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1. IMPLEMENTING ARRANGEMENTS ON THE TECHNICAL COOPERATION BETWEEN THE BUREAU OF TELECOMMUNICATIONS, MINISTRY OF TRANSPORTATION & COMMUNICATIONS AND THE JAPAN INTERNATIONAL COOPERATION AGENCY FOR THE FEASIBILITY STUDY ON THE RURAL TELECOMMUNICATION DEVELOPMENT PROJECT, REGION V (BICOL) OF THE REPUBLIC OF THE PHILIPPINES

AGREED
BETWEEN

BUREAU OF TELECOMMUNICATIONS
MINISTRY OF TRANSPORTATION & COMMUNICATIONS

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Manila, Philippines
February 26, 1982

RYOJI SASAKI
LEADER
THE JAPANESE PRELIMINARY STUDY TEAM, JAPAN INTERNATIONAL COOPERATION AGENCY

MANUEL B. CASAS
ASSISTANT DIRECTOR
(OFFICER-IN-CHARGE)
BUREAU OF TELECOMMUNICATIONS
MINISTRY OF TRANSPORTATION & COMMUNICATIONS

APPROVED:

JOSE P. DANS JR.
MINISTER
MINISTRY OF TRANSPORTATION & COMMUNICATIONS
REPUBLIC OF THE PHILIPPINES

IMPLEMENTING ARRANGEMENTS

I. INTRODUCTION

In response to the request of the Government of the Republic of the Philippines, the Government of Japan dispatched a preliminary study team to the Philippines on February 1982 prior to a feasibility study of the Rural Telecommunication Development Project, Region V (Bicol).

Based on the report of the above preliminary study team, the Government of Japan has decided to undertake a feasibility study in accordance with laws and regulations in force in Japan with regard to the technical assistance programs.

The Japan International Cooperation Agency (hereinafter to be referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation program of the Government of Japan, will carry out the works necessary for the study.

The Bureau of Telecommunications (hereinafter to be referred to as "BUTEL") under the Ministry of Transportation and Communications (hereinafter to be referred to as "MOTC") shall be the coordinating body to other governmental and

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non-governmental organizations concerned for the smooth implementation of the study. Under this study, the Government of the Philippines shall refer to BUTEL and/or MOTC.

The present document sets forth the Implementing Arrangement agreed between JICA and BUTEL for the study which is to be implemented by JICA in close collaboration with BUTEL and other agencies concerned.

II. IMPLEMENTATION OF THE STUDY

1. The study shall be implemented in accordance with the work plan which is given in detail in the Scope of Work (Annex 1).

2. The study shall be undertaken in accordance with the Study Schedule (Annex 2) which is formulated on the basis of the Scope of Work.

III. DISPATCH OF JAPANESE STUDY TEAM

JICA shall, at its own expense, dispatch Japanese study

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team in accordance with the schedule mutually agreed upon by both JICA and BUTEL.

IV. PROVISION OF MEASURING EQUIPMENT AND OTHER MATERIALS

JICA shall, at its own expense, provide measuring equipment and other materials, necessary for the implementation of the study.

V. TRAINING OF PHILIPPINE COUNTERPARTS IN JAPAN

JICA shall, at its own expense, receive Philippine Government personnel connected with the study for technical training in Japan in accordance with the normal procedures under the Colombo Plan Technical Cooperation Scheme.

VI. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE PHILIPPINES

1. The Government of the Philippines, in accordance with the Note Verbale exchanged between the Government of the Philippines and the Government of Japan, shall be responsible for dealing with claims which may be brought by third parties against the Japanese study team

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members, and shall hold them harmless in respect of claims or liabilities arising in the course of or otherwise connected with the discharge of their duties in the implementation of the study, except when such claims or liabilities arise from the gross negligence or wilfull misconduct of the above-mentioned individuals.

2. BUTEL shall, at its own expense, provide the following:

   1) Available data and information related to the study (Annex 3)
   2) Counterpart officials during the field survey
   3) Credentials or identification (ID) cards to the members of the study team who shall work in the Philippines for the execution of the study
   4) Suitable office space in BUTEL office
   5) Appropriate number of vehicles with drivers
   6) Available measuring equipment necessary for the field survey

3. BUTEL shall make the necessary arrangements for the following:

   1) Secure permission for entry into private properties and restricted areas

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2) Hiring of laborers as needed, but wages shall be chargeable to JICA funds allotted for the study

3) Availability of medical facilities when needed but medical expenses shall be chargeable to JICA allotted for the study

4. BUTEL shall make the necessary arrangements with proper agencies concerned:

1) To ensure the safety of the study team

2) To exempt the study team members from taxes, duties, fees and other charges on measuring equipment and other materials brought into the Philippines for conducting the study

3) To secure permission to bring out data and materials relating to the study from the Philippines to Japan

VII. OTHERS

Should any question arise in connection with the foregoing, MOTC, BUTEL and the Japanese Study Team shall immediately consult with each other.

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Annex 1

SCOPE OF WORK

FOR

FEASIBILITY STUDY

ON

THE RURAL TELECOMMUNICATION DEVELOPMENT PROJECT, REGION V (BICOL)

OF

REPUBLIC OF THE PHILIPPINES

I. OBJECTIVE OF THE STUDY

The study aims to confirm the feasibility of the Rural Telecommunication Development Project, Region V (Bicol).

II. OUTLINE OF THE STUDY

The study will entail survey in the Philippines and analysis work in Japan. Items to be covered by the study are as follows:

1. General
    1) Present status of telecommunication facilities and services
    2) Telecommunication development plan
    3) Present engineering standards of telecommunication
    4) Telecommunication service revenues and expenditures
    5) Present tariff system

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2. Region V (Bicol)

1) Telecommunication demand forecast

2) Telecommunication traffic forecast

3) Network plan

4) Telecommunication installation plan

5) System design

a) Telephone exchange

b) Subscriber network

c) Radio transmission system

d) Cable transmission system

e) Telex exchange

f) Building and tower

6) Implementation schedule

7) Operation and maintenance

8) Cost estimation

9) Financial analysis and economic analysis

10) Project evaluation

III. REPORT

1. Preparation of report

JICA will prepare and submit 20 copies of the following reports to the Government of the Philippines.

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1) Draft final report

Within about 3 months after the completion of the field survey, the draft final report will be submitted to the Government of the Philippines.

The Government of the Philippines is requested to provide with its comments on the draft final report within 1 month after the submission of the report.

2) Final report

Within about 2 months after reception of the comments on the draft final report, JICA will submit the final report to the Government of the Philippines.

2. Contents of report

The report will contain the following items.

1) Telephone and telex demand forecast in the area
2) Telephone and telex traffic forecast in the area
3) Telephone network plan for the area
4) Engineering standards for the project
5) System design
   a) Telephone exchange
   b) Subscriber network

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c) Radio transmission system

d) Cable transmission system

e) Telex exchange

f) Building and tower

6) Implementation schedule

7) Operation schedule

8) Cost estimation

9) Financial evaluation and economic evaluation

10) Project evaluation

11) Annex

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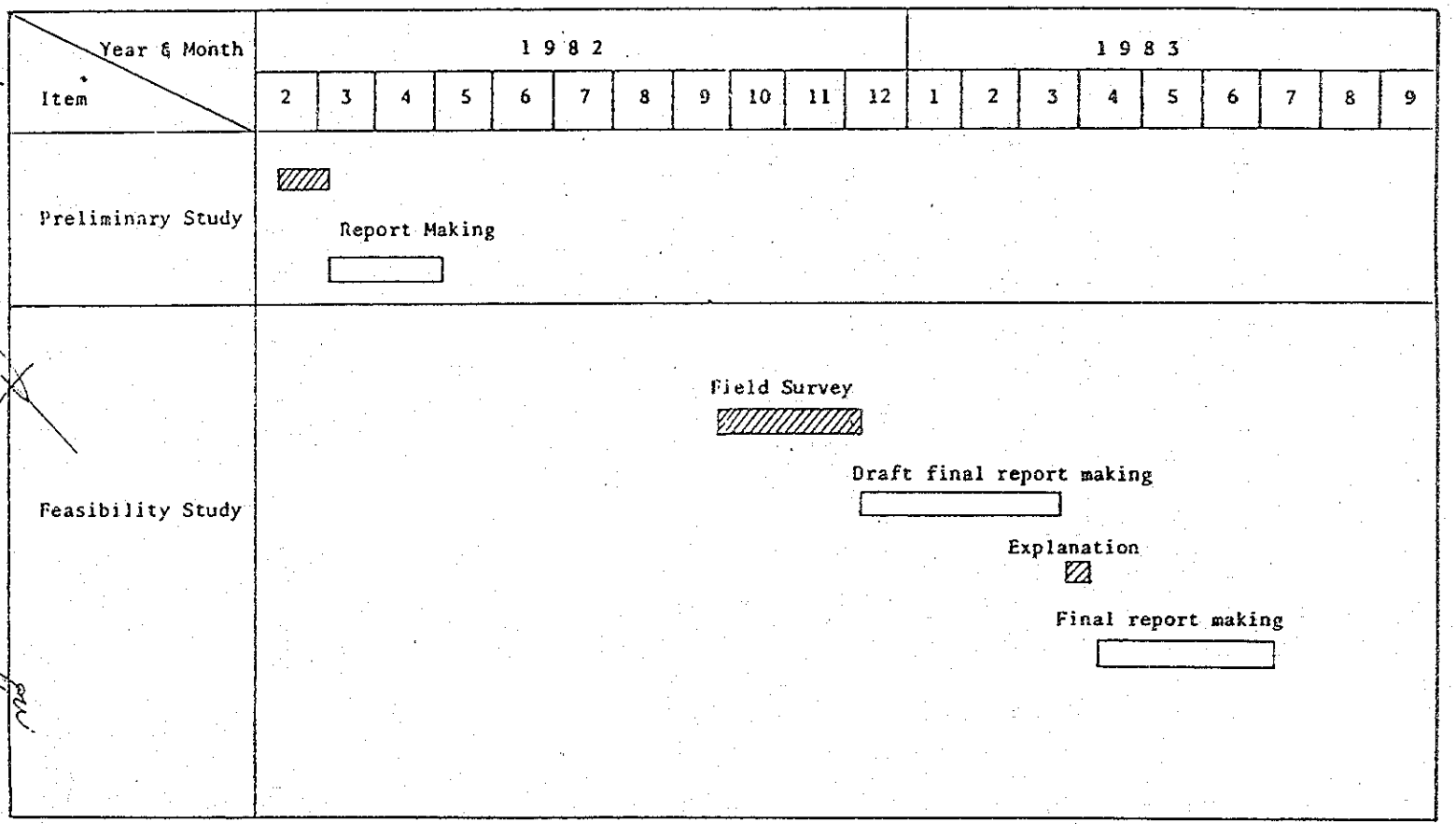
STUDY SCHEDULE (Tentative)



Annex 3

DATA AND INFORMATION REQUIRED

1. Statistical data on the national economy

2. Statistical data on the telecommunications facilities

3. The national development plan

4. The telecommunications development plan

5. Engineering standards of telecommunications facilities

6. General meteorological statistics

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2. MINUTES OF MEETING ON THE IMPLEMENTING ARRANGEMENTS FOR THE FEASIBILITY STUDY ON THE RURAL TELECOMMUNICATION DEVELOPMENT PROJECT, REGION V (BICOL) OF THE REPUBLIC OF THE PHILIPPINES

At the request of the Government of the Republic of the Philippines, the Government of Japan has decided to conduct the Feasibility Study on the Rural Telecommunication Development Project, Region V (Bicol), as executed by the Japan International Cooperation Agency. JICA dispatched in February 1982, a six member Preliminary Study Team, headed by Mr. Ryoji SASAKI.

To discuss the draft of "Implementing Arrangements", meetings were held on February 11, 22-26, 1982 at the conference room of MOTC and BUTEL. List of Attendants is given in the attached paper. The results of the meetings are as follows:

1. Object Area.

   a. The study shall cover all municipalities/cities in Region V.

   b. The study shall include necessary demand forecast on the private telephone operators in Region V.

2. Tentative Network Plan.

   Quezon Rly - Bagacay Rly - Goa Rly - Catanduanes Rly - Sorsogon Rly microwave route shall be studied by JICA, since Manila - Quezon Rly - Vermassi Rly - Albay Rly -< Sorsogon Rly / Masbate Rly microwave system is to be implemented by PLDT.

3. Annex of the study report.

   The study report shall include in the annex the description of all the technical, financial and economic assumptions used in the study.

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4. Investment Plan.

The investment plan of the study report shall not involve ultimate PLDT's X-5 program in Region V which shall be decided by MOTC at the end of the field survey.

5. Explanation.

Explanation on demand forecast and economic financial evaluation shall be made with MOTC at this time.

6. Report Making

The report shall be prepared based on the documents, materials and data which will be acquired during the field survey.

No modification shall be accepted based on changes of situation after the field survey.

The final evaluation shall be done by the Government of the Philippines.

Manila, Philippines
February 26, 1982

RYOJI SASAKI
LEADER
THE JAPANESE PRELIMINARY STUDY TEAM, JAPAN INTERNATIONAL COOPERATION AGENCY

MANUEL B. CASAS
ASSISTANT DIRECTOR
(OFFICER-IN-CHARGE)
BUREAU OF TELECOMMUNICATIONS
MINISTRY OF TRANSPORTATION & COMMUNICATIONS

APPROVED:

JOSE P. DANS JR.
MINISTER
MINISTRY OF TRANSPORTATION & COMMUNICATIONS
REPUBLIC OF THE PHILIPPINES

LIST OF ATTENDANTS

MOTC	-	Minister Jose P. DANS Jr. Mr. Renato B. GARCIA Mr. Gaudencio del ROSARIO Mr. Lamberto MONSANTO Mr. Rogelio V. CABANA Mr. Norberto P. LEANO
NTC	-	Mr. Antonio C. BARREIRO
BUTEL	-	Gen. Ceferino S. CARREON Mr. Manuel B. CASAS Mr. Ricard S. ALALAY
Embassy of JAPAN	-	Mr. Koji KOBUNE
Japanese Expert	-	Mr. Yasukazu SUGIYAMA
Japanese Study Team	-	Mr. Ryoji SASAKI Mr. Hironori KANEKO Mr. Masayuki KASHIWANO Mr. Shigeru OKAMOTO Mr. Kanji YAMAMURO Mr. Norimoto OHTAKE
JICA Manila Office	-	Mr. Hiroyuki ARAI

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3. Terms of Reference

No. 81-819

POLITICAL				
ECONOMIC	✓			
CONSULAR				
JIC				
ADMINISTRATIVE				
PROTOCOL		JICA	JOCV	

The Ministry of Foreign Affairs presents its compliments to the Embassy of Japan and has the honor to convey the request of the Philippine Government for technical assistance in the conduct of a feasibility study for the Rural Telecommunications Development Project (RTDP) for Region V (Bicol Region).

The Ministry has further the honor to mention that the proposed study, which may be patterned after the development surveys conducted by JICA for Region I, II, III and IV, shall consider the improvement of the Manila-Bicol communication links and take into account the present and future demands for transmission facilities to support regional development. The channel capacity of the telecommunication system is inadequate to cope with present demand whilst the existing microwave link to Manila is composed of outmoded equipment and is faced with maintenance problems due the scarcity and high cost of replacement parts.The feasibility study should therefore include,among others,a review of the existing networks and facilities, demand and traffic studies and forecasts, project identification, estimates of investment costs and financial forecasts. Attached is the Terms of Reference for the proposed feasibility study.

In view of the importance of the Rural Telecommunications Development Project to the envisioned transmission network for the country, favorable consideration of the herein request would be greatly appreciated.

The Ministry of Foreign Affairs avails itself of this opportunity to renew to the Embassy of Japan the assurances of its highest consideration.

RURAL TELECOMMUNICATIONS DEVELOPMENT PROJECT
REGION V

TERMS OF REFERENCE FOR FEASIBILITY STUDY

A. INTRODUCTION

The Bureau of Telecommunications considers the improvement of its Manila-Bicol communication links among the priority projects of the government. The existing Manila-Bicol microwave link in particular is composed of outmoded equipment and is plagued by maintenance problems caused by scarcity and high cost of replacement parts. The systems limited channel capacity for telephone and telegraph cannot cope with the present communications demand of the Region. The need for a high quality network that could be able to serve or satisfy demands in the Bicol area to support development is therefore urgent.

For these reasons, the Bureau of Telecommunications has requested assistance for consultants to undertake feasibility studies for the above project.

B. SCOPE OF WORK

1.0 General

The feasibility studies (for both the technical and economic aspects of the project) shall ultimately be aimed at identifying the projects which should best be implemented involving establishment/construction of modern radio transmission facilities for telephone and telegraph services from Manila to Bicol with consideration given for these facilities to be able to transmit color television with linkage to the proposed earth stations of DOMSAT in the region concerned. It shall consider provision of direct trunks from Manila to the regional center in Legaspi and drops to key cities and municipalities along the proposed routes. The transmission networks shall meet the immediate and future communication requirements of the different government instrumentalities/offices, public and private sectors located in the project areas and shall generally conform to the overall ultimate toll network plan invisioned for the country.

16 MAR 1981

Besides the main transmission facilities above mentioned (backbone) the study shall also take regard on the stablishment/provision of the following:

1. Local Telephone exchanges
2. Toll switching centers
3. Telex exchanges
4. Public Toll Telephone Stations

2.0 Items Under the Feasibility Study

Consultants will specifically undertake the following:

a. Reveiw of existing networks and facilities
b. Investigation of requirements/demands with the areas concerned
c. Traffic study; traffic forecasts; trunking and routing requirements
d. Identification of projects (replacement, expansion of existing facilities or establishment of new ones involving the main transmission links, telephone exchanges, telex exchanges, public toll telephone stations)
e. Rough technical design and specifications
f. Implementation plan
g. Requirements for operation and staffing
h. Personnel Training requirements
i. Estimate of investment costs indicating contingencies and taking into account price escalations
j. Financial forecast covering operating costs, financing schemes, expected revenues
k. Recommendations

C. DATA AND ASSISTANCE TO BE PROVIDED BY THE GOVERNMENT

1.0 The Government will provide the Consultants/Experts with;

a. Copy of the previous feasibility study report with the government views on the recommendations therein.
b. Available maps of the areas concerned and such other statistical data related to the project.

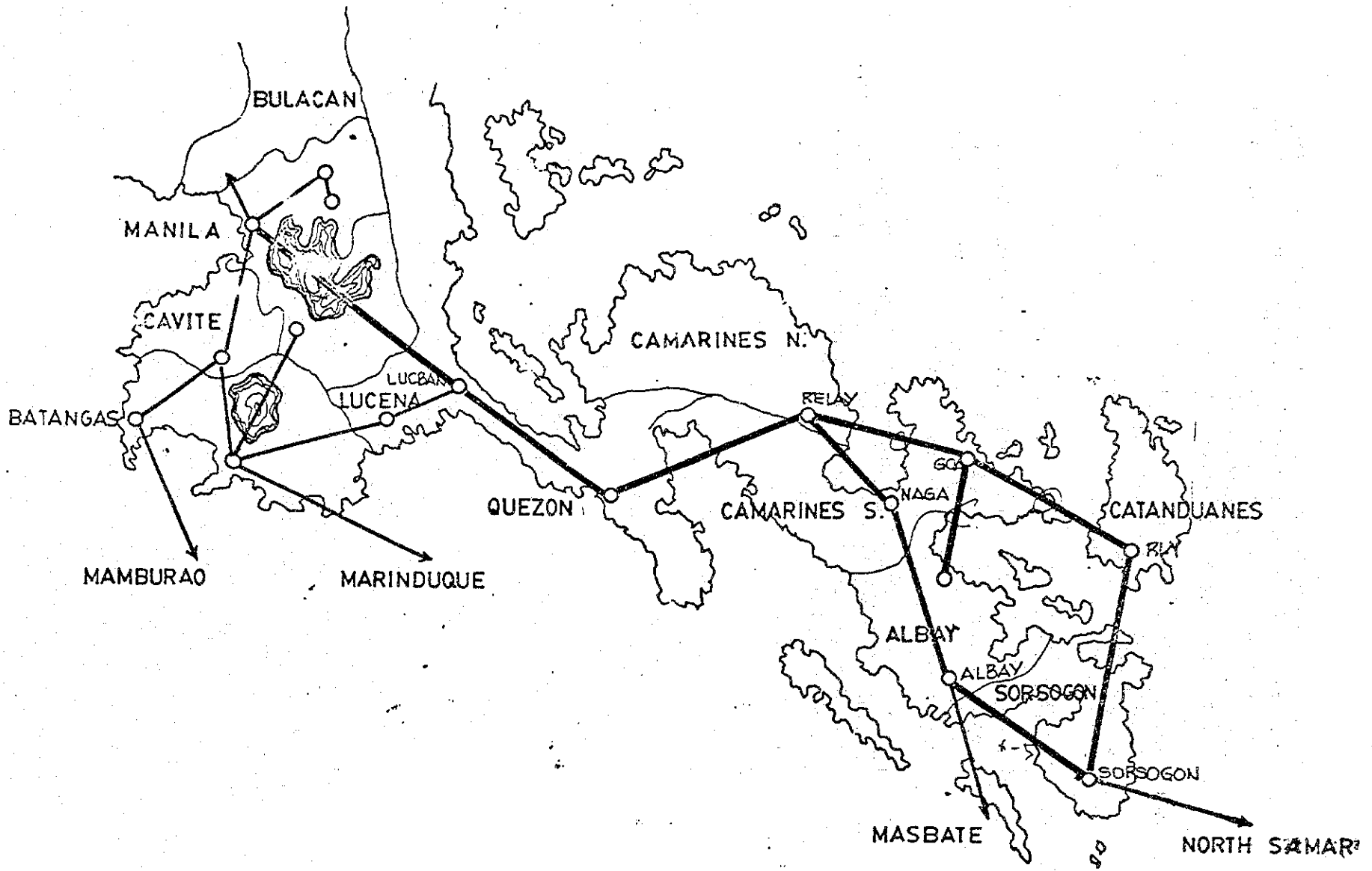
2.0 In connection with the work by the Consultants requiring cooperation of other government agencies, the government will provide liaison and will ensure that the Consultants have access to all information as maybe allowed by law for the performance of these services.

3.0 A local counterpart staff composed of counterpart engineers, clerks, helpers, etc. will assist the Consultants in connection with the field surveys and in the preparation/typing of the reports.

D. REPORTS AND DOCUMENTS REQUIRED

1.0 The Consultants/Experts shall submit a feasibility study report in 18 copies within six (6) months from the start of the feasibility study all in English to BUTEL on specified general format and contents.

E. NUMBER, QUALIFICATIONS OF CONSULTANTS NEEDED - As maybe deemed necessary by JICA to meet the objectives of the study. Period of surveys and report making preferebly should not exceed 6 months.


BULACAN
MANILA
CAVITE
BATANGAS
LUCBAN
LUCENA
CAMARINES N.
RELAY
QUEZON
CAMARINES S.
NAGA
GO
CATANDUANES
RIV
MAMBURAO
MARINDUQUE
ALBAY
ALBAY
SORSOGON
SORSOGON
MASBATE
NORTH SAMAR

4. PROJECT BRIEF

1. NAME OF PROJECT: Rural Telecommunication Development Project (Region V)

2. CATEGORY : Telecommunication

3. DURATION : Feasibility study is expected to be started on March, 1982.

4. TOTAL PROJECT COST:

Total project cost will be determine by the consultant advisers after the feasibility study.

5. OBJECTIVES:

This project aims to provide a modern and reliable telecommunication facilities for telephone and telegraph between Manila and the Bicol region and the rest of the archipelago.

6. DESCRIPTION:

The proposed contractors/suppliers shall be responsible for the supply, delivery and installation of all necessary equipment. The repair of existing buildings and access roads including the construction of new repeater stations, telephone buildings and access roads shall be undertaken by local contractors under the administration of BUTEL.

7. JUSTIFICATION:

The expansion and development of BUTEL facilities in the Bicol region will be accompanied by modernization of services and extensive use of sophisticated equipment.

The realization of this project therefore, will not only help correct disparities between rural and urban settlements, but will also improve the commercial and economic status of the area.

8. EXPECTED OUTPUT:

a.) Acquisition of all sites required

b.) Construction of all access roads going to repeater stations

c.) Completion of about 45 local telephone exchanges with a total of 12,000 telephone lines.

9. METHODOLOGY:

a.) Acquisition of sites- negotiation for donation of sites to the Bureau will be done by appointed BUTEL personnels. Sites will be purchased when necessary.

b.) Construction of Buildings, Access Roads and Cable Plants- cable plants network will be bidded to local contractors.

c.) Supply and Installation of Equipment will be done by a foreign contractor to be charged against the loan.

