3.1.3 The history of HONDUTEL

The history of telecommunications services in Honduras is as follows:

(1) A telegraph service was started in the section linking Tegucigalpa - Comayagua - La Paz, in May 1877.

(2) The telegraph service was expanded to cover the borders of El Salvador and Nicaragua in 1878, and 40 cities in 1882.

(3) The first telephone exchanges to offer a telephone service in and between Tegucigalpa and Comayagua were introduced in 1932.

These telegraph and telephone services had been provided by a governmental organization until HONDUTEL was established in 1976 to operate all the telecommunications services in the country.

The mission of HONDUTEL is as follows:

(1) Affairs concerning national and international telegraph and telephone services

(2) Affairs concerning national and international telex service

(3) Affairs concerning national and international data transmission service

(4) Affairs concerning radio frequency control for national radio communication and television broadcasting

(5) Affairs concerning transmission of radio and television broadcasting programs

3.2 Present State of Telecommunications Services

3.2.1 Present State of telecommunications services in Honduras

1) Menu of telecommunications services

In addition to the general telephone service, other telecommunications services available in Honduras are paging service, telex service, data communications service by means of a packet switching system, telegraph service, and leased circuit service.

All telecommunications services are offered by HONDUTEL except the paging service, which is offered by two companies in the private sector: MELECTRO and RADIO SISTEMA BUSCA PERSONAS (R.B.P.). The services available in Honduras are shown in Table 3.2.1-1.

Table 3.2.1-1 Telecommunications Services in Honduras

Services	Offered by
Telephone services	HONDUTEL
General telephone service	
Public telephone service	
By automatic coin telephones	
By attended manual telephones	
Paging service	MELECTRO
	R.B.P.
Telex service	HONDUTEL
Data communications service	HONDUTEL
Packet switching service	
Telegraph service	HONDUTEL
Leased circuit services	HONDUTEL
Physical lines	
Channels to third parties	
Transmission of radio broadcasting programs	
Transmission of television broadcasting programs	
Channels to other administrative organizations	

2) General telephone service

The general telephone service is provided by automatic or manual connection. In the automatic connection telephone service, the local, toll, and international calls are connected automatically by the subscriber's dialing. For toll and international calls, operator assistance is available. Special code services to call the police, fire station, complaint desk for telephone faults, etc. are also offered. Optional services such as conference calling, call transfering, call waiting, etc. are available by means of special code dialing, when requested by the subscriber. The services available by special codes are shown in Table 3.2.1-2. In the manual connection telephone service, all the connections of the local, toll, and international calls are assisted by the operator.

Table 3.2.1-2 Special Code Services

Service	Code
International operator (AT&T)	123
Conference	151
Call transfer (registration)	153
Call transfer (cancellation)	155
Busy holding (registration)	157
Busy holding (cancellation)	159
Subscriber line automatic test	187
Long distance operator assistance	191
National information	192
Official circuit information	193
Fault complaint	194
Correct time and weather	196
International operator assistance	197
Fire	198
Police	199

Source: Information presented by HONDUTEL for this Study.

The number of the main lines was 92,386 and the telephone penetration rate was 1.88 main lines per 100 inhabitants at the end of 1991. The number of main lines increased by around 10% per year until 1991 and was double the number in 1985. On the other hand, the penetration rate marked a growth from 1.14 to 1.88 during this period. This growth is lower than that of the main lines, because the population growth rate had a higher increase rate of 3.3% per year on average during that period. Table 3.2.1-3 shows the growth in the number of main lines and the penetration rate from 1980 to 1991.

Table 3.2.1-3 Growth of Telephone Lines

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Main Lines												
Automatic	28,944	31,468	33,159	35,365	43,105	45,909	49,659	53,858	65,787	78,014	87,466	91,666
Manual	492	584	629	629	629	310	467	543	689	675	727	720
Total	29,436	32,052	33,788	35,994	43,734	46,219	50,126	54,401	66,476	78,689	88,193	92,386
Ratio to the year before	1	1.09	1.05	1.07	1.22	1.06	1.08	1.09	1.22	1.18	1.12	1.05
Population (thousand)	3,431	3,545	3,663	3,785	3,911	4,041	4,175	4,313	4,457	4,605	4,758	4,913
Main Lines /100 Inhabitants	0.86	0.90	0.92	0.95	1.12	1.14	1.20	1.26	1.49	1.71	1.85	1.88

Source:

Main lines: Data presented by HONDUTEL for this Study.

Population: "Honduras en Cifras" by Central Bank of Honduras, except for the year 1991, which was estimated by average increase rate, or 3.3%.

99% of the general telephone service is offered by automatic connection at the end of 1991.

The general automatic telephone service is offered in 30 major cities. In addition to this general automatic telephone service in the urban areas, the general telephone service by means of satellite communications systems and that of manual switch boards are offered. Table 3.2.1-4 shows the cities provided with telephone service.

Table 3.2.1-4 Cities or Municipalities with Telephone Service

As of December 1991.

Department	City/municipality	Exchange
Automatic exchanges		
Urban Network		
Atlántida	La Ceiba	La Ceiba I
		La Ceiba II
	Tela	Tela
Choluteca	Choluteca	Choluteca
Colón	Tocoa	Tocoa
	Trujillo	Trujillo
Comayagua	Comayagua	Comayagua
	Siguatepeque	Siguatepeque
Copán	Santa Rosa de Copán	Santa Rosa de Copán
Cortés	Choloma	Choloma
	La Lima	La Lima
	Puerto Cortés	Puerto Cortés
	San Pedro Sula	San Pedro Sula III
		San Pedro Sula IV
El Paraíso	Danlí	Danlí
	El Paraíso	El Paraíso
Francisco Morazán	Distrito Central	Miraflores
		Principal I
		Principal II
		Toncontín
	Valle de Angeles	Valle de Angeles
	San Antonio de Oriente	Zamorano
Islas de la Bahía	Guanaja	Guanaja
	José Santos Guardiola	Oak Ridge
	Roatán	Roatán
	Utila	Utila
La Paz	La Paz	La Paz
Ocotepeque	Nueva Ocotepeque	Nueva Ocotepeque
Olancho	Catacamas	Catacamas
	Juticalpa	Juticalpa
Santa Bárbara	Santa Bárbara	Santa Bárbara
Valle	San Lorenzo	San Lorenzo
Yoro	El Progreso	El Progreso
	Olanchito	Olanchito
	Yoro	Yoro

Table 3.2.1-4 Cities or Municipalities with Telephone Service (continued)

Department	City/municipality	Exchange
DOMSAT Network (Public)		
Copán	Copán Ruinas	Copán Ruinas
Lempira	Gracias	Gracias
Copán	La Entrada	La Entrada
Intibucá	La Esperanza	La Esperanza
La Paz	Marcala	Marcala
Manual exchanges		
Choluteca	San Marcos de Colón	San Marcos de Colón
El Paraíso	Yuscarán	Yuscarán
Intibucá	La Esperanza	La Esperanza
Olancho	San Francisco de la Paz	San Francisco de la Paz
Olancho	San Francisco de Becerra	San Francisco de Becerra
Valle	Amapala	Amapala

Source: Information presented by HONDUTEL for this Study.

Most of the cities with automatic telephone service are major cities having a population of 10,000 or more. Some small cities with sight-seeing spots or pivotal points of land traffic are also provided with the automatic telephone service, even if the population is around 2,000.

Some Department Capitals had not provided with automatic telephone service as of December, 1991. They were Yuscarán of El Paraíso, Nacaome of Valle, La Esperanza of Intibucá, Gracias of Lempira, Puerto Lempira of Gracias a Dios. Of these, manual telephone service was offered in Yuscarán, Nacaome, and La Esperanza. An automatic telephone exchange was installed at Nacaome in 1991 and ready to start service. La Esperanza and Gracias were being incorporated with the satellite communications system called DOMSAT, which is a type of rural communications system, and provided with automatic telephone service at the end of 1991.

The penetration rate, or the number of main lines per 100 inhabitants, was 8.08 in Tegucigalpa, 7.75 in San Pedro Sula, and 5.35 in La Ceiba as of December, 1991. Table 3.2.1-5 shows the penetration rate calculated for the urban area population (poblacion de cabecera) of cities with automatic telephone service.

Table 3.2.1-5 Telephone Density of Cities with Automatic Telephone Exchange

As of December 1991

Department	City/Municipality	Main lines	Population of urban service area	Main lines per 100 inhabitants
Islas de la Bahía Roatán	Roatán	535	4,498	13.71
Francisco Morazán	Valle de Angeles	300	2,970	11.29
Islas de la Bahía Utila		126	1,185	9.99
Francisco Morazán	San Antonio de Oriente (Zamorano)	150	1,732	9.55
Islas de la Bahía Guanaja		191	2,047	9.42
Francisco Morazán	M.D.C.	46,604	670,040	8.08
Cortés	San Pedro Sula	22,278	327,820	7.75
Cortés	Puerto Cortés	2,071	32,941	6.56
Colón	Trujillo	331	6,215	5.72
Atlántida	La Ceiba	3,677	77,618	5.35
Santa Rosa de Copán	Santa Rosa de Copán	944	21,605	4.80
Islas de la Bahía	José Santos Guardiola (Oak Ridge)	142	3,360	4.66
Ocotepeque	Nueva Ocotepeque	320	7,513	4.59
Olancho	Juticalpa	897	22,715	4.57
Choluteca	Choluteca	2,265	63,593	4.16
Santa Bárbara	Santa Bárbara	417	11,757	3.97
Comayagua	Comayagua	1,387	44,437	3.73
Atlántida	Tela	865	24,331	3.71
Yoro	El Progreso	2,197	69,485	3.66
Comayagua	Siguatepeque	990	32,259	3.63
Cortés	La Lima	985	31,944	3.43
Yoro	Yoro	323	11,010	3.43
El Paraíso	Danlí	979	35,597	3.37
Yoro	Olanchito	459	15,904	3.29
Olancho	Catacamas	531	20,625	2.96
La Paz	La Paz	297	12,445	2.64
Colón	Tocoa	322	19,822	2.29
El Paraíso	El Paraíso	284	15,047	2.17
Valle	San Lorenzo	288	15,748	2.03
Cortés	Choloma	511	53,066	1.31
Total		91,666	1,659,329	6.39

Note: Population in the year 1991 was estimated applying increase rate of each municipal for the period of National Census 1974 to 1988.

Table 3.2.1-6 shows the telephone waiting applicants registered by HONDUTEL.

Table 3.2.1-6 Telephone Waiting Applicants Registered by HONDUTEL

As of December 1991

Area	Waiting applicants	Area	Waiting applicants
Tegucigalpa	21,893	Tocoa	138
Comayagua	667	Trujillo	146
Siguatepeque	477	Olanchito	209
La Paz	139	Coxen Hole	249
Marcala	73	Oak Ridge	65
Valle de Angeles	60	Utila	58
Zamorano	17	Guanaja	89
San Lorenzo	136	Tela	360
Choluteca	981	San Pedro Sula	10,108
Danlí	456	Puerto Cortés	917
El Paraíso	136	La Lima	476
Juticalpa	394	Choloma	231
Catacamas	245	Santa Rosa de Copán	446
Gracias	41	Nueva Ocotepeque	72
Amapala	21	Santa Bárbara	194
La Esperanza	126	El Progreso	747
La Ceiba	1,729	Yoro	115
		Total	42,211

Source: Information presented by HONDUTEL for this Study.

The number of national calls for the year 1990 was around 1.6 times that for the year 1985. The growth in the number of national calls, international calls, and cities with automatic telephone service is shown in Table 3.2.1-7.

Table 3.2.1-7 Growth of Telephone Calls

Year	1985	1986	1987	1988	1989	1990
National calls (in '000,000s)	119.3	138.3	148.2	163.3	143.4	185.0
International calls (in '000,000s)	1.6	1.7	1.8	2.0	2.7	3.4
Cities with automatic telephone service	–	–	–	–	27	28

Source: HONDUTEL's annual reports "Memoria" 1987 to 1990.

3) Public telephone service

Public telephones in the urban areas consist of automatic telephones installed on poles along the street or in parks and manual telephones that require operator assistance, placed in the HONDUTEL offices.

Most of the automatic public telephones are only for local calls, but a new type of public telephones have been introduced recently. Using the new public telephone, the user can call the operator of AT&T in the U.S.A. by dialing "123". International collect calls are available with the new public telephone.

The operator assisted manual public telephones are used for making toll and international calls. The number of public coin telephones in December 1991 is shown in Table 3.2.1-8.

Table 3.2.1-8 Public Coin Telephone Distribution

As of December 1991

City	Number of public coin telephones
Tegucigalpa	206
Catacamas	1
Choluteca	3
Comayagua	2
Danlí	2
El Paraíso	2
Juticalpa	2
La Paz	3
Siguatepeque	6
San Pedro Sula	54
La Ceiba	17
El Progreso	6
La Lima	3
Puerto Cortés	4
Santa Rosa de Copán	3
Tela	6
Total	320

Source: Information presented by HONDUTEL for this Study

4) Paging service

The paging service is offered by two private companies: MELECTRO and RADIO SISTEMA BUSCA PERSONAS. The number of subscribers is supposed to be several hundred for each. Both offer the service in Tegucigalpa and San Pedro Sula.

5) Telex service

Telex service is available in 34 cities. The number of telex subscribers is decreasing and the total number of terminals was 747 at the end of 1991. Table 3.2.1-9 shows the number of telex subscribers.

Table 3.2.1-9 Number of Telex Subscribers

Year	1986	1987	1988	1989	1990	1991
Subscribers	806	825	830	860	771	747

Source: Information for the year 1989 to 1991 presented by HONDUTEL and the rest by ITU yearbook.

The telex subscribers are allowed to access "World Letter" and "INSIGHT" services offered in the U.S.A.

Besides the subscribed telex service, a public telex service is offered at some HONDUTEL offices. Table 3.2.1-10 shows the location of the offices.

Table 3.2.1-10 Location of the Public Telex Service Offices

Department	Location	Telex Number
Francisco Morazán	Sucursal Kennedy Miraflores Comayagüela Valle de Tamara Cantarranas	1532 399/400 1355/PBX Estación Terrena Café Honduras Azucarera
El Paraíso	Danlí Yuscarán El Paraíso Ojo de Agua	4502 4506 4511 Fuerzas Armadas
Olancho	Juticalpa Catacamas	4602 4608
Valle	San Lorenzo Amapala Nacaome	4602 4205 4206
Comayagua	Comayagua Siguatepeque	4702 4802
Choluteca	Choluteca San Marcos de Colón	4202 4212
Cortés	San Pedro Sula Sucursal Medina Puerto Cortés La Lima	5835 5827 8002 8302
Atlántida	La Ceiba Tela	8802 8702
Yoro	El Progreso Yoro Olanchito Santa Rita	8502 8512 8514 8513
Lempira	Gracias	7202
La Paz	La Paz Marcala	4705 4803
Intibucá	La Esperanza	4807
Copán	Santa Rosa de Copán	7002
Santa Bárbara	Santa Bárbara	7102
Islas de La Bahía	Roatán Coxen Hole Guanaja	8402 8404
Colón	Trujillo Savá Sonaguera Bonito Orintal Puerto Castilla	8102 8104 8108 8110 Base Naval

6) Data communications service

The data communications service is offered by means of a packet switching system. The access nodes are allocated in Tegucigalpa and San Pedro Sula. The service areas of each node are as follows.

Tegucigalpa node:

Catacamas, Comayagua, Choluteca, Danlí, Juticalpa, La Paz, Marcala, Siguatepeque, Tegucigalpa, San Lorenzo.

San Pedro Sula node:

Islas de la Bahía, El Progreso, La Ceiba, Olanchito, Puerto Cortés, Yoro, Santa Bárbara, San Pedro Sula, Santa Rosa de Copán, Tela, Tocoa, Trujillo.

Table 3.2.1-11 shows the number of packet service subscribers.

Table 3.2.1-11 Number of Packet Service Subscribers

Year	1985	1986	1987	1988	1989	1990
Subscribers	16	29	51	74	99	140

Source: Information presented by HONDUTEL for this Study.

The data communications service by packet switching system allows the subscribers to access not only the private and public data banks in Honduras but also the international private and public data banks. The data banks include Commodity System Inc., Compuserve, Data Resources Inc., Delphi, Dialog Information Services Inc., Dow Jones Company Inc., Newsnet Inc., Orbit, etc.

7) Telegram service

The telegram service is offered at service offices of HONDUTEL located throughout the country. The telegram service has two classes corresponding to the priority to process: ordinary and urgent. The number of accepted telegrams remained almost constant for the five years up to and including the year 1990. Table 3.2.1-12 shows the volume of the telegram service in processed words.

Table 3.2.1-12 Volume of the Telegram Service in Processed Words

Year	1985	1986	1987	1988	1989	1990
Words (in '000s)	5,738	5,325	4,776	5,182	4,491	5,035

Source: Information presented by HONDUTEL for this Study.

8) Leased circuit service

The leased circuit service comprises the following service items:

- Physical lines,
- Channels to third parties,
- Transmission of radio broadcasting program,
- Transmission of television broadcasting programs,
- Channels to other administration organization.

9) Public facsimile service

Facsimile service is available by means of the telephone network, though a special network dedicated to facsimile service is not provided. The public facsimile service is offered at 15 service offices of HONDUTEL shown in Table 3.2.1-13.

Table 3.2.1-13 Service Offices of Facsimile

As of December 1991

Department	Location	Facsimile number
Francisco Morazán	Centro(Principal)	37-9715
	Comayagüela	38-2713
	Toncontín	33-8770
El Paraíso	Danlí	93-2529
	Yuscarán	By operator
Valle	Nacaome	By operator
Comayagua	Comayagua	72-0500
Choluteca	Choluteca	82-0053
Cortés	San Pedro Sula	52-4923
Atlántida	La Ceiba	42-0008
Yoro	El Progreso	56-4598
La Paz	La Paz	74-2137
Copán	Santa Rosa de Copán	62-0365
Islas de la Bahía	Roatán (Coxen Hole)	45-1006
Colón	Trujillo	44-4200

Source: Information presented by HONDUTEL for this Study.

