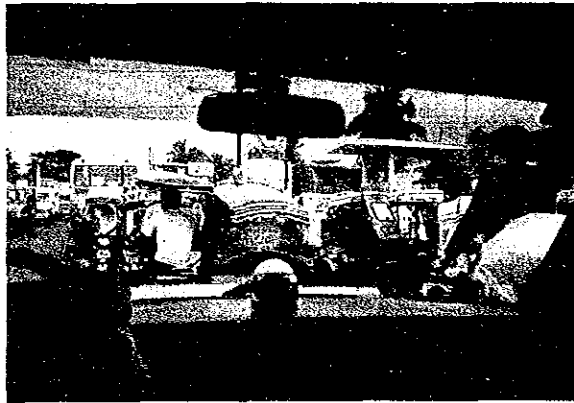
Sta. Rita ~ Aritao の調査始点より北を見る

②



Plaridel 市内の交差点

③



Plaridel 市内の交通渋滞

④



Plaridel 市内

⑤



Baliuag 付近の水田地帯を走る道路（路肩は砂利路肩）

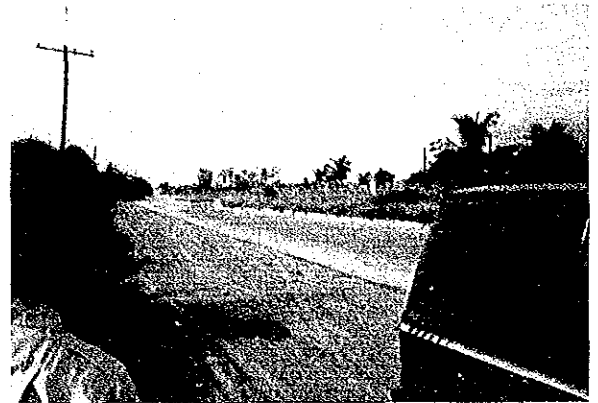


⑥



Baliuag 付近の舗装の状況 (⑤と  
同じ箇所)

⑦



Baliuag のバイパス終点部 (交差を分散して処  
理する方式の交差点)

⑧



San Ildefonso の町

⑨



San Ildefonso の町の中 (ジブニーの群れ)

⑩

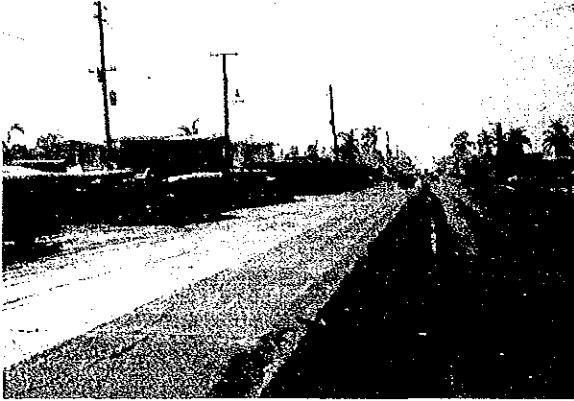


San Miguel のバイパス (車道の上でもみの乾燥  
を行っている)