10. ORGANIZATION:

A new staff similar to that presently involved in Regions I and II will be created to handle the supervision and coordination of the project. The technical staff shall be responsible for the engineering and management requirement of the project in coordination with the foreign consultants/ advisers.

11. TRAINING OF PERSONNEL:

The supplier/contractor shall provide formal training (theory and practice) at their factory site for at least three (3) months. Field of Training shall be for Microwave/VHP/UHF radio, multiplexing, telephone switching, system engineering, etc. All expenses to be incurred by the trainees shall be free of charge and to be shouldered by the supplier/contractor. In addition the supplier/contractor shall provide on-the-job training for the bureaus Engineer/technician that may be assigned at the job sites during the construction and testing period.

STATISTIC OF REGION V

LOCATION	CLASSIFICATION as of 1979	POPULATION as of 1975
ALBAY	FIRST CLASS	728,827
1st DISTRICT		
1. Bacacay	5th Class	40,130
2. Malilipot 1/	5th Class	20,497
3. Malinao 1/	5th Class	24,889
4. Santo Domingo	5th Class	17,562
5. Tabaco 1/	3rd Class	65,254
6. Tiwi	5th Class	24,350
2nd DISTRICT		
1. Camalig	5th Class	41,702
2. Daraga 1/	3rd Class	63,265
3. Manito	6th Class	13,647
4. Rapu-Rapu	5th Class	21,818
5. Legaspi City 1/ 3/	2nd Class	88,378
3rd DISTRICT		
1. Guinobatan	4th Class	49,724
2. Jovellar	5th Class	14,121
3. Libon	5th Class	47,890
4. Ligao	4th Class	61,548
5. Oas	5th Class	50,293
6. Pioduran	5th Class	31,108
7. Polangui	4th Class	52,541
CATANDUANES	THIRD CLASS	172,780
1. Bagamanoc	6th Class	9,456
2. Baras	6th Class	10,338
3. Bato	5th Class	15,415
4. Caramoran	5th Class	18,055
5. Gigmoto	6th Class	5,950
6. Pandan	6th Class	14,862
7. Panganiban	6th Class	7,789
8. San Andres	5th Class	24,848
9. San Miguel	6th Class	11,222
10. Viga	5th Class	16,063
Virac 2/	3rd Class	38,782
CAMARINES NORTE	SECOND CLASS	288,406
1. Basud	5th Class	21,098
2. Capalonga	5th Class	20,904
3. Daet 1/ 2/	3rd Class	50,010
4. Imelda	6th Class	8,227

LOCATION	CLASSIFICATION	POPULATION
5. Jose Panganiban	3rd Class	32,746
6. Labo 1/	4th Class	52,781
7. Mercedes	5th Class	25,161
8. Paracale	5th Class	22,619
9. San Vicente	6th Class	6,330
10. Santa Elena	6th Class	10,841
11. Talisay	6th Class	13,328
12. Vinzons	5th Class	24,361
CAMARINES SUR	FIRST CLASS	1,023,819
1st DISTRICT		
1. Bombon	6th Class	7,494
2. Cabusao	6th Class	10,110
3. Calabanga	5th Class	40,274
4. Camaligan	6th Class	9,853
5. Canaman	6th Class	14,522
6. Del Gallego	5th Class	13,754
7. Gainza	6th Class	5,931
8. Libmanan	4th Class	66,601
9. Lupi	5th Class	19,682
10. Magarao	6th Class	11,846
11. Minalabac	5th Class	27,089
12. Milaor	6th Class	13,167
13. Naga City 1/ 3/	1st Class	83,337
14. Pamplona	5th Class	18,350
15. Pasacao	5th Class	21,889
16. Ragay	5th Class	32,635
17. San Fernando	5th Class	15,524
18. Sipocot	4th Class	39,457
2nd DISTRICT		
1. Baao	5th Class	30,219
2. Balatan	5th Class	13,159
3. Bato	5th Class	28,492
4. Buhi 2/	5th Class	44,226
5. Bula	5th Class	36,904
6. Caramoan	5th Class	31,399
7. Gatchitorena	5th Class	16,438
8. Goa	5th Class	34,049
9. Lagonoy	5th Class	33,297
10. Nabua 2/	4th Class	48,635
11. Ocampo	5th Class	19,283
12. Pili	5th Class	36,676
13. Presentacion	6th Class	13,355
14. Sagnay	5th Class	18,013
15. San Jose	5th Class	21,859
16. Siruma	6th Class	10,435

LOCATION	CLASSIFICATION	POPULATION
17. Tigaon	5th Class	25,282
18. Timambac	5th Class	34,415
MASBATE	FIRST CLASS	571,170
1. Aroroy	5th Class	32,712
2. Baleno	5th Class	15,909
3. Balud	5th Class	24,057
4. Batuan	6th Class	10,403
5. Cataingan	5th Class	39,082
6. Cawayan	5th Class	33,266
7. Claveria	5th Class	41,436
Dimasalang	5th Class	20,889
9. Esperanza	6th Class	13,341
10. Mandaon	5th Class	21,567
1. Masbate 1/ 3/	5th Class	52,830
2. Milagros	5th Class	28,367
13. Mobo	5th Class	25,060
14. Monreal	6th Class	15,269
15. Palanas	5th Class	27,635
16. Dio V. Corpuz	5th Class	20,247
17. Placer	5th Class	34,965
18. San Fernando	5th Class	18,538
19. San Jacinto	5th Class	22,808
20. San Pascual	5th Class	35,582
21. Uson	5th Class	37,127
SORSOGON	FIRST CLASS	446,502
1st DISTRICT		
1. Barcelona	5th Class	14,406
2. Bulan	3rd Class	56,013
3. Bulusan	5th Class	16,393
4. Gubat	4th Class	38,504
5. Irosin	5th Class	30,989
6. Matnog	5th Class	20,680
7. Prieto-Diaz	5th Class	14,006
8. Santa Magdalena	5th Class	10,887
2nd DISTRICT		
1. Bacon	5th Class	28,546
2. Casiguran	5th Class	18,224
3. Castilla	5th Class	29,614
4. Donsol	5th Class	32,310
5. Juban	5th Class	16,809
6. Magallanes	5th Class	23,101
7. Pilar	5th Class	42,320
8. Sorsogon 2/	3rd Class	53,700

NOTE: 1/ - w/ existing local telephone exchange (PRIVATD)
2/ - w/ existing local telephone exchange (BUTEL)
3/ - w/ existing Telex Facilities

STATISTICS OF PROPOSED LOCAL EXCHANGES & IPTS

REGION V

LOCATION	PROPOSED NUMBER of lines	CLASSIFICATION as of 1979	POPULATI as of 19
ALBAY		FIRST CLASS	728,827
1. Bacacay	400L	5th Class	40,130
2. Santo Domingo	200L	5th Class	17,562
3. Legaspi City		2nd Class	88,378
4. Pioduran	200L	5th Class	31,188
5. Polangui	500L	4th Class	52,541
6. Iwi	200L	5th Class	24,350
CATANDUANES		THIRD CLASS	172,780
1. Pandan	200L	6th Class	14,862
2. San Andres	200L	5th Class	24,348
3. Virac	300L	3rd Class	38,782
4. Caramoran	200L	5th Class	18,055
5. Viga	200L	5th Class	16,063
CAMARINES NORTE		SECOND CLASS	288,406
1. Daet	500L	3rd Class	50,010
2. Mercedes	200L	5th Class	25,161
3. Paracale	200L	5th Class	22,619
4. Vinzons	200L	5th Class	24,361
CAMARINES SUR		FIRST CLASS	1,023,919
1. Libmanan	500L	4th Class	66,601
2. Minalabac	200L	5th Class	27,089
3. Naga City		1st Class	83,337
4. Pasacao	200L	5th Class	21,809
5. Ragay	200L	5th Class	32,635
6. Sipocot	300L	4th Class	39,457
7. Buhi	400L	5th Class	44,226
8. Bula	300L	5th Class	36,904
9. Caramoan	200L	5th Class	31,399
10. Lagonoy	200L	5th Class	33,297
11. Tigaon	200L	5th Class	25,282
12. Timambac	200L	5th Class	34,415
13. Goa	200L	5th Class	34,049
MASBATE		FIRST CLASS	571,170
1. Baleno	200L	5th Class	15,909
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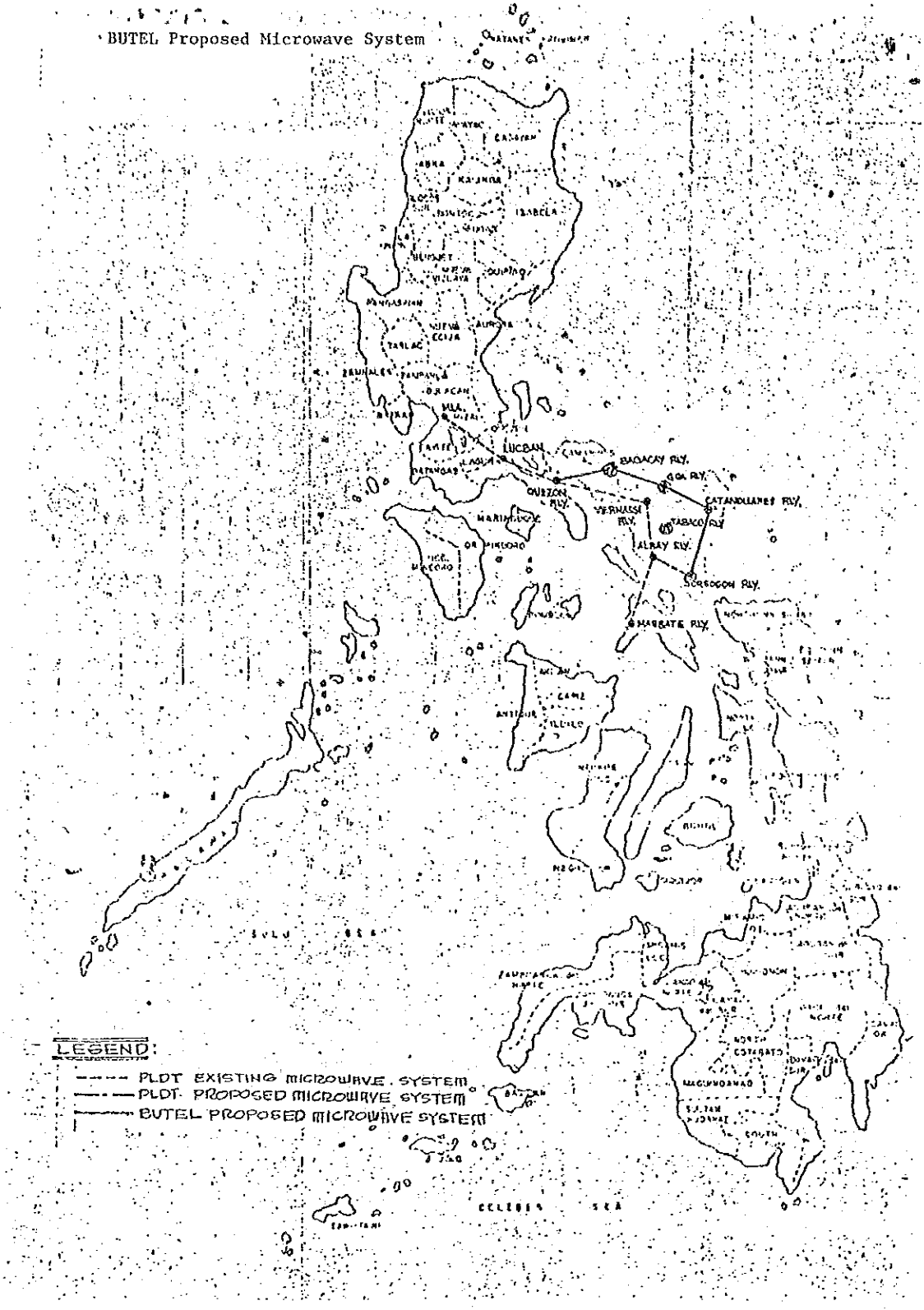
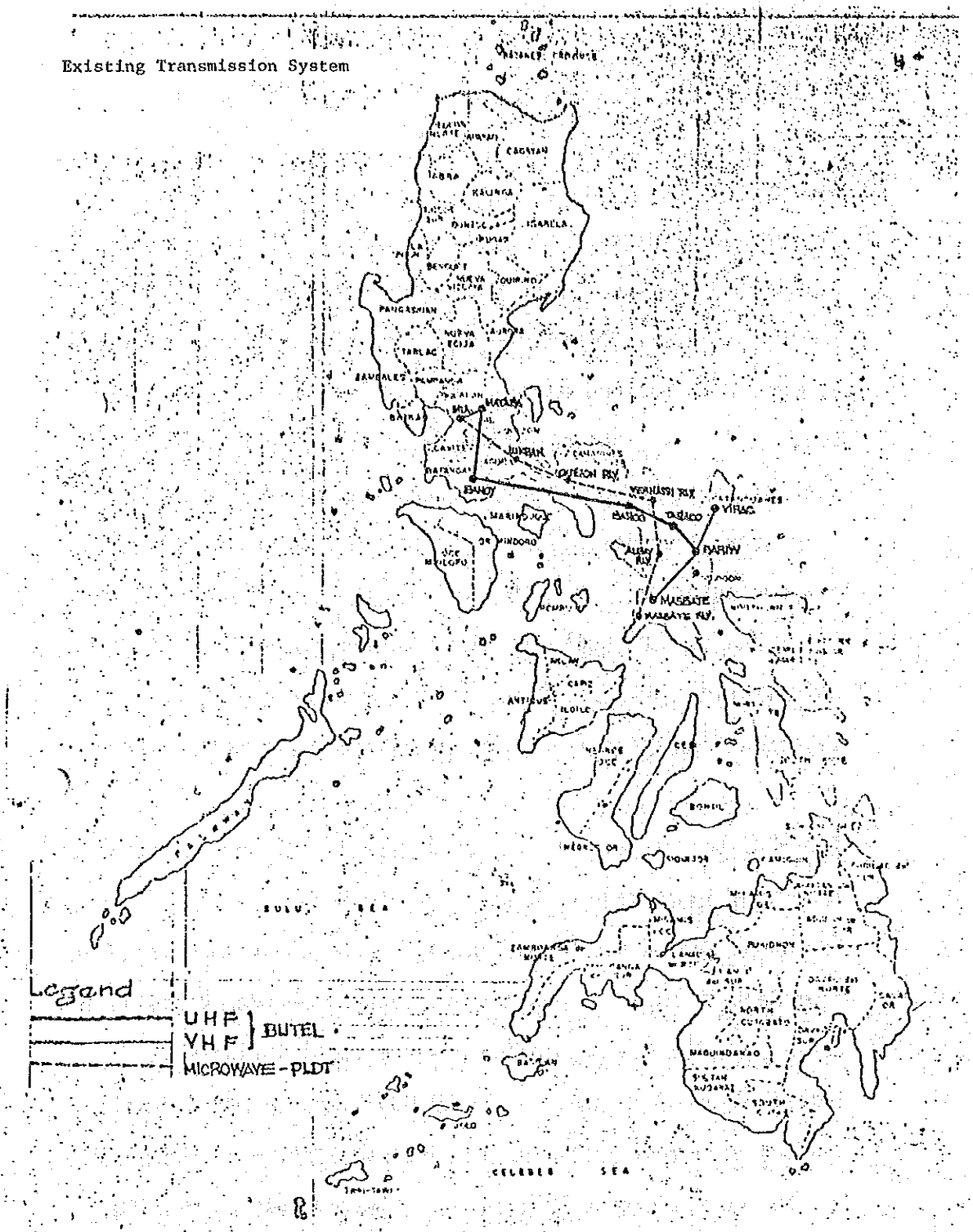
LOCATION	PROPOSED NUMBER of lines	CLASSIFICATION as of 1979	POPULATION as of 1975
4. Pio V. Corpuz	200L	5th Class	20,247
5. San Jacinto	200L	5th Class	22,808
6. Claveria	400L	5th Class	41,436
7. Dimasalang	200L	5th Class	20,889
8. Aroroy	200L	5th Class	32,712
9. Catangan	300L	5th Class	39,082
10. Placer	300L	5th Class	34,965
11. Uson	300L	5th Class	37,127
SORSOGON		FIRST CLASS.	446,502
1. Bulusan	200L	5th Class	16,393
2. Bacon	200L	5th Class	28,546
3. Casiguran	200L	5th Class	18,224
4. Donsol	300L	5th Class	32,310
5. Pilar	400L	5th Class	42,320
6. Sorsogon	500L	3rd Class	53,700

- 11 20 V
45 (2)


BUTEL Proposed Microwave System
LEGEND:
PLDT EXISTING MICROWAVE SYSTEM
PLDT PROPOSED MICROWAVE SYSTEM
BUTEL PROPOSED MICROWAVE SYSTEM
LUCBAN
BAGACAY RLY.
QUEZON RLY.
VERNAZZA RLY.
TABACO RLY.
CATANDUANES RLY.
ALBAY RLY.
SORSOGON RLY.
MARINDUQUE
SULU SEA
CELEBES SEA

Existing Transmission System



5. Ministry Guidelines

MINISTRY GUIDELINES
FOR TELECOMMUNICATIONS PLANNING
23 November 1981

1. Demand Forecasts

The economic forecast must include the use of comparative models for the whole area under consideration down to a municipal level. Preliminary studies by the Ministry indicate requirements nationwide for a 960-1200 channel backbone network and a distribution system, with approximately 2,019,000 main stations by 1987. At present, there are 69 local telephone companies, in addition to BUTEL and the PLDT and its subsidiaries, operating 140,000 main stations outside Metro Manila (282,000). Of the aforementioned, only 20,000 main stations in 46 municipalities operated by 22 local telephone companies are interconnected to the PLDT backbone.

The PLDT terrestial network has a capacity of 960-1200 channels from Sto. Tomas-Baguio to Cebu thru La Union, Tarlac, Pampanga, Manila and Lucena and a 240-300 channels, extending from Cebu to Davao thru Siquijor, Cagayan de Oro, Pagadian and Cotabato. The PLDT expansion program (X-4) includes the installation of an additional 200,000 lines in Metro Manila and selected municipalities, the reinstallation of the step by step equipments by 1984 at an estimated cost of US $400 million.

2. Technical Design Concepts

The technical aspect of the study must propose a preliminary conceptual design of the network, to include the capacity of the distribution system, transmission and interfacing facilities, the telephone and telex switching philosophy and performance. The location of relays, spurs, drop points, cable runs and terminals must be drawn on regional maps based initially on the existing topological descriptions of the area, coupled by preliminary site surveys.

2.1 Backbone

The Ministry, as a policy, requires that the present "state of the art", digital technology, be applied in all new expansion programs of the sector. The backbone switching and transmission facilities must be completely digital, and designed based on the perceived demand over the life of the equipment. The backbone switching exchanges must have the capacity to handle both telephone, telex and data transmission at a minimum speed of 64KBPS. Cognizant of current researches and tests being made to provide a public integrated subscriber's data network that will use the digital technology down to the subscriber loop, it is desirable, but not mandatory, that the specifications of equipment for installation have the utmost flexibility to integrate the other telecommunications services into the network, such as radio and TV transmission, facsimile, teletext, word processing, telemail or such

other services. The full interconnection of existing facilities must be considered, where feasible.

2.2 Distribution

The distribution network must similarly avail of the economic advantage provided using the digital technology. The Ministry requires that public call stations be installed in all municipalities where there are no sizeable demands to operate profitably. The rural exchanges, therefore, must have the capability to connect at least from 50 or lower, to 600 lines or higher so that expansion is assured and upgrading may be implemented at lower incremental costs. Analog systems may be considered only in the areas where there are remote stations necessary, e.g. individual island municipalities.

3. Financial Studies

3.1 Forecasts

The financial aspect of the study must include projected income statements over the life of the project. A discounted cash flows analysis is required, using the current experiences of the operating companies existing in the Philippines as a basis for estimating revenue and expenses growth rates. It is the Ministry objective to install a telecommunications system that will be independently financially viable and can be in a fairly good position to respond to expansion

requirements to meet the present demand by year 2000. The area of operation has considered larger regional aggruppations, in order that, with economies of scale the profitable operations in densely populated areas may cross-subsidize the outlying rural areas.

3.2 Sources of Financing

Due to the high investment requirements for telecommunications investment, the government will assist in securing the financing for the project. The government will, where necessary, invest in the sector and then lease back facilities to a single operator for each of the whole islands of Luzon, Visayas and Mindanao. The government is securing soft long term loans on government to government basis at 20 to 30 years repayment periods, coupled with mixed commercial financing at 8.5% to 12% at 12-15 years maturity.

4. Social Benefits

The Ministry recognizes that there is a lack of an accepted methodology for calculating the social rate of return in the telecommunications industry. An accepted procedure is to calculate the social rate of return by adjusting the financial returns of the project for shadow prices where there is a gap between market prices and the true value for the service and the quantifiable benefits of a consumer surplus to the community.

5. Implementation Plan

As a strategy for implementing the abovestated goals and targets, the phasing of the installation plan may be necessary due to the limited financing available. Rather than to initially set up a backbone system and gradually increase the distribution system in succeeding stages, the Ministry prefers an approach that will phase the installation plan on a comprehensive area by area basis, i.e. to break the regional groups into two or three areas and install a network and a comprehensive distribution system with public toll stations in all the non-profitable municipalities for each area, moving to the other area every year or two years thereafter. The Ministry objective is to implement the whole construction project within the 1983-1987 time frame.

THE PHILIPPINES TODAY IN TELECOMMUNICATIONS (1)

	POPULATION[2] (x 1 Million)	TEL. MAIN STATIONS[3]	TELEPHONE DENSITY[1]
BY URBAN/RURAL AREAS			
Metro Manila (NCR)	5.92	282,141	4.77
Other Urban Areas[4]	1.96	44,063	2.25
Rest of Philippines	40.02	96,574	0.24
TOTAL	47.90	422,778	0.88
BY REGIONS			
NC Region	5.92	282,741	4.77
Region I	3.54	13,008	0.37
II	2.22	2,109	0.09
III	4.79	19,960	0.42
IV	6.11	24,379	0.40
V	3.47	5,281	0.15
VI	4.53	20,953	0.46
VII	3.79	23,793	0.63
VIII	2.81	3,414	0.12
IX	2.45	4,239	0.17
X	2.75	5,910	0.21
XI	3.31	15,099	0.46
XII	2.21	2.492	0.11
TOTAL	47.90	422,778	0.88

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[1] No. of Main Stations/100 people.
[2] As of May 1980.
[3] Includes 9,457 telephones operated by the AFP.
[4] Includes Baguio, Cebu, Bacolod, Iloilo, Davao, Cagayan de Oro cities.

THE PHILIPPINES TODAY IN TELECOMMUNICATIONS (2)

	POPULATION (x 1 Million)	TEL. MAIN STATIONS	TELEPHONE DENSITY[1]
THE PHILIPPINES VIS-A-VIS ASEAN			
SINGAPORE	2.4	379,702	15.82
		645,028	26.87
MALAYSIA	13.3	325,154	2.44
		507,792	3.82
PHILIPPINES[2]	47.9	422,778	0.88
		695,162	1.45
THAILAND	46.1	N.A.	N.A.
		451,000	0.97
INDONESIA	148.5	317,115	0.21
		442,101	0.30
THE PHILIPPINES VIS-A-VIS DEVELOPED COUNTRIES			
PHILIPPINES	47.9	442,778	0.88
		695,612	1.45
SOUTH KOREA	37.6	2,341,198	6.23
		2,898,687	7.71
FRANCE	53.5	13,870,738	25.94
		22,211,952	41.53
U.K.	53.8	17,717,000	31.74
		26,835,000	48.07
JAPAN	115.9	37,760,837	32.59
		53,633,759	46.29
U.S.A.	220.2	91,256,000	41.44
		175,808,000	79.84

NOTE: FIRST LINE FIGURES INCLUDE MAIN STATIONS ONLY;
SECOND LINE FIGURES INCLUDE EXTENSIONS.