10) Telecommunications service in rural area

Rural telecommunications service is offered through service offices of HONDUTEL located throughout the country. These offices are classified into four types: Telegram service office, Telegram and telephone service office, Telephone service office, and Radio service office, and shown in Appendix 3.2.1-1. They number 200, 152, 47, and 21 respectively. Table 3.2.1-14 shows the number of service offices in each Department.

Table 3.2.1-14 Rural Telecommunications Service Offices

As of December 1991

Department	Telegram	Telegram & Telephone	Telephone	Radio	Total
Atlántida	6	1	0	5	12
Choluteca	6	16	1	0	23
Colón	2	2	3	3	10
Comayagua	17	10	3	2	32
Copán	16	12	5	1	34
Cortés	15	6	0	2	23
El Paraíso	7	14	7	1	29
Francisco Morazán	9	24	8	1	42
Gracias a Dios	0	0	0	1	1
Intibucá	4	11	4	0	19
Islas de la Bahía	0	0	3	0	3
La Paz	14	7	3	0	24
Lempira	30	4	0	1	35
Ocotepeque	14	5	0	1	20
Olancho	16	12	1	2	31
Santa Bárbara	23	11	8	1	43
Valle	2	11	1	0	14
Yoro	19	6	0	0	25
Total	200	152	47	21	420

Source: 'Estado actual del servicio de telecomunicación rural, Anexo 2, Plan maestro para las telecomunicaciones rurales', by HONDUTEL, modified by survey result.

The telegram service offices of HONDUTEL are equipped with a Morse telegraph device that is very old and obsolete. The batteries used with the device are mostly dry batteries, but in some cases hand-made wet batteries are connected to the device.

The telegraph line is sometimes disconnected which causes faults. Once out of order, the line is left faulty for a long time, because the line passes through mountains in many cases and its repair needs plenty of time. Once in a while it is left faulty for several days.

The telephone set equipped at the telephone service offices is an old type magnetic telephone set connected to a manual board. In most cases the line extends as much as 20 Km to 30 Km from the base manual board. In some cases, two or three telephone sets are connected in parallel to one physical line. This causes high transmission loss and very poor speech quality. Once out of order, the line is left faulty for a long time, because of the same reason as the telegraph line.

The present situation of telecommunications services at the 223 subject areas are as follows:

a) Telephone service

General telephone service is not provided in the 223 subject areas. HONDUTEL service offices are located in these areas to offer public telephone service as follows:

- Public telephone and telegram service office - 75 areas
- Public telephone service office - 13 areas

The public telephone service is seldom offered by automatic telephone service but mostly by manual telephone service. Those telephone sets are a magnetic type and connected to a manual switch board as far away as 20km or more. The speech quality is very poor, noisy and faint, and interrupted occasionally during conversation.

Thus, the telephone services at the subject areas are not good. The results of the analysis of the telephone service at the subject areas are as follows:

- Telephone density per 100 inhabitants is 0.02 lines.
- Average number of calls handled per month is 132.
- Average holding time per call is 4 minutes.
- Average charge per call is 4 Lempiras.

As mentioned above, the telephone density per 100 inhabitants is only 0.02 lines. This is very low compared with 1.88 lines nationwide including urban areas in1991.

b) Telegram service

Telegram service is available at HONDUTEL service offices where public telegram service is offered. Details are as follows:

- Public telephone and telegram service office - 75 areas
- Public telegram service office - 94 areas

In these rural areas, the public telegram service is more useful, because the telephone service is poor.

At the subject areas, average number of telegrams handled per month are as follows:

- official telegrams - 61 cases/Month
- private telegrams - 108 cases/Month
- average charge - 0.9 Lempiras

The results of the Study at the subject areas are as follows:

- 88 rural community areas or 39% of the areas have public telephone service
- 94 rural community areas or 42% of the areas have only telegram service
- 41 rural community areas or 19% of the areas have no telecommunications service

3.2.2 Comparison with surrounding countries

The state of the telecommunications services in four neighboring countries, Guatemala, El Salvador, Nicaragua, and Costa Rica was compared to grasp the situation in Honduras.

1) General telephone service and telephone waiting applicants

The number of main lines and telephone density per 100 inhabitants in each country is shown in Table 2.2.2-1. The number of main telephone lines in Honduras showed an annual increase of more than 10% from 1988 to 1990, which was the highest among the four countries. Honduras had the lowest telephone density of the four countries until 1987. However, Honduras exceeded Nicaragua in telephone density in 1989 and reached 1.85 lines per 100 inhabitants in 1990. The highest telephone density in 1990 was 9.60 lines per 100 inhabitants in Costa Rica.

Table 3.2.2-1 Main Lines and Telephone Density

	1986	1987	1988	1989	1990
HONDURAS	50,126/1.20	54,401/1.26	66,476/1.49	78,689/1.71	88,193/1.85
GUATEMALA	130,971/1.86	132,781/1.57	138,222/1.58	148,222/1.61	187,817/1.99
EL SALVADOR	91,122/1.98	98,107/1.99	104,248/2.09	120,561/2.36	124,789/2.05
NICARAGUA	39,500/1.17	45,962/1.34	45,483/1.52	46,169/1.59	46,993/1.57
COSTA RICA	206,787/8.38	223,492/8.04	241,927/8.64	272,619/9.51	277,032/9.60

In A/B

A: Number of main lines

B: Telephone density (Number of main lines per 100 inhabitants)

Source: Information on Honduras presented by HONDUTEL for this Study and the rest by COMTELCA.

The number of telephone waiting applicants is shown in Table 3.2.2-2. More than 10,000 main lines were installed each year in Honduras from 1988 to 1990, with the number of telephone waiting applicants decreasing from 1985. Nevertheless, there are still many telephone waiting applicants. The number of telephone waiting applicants in Costa Rica was half of that in Honduras in 1990.

Table 3.2.2-2 Number of Telephone Waiting Applicants

	1984	1985	1986	1987	1988
HONDURAS	38,600	41,100	37,500	31,300	26,400
GUATEMALA	–	–	–	–	–
EL SALVADOR	12,764	11,257	11,200	95,970	–
NICARAGUA	827	–	–	–	–
COSTA RICA	7,285	7,527	3,249	5,911	13,825

Source: ITU "Yearbook of Common Carrier Telecommunication Statistics", 1991

2) Telegram service

The number of national paid telegrams is shown in Table 3.2.2-3. The number of national paid telegrams in Honduras was at a peak in 1986, after which it decreased. However, about 85,000 paid telegrams, 27 times the number of paid telegrams in Costa Rica, were handled in Honduras in 1988.

Table 3.2.2-3 Number of National Paid Telegrams

	1984	1985	1986	1987	1988
HONDURAS	1,089,900	1,075,800	1,986,000	1,249,500	844,700
GUATEMALA	–	–	–	–	–
EL SALVADOR	1,096,940	1,645,748	1,639,875	2,077,443	
NICARAGUA	755,500	–	–	–	–
COSTA RICA	222,601	227,523	–	–	31,198

Source: ITU "Yearbook of Common Carrier Telecommunication Statistics", 1991

3) Telex service

The number of telex subscribers is shown in Table 3.2.2-4. The number of telex subscribers has not changed much. The number of telex subscribers in Honduras was half that in Costa Rica in 1990.

Table 3.2.2-4 Number of Telex Subscribers

	1984	1985	1986	1987	1988
HONDURAS	725	725	806	827	854
GUATEMALA	–	1,182	–	–	–
EL SALVADOR	756	910	879	906	–
NICARAGUA	827	–	–	–	–
COSTA RICA	1,474	1,534	1,623	1,639	1,500

Source: ITU "Yearbook of Common Carrier Telecommunication Statistics", 1991

3.3 Present State of Telecommunications Facilities

3.3.1 Exchange

Exchanges are local, toll, local-toll combined, and international. At all levels, digital exchanges, analog electronic exchanges, crossbar exchanges, crosspoint exchanges, step by step exchanges, and manual exchanges are used in Honduras.

1) Local Exchange

Local exchanges are used to connect subscribers. Two digital exchanges, two analog electronic exchanges, 14 crossbar exchanges, 12 crosspoint exchanges, one step by step exchange, and eight manual exchanges are installed.

The capacity of the automatic local exchanges is generally small. The capacity of four exchanges in Tegucigalpa and San Pedro Sula is more than 10,000 lines, and the capacity of others is less than 4,000 lines. In particular, the capacity of exchanges in the provinces is small, with 23 units having fewer than 1,000 lines. Automatic exchanges are installed in Tegucigalpa, the capital city, San Pedro Sula, a commercial city, La Ceiba, a harbor city, and other provincial cities that have populations more than 10,000. There are 18 Departments in Honduras; three Department capitals, such as Yuscarán in El Paraíso, La Esperanza in Intibucá and Gracias in Lempira, which have no automatic exchanges.

2) Toll Exchange

A toll exchange has the function to switch toll calls. One crossbar exchange was installed each in Tegucigalpa and San Pedro Sula in 1973.

3) Local-toll Combined Exchange

The local-toll combined exchange functions both to connect subscribers and to switch toll calls. One digital exchange for local-toll exchange was installed in each of Tegucigalpa, San Pedro Sula, and La Ceiba in 1987 and one crossbar exchange for local-toll exchange was installed in each of Comayagua and Choluteca in 1973.

4) International Exchange

International exchanges handle international calls. One digital exchange to handle international calls was installed in Tegucigalpa in 1989.

Existing exchanges are shown in Table 3.3.1-1.

Table 3.3.1-1 Exchange (1/2)

As of December 1991

Exchange	Type	Model	In service from	Expanded in	Installed capacity	Lines in service
LOCAL EXCHANGE						
Automatic exchange						
Urban network						
Agua Caliente	A xp	SIEMENS CPR-10	1991		40	
Catacamas	A xb	OKI ACC-23M	1979	1987	1,000	531
Choloma	A xb	ERICSSON ARF-102	1980	1989	1,000	511
Choluteca	A xb	OKI ACC-460	1973		3,000	2,265
Comayagua	A xb	OKI ACC-460	1973		1,400	1,387
Danlí	A xb	OKI ACC-23	1973		1,000	979
El Paraíso	A xp	SIEMENS CPR-30	1984		300	284
El Progreso	Digital	OKI D-70	1990		4,000	2,197
Guanaja	A xp	SIEMENS CPR-30	1988		230	191
Juticalpa	A xb	OKI ACC-23M	1978		1,000	897
La Ceiba I	A xb	OKI ACC-460	1973		2,000	1,980
La Ceiba II	Digital	OKI D-70	1987		1,712	1,697
La Lima	A xb	OKI ACC-23	1974		1,000	985
La Paz	A xp	SIEMENS CPR-30	1984		300	297
Miraflores I	A ess (SD)	OKI KBD-10	1987		16,000	15,870
Nueva Ocotepeque	A xp	SIEMENS CPR-100	1991		358	320
Oak Ridge	A xp	SIEMENS CPR-30	1988		230	142
Olanchito	A xb	ERICSSON ARF-102	1980	1987	1,000	459
Principal I	A sxs	OKI A8	1963		10,000	5,055
Principal II	Digital	OKI D-70	1987		16,000	13,851
Puerto Cortés	A xb	OKI ACC-460	1974		2,500	2,071
Roatán	A xp	SIEMENS CPR-100	1988		610	535
San Lorenzo	A xp	SIEMENS CPR-30	1984	1988	300	288
San Pedro Sula III	Digital	ERICSSON AXE-10	1987		15,000	12,223
San Pedro Sula IV	Digital	OKI D-70	1987		12,000	10,055
Santa Bárbara	A xb	ERICSSON ARF-102	1980	1987	1,000	417
Santa Rosa de Copán	A xb	OKI ACC-23	1973		1,000	944
Siguatepeque	A xb	OKI ACC-23	1974		1,000	990
Tela	A xb	OKI ACC-23	1974		1,000	865
Tocoa	A xb	ERICSSON ARF-102	1980	1987	1,000	322
Toncontín	A ess (SD)	OKI KBD-10	1987		12,000	11,828
Trujillo	A xb	ERICSSON ARF-102	1980	1987	1,000	331
Utila	A xp	SIEMENS CPR-30	1988		230	126
Valle de Angeles	A xp	SIEMENS CPR-30	1991		300	300
Yoro	A xp	SIEMENS CPR-30	1990		600	323
Zamorano	A xp	SIEMENS CPR-30	1991		150	150
(SUBTOTAL)					111,260	91,666

Table 3.3.1-1 Exchange (2/2)

Exchange	Type	Model	In service from	Expanded in	Installed capacity	Lines in service
DOMSAT network						
Copán ruinas	Digital	HARRIS 20-20	1991		432	0
Gracias	Digital	HARRIS 20-20	1991		432	0
La Entrada	Digital	HARRIS 20-20	1991		136	0
La Esperanza	Digital	HARRIS-20-20	1991		576	0
Marcala	Digital	HARRIS 20-20	1991		576	0
Others	Digital	HARRIS 20-20	1991		2,556	0
(SUBTOTAL)					4,708	0
TOTAL(AUTOMATIC)					115,968	91,666
Manual exchange						
Amapala					40	40
Amatillo					40	40
Nacaome					160	160
San Fco. de Copán					60	60
San Fco. de La Paz					160	160
San Fco. de Becerra					70	70
Yuscarán					50	50
La Eseranza					140	140
(SUBTOTAL)					720	720
LOCAL EXCHANGE NATIONAL TOTAL					116,688	92,386
TRANSIT EXCHANGE						
International	Digital	NEC NEAX-61	1989		1,920	---
CST	A xb	OKI ACC-5	1973		1,000	---
CSS	A xb	OKI ACC-5	1973		1,000	---
TRANSIT EXCHANGE NATIONAL TOTAL					3,920	---

Note: A sxs : Step by step analog exchange
A ess (SD) : Semi-electronic analog exchange
A xb : Cross-bar analog exchange
A xp : Cross-point analog exchange

3.3.2 Outside plant facilities

1) Configuration of Subscriber line system

a) Subscriber line facilities

i) System

There are two kinds of subscriber line systems. One is the flexible distribution system, and the other is the direct distribution system. Both systems are used by HONDUTEL.

The flexible distribution system consists of primary cables, secondary cables, and cabinets. The primary cables are laid in conduit pipes buried underground and the secondary cables are installed on poles. The cabinets are installed between the primary cable and the secondary cable. Primary and secondary cable pairs are connected with jumper wires through the cabinet. At the drop point, secondary cable pairs and a drop wire are connected to reach subscriber premises. This system can provide cable pairs effectively for a demand change. Hence, the flexible distribution system is used in large cities such as Tegucigalpa. HONDUTEL is planning to adopt the flexible distribution system gradually in Honduras.

On the other hand, the direct distribution system is used at small exchange sites in rural areas. The cable pairs are provided directly without cabinet when they are required. Configuration of the subscriber line system is shown in Figure 3.3.2-1.

ii) Cable

There are two kinds of underground cable for the primary cable. One is the conduit cable, and the other is the buried cable. Conduit cable is mainly used by HONDUTEL. The continuous gas flow system has been applied to the existing underground cable, and jelly-filled cables have also been applied. The gas-filled cable to jelly-filled cable ratio used in Tegucigalpa is six to four. The types of the existing cables used by HONDUTEL are shown in Table 3.3.2-1.

Figure 3.3.2-1. Configuration of Subscriber Line System

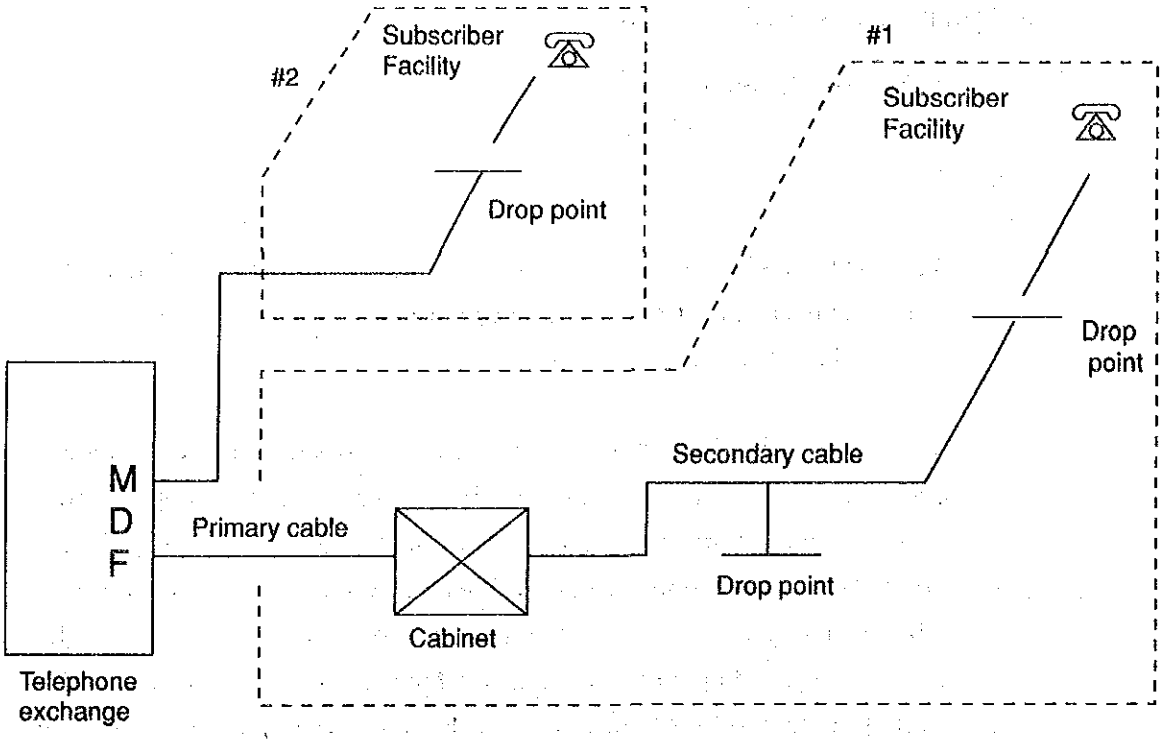


Table 3.3.2-1 Type of Existing Cable of HONDUTEL

Type of cable	STALPETH Sheathed Cable	ALPETH Sheathed cable	
Conductor twisting	Pair twining		
Conductor insulation	Paper	Polyethylene	Foamed Polyethylene
Number of pairs	400~2400	400~2400	400~2400

There are self-supporting cables and open wires for aerial cable. Self-supporting cables of 6 pairs to 300 pairs are in use. Open wires are mainly used in the rural areas.