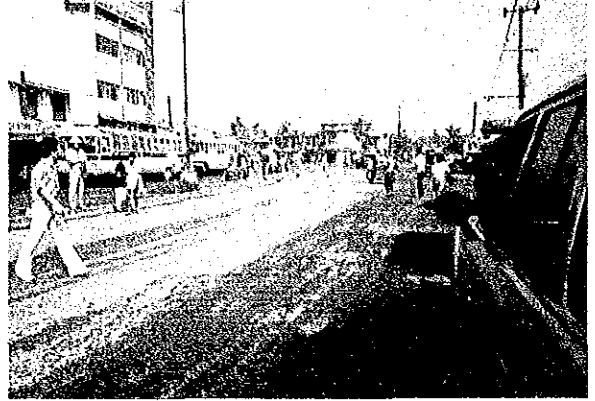


⑪



Gapan の町の南部（マニラ方向の車線の舗装の破壊が著しい。また中央分離帯が設置されている。）

⑫



Gapan の町の中心

⑬



Sta. Rosa の町の南方向

⑭



Sta. Rosa の町の中

⑮



Cabanatuan 市内（市内の街路）



16



Cabanatuan 市内（市内の市場）

17



Cabanatuan の本線（南向）

18



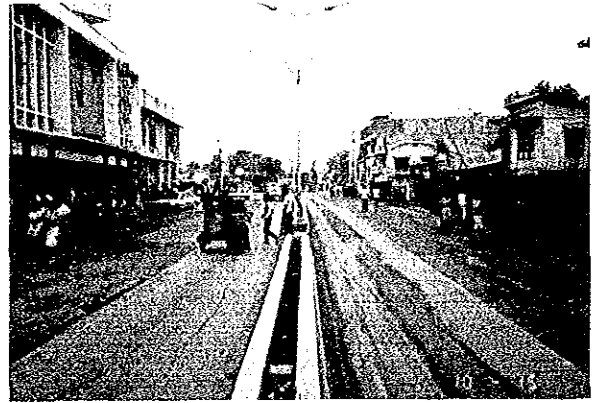
Cabanatuan の本線（北向）

19



Talavera の町並

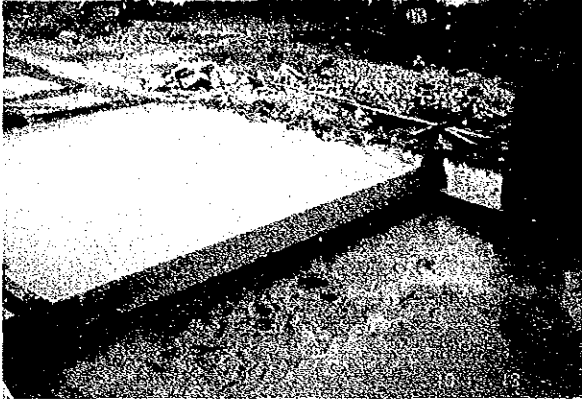
20



San Jose 市内（中央分離帯のため通過車両の追い越しに影響がでている）

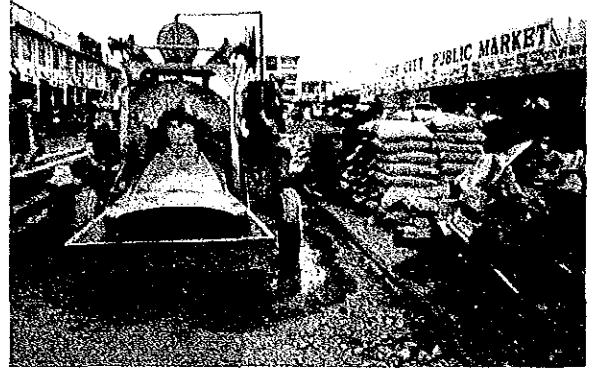


⑳



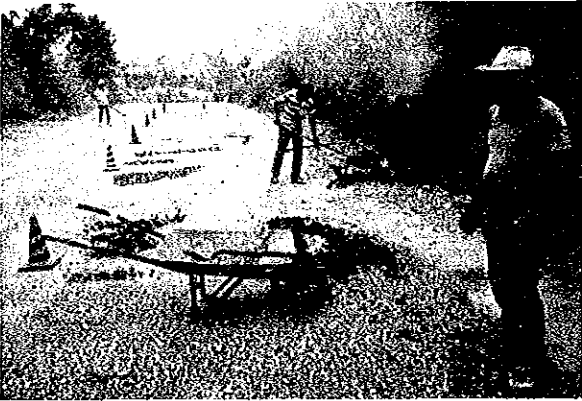
San Jose 市内の本道路の舗装打換工事現場

㉑



San Jose 市内の木道路の舗装打換工事現場（手前の升で計量している）

㉒