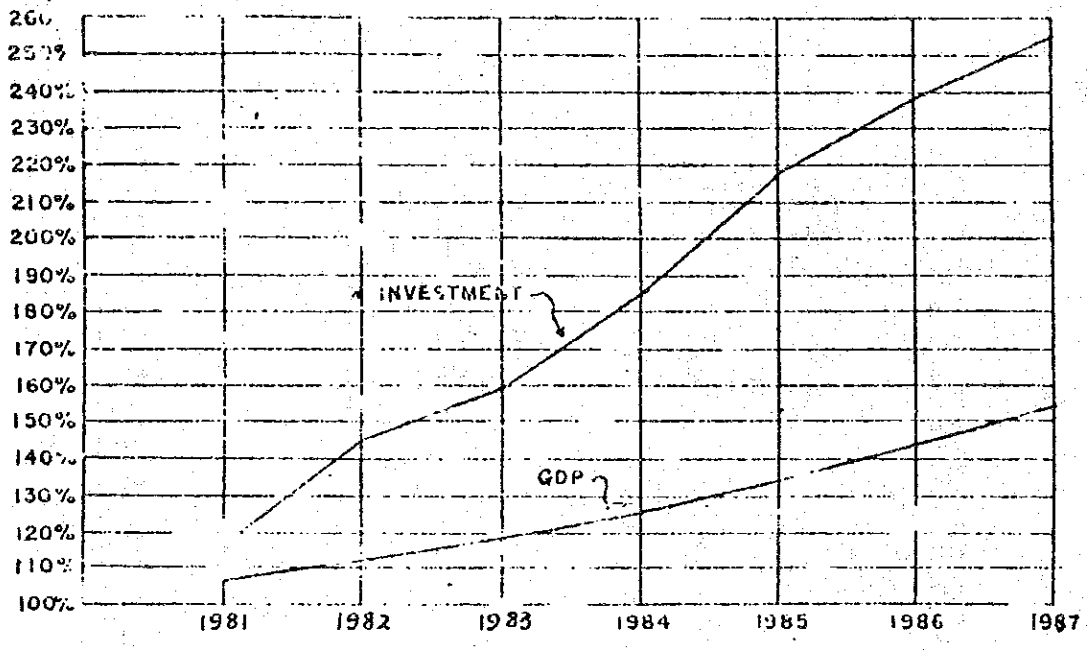
NO. OF MAIN STATIONS/100 PEOPLE
POPULATION AS OF MAY 1980; STATIONS EXCLUDE 9,457 TELEPHONES OPERATED BY THE AFP.

FIVE YEAR STRATEGY

NEDA GDP GROUTH RATE IS 52.6% FOR 1983-1987, BASED ON ITS PRELIMINARY DEVELOPMENT PLAN FOR 1983-1987[1].

IF WE ARE TO MEET 100% OF THE TELEPHONE DEMAND BY YEAR 2000, BASED ON 25% SUPPLY IN 1980, AT LEAST 40% OF THE DEMAND MUST BE MET BY 1987.

	1981	1982	1983	1984	1985	1986	1987	TOTAL
NEDA	5.3%	6.1%	6.3%	6.2%	6.5%	6.5%	6.7%	52.6%
MOTC INVEST.	16.5%	23.4%	11.1%	16.9%	17.1%	9.7%	6.4%	154.9%



AVE:	NEDA	MOTC
	6.2%	14.3%

[1] NEDA DEVELOPMENT PLANNING FOR 1983-1987, SEPT. 1981

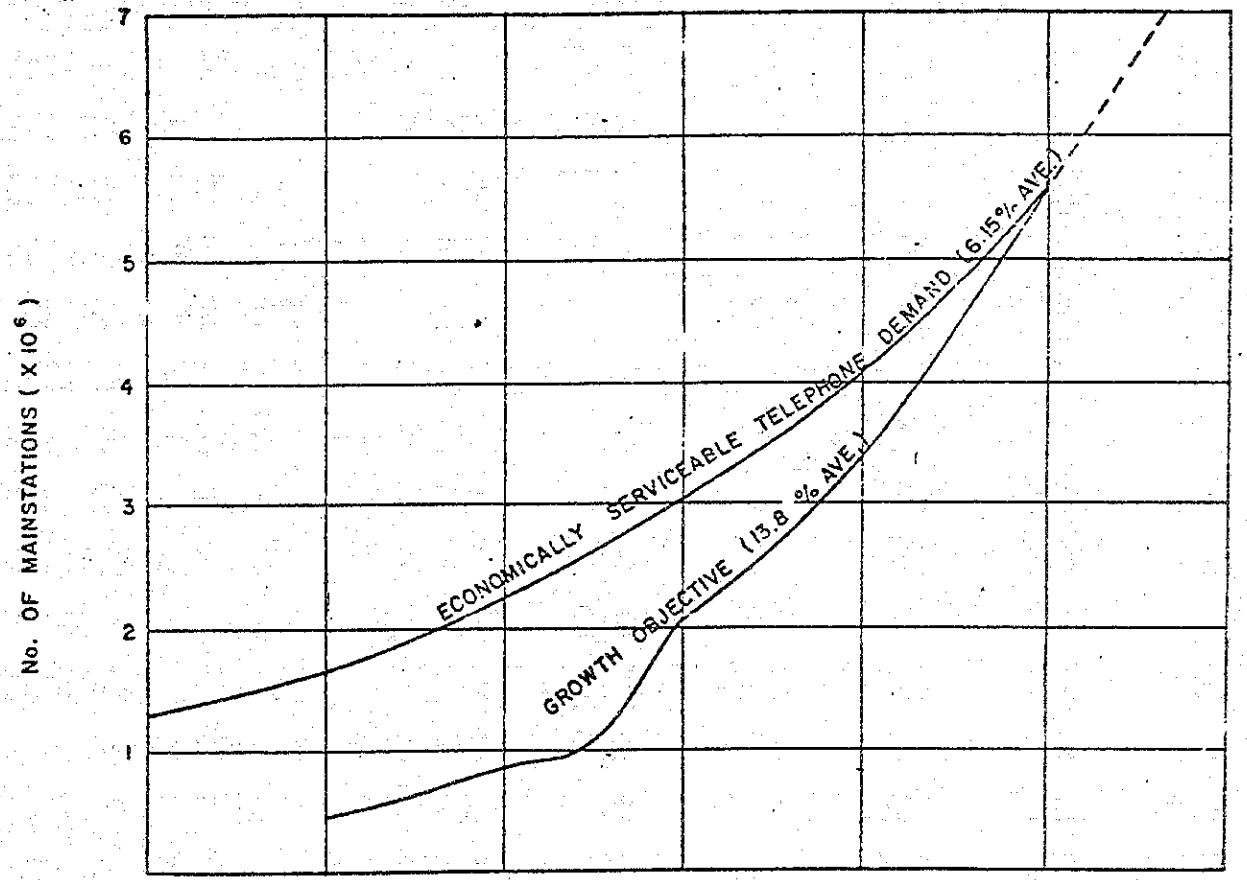
[2] USING MOTC ASSUMPTIONS.

STRATEGY FOR TELECOMMUNICATIONS, A STRATEGY

	1980	1985	1987	1990	1995	2000	GROWTH RATE
TELEPHONE DEMAND	1,695	2,255	2,442	3,024	4,098	5,591	6.15%
TELEPHONE SUPPLY OBJECTIVES	423	923	958	2,019	3,334	5,591	13.8 %
PERCENT DEMAND SATISFIED	25%	41%	39%	67%	81%	100%	7.17%
TELEPHONE DENSITY							
DEMAND	3.5	4.0	4.2	4.75	5.7	7.0	3.5%
SUPPLY	0.9	1.7	1.7	3.2	4.6	6.97	12.8%

NOTE: ALL TELEPHONE FIGURES ARE IN MAIN STATIONS.

TELEPHONE DEMAND & GROWTH OBJECTIVES (1980-2000)



CALENDAR YEAR	1980	1985	1990	1995	2000
% DEMAND SATISFIED	25%	39%	57%	81%	100%
5 - YEAR INCREASES		500,000	1,196,000	1,315,000	2,257,000

TELEPHONE DEMAND FORECASTS[2] (x 1,000)

		GROWTH RATE	1980	1985	1987	1990	1995	2000
I	ILOCOS	6.30%	117	164	179	225	302	396
II	CAGAYAN VALLEY	8.89%	58	96	105	151	225	320
III	CENTRAL LUZON	(3.97%)	171	166	155	128	97	78
IV	SOUTHERN TAGALOG	5.37%	191	250	279	325	405	544
V	BICOL	(0.97%)	47	45	44	43	41	39
VI	WESTERN VISAYAS	3.48%	107	127	136	151	179	212
VII	CENTRAL VISAYAS	4.98%	74	95	103	121	154	195
VIII	EASTERN VISAYAS	(2.99%)	62	54	51	47	40	34
IX	WESTERN MINDANAO	2.24%	53	59	62	67	74	83
X	NORTHERN MINDANAO	5.77	51	68	75	90	119	157
XI	SOUTHERN MINDANAO	0.97%	116	123	124	130	136	140
XII	CENTRAL MINDANAO	0.44%	57	59	59	60	62	62
	REGIONS I-XII	3.65%	1,104	1,306	1,372	1,538	1,834	2,260
	NATL. CAPITAL REGION	9.03%	591	948	1,070	1,486	2,264	3,331
	NATIONAL TOTAL	6.15%	1,695	2,254	2,442	3,024	4,098	5,591

[1] IN MAIN STATIONS.

PROJECTS	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990		1995	2000	
National Telecommunications Dev. Project (UNDP/ITU)	282*1			472*2	482*2						995		1820	3331	
National Capital Region											(19.4%)	12.84%		(12.8%)	13.1%
Regions I, II	15*1		18*2			28*3					259		430	716	
											(33.0%)	56.00%		(10.2%)	21.3%
Regions III, IV	44*1	52*2					62*4				290		424	622	
											(20.8%)	47.10%		(2.9%)	14.2%
Region V	5*1							15*4			24		30	39	
											(17.0%)	16.96%		(5.0%)	10.8%
Region VI, VII	45*1		49*2		140*5						179		271	407	
											(14.8%)	4.18%		(8.6%)	11.6%
Region VIII	3*1			6*6				29*7			30		32	34	
											(25.9%)	-1.14%		(1.3%)	12.9%
Regions IX - XII	28*1		33*2					202*8			242		327	442	
											(24.1%)	6.21%		(6.2%)	14.8%
Philippines	422	430	442	635	736	746	756	958	958	958	2019		3334	5591	
											(17.0%)			(10.7%)	13.8%
Population (Millions)	47.9	49.1	50.4	51.7	53.1	54.6	56.0	57.5	59.0	60.5	62.1		71.9	80.2	
Mainstation Density	0.88	0.88	0.88	1.23	1.39	1.37	1.35	1.67	1.62	1.58	3.25		4.64	6.97	

Notes :
- *1 EXISTING MAINSTATION
- *2 ADDITIONAL FROM PLDT X-4 PROGRAM
- *3 OECF PROJECT
- *4 JICA STUDIES
- *5 SEL-ITT PROPOSAL
- *6 EVITELCO EXPANSION (Eastern Visaya Telephones Company)
- *7 EVITELCO PROPOSAL
- *8 MINDANAO STUDY

TEN YEAR REGIONAL INVESTMENT REQUIREMENT
(IN MILLION PESOS)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
NC	1,996.4	1,094.4	1,706.6	441.7	516.7	513.5	426.8	711.0	426.8	226.0	199.5
Regions I & II	-	94.2	127.5	8 .6	52.7	67.7	79.8	105.0	1,272.0	1,696.5	1,272.0
Region III & IV	-	-	-	89.5	115.5	64.7	43.8	61.5	1,360.0	1,607.5	1,350.0
Region V	-	-	-	45.8	59.6	34.5	22.8	32.0	51.8	6-.0	51.8
Regions VI & VII	-	-	205.5	395.0	616.5	616.5	221.5	156.0	207.0	103.5	51.8
Region VIII	-	9.0	9.0	12.0	118.0	152.9	152.9	56.2	6.0	4.5	4.5
Regions IX - XII	-	-	-	202.9	778.2	1,014.5	1,014.5	372.4	213.8	159.7	159.7
TOTAL (SECTORAL)	1,990.4	1,197.6	2,078.6	1,269.5	2,257.2	2,604.3	1,962.1	1,494.0	3,527.4	4,068.7	3,089.3
									TOTAL ----------		₱ 25,739.1
GOVERNMENT FINANCED[a/]	-	94.2	333.0	815.6	1,740.5	1,950.8	1,535.3	627.1	2,673.8	3,573.0	2,673.8
									TOTAL ----------		₱ 16,017.3

a/ Government financing will only be provided to the following: Regions I & II from 1981-1990; Regions III & IV from 1983-1990; Regions V from 1983-1990; Regions VI & VII from 1982-1986; Region VIII from 1984-1987; and Regions IX-XII from 1983-1987.

SECTORAL INVESTMENT TO GROSS DOMESTIC PRICES

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross Domestic Product [a]	₱ 247,400.0	28[illegible],000.0	321,500.0	366,500.0	417,800.0	478,300.0	543,000.0	619,000.0	705,700.0	804,500.6	917,700.0
Population (millions)	47.9	49.1	50.4	51.7	53.1	54.6	56.0	57.5	59.0	60.5	62.1
Per Capital GDP (Pesos)	5,165.0	5,743.0	6,379.0	7,089.0	7,868.0	8,723.0	9,696.0	10,765.0	11,961.	13,297.0	14,768.0
Telecom Investments [b] (million Pesos)	1,980.4	1,197.6	2,078.6	1,269.5	2,257.2	2,804.3	1,952.1	1,494.0	3,527.4	4,068.7	3,089.3
Investment/GDP [c]	0.80%	0.42%	0.64%	0.35%	0.54%	0.59%	0.36%	0.24%	0.50%	0.51%	0.34%

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[a] Current prices based on 14% p.a. growth rate versus higher NEDA growth rate projections at 17.8% for 1982 - 1987. (NEDA : 5 Year Development Plant 1978 - 82)

[b] Includes expansion programs of the private sector. Based on a 5% inflation rate cost of telecom equipment.

[c] IBRD ratios for developing countries are between 0.03% to 0.61%

6. FIVE YEAR DEVELOPMENT PLAN
for
TELECOMMUNICATION
(1983-1987)

NEDA-MOTC

Sept. 1981

TABLE OF CONTENT

TABLES & APPENDICES

FIVE YEAR PLAN FOR TELECOMMUNICATIONS

Prepared by: The National Economic Development Authority
and the Ministry or Transportation & Communications
25 September 1981

1. SITUATIONAL ANALYSIS

Telecommunications services in the country progressed very slowly during the last plan period. Telephone density per 100 population increased from 0.7 to 0.88 main stations or from 1.29 to 1.45 total telephones, low compared to those of developing countries; 2.44 main stations or 3.82 total telephones in Malaysia and 6.23 or 7.71 in South Korea (Table 1).

Services and development efforts continued to be concentrated largely in profitable urban centers; with telephone density increasing to 4.77 main telephones per hundred population in Metro Manila, 2.25 in other urban centers and remaining at a low 0.24 for the rest of the Philippines (Table 2). This poor balance has resulted in an overall lack or absence of adequate and reliable telephone services in the rural areas.

The creation of the Ministry of Transportation & Communications during the last plan period has, however, triggered renewed thrusts to solve this sad state of telecommunications services facing the country. Already, the Ministry has defined a broad program to develop an integrated telecommunications system that will service the entire country. The principal strategy will be

in the integration of local telephone distribution companies for specified geographic areas, in order that rural systems can be cross-subsidized by the more profitable ones within the given areas; and to strengthen the structure and capabilities of existing government regulatory agencies to better organize and coordinate the growth of the industry.

The thrust of the national telecommunications program is towards providing widespread telecommunications facilities as a stimulus to greater productivity; badly needed at this present stage of national development. The contribution of telecommunications infrastructure to social and economic development is listed in Appendix A.

2. STATE POLICY

The policy of the government and the statement of general objectives for telecommunications is clearly spelled out under Executive Order No.546, creating the Ministry of Transportation & Communications and the National Telecommunications Commission, as follows:

> "Provide, extend and operate by itself or through or together with other entities, private or government, local or national, telephone, telegraph, telex and other public telecommunications services throughout the country whenever economic, social and political development activities warrant the provision thereof: Provided, however, That the national economic viability of the entire network or components thereof is maintained at reasonable rates;

Develop an integrated nationwide transmission system by itself or through or together with other entities in accordance with national and international telecommunications service standards to meet all telecommunications service requirements including, among others, radio and television broadcast relaying, leased channel services and data transmission;

Establish, operate and maintain by itself or through or together with other entities an international switching system for incoming and outgoing international telecommunications services;

Encourage the development of a domestic telecommunications industry in coordination with the concerned entities, particularly the manufacture of communications/electronics equipment and components to complement and support, as much as possible, the expansion, development, operation and maintenance of the nationwide telecommunications network; ..."

3. OBJECTIVES

It is the Ministry objective:

To meet 100% of the demand for telephone, telex and telegraph and other telecommunications service by year 2,000;

To provide service coverage to all municipalities during the next ten years; and

To provide an adequate return on investment to ensure that financial and economic viability is maintained.

In order to meet 100 of the telephone demand by year 2000, starting with a 25% supply situation in 1980 about 40% of the demand must be met by 1987. Main telephone density will then be increased from 0.88 to 1.67 in 1987 and to a 7.0 density target in year 2000. This will require and average annual growth rate of 16.7% over the next five years and 14.53% over the next thirteen years.

4. STRATEGY

To facilitate the achieving of these objectives, the national telecommunications development program seeks to integrate all telecommunications facilities for domestic services into a single public nationwide telecommunications network to serve the national, urban and rural requirements in telecommunications. Such a system will include all types of transmission and reception, at the lowest cost and using the latest in advanced technology.

More specifically, the program will integrate/interconnect all the long lines or backbone networks covering the entire country. Ownership and operation of the distribution system, including the regional backbone, shall be limited to three franchised areas (Luzon, Visayas and Mindanao) or, where possible, to two.

Telex and telegram services will also be integrated nationwide, with one private entity and one government entity for telegram and primarily utilizing the national backbone and other facilities

for its transmission requirements. The same will be true for data communications and the relay of radio and television broadcast signals. The mobile telephone service, interconnected to the public telephone system, will be owned and operated by the franchised area monopoly operator for telephone.

Private networks shall not be authorized, except for communication lines which will supervise and interconnect remote plants through process-control computers. Special services, such as facsimile, paging systems and other value added services, including the installation of various peripheral/terminal equipment shall be allowed through regulated competitive arrangements. All public coast stations in the maritime service shall also be integrated, owned by the government and operated possibly by the private sector with service to all ships at sea and all ports in the country.

Appropriate user-charges shall be instituted, based on the ability of the subscriber to pay for the services. Manpower development programs, to develop the necessary skills and levels of manpower agreements, will be pursued to support the basic and sectoral telecommunications requirements.

Presently, the government is undertaking the following steps:

The franchise system is being organized to allow for the integration of the present 69 operators, on an area basis, in order to allow profitable operations in densely populated areas to cross subsidize the outlying rural areas. The

system of granting of franchises is being renewed, in order that all proponents for franchises shall be screened by the National Telecommunications Commission, prior to the filing of applications in the respective areas of regional governments.

A study for each franchise area has been completed where the country has been grouped into seven regional aggrupations, based on the demand forecasted over the next twenty years. The studies will ensure that each of the areas are independently financially viable and can be in a fairly good position to respond to expansion requirements to meet the forecast demand by year 2000.

The use of the newest technology in telephony, the PCM digital system is being encouraged to avail of advantages from lower network costs, integrated service capability in the backbone and to guard against the early obsolescence of telecommunications systems by the time these become operational. In applying the latest "state-of-the-art" applications, the system can only be, at the worst, one generation behind in technology. It will be capable of being easily upgraded, as is required to satisfy demand within the 20-year time frame.

Due to the massive funding and borrowing requirements for the development of the sector, the government will assist in securing the financing for the sectoral programs and

projects. The government will, where necessary, invest in the sector and then lease back facilities to the franchise operators. All operations are expected to be be financially self sufficient and definitely be left to private sector management.

With the implementation of such programs, investments in progressive local manufacturing facilities for exchanges, instruments, terminals and other telecommunications equipment will be possible. The pursuit of supportive manpower development programs will be continued by upgrading and strengthening the capabilities of the Telecommunications Training Institute.

5. GOALS/TARGETS

The specific goals/targets, within the parameters set by government policy and the sectoral strategies, have been defined as follows:

5.1 In year 1987, a total of 958,000 main stations will be provided nationwide, broken down into 482,000 main stations in NCR and 476,000 main stations in Regions I to XII. This represents from 1980 an additional 535,000 main stations, with 200,000 main stations for NCR and 335,000 main stations for Regions I to XII. The primary criterion for projects through 1987 as discussed in the following section, other than the current expansion programs, is the available financing to both the private sector and government.

5.2 In year 1990, a total of 2,019,000 main stations nationwide will be provided, with 995,000 main stations in NCR and 1,023,000 main stations in Regions I to XII. This represents, from 1987, an additional 1,061,000 main stations nationwide, with 513,000 main stations to be installed in NCR and 547,000 in Regions I to XII. It is expected that the Philippine Long Distance Telephone Company and the other operator/s will be able to secure their own financing to maintain a 12.84% average growth rate from 1984 to satisfy 100% of demand by year 2000.

Additional packages are necessary in the regional projects. Government assistance in financing is required in Regions I-II and Regions III-IV, where the 1987 facilities for these areas will still be far below the demand requirement and of insufficient volume to generate its own internal financing for future expansion.

The 1990 target is intended to serve 75% of the total measured demand. The regional targets are based on a scenario where, in forecasting demand, tariff rates are increased by 40% to, in effect, dampen the demand for telephones.

5.3 In year 2000, a total of 5,591,000 main stations nationwide will be provided, with a main telephone density of 6.97 per hundred population. This represents, from 1990, an additional 3,572,000 main stations nationwide, with 2,336,000 main stations in NCR and 1,236,000 main stations in Regions I to XII.

The growth rates for regional projects, starting from 1990 are "catch up" rates to meet 100% of demand in year 2000. These growth rates range from 5% to 12.8%, or an average of 10.7%. At this stage, no additional government assistance in financing is envisioned, as the regional telephone systems should then be capable of sourcing their own financing to maintain the required regional growth rates that will satisfy all demand.

These goals/targets are found in Tables 3 & 4 and graphically illustrated in Charts 1, 2, 2A & 2B. A Gantt chart is also presented in Chart 3.

6. INVESTMENT REQUIREMENTS

The Ten Year Regional Investment Requirements for the whole sector is shown on Tables 5. Table 6 presents the sectoral investment to GDP ratio. The ratios range from 0.24% to 0.64% as against the IBRD ratios for developing countries of between .03% to 0.61%.

The telecommunications development program for the period 1983-1987, which includes the private sector program, will require an estimated total investment requirement of ₱10,652 million.

Direct government investment (General Fund) in the program is envisioned to reach a total of ₱1,874 million by 1987 (Table 7).

7. REGIONAL DEVELOPMENT PROJECTS (Present to 1987)

The Ministry is currently actively pursuing telcommunications development projects in the seven (7) regional groups that cover the entire Philippines. The Ministry is persuading the private sector to take the lead in undertaking such development programs. These regional development programs are reflected in white bars in Chart 3, illustrating the resulting projected cumulative number of main stations based on the respective planned or proposed time schedules from 1981 to 1987. A total of 958,000 main stations is expected to be installed by 1987; this will increase telephone density to 1.67 per hundred population.

7.1 The National Capital Region

Prior to 1973, there were three telephone companies operating in the National Capital Region, the PLDT, the Republic Telephone Company (RETELCO) and the government Bureau of Telecommunications (BUTEL). During the early seventies, the BUTEL dismantled its telephone operations in Metro Manila to pave the way for an area monopoly operator. Subsequently, the PLDT acquired the assets of RETELCO in early 1981.

The PLDT, prior to the merger, operated 253,400 main stations in the Greater Manila area, and RETELCO operated 28,700 main stations in the suburbs of Greater Manila. The PLDT now has an extensive land line distribution system in the center and the surrounding areas of Manila. The

PLDT X-4 expansion program will establish new electronic analog exchanges that will supplement the old existing exchanges and provide an additional 200,000 main stations by 1984. The total investment is ₱4,990 million for 231,100 main stations, including the provincial telephones and telephones installed in 1980, with an average cost per line of ₱21,595. The PLDT is currently securing financing for the succeeding expansion phase of its X-5 program.

7.2 Region I & II

In addition to the BUTEL and PLDT and its related companies, there are eight local telephone companies operating in Regions I & II. Five of these companies, in 12 municipalities, are not interconnected to the PLDT backbone. A total of 15,000 main stations exist in 40 of the 289 municipalities, as of 1980. The PLDT terrestrial network extends up to Dagupan in Pangasinan and San Fernando in La Union and the X-4 program will further expand its toll trunks to Baguio.

The BUTEL has submitted, as early as 1980, a project for a regional transmission network in Regions I & II under the OECF 9th Yen Credit in the amount of approximately $34.7 milliom plus a counterpart fund of about ₱155 million or a total cost of US $55 million. Evaluation of bids is presently being undertaken.

The project, consisting of an electronic analog system, will interconnect to the PLDT trunklines in Baguio City and will extend from Baguio City to the Ilocos Region and the Cagayan Valley. The existing project excludes a necessary link to complete the loop from Ilocos Norte to Cagayan.