The conductor diameter of cables are 0.4mm, 0.5mm, 0.65mm, and 0.9mm, and that of open wire is 2.0mm. These are made of copper or steel. The resistance and attenuation of cables and open wires are shown in Table 3.3.2-2.

The quantity of subscriber line cable is shown in Table 3.3.2-3. Appendix 3.3.2-1 shows the number of subscriber line cable facilities in each exchange.

Table 3.3.2-2 Resistance and Attenuation of Cable and Open Wire

[Cable]

Conductor Diameter [mm]	Conductor Resistance [Ω/Km]	Attenuation at 1.0kHz [dB/Km]	with H-88 Loading coil: Conductor Resistance [Ω/Km]	with H-88 Loading coil: Attenuation at 1.0kHz [dB/Km]
0.4	303	1.92	290.4	1.29
0.5	188.7	1.52	194	0.81
0.65	118.7	1.18	123.4	0.52
0.9	58.8	0.84	58.4	0.24

[Open wire]

Material	Diameter	Resistance
Copper weld	2.0 [mm]	37.4 [Ω/Km]

Table 3.3.2-3 Quantity of Subscriber Line Cable

Area	Quantity [Pair x Km]
CEN-SUR	343,364
NOR-OCC	252,965
TOTAL	596,329

CEN-SUR : CENTRAL-SOUTH
NOR-OCC : NORTH-WEST

iii) Poles

There are three kinds of poles for the subscriber line: creosote impregnated wooden poles, concrete poles, and steel poles. For HONDUTEL, the wooden pole is the most commonly used because it is the cheapest and easiest to install.

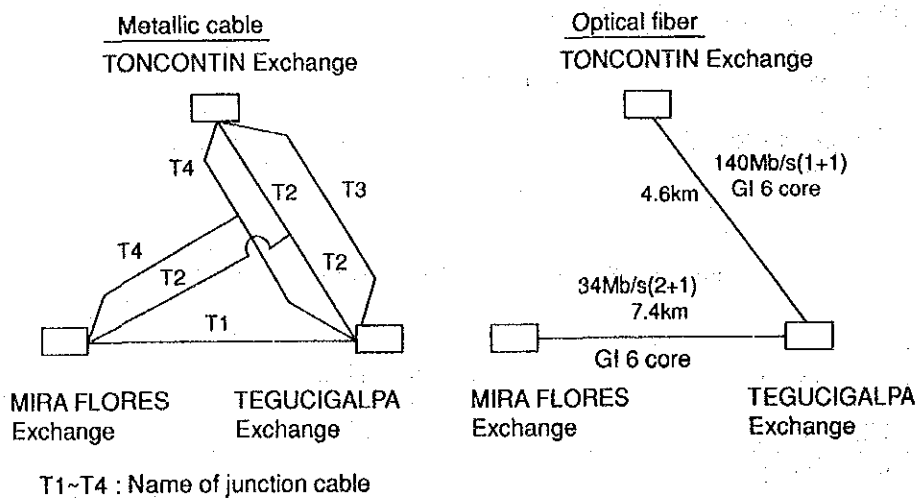
b) Civil facilities

HONDUTEL has many conduit pipes and manholes in urban areas. The internal diameter of the ducts are 75mm and 100mm. The principal material of the most frequently used duct is polyvinyl chloride (PVC). Most HONDUTEL manholes are made of concrete. There are no civil facilities in the rural area except for some short sections of a small scale in a few areas.

2) Configuration of the junction cable network

At present, HONDUTEL has junction cable facilities in Tegucigalpa mainly. The route maps are shown in Figure 3.3.2-2, and total volume of junction cable facilities is shown in Table 3.3.2-4. Appendix 3.3.2-2 shows the number of junction cable facilities in detail.

Figure 3.3.2-2 Route Maps of Junction Cable



T1~T4 : Name of junction cable

Table 3.3.2-4. Number of Junction Cables

Cable	Total Length (Km)	Quantity (pair/core x Km)
Metallic cable	33	19,091
Optical fiber	12	72

3.3.3 Transmission facilities

Two transmission systems, namely radio and wire transmission systems, are utilized in Honduras.

The transmission route is shown in Appendix 3.3.3-1.

The earth station named "Lempira" is installed for international telecommunications through the INTELSAT satellite.

1) Radio transmission facility

a) Digital microwave facility

Digital microwave links in Honduras are classified into two groups; trunk links which use an 8 GHz frequency band and spur links which use a 2 GHz frequency band.

The principal items such as the name of the radio stations, frequency, capacity, latitude, longitude, etc., are shown in Appendix 3.3.3-2.

There are three main routes in Honduras. The route which connects Santa Rosa de Copán and Calentura through La Ceiba has a capacity of 960 channels. The route which connects Tegucigalpa and San Pedro Sula has a capacity of 1,920 channels. The route which connects Tegucigalpa and Juticalpa has a capacity of 1,344 channels.

The spur links are connected to 11 local cities from the radio repeater stations of the main links.

b) Analog microwave facility

Analog microwave links were installed to connect the five capitals of Central America (Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica). They are international radio links which use the 4 GHz frequency band and have a capacity of 960 channels. However, the digitization of these links is currently being performed.

There are two other links; one is from Choluteca to Tegucigalpa and the other is from San Pedro Sula to Tegucigalpa.

The principal items such as the name of the radio stations, frequency, capacity, latitude, longitude, etc., are shown in Appendix 3.3.3-3.

c) Analog VHF and UHF radio facility

Four kinds of low capacity VHF and UHF radio links using 900 MHz, 400 MHz, 160 MHz, and 150 MHz frequency bands have been installed to connect local cities. 14 radio links in the 900 MHz frequency band have been installed. There are nine radio links in the 400 MHz frequency band, and three radio links in the 150 MHz and 160 MHz frequency bands. There are also single channel links in the 100 MHz frequency band.

The principal items such as the name of the radio stations, frequency, capacity, latitude, longitude, etc., are shown in Appendix 3.3.3-4.

d) Domestic satellite telecommunications facility

24 satellite earth stations and three mobile earth stations have been installed to connect the isolated rural cities. The satellite was launched by PANASAT of the U.S.A.

e) International satellite facility

A Standard-A earth station has been installed in Honduras.

f) Radio-telephone and radio-telegraph facility

Six radio-telephone stations and 21 radio-telegraph stations which use high frequency bands have been installed.

The station names, frequencies, etc., are shown in Appendix 3.3.3-5.

2) Wire transmission facility

a) Optical fiber transmission facility

Two optical fiber transmission links which connect Palacio – Miraflores, Palacio – Toncontin have been installed.

The principal items of these stations are shown in Appendix 3.3.3-6.

b) PCM transmission facility

There is a link of PCM transmission system. The name of the link is shown in Appendix 3.3.3-6.

c) Pair wire transmission facility

There are seven links using a pair wire transmission system. The names of the links are shown in Appendix 3.3.3-6.

3.3.4 Power supply facilities

The telephone office facilities in Honduras are supplied with commercial power. Each telephone office has its own power supply facility such as a rectifier and batteries. The main telephone offices have generators in case of power failure. The main power supply facilities of the telephone offices are shown in Appendix 3.3.4-1.

Each of main radio repeater stations is equipped with a rectifier, batteries and a generator. The main power supply facilities of these radio stations are shown in Appendix 3.3.4-2.

3.3.5 Operation and maintenance equipment

The operation and maintenance equipment for the exchanges, outside plant, transmission, and electric power in HONDUTEL are as follows:

1) Exchange

a) Staff in charge of the exchange system of each telephone office is responsible for the mainenance of their own office's exchange.

b) The D70 digital exchanges, installed in San Pedro Sula and La Ceiba are equipped with centralized maintenance and supervisory equipment with the information transferred to the Tegucigalpa office by way of data transmission links.

2) Outside plant

a) Staff in charge of the outside plant of each telephone office is responsible for the maintenance of their gas cable using gas pressure alarm equipment.

b) The outside plant section of the maintenance department possesses handy transceivers.

3) Transmission

a) Staff of the transmission section of the maintenance departments in Tegucigalpa, San Pedro Sula, and La Ceiba maintain transmission equipment of their own maintenance area, including repeater stations.

b) Important transmission stations are supervised 24 hours a day by the staff of the Tegucigalpa telephone office.

4) Electric power

The electric power section of the maintenance departments has no supervisory equip ment.

5) Others

a) Each telephone office has a number of vehicles for maintenance and installation work. Appendix 3.3.5-1 shows the vehicle arrangement.

b) Some telephone offices have motorcycles and bicycles for the delivery of telegrams.

c) Measuring instruments are provided for the telephone office and the maintenance section of the maintenance departments.

d) Each technician has his own tool set.

e) Spare maintenance panels are managed by the maintenance section. Appendix 3.3.5-2 shows measuring instrument.

f) Special telephones, accessed by dialing 194, receive complaint calls. They are installed in the service center of each maintenance department.

3.3.6 Telecommunications facilities in the subject areas

Almost all of the 223 subject areas for this Study are located in a farm or a mountain away from a main city, so it is difficult to get access to these areas.

There are two kinds of transmission systems for these rural areas. One is the wire transmission system using mainly open wire, another is the radio transmission system. The wire transmission system is mainly used.

For the wire transmission system, open wires are mainly used for the subscriber line facilities which connect between the local exchange and a public telecommunications service office.

In the area near a city, a two-wire circuit (open wire) is widely used for the telephone circuit with metallic cable sometimes being used. The poles are maintained in good condition.

On the other hand, a single open wire system named the B-WIRE SYSTEM is used for telegraph service in the areas far from city. The poles are simple and sometimes trees are used with insulators on them. These open wire routes are mainly distributed through the uncultivated plains and mountains.

These circuits are mainly used for public telecommunications service offices in the rural areas.

Sometimes these line facilities are damaged by a burning grass fire or by a bullet, and therefore urgent improvement is required.

A short wave radio system (HF) is used in 12 places in the subject areas.

The telecommunications media in the public telecommunications service office is a single and obsolete Morse telegraph set and magnet telephone set.

3.4 On-going Telecommunications Project

The main projects planned to be carried out between 1989 and 1992 are as follows:

1) Telephone network for 10 cities

The main objective is to meet demand and provide efficient telecommunications services to the cities of Villanueva, Potrerillos, Pimienta, Yoro, Ocotepeque, Danlí, and Tela, and the completion of the external network in Islas de la Bahía, Miraflores, Toncontín, and Valle de Angeles.

2) Extension of transmission links

As an extension of the national transmission network, the 24-channel systems in La Paz - Horno and El Paraíso - Moncerrato are to be replaced by 60-channel systems.

As an extension of the Central American route used for the national network, the number of channels will be extended from 120 channels to 300 channels and repeaters and terminal stations in Tegucigalpa - Choluteca, Tegucigalpa - Danlí, and Tegucigalpa – San Pedro Sula routes will be extended.

3) International digital link for the Central American regional network

The main objective is to replace, modernize and extend the existing Central American network with a modern regional digital telecommunications system, having a minimum capacity of 1,920 telephone channels in its main routes to interconnect the capitals of Central American countries.

4) Rural satellite telecommunications

This project is to meet the needs of telecommunications services in communities having difficult access by other means, and at the same time provide efficient and safe communications to the Honduran Army. The service has already started.

5) Rural network

This project will provide automatic telephone service to 51 rural communities in the rural sector bordering the Departments of Ocotepeque, Lempira, Intibucá, Valle, Choluteca, and El Paraíso, with a digital multi-access system. The civil works of this project have been completed.

6) Sub-urban network

This project is to provide automatic telephone service to 1,100 new subscribers distributed in the Departments of Santa Bárbara, Choluteca, Tocoa, Trujillo, Olancho, and La Paz, through a multi-access system and existing analog exchanges.

7) Local network of Tegucigalpa

The objective of the project is to meet the existing telephone demand, both by installing a 30,000-line digital exchange in Miraflores and by extending the digital exchanges of Tegucigalpa Centro (8,000 lines) and La Ceiba, (4,000 lines).

8) Mobile telephone exchanges

Mobile telephone exchanges will be installed to satisfy a growing demand in the cities of Tegucigalpa, San Pedro Sula, La Ceiba, La Lima, Nacaome, Juticalpa, and French Harbor.

Other projects are as follows:

- In February, 1992, the plan called for an automatic telephone service in 47 rural communities in the south and southwest part through a multi-access system provided by aid from the European Community.

- In November, 1990, the plan called for Canada to provide an automatic telephone service through a multi-access system in rural communities with Ocotepeque in the southwest, Santa Rosa de Copán in the West, Danlí in the East, Tegucigalpa in the center, and Choluteca in the south. However, this project has not started yet.

The on-going rural telecommunications projects above are to provide an automatic public telephone service, not an automatic general telephone service. When a full-scale automatic general telephone service is provided by these rural telecommunications projects, these automatic public telephone sets will be moved to other areas.

Appendix 3.4-1 shows projects planned to be carried out between 1989 and 1992.

3.5 Financial Condition of HONDUTEL

Tables 3.5-1 and 3.5-2 show the financial condition of HONDUTEL. In 1990 the revenue from international calls was double what it was in 1989 and amounted to more than two thirds of total telephone revenue. This is because of the devaluation of the Lempira to the US dollar. Tariffs of international telephone calls have not changed in US dollar terms.

"Tax" in expenses of the income statement means the consumption by governments.

Table 3.5-1 Income Statement (Unit: Lempiras)

Year	1988	1989	1990
TELEPHONE REVENUES	142,258,942	191,819,644	333,221,177
Installation fee	3,445,167	2,944,184	2,996,992
Basic charge	12,423,361	16,277,094	20,959,458
Local call	14,747,188	12,534,019	15,398,080
Long distance call	34,943,998	45,518,774	59,155,869
International call	72,536,416	111,445,162	231,372,101
Others	4,162,812	3,100,411	3,338,677
TELEGRAPH REVENUES	3,144,337	2,076,937	2,582,435
LEASED CIRCUIT REVENUES	1,978,768	3,325,679	4,206,910
MISCELLANEOUS REVENUES	13,781,152	18,730,417	35,963,744
TOTAL REVENUES	161,163,199	215,952,677	375,974,266
EXPENSES			
Personnel	58,573,926	97,321,390	77,027,128
Non-personnel	15,662,207	18,967,040	76,379,182
Depreciation & amortization	10,725,783	9,311,311	22,083,772
Interest expense	15,037,725	22,319,593	24,016,158
Taxes	24,935,785	30,601,431	27,602,049
Others	–	424,370	2,666,637
TOTAL EXPENSES	124,935,426	178,945,135	229,774,926
NET INCOME	36,227,773	37,007,542	146,199,340

Source: HONDUTEL

Table 3.5-2 Balance Sheet (Unit: Lempiras)

(As of December 31)

Year	1988	1989	1990
[ASSETS]			
CURRENT ASSETS			
Cash & deposits	29,646,093	77,868,732	134,249,879
Quick assets	32,348,071	34,810,800	70,861,112
Inventories	17,943,217	16,905,614	13,590,650
Others	1,286,032	450,897	39,013,327
(Total)	81,223,413	130,036,043	257,714,968
FIXED ASSETS			
Tangible fixed assets	304,214,239	315,204,338	410,025,211
Intangible fixed assets	–	–	–
Financial investments	1,286,032	1,286,032	1,286,032
Deferred charges	85,301,583	28,075,981	382,011,512
Others	–	2,423,385	–
(Total)	390,801,854	346,989,736	793,322,755
TOTAL ASSETS	472,025,267	477,025,779	1,051,037,723
[LIABILITIES]			
CURRENT LIABILITIES			
Short-term loans	92,810,543	91,040,435	93,595,485
LONG-TERM LIABILITIES			
Long-term loans	221,232,220	214,308,268	642,224,602
Others	–	2,658,780	–
(Total)	314,042,763	308,007,483	735,820,087
EQUITY			
Capital stock	121,754,731	132,010,755	169,018,296
Net income	36,227,773	37,007,541	146,199,340
(Total)	157,982,504	169,018,296	315,217,636
TOTAL LIABILITIES	472,025,267	477,025,779	1,051,037,723

Source : HONDUTEL

3.6 Tariff

1) Telephone installation fee

Table 3.6-1 Telephone Installation Fee

(Unit: Lempiras)

Type of Subscriber	Area (*) A	B	C
Residential	200.00	150.00	100.00
Commercial	400.00	300.00	250.00
Official	250.00	200.00	200.00

2) Basic monthly charge

Table 3.6-2 Basic Monthly Charge(**)

(Unit: Lempiras)

Type of Subscriber	Area (*) A	B	C
Residential	20.00	20.00	10.00
Commercial	40.00	40.00	20.00
Official	40.00	40.00	10.00

(*) A: City having automatic exchange(s) with a capacity of 1,000 lines or more.

B: City having automatic exchange(s) with a capacity between 100 and 1,000 lines.

C: City having automatic or manual exchange(s) with a capacity of less than 100 lines or rural communities having manual exchange(s).

(**) Basic monthly charge includes telephone charges for up to 150 calls.

Local call rate after 150 calls is Lps.0.08/3 minutes.

3) Automatic toll call rate

Toll call rate is set by taking into account 18 message areas and four call levels.

Table 3.6-3 Automatic Toll Call Rate

(Unit: Lempiras)

(*) Level	Day Rate	(**) Reduced Rate	(***) Special Reduced Rate
1	0.34	0.25	0.17
2	0.69	0.48	0.34
3	1.04	0.74	0.51
4	1.37	1.04	0.69

(*) Level 1 applies to calls within the same message area, level 2 to calls to adjacent areas, level 3 to calls to non-adjacent areas, and level 4 to calls to non-adjacent areas separated by more than 200 Kms or two message areas.

(**) Applies to the night hours (22:00-7:00) and all day on Sundays and national holidays.

(***) Applies to the specified days, December 24, and December 31.