San Jose 市の北の郊外の舗装のパッチング工事現場（ポットホールに砂利や砂を詰め加熱アスファルトを浸透させる方式）

㉓



San Jose 市側より Baleté 峠方向を見る

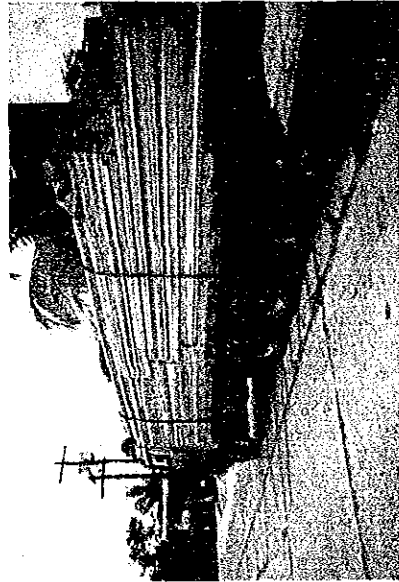


25



Belete 峠の全景（左がAritao 側、右がSan Jose 市側）

26



大型トラックの過積載の様子

27

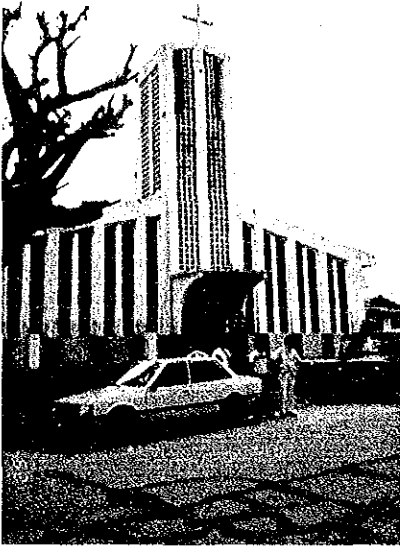


Sta. Fe の町並



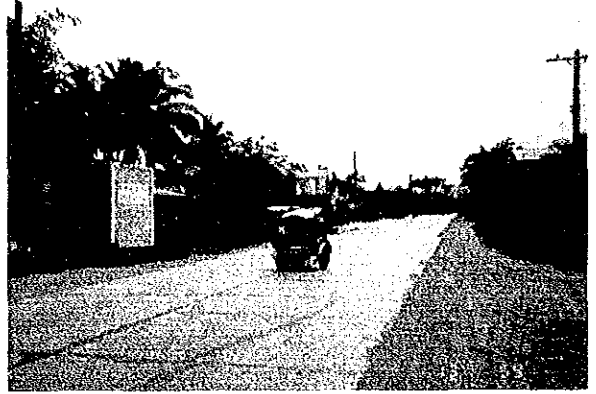


28



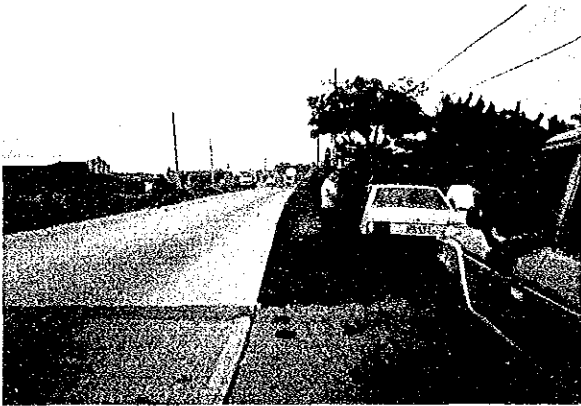
Aritao の町の教会

29



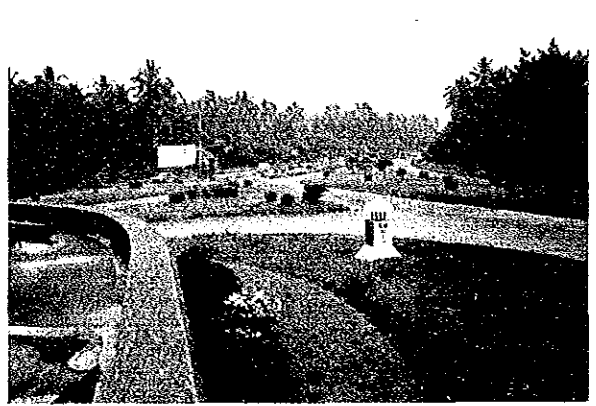
Aritao の町の北のはずれ ( Sta. Rita ~ Aritao 区間の調査の終点 )

30



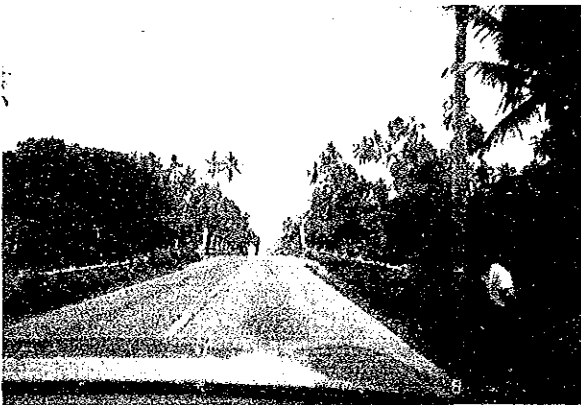
Calamba ~ Calanag 区間の調査区間の起点 ( 起点から終点方向をみる )

31



Batangas 方向への分岐交差点 ( 各交差を分散して処理する方式の交差点 )