It will provide 24 local exchanges for 9,500 main stations in 16 new municipalities and 20 toll booths in 20 additional municipalities, each with 40 line PABX stations by 1985. This will increase the geographical coverage from 40 to 76 of the 289 municipalities in the Region. Two provinces, Ifugao and Kalinga-Apayao, will however, remain without any local telephone systems.

A Phase II is presently being proposed under the OECF 10th or 11th Yen Credit for an additional 24,170 main stations and 36 local exchanges with 37 toll stations. The estimated cost for Phase II including a $35 million foreign component and a ₱150 million local counterpart. In addition, the PLDT X-4 program includes the installation of an additional 3,000 lines, by 1982; in La Union and Pangasinan.

7.3 Regions III and IV

There are 14 local telephone companies, in addition to BUTEL, PLDT and its subsidiaries. A total of 44,300 main stations exist in 93 of the 323 municipalities. Three telephone companies, operating in 9 municipalities, are not interconnected to the PLDT backbone.

The PLDT backbone extends north from Manila to Bulacan, Pampanga, Tarlac, Nueva Ecija and Aurora; and south from Manila to Batangas, Bataan, Laguna, Quezon and into Region V in Camarines Norte, Camarines Sur, Albay and Masbate.

A preliminary feasibility study has just been completed by JICA for a backbone and distribution network covering Regions III and IV, with the exception of Palawan. A review of the study is being made by the Ministry and the BUTEL to be completed by the end of October 1981. This will be the basis for funding under the 11th or 12th Yen Credit Loan. The estimated cost for the project is $50 million, of which P105 million is the local component.

The Ministry has submitted to the JICA its network design, based on a 960 channel backbone, with connecting loops northward to Zambales, San Fernando, Quezon and southward to Batangas, Mindoro, and Marinduque. It is projected to provide, as in Regions I and II, approximately 10,000 main stations under Phase I. In addition, the PLDT X-4 expansion program includes the upgrading of its existing trunk lines and the installation of an additional 3,000 lines in Batangas, Bataan and Laguna by 1981.

7.4 Region V

There are 6 local telephone operators in Region V other than BUTEL and PLDT. These operate a total of 5,281 main stations in 15 municipalities out of the 115 municipalites in the region. The BUTEL system is not interconnected to the PLDT backbone.

The existing PLDT backbone from Manila to Cebu traverses Naga City, Albay and Masbate. Its X-4 program will also provide an additional loop to Cebu through Sorsogon and Region VIII.

The Ministry submitted in early 1981 its application for JICA assistance to undertake a feasibility study for this region. The Ministry has proposed the establishment of new trunk lines to provide a loop to the PLDT backbone from Quezon to Sorsogon via Camarines Norte, Camarines Sur and Catanduanes. It may be expected that approximately 10,000 main stations may be installed under Phase I and an additional 9,000 main stations under Phase II of this project. The estimated cost of the project is US $26 million.

7.4 Regions VI & VII

There are six local telephone comapnies operating in Regions VI and VII, in addition to the PLDT and the BUTEL. These operate a total of 44,000 main stations in 23 of the 262 municipalities. The BUTEL system is not interconnected to the PLDT system. The existing PLDT terrestrial network connects the island of Panay and Negros to Cebu from Manila. Its current X-4 expansion program will similarly connect Tagbilaran, Bohol and Cebu and install an additional 4,500 lines by 1982.

A comprehensive proposal was received in December 1980 from SEL/ITT for a high density PCM (pulse code modulated) digital network for Regions VI and VII. The proposed network includes intra-provincial toll trunks that will interconnect into the

PLDT X-4 backbone, with a 960 channel backbone. The proposal carries a financing proposal, as well, from the West German government, consisting of a capital aid loan and buyers credit, totalling US $240 million. An additional $34 million in government bonds may have to be floated to cover pre-operating expenses including real estate, organization costs, financing fees, interest expenses during construction.

The project consists of a network of 103,000 main stations in all of the 262 municipalities and provides an average of 7 toll booths for municipalities with insufficient demand.

7.6 Region VIII

There are three telephone companies operating in Region VIII; the telephone system in Tacloban City, operated by a corporation owned by the provincial government Eastern Visayas Telephone Co. (EVTELCO); the Calbayong Telephone System; and the BUTEL systems in Baybay, Borongan, Catarman, Catbalogan, Guian, Ormoc, and Maasin, all of which are not interconnected to the PLDT backbone. A total of 2,400 main stations exist in nine of the 138 municipalities in Region VIII.

The PLDT under its X-4 program will provide an additional toll trunk line from Manila to Cebu thru Calbayog, Catbalogan and N. Leyte; and from Cebu to Surigao thru Bohol and Southern Leyte. One hundred line stations each will be installed in Tolosa and Burauen, Leyte.

Eastern Visayas Telephone Co. (EVTELCO) has been recently granted a telephone franchise by the City of Tacloban. It is now in the process of securing a franchise for Leyte and Samar which will allow it to service all the municipalities in these two islands.

The project will initially consist of a computer PCM digital network for Tacloban City only, with 3,000 main stations by 1983 at the cost of about US $4 million. A subsequent program will expand this network by 23,000 additional main stations by 1987, costing about US $68 million. The Ministry will require that EVTELCO adopt the regional network design within the national network system.

7.7 Regions IX-XII

There are 24 local telephone companies, in addition to BUTEL and the PLDT and its subsidiaries, operating in the whole Mindanao. There are 27,700 main stations existing in 30 of the 374 municipalities. There is interconnection to the PLDT backbone from 16 of the 24 local telephone companies, representing 12 of the 30 municipalities or 7,500 of the 27,700 existing main stations.

The PLDT terrestrial network (240-300 channels) extends from Cebu to Davao thru Siquijor, Cagayan de Oro, Pagadian and Cotabato. It expects to install another 3,000 lines by 1982 in Sasa, Davao and reinstall 2,200 lines of step-by-step

equipment in Zamboanga by 1982 at an estimated cost of US $8.5 million.

A preliminary proposal was submitted in 1977 by the French consortium for a microwave backbone network that would link Cagayan de Oro, Pagadian, Zamboanga, Agusan, Davao and Surigao to the PLDT backbone. Negotiations, however, failed in late 1980. The Ministry is presently securing the interest of international suppliers to submit proposals for this project on a turn-key basis with financing. Preliminary studies by the Ministry indicate requirements for a 960-1200 channel backbone network and a distribution system, with approximately 170,000 main stations by 1987. The project is estimated to cost about US $450 million.

8. OTHER PROGRAMS/PROJECTS

8.1 Domestic Records Services

There are 338 municipalities out of the 1,561 nationwide without telegram service. Duplication exists in 309 of the 1,223 municipalities with service (Table 8). The government BUTEL has facilities in 1,217 municipalities. There are 10 major companies in the private telegraph/telex service, four(4) of which are owned by one single company, as follows:

- Telectronic Systems, Inc., owner of
  - Philippine Telegraph & Telephone (PT&T)
  - Capitol Wireless, Inc. (CAPWIRE)

- Philippine Wireless, Inc. (TELEFAST)
- Central Radio Communications (CRC)

° Radio Communications of the Philippines (RCPI)

° Clavecilla Radio System (CRS)

° Francisco N. Cervantes (BFC Communications)

° Federal Wireless System (FEDERAL)

° Universal Telecommunications Service (UTS)

° Radio Marine Philippines, Inc.

The Ministry is currently discussing with these companies to integrate all these companies. The emerging single company will provide telegraph/telex services in the profitable areas.

The telegram service is considered as a basic telecommunications service which should be provided to all cities/municipalities and urban centers. This service, in the experience of other countries, has been subsidized by the government. For this reason, the BUTEL telegram/telex network will remain and continue to extend its facilities to all non-profitable areas.

The two networks, one private and one government, shall, therefore, co-exist within an atmosphere of healthy cooperation, taking into account public interest and welfare. Service interconnection between the two systems will be effected as much as may be technically possible and acceptable to both operators. The development of the two networks will take

into consideration the development program of other telecommunication services, particularly the telephone service. It will take into account the use of all available and proposed facilities, with the view of avoiding unnecessary duplication of investments in transmission facilities.

A preliminary study has been undertaken to determine the investment requirements and the desireable program of the government for the telegram service (Table 9). The same is presently being reviewed by the Ministry, and indicates that ₱573 million will be required by the sector over the next five years for the telex-gentex service and ₱622 million for the data communications service. The BUTEL requirement is estimated at ₱370 million, as contained in the Government's Investment Program (Table 7) and detailed in the BUTEL's Program (Table 10).

It is expected however that these estimates will be reduced as the subscriber telex terminals, telegraph stations or computer terminals may then be hooked directly to the central digital switching exchange in the telephone backbone system. Incremental costs will be limited to the subscriber circuits/boards, connectors, teletype machines and the like.

8.2 Existing Facilities

This aspect will involve the improvement and maintenance of existing BUTEL facilities such as inter-provincial telephone systems, low channel long lines facilities, telegraph stations, telex/gentex facilities, and telecommunications

buildings and other civil works. This will ensure that the economic lives of existing facilities, especially the telex/gentex facilities, are prolonged. The telephone system will, where warranted be turned over to the private sector operator for integration.

8.3 Training

The national program, as envisioned, will demand the expansion and upgrading of the present trianing facilities of both the public and private sectors. This will provide for the present and future telecommunications manpower requirements. For government, the Telecommunications Training Center will require additional buildings for laboratories, classrooms, trainees quarters and auditorium facilities. The total number of training and support staff will also have to be increased.

8.4 International Records Carriers

There are five carriers including the communications satellite in the international records service, as follows:

	As of 1980		
	Net Sales	%Telex Share	%Telegraph Share
Phil. Global Communications, Inc.	₱127.9M	31.4	45.0%
Eastern Telecommunications Phils.	125.6M	27.9	13.7%
Globe MacKay Cable & Radio Corp.	99.7M	36.0	34.6%
Capitol Wireless, Inc.	35.8M	4.7%	6.7%
Phil. Communications Satellite, Inc.	-	-	-
	₱389.0M	100.0%	100.0%

These companies generally are able to deliver an efficient service with good market shares. Capitol Wireless, however, does not have an equal share of the market.

8.5 Other Services

8.5.1 Data Communications

It is the Ministry objective to provide a public service for Data Communications. The National backbone is being developed to allow interconnections of computer terminals thru a switch located in the same exchange. The backbone network being developed will be capable of handling 64 KBPS Data Transmission.

8.5.2 Private Networks

The development/installation of private networks using microwave, PCM cable or advanced technology systems shall not be authorized except for interconnecting manufacturing plants via process-control computers that manage and regulate instanteously (seconds) the actual flow of valuable products (such as power or electricity).

The use of the public utility network will be encouraged at all times.

8.5.3 Satellite Communications

There will only be one satellite communications to be installed and developed in selected remote areas of the country in complementation with the public terrestial network.

8.5.4 Marine Coastal Communications

A governmnent-owned single Marine Coastal Communications system shall be developed to provide ship-to-shore communications in complementation with the public terrestial network.

Existing coastal stations will be integrated under the new network. This service in the experience of other countries has also been subsidized.

8.5.5 Mobile Radio Communications

Only the telephone franchised area monopoly operators shall be authorized to provide Mobile Radio Communications interconnected to the public telephone system. Private mobile radios shall be discouraged and interconnection of such sets directly to the public telephone system shall be totally banned.

8.5.6 Radio Communications

Due to the overcrowding of existing frequencies, expansion of radio communications facilities will be discouraged. Additional frequencies will not be granted.

8.5.7 Radio/TV Broadcasting

A study will be undertaken together with the private regulatory agencies to review the existing Radio/TV broadcasting systems to identify areas for improvement.

8.5.8 Facsimile, Paging Devices, Other Values Added Services

Control and supervision of facsimile, paging devices, user peripheral equipments such as PABX and telephone sets will be deregulated, except as to the assignment of frequencies and the payment of fees thereto.

8.6 In-country Manufacturing Program Strategy

With the implementation of the above programs, investments in in-country manufacturing facilities can then be encouraged.

A study is being undertaken to determine the most feasible approach on a forward or backward linkage. Presently there are manufacturers of telephone sets, and old switching equipment (more of branch exchanges) of obsolete designs. There are also existing producers of telephone wire and cables. The reluctance of foreign companies to invest in the Philippines may be attributed to the absence of a definite program, a lack of a basis for quantifying market demand. Technology, on the other hand, has advanced tremendously over the past two decades, making existing facilities in the country obsolete. The compensating factor is the integration in technology from the use of the electronic components, the "computer on a chip". All means of telecommunications, including telephone, telex, telegraph, data, facsimile, television and radio are consolidating into a single modular production system.

There are also operating manufacturing companies in the country for the assembly of electronic components and parts, boards and circuits. The application of existing local technology, in the manufacture of these parts, is being examined to determine whether the same may be utilized in a program for manufacturing digital telephone exchanges and switchboards on a forward linkage. Such an approach may prove more beneficial to the national economy and may be consistent with a total in-country manufacturing devellopment program, rather than merely adopting a backward linkage approach by assembling telephone sets, instruments, teletype printers; and other peripheral

equipment.

Government is developing jointly with the Ministry of Industry this in-country manufacturing program. When this is implemented, a maximum of three telecommunications manufacturing companies in the Philippines will be the standard supplier(s) of equipment in the country. The Ministry, at present, has started to implement standardization and compatibility in the procurement of equipment.

Todate five companies have signified their intentions to establish local manufacturing plants in the country. GTE Industries, Inc. has an existing plant for manufacturing telephone instruments and plans for assembling branch exchanges on a backward linkage. Stromberg-Carlson, a General Dynamics subsidiary, and the Ericson Group have separately proposed the production of digital telephone exchanges on a forward linkage that may utilize as production inputs electronic boards and circuits assembled locally and that will manufacture both for local consumption and exports to Asia and Africa. Siemens, A.G. is seeking registration with the Board of Investments as a pioneering enterprise for manufacturing of telephone instruments connectors, boards and other peripheral equipments on a (backward linkage). Standard Electrik Lorenz SA (SEL) is proposing the establishment of a software house for telecommunications equipments. Similarly the American Chamber of Commerce has expressed its interest in encouraging its member firms to participate in such manufacturing projects.

THE PHILIPPINES TODAY IN TELECOMMUNICATIONS (2)

	POPULATION (x 1 MILLION)	TEL. MAIN STATIONS	TELEPHONE DENSITY[1]
THE PHILIPPINES VIS-A-VIS ASEAN			
SINGAPORE	2.4	379,702	15.82
		645,028	26.87
MALAYSIA	13.3	325,154	2.44
		507,792	3.82
PHILIPPINES[2]	47.9	422,778	0.88
		695,162	1.45
THAILAND	46.1	N.A.	N.A.
		451,000	0.97
INDONESIA	148.5	317,115	0.21
		442,101	0.30
THE PHILIPPINES VIS-A-VIS DEVELOPED COUNTRIES			
PHILIPPINES	47.9	442,778	0.88
		695,612	1.45
SOUTH KOREA	37.6	2,341,198	6.23
		2,898,687	7.71
FRANCE	53.5	13,870,738	25.94
		22,211,952	41.53
U. K.	53.8	17,717,000	31.74
		26,835,000	48.07
JAPAN	56.9	17,760,837	32.59
		53,633,759	46.29
U. S. A.	220.2	91,256,000	41.44
		175,808,000	79.84

NOTE: FIRST LINE FIGURES INCLUDE MAIN STATIONS ONLY; SECOND LINE FIGURES INCLUDE EXTENSIONS.

[1] NO. OF MAIN STATIONS/100 PEOPLE
[2] POPULATION AS OF MAY 1980; STATIONS EXCLUDE 9,457 TELEPHONES OPERATED BY THE AFP.

THE PHILIPPINES TODAY IN TELECOMMUNICATIONS (1)

	POPULATION[2] (x 1 Million)	TEL. MAIN STATIONS[3]	TELEPHONE DENSITY[1]
BY URBAN/RURAL AREAS			
Metro Manila (NCR)	5.92	282,141	4.77
Other Urban Areas[4]	1.96	44,063	2.25
Rest of Philippines	40.02	96,574	0.24
TOTAL	47.90	422,778	0.88
BY REGIONS			
NC Region	5.92	282,741	4.77
Region I	3.54	13,008	0.37
II	2.22	2,109	0.09
III	4.79	19,960	0.42
IV	6.11	24,379	0.40
V	3.47	5,281	0.15
VI	4.53	20,953	0.46
VII	3.79	23,793	0.63
VIII	2.81	3,414	0.12
IX	2.45	4,239	0.17
X	2.75	5,910	0.21
XI	3.31	15,099	0.46
XII	2.21	2,492	0.11
TOTAL	47.90	422,778	0.88

1. No. of Main Stations/100 people.
2. As of May 1980.
3. Includes 5,457 telephones operated by the AFP.
4. Includes Baguio, Cebu, Iloilo, Davao, Cagayan de Oro cities.

TELEDENSITY DEMAND FORECASTS[2] (x 1,000)

		GROWTH RATE	1980	1985	1987	1990	1995	2000
I	ILOCOS	6.30%	117	164	179	225	302	396
II	CAGAYAN VALLEY	8.89%	58	96	105	151	225	320
III	CENTRAL LUZON	(3.97%)	171	166	155	128	97	78
IV	SOUTHERN TAGALOG	5.37%	191	250	279	325	405	544
V	BICOL	(0.97%)	47	45	44	43	41	39
VI	WESTERN VISAYAS	3.48%	107	127	136	151	179	212
VII	CENTRAL VISAYAS	4.98%	74	95	103	121	154	195
VIII	EASTERN VISAYAS	(2.99%)	62	54	51	47	40	34
IX	WESTERN MINDANAO	2.24%	53	59	62	67	74	83
X	NORTHERN MINDANAO	5.77	51	68	75	90	119	157
XI	SOUTHERN MINDANAO	0.97%	118	123	124	130	136	140
XII	CENTRAL MINDANAO	0.44%	57	59	59	60	62	62
	REGIONS I-XII	3.65%	1,104	1,306	1,372	1,538	1,834	2,260
	NATL. CAPITAL REGION	9.03%	591	948	1,070	1,486	2,264	3,331
	NATIONAL TOTAL	6.15%	1,695	2,254	2,442	3,024	4,098	5,591

[2] IN MAIN STATIONS.

STRATEGY FOR TELECOMMUNICATIONS, A STRATEGY

	1980	1985	1987	1990	1995	2000	GROWTH RATE
TELEPHONE DEMAND	1,695	2,255	2,442	3,024	4,098	5,591	6.15%
TELEPHONE SUPPLY OBJECTIVES	423	923	958	2,019	3,334	5,591	13.8 %
PERCENT DEMAND SATISFIED	25%	41%	39%	67%	81%	100%	7.17%
TELEPHONE DENSITY							
DEMAND	3.5	4.0	4.2	4.75	5.7	7.0	3.5%
SUPPLY	0.9	1.7	1.7	3.2	4.6	6.97	12.8%

NOTE: ALL TELEPHONE FIGURES ARE IN MAIN STATIONS.

TEN YEAR REGIONAL INVESTMENT REQUIREMENT
(IN MILLION PESOS)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
NC	1,996.4	1,094.4	1,706.6	441.7	516.7	833.5	426.8	711.0	426.8	226.0	199.5
Regions I & II	-	94.2	127.5	8 .6	52.7	67.7	79.8	105.0	1,272.0	1,696.5	1,272.0
Region III & IV	-	-	-	89.5	115.5	64.7	43.8	61.5	1,360.0	1,607.5	1,350.0
Region V	-	-	-	45.8	59.6	34.5	22.8	32.0	51.8	6-.0	51.8
Regions VI & VII	-	-	205.5	395.0	616.5	616.5	221.5	156.0	207.0	103.5	51.8
Region VIII	-	9.0	9.0	12.0	118.0	152.9	152.9	56.2	6.0	4.5	4.5
Regions IX - XII	-	-	-	202.9	778.2	1,014.5	1,014.5	372.4	213.8	159.7	159.7
TOTAL (SECTORAL)	1,990.4	1,197.6	2,078.6	1,269.5	2,257.2	2,804.3	1,962.1	1,494.0	3,527.4	4,068.7	3,089.3
									TOTAL ----------		₱ 25,739.1
GOVERNMENT FINANCED[a/]	-	94.2	333.0	815.6	1,740.5	1,950.8	1,535.3	627.1	2,673.8	3,573.0	2,673.8
									TOTAL ----------		₱ 16,017.3

a/ Government financing will only be provided to the following: Regions I & II from 1981-1990; Regions III & IV from 1983-1990; Regions V from 1983-1990; Regions VI & VII from 1982-1986; Region VIII from 1984-1987; and Regions IX-XII from 1983-1987.

SECTORAL INVESTMENT TO GROSS DOMESTIC PRICES

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross Domestic Product [a/]	₱ 247,400.0	281,000.0	321,500.0	366,500.0	417,800.0	478,300.0	543,000.0	619,000.0	705,700.0	804,500.0	917,700.0
Population (millions)	47.9	49.1	50.4	51.7	53.1	54.6	56.0	57.5	59.0	60.5	62.1
Per Capital GDP (Pesos)	5,165.0	5,743.0	6,379.0	7,089.0	7,866.0	8,723.0	9,696.0	10,765.0	11,961.	13,297.0	14,788.0
Telecom Investments [b/] (million Pesos)	1,990.4	1,197.6	2,078.6	1,269.5	2,257.2	2,804.3	1,982.1	1,494.0	3,527.4	4,068.7	3,089.3
Investment/GDP [c/]	0.80%	0.42%	0.64%	0.35%	0.54%	0.59%	0.36%	0.24%	0.50%	0.51%	0.34%

a/ Current prices based on 14% p.a. growth rate versus higher NEDA growth rate projections at 17.8% for 1982 - 1987. (NEDA : 5 Year Development Plant 1978 - 82)

b/ Includes expansion programs of the private sector. Based on a 5% inflation rate cost of telecom equipment.

c/ ISRD ratios for developing countries are between 0.03% to 0.61%

TABLE 7
Investment Requirements
CY 1983-1987
Summary by Source of Funds
(In Million ₱/$)

CATEGORY: General Summary

SOURCE OF FUNDS	Total CY 1983-1987	1983	1984	1985	1986	1987
General Fund (₱)	1874.00	279.30	390.50	454.00	413.00	332.20
Foreign Borrowing Grant (₱)	777.10	116.80	197.30	219.80	174.50	68.50
Grand Total (₱)	7702.25**	1155.30	1870.25	2102.50	1726.75	847.45

**Excludes investments for the NCR Network (₱2,949.7 million for 1983-87).

Table 7-A

Project/Status	Estd. Total Requirement (1983-1987) Total in Peso		ANNUAL INVESTMENT					Remarks
		₱ / $	1983	1984	1985	1986	1987	
FOREIGN ASSISTED PROJECTS								
1. Development of Telecommunications Training Inst.	₱ 13.50	13.50	3.50	2.50	2.50	2.50	2.50	General Fund
		$ 1.50	0.50	0.50	0.50	-	-	JICA Grant
2. Rural Telecommunications Development Project Region I & II	500.00	249.50	50.00	35.00	35.00	65.00	63.50	General Fund
		$ 33.40	4.40	4.00	6.50	8.50	10.00	Foreign Borrowing
3. Rural Telecommunications Development Project, Regions III & IV	375.00	105.00	13.70	26.20	32.60	16.80	15.70	General Fund
		$ 36.00	10.10	11.90	4.30	3.60	6.10	Foreign Borrowing
4. Rural Telecommunications Development Project, Region V	194.70	58.20	7.60	14.60	19.00	9.30	8.70	General Fund
		$ 18.20	5.10	6.00	2.20	1.80	3.10	Foreign Borrowing
5. Rural Telecommunications Development Project Regions VI & VII	2,055.00	255.00	74.00	76.50	76.50	28.00		General Fund
		$ 240.00	70.20	72.00	72.00	25.80		Foreign Borrowing
6. Telecommunications Dev. Project Regionwide, Reg. VIII	540.00	132.00	5.30	24.30	30.60	30.60	41.20	General Fund
		$ 54.40	3.30	12.50	16.30	16.30	6.00	Foreign Borrowing
7. Rural Telecommunications Dev. Proj. Reg. IX, X, XI, XII	3,382.55	419.30	25.20	96.40	125.80	125.80	46.10	General Fund
		395.10	23.70	90.90	118.50	118.50	43.50	Foreign Borrowing
Sub-Total	₱7,060.75	1,232.50	179.30	275.50	321.00	279.00	177.70	
		777.10	116.80	197.30	219.80	174.50	68.70	

	Total In Peso	₱	$	1983	1984	1985	1986	1987	Remarks
B. LOCALLY FUNDED PROJECTS									
1. Major Repair and Expansion of Government Telephone Exchange and Establishment of IPTS	₱ 87.90	87.90		12.00	15.00	18.00	20.00	22.90	General Fund
2. Improvement/Development of Long Lines Facilities	85.60	85.60		12.00	15.00	19.00	20.00	19.60	General Fund
3. Establishment/Improvement of Telegraph Stations	89.00	89.00		13.00	16.00	18.00	20.00	22.00	General Fund
4. Improvement/Development of Telex/Gentex Facilities	316.00	316.00		55.00	59.00	66.00	64.00	72.00	General Fund
5. Buildings, Right of Ways, Civil Works, etc.	63.00	63.00		8.00	10.00	12.00	15.00	18.00	General Fund
Sub-Total - - -	₱ 641.50	641.50		100.00	115.00	133.00	139.00	154.50	
T O T A L - - -	₱7702.25	+ 1874.00		279.30	390.50	454.00	418.00	332.20	
		$ 777.10		116.80	197.30	219.80	174.50	68.70	

NOTE ** JICA COMPONENT
* ON-GOING PROJECTS

+ Excludes investments for the NCR Network (₱2,949.7 million for 1983-87).