4) Semi-automatic or manual toll call rate (Station-to-station)

Table 3.6-4 Semi-automatic/Manual Toll Call Rate (Station -to- Station)

(Unit: Lempiras)

Level	Day Rate 3 minutes	Additional min.	Reduced Rate 3 minutes	Additional min.
1	1.90	0.40	1.50	0.40
2	3.80	0.85	2.95	0.85
3	5.70	1.25	4.40	1.25
4	7.60	1.70	5.90	1.70

5) Semi-automatic or manual toll call rate (Person-to-person)

Table 3.6-5 Semi-automatic/Manual Toll Call Rate (Person -to- Person)

(Unit: Lempiras)

Level	Day Rate 3 minutes	Additional min.	Reduced Rate 3 minutes	Additional min.
1	2.10	0.40	1.70	0.40
2	4.20	0.85	3.40	0.85
3	6.30	1.25	5.05	1.25
4	8.40	1.70	6.70	1.70

6) Automatic international call rate

Table 3.6-6 Automatic International Call Rate

(Unit: US$)

Area(*)	Day Rate	Reduced Rate	Special Reduced Rate
1	0.64-1.00	0.48-0.80	0.32-0.39
2	1.25	1.00	—
3	3.50	2.88	—
4	4.00	3.25	—
5	4.50	4.00	—
6	6.00	5.40	—

(*) Area 1: Central America
Area 2: Mexico
Area 3: Colombia, Ecuador
Area 4: Peru, Cuba, Argentina, Brazil, Chile, Venezuela, Haiti, Bolivia, Paraguay, Uruguay, Puerto Rico
Area 5: European countries
Area 6: Other countries

CHAPTER 4 DEMAND FORECAST

CHAPTER 4 DEMAND FORECAST

4.1 Framework of Society and Economy

4.1.1 Honduras overall

The national economy in the past decade has experienced a cycle of boom and bust as mentioned in Chapter 2. In the telecommunications sector, large improvements were made in terms of service quality and quantity with economic aid from many countries including Japan. However, the national deficit has increased owing to the low price of agricultural products in the international market. Honduras devalued its currency to adjust its economic structure and debt.

4.1.2 *Subject areas*

Rural areas in Honduras consist of mountains and coastal villages. They lag behind urban areas in terms of social conditions and industrial growth, as mentioned in Chapter 2. In each area there is a disparity in wealth. The poor have been self-sufficient for a long time, but have not prospered enough to be able to trade their agricultural and livestock products.

The subject areas are important areas in each region, including the capitals of Municipalities, centers of tourism and border towns. The areas are located throughout the country except for the jungles and islands; over 60% of the areas have a population between 1000 and 3000. The population distribution for each Department is shown in Table 4.1.2-1.

Table 4.1.2-1 Distribution of Population Size in 1990 for 223 Subject Areas

Population level / Department	Number of Subject areas	0--500	501--1000	1001--2000	2001--3000	3001--4000	4001--5000	5001--10000	10001-
ATLANTIDA	18	1	1	5	6	3	2		
COLON	7			1	5	1			
COMAYAGUA	13			6	4	2	1		
COPAN	21	2		10	5	2	1	1	
CORTES	18	1		7	5	1	2	2	
CHOLUTECA	20	4	2	6	4	1	1	1	1
EL PARAISO	20	2	4	6	3	1	2	1	1
FRANCISCO MORAZAN	22	1	2	8	6	3		2	
INTIBUCA	8			5	2				1
LA PAZ	4			4					
LEMPIRA	14		6	7	1				
OCOTEPEQUE	7		2	5					
OLANCHO)	14			2	6	2	2	2	
SANTA BARBARA	22			8	9	2	1	1	1
VALLE	8	1	3	3				1	
YORO	7			1	3			3	
Total	223	12	20	84	59	18	12	14	4

4.2 Subscriber's Telephone

4.2.1 Analysis of present demand

The present telephone service level in the subject areas is very low and is limited as mentioned in Chapter 3. Most of the residents of the areas do not know much about the benefits and effects of a telephone service. Because of the population's inexperience and poverty, many public telephones should be installed in place of general subscriber's telephone. The value of the public telephone should be included in the subscriber's telephone demand.

Owners of shops, farms and some organizations, like Municipal offices, have a great need for a telephone service.

4.2.2 Method of estimation

Telephone demand was estimated using information based on national/ regional development plans, the socio-economic situation, telecommunications development plans, and existing telecommunications services. Assuming that the conditions will not change radically during this estimation period, the following six methods were used to estimate telephone demand. A flowchart of the demand estimate is shown in Figure 4.2.2-1.

1) Extrapolation of the chronological model

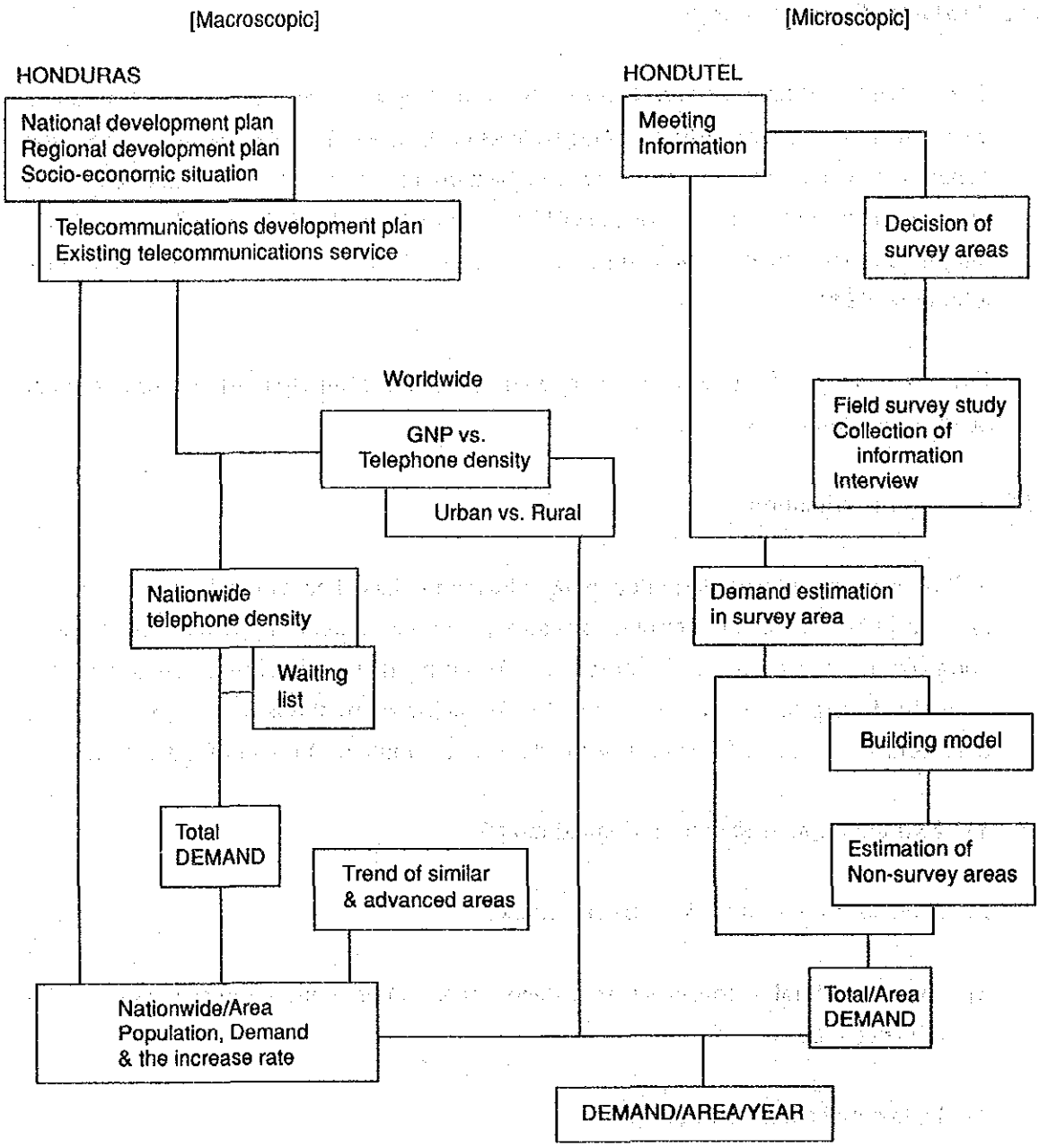
2) Regression with the econometrics model

3) Trends in durable consumer goods and trends in telephone services in similar and advanced areas

4) Data collected in field survey

5) Replies to questionnaire from residents, central/regional government officials and HONDUTEL's operators

Figure 4.2.2-1 Flowchart of Demand Estimate



6) Opinion of HONDUTEL's engineers

All the subject areas are located in rural areas and have similar socio-economic conditions such as population distribution and product per capita, even with some differences in the industrial and geographical conditions. Therefore, the sampling method for a field survey study will be applied to the Study for demand forecast.

4.2.3 Macroscopic demand forecast

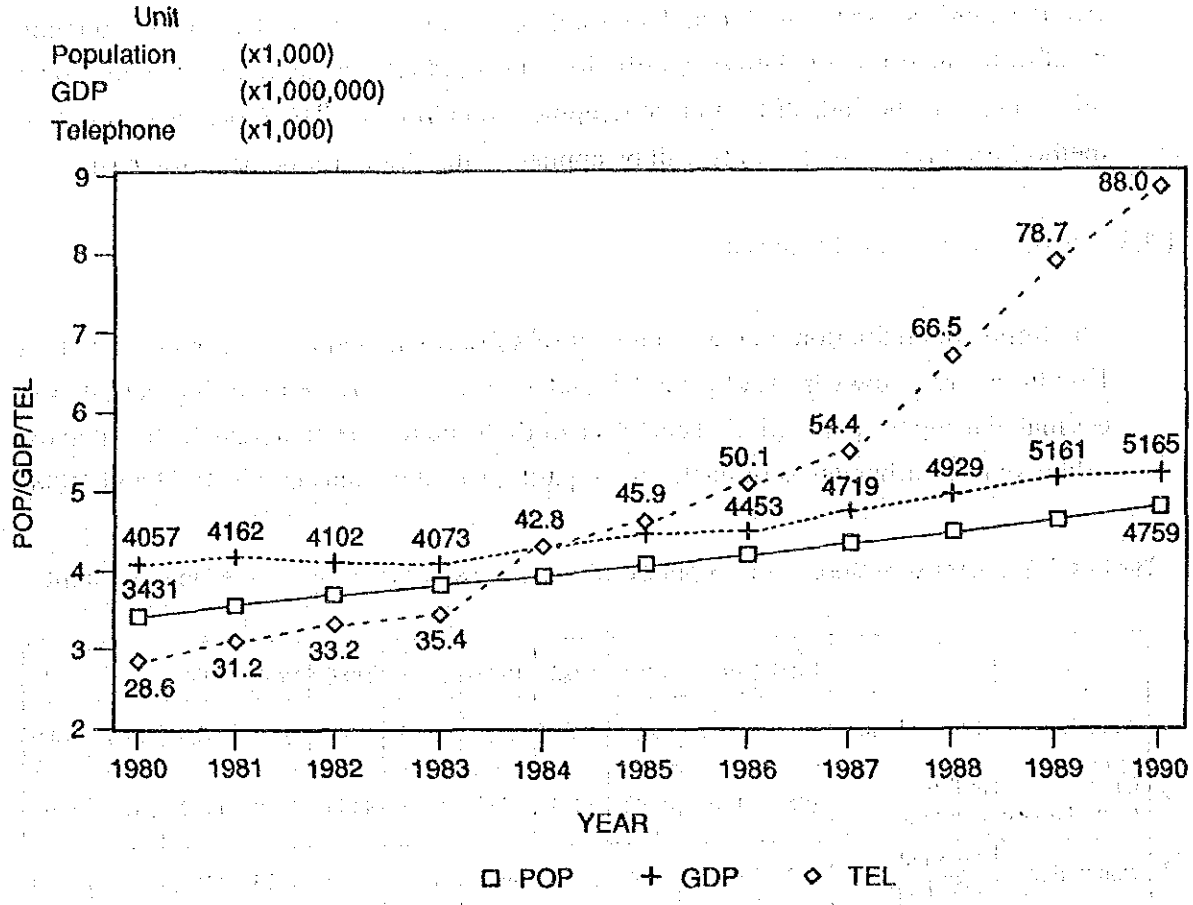
The trends in population increase, number of subscribers and the economic growth in Honduras are shown in Table 4.2.3-1 and Figure 4.2.3-1. Future population was estimated using the population of each area in 1988 and its rate of increase calculated for urban and sub urban areas of each Municipality, based on censuses in 1974 and 1988.

Table 4.2.3-1 Trend of Socio-economic Conditions & Telecommunications Development

			1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
*1	Main line	thousand lines	28.6	31.2	33.3	34.4	43.1	45.9	50.1	54.4	66.5	78.7	88.0
*2	GDP (at 1978 prices)	million Lempiras	4057	4162	4102	4073	4250	4428	4453	4719	4929	5161	5165
*3	Population	thousand inhabitants	3431	3545	3663	3785	3911	4041	4175	4313	4457	4605	4759
	Telephone density	lines/ 100 inhabitants	0.83	0.88	0.91	0.91	1.10	1.14	1.20	1.26	1.49	1.71	1.85

Source: * 1 HONDUTEL
* 2 CENTRAL BANK OF HONDURAS
* 3 CENTRAL BANK OF HONDURAS

Figure 4.2.3-1 Trends in Honduras' Population, GDP, Telephones



POP: Population
GDP: Gross Domestic Product at 1978 prices (Lps.)
TEL: Telephones

The correlation between telephone density (1990) and GNP (the average value from 1987 to 1989) for 88 countries in the world as shown in Figure 4.2.3-2 is depicted in a graph using the following equation:

$$Y = 0.0006363 \times (X)^{1.1753179} \qquad (R^2=0.88)$$

where

Y : Telephone density (main telephone lines per 100 inhabitants)

X : GNP per capita

R^2 : Coefficient of determination

Correlation between telephone density and GNP per capita in Honduras is shown in Figure 4.2.3-3.

Figure 4.2.3-2 World Telephone Density and GNP per capita

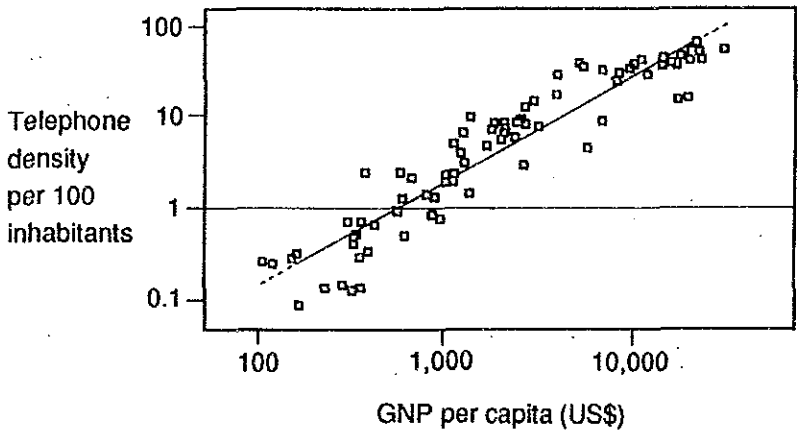
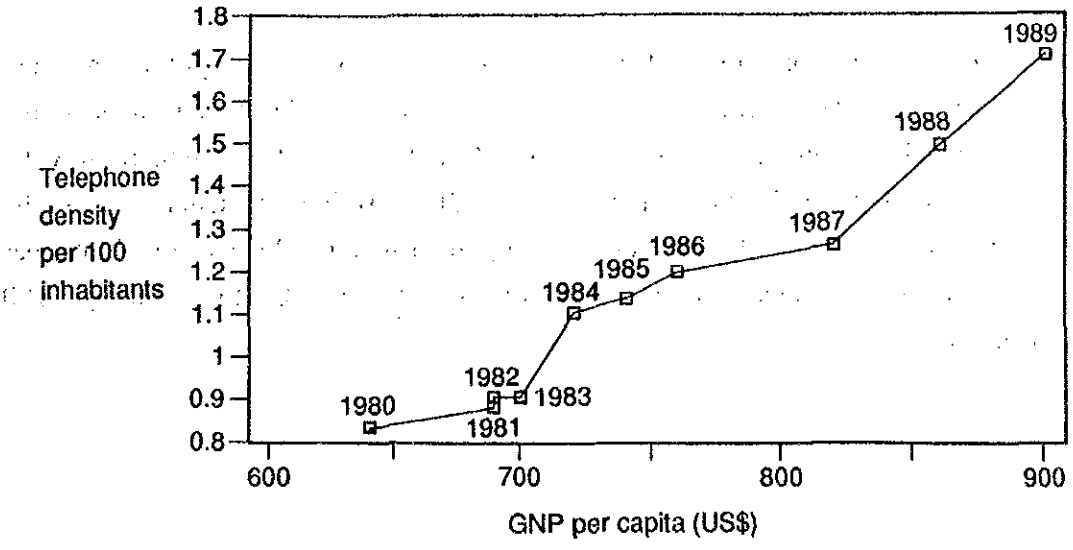


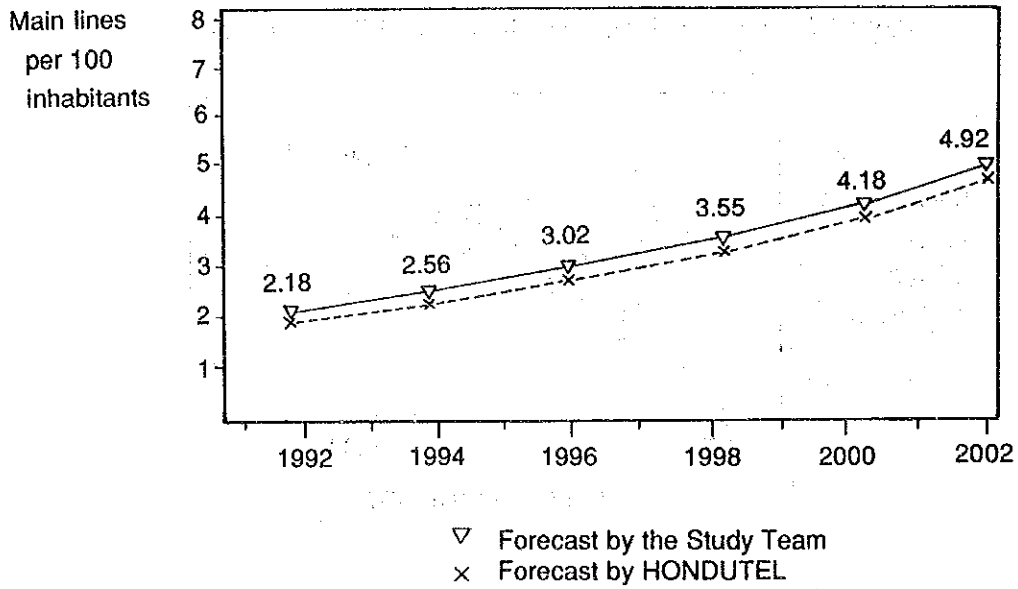
Figure 4.2.3-3 Telephone Density and GNP per capita in Honduras



The above equation, however, cannot be applied for estimating the telephone density in the future because of the devaluation of the Honduran currency in 1990. Therefore, the chronological model is extrapolated for the demand forecast in the Study.