32



Alaminous 付近の橋梁

33



San Pablo 市のバイパスの分岐点 ( 左が市内, 右がバイパス方向 )



34



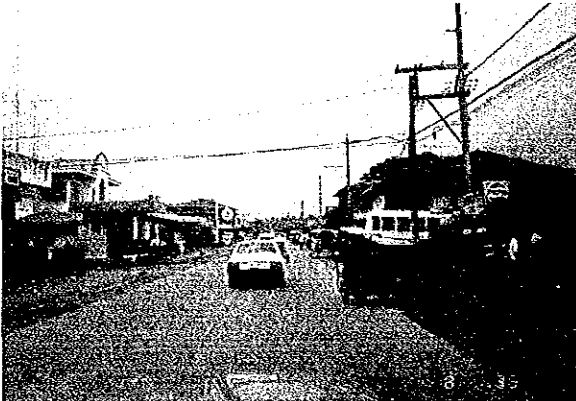
San Pablo 市内

35



Tiangong の町並

36



Candalaria の町並

37



Sariaya の町並

38



Lucena 市のバイパスの分岐点（左がバイパス、  
右が市内方向）

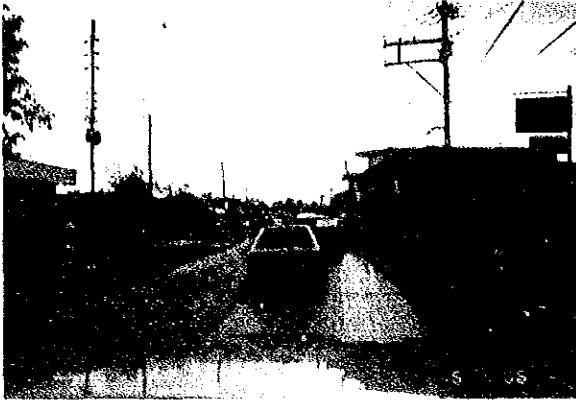
39



Lucena 市のバイパスの中央付近の市内方向への  
取付道路（舗装工事中）



⑩



Lucena 市内の町並

⑪



Pagbilao の町の入口 (この先が一方通向となっている。)

⑫



Pagbilao の町の終点側 (舗装の破損が著しい)

⑬



Malicboy 付近の峠の区間の舗装の破壊状況

⑭



Malicboy 付近の峠の区間の舗装の打換工事現場  
(降雨のため路床(?)がぬかるんで交通不能となっている。)

⑮



Atimonan 付近



46



Plaridel の町並

47



Gumaca の町並

48



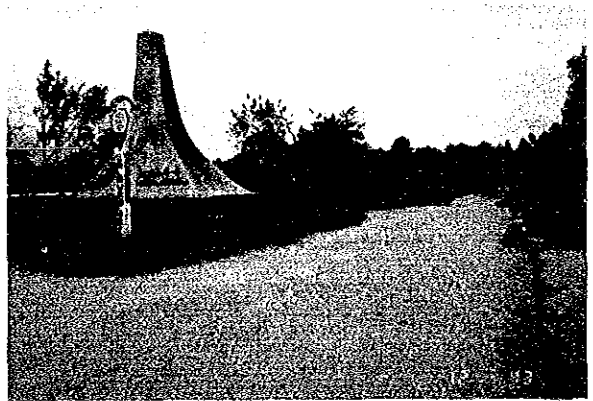
Lopez の町並

49



Calauag の町の中 (町なかの街路)

50



Calauag (調査区間の終点)





DAANG MAHARLIKA (PHILIPPINE-JAPAN FRIENDSHIP HIGHWAY)  
INTEGRATED IMPROVEMENT PROJECT-PHASED 1

THE DAANG MAHARLIKA WHICH ALSO KNOWN AS THE PHILIPPINE-JAPAN FRIENDSHIP HIGHWAY STRETCHES THE WHOLE LENGTH OF THE ARCHIPELAGO FROM AS FAR NORTH IN APARRI, CAGAYAN (LUZON) TO DOWN SOUTH IN DAVAO CITY IN MINDANAO. CONSTRUCTED MAINLY WITH FINANCIAL ASSISTANCE FROM THE JAPANESE GOVERNMENT, THE MORE 2000 KILOMETERS OF THE NATIONAL ROAD SYSTEM WAS INITIATED IN 1969 AND COMPLETED IN 1979.