FIVE YEAR DEVELOPMENT PLAN

CY 1983-1987

Kinds of Telecommunications Type of Project	Total	Yearly Physical Targets 1983	1984	1985	1986	1987
A. FOREIGN ASSISTED PROJECTS						
Development of Telecommunications Training Institute						
a. Completion of two storey building (sq. meter floor area)	720	720				
b. Trainess quarters (sq. meters)	420	420				
c. Recreation facilities (sq. meters)	2,750		2,750			
d. Repair of Caloocan Exchange (sq. meters)	288		288			
e. Training of Counter Parts (Man-month)	58	11	17	15	15	
2. Rural Telecommunications Development Project, Regions I and II						
a. Telephones	14,300	3,200	3,200	3,100	2,400	2,400
b. I P T S	45	8	7	5	12	13
c. Gentex Stations	57	8	10	9	15	15
3. Rural Telecommunications Development Project, Regions III and IV						
a. Telephones	8,800		500	6,000	2,300	
b. IPTS Station	10		3	4	3	
c. Gentex Station	38		2	25	11	

NAME OF PROJECT	Total	1983	Yearly Physical Target 1984	1985	1986	1987
4. Rural Telecommunications Development Project, Region V						
Telephones	10,000			3,000	3,000	4,000
5. Telecommunications Development Project, Region VI and VII						
Telephones	103,000		26,000	26,000	26,000	25,000
6. Telecommunication Development Project, Regionwide (Reg. VIII)						
Telephones	23,000		5,000	6,000	6,000	6,000
/7. Rural Telecommunications Development Project, Regions IX, X, XI and XII						
Telephones	170,000		40,000	40,000	45,000	45,000

Name of Project	Total	Years Fiscal Period 1981	1982	1983	1984	1985
Locally Funded Projects:						
Major Repair and Expansion of Government Telephone Exchanges and Establishment of IPTS						
a. Telephone Lines	5,500	400	1,000	600	1,600	1,900
b. IPTS	18	5	2	8	2	1
2. Improvement/Development of Long Lines Facilities (Circuit Kilometers)	9,800	1,300	1,700	2,000	2,000	2,500
3. Establishment/Improvement of Telegraph Stations						
a. Stations	200	40	40	40	40	40
b. Circuit Kms. Improvement	166,055	23,140	29,418	33,654	37,861	42,072
4. Improvement/Development of Gentex/ Telex Facilities						
a. Exchanges (Lines)	1,600		850	150	600	
Gentex Stations	128	28	21	25	24	30
5. Telecommunications Buildings, Right of Ways, and other Civil Works for NCR and the twelve (12) Regions (sq. Meters)	51,571	4,400	6,477	12,915	13,579	14,200

DOMESTIC RECORDS CARRIERS

TELEGRAM SERVICE IN DIFFERENT MUNICIPALITIES
(As of 31 December 1980)

		Number of Municipalities
Total, Philippines		1,561
Without Service		338
With Service		
One Operator	914	
Two Operators	201	
Three Operators	58	
Four Operators	24	
Five Operators	12	
Six Operators	6	
Seven Operators	2	
Eight Operators	6	1,223

DISTRIBUTION OF NATIONWIDE TELEGRAPH FACILITIES

	Gov't	Private	Total
NC Region	16	15	31
Region I	84	36	120
II	90	20	117
III	112	31	143
IV	199	63	262
V	107	49	156
VI	120	38	158
VII	112	51	163
VIII	123	45	168
IX	59	39	98
X	80	59	139
XI	60	42	102
XII	55	33	88
TOTAL	1,217	528	1,745

SECTORAL INVESTMENT (×P.1000)

Table 9

	1982-1986	1987-1991
Telex-centex service		
Telex Exchance*	P 105,630	P 121,665
Line Concentrator	26,240	44,500
TTY Machine	242,100	277,200
Carrier (VF) Transmission Ecuipment*	109,800	82,800
Civil Works	5,210	1,730
Radio Equipment	44,500	29,500
Mix Eouipment	39,100	21,840
Sub-Total	P 572,700	P 529,235
TOTAL		P 1,151,935
DATA COMMUNICATIONS SERVICE		
Data Switching Exchange	P 37,905	P 21,595
Computer/Processors	72,000	96,000
Through Put Equipment	199,360	130,800
Input/Output Equipment	162,900	95,000
Other Costs	150,000	100,000
Sub-Total	P 622,165	P 443,395
TOTAL	P 1,194,865	P 1,065,560

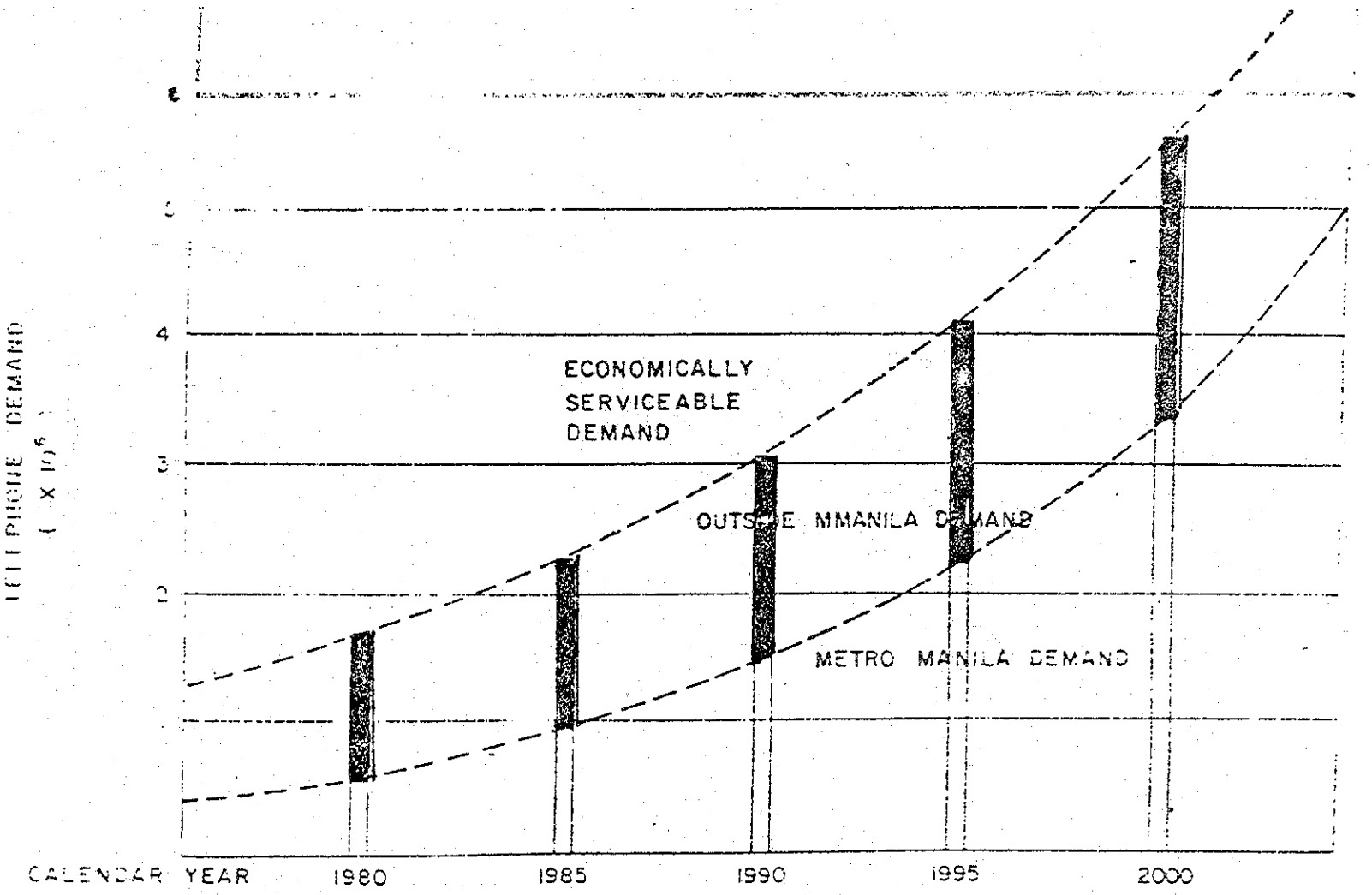
Telex/transmission equipment investments may be reduced with the application of SPC digital exchanges for the telephone backbone system.
Incremental costs for telexsubscribers will then be limited to the telex card, teletype machines, concentrators.

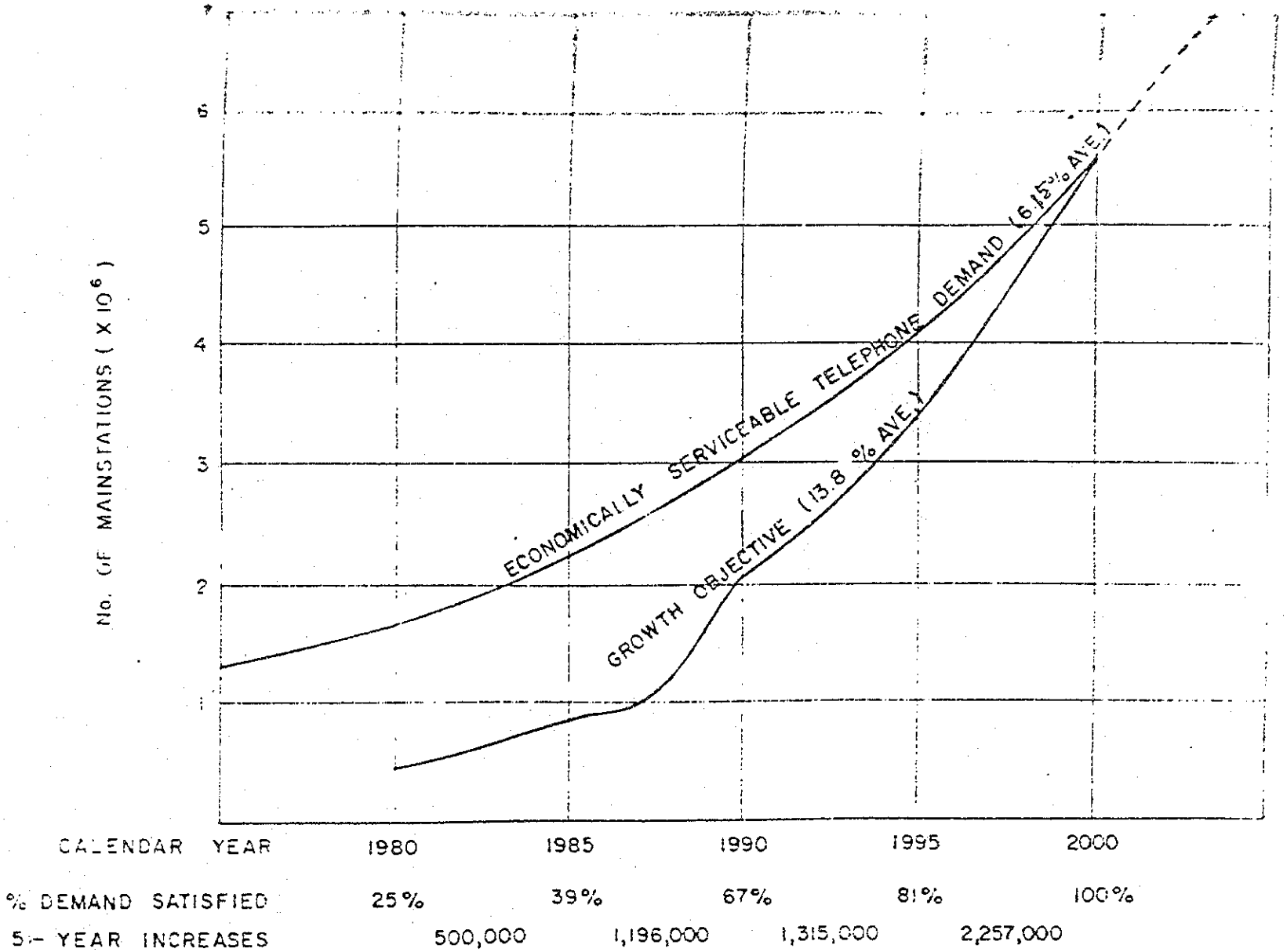
Table 10

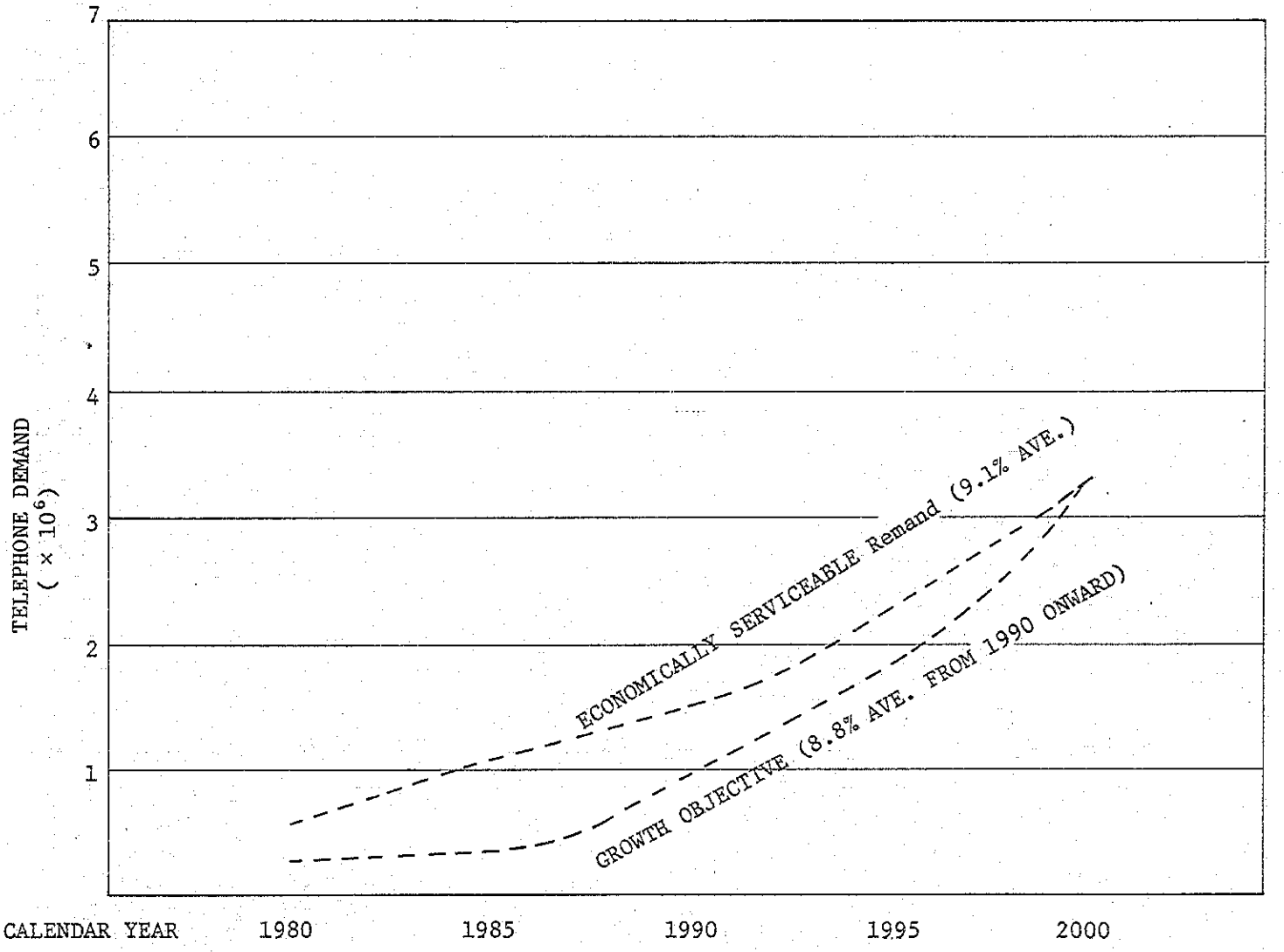
1984-1986

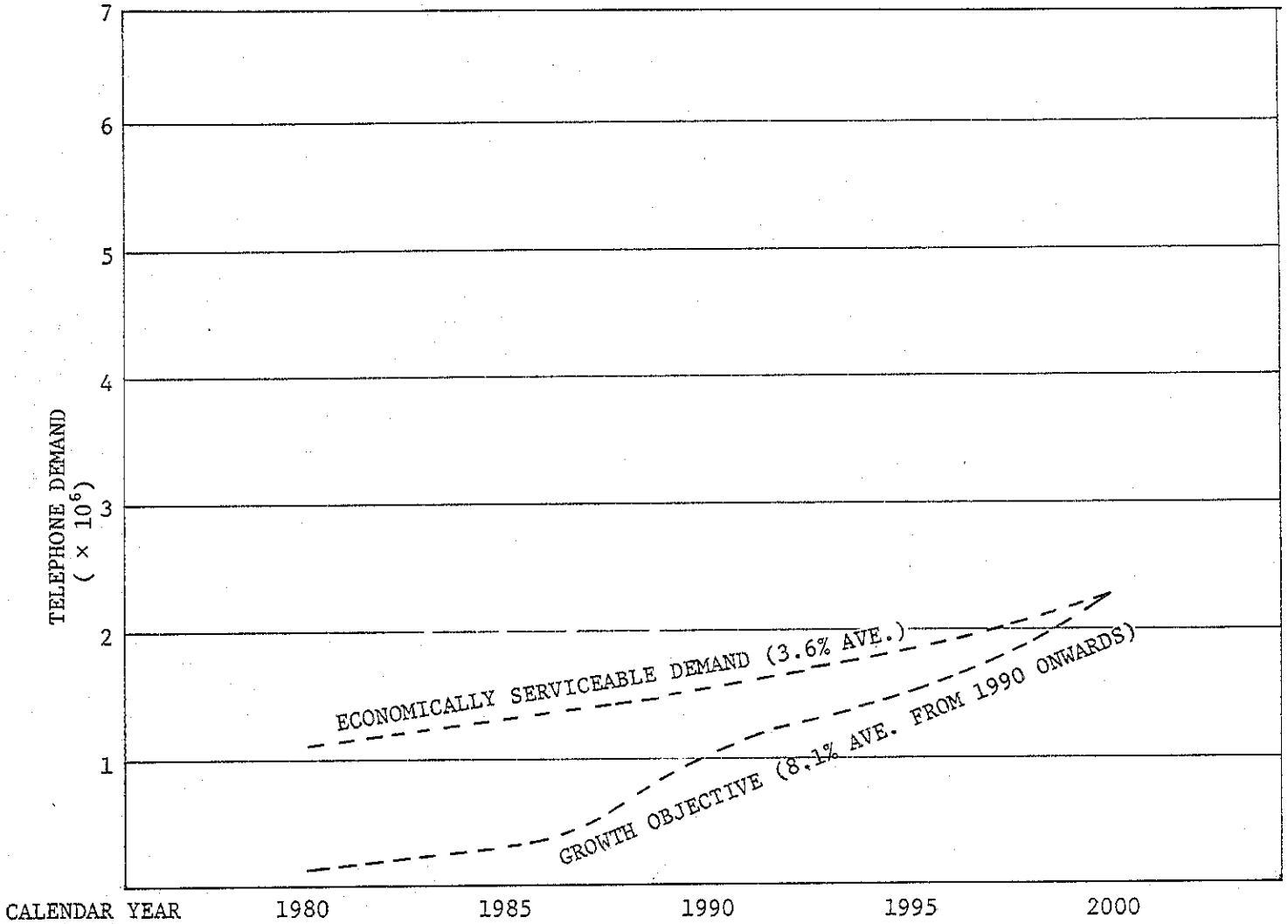
GOICL REQUIREMENT

Telex-Gentex Service	
Telex Exchange	₱ 36,950
Line Concentrator	16,070
TTY Machine	123,360
Carrier Transmission Equipment	69,330
Radio Equipment	77,710
Civil Works	13,200
Training (Local)	150
Test Insturments	2,500
Others	3,680
Sub-Total -	₱342,950
Telegram Service	
Telegraph Facilities (HF/Wire)	
Sub-Total -	₱ 5,350
TOTAL (Approx.)	₱348,300


4
ECONOMICALLY
SERVICEABLE
DEMAND
METRO MANILA DEMAND
CALENDAR YEAR
1980
1985
1990
1995
2000


No. OF MAINSTATIONS (X 10⁶)
6
5
4
3
2
1
ECONOMICALLY SERVICEABLE TELEPHONE DEMAND (6.15% AVE.)
GROWTH OBJECTIVE (13.8 % AVE.)
CALENDAR YEAR
1980
1985
1990
1995
2000
% DEMAND SATISFIED
25%
39%
67%
81%
100%
5 - YEAR INCREASES
500,000
1,196,000
1,315,000
2,257,000


7
6
5
4
3
2
1
TELEPHONE DEMAND
(× 10⁶)
ECONOMICALLY SERVICEABLE Remand (9.1% AVE.)
GROWTH OBJECTIVE (8.8% AVE. FROM 1990 ONWARD)
CALENDAR YEAR
1980
1985
1990
1995
2000


7
6
5
4
3
2
1
TELEPHONE DEMAND
(× 10⁶)
ECONOMICALLY SERVICEABLE DEMAND (3.6% AVE.)
GROWTH OBJECTIVE (8.1% AVE. FROM 1990 ONWARDS)
CALENDAR YEAR
1980
1985
1990
1995
2000

PROJECTS	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990		1995	2000	
National Telecommunications Dev. Project (UNDP/ITU)	282*1			472*2	482*2						995	-	1620	3331	
National Capital Region											(13.4%)	12.84%		(12.8%)	13.1%
	15*1		18*2			28*3					259		430	716	
Regions I, II											(33.0%)	56.00%		(10.7%)	21.3%
	44*1	52*2					62*4				290		424	622	
Regions III, IV											(20.8%)	47.10%		(7.9%)	14.2%
	5*1							15*4			24		30	39	
Region V											(17.0%)	16.96%		(5.6%)	10.8%
	45*1		49*2		140*5						179		271	407	
Region VI, VII											(14.8%)	4.18%		(8.5%)	11.6%
	3*1			6*6				29*7			30		32	34	
Region VIII											(25.9%)	1.14%		(1.3%)	12.9%
	28*1		33*2					202*8			242		327	442	
Regions IX - XII											(24.1%)	6.21%		(6.2%)	14.8%
	422	430	442	635	736	746	756	958	958	958	2019		3334	5591	
Philippines											(17.0%)			(10.7%)	13.8%
Population (Millions)	47.9	49.1	50.4	51.7	53.1	54.6	56.0	57.5	59.0	60.5	62.1		71.9	80.2	
Mainstation Density	0.88	0.88	0.88	1.23	1.39	1.37	1.35	1.67	1.62	1.58	3.25		4.64	6.97	

Notes :
- *1 EXISTING MAINSTATION
- *2 ADDITIONAL FROM PLDT X-4 PROGRAM
- *3 OECF PROJECT
- *4 JICA STUDIES
- *5 SEL-ITT PROPOSAL
- *6 EVITELCO EXPANSION (Eastern Visaya Telephones Company)
- *7 EVITELCO PROPOSAL
- *8 MINDANAO STUDY

SOCIAL AND ECONOMIC SUPPORT

AT OUR STAGE OF DEVELOPMENT AND CONSIDERING OUR DEVELOPMENT PROGRAMS, THERE IS NOW A STRONG NEED FOR TELECOMMUNICATIONS INFRASTRUCTURE SUPPORT, ESPECIALLY IN THE FOLLOWING SECTORS:

1. SOCIAL DEVELOPMENT

INTEGRATION AND MODERNIZATION OF NATIONAL SOCIETY, BY MAKING AVAILABLE INFORMATION CHANNELS FOR RAPID DISSEMINATION OF MODERNIZING IDEAS. THIS WILL FACILITATE MORE EFFECTIVE GOVERNMENT; IT WILL INDUCE EFFICIENT DEPLOYMENT OF EXPERTISE THROUGHOUT THE NATION.