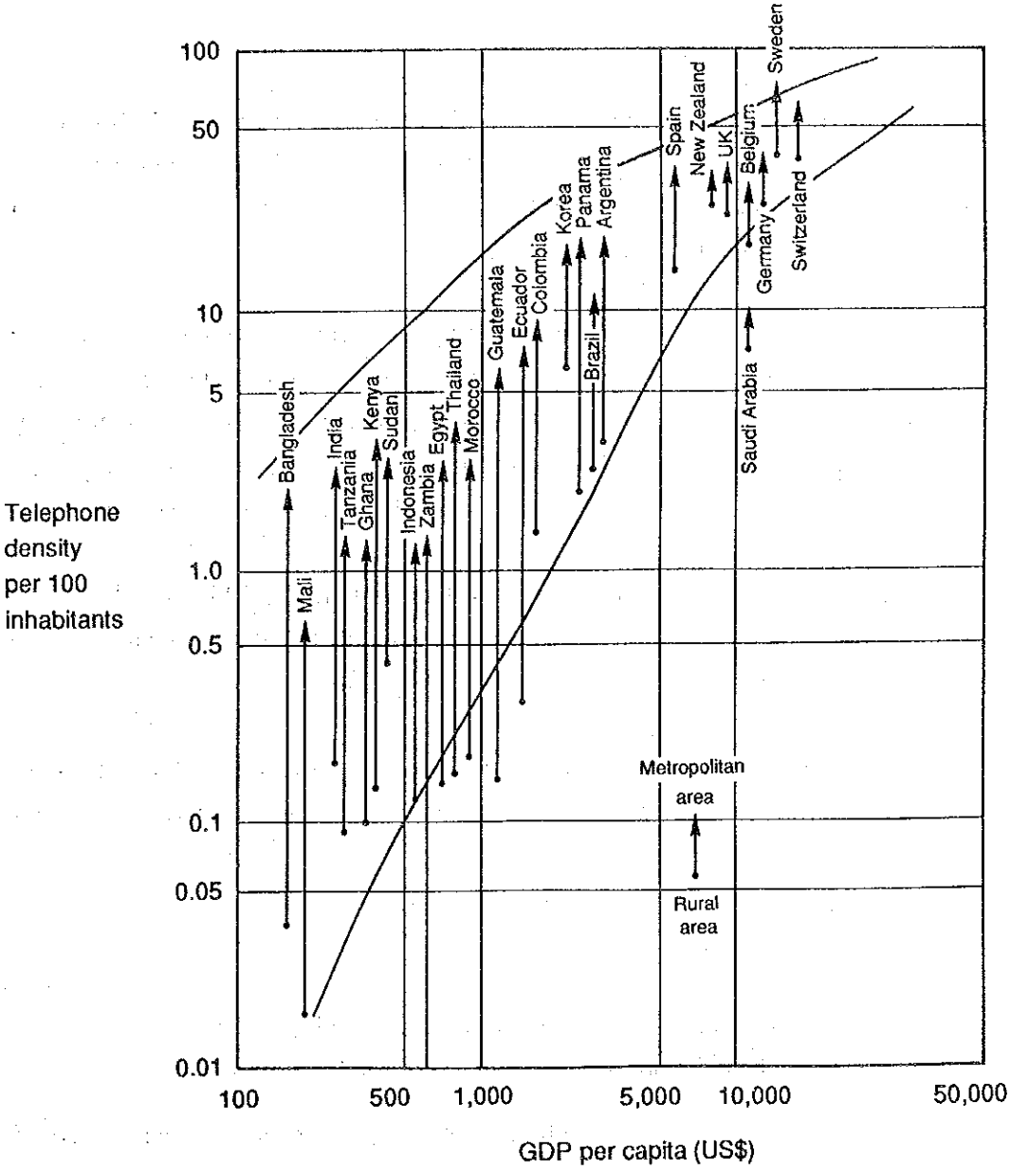
Overall demand in Honduras had been estimated by HONDUTEL's engineers with assistance from JICA by a method applied to various plans and studies in many countries. Figure 4.2.3-4 shows the demand forecast. These two forecasts are similar. Therefore the data for nationwide demand estimated by HONDUTEL could be used in this Study.

Figure 4.2.3-4 Demand Forecast in Honduras



In general, there is a correlation between telephone density in the metropolitan areas and the rural areas and GDP per capita as shown in Figure 4.2.3-5. An average range for the demand rate in the subject areas was estimated from the correlation. Accordingly the demand rate in the rural areas is approximately 1/10 to 1/20 of the demand rate in the metropolitan areas. Since the demand in metropolitan areas in 1992 was 13.49 lines per 100 inhabitants, the demand in rural areas was estimated from 0.7 to 1.4 lines per 100 inhabitant.

Figure 4.2.3-5 Telephone Density in Metropolitan Areas and Rural Areas



Source: ITU, "The Missing Link" Addendum IV, 1984

4.2.4 Microscopic demand forecast

1) Field survey

There is no detailed data such as a waiting list for rural areas where the telephone service is not yet available. During Work in Honduras-1, the Study Team visited 191 of the total 223 subject areas with the HONDUTEL counterparts. The survey sheet is shown in Appendix 4.2.4-1.

Not only the subject areas but also Departmental offices, Municipal offices and HONDUTEL's offices were visited. Many kinds of information for demand estimation were collected, such as development plans, population, condition of public services, socio-relationships with the nearest main city, official organizational activities, household goods, and present telecommunications services.

Further, the Study Team interviewed users, Departmental and Municipal officials and telephone operators with a questionnaire about telephone service and regional circumstances. The questionnaire is shown in Appendix 4.2.4-2.

The results of the field survey showed that the average demand was 1.19 main lines per 100 inhabitants. The demand is roughly classified as 70% private use, 23% official use and 7% public telephones.

2) Analysis and building model

The data obtained in the field survey was analyzed and a model built to estimate telephone demand for the non-survey areas. The methods are as follows :

a) All the subject areas were classified into one of four groups: general, tourism, factory, and border area.

b) The general areas are distributed throughout the country and they could be grouped appropriately into 9 regional blocks according to their geographical, cultural, and socio-economic conditions.

c) Important factors considered to exert influence on demand were selected. They should be obtained in the non-survey areas with less difficulty, so the factors were selected as follows:

- Tax income of the Municipality, representing the economic activity
- Population of the subject area, representing manpower
- Time required to the main city of influence from the center of the regional block that the subject area belongs to
- Capital of Municipality or not, showing the political status

d) Correlation between the factors selected above and the quantity of telephone demand in the survey areas, provided a model using an adequate equation. The model equation is shown below.

$$Y = (X_1)^A \times (X_2)^B \times (X_3)^C \times (X_4)^D \times E$$

where

Y : Telephone demand

(X_1) : Tax income of Municipality

(X_2) : Population of subject area

(X_3) : Time required to main city

(X_4) : Capital of Municipality or not

A, B, C, D, E: Coefficients

The result of analysis generally showed a good correlation between telephone demand and the selected factors. However, in some blocks the equations were modified owing to the particular circumstances of the area or lack of data. Equations and the main cities of each block are shown in Table 4.2.4-1.

Table 4.2.4-1 Equations and Main Cities

[legend] Y : Telephone demand
(X_1) : Tax income of Municipality
(X_2) : Population of subject area
(X_3) : Time required to main city
(X_4) : Capital of Municipality or not
R^2 : Coefficient of determination
( ) : T-value (figure in parentheses)
** indicates the significance level of 1%
* indicates the significance level of 5%

Block # 1

Main city : TEGUCIGALPA

No. of subject areas : 47 areas

$Y = (X_1)^{0.42} \times (X_2)^{0.77} \times (X_4)^{2.89} \times 0.0194$ (R^2=0.72)

$(2.80)^{**}$ $(4.53)^{**}$ $(4.59)^{**}$

Block # 2

Main city : SAN PEDRO SULA

No. of subject areas : 30 areas

$Y = (X_1)^{0.06} \times (X_2)^{1.10} \times (X_4)^{0.32} \times 0.0683$ (R^2=0.67)

(0.40) $(5.50)^{**}$ (0.73)

Block # 3

Main city : LA CEIBA

No. of subject areas : 20 areas

$Y = (X_1)^{0.48} \times (X_2)^{1.12} \times (X_3)^{-0.18} \times (X_4)^{0.49} \times 0.0067$ (R^2=0.67)

$(2.67)^{*}$ $(3.86)^{**}$ (1.29) (1.14)

Block # 4

Main city : COMAYAGUA

No. of subject areas : 18 areas

$Y = (X_2)^{0.80} \times (X_3)^{-0.46} \times (X_4)^{0.30} \times 0.4737$ (R^2=0.83)

$(3.81)^{**}$ $(3.29)^{**}$ (0.68)

Block # 5

Main city : CHOLUTECA

No. of subject areas : 25 areas

$Y = (X_1)^{0.28} \times (X_2)^{0.36} \times (X_4)^{1.21} \times 0.2088 \quad (R^2=0.69)$

$(2.15)^{*} \quad (2.25)^{*} \quad (3.56)^{**}$

Block # 6

Main city : SANTA ROSA DE COPAN

No. of subject areas : 42 areas

$Y = (X_1)^{0.19} \times (X_2)^{0.53} \times (X_3)^{-0.07} \times (X_4)^{1.47} \times 0.1985 \quad (R^2=0.67)$

$(1.90)^{*} \quad (2.79)^{**} \quad (0.54) \quad (3.68)^{**}$

Block # 7

Main city : TELA

No. of subject areas : 5 areas

$Y = (X_2) \times (-0.0010 X_3 + 0.0043)$

Note: Because X_1:not obtained, X_4:all non-capital, and lack of data, demand rate (Y/X_2) was calculated by a linear equation with X_3

Block # 8

Main city : DANLI

No. of subject areas : 11 areas

$Y = (X_2)^{0.85} \times (X_3)^{-0.23} \times (X_4)^{0.48} \times 0.3487 \quad (R^2=0.88)$

$(4.25)^{**} \quad (1.21) \quad (0.30)$

Block # 9

Main city : SANTA BARBARA

No. of subject areas : 14 areas

$Y = (X_2)^{0.99} \times (X_3)^{-0.27} \times 0.1260 \quad (R^2=0.83)$

$(4.95) \quad (1.29)$

3) Telephone demand in total subject area

Telephone demand in 191 survey areas was estimated using the results of the field survey.

Telephone demand in 30 non-survey areas was estimated using the models above with the data collected from the Central government, Departmental and Municipal governments, and HONDUTEL's head office.

Telephone demand for sugar factories in two areas was estimated by telephone interviews with the persons responsible in the companies.

The results of estimation for the total subject area show that the total demand was 6,077 and the demand rate per population was 1.19 lines per 100 inhabitants.

This value is in the range of the demand estimated by the macroscopic demand forecast in Section 4.2.3. The results of the detailed estimation are shown in Table 4.2.4-2.

Table 4.2.4-2 Telephone Demand in 1992 (1/4)

Code	DEPARTMENT / Community	Population 1992	Distance from city of	Km	Hours	Capital yes=2 no=1	Average Tax Revenue of Municipality (1985-90) (Lps.)	Demand in 1992
	ATLANTIDA (01)							
10101	Sambo Creek	2,145	3	20	0.20	1	-	18
10102	Corozal	2,519	3	13	0.20	1	-	20
10201	La Unión	1,713	3	25	0.50	1	61,319	20
10202	El Porvenir	2,103	3	15	0.30	2	61,319	15
10301	Arizona	3,643	3	25	0.20	1	97,098	30
10302	Esperta	1,020	3	80	1.50	2	97,098	10
10303	Ceibita Way	1,799	7	55	1.50	1	97,098	5
10304	Santa María	1,495	7	35	1.50	1	97,098	4
10305	Mezapa	883	7	40	0.80	1	97,098	3
10306	Atenas de San Cristóbal	2,312	7	15	0.30	1	97,098	9
10401	Nueva Armenia	1,608	3	41	1.00	1	98,295	5
10402	Jutiapa	2,013	3	33	0.50	2	98,295	20
10501	La Masica	3,364	3	42	0.50	2	89,202	35
10502	San Juan Pueblo	4,647	3	52	1.00	1	89,202	40
10503	San Juan Benque	1,010	3	55	1.00	1	89,202	5
10601	Santa Ana	4,096	3	38	0.50	1	73,495	28
10602	San Francisco	2,561	3	34	0.50	2	73,495	25
10701	El Triunfo de la Cruz	2,969	7	8	0.25	1	-	15
	COLON (02)							
20401	Limón	2,493	3	190	3.00	2	15,741	8
20501	Elixir	2,929	3	80	1.50	1	96,727	50
20701	Santa Rosa de Aguán	2,982	3	161	3.00	2	12,474	7
20901	Salamá	2,437	3	125	2.00	1	312,712	15
20902	Quebrada de Arena	2,010	3	125	2.00	1	312,712	70
20903	Zamora	2,678	3	100	1.50	1	312,712	15
21001	Corocito	2,141	3	160	4.00	1	101,650	10
	COMAYAGUA (03)							
30101	Palo Pintado	2,380	4	10	0.33	1	475,221	18
30301	El Rosario	1,732	4	23	0.92	2	24,475	20
30401	Esquías	1,169	1	80	3.00	2	37,837	10
30601	La Libertad	4,202	4	44	0.92	2	81,822	150
30701	Lamaní	2,171	4	34	0.85	2	22,600	40
31101	Minas de Oro	2,666	1	80	3.00	2	72,131	200
31301	San Antonio	1,956	4	27	1.50	1	40,556	20
31302	San Jerónimo	1,635	4	23	0.42	2	40,556	25
31501	San Juan de Potrero	1,120	1	92	3.20	2	9,861	5
31601	San Luis	1,687	1	85	3.50	2	44,165	40
31701	San Sebastián	1,438	4	30	0.75	2	12,485	20
32001	Las Lajas	3,476	4	64	2.00	2	63,241	24
32101	Taulabé	3,755	4	50	1.00	2	88,755	200
	COPAN (04)							
40101	Quezailica	1,460	6	28	1.00	1	975,379	20
40301	Concepción	434	6	23	0.67	2	9,568	10
40401	El Florido	1	6	122	2.50	1	106,082	10
40501	Corquín	4,341	6	42	1.50	2	64,906	145
40601	Cucuyagua	2,378	6	30	1.00	2	49,067	50
40801	Dulce Nombre	2,829	6	18	0.50	2	31,640	45
40901	El Paraíso	3,434	6	78	2.00	2	67,487	40
41001	Florida	5,209	6	52	1.17	2	151,820	100
41101	La Jigua	1,469	6	46	1.00	2	21,448	15
41202	La Unión	2,185	6	35	0.50	2	33,328	20
41301	Nueva Arcadia	1,302	6	38	0.83	1	313,960	15
41302	Chalmeca	3,364	6	55	1.00	1	313,960	10
41401	San Agustín	1,563	6	38	1.50	2	11,058	19
41501	San Antonio	1,694	6	58	1.50	2	20,853	20
41502	Concepción	431	6	58	1.30	1	8,052	3
41602	La Esperanza	1,022	6	54	0.90	1	14,664	10
41701	San José	1,437	6	30	1.00	2	16,781	30
41801	San Juán de Opoa	1,741	6	12	0.50	2	7,350	20
41901	San Nicolás	2,361	6	34	0.83	2	34,498	45
42001	San Pedro de Copán	1,564	6	32	1.00	2	24,638	30
42201	Trinidad	2,535	6	25	0.83	2	24,463	35

Table 4.2.4-2 Telephone Demand in 1992 (2/4)