FROM THE TIME THE INITIAL IMPROVEMENTS WERE UNDERTAKEN, THIS HIGHWAY HAS INCREASINGLY PLAYED A VERY VITAL ROLE IN THE ECONOMIC DEVELOPMENT TO THE REGIONS DIRECTLY TRAVERSED AND TO THE COUNTRY AS A WHOLE. UNDOUBTEDLY, THE DAANG MAHARLIKA HAS BECOME THE PRINCIPAL ARTERY OF THE PHILIPPINE HIGHWAY SYSTEM, SOCIO-ECONOMIC DEVELOPMENT ACTIVITIES ALONGSIDE HAVE CONTINUOUSLY INCREASED AT A PACE EVEN FASTER THAN WHAT WAS INITIALLY ENVISIONED. CONSEQUENTLY, VEHICULAR TRAFFIC INCREASED IN FOLDS AND TO SUCH EXTENT THAT PROBLEMS RELATED TO TRANSPORT EFFICIENCY IN THE UTILIZATION OF THE FACILITY HAS LIKEWISE INCREASINGLY DEVELOPED THRU THE YEARS. CAPACITY PROBLEMS IN SOME SECTIONS ARE STARTING TO BE FELT SO MUCH SO THAT TRAFFIC CONGESTION HAS BECOME CRITICAL IN SOME URBAN AREAS TRAVERSED. THESE, PLUS OTHER PROBLEMS, HAVE STARTED TO AFFECT THE OVERALL FUNCTIONAL EFFICIENCY OF THE DAANG MAHARLIKA WHICH IF NOT CORRECTED, WILL SLOW DOWN THE MOMENTUM OF THE SOCIO-ECONOMIC DEVELOPMENT PROGRAM CURRENTLY BEING PURSUED FOR THE COUNTRY.

THE PRESENT TECHNICAL ASSISTANCE BEING REQUESTED FROM THE JAPAN INTERNATIONAL COOPERATION AGENCY IS A STARTING POINT INTENDED TO FORMULATE AN INTEGRATED MASTER PLAN TO UPGRADE THE FUNCTIONAL EFFICIENCY OF THE DAANG MAHARLIKA.

WE OF COURSE REALIZE, THAT TO DO A FULL SCALE PLAN IN ONE SETTING FOR THE ENTIRE LENGTH OF THE NETWORK WOULD REQUIRE QUITE SUBSTANTIAL RESOURCES FOR THE JICA AND THE GOP. UNDER THE PRESENT CONSTRAINTS, THEREFORE, WE ARE PROPOSING TO UNDERTAKE THIS IN PHASES, PERHAPS FOCUSING IN THE CRITICAL AND PRIORITY SECTIONS ONE AT A TIME.

FOR PHASE I, WE PROPOSE TO FOCUS OUR ATTENTION TO THE STA. RITA-SANTIAGO SECTION. THIS SECTION IS APPROXIMATELY A 300 KILOMETER STRETCH ON THE CAGAYAN VALLEY ROAD, NORTH OF MANILA, WHICH LINKS FOUR PROVINCES (BULACAN, NUEVA ECIJA, NUEVA VIZCAYA AND ISABELA) AND TWO CITIES (CABANATUAN AND SAN JOSE).

ALONG THIS SECTION THERE ARE AT LEAST 16 MAJOR TOWNS WITH 1980 POPULATION RANGING FROM 32,000 TO 138,000. THE TOTAL POPULATION, IN THE DIRECT INFLUENCE ARE INCLUDING THE MINOR TOWNS, HOWEVER, IS ABOUT 971,856.

IN 1983, THE TRAFFIC VOLUMES ON THIS STRETCH RANGED FROM 2,800 TO 7,400 VEHICLES PER DAY. THE SECTION NEAREST TO MANILA, PLARIDEL-SAN ILDEFONSO SECTION IN BULACAN, HAS THE HIGHEST TRAFFIC WITH 7,370 VEHICLES PER DAY IN 1983 WHICH ACTUALLY INCREASED BY ABOUT 19% FROM THE 1982 FIGURE (6,170). THE SECOND MOST TRAVELLED SECTION IS THE GAPAN-CABANATUAN CITY SECTION IN NUEVA ECIJA WITH 5,870 VEHICLES PER DAY IN 1983 OR AN INCREASE OF 15% FROM THE 1982 VOLUME (5,100). THIS IS FOLLOWED BY THE TALAVERA-MUÑOZ SECTION ALSO IN NUEVA ECIJA OF ABOUT 4,500 VEHICLES PER DAY; STA. FEBAYOMBONG SECTION IN NUEVA VIZCAYA, 3,570 VEHICLES PER DAY AND THE LAST SECTION BAYOMBONG-SANTIAGO MAINLY WITHIN ISABELA WITH 2,820 VEHICLES PER DAY.