1.1 HEALTH CARE

- DEVELOPMENT OF A HIGHER LEVEL HEALTH CARE PROGRAM.
- ACCESS TO HIGHER MEDICAL CENTERS FOR ASSISTANCE IN DIAGNOSIS, MEDICINE SUPPLIES AND AMBULANCE DISPATCH.
- ACCEPTANCE BY MORE DOCTORS OF RURAL ASSIGNMENTS, WITH LESS REMOTE POSSIBILITY OF PROFESSIONAL ISOLATION.

1.2 RADIO/TV

- RADIO AND TV CAN PLAY AN IMPORTANT ROLE IN FORMAL AND INFORMAL EDUCATION.
- TWO WAY INTERACTIVE FEEDBACK SYSTEM FOR LOCAL PARTICIPATION.

1.3 Extension Work

- Access by extension workers to higher levels of information and and assistance.
- More contact with individual families/small groups at relatively shorter intervals.
- Access of barrio people to extension workers.

1.4 Planning & Development

- Stronger participation of barangays, barrios, municipalities, provinces, regions in planning.
- Improved lateral and vertical sharing of ideas, plans, techniques, experiences, leading increased production and development.

2. ECONOMIC DEVELOPMENT

2.1 Commerce & Industry

- Increase in tourism.
- Infrastructure support to power supply, water supply, railways, transportation, etc.
- Agricultural support in supply of seed, fertilizer and irrigation control.
- Farmer contact with the marketplace to deliver produce earlier and and to close early sales at fair prices.
  Financial viability of telecommunications business.

2.2 Oil Prices

- Relief to Transportation, reducing current levels of demand.
- Improved communications with areas with low levels of transportation.

2.3 Migration Control

- Reduction of urban in-migration with commerce and industry moving out of the countryside.
- Resulting generation of exployment.

2.4 Other Benefits

- Reduction in transaction costs for business and government.
- Access to price information at farmers' level.
- Improvement of communication organization in all sectors.
- Better utilization of scarce management skills.
- Incentive to a manufacturing program for telecommunications.

3. CONCLUSION

Widespread telecommunications facilitate two way interactive links that enable the people in all regions of the nation to participate and share in the process of economic development. It provides a means to contribute to the reduction of regional disparities and the "gap" between the potential of a nation for development and the actual realization of those potentials.

Any reductio of these disparities can be a significant step forward in the reduction of income and expenditure differentials. Telecommunications enable a more equitable distribution of the gains of the development process itself. It can also assist in bringing about an improvement of the living standards in the less developed regions, where more than 70% of the national population lives.

These improvements wiil create greater opportunities and inject greater productivity into the operation of the communities touched by the telecommunications network. Motivational stimulus, imparted through easy access to market information and by two-way interactive flows of ideas and information, between rural and urban entities, can contribute to the energy of growing nation.

7. PHILIPPINE LONG DISTANCE TELEPHONE COMPANY X-4 EXPANSION AND SERVICE IMPROVEMENT PROGRAM

1978 - 1984

PHILIPPINE LONG DISTANCE TELEPHONE COMPANY
X4 EXPANSION AND SERVICE IMPROVEMENT PROGRAM

1. EXECUTIVE SUMMARY

The PLDT X-4 Program covering the period 1978-1984, was developed to provide a greater number of telephones, to extend PLDT's geographical coverage, and to upgrade and modernize its telephone facilities including the toll network.

1.1 OBJECTIVES OF X-4 PROGRAM

The basic objectives of the X-4 Program are:

1.1.1 SERVICE EXPANSION AND MODERNIZATION

Metro Manila

1. Expansion of basic telephone service from 246,277 MS to 427,209 MS or an increase of 73%.
2. Metering of local service.
3. Provision of new subscriber features such as pushbutton dialling, abbreviated dialling, wake-up service, malicious call tracing, and do not disturb service.
4. Provision of Automatic Mobile Telephone Service.
5. Reduction in down-time of facilities.

Provinces

1. Extension of basic telephone service to 60 new municipalities involving a total of 7,100 MS.
2. Expansion of service in existing areas served from 54,833 MS to 74,986 MS or an increase of 37%.

Toll

1. Extension of domestic toll telephone service to 67 municipalities and 66 toll stations.
2. Introduction of domestic and international direct distance dialling.
3. Provision of 96 toll data channels.
4. Expansion of message handling capability of domestic and international toll service.

1.1.2 Facility Expansion and Upgrading

Local Service Facilities

1. Installation of switching and corresponding cable facilities equivalent to:

   a. Metro Manila: 214,400 main stations of which 200,000 are stored program control (SPC) lines.

   b. Provinces: 35,800 main stations of which 16,000 are SPC lines.

2. Establishment of service yards:

   a. Metro Manila : 4

   b. Provinces : 3

3. Establishment of 2 service centers in Metro Manila

4. Construction of new and expansion of existing central office buildings.

	New	Expansion
a. Metro Manila	4	1
b. Provinces	60	2

5. Installation of facilities for automatic fault detection.

6. Installation of facilities for automatic and periodic gathering of data for administrative, engineering and planning purposes.

Toll Service Facilities

1. Replacement/Retirement of obsolete equipment/facilities.

2. Installation of 2,958 and 503 overseas toll circuits.

3. Expansion of domestic and international toll switching facilities.

4. Installation of 344 domestic and 134 overseas toll switchboards.

5. Establishment of 3 new toll centers.

6. Establishment of 11 new relay stations.

1.2 INVESTMENT REQUIREMENTS AND SOURCES

The total investment requirement includes a non-cash portion which represents capitalized interest during construction, drawings from inventory, and recovered equipment.

The portion of the program which involves actual cash outlays is to be financed through a combination of foreign loan and locally generated funds. A total of $412.3M or ₱3,100M already contracted and another $76.6M or about ₱570M still to be negotiated loans serve as the sources of foreign loans component.

1.3 ACHIEVEMENT: 1978-1980

1.3.1 Telephone Service

a. Between 1978 and 1980, some 24,220 main stations have been connected to PLDT's Metro Manila network bringing total main stations in service in the area to 270,497 by December, 1980. Proportion of party-line subscribers was 55% in 1980 compared to 62% three years ago.

b. Service was extended to 5 municipalities with combined capacity of 1,400 main stations of which 652 have been subscribed. A net gain of 10,812 main stations were realized in other cities and municipalities with existing service.

1.3.2 Basic Telephone Facilities

a. By year-end 1980, 25,000 lines with corresponding outside plant facilities out of the total 200,000 SPC lines in Metro Manila have been installed in 2 new central offices: 10,000 lines in Makati; and 15,000 lines in Pasay. Before the end of January 1981, another 10,000 SPC lines in Sampaloc and 2,000 EMD lines in Mandaluyong, Novaliches, and Quezon City were operational. Completion of cut-over to New Pasay C.O. also paved the way for the complete retirement of the Old Pasay C.O.

b. In the provinces, five new central offices were constructed to house the five new rural exchanges with switching and cable facilities equivalent to 1,400 main stations.

1.3.3 Special Services

Installed SPC switches are capable of subscriber metering and the various special features specified under the objectives of the program. These shall be offered to subscribers once authority has been secured from, and, rates/tariffs have been filed with and duly approved by, the NTC.

1.3.4 Toll Services

a. National Direct Distance Dialling (NDDD)

First phase of NDDD went into service at year-start with a few selected subscribers in Makati. These subscribers can reach a total of 9 points through 38 circuits. Market base has been limited because of subscribers' apprehension over their capability to control unauthorized calls. Additional 85 circuits are scheduled to be installed in April while service shall gradually be opened to more SPC - connected subscribers.

b. International Subscriber Dialling (ISD)

This is presently under test and initial results have been encouraging such that ISD may be offered to selected subscribers by March 19 this year. Initially, places which can be reached are: United States, Canada, Hongkong, and Singapore.

1.3.5 Toll Facilities

Facilities added between 1978 and 1980 are as follows:

a. 382 domestic and 296 international toll circuits

b. 98 domestic and 28 overseas toll switchboard positions

OBJECTIVES AND ACHIEVEMENTS OF X-4 PROGRAM

	UNIT	STATUS 12.31.77	X-4 PROGRAM: 1978-84 GAIN	STATUS 12.31.84	ACHIEVEMENTS: 1978-80 GAIN	STATUS 12.31.80
LOCAL SERVICE/FACILITIES						
1. Main Stns. In Service	MS					
Metro Manila		246,277	180,932	427,209	24,220	270,497
Luzon		9,967	7,333	17,300	5,064	15,031
Visayas		35,255	7,990	43,245	4,286	39,541
Mindanao		9,611	4,830	14,441	1,723	11,334
T o t a l		301,110	201,085	502,195	35,293	336,403
2. Switching Facilities	MS					
Addition						
Metro Manila		300,600	214,400	515,000	74,000	374,600
Luzon		12,700	17,650	30,350	1,750	14,450
Visayas		40,500	10,700	51,200	4,535	45,035
Mindanao		11,600	7,450	19,050	2,000	13,600
T o t a l		365,400	250,200	615,600	82,285	447,685
Retirement						
Metro Manila		-	54,500	54,500	9,500	9,500
Luzon		-	6,100	6,100	-	-
Visayas		-	400	400	-	-
Mindanao		-	-	-	-	-
T o t a l		-	61,000	61,000	9,500	9,500
TOTAL						
Metro Manila		300,600	159,900	460,500	64,500	365,100
Luzon		12,700	11,550	24,250	1,750	14,450
Visayas		40,500	70,300	50,800	4,535	45,035
Mindanao		11,600	7,450	19,050	2,000	13,600
T o t a l		365,400	189,200	554,600	72,785	438,185
3. Cable Facilities	PAIR Km.					
Metro Manila		687,740	1,773,871	2,461,611	172,523	860,263
Luzon		14,951	79,885	94,836	20,687	35,638
Visayas		43,772	108,924	152,696	54,980	98,752
Mindanao		24,585	67,269	91,854	29,253	53,838
T o t a l		771,048	2,029,949	2,800,997	277,443	1,048,491
4. Central Office Bldgs.	No.					
Metro Manila		12	5	17	3	15
Luzon		6	36	42	4	10
Visayas		5	19	24	-	5
Mindanao		2	5	7	1	3
T o t a l		25	65	90	8	33
5. Other Facilities MM	No.					
Service Centers		2	2	4	-	2
Service Yards		10	4	14	-	10
Business Offices		10	14	24	6	16

*Other local service facilities in the provinces are integrated in the central offices facilities.

	UNIT	STATUS 12.31.77	X-4 PROGRAM: 1978-84 GAIN	STATUS 12.31.84	ACHIEVEMENTS 1978-80 GAIN	STATUS 12'31'80
TOLL SERVICE/FACILITIES						
1. Domestic Toll						
Toll Telephone Service	Mun.	-	67	-	5	-
Toll Station Service	Toll Stn.	-	66	-	-	-
Toll Circuits	No.	1,214	2,958	4,172	382	1,596
Toll Centers	No.	12	3	15	-	12
Switchboard Positions	No.	166	344	510	98	264
Relay Stations	No.	23	11	34	-	23
Domsat Terrestrial Link	No.	-	11	11	9	9
2. Overseas Toll	No.					
Countries/Territories Reached		183	As Req'd.	As Req'd.	66	249
Toll Circuits		244	503	747	296	540
Switchboard Positions		30	134	164	28	58

2. LOCAL SERVICES

The X4 Program of PLDT is divided into two supply contracts of 60,000 L and 156,000 L of Stored Program Control (SPC) and 6,500 L of EMD switching equipment for local services. These are for installation in the primary urban center of Metro-Manila and selected provincial exchanges as the first step in the long process of transition to electronic technology and introduction of new service to subscribers especially National Direct Distance Dialling (NDDD) and International Subscriber Dialling (ISD).

X-4 SWITCHING EQUIPMENT PROGRAM

	TYPE	PHASE 1	PHASE 2	TOTAL	IN SERVICE 12-31-80	IN SERVICE 1981	IN SERVICE 1982-1984
A. METRO MANILA							
Makati	SPC	20,000	30,000	50,000	10,000	10,000	30,000
Pasay	SPC	15,000	15,000	30,000	15,000	-	15,000
Sampaloc	SPC	10,000	35,000	45,000	-	10,000	35,000
Quezon City	SPC	5,000	15,000	20,000	-	15,000	5,000
Las Piñas	SPC	5,000	5,000	10,000	-	5,000	5,000
Grace Park	SPC	5,000	10,000	15,000	-	10,000	5,000
Malate	SPC	-	15,000	15,000	-	-	15,000
Mandaluyong	SPC	-	15,000	15,000	-	-	15,000
Sub-Total		60,000	140,000	200,000	25,000	50,000	125,000
Mobile Vans	EMD						
4 units 400 lines		-	1,600	1,600	-	1,600	-
4 units 600 lines		-	2,400	2,400	-	2,400	-
Sub-Total			4,000	4,000		4,000	
Retirement							
Lines	SXS	(8,250)	(18,400)	(26,650)	-	(8,250)	(18,400)
Connector Terminals	SXS	(11,500)	(43,000)	(54,500)	-	(11,500)	(43,000)
Reinstallation							
Lines	SXS	-	19,400	19,400	-	-	19,400
C.T.	SXS	-	10,400	10,400	-	-	10,400
B. LUZON							
San Fernando, U	SPC	-	3,000	3,000	-	-	3,000
San Fernando, P	SPC	-	4,000	4,000	-	-	4,000
Lucena	SPC	-	3,000	3,000	-	-	3,000
Sub-Total			10,000	10,000			10,000
Concepcion, Tarlac Rural Exchanges	EMD	-	1,000	1,000	-	-	1,000
Locations		4	37	41	4	6	31
Lines	Various	1150	3,900	5050	1150	800	3,100
Retirement							
Lines	Manual	-	(300)	(300)	-	-	(300)
	SXS	-	(4,800)	(4,800)	-	-	(4,800)
C.T.	SXS	-	(5,800)	(5,800)	-	-	(5,800)
Reinstallation							
Lines	SXS	-	1,200	1,200	-	-	1,200
C.T.	SXS	-	1,600	1,600	-	-	1,600

	TYPE	PHASE 1	PHASE 2	TOTAL	IN SERVICE 12-31-80	1981	1982-1984
C. VISAYAS							
Talisay, Cebu	SPC	-	3,000	3,000	-	-	3,000
Roxas, Capiz	EMD	-	1,500	1,500	-	-	1,500
Retirement							
Lines (Roxas)	X-Bar	-	(400)	(400)	-	-	(400)
Reinstallation							
Lines	SXS	-	4,000	4,000	-	-	4,000
C.T.	SXS	-	5,000	5,000	-	-	5,000
Rural Exchanges							
Locations		-	12	12	-	3	9
Lines	Various	-	1,200	1,200	-	300	900
D. MINDANAO							
Sasa-Davao	SPC	-	3,000	3,000	-	-	3,000
Reinstallation							
Lines	SXS	-	2,200	2,200	-	-	2,200
C.T.	SXS	-	3,600	3,600	-	-	3,600
Rural Exchanges							
Locations		1	6	7	1	-	6
Lines	Various	250	600	850	250	-	600

2.1 METRO MANILA STATUS

Activities to support installation of SPC/EWS switching facilities started in the latter part of 1977. Service to about 80,000 existing SXS subscribers will be upgraded/modernized to new SPC offices. The balance of SPC facilities will be used to meet demands of new subscribers in the new central office areas. Vacated SXS facilities will be used as follows:

1. Provide inter-office trunking capacity for SXS office to SPC office.
2. Reconditioning/reinstallation in the Metro Manila SXS office for new services and upgrading of party line to main line service.
3. Reconditioning/re-assignment of vacated facilities in same offices.
4. Reconditioning/re-installation in Provincial SXS exchange

METRO-MANILA SXS EQUIPMENT

	LINES	C.T.
RETIREMENT	26,650	54,500
REINSTALLATION		
Metro Manila	19,400	10,400
Luzon	1,200	1,600
Visayas	4,000	5,000
Mindanao	2,200	3,600
NET SYSTEM RETIREMENT	2,600	33,400

As of Jan. 31, 1981, Makati, Pasay and Sampaloc EWS offices are operational with a total of 35,000 L. As per program, service to 15,146 SXS subscribers have been upgraded to SPC.

STATUS AS OF JAN. 31, 1981

CENTRAL OFFICE	OPERATIONAL	SXS UPGRADING	1981 ADDN.	TOTAL BY DEC. 31, 1981
Makati	10,000 L	5,001	10,000	20,000 L
Pasay	15,000 L	7,431	-	15,000 L
Sampaloc	10,000 L	2,714/1	-	10,000 L
Quezon City	-	/2	15,000	15,000 L
Las Piñas	-	/3	5,000	5,000 L
Grace Park	-	/4	10,000	10,000 L
TOTAL	35,000	15,146	40,000	75,000 L

SXS subscriber upgrading during 1981 -

/1	Sampaloc	1,803
/2	Quezon City	10,970
/3	Las Piñas	1,515
/4	Grace Park	5,063

A 10,000 L EMD switch is presently working at Makati on an interim basis to provide immediate service in Makati with the delivery delay in the first Makati 10,000 L SPC project. This will be retired upon completion of the second SPC 10,000 L installation. However, eight mobile EMD vans have been purchased for emergency relief planning.

The various projects completed since 1978 to support the above program until the end of year are as follows:

	STATUS 1978-1980	1981 OBJECTIVE
A. CIVIL WORKS		
Makati Building	In-Service	Completed
Pasay Building	In-Service	Completed
Sampaloc Building	In-Service	Completed
Las Piñas	86%	April 1981
Grace Park Renovation	In-Service	Completed
M.H. (Units)	552	244
Conduits (duct-km)	1,356	353
B. CABLE/TRUNK FACILITIES		
Subscriber Cable pairs	51,825	140,000
pair-km	124,294	245,000
Trunk Cable pair	20,420	33,900
pair-km	134,982	200,000
PCM Channels	6,336	21,780

		STATUS 1978-1980	1981 OBJECTIVE
C. PABX/PBX FACILITIES			
PBX/ATEA/MINI-BX	units	564	340
	trunks	686	1,700
	locals	451	3,40
PABX	units	89	87
	trunks	2,580	960
	locals	7,298	5,840
D. STATION GAIN			
Primary Stations		20,954	25,214
PABX Trunks		3,266	2,385
Telephones		51,150	42,490
E. OPERATION SUPPORT FACILITIES			
Operation Maintenance Center		- Makati In Service	Sampaloc
Service Center		-	Sampaloc Makati
Service Yard		- Malugay In Service	Pasay Grace Park Las Piñas
Business Offices		- 4 offices In Service	New Makati In Service
Vehicles		860	300

2.2 LUZON EXCHANGES

Modernization in the Luzon provincial exchanges is being implemented with the replacement of existing plunger type line equipment with Stored Program Control (SPC) switching in San Fernando, La Union, San Fernando, Pampanga and Lucena. The manual system in Concepcion Tarlac will be replaced with EMD switching equipment.

LUZON EXCHANGES SWITCHING PROGRAM

		TYPE	LINES	C. T.	START	FINISH
San Fernando, Pampanga (SFP)	Installation	SPC	4,000	-	03-82	07-82
	Retirement	SXS	(1,700)	(2,000)	12-82	05-83
San Fernando, La Union	Installation	SPC	3,000	-	04-82	07-82
	Retirement	SXS	(1,100)	(1,300)	12-82	05-83
Lucena	Installation	SPC	3,000	-	03-82	06-82
	Retirement	SXS	(2,000)	(2,400)	12-82	02-83
Concepcion	Installation	EMD	1,000	-	04-82	08-82
	Retirement	Manual	(300)	-	12-82	02-83
Dagupan	Installation	SXS	400	400	07-82	09-82
San Pablo	Installation	SXS	800	1,200	01-83	04-83
Rural Exchanges	2 sites	SXS	400	-	12-80	05-81
	4 sites	PAX	400	-	03-81	09-81

The status of projects to support the above program until the end of 1981 are as follows:

	STATUS 1978-1980	1981 OBJECTIVE
A. CIVIL WORKS		
SFP Bldg.	In-Service	Completed
SFU Bldg.	-	November
Lucena Bldg.	-	October
Concepcion Bldg.	In-Service	Completed
Dagupan Addn.	-	September
San Pablo	42%	April
Rural Exchanges		
2 sites	-	May
4 sites	-	August
B. CABLE FACILITIES		
Subscriber Cable pairs terminated	10,309	24,800
pair km	20,687	49,800
C. STATION GAIN		
Primary Stations	5,006	561
PABX Trunks	58	9
Telephones	6,514	705
D. OPERATION SUPPORT FACILITIES		
Service Yard	-	June, 1982

2.3 VISAYAS EXCHANGES

Modernization in the Visayas exchanges is similarly being implemented with the installation of 3,000 line SPC switching equipment in a new central office in Talisay, Cebu. The existing X-bar switch at Roxas City will be replaced with a 1,500 line EMD equipment.

VISAYAS EXCHANGES SWITCHING PROGRAM

		TYPE	LINES	C. T.	START	FINISH
Talisay, Cebu	Installation	SPC	3,000	-	04-82	07-82
Roxas City	Installation	EMD	1,500	-	09-81	01-82
	Retirement	X-bar	(400)	-	04-82	07-82
Cebu	Reinstallation	SXS	800	600	10-82	12-82
Mandaue	- do -	SXS	1,400	2,200	04-82	08-83
Iloilo	- do -	SXS	800	1,000	08-82	11-82
Bacolod	- do -	SXS	1,000	1,200	10-82	10-83
Rural Exchanges	3 sites	PAX	300	-	12-80	10-81

The status of various projects to support the above program until the end of 1981 are as follows:

	STATUS 1978-1980	1981 OBJECTIVE
A. CIVIL WORKS		
Talisay Bldg.	-	40%
Roxas Bldg.	-	August

	STATUS 1978-1980	1981 OBJECTIVE
Rural Exchanges		
2 sites	-	May
1 site	-	September
B. CABLE FACILITIES		
Subscriber Cable		
pairs terminated	5,440	303
pair km	46,183	2,600
Trunking Cable		
pairs terminated	1,313	-
pair km	8,797	-
C. STATION GAIN		
Primary Stations	4,016	398
PABX Trunks	270	10
Telephones	7,598	571

2.4 MINDANAO EXCHANGES

Modernization is likewise implemented in the Mindanao exchanges with the installation of a 3,000 line Stored Program Control switching equipment in Sasa-Davao. This completes the introduction of modern technology throughout the PLDT system.

MINDANAO EXCHANGES SWITCHING PROGRAM

		TYPE	LINES	C. T.	START	FINISH
Sasa, Davao	Installation	SPC	3,000	-	04-82	08-82
Zamboanga	Reinstallation	SXS	600	1,000	10-82	01-83
			1,000	2,000	09-83	12-83
Rural Exchanges	6 sites	PAX	600	-	01-82	06-84

Status of projects to support the above program are as follows:

	STATUS 1978-1980	1981 OBJECTIVE
A. CIVIL WORKS		
Sasa, Bldg.	-	Start November
B. CABLE FACILITIES		
Subscriber Cable		
pairs terminated	4,035	-
pair km	27,738	-
Trunk Cable		
pairs terminated	303	-
pair km	1,515	-
C. STATION GAIN		
Primary Station	1,708	320
PABX Trunks	15	22
Telephones	2,784	534

3. DOMESTIC TOLL SERVICE

3.1 GENERAL

The X-4 Program covers the modernization of the existing facilities and expansion to serve more areas which are not possible to be served under the present system. This includes the provision for adequate toll trunks between toll switching centers as well as to connecting telephone companies and toll stations; upgrading of existing and establishment of new toll switching centers to attain a more logical homing arrangement; upgrading and extension of the microwave toll network; construction of new building and/or rearrangement of existing ones to accommodate additional toll switching equipment and switchboard positions; and provision of terrestial link to Domsat earth stations.

This service improvement and expansion program will enable the company to introduce the following services:

a. DDD - Direct Distance Dialling
b. Automatic Mobile Telephone
c. Data

and continue offering the following:

d. Hot Lines
e. FEX Lines
f. Lease Lines

3.1.1 X-4 TOLL SWITCHING EQUIPMENT PROGRAM

Toll switching equipment upgrading program is in two (2) phases. Phase I covers the utilization of the inter-city trunking facilities of the electronic switch (EWS-A) installed for local exchanges, and Phase II, considers the introduction of the final toll digital switch (EWS-D). Switching centers which will not be upgraded, will be provided with additional SXS facilities.