Code	DEPARTMENT / Community	Population 1992	Distance from city of	Km	Hours	Capital yes=2 no=1	Average Tax Revenue of Municipality (1985-90) (Lps.)	Demand in 1992
	CORTES (05)							
50401	Cuyamel	5,128	2	96	1.50	1	121,164	100
50501	Santiago	2,449	2	30	0.50	1	74,067	30
50901	San Buenaventura	1,600	2	65	1.00	1	73,703	10
50902	Río Lindo	4,462	2	63	1.00	1	73,703	50
50903	San Francisco de Yojoa	1,405	2	65	1.00	2	73,703	20
50904	Cañaveral	2,111	2	85	1.50	1	73,703	20
51001	San Manuel	3,789	2	28	0.50	2	87,837	45
51101	Agua Azul Sierra	1,008	2	75	1.20	1	231,424	10
51102	Yojoa	2,422	2	53	0.67	1	231,424	30
51103	El Olivar	1,381	2	50	1.00	1	231,424	6
51104	Los Caminos	1,233	2	82	1.50	1	231,424	10
51105	San Isidro	1,952	2	75	1.20	1	231,424	10
51106	El Edén	986	2	85	1.50	1	231,424	35
51107	Concepción	1,938	2	61	0.83	1	231,424	3
51108	La Barca	431	2	46	0.50	1	231,424	2
51109	Peña Blanca	1,812	2	85	1.50	1	231,424	30
51110	Santa Cruz de Yojoa	7,421	2	65	1.00	2	231,424	150
51201	Dos Caminos	3,784	2	15	0.35	1	-	40
	CHOLUTECA (06)							
60101	Pavana	1,716	5	20	0.75	1	-	8
60201	Apacilagua	1,257	5	33	1.50	2	12,912	10
60301	Concpción de María	2,799	5	40	2.00	2	29,942	15
60401	Duyure	1,287	5	88	2.50	2	22,910	17
60501	El Corpus	1,553	5	21	0.75	2	50,570	14
60502	El Banquito	1,005	5	30	0.50	1	50,570	4
60601	El Triunfo	6,120	5	40	1.20	2	89,440	37
60602	El Guasaule	373	5	43	1.00	1	-	20
60701	Punta Ratón	868	5	52	1.50	1	184,195	10
60702	Cedeño	2,443	5	50	1.50	1	184,195	15
60703	Marcovia	2,979	5	15	0.50	2	184,195	20
60704	Monjarás	10,565	5	40	1.17	1	184,195	25
60705	Azucarera Choluteca 1	11	5	12	0.40	1	-	5
60706	Azucarera Choluteca 2	11	5	12	0.40	1	-	3
60801	Morolica	1,050	5	30	2.00	2	22,827	20
61001	Orocuina	2,978	5	25	1.00	2	39,062	25
61101	Pespire	3,725	5	60	1.00	2	37,419	150
61201	San Antonio de Flores	630	5	70	1.50	2	13,349	10
61501	El Espino	184	5	66	1.25	1	28,737	7
61601	Santa Ana de Yusguare	2,217	5	4	0.50	2	27,528	15
	EL PARAISO (07)							
70101	El Rodeo	430	1	85	2.00	1	73,630	1
70201	Alauca	655	8	36	0.70	2	29,096	7
70202	Las Manos	510	8	33	0.50	1	-	6
70301	Jutiapa	5,497	8	30	0.70	1	1,035,773	20
70302	El Arenal	1,411	8	5	0.20	1	1,035,773	5
70303	El Chichicaste	5,119	8	34	0.70	1	1,035,773	15
70501	Güinope	1,887	1	60	1.00	2	26,306	50
70601	Jacaleapa	2,201	8	12	0.30	2	29,613	20
70701	Liure	779	5	35	2.00	2	8,153	12
70801	Morocelí	2,129	8	60	1.50	2	28,779	20
70901	Oropolí	1,283	1	90	2.00	2	14,625	20
71001	Potrerillos	194	8	32	1.00	2	9,954	2
71201	San Lucas	1,519	1	86	2.00	2	10,795	14
71301	San Matías	943	8	12	0.30	2	8,400	9
71401	Soledad	1,390	5	40	2.00	2	11,401	12
71501	Teupasenti	4,218	8	45	1.40	2	75,008	20
71601	Texiguat	1,556	5	60	5.00	2	6,554	10
71801	Yauyupe	736	1	83	2.00	2	4,944	8
71901	Trojes	16,682	8	80	2.00	2	131,319	40
71902	Cifuentes	3,503	8	65	1.60	1	131,319	5

Table 4.2.4-2 Telephone demand in 1992 (3/4)

Code	DEPARTMENT / Community	Population 1992	Distance from city of	Distance Km	Distance Hours	Capital yes=2 no=1	Average Tax Revenue of Municipality (1985-90) (Lps.)	Demand in 1992
	FRANCISCO MORAZAN (08)							
80101	San Juancito	1,481	1	25	0.50	1	-	15
80301	Agalteca	1,424	1	70	1.50	1	53,382	3
80302	El Suyatal	1,853	1	80	2.00	1	53,382	4
80303	Cedros	1,960	1	85	2.50	2	53,382	20
80401	Curarén	1,357	1	130	4.30	2	26,265	18
80501	El Terrero	1,274	1	100	2.10	1	85,221	2
80502	El Porvenir	4,276	1	96	2.00	2	85,221	100
80901	Lepaterique	1,147	1	40	1.00	2	42,251	18
81001	Maraita	840	1	60	2.00	2	15,124	10
81101	Marale	2,061	1	116	3.30	2	17,961	21
81301	Ojojona	1,676	1	32	0.50	2	48,720	50
81401	Orica	3,042	1	94	2.00	2	35,483	15
81501	Reitoca	1,762	1	120	4.00	2	18,913	15
81601	Sabanagrande	2,250	1	37	0.70	2	77,640	100
81701	San Antonio de Oriente	275	1	40	1.00	2	25,113	3
81901	San Ignacio	2,274	1	95	2.00	2	41,212	35
82001	San Juan de Flores	3,027	1	30	0.75	2	51,466	30
82201	Santa Ana	867	1	20	0.50	2	32,024	10
82401	Jalaca	1,421	1	45	1.00	1	219,453	10
82501	Tatumbla	638	1	20	0.30	2	34,356	10
82701	Villa de San Francisco	4,623	1	40	1.00	2	30,235	30
82801	Vallecillo	3,246	1	85	2.50	2	43,724	42
	INTIBUCA (10)							
100201	Camasca	1,102	4	182	4.00	2	11,586	12
100301	Colomoncagua	1,143	4	189	4.00	2	14,639	9
100401	Concepción	873	4	173	3.50	2	10,308	9
100702	Jesús de Otoro	7,512	4	70	2.00	2	55,870	80
100801	Magdalena	2,186	4	196	4.50	2	7,923	12
100901	Masaguara	1,455	4	99	2.40	2	13,716	10
101501	Santa Lucía	1,200	4	199	4.50	2	5,339	9
101601	Yamaranguila	2,184	4	131	3.00	2	21,698	12
	LA PAZ (12)							
121201	San José	1,759	1	103	1.50	2	25,175	25
121401	San Pedro de Tutule	1,677	4	34	0.75	2	23,282	50
121701	Santa María	1,065	1	113	2.00	2	28,894	20
121801	Santiago Puringla	2,001	1	129	3.00	2	25,610	60
	LEMPIRA (13)							
130301	Candelaria	1,602	6	145	4.50	2	10,553	15
130401	Cololaca	1,477	6	85	2.00	2	7,196	7
130501	Erandique	1,469	6	120	4.00	2	23,954	20
130601	Gualcince	977	6	140	4.50	2	7,922	8
130701	Guarita	613	6	110	3.00	2	6,414	15
130801	La Campa	625	6	65	1.50	2	14,962	8
131101	La Unión	2,665	9	42	2.50	2	26,939	16
131201	La Virtud	1,584	6	135	3.50	2	10,326	20
131301	Lepaera	1,975	6	45	2.00	2	75,573	50
131401	Mapulaca	1,059	6	145	4.00	2	5,388	30
131501	Piraera	1,556	6	160	5.00	2	13,907	18
132401	Tambla	845	6	110	3.00	2	3,154	7
132501	Tomalá	668	6	110	3.00	2	3,555	10
132601	Valladolid	548	6	116	4.00	2	3,470	7
	OCOTEPEQUE (14)							
140601	La Encarnación	1,373	6	80	3.00	2	10,582	30
140701	La Labor	1,079	6	60	1.00	2	9,099	25
140801	Lucerna	1,085	6	45	1.00	2	4,835	8
141101	San Francisco del Valle	1,627	6	65	1.00	2	12,002	15
141501	Sensenti	1,350	6	60	1.25	2	15,358	15
141502	Azacualpa	792	6	65	1.50	1	15,358	7
141503	San Antonio	805	6	55	1.00	1	15,358	3

Table 4.2.4-2 Telephone Demand in 1992 (4/4)

Code	DEPARTMENT / Community	Population 1992	Distance from city of	Distance Km	Distance Hours	Capital yes=2 no=1	Average Tax Revenue of Municipality (1985-90) (Lps.)	Demand in 1992
	OLANCHO (15)							
150101	Jutiquile	3,722	1	185	3.50	1	461,228	50
150102	Punuare	2,400	1	196	3.50	1	461,228	20
150103	Arimís	2,587	1	200	3.50	1	461,228	20
150301	San José de Río Tinto	4,215	1	239	3.50	1	370,995	8
150302	San Pedro	3,958	1	232	3.00	1	370,995	8
150801	Gualaco	1,931	1	250	4.00	2	13,233	40
150901	Guarizama	1,218	1	218	4.00	2	5,776	10
151301	La Unión	5,252	1	204	4.00	2	16,065	18
151501	Manto	1,809	1	235	4.50	2	10,288	15
151601	Salamá	2,466	1	170	3.00	2	50,216	21
151701	San Esteban	2,399	1	270	5.00	2	38,606	30
151801	San Francisco Becerra	2,820	1	184	3.40	2	23,000	45
151901	San Francisco de la Paz	5,296	1	195	3.50	2	37,753	200
152001	Santa María del Real	4,226	1	204	3.50	2	21,426	40
	SANTA BARBARA (16)							
160201	La Arada	2,857	9	16	0.50	2	27,475	30
160301	Atima	2,124	9	40	1.50	2	36,683	15
160401	Azacualpa	5,310	2	82	2.00	2	68,955	50
160501	Ceguaca	1,473	9	19	0.50	2	12,880	15
160701	Concepción del Sur	1,087	9	24	0.70	2	10,794	10
160901	El Níspero	2,679	9	27	1.50	2	8,754	20
161101	Ilama	1,478	9	17	0.50	2	18,840	20
161201	Sula	2,487	2	77	1.50	1	-	20
161202	La Flecha	2,239	2	70	1.00	1	-	20
161301	Naranjito	4,057	6	32	1.00	2	42,770	100
161401	Nuevo Celilac	1,462	9	20	0.80	2	15,941	8
161501	Pueblo Nuevo	1,129	2	50	1.00	1	39,926	9
161601	Protección	1,852	6	52	2.00	2	11,452	20
161701	Pinalejo	3,730	2	64	1.50	1	112,511	30
161702	Quimistán	2,548	2	59	1.00	2	112,511	45
161801	San Francisco de Ojuera	1,003	9	34	1.00	2	19,603	8
162101	San Francisco Valle	1,300	2	47	0.75	1	68,354	15
162201	El Porvenir	2,476	9	50	2.00	1	51,880	16
162301	San Pedro Zacapa	1,467	9	32	1.80	2	58,371	10
162401	San Vicente Centenario	2,277	9	8	0.30	2	8,946	20
162501	Santa Rita	2,226	9	27	1.00	2	12,698	17
162701	El Mochito	7,224	9	48	1.50	1	-	50
	VALLE (17)							
170106	Jícaro Galán	884	5	45	1.00	1	297,161	15
170202	Alianza	871	5	90	3.00	2	23,325	15
170401	Aramecina	998	5	120	2.50	2	10,236	12
170501	Caridad	863	5	140	3.00	2	8,773	11
170601	Goascorán	1,770	5	80	1.50	2	32,605	65
170602	El Amatillo	284	5	80	1.50	1	50,216	20
170701	Langue	5,670	5	85	2.00	2	35,514	50
170801	San Francisco de Coray	1,599	5	65	2.50	2	10,759	15
	YORO (18)							
180301	Jocón	1,583	2	210	6.00	2	28,269	20
180401	Agua Blanca Sur	5,613	2	45	1.00	1	-	50
180501	El Negrito	8,431	2	75	1.00	2	94,131	80
180601	Morazán	7,817	2	86	1.00	2	103,358	120
180602	Nueva Esperanza	2,678	2	90	1.10	1	7,264	15
180901	Sulaco	2,200	2	180	5.00	2	17,527	20
181101	Yorito	2,281	2	150	3.50	2	18,865	20

4) Future telephone demand

Telephone demand up to the year 2002 was forecast based on the demand in 1992, considering the future population and penetration rate. Table 4.2.4-3 shows the future population in the subject areas.

Table 4.2.4-3 Population (1/4)

Code	DEPARTMENT Community	Population 1988	Increase rate	Population 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	ATLANTIDA (01)													
10101	Sambo Creek	1985	1.96	2,145	2,187	2,230	2,274	2,318	2,364	2,410	2,457	2,506	2,555	2,605
10102	Corozal	2331	1.96	2,519	2,569	2,619	2,670	2,723	2,776	2,830	2,886	2,942	3,000	3,059
10201	La Unión	1502	3.34	1,713	1,770	1,829	1,890	1,954	2,019	2,086	2,156	2,228	2,302	2,379
10202	El Porvenir	1786	4.17	2,103	2,191	2,282	2,377	2,476	2,580	2,687	2,799	2,916	3,038	3,164
10301	Arizona	3204	3.26	3,643	3,761	3,884	4,011	4,141	4,276	4,416	4,560	4,708	4,862	5,020
10302	Esparta	947	1.87	1,020	1,039	1,058	1,078	1,098	1,119	1,140	1,161	1,183	1,205	1,227
10303	Ceibita Way	1582	3.26	1,799	1,857	1,918	1,980	2,045	2,112	2,180	2,251	2,325	2,401	2,479
10304	Santa María	1315	3.26	1,495	1,544	1,594	1,646	1,700	1,755	1,812	1,871	1,932	1,995	2,061
10305	Mezapa	777	3.26	883	912	942	973	1,004	1,037	1,071	1,106	1,142	1,179	1,218
10306	Atenas de San Cristóbal	2034	3.26	2,312	2,388	2,466	2,546	2,629	2,715	2,803	2,895	2,989	3,087	3,187
10401	Nueva Armenia	1323	5.00	1,608	1,689	1,773	1,862	1,955	2,052	2,155	2,263	2,376	2,495	2,619
10402	Jutiapa	1798	2.87	2,013	2,071	2,131	2,192	2,255	2,319	2,386	2,455	2,525	2,597	2,672
10501	La Masica	2924	3.57	3,364	3,485	3,609	3,738	3,871	4,009	4,153	4,301	4,454	4,613	4,778
10502	San Juan Pueblo	4032	3.61	4,647	4,814	4,988	5,168	5,355	5,548	5,748	5,956	6,171	6,394	6,624
10503	San Juan Benque	876	3.61	1,010	1,046	1,084	1,123	1,163	1,205	1,249	1,294	1,341	1,389	1,439
10601	Santa Ana	3582	3.41	4,096	4,236	4,380	4,530	4,684	4,844	5,009	5,180	5,356	5,539	5,728
10602	San Francisco	2254	3.24	2,561	2,644	2,729	2,818	2,909	3,003	3,101	3,201	3,305	3,412	3,522
10701	El Triunfo de la Cruz	2585	3.52	2,969	3,073	3,181	3,293	3,409	3,529	3,653	3,782	3,915	4,053	4,196
	COLON (02)													
20401	Limón	2315	1.87	2,493	2,540	2,587	2,636	2,685	2,735	2,786	2,838	2,891	2,945	3,001
20501	Elixir	2618	2.85	2,929	3,013	3,099	3,187	3,278	3,371	3,467	3,566	3,668	3,772	3,880
20701	Santa Rosa de Aguán	3382	-3.10	2,982	2,889	2,800	2,713	2,629	2,547	2,468	2,392	2,318	2,246	2,176
20901	Salamá	2090	3.91	2,437	2,532	2,631	2,734	2,841	2,952	3,067	3,187	3,312	3,441	3,576
20902	Quebrada de Arena	2010	3.91	2,343	2,435	2,530	2,629	2,732	2,839	2,950	3,065	3,185	3,309	3,439
20903	Zamora	2297	3.91	2,678	2,783	2,891	3,004	3,122	3,244	3,371	3,503	3,640	3,782	3,930
21001	Corocito	1772	4.84	2,141	2,244	2,353	2,467	2,586	2,711	2,843	2,980	3,125	3,276	3,434
	COMAYAGUA (03)													
30101	Palo Pintado	2096	3.23	2,380	2,457	2,536	2,618	2,703	2,790	2,880	2,973	3,069	3,169	3,271
30301	El Rosario	1847	-1.60	1,732	1,704	1,677	1,650	1,623	1,597	1,572	1,547	1,522	1,498	1,474
30401	Esquías	1066	2.34	1,169	1,197	1,225	1,253	1,283	1,313	1,343	1,375	1,407	1,440	1,474
30601	La Libertad	3720	3.09	4,202	4,331	4,465	4,603	4,745	4,892	5,043	5,199	5,360	5,525	5,696
30701	Lamaní	1945	2.79	2,171	2,232	2,294	2,358	2,424	2,492	2,561	2,633	2,706	2,782	2,859
31101	Minas de Oro	2671	-0.05	2,666	2,664	2,663	2,662	2,660	2,659	2,658	2,656	2,655	2,654	2,652
31301	San Antononio de la Cuesta	1616	4.89	1,956	2,052	2,152	2,257	2,368	2,483	2,605	2,732	2,866	3,006	3,153
31302	San Jerónimo	1351	4.88	1,635	1,714	1,798	1,886	1,978	2,074	2,176	2,282	2,393	2,510	2,632
31501	San Juan de Potrero	1043	1.79	1,120	1,140	1,160	1,181	1,202	1,224	1,245	1,268	1,290	1,314	1,337
31601	San Luis	1528	2.50	1,687	1,729	1,772	1,816	1,862	1,908	1,956	2,005	2,055	2,106	2,159
31701	San Sebastián	1271	3.13	1,438	1,483	1,529	1,577	1,626	1,677	1,730	1,784	1,840	1,897	1,957
32001	Las Lajas	2683	6.69	3,476	3,709	3,957	4,222	4,504	4,805	5,127	5,470	5,836	6,226	6,643
32101	Taulabé	3188	4.18	3,755	3,912	4,076	4,246	4,424	4,609	4,801	5,002	5,211	5,429	5,656
	COPAN (04)													
40101	Quezailica	1343	2.11	1,460	1,491	1,522	1,554	1,587	1,621	1,655	1,690	1,725	1,762	1,799
40301	Concepción	397	2.23	434	443	453	463	474	484	495	506	517	529	541
40401	El Florido	1	3.57	1	1	1	1	1	1	1	1	2	2	2
40501	Corquín	4047	1.77	4,341	4,418	4,496	4,576	4,657	4,739	4,823	4,909	4,995	5,084	5,174
40601	Cucuyagua	2013	4.25	2,378	2,479	2,584	2,694	2,808	2,928	3,052	3,182	3,317	3,458	3,605
40801	Dulce Nombre	2649	1.66	2,829	2,876	2,924	2,973	3,022	3,072	3,123	3,175	3,228	3,281	3,336
40901	El Paraíso	3045	3.05	3,434	3,539	3,646	3,758	3,872	3,990	4,112	4,238	4,367	4,500	4,637
41001	Florida	4695	2.63	5,209	5,346	5,486	5,631	5,779	5,931	6.087	6,247	6,411	6,580	6,753
41101	La Jigua	1495	-0.43	1,469	1,463	1,457	1,451	1,444	1,438	1,432	1,426	1,420	1,414	1,407
41202	La Unión	1837	4.43	2,185	2,282	2,383	2,488	2,598	2,714	2,834	2,959	3,090	3,227	3,370
41301	Nueva Arcadia	1167	2.77	1,302	1,338	1,375	1,413	1,452	1,492	1,534	1,576	1,620	1,665	1,711
41302	Chalmeca	3016	2.77	3,364	3,458	3,553	3,652	3,753	3,857	3,964	4,073	4,186	4,302	4,421
41401	San Agustín	1422	2.39	1,563	1,600	1,638	1,678	1,718	1,759	1,801	1,844	1,888	1,933	1,979
41501	San Antonio	1534	2.51	1,694	1,736	1,780	1,825	1,870	1,917	1,966	2,015	2,065	2,117	2,170
41502	Cocepción	399	1.95	431	439	448	457	466	475	484	493	503	513	523
41602	La Esperanza	1006	0.40	1,022	1,026	1,030	1,035	1,039	1,043	1,047	1,051	1,055	1,060	1,064
41701	San José	1367	1.26	1,437	1,455	1,474	1,492	1,511	1,530	1,549	1,569	1,589	1,609	1,629
41801	San Juan de Opoa	1572	2.59	1,741	1,786	1,833	1,880	1,929	1,979	2,030	2,083	2,137	2,192	2,249
41901	San Nicolás	2318	0.46	2,361	2,372	2,383	2,394	2,405	2,416	2,427	2,438	2,449	2,461	2,472
42001	San Pedro de Copán	1401	2.79	1,564	1,608	1,653	1,699	1,746	1,795	1,845	1,896	1,949	2,004	2,059
42201	Trinidad	2422	1.15	2,535	2,565	2,594	2,624	2,654	2,685	2,715	2,747	2,778	2,810	2,842