FROM INITIAL ASSESSMENTS OF THE SECTION, IMPROVEMENT WORKS WOULD INCLUDE MOSTLY LIKELY BY-PASS OPTIONS IN FIVE URBAN CENTERS DIRECTLY TRAVERSED IN CABANATUAN CITY, SAN JOSE CITY, BAYOMBONG, SAN MIGUEL AND STA. ROSA. WIDENING OF THE EXISTING PAVEMENTS MAY BE POSSIBLE IN THE TOWN CENTERS OF STA. ROSA AND GAPAN IN NUEVA ECIJA. RECONSTRUCTION OF PAVEMENT ON WEAK FOUNDATION ALONG THE STA. ROSA-SAN JOSE CITY SECTION ABOUT 52 KILOMETERS IN NUEVA ECIJA. INTERSECTION IMPROVEMENTS INCLUDING TRAFFIC SIGNALIZATION SEEM POSSIBLE IN ALL TOWN CENTERS. IMPROVEMENT OF ALIGNMENT MAINLY TO SMOOTHEN OUT SUBSTANDARD CURVES OR PROVISION OF CLIMBING LANES MAY BE NEEDED ON THE DALTON PASS SECTION.

DAANG MAHARLIKA (PHILIPPINE-JAPAN FRIENDSHIP HIGHWAY)  
INTEGRATED IMPROVEMENT MASTER PLAN-PHASE I

I BACKGROUND

The public road network of the Philippines at present totals to approximately 155,000 kilometers. This consists of about 24,000 km of national roads which form the main trunkline systems, 46,000 km of provincial, municipal and city roads and 85,000 km of barangay or farm-to-market roads.

In general, national roads carry significant volumes of traffic, provide connections between main population centers and link provinces. Provincial roads usually carry medium to low traffic volumes and constitute the basic network within the provinces. City and municipal roads are urban roads, while barangay roads function mostly as penetration, feeder or farm-to-market roads.

The network, is in general, quite adequate in location and extent, but suffers from many deficiencies to provide an efficient system. Of the national roads, the Maharlika Highway (Philippine-Japan Friendship Highway) is undoubtedly the most important trunkline in the country's highway network linking the four major islands of Luzon, Samar, Leyte and Mindanao. This artery extends as long as 2100 km starting from the province of Cagayan in the northeastern part of Luzon and ends in the City of Davao in the island of Mindanao. Initial upgrading of existing sections were started in 1969 with financial assistance from Japan and the entire length of the highway was completed in 1979.

The Maharlika Highway is by standards a two-lane road with 6.7 meters pavement width 95 percent of which is paved with portland cement concrete and the rest with asphalt concrete. Complementary to the system are the presence of two ferry services between the islands of Luzon and Samar, and between Leyte and Mindanao, which makes possible a continuous trip from any part of Luzon to Mindanao.

From the time the initial improvements were undertaken up to the present (1985); the highway has increasingly played a very vital role in the economic development to the regions directly traversed and to the country as a whole. Socio-economic development activities alongside have continuously increased at a pace even faster than what initially was envisioned. Consequently, vehicular traffic increased in folds and to such an extent that problems related to transport efficiency in the utilization of the facility has likewise increasingly developed thru the years. Capacity problems in some sections are starting to be felt so much so that traffic congestion has become critical in the urban areas traversed. Some bridges have deteriorated and/or become obsolete in view of the heavy loads they now have to carry. These plus other problems, have started to affect the overall efficiency of the network, which if not corrected, will impede the momentum of the socio-economic development currently being pursued for the country.

Cognizant of the related problems and in view of the importance of the Maharlika Highway in the overall network of the country, the Government of the Philippines (GOP) thru the Ministry of Public Works and Highways (MPWH) has decided to pursue a "Integrated Improvement Master Plan (Philippine-Japan Friendship Highway)" thru a proposed Technical-assistance from the Japan International Cooperation Agency (JICA) so that remedial measures could be identified and subsequently undertaken before these problems get worse.

## II OBJECTIVES:

1. To identify and establish the needed improvement works to upgrade the functional efficiency of the Daang Maharlika.
2. To prioritize the road sections for which improvement works are required.
3. To conduct the feasibility study of typical improvement works proposed within a high priority road section.