TOLL SWITCHING CENTER	TRUNK CAPACITY	
	PHASE I (EWS-A)	PHASE II (EWS-D)
Sampaloc	2,773	5,064
Lucena	107	281
Sasa, Davao	127	-
Talisay, Cebu	121	-
San Fernando, Pampanga	250	646
San Fernando, La Union	286	522
Mandaue	-	942
Iloilo	-	289
Legaspi	-	162
Cagayan de Oro	-	418

3.1.2 X-4 TOLL BACKBONE EXPANSION/UPGRADING PROGRAM

Toll backbone expansion program covers replacement of the existing radio/carrier facilities with higher capacity, to accommodate the increasing demand of the country. Details are as follows:

RADIO LINK	CHANNEL CAPACITY		READY FOR SERVICE DATE
	EXISTING	PROGRAM	
NORTH			
Manila to Dau	960	1,800	June, 1981
Sto. Tomas to Baguio/ Dagupan	300	1,200	August, 1981
Dau to Sto. Tomas	300	1,800	August, 1981

RADIO LINK	CHANNEL CAPACITY EXISTING	CHANNEL CAPACITY PROGRAM	READY FOR SERVICE DATE
SOUTH			
Manila to Quezon Relay	600	1,200	August, 1981
Quezon Relay to Cebu Relay	600	1,200	May, 1982
Cebu Relay to Mandaue	1,200	1,800	May, 1982
WEST			
Manila to Lucena/ San Pablo	48	300	December, 1981

This will be complemented by the establishment of five (5) new relay stations: Antipolo, Sto. Tomas and Batangas in 1981 and New Naga, Camarines Norte in 1982. Two (2) existing relays, San Fernando, U. and Naga will be retiredto eliminate high maintenance costs.

Expansion of the backbone network involves the establishment of the following seven (7) relay stations, namely:

RELAY STATION	CHANNEL CAPACITY	READY FOR SERVICE DATE
Zambales	1,200	November, 1981
South Cebu	1,200	June, 1981
Roxas	1,200	May, 1982
Camotes	1,200	June, 1982
N. Leyte	1,200	June, 1982
Catbalogan	1,200	July, 1982
Calbayog	1,200	July, 1982

This expansion and extension program opens services to five (5) new areas in 1981, fifty six (56) in 1982, forty nine (49) in 1983 and eighteen (18) in 1984.

3.1.3 OTHER PROGRAMS UNDER X-4

Open wire lines, AN/TRC and single-channel radios which often limit reliability and circuit addition will be replaced with multi-channel radios or multi-pair cables.

Additional building space will be provided to accommodate the additional and replacement facilities in the following toll centers/ relay stations:

		FLOOR AREA (SQ.M.)
1.	Mandaue	270
2.	San Fernando, P.	180
3.	San Fernando, U.	230
4.	Iloilo	180
5.	San Pablo	215
6.	Cagayan de Oro	320
7.	Legaspi	620
8.	Bacolod	190
9.	Dagupan	170
10.	Marilao relay	80
11.	Sto. Tomas relay	150
12.	Lucena	320
13.	Manticao relay	50
14.	Pagadian relay	50

Twelve (12) existing and proposed PLDT stations will be equipped with live telecast facilities, as follows:

1. Bacolod Relay
2. Cebu Relay
3. Baguio
4. Tagaytay Relay
5. Sampaloc
6. Camarines Norte Relay
7. Panay Relay
8. Zambales Relay
9. San Fernando, U.
10. Sto. Tomas Relay
11. Batangas Relay
12. Catbalogan Relay

3.2 STATUS

Engineering activities to support the program was started since 1978, and actual implementation commenced in 1979.

3.2.1 NATIONAL DIRECT DISTANCE DIALLING (DDD)

Tests on Direct Distance Dialling was started in mid 1979 and was placed into commercial service last January, 1981, because of problems on the automatic billing equipment. Selected Metro-Manila subscribers served by this first phase of the DDD program can reach the following:

	DESTINATION	CIRCUITS
a.	San Fernando, U.	4
b.	Dagupan	4
c.	Baguio	4
d.	Tarlac	4
e.	San Fernando, P.	4
f.	Iloilo	4
g.	Bacolod	4
h.	Davao	4
i.	Mandaue	6

In March and April, 1981, additional Metro-Manila subscribers will be served with DDD facilities with the scheduled installation of 85 additional circuits leading to the following:

	DESTINATION	EXISTING	ADD'L. CIRCUITS	TOTAL
a.	Dagupan	4	12	16
b.	Baguio	4	12	16
c.	Tarlac	4	3	7
d.	San Fernando, P.	4	12	16
e.	Iloilo	4	12	16
f.	Bacolod	4	12	16
g.	Davao	4	10	14
h.	Mandaue	6	12	18
i.	San Fernando, U.	4	-	4

In December, 1981, shortly after completion of the upgrading program of the backbone system - North and West, the San Fernando, P. and Lucena EWS-A local switch will be ready for service. It's built-in inter - city trunks will enable to introduce DDD service to EWS subscribers of San Fernando, P. and Lucena. This will provide additional 73 and 116 circuits between Manila-Lucena and Manila-San Fernando,P.

Come June, 1982, in time with the backbone upgrading program in the South, is the establishment of San Fernando, U., Sasa and Talisay EWS-A exchanges. Subscribers of these offices will now have direct access to Metro-Manila subscribers through the 22 circuits from Sasa, 22 from Talisay and 47 from San Fernando, U.

The following places will be reached through DDD from Manila:

	CCTS	YEAR AVAILABLE
Bacolod	23*	1982
Baguio	32*	1981
Cagayan de Oro	14	1982
Dagupan	10*	1981
Davao	41*	1982
Iloilo	23*	1982
Mandaue	76*	1982
San Pablo	35	1981
Tarlac	30*	1981
Zamboanga	16	1982
Batangas	25	1981
Calamba	27	1981
Cavite	25	1981
Marilao	7	1981
Malolos	27	1981

* Additional DDD circuits from Manila

Final phase of DDD program will be upon establishment of the final toll switch (EWS-D) at Sampaloc in 1984.

3.2.2 TOLL OPERATION

As of December, 1977, a total of 182 toll switchboard positions are in operation, and between 1978 to 1980, an additional 82 positions were installed. These are all cord-type (31-C) and operating on combined line recording (CLR) configuration. Following is the distribution of switchboard positions among the toll centers:

	EXISTING 12/31/77	1978-1980 ADDITION	1981-1984 PROGRAM	TOTAL 12/31/84
Baguio	14	8	-	22
Dagupan	6	4	-	10
Lucena	4*	-	16**	16**
Manila	78*	14*	150**	150**
San Pablo	4	-	-	4
San Fernando,P	10	2*	16**	16**
San Fernando,U	-	-	14**	14**
Tarlac	8	2	-	10
Bacolod	12	12	-	24
Iloilo	10*	10*	10**	10**
Mandaue	18*	6*	32**	32**
Davao	8	10	-	18
Zamboanga	4	-	-	4
Cotabato	2	-	-	2
Clark	2	2	-	4
Subic	2	4	-	6
Bepza (Bataan)	-	8	-	8
Legaspi	-	-	4**	4**
C. de Oro	-	-	4**	4**

NOTES:

* Scheduled for retirement starting 1984
** Electronic type switchboard positions

The 1981-1984 toll switchboard facility additions will likewise be on a CLR operation.

There are presently 94 telephone exchanges and 93 toll stations connected to the PLDT system. These are operating on one-way-dial/one-way-ringdown (1D/1R) and two-way-ringdown (2R), respectively and will be reconfigured to two-way-dial (2D) and one-way-dial/one-way-ringdown (1D/1RD), respectively.

The program will provide toll interconnection to 67 existing and proposed telephone exchanges and 66 new toll stations as follows:

	1981	1982	1983	1984	TOTAL
Toll Stations	3	34	29	-	66
Interconnected Telephone Exchanges	2	22	20	18	67

3.2.3 MOBILE TELEPHONE

Equipment evaluation has already been completed and in the process of ordering.

This is scheduled to be operational in early 1982, aims to upgrade the presently working simplex and manual type mobile telephone to automatic and will serve 200 Metro-Manila mobile subscribers. This will enable mobile subscribers to communicate with an ordinary telephone subscriber, with other mobile subscribers, and vice-versa.

3.2.4 DATA

Data communication shall initially be provided on a point-to-point configuration as follows:

a.	Manila-San Fernando, U.	-	12 channels	1981
b.	Manila-San Fernando, P.	-	6 "	1981
c.	Baguio	-	12 "	1981
d.	Dagupan	-	6 "	1981
e.	Tarlac	-	6 "	1981
f.	San Pablo	-	6 "	1981
g.	Lucena	-	6 "	1981
h.	Bacolod	-	6 "	1982
i.	Davao	-	12 "	1982
j.	Iloilo	-	6 "	1982
k.	Cebu	-	12 "	1982
l.	Davao-Mandaue	-	6 "	1982

Provision for Bacolod, Davao, Iloilo and Cebu was deferred to 1982 due to its dependency on the backbone network upgrading.

3.2.5 HOT/LEASE/FEX LINES

Hot/Lease/Fex lines will be served on "as required" basis, utilizing facilities provided in the backbone and switching equipment expansion.

3.2.6 DOMSAT

To date, nine (9) out of eleven (11) programmed terrestrial links to Domsat earth station have been cut into service. Laoag, will operate in 1981, while installation for Davao has long been overdue because of problems on the selection and site acquisition. Stations which links were in operation are the following:

a.	Bacolod	d.	Iriga	g.	Tacloban
b.	Palawan	e.	Tuguegarao	h.	Zamboanga
c.	Antipolo	f.	Cebu	i.	Cagayan de Oro

3.2.7 TOLL CIRCUITS

As of December, 1980, a total of 1,596 toll circuits are in service distributed as follows:

a.	Toll/Message	1,254
b.	Lease	223
c.	Record	30
d.	DDD-1	38
e.	DID	21

4. OVERSEAS TOLL SERVICE

4.1 GENERAL

The X-4 Program calls for the introduction of International Subscriber Dialling (ISD) with the establishment of the Antipolo Relay Station in July, 1981 linking the Sampaloc Toll Office and Tanay Earth Station. This will expand the international backbone from 600 to 1200 channels, and in turn, increase the international circuits for lease lines, data channels, operator and ISD circuits, and coverage of special events.

4.1.1 INTERNATIONAL SUBSCRIBER DIALLING (ISD)

Overseas Toll Service reaches a total of 183 countries and territories in 1977, and 249 in 1980. Tabulation below shows the number of countries accessible via direct route and through transit.

	NO. OF COUNTRIES		
	1977	1978-1980 ADD'N.	TOTAL
Accessible via direct route	20	4	24
Accessible through transit	163	62	225

Presently, tests are being undertaken to offer ISD service on March 1981 to selected subscribers who are:

1. connected to the Makati, Pasay, and Sampaloc SPC offices
2. engaged in international business
3. with significant volume of overseas calls

Countries to be considered for ISD according to priority are:

PRIORITY I	PRIORITY II
1. United States	1. Germany
2. Singapore	2. United Kingdom
3. Hongkong	3. Spain
4. Canada	4. France
5. Hawaii	5. Australia
	6. Japan
PRIORITY III	7. Taiwan
	8. Saudi Arabia
1. Malaysia	9. Italy
2. Indonesia	10. Guam

The second phase of the ISD program will be put to service in December, 1981 and Phase III, full operation, is scheduled in 1984.

4.1.2 FACILITIES

In 1977, a total of 244 international circuits were made available and an addition of 296 was installed in 1980.

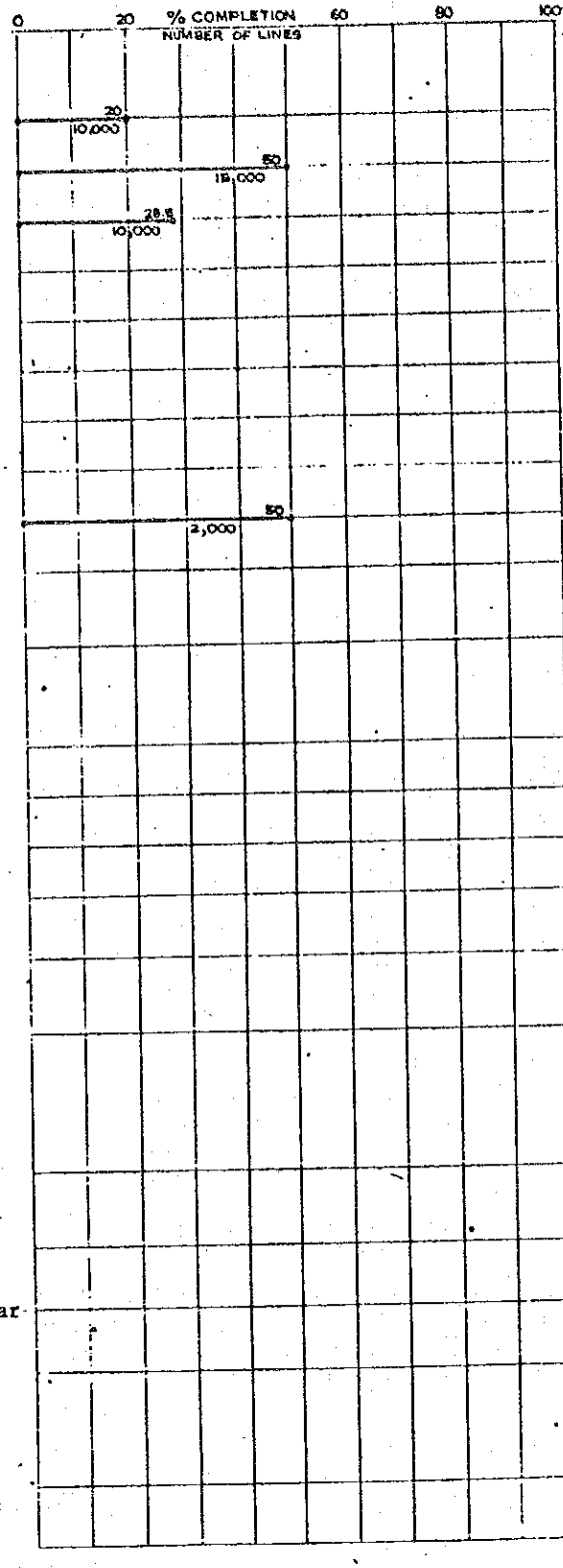
During the initial offering of ISD service, sixty (60) additional circuits between Tanay and Intramuros will be installed. This will complement the expansion being done at the existing international toll switch (ARM), which will be completed in March, 1981.

An interim international toll switch (ESK) will be established in December, 1981 to inter-work with the present system. This will support the implementation of the second phase of ISD and will be equipped with 653 trunks to serve additional ISD subscribers.

The final phase will be dependent on the installation of the combined national and international toll switch (EWS-D) at Sampaloc in 1984. At which time, the gradual retirement of the existing ARM switch at Intramuros and the interim ESK at Sampaloc will be implemented.

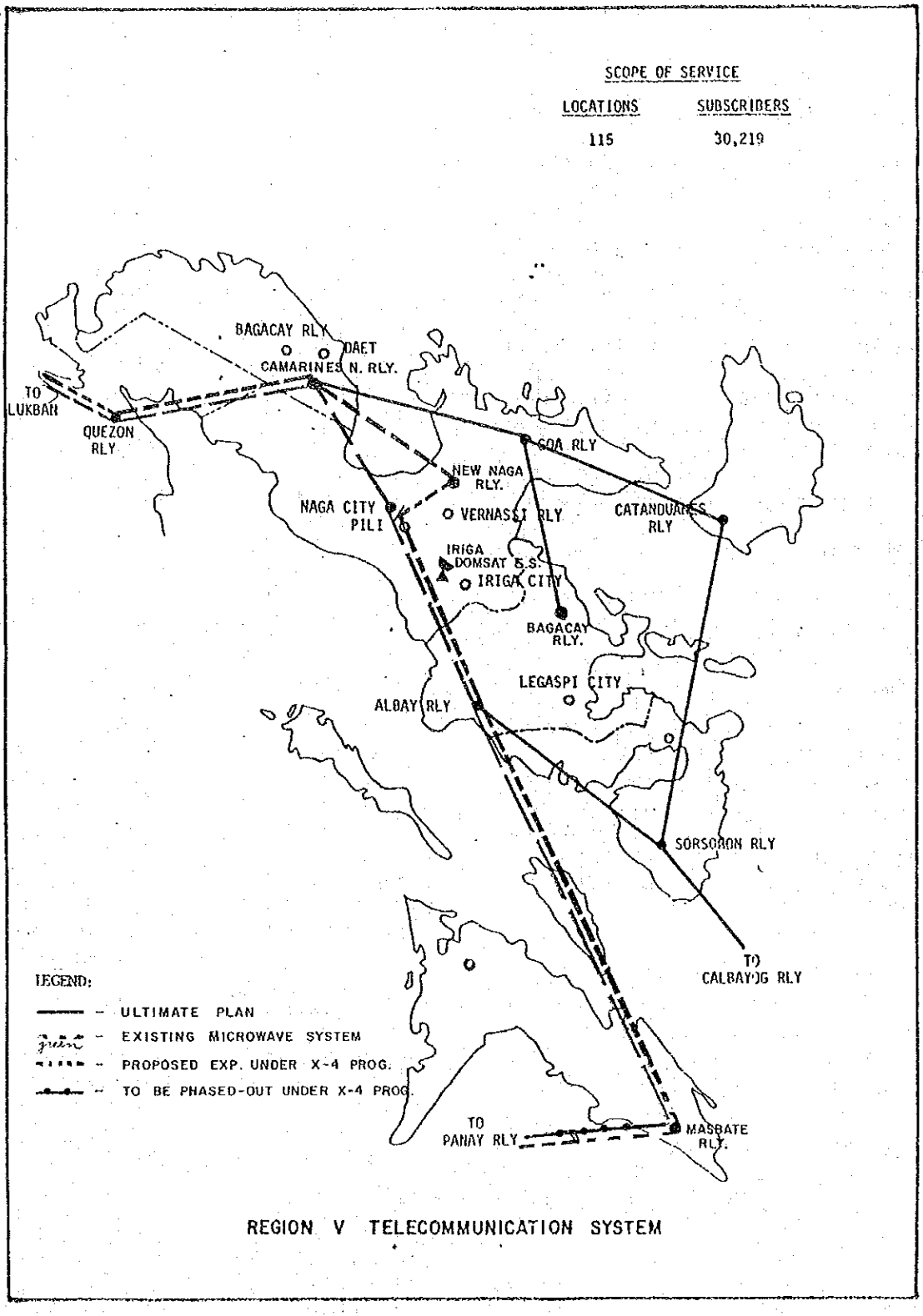
In time with expansion of the ARM switch, 16 cordless-type switchboard positions will be installed brining the total to 64 positions. These will be replaced by 90 positions of electronic type switchboards upon installation of the final EWS-D toll switch to serve the operator assisted traffic.

X4 SWITCHING EQUIPMENT
PROGRAM STATUS AS OF FEB. 1981



		MO./YR START	MO./YR FINISH	FACILITIES
A. METRO MANILA				
Makati	SPC	06-79	06-84	50,000 Lines
Pasay	SPC	10-79	05-83	30,000 L
Sampaloc	SPC	04-80	05-83	45,000 L
Quezon City	SPC	09-80	12-82	20,000 L
Las Piñas	SPC	09-80	12-82	10,000 L
Grace Park	SPC	01-81	07-82	15,000 L
Malate	SPC	12-80	10-83	15,000 L
Mandaluyong	SPC	04-82	08-83	15,000 L
EMD Vans	EMD	04-82	09-83	4,000 L
Retirement	SXS	01-81	04-81	18,400 L 43,000 CT
Reinstal-lation	SXS	04-82	09-84	19,400 L 10,400 CT
B. LUZON				
San Fdo.,U	SPC	04-82	07-82	3,000 L
San Fdo.,P	SPC	03-82	08-82	4,000 L
Luceua	SPC	03-82	07-82	3,000 L
Concepcion	EMD	04-82	08-82	1,000 L
Retirement	SXS	04-82	12-82	5,100 L 5,800 CT
Reinstal-lation	SXS	04-82	04-83	1,200 L 1,600 CT
C. VISAYAS				
Talisay, Cebu	SPC	04-82	08-82	3,000 L
Roxas, Capiz	EMD	09-81	01-82	1,500 L
Retirement	X-Bar	04-82	07-82	400 L
Reinstal-lation	SXS	08-82	12-83	3,000 L 4,000 CT
D. MINDANAO				
Sasa,Davao	SPC	04-82	08082	3,000 L
Reinstal-lation	SXS	10-82	12-83	1,600 L 3,000 CT

5. Region V



REGION V TELECOMMUNICATION SYSTEM

		Existing (As of Dec., 1981)	After X-4	Additions Under X-4
South System				
Manticao Rly	- Cag. de Oro C.O.	120	120	-
Roxas Rly	- Roxas C.O.	-	300	300
Bacolod Rly	- Iloilo C.O.	300	300	-
Bacolod Rly	- Bacolod C.O.	300	300	-
Cotabato Rly	- Apo Rly	300	300	-
Apo Rly	- Davao Rly	300	300	-
Davao Rly	- Davao C.O.	300	300	-
Cebu Rly	- So. Cebu Rly	-	1200	1200
Cebu Rly	- Camotes Rly	-	1200	1200
Camotes Rly	- North Leyte Rly	-	1200	1200
North Leyte Rly	- Catbalogan Rly	-	1200	1200
Catbalogan Rly	- Calbayog Rly	-	1200	1200
Mandaue C.O.	- Bohol Rly	-	1200	1200
Bohol Rly	- So. Leyte Rly	-	1200	1200
So. Leyte Rly	- Surigao Rly	-	1200	1200
East System				
Manila	- Tanay (Via Antipolo Rly)	600	1200	600
West System				
Manila	- Tagaytay Rly	1200	2400	1200
Tagaytay Rly	- BEPZA	1200	-	-
Manila	- Imoc Rly	-	1200	1200
Imoc Rly	- San Pablo	-	300	300
Imoc Rly	- Candelaria	-	300	300
Candelaria	- Sariaya	-	300	300
Sariaya	- Lucena	-	300	300

TOLL NETWORK DEVELOPMENT
FACILITY/CIRCUIT PROVISION

		Existing (As of Dec., 1989)	After X-4	Additions Under X-4
MICROWAVE BACKBONE CAPACITY				
North System				
Manila	- Marilao Rly	960	2760	1800
Marilao Rly	- SFP C.O.	960	2760	1800
Marilao Rly	- Malolos C.O.	120	300	180
SFP C.O.	- Dau O/H Stn	960	2760	1800
Dau O/H Stn	- Tarlac C.O.	600	2400	1800
Tarlac C.O.	- Baguio Rly	600	-	-
Tarlac C.O.	- Cabanatuan C.O.	48	300	152
Baguio Rly	- Baguio C.O.	300	300	-
Baguio C.O.	- Sto. Tomas Rly	300	1200	900
Sto. Tomas Rly	- SFU Rly	300	1200	900
Sto. Tomas Rly	- Dagupan C.O.	300	300	-
Dau Rlay	- Sierra Madre Rly	1200	1200	-
Sierra Madre Rly	- Baler O/H Stn	1200	1200	-
Tarlac C.O.	- Sto. Tomas Rly	-	1800	1800
SFP C.O.	- Zambales Rly	-	1200	1200
South System				
Manila	- Lucban Rly	600	1800	1200
Lucban Rly	- Quezon Rly	600	1800	1200
Quezon Rly	- Naga Rly	600	-	-
Naga Rly	- Albay Rly	600	-	-
Quezon Rly	- Cam. Norte Rly	-	1200	1200
Cam. Norte Rly	- Sipocot Rly	-	1200	1200
Sipocot Rly	- Polangui Rly	-	1200	1200
Polangui Rly	- Albay Rly	-	1200	1200
Albay Rly	- Sorsogon Rly	-	1200	1200
Sorsogon Rly	- Legaspi Toll Center	-	300	300
Albay Rly	- Masbate Rly	600	1800	1200
Masbate Rly	- Panay Rly	600	1200	600
Panay Rly	- Bacolod Rly	600	1800	1200
Panay Rly	- Roxas Rly	-	1200	1200
Bacolod Rly	- Cebu Rly	600	1200	600
Cebu Rly	- Mandaue C.O.	1800	1800	-
Cebu Rly	- Siquijor Rly	300	300	-
Siquijor Rly	- Manticao Rly	300	300	-
Manticao Rly	- Pagadian Rly	300	300	-
Pagadian Rly	- Cotabato Rly	300	300	-
Cotabato Rly	- Cotabato C.O.	120	300	180