Table 4.2.4-3 Population (2/4)

Code	DEPARTMENT Community	Population 1988	In-crease rate	Population 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	CORTES (05)			0	0	0	0	0	0	0	0	0	0	0
50401	Cuyamel	4443	3.65	5,128	5,315	5,509	5,710	5,919	6,135	6,359	6,591	6,831	7,081	7,339
50501	Santiago	2204	2.67	2,449	2,514	2,582	2,650	2,721	2,794	2,868	2,945	3,024	3,104	3,187
50901	San Buenaventura	1421	3.01	1,600	1,648	1,698	1,749	1,801	1,856	1,912	1,969	2,028	2,089	2,152
50902	Río Lindo	3963	3.01	4,462	4,596	4,735	4,877	5,024	5,175	5,331	5,492	5,657	5,827	6,003
50903	San Francisco de Yojoa	1270	2.55	1,405	1,440	1,477	1,515	1,553	1,593	1,634	1,675	1,718	1,762	1,807
50904	Cañaveral	1875	3.01	2,111	2,175	2,240	2,308	2,377	2,449	2,522	2,598	2,676	2,757	2,840
51001	San Manuel	3363	3.03	3,789	3,904	4,023	4,145	4,270	4,399	4,533	4,670	4,812	4,957	5,108
51101	Agua Azul Sierra	870	3.75	1,008	1,046	1,085	1,126	1,168	1,212	1,257	1,304	1,353	1,404	1,457
51102	Yojoa	2090	3.75	2,422	2,512	2,607	2,704	2,806	2,911	3,020	3,133	3,251	3,373	3,499
51103	El Olivar	1192	3.75	1,381	1,433	1,487	1,542	1,600	1,660	1,722	1,787	1,854	1,924	1,996
51104	Los Caminos	1064	3.75	1,233	1,279	1,327	1,377	1,428	1,482	1,538	1,595	1,655	1,717	1,781
51105	San Isidro	1685	3.75	1,952	2,026	2,101	2,180	2,262	2,347	2,435	2,526	2,621	2,719	2,821
51106	El Edén	851	3.75	986	1,023	1,061	1,101	1,142	1,185	1,230	1,276	1,324	1,373	1,425
51107	Concepción	1673	3.75	1,938	2,011	2,087	2,165	2,246	2,330	2,418	2,508	2,602	2,700	2,801
51108	La Barca	372	3.75	431	447	464	481	499	518	538	558	579	600	623
51109	Peña Blanca	1564	3.75	1,812	1,880	1,951	2,024	2,100	2,178	2,260	2,345	2,433	2,524	2,619
51110	Santa Cruz de Yojoa	5569	7.44	7,421	7,973	8,566	9,203	9,888	10,624	11,414	12,263	13,176	14,156	15,209
51201	Dos Caminos	3003	5.95	3,784	4,009	4,248	4,501	4,768	5,052	5,353	5,671	6,009	6,366	6,745
	CHOLUTECA (06)													
60101	Pavana	1537	2.79	1,716	1,764	1,813	1,864	1,915	1,969	2,024	2,080	2,138	2,198	2,259
60201	Apacilagua	983	6.35	1,257	1,337	1,422	1,513	1,609	1,711	1,819	1,935	2,058	2,188	2,327
60301	Concepción de María	2401	3.91	2,799	2,909	3,022	3,140	3,263	3,391	3,523	3,661	3,804	3,953	4,108
60401	Duyure	1050	5.22	1,287	1,354	1,425	1,499	1,578	1,660	1,747	1,838	1,934	2,035	2,141
60501	El Corpus	1434	2.01	1,553	1,584	1,616	1,648	1,681	1,715	1,750	1,785	1,821	1,857	1,895
60502	El Banquito	934	1.84	1,005	1,023	1,042	1,061	1,081	1,101	1,121	1,141	1,162	1,184	1,206
60601	El Triunfo	5339	3.47	6,120	6,332	6,552	6,779	7,014	7,258	7,509	7,770	8,040	8,319	8,607
60602	El Guasaule	322	3.76	373	387	402	417	433	449	466	483	501	520	540
60701	Punta Ratón	741	4.03	868	903	939	977	1,016	1,057	1,100	1,144	1,190	1,238	1,288
60702	Cedeño	2086	4.03	2,443	2,542	2,644	2,751	2,861	2,977	3,097	3,222	3,351	3,486	3,627
60703	Marcovia	2515	4.32	2,979	3,107	3,241	3,382	3,528	3,680	3,839	4,005	4,178	4,358	4,547
60704	Monjarás	9021	4.03	10,565	10,991	11,434	11,895	12,374	12,873	13,392	13,932	14,493	15,077	15,685
60705	Azucerera Choluteca 1	9	4.03	11	11	11	12	12	13	13	14	14	15	16
60706	Azucarera Choluteca 2	9	4.03	11	11	11	12	12	13	13	14	14	15	16
60801	Morolica	989	1.50	1,050	1,065	1,081	1,098	1,114	1,131	1,148	1,165	1,182	1,200	1,218
61001	Orocuina	2827	1.31	2,978	3,017	3,057	3,097	3,137	3,178	3,220	3,262	3,305	3,348	3,392
61101	Respire	3561	1.13	3,725	3,767	3,809	3,852	3,896	3,940	3,984	4,030	4,075	4,121	4,168
61201	San Antonio de Flores	627	0.12	630	631	632	632	633	634	635	635	636	637	638
61501	El Espino	170	2.03	184	188	192	196	200	204	208	216	216	221	225
61601	Santa Ana de Yusguare	2134	0.96	2,217	2,238	2,260	2,282	2,304	2,326	2,348	2,370	2,393	2,416	2,439
	EL PARAISO (07)													
70101	El Rodeo	386	2.75	430	442	454	467	480	493	506	535	535	549	564
70201	Alauca	618	1.45	655	664	674	684	693	703	714	724	735	745	756
70202	Las Manos	454	2.94	510	525	540	556	572	589	607	624	643	662	681
70301	Jutiapa	4286	6.42	5,497	5,850	6,226	6,625	7,051	7,503	7,985	8,498	9,043	9,624	10,242
70302	El Arenal	1100	6.42	1,411	1,501	1,598	1,700	1,810	1,926	2,049	2,181	2,321	2,470	2,629
70303	El Chichicaste	3991	6.42	5,119	5,448	5,797	6,169	6,565	6,987	7,436	7,913	8,421	8,962	9,537
70501	Güinope	1797	1.23	1,887	1,910	1,934	1,958	1,982	2,006	2,031	2,056	2,081	2,107	2,132
70601	Jacaleapa	2087	1.34	2,201	2,231	2,261	2,291	2,322	2,353	2,384	2,416	2,448	2,481	2,515
70701	Liure	777	0.07	779	780	780	781	781	782	782	783	784	784	785
70801	Morocelí	1987	1.74	2,129	2,166	2,204	2,242	2,281	2,321	2,361	2,402	2,444	2,487	2,530
70901	Oropolí	1204	1.61	1,283	1,304	1,325	1,346	1,368	1,390	1,413	1,435	1,458	1,482	1,506
71001	Potrerillos	204	-1.29	194	191	189	186	184	182	179	177	175	172	170
71201	San Lucas	1500	0.31	1,519	1,523	1,528	1,533	1,538	1,542	1,547	1,552	1,557	1,562	1,566
71301	San Matías	849	2.66	943	968	994	1,020	1,047	1,075	1,104	1,133	1,163	1,194	1,226
71401	Soledad	1265	2.39	1,390	1,424	1,458	1,492	1,528	1,565	1,602	1,640	1,680	1,720	1,761
71501	Teupasenti	3570	4.26	4,218	4,398	4,585	4,781	4,984	5,197	5,418	5,649	5,890	6,140	6,402
71601	Texiguat	1457	1.66	1,556	1,582	1,608	1,635	1,662	1,690	1,718	1,746	1,775	1,805	1,835
71801	Yauyupe	754	-0.60	736	732	727	723	719	714	710	706	701	697	693
71901	Trojes	13006	6.42	16,682	17,753	18,892	20,105	21,396	22,769	24,231	25,787	27,442	29,204	31,079
71902	Cifuentes	2731	6.42	3,503	3,728	3,967	4,222	4,493	4,781	5,088	5,415	5,762	6,132	6,526

Table 4.2.4-3 Population (3/4)

Code	DEPARTMENT Community	Population 1988	Increase rate	Population 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	FRANCISCO MORAZAN (08)			0	0	0	0	0	0	0	0	0	0	0
80101	San Juancito	1343	2.47	1,481	1,517	1,555	1,593	1,632	1,673	1,714	1,756	1,800	1,844	1,890
80301	Agalteca	1246	3.39	1,424	1,472	1,522	1,574	1,627	1,682	1,739	1,798	1,859	1,922	1,987
80302	El Suyatal	1622	3.39	1,853	1,916	1,981	2,048	2,118	2,190	2,264	2,341	2,420	2,502	2,587
80303	Cedros	1779	2.45	1,960	2,008	2,057	2,107	2,159	2,212	2,266	2,322	2,379	2,437	2,497
80401	Curarén	1306	0.97	1,357	1,371	1,384	1,397	1,411	1,425	1,438	1,452	1,466	1,481	1,495
80501	El Terrero	1163	2.31	1,274	1,304	1,334	1,365	1,396	1,428	1,461	1,495	1,530	1,565	1,601
80502	El Porvenir	4122	0.92	4,276	4,315	4,355	4,395	4,435	4,476	4,517	4,559	4,601	4,643	4,686
80901	Lepaterique	1134	0.29	1,147	1,151	1,154	1,157	1,161	1,164	1,167	1,171	1,174	1,178	1,181
81001	Maraita	960	-3.27	840	813	786	761	736	712	688	666	644	623	603
81101	Marale	1693	5.04	2,061	2,165	2,274	2,389	2,509	2,635	2,768	2,908	3,054	3,208	3,370
81301	Ojojona	1450	3.69	1,676	1,738	1,802	1,869	1,938	2,009	2,083	2,160	2,240	2,322	2,408
81401	Orica	2846	1.68	3,042	3,093	3,145	3,198	3,252	3,306	3,362	3,418	3,476	3,534	3,594
81501	Reitoca	1513	3.88	1,762	1,830	1,901	1,975	2,052	2,131	2,214	2,300	2,389	2,482	2,578
81601	Sabanagrande	2287	-0.41	2,250	2,240	2,231	2,222	2,213	2,204	2,195	2,186	2,177	2,168	2,159
81701	San Antonio de Oriente	330	-4.45	275	263	251	240	229	219	209	200	191	183	174
81901	San Ignacio	2278	-0.04	2,274	2,273	2,273	2,272	2,271	2,270	2,269	2,268	2,267	2,266	2,265
82001	San Juan de Flores	2546	4.42	3,027	3,161	3,300	3,446	3,599	3,758	3,924	4,097	4,278	4,467	4,665
82201	Santa Ana	731	4.36	867	905	944	985	1,028	1,073	1,120	1,169	1,220	1,273	1,329
82401	Jalaca	1233	3.61	1,421	1,472	1,525	1,580	1,637	1,697	1,758	1,821	1,887	1,955	2,026
82501	Tatumbla	596	1.71	638	649	660	671	683	694	706	718	730	743	756
82701	Villa de San Francisco	3875	4.51	4,623	4,831	5,049	5,277	5,515	5,764	6,024	6,295	6,579	6,876	7,186
82801	Vallecillo	2841	3.39	3,246	3,356	3,470	3,588	3,709	3,835	3,965	4,100	4,239	4,382	4,531
	INTIBUCA (10)													
100201	Camasca	839	7.05	1,102	1,179	1,263	1,352	1,447	1,549	1,658	1,775	1,900	2,034	2,178
100301	Colomoncagua	1057	1.98	1,143	1,166	1,189	1,212	1,237	1,261	1,286	1,311	1,337	1,364	1,391
100401	Concepción	822	1.53	873	887	900	914	928	942	957	971	986	1,001	1,017
100702	Jesús de Otoro	6747	2.72	7,512	7,716	7,926	8,141	8,363	8,590	8,824	9,064	9,310	9,564	9,824
100801	Magdalena	2007	2.16	2,186	2,233	2,282	2,331	2,381	2,433	2,485	2,539	2,594	2,650	2,707
100901	Masaguara	1383	1.28	1,455	1474	1,493	1,512	1,531	1,551	1,571	1,591	1,611	1,632	1,653
101501	Santa Lucía	1183	0.36	1,200	1204	1,209	1,213	1,218	1,222	1,226	1,231	1,235	1,240	1,244
101601	Yamaranguila	2093	1.07	2,184	2,207	2,231	2,255	2,279	2,303	2,328	2,353	2,378	2,404	2,429
	LA PAZ (12)													
121201	San José	1257	8.76	1,759	1,913	2,080	2,263	2,461	2,676	2,911	3,166	3,443	3,745	4,073
121401	San Pedro de Tutule	1370	5.18	1,677	1,764	1,855	1,951	2,052	2,158	2,270	2,388	2,511	2,642	2,778
121701	Santa María	983	2.02	1,065	1,086	1,108	1,131	1,154	1,177	1,201	1,225	1,250	1,275	1,301
121801	Santiago de Puringla	1575	6.17	2,001	2,125	2,256	2,395	2,543	2,700	2,866	3,043	3,231	3,430	3,642
	LEMPIRA (13)													
130301	Candelaria	1517	1.37	1,602	1,624	1,646	1,669	1,691	1,715	1,738	1,762	1,786	1,811	1,835
130401	Cololaca	1289	3.46	1,477	1,528	1,581	1,636	1,692	1,751	1,811	1,874	1,939	2,006	2,075
130501	Erandique	1418	0.88	1,469	1,481	1,495	1,508	1,521	1,534	1,548	1,561	1,575	1,589	1,603
130601	Gualcince	891	2.33	977	1,000	1,023	1,047	1,071	1,096	1,122	1,148	1,175	1,202	1,230
130701	Guarita	591	0.90	613	618	624	629	635	641	646	652	658	664	670
130801	La Campa	569	2.37	625	640	655	670	686	703	719	736	754	772	790
131101	La Unión	2419	2.45	2,665	2,730	2,797	2,866	2,936	3,008	3,081	3,157	3,234	3,314	3,395
131201	La Virtud	1428	2.63	1,584	1,626	1,669	1,713	1,758	1,804	1,851	1,900	1,950	2,001	2,054
131301	Lepaera	1782	2.60	1,975	2,026	2,079	2,133	2,188	2,245	2,303	2,363	2,425	2,488	2,553
131401	Mapulaca	962	2.43	1,059	1,085	1,111	1,138	1,166	1,196	1,223	1,253	1,283	1,314	1,346
131501	Piraera	1313	4.33	1,556	1,623	1,693	1,767	1,843	1,923	2,006	2,093	2,184	2,278	2,377
132401	Tambla	714	4.29	845	881	919	958	999	1,042	1,087	1,133	1,182	1,233	1,286
132501	Tomalá	554	4.79	668	700	734	769	806	844	885	927	971	1,018	1,067
132601	Valladolid	498	2.44	548	562	576	590	604	619	634	649	665	681	698
	OCOTEPEQUE (14)													
140601	La Encarnación	1324	0.91	1,373	1,385	1,398	1,411	1,424	1,436	1,450	1,463	1,476	1,489	1,503
140701	La Labor	888	4.99	1,079	1,133	1,189	1,249	1,311	1,376	1,445	1,517	1,593	1,672	1,756
140801	Lucerna	918	4.27	1,085	1,131	1,180	1,230	1,283	1,337	1,395	1,454	1,516	1,581	1,648
141101	San Francisco del Valle	1375	4.29	1,627	1,696	1,769	1,845	1,924	2,007	2,093	2,183	2,276	2,374	2,476
141501	Sensentí	1167	3.70	1,350	1,399	1,451	1,505	1,561	1,618	1,678	1,740	1,805	1,872	1,941
141502	Azacualpa	714	2.63	792	813	834	856	879	902	926	950	975	1,001	1,027
141503	San Antonio	726	2.63	805	827	848	871	894	917	941	966	991	1,017	1,044