Data Requirement:

- 1) Road inventory
- 2) Traffic data
- 3) Landuse maps and plans
- 4) Socio-economic data
- 5) Engineering data
- 6) Highway development plans and programs

Stage II: Project Prioritization

On the basis of the initial assessment made in Stage I the relative priorities of the road segments shall be established using a simple acceptable methodology which shall include the following process.

- 1) Identify and establish homogeneous segments on the basis of the initial data available.
- 2) Identify and categorize the proposed improvement works in each segment.
- 3) Develop a prioritization methodology on the basis of parameters which would be supported from the available data.
- 4) Determine the relative priorities of the road segments.

Stage III: FEASIBILITY STUDIES

Feasibility study for each of the typical improvement works shall be conducted within the highest priority segment.

Data Requirement:

- 1) Additional traffic surveys
- 2) Alignment/topographic surveys
- 3) Soils investigations
- 4) Sub-soil explorations
- 5) Unit Price analysis
- 6) Preliminary Design
- 7) Cost estimates
- 8) Quantification of benefits
- 9) Economic and financial analyses
- 10) Implementation and investment program
- 11) Assessment of social/environmental impact

### III SCOPE OF THE STUDY

1. The Study will cover in general the assessment of the Cagayan Valley Road, Sta. Rita-Santiago Section approximately 300 kilometers of continuous stretch along the Daang Maharlika.
2. The conduct of feasibility study of typical improvement works within the Study section.
3. Improvement Works

The types of improvement works that shall be considered in the overall assessments (and which shall be considered) in the feasibility study shall include the following:

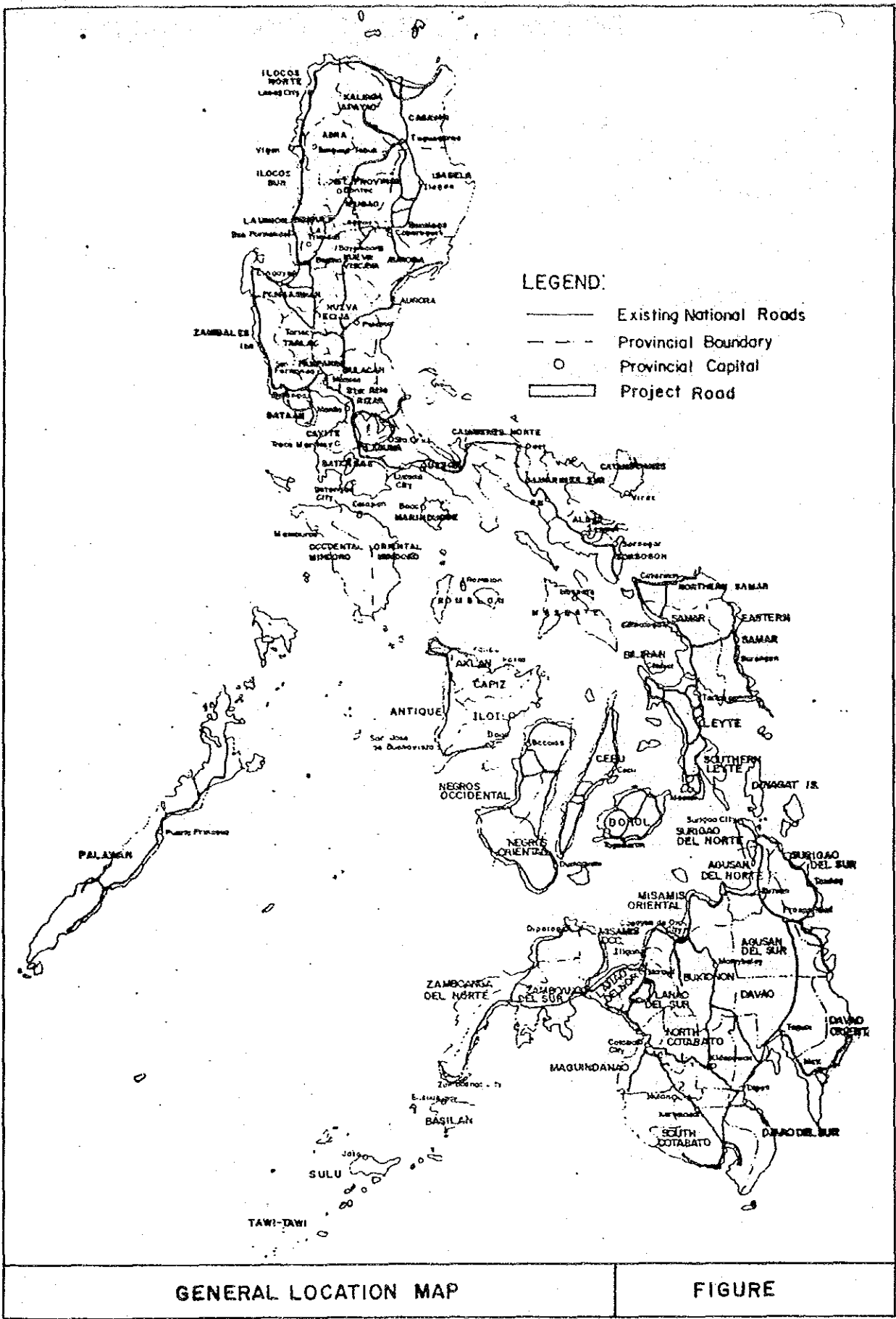
- i) Improvement works for the alleviation of traffic congestion and development of the affected areas such as:
  - a. Establishment of by-pass to improve traffic flows and effecting land use development
  - b. Widening narrow sections to increase road capacity
- ii) Intersection improvement and/or installation of traffic signals
- iii) Improvement of sub-standards geometric alignments
- iv) Improvement and/or realignment of ~~structures and~~ road sections on weak foundation.