EXISTING BASEBAND STATUS

North System	Equipped	No. of Channels Working	Capacity
Intramuros - Marilao Rly	14 SG	712	960
Marilao - SFP C.O.	12 SG	592	960
SFP C.O. - Dau Rly	11 SG	556	960
Dau Rly - Tarlac C.O.	5 SG	240	600
Tarlac C.O.- Baguio Rly	4 SG	180	600
Baguio Rly - Baguio C.O.	4 SG	180	300
Baguio C.O.- Sto. Tomas Rly	3 SG	145	300
Sto. Tomas - SFU Stn.	2 SG	80	300
Sto. Tomas - Dagupan	2 SG	77	300
South System			
Intramuros - Lucban Rly	9 SG	402	600
Lucban Rly - Quezon Rly	8 SG	402	600
Quezon Rly - Naga Rly	8 SG	402	600
Naga Rly - Albay Rly	8 SG	354	600
Albay Rly - Masbate Rly	8 SG	334	600
Masbate Rly- Bacolod Rly	7 SG	322	600
Bacolod Rly- Iloilo C.O.	2 SG	85	300
Bacolod Rly- Bacolod C.O.	4 SG	108	300
Bacolod Rly- Cebu Rly	6 SG	223	600
Cebu Rly - Mandaue	7 SG	323	1800
Cebu Rly - Siquijor Rly	3 SG	122	300
Siquijor Rly-Manticao Rly	3 SG	122	300
Manticao Rly-Pagadian Rly	2 SG	98	300
Pagadian Rly-Cotabato Rly	2 SG	95	300
Cotabato Rly-Apo Rly	2 SG	77	300
Apo Rly - Davao Rly	2 SG	77	300
Davao Rly - Davao C.O.	2 SG	77	300
West System			
Intramuros - Tagaytay Rly	18 SG	998	1200
Tagaytay Rly-Bepza Stn.	2 SG	76	1200
Tagaytay Rly-San Pablo C.O.	1 SG	33	48
Lucban Rly - Lucena C.O.	1 SG	33	48
East System			
Intramuros - Tanay Earth Stn.	2 SG	100	600

FACILITY IMPROVEMENT AND UPGRADING
UNDER X-4 PROGRAM

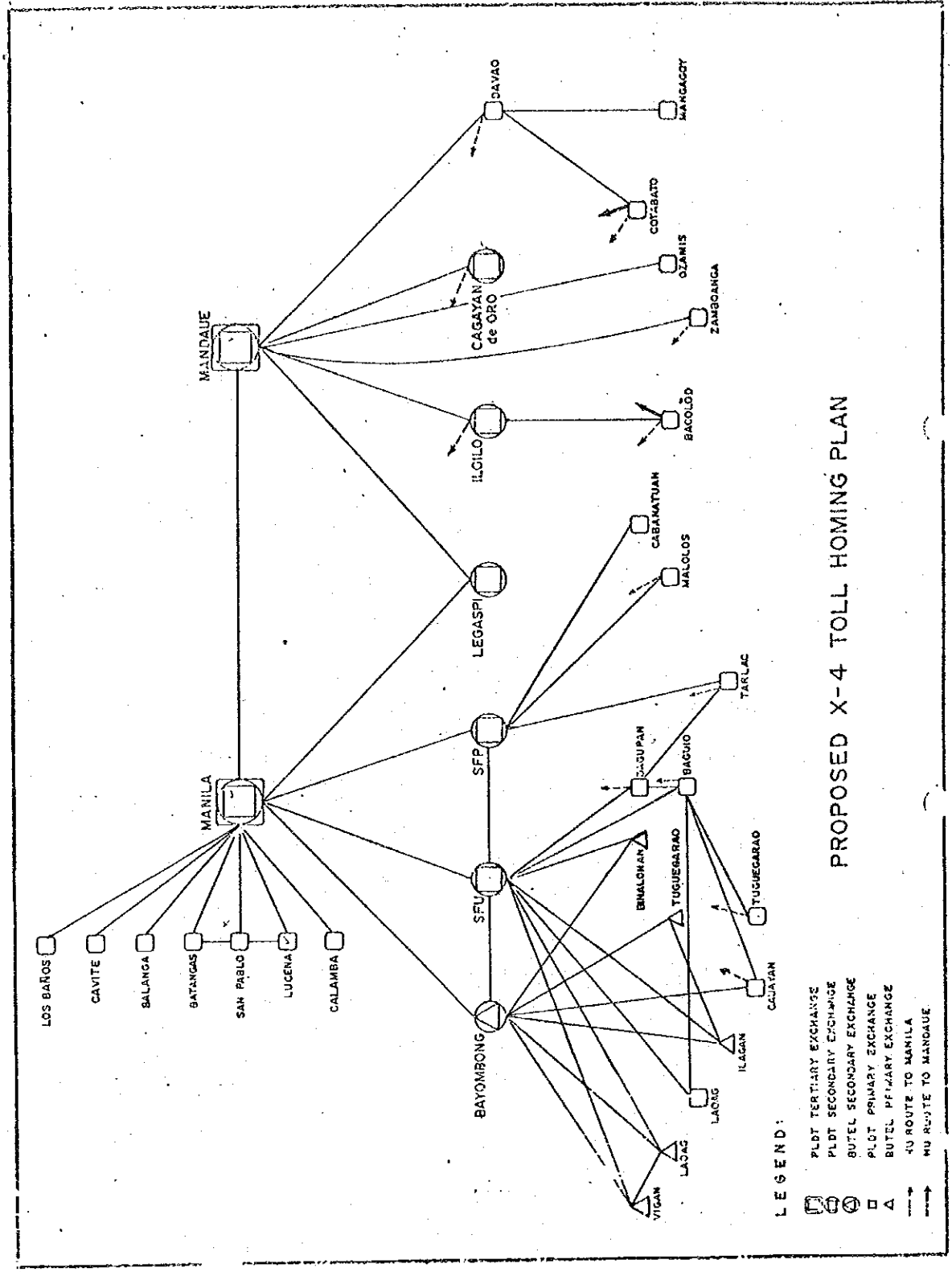
LINKS TO BE ESTABLISHED UNDER X-4

1.	Tarlac C.O.	- Sto. Tomas Rly
2.	SFP C.O.	- Zambales Rly
3.	Quezon Rly	- Cam. Norte Rly
4.	Cam. Norte Rly	- Sipocot Rly
5.	Sipocot Rly	- Polangui Rly
6.	Polangui Rly	- Albay Rly
7.	Albay Rly	- Sorsogon Rly
8.	Sorsogon Rly	- Legaspi Toll Center
9.	Panay Rly	- Roxas Rly
10.	Cebu Rly	- So. Cebu Rly
11.	Cebu Rly	- Camotes Rly
12.	Camotes Rly	- North Leyte Rly
13.	North Leyte Rly	- Catbalogan Rly
14.	Catbalogan Rly	- Calbayog Rly
15.	Mandaue C.O.	- Bohol Rly
16.	Imoc Rly	- San Pablo C.O.
17.	Imoc Rly	- Candelaria
18.	Candelaria	- Sariaya
19.	Sariaya	- Lucena C.O.

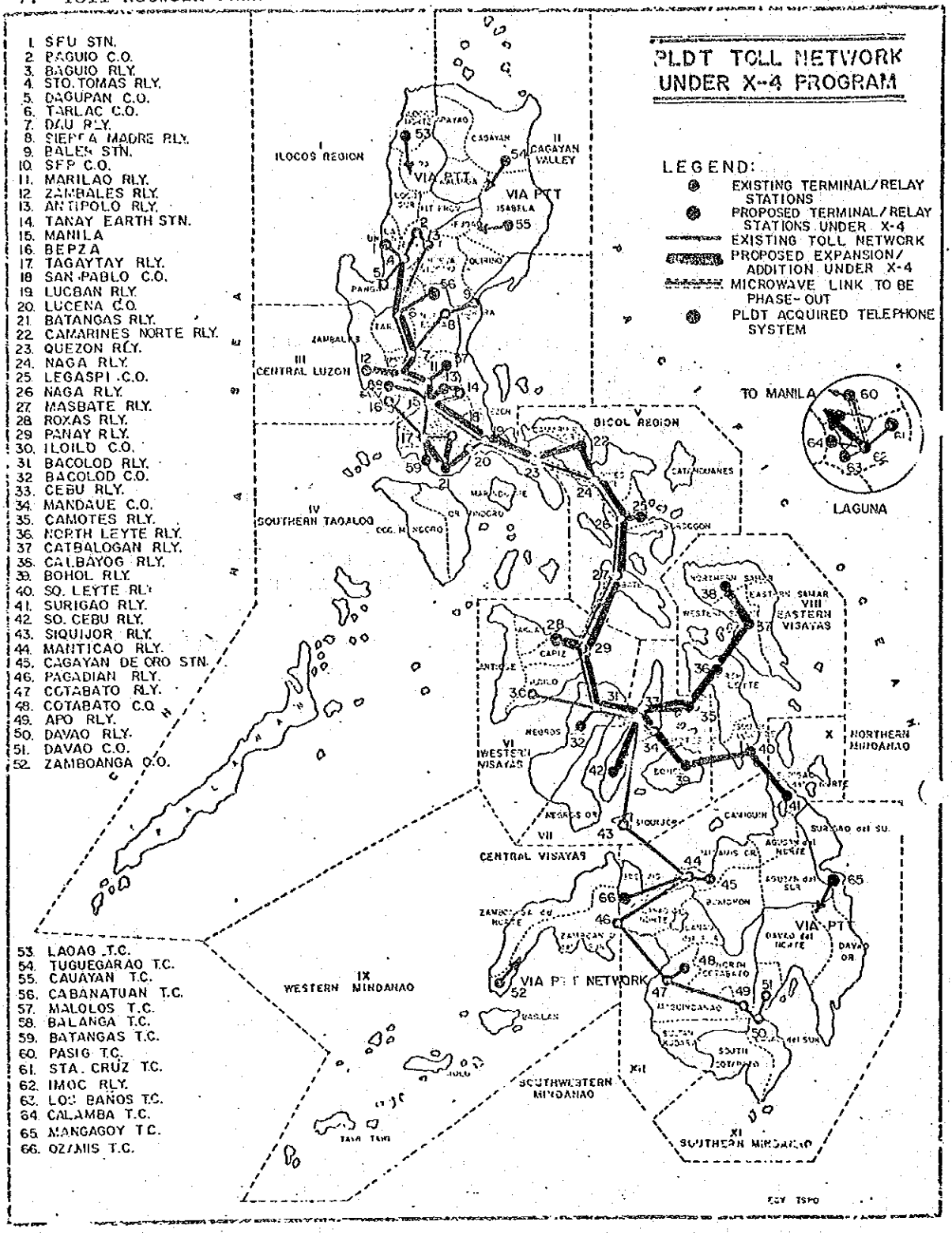
LINKS TO BE RETIRED UNDER X-4

1.	Tarlac C.O.	- Baguio Rly
2.	Quezon Rly	- Naga Rly
3.	Naga Rly	- Albay Rly
4.	Lucban Rly	- Lucena C.O.
5.	Tagaytay Rly	- San Pablo C.O.
6.	Manila	- Tanay

6. Toll Homing Plan



7. Toll Network Plan



8. PHILIPPINE LONG DISTANCE TELEPHONE COMPANY X-5 PROGRAM (1983-1987)

I. RATIONALE

1.0 The proposed PLDT X-5 Program was developed to fulfill the Company's commitment to provide the necessary telecommunications infrastructure to:

1.1 Support the government's socio-economic program:

- Stimulate the country's economic growth
- Attract foreign investors
- Encourage industrial dispersal
- Accelerate development of regional and rural sectors

1.2 Serve the growing needs of the public for sophisticated reliable and quality telecommunications service.

1.3 Continue efforts to keep pace with the latest worldwide developments in the telecommunications industry.

II. OBJECTIVES

1.0 In keeping with the above policy guidelines, the main objectives of this proposed PLDT Program will be as follows:

1.1 Service improvement and upgrading to improve quality of telecommunication services.

1.2 System expansion to increase the overall capacity of PLDT to provide service.

1.3 System extension to more areas in the countryside in support of the regional development objective of the country.

III. STRATEGY

In order to achieve the overall objectives of this Program, the following strategies will be employed in implementing this Program:

1.0 System Improvement/Upgrading - This will comprise all projects aimed at further upgrading and modernizing the Company's telecommunication facilities which was started under the X-4 Program.

This will primarily involve:

1.1 Local Service

1.1.1 Introduction of Digital SPC Switching Equipment to improve local subscriber calling and to serve demand for new and sophisticated services such as DDD, ISD, Data Communications and special subscriber features.

1.1.2 Installation of Fiber-Optic Transmission Facility in Metro Manila to improve transmission and to support expanded telecommunications services such as Data Communications.

1.1.3 Establishment of Digital SPC Tandem Switches to improve the call handling capability of the local network.

1.1.4 Establishment of SPC Operations and Maintenance Centers to facilitate maintenance and administration of the local telephone network.

1.1.5 Installation of computerized facilities for Repair, Directory Assistance and Operator Intercept Services to speed-up the servicing of customer requests for telephone service.

1.1.6 Retirement of SXS switching equipment (to be replaced by SPC switching systems) in order to upgrade the network facilities.

1.2 Toll Service

1.2.1 Introduction of new technology and modern equipment such as:

- Solar Powered Remote-Controlled Relay Station
- Digital Transmission Facilities to initiate the long term plan of establishing an integrated digital switching and transmission facilities
- Digital Public Paging System in Metro Manila
- Maritime Mobile Telephone System

1.2.2 Introduction of data transmission service ranging from 600 bps to 64 kbps. Application includes telex, facsimile, electronic mail, teletext, videotext and telecontrol.

1.2.3 Upgrading of the remaining SXS Toll Exchanges from Analog to Digital to provide the toll network with improved capability for DDD operations, alternate routing, rapid and reliable MFC signalling and automatic toll ticketing.

1.2.4 Upgrading of microwave backbone network to provide adequate capacity and flexibility in baseband rearrangement, restoration and expansion for the next 10 years.

1.2.5 Extension of DDD/ISD service to selected local exchanges and the adoption of automatic detailed Billing System to enhance the toll service capability in the country.

2.0 System Expansion - This will comprise all projects geared towards serving the growing needs of the public for basic as well as sophisticated and reliable telecommunications services in existing service areas.

This will primarily involve:

2.1 Expansion of service provision in existing areas being served by establishing more central offices, service centers, and service yards and by expanding inter-office trunking using latest technology.

2.2 Provision of more toll circuits to meet requirements of both PLDT and other carriers for both conventional and new services.

3.0 System Extension - The thrust of this portion of the Program is to catalyze and support the development of the regional and rural areas throughout the country.

In extending PLDT services, priority shall be given to:

- Industrial estates; export processing zones
- Government identified development priority areas such as regional, major and minor urban centers
- Government and private development sites
- Provincial capital

3.1 Service Provision Strategy

Based on economic considerations, service shall be effected via either one of the following approaches:

- Cable extension from an adjacent municipality with existing service where requirement is small and distance between municipalities is minimal.
- Use of concentrators connected to the exchange of an adjacent municipality where requirement and distance between the two municipalities are moderate.
- Establishment of an independent local exchange within the municipality where requirement is substantial or where distance to an adjacent municipality with service is significant.

3.2 Equipment Standard

The C.O. equipment standards to be followed in establishing a local exchange in a specific area will be:

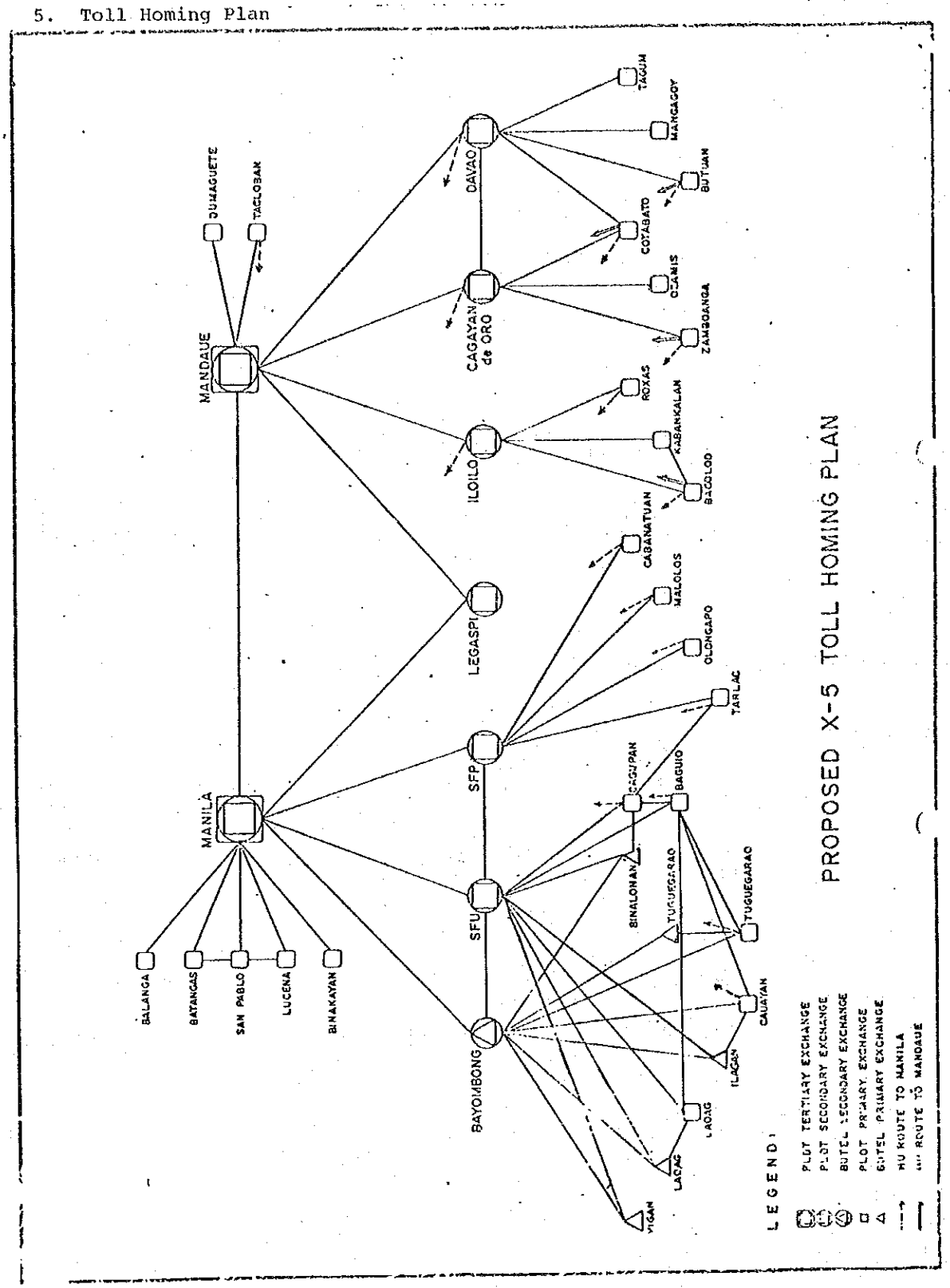
Demand (M.S.)	Type of Switch
100 - 200	Mobile Van or Remote Subscriber Unit from a nearby SPC Digital Switch
200 - 500	Step by step switch retired from the urban areas
500 - 1000	Rural SPC Switch
1000 and above	Regular SPC Digital Switch

4. Region V

PROPOSED PLDT PROGRAM (REGION V)

Province	C.O. Site	Municipalities Served	Implementation Phase
Albay	Polangui	Polangui	X-4 Program
		Oas	X-5 Program
	Libon	Libon	X-5 Program
Camarines Norte	J. Panganiban	J. Panganiban	X-5 Program
Camarines Sur	Bato	Bato	X-5 Program
	Bombon	Bombon	X-5 Program
		Calabanga	X-5 Program
		Canaman	X-5 Program
		Magarao	X-5 Program
orsogon	Gubat	Gubat	X-5 Program
	Irosin	Irosin	X-5 Program
	Magallanes	Magallanes	X-5 Program

5. Toll Homing Plan



9. **Existing Facilities/Stations in Region V (Bicol), as of December 1981.**

REGION - V - BICOL (120)

STATION		FACILITY
ALBAY		
1.	Albay Capitol	Telegraph
2.	Bacacay	Telegraph
3.	Camalig	Telegraph
4.	Daraga	Telegraph
5.	Guinobatan	Telegraph
6.	Jovellar	Radio
7.	Legaspi City (Capital)	Radio/Telegraph/Telex (Relay)
8.	Libon	Telegraph
9.	Ligao	Telegraph
10.	Malilipot	Telegraph
11.	Malinao	Telegraph
12.	Manito	Telegraph
13.	Oas	Telegraph
14.	Tabaco	Telegraph
15.	Pio Duran	Radio
16.	Polangui	Telegraph
17.	Rapu-Rapu	Radio
18.	Sto Domingo	Telegraph
19.	Tiwi	Telegraph
20.	Pantao	Radio
CAMARINES NORTE		
1.	Basud	Telegraph
2.	Capalonga	Radio
3.	Daet (Capital)	Radio/Telegraph/Telex/(Relay)
4.	J Panganiban	Telegraph
5.	Labo	Telegraph
6.	Mercedes	Telegraph
7.	Paracale	Telegraph
8.	San Vicente	Telegraph

CAMARINES NORTE (CONT.)

9.	Sta. Elena	Radio
10.	Talisay	Telegraph
11.	Vinzons	Telegraph

CAMARINES SUR

1.	Baao	Telegraph
2.	Bato	Telegraph
3.	Balatan	Radio
4.	Bombon	Telegraph
5.	Buhi	Telegraph
6.	Bula	Telegraph
7.	Cabusao	Telegraph
8.	Calabanga	Telegraph
9.	Camaligan	Telegraph
10.	Canaman	Telegraph
11.	Caramoan	Radio
12.	Del Gallego	Telegraph
13.	Garchitorena	Radio
14.	Goa (Capital)	Radio/Telegraph (Relay)
15.	Iriga City	Telegraph (Relay)
16.	Lagonoy	Telegraph
17.	Libmanan	Telegraph
18.	Lupi	Telegraph
19.	Magarao	Telegraph
20.	Mangogon	Radio
21.	Milaor	Telegraph
22.	Nabua	Telegraph
23.	Naga City	Radio/Telegraph/Telex (Relay)
24.	Minalabac 4- 9-81	Telegraph
25.	Ocampo	Telegraph
26.	Pamplona	Telegraph
27.	Pasacao	Telegraph
28.	Pili	Telegraph
29.	Presentacion (Parubcan)	Radio

CAMARINES SUR CONT.

30.	Ragay		Telegraph
31.	San Jose		Telegraph
32.	Sagnay	4- 8-81	Telegraph
33.	Sipocot		Telegraph
34.	Siruma		Radio
35.	Tandoc		Radio
36.	Tigaon		Telegraph
37.	Tinambac		Radio

CATANDUANES

1.	Bagamanoc	Telegraph
2.	Baras	Radio
3.	Bato	Telegraph
4.	Caramoran	Telegraph
5.	Gigmoto	Radio
6.	Pandan	Radio/Telegraph
7.	Panganiban (Payo)	Radio/Telegraph (Relay)
8.	San Andres	Telegraph
9.	San Miguel	Telegraph
10.	Viga	Telegraph
11.	Virac	Radio/Telegraph/Telex (Relay)

MASBATE

1.	Aroroy	Telegraph
2.	Baleno	Radio/Telegraph
3.	Balud	Radio
4.	Boncanaway	Radio
5.	Cataingan	Radio
6.	Cawayan	Radio
7.	Claveria	Radio
8.	Dimasalang	Radio/Telegraph
9.	Esperanza	Radio
10.	M A C	Radio
11.	Mandaon	Radio
12.	Masbate Capitol	Telegraph

MASBATE (CONT.)

13.	Masbate (Capital)	Radio/Telegraph/Telex (Relay)
14.	Milagros	Telegraph
15.	Mobo	Telegraph
16.	Monreal	Telegraph
17.	Palanas	Telegraph
18.	Pio Corpuz	Radio
19.	Placer	Telegraph
20.	San Fernando	Telegraph
21.	San Jacinto	Radio/Telegraph
22.	San Pascual	Radio
23.	Uson	Telegraph

SORSOGON

1.	Bacon	Telegraph
2.	Barcelona	Telegraph
3.	Bulan	Telegraph
4.	Bulusan	Telegraph
5.	Cumadcad	Telegraph
6.	Casiguran	Telegraph
7.	Castilla	Telegraph
8.	Donsol	Radio/Telegraph
9.	Gubat	Telegraph
10.	Irosin	Telegraph
11.	Juban	Telegraph
12.	Magallanes	Telegraph
13.	Matnog	Telegraph
14.	Pilar	Telegraph
15.	Putiao	Telegraph
16.	Prieto Diaz	Radio
17.	Sta. Magdalena	Telegraph
18.	Sorsogon	Radio/Telegraph/Telex