### IV STUDY PROCEDURE

The Study shall be carried out generally in three main stages, namely: i) project assessment, ii) prioritization, and iii) feasibility study.

#### Stage I : Project Assessment

The road section covered by the present Study shall be assessed to identify the improvement works necessary to attain the level of service that will be established for various segments.



GENERAL LOCATION MAP

FIGURE

DAANG MAHARLIKA INTEGRATED IMPROVEMENT PROJECT

Sta. Rita - Santiago Section  
Cagayan Valley Road (Luzon)  
Approximate Length - 300 km.

Basic Data

Provinces/Cities traversed:

- |                  |                    |
|------------------|--------------------|
| 1. Bulacan       | 5. Cabanatuan City |
| 2. Nueva Ecija   | 6. San Jose City   |
| 3. Nueva Vizcaya |                    |
| 4. Isabela       |                    |

Major towns traversed:

Bulacan:

Population (1980)

- |                  |        |
|------------------|--------|
| 1. Malolos       | 95,700 |
| 2. Baliuag       | 73,100 |
| 3. San Miguel    | 73,000 |
| 4. San Ildefonso | 44,900 |
| 5. Plaridel      | 39,100 |
| 6. Pulilan       | 38,100 |
| 7. San Rafael    | 36,800 |

Nueva Ecija:

- |                    |         |
|--------------------|---------|
| 1. Cabanatuan City | 138,300 |
| 2. San Jose City   | 64,300  |
| 3. Talavera        | 62,200  |
| 4. Gapan           | 60,000  |
| 5. Munoz           | 43,200  |



Nueva Vizcaya:Population (1980)

- |              |        |
|--------------|--------|
| 1. Solana    | 36,700 |
| 2. Bayombong | 32,100 |

Isabela:

- |             |        |
|-------------|--------|
| 1. Santiago | 69,900 |
| 2. Cauayan  | 62,200 |

Present Traffic Volumes (outside urban areas)

<u>S e c t i o n</u>	<u>Province</u>	<u>1982</u>	<u>1983</u>	<u>% Increase</u>
1. Plaridel-San Ildefonso	Bulacan	6,169	7,374	19
2. Gapan-Cabanatuan	Nueva Ecija	5,102	5,868	15
3. Talavera-Muñoz	Nueva Ecija	3,677	4,496	22
4. Sta. Fe-Bayombong	Nueva Vizcaya	-	3,569	-
5. Bayombong-Santiago	Isabela	-	2,823	-

Possible Improvement Works

<u>T y p e</u>	<u>L o c a t i o n</u>
1. By-pass:	1. Cabanatuan City - Nueva Ecija 2. San Jose City - Nueva Ecija 3. Bayombong - Nueva Vizcaya 4. San Miguel - Bulacan 5. Sta. Rosa - Bulacan
2. Widening:	1. Sta. Rosa - Nueva Vizcaya 2. Gapan - Nueva Ecija
3. Reconstruction of Pavement on Weak Foundation:	Sta. Rosa - San Jose Section - Nueva Ecija
4. Intersection Improvements:	All major town centers
5. Improvement of Alignment (smoothing of curves, etc.):	Dalton Pass Section





JICA