Table 4.2.4-3 Population (4/4)

Code	DEPARTMENT Community	Population 1988	Increase rate	Population 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	OLANCHO (15)													
150101	Jutiquile	3084	4.81	3,722	3,901	4,088	4,285	4,491	4,707	4,933	5,171	5,419	5,680	5,953
150102	Punuare	1989	4.81	2,400	2,516	2,637	2,763	2,896	3,036	3,182	3,335	3,495	3,663	3,839
150103	Arimís	2144	4.81	2,587	2,712	2,842	2,979	3,122	3,272	3,430	3,595	3,768	3,949	4,139
150301	San José de Río Tinto	3311	6.22	4,215	4,477	4,756	5,051	5,365	5,699	6,054	6,430	6,830	7,255	7,706
150302	San Pedro	3109	6.22	3,958	4,204	4,465	4,743	5,038	5,352	5,684	6,038	6,414	6,812	7,236
150801	Gualaco	1559	5.49	1,931	2,037	2,148	2,266	2,391	2,522	2,660	2,807	2,961	3,123	3,295
150901	Guarizama	1137	1.73	1,218	1,239	1,260	1,282	1,304	1,327	1,350	1,373	1,397	1,421	1,446
151301	La Unión	4043	6.76	5,252	5,607	5,986	6,391	6,823	7,284	7,777	8,302	8,864	9,463	10,102
151501	Manto	1684	1.80	1,809	1,841	1,874	1,908	1,942	1,977	2,013	2,049	2,086	2,124	2,162
151601	Salamá	2186	3.06	2,466	2,542	2,619	2,699	2,782	2,867	2,955	3,045	3,139	3,235	3,334
151701	San Esteban	1838	6.89	2,399	2,565	2,741	2,930	3,132	3,348	3,579	3,825	4,089	4,370	4,672
151801	San Francisco Becerra	2408	4.03	2,820	2,934	3,052	3,175	3,303	3,436	3,575	3,719	3,869	4,025	4,187
151901	San Francisco de la Paz	4417	4.64	5,296	5,541	5,798	6,068	6,349	6,644	6,952	7,274	7,612	7,965	8,335
152001	Santa María del Real	3491	4.89	4,226	4,432	4,649	4,876	5,115	5,365	5,627	5,902	6,191	6,494	6,811
	SANTA BARBARA (16)													
160201	La Arada	2622	2.17	2,857	2,919	2,982	3,047	3,113	3,181	3,250	3,320	3,392	3,466	3,541
160301	Atima	1994	1.59	2,124	2,158	2,192	2,227	2,262	2,298	2,335	2,372	2,410	2,448	2,487
160401	Azacualpa	4716	3.01	5,310	5,470	5,634	5,804	5,979	6,159	6,344	6,535	6,732	6,934	7,143
160501	Ceguaca	1422	0.88	1,473	1,486	1,499	1,512	1,525	1,539	1,552	1,566	1,580	1,594	1,608
160701	Concepción del Sur	1053	0.80	1,087	1,096	1,105	1,113	1,122	1,131	1,140	1,149	1,159	1,168	1,177
160901	El Níspero	2366	3.15	2,679	2,763	2,850	2,940	3,032	3,128	3,226	3,328	3,433	3,541	3,652
161101	Ilama	1323	2.80	1,478	1,519	1,561	1,605	1,650	1,696	1,744	1,793	1,843	1,894	1,947
161201	Sula	2182	3.33	2,487	2,570	2,656	2,744	2,836	2,930	3,028	3,129	3,233	3,340	3,452
161202	La Flecha	1964	3.33	2,239	2,314	2,391	2,470	2,552	2,637	2,725	2,816	2,910	3,007	3,107
161301	Naranjito	3691	2.39	4,057	4,154	4,253	4,355	4,459	4,565	4,674	4,786	4,900	5,018	5,137
161401	Nuevo Celilac	1325	2.49	1,462	1,498	1,536	1,574	1,613	1,653	1,694	1,737	1,780	1,824	1,870
161501	Pueblo Nuevo	1026	2.43	1,129	1,157	1,185	1,214	1,243	1,273	1,304	1,336	1,369	1,402	1,436
161601	Protección	1606	3.63	1,852	1,919	1,989	2,061	2,136	2,214	2,294	2,377	2,464	2,553	2,646
161701	Pinalejo	3070	4.99	3,730	3,916	4,112	4,317	4,532	4,758	4,996	5,245	5,507	5,782	6,070
161702	Quimistán	2356	1.98	2,548	2,599	2,650	2,703	2,756	2,811	2,866	2,923	2,981	3,040	3,100
161801	San Francisco de Ojuera	948	1.41	1,003	1,017	1,031	1,046	1,060	1,075	1,090	1,106	1,121	1,137	1,153
162101	San Francisco Valle	1140	3.33	1,300	1,343	1,388	1,434	1,482	1,531	1,582	1,635	1,689	1,745	1,803
162201	El Porvenir	2171	3.34	2,476	2,559	2,644	2,732	2,824	2,918	3,015	3,116	3,220	3,328	3,439
162301	San Pedro Zacapa	1361	1.90	1,467	1,495	1,524	1,553	1,582	1,612	1,643	1,674	1,706	1,738	1,771
162401	San Vicente Centanario	2084	2.24	2,277	2,328	2,380	2,434	2,488	2,544	2,601	2,659	2,719	2,780	2,842
162501	Santa Rita	2112	1.32	2,226	2,255	2,285	2,315	2,346	2,377	2,408	2,440	2,472	2,505	2,538
162701	El Mochito	6690	1.94	7,224	7,365	7,507	7,653	7,802	7,953	8,107	8,265	8,425	8,588	8,755
	VALLE (17)													
170106	Jícaro Galán	829	1.61	884	898	912	927	942	957	973	988	1,004	1,020	1,037
170202	Alianza	816	1.64	871	885	900	914	929	945	960	976	992	1,008	1,025
170401	Aramecina	935	1.65	998	1,015	1,031	1,048	1,066	1,083	1,101	1,119	1,138	1,157	1,176
170501	Caridad	786	2.36	863	883	904	925	947	970	992	1,016	1,040	1,064	1,090
170601	Goascorán	1678	1.35	1,770	1,794	1,819	1,843	1,868	1,893	1,919	1,945	1,971	1,998	2,025
170602	El Amatillo	269	1.35	284	288	292	295	299	304	308	312	316	320	325
170701	Langue	5171	2.33	5,670	5,802	5,937	6,076	6,217	6,362	6,510	6,662	6,817	6,976	7,139
170801	San Francisco de Coray	1394	3.49	1,599	1,655	1,713	1,772	1,834	1,898	1,964	2,033	2,104	2,177	2,253
	YORO (18)													
180301	Jocón	1394	3.23	1,583	1,634	1,687	1,741	1,798	1,856	1,916	1,978	2,041	2,107	2,175
180401	Agua Blanca Sur	5012	2.87	5,613	5,774	5,939	6,110	6,285	6,466	6,651	6,842	7,038	7,240	7,448
180501	El Negrito	7035	4.63	8,431	8,822	9,230	9,657	10,104	10,572	11,062	11,574	12,110	12,671	13,257
180601	Morazán	6695	3.95	7,817	8,126	8,447	8,781	9,127	9,488	9,863	10,252	10,657	11,078	11,516
180602	Nueva Esperanza	2209	4.93	2,678	2,810	2,948	3,094	3,246	3,406	3,574	3,751	3,935	4,129	4,333
180901	Sulaco	1863	4.24	2,200	2,293	2,390	2,491	2,597	2,707	2,822	2,942	3,066	3,196	3,332
181101	Yorito	1969	3.74	2,281	2,366	2,454	2,546	2,641	2,740	2,843	2,949	3,059	3,174	3,292
TOTAL				508795	526063	544089	562910	582565	603095	624544	646958	670386	694879	720492
INCREASE RATE					3.39	3.43	3.46	3.49	3.52	3.56	3.59	3.62	3.65	3.69

As mentioned above, automatic telephone service is not available in most of the subject areas. The demand is not likely to increase rapidly for some years to come. Once the telephone service starts, however, people will understand the benefit of telephones and develop the habit of using them frequently. Then the demand will start to rise rapidly, just as in the urban areas.

In the first half of the decade from 1992 to 2002, the rate of increase in demand is anticipated to keep pace with the rate of increase in population, which is 3.39%, 3.43%, 3.46%, 3.49%, and 3.52% p.a., respectively. This is because the correlation coefficient for population (X_2) in the equations shown in Table 4.2.4-1 was approximately one. In the latter half of the decade, the rate of increase will be the same as the rate of increase in demand as that in urban areas, which is estimated to be 10.9% p.a.

The result of the forecast for the total subject areas shows that the total demand in 2002 will be 12,090. This means the demand will be 1.66 lines per 100 inhabitants, as shown in Table 4.2.4-4. HONDUTEL's estimate produced a similar figure (1.5-2.0). The result for each area is shown in Table 4.2.4-5.

It is necessary to review the telephone demand according to a change in the social situation and/or the economic condition in the future.

Table 4.2.4-4 Total Telephone Demand for the Subject Areas

	Unit	1992	1994	1996	1998	2000	2002
Population	10^3	508.8	544.1	582.6	624.5	670.4	729.5
Demand	lines	6,077	6,512	6,978	8,023	9,837	12,090
Demand rate	%	1.19	1.20	1.20	1.28	1.47	1.66

Note : Demand rate(%) = (Demand / population) x 100

Table 4.2.4-5 Telephone Demand 1992-2002 (1/4)

Code	DEPARTMENT Community	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	ATLANTIDA (01)											
10101	Sambo Creek	18	19	20	21	22	23	26	29	32	35	39
10102	Corozal	20	21	22	23	24	25	28	31	34	38	42
10201	La Unión	20	21	22	23	24	25	28	31	34	38	42
10202	El Porvenir	15	16	17	18	19	20	22	24	27	30	33
10301	Arizona	30	31	32	33	34	35	39	43	48	53	59
10302	Esparta	10	10	10	10	10	10	11	12	13	14	16
10303	Ceibita Way	5	5	5	5	5	5	6	7	8	9	10
10304	Santa María	4	4	4	4	5	5	5	6	6	7	8
10305	Mezapa	3	3	3	3	3	4	4	4	5	5	6
10306	Atenas de San Cristóbal	9	9	9	9	9	9	10	11	12	13	14
10401	Nueva Armenia	5	5	5	5	5	5	6	6	8	9	10
10402	Jutiapa	20	21	22	23	24	25	28	31	34	38	42
10501	La Masica	35	36	37	38	39	40	44	49	54	60	67
10502	San Juan Pueblo	40	41	42	43	45	47	52	58	64	71	79
10503	San Juan Benque	5	5	5	5	5	5	6	7	8	9	10
10601	Santa Ana	28	29	30	31	32	33	37	41	45	50	55
10602	San Francisco	25	26	27	28	29	30	33	37	41	45	50
10701	El Triunfo de la Cruz	15	16	17	18	19	20	22	24	27	30	33
	COLON (02)											
20401	Limón	8	8	8	8	8	8	8	10	11	12	13
20501	Elixir	50	52	54	56	58	60	67	74	82	91	101
20701	Santa Rosa de Aguán	7	7	7	7	7	7	8	9	10	11	12
20901	Salamá	15	16	17	18	19	20	22	24	27	30	33
20902	Quebrade de Arena	70	72	74	77	80	83	92	102	113	125	139
20903	Zamora	15	16	17	18	19	20	22	24	27	30	33
21001	Corocito	10	10	10	10	10	10	11	12	13	14	16
	COMAYAGUA (03)											
30101	Palo Pintado	18	19	20	21	22	23	26	29	32	35	39
30301	El Rosario	20	21	22	23	24	25	28	31	34	38	42
30401	Esquías	10	10	10	10	10	10	11	12	13	14	16
30601	La Libertad	150	155	160	166	172	178	197	218	242	268	297
30701	Lamaní	40	41	42	43	45	47	52	58	64	71	79
31101	Minas de Oro	200	207	214	221	229	237	263	292	324	359	398
31301	San Antononio de la Cuesta	20	21	22	23	24	25	28	31	34	38	42
31302	San Jerónimo	25	26	27	28	29	30	33	37	41	45	50
31501	San José de Potrero	5	5	5	5	5	5	6	7	8	9	10
31601	San Luis	40	41	42	43	45	47	52	58	64	71	79
31701	San Sebastián	20	21	22	23	24	25	28	31	34	38	42
32001	Las Lajas	24	25	26	27	28	29	32	35	39	43	48
32101	Taulabé	200	207	214	221	229	237	263	292	324	359	398
	COPAN (04)											
40101	Quezailica	20	21	22	23	24	25	28	31	34	38	42
40301	Concepción	10	10	10	10	10	10	11	12	13	14	16
40401	El Florido	10	10	10	10	10	10	11	12	13	14	16
40501	Corquín	145	150	155	160	166	172	191	212	235	261	289
40601	Cucuyagua	50	52	54	56	58	60	67	74	82	91	101
40801	Dulce Nombre	45	47	49	51	53	55	61	68	75	83	92
40901	El Paraíso	40	41	42	43	45	47	52	58	64	71	79
41001	Florida	100	103	107	111	115	119	132	146	162	180	200
41101	La Jigua	15	16	17	18	19	20	22	24	27	30	33
41202	La Unión	20	21	22	23	24	25	28	31	34	38	42
41301	Nueva Arcadia	15	16	17	18	19	20	22	24	27	30	33
41302	Chalmeca	10	10	10	10	10	10	11	12	13	14	16
41401	San Agustín	19	20	21	22	23	24	27	30	33	37	41
41501	San Antonio	20	21	22	23	24	25	28	31	34	38	42
41502	Cocepción	3	3	3	3	3	4	4	4	5	5	6
41602	La Esperanza	10	10	10	10	10	10	11	12	13	14	16
41701	San José	30	31	32	33	34	35	39	43	48	53	59
41801	San Juan de Opoa	20	21	22	23	24	25	28	31	34	38	42
41901	San Nicolás	45	47	49	51	53	55	61	68	75	83	92
42001	San Pedro de Copán	30	31	32	33	34	35	39	43	48	53	59
42201	Trinidad	35	36	37	38	39	40	44	49	54	60	67

Table 4.2.4-5 Telephone demand 1992-2002 (2/4)

Code	DEPARTMENT Community	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	CORTES (05)											
50401	Cuyamel	100	103	107	111	115	119	132	146	162	180	200
50501	Santiago	30	31	32	33	34	35	39	43	48	53	59
50901	San Buenaventura	10	10	10	10	10	10	11	12	13	14	16
50902	Río Lindo	50	52	54	56	58	60	67	74	82	91	101
50903	San Francisco de Yojoa	20	21	22	23	24	25	28	31	34	38	42
50904	Cañaveral	20	21	22	23	24	25	28	31	34	38	42
51001	San Manuel	45	47	49	51	53	55	61	68	75	83	92
51101	Agua Azul Sierra	10	10	10	10	10	10	11	12	13	14	16
51102	Yojoa	30	31	32	33	34	35	39	43	48	53	59
51103	El Olivar	6	6	6	6	6	6	7	8	9	10	11
51104	Los Caminos	10	10	10	10	10	10	11	12	13	14	16
51105	San Isidro	10	10	10	10	10	10	11	12	13	14	16
51106	El Edén	35	36	37	38	39	40	44	49	54	60	67
51107	Concepción	3	3	3	3	3	4	4	4	5	5	6
51108	La Barca	2	2	2	2	2	2	3	3	3	4	4
51109	Peña Blanca	30	31	32	33	34	35	39	43	48	53	59
51110	Santa Cruz de Yojoa	150	155	160	166	172	178	197	218	242	268	297
51201	Dos Caminos	40	41	42	43	45	47	52	58	64	71	79
	CHOLUTECA (06)											
60101	Pavana	8	8	8	8	8	8	9	10	11	12	13
60201	Apacilagua	10	10	10	10	10	10	11	12	13	14	16
60301	Concepción de María	15	16	17	18	19	20	22	24	27	30	33
60401	Duyure	17	18	19	20	21	22	24	27	30	33	37
60501	El Corpus	14	14	14	14	14	14	16	18	20	22	24
60502	El Banquito	4	4	4	4	5	5	5	6	6	7	8
60601	El Triunfo	37	38	39	40	41	42	47	52	58	64	71
60602	El Guasaule	20	21	22	23	24	25	28	31	34	38	42
60701	Punta Ratón	10	10	10	10	10	10	11	12	13	14	16
60702	Cedeño	15	16	17	18	19	20	22	24	27	30	33
60703	Marcovia	20	21	22	23	24	25	28	31	34	38	42
60704	Monjarás	25	26	27	28	29	30	33	37	41	45	50
60705	Azucarera Choluteca 1	5	5	5	5	5	5	6	7	8	9	10
60706	Azucarera Choluteca 2	3	3	3	3	3	4	4	4	5	5	6
60801	Morolica	20	21	22	23	24	25	28	31	34	38	42
61001	Orocuina	25	26	27	28	29	30	33	37	41	45	50
61101	Pespire	150	155	160	166	172	178	197	218	242	268	297
61201	San Antonio de Flores	10	10	10	10	10	10	11	12	13	14	16
61501	El Espino	7	7	7	7	7	7	8	9	10	11	12
61601	Santa Ana de Yusguare	15	16	17	18	19	20	22	24	27	30	33
	EL PARAISO (07)											
70101	El Rodeo	1	1	1	1	1	1	1	1	2	2	2
70201	Alauca	7	7	7	7	7	7	8	9	10	11	12
70202	Las Manos	6	6	6	6	6	6	7	8	9	10	11
70301	Jutiapa	20	21	22	23	24	25	28	31	34	38	42
70302	El Arenal	5	5	5	5	5	5	6	7	8	9	10
70303	El Chichicaste	15	16	17	18	19	20	22	24	27	30	33
70501	Güinope	50	52	54	56	58	60	67	74	82	91	101
70601	Jacaleapa	20	21	22	23	24	25	28	31	34	38	42
70701	Liure	12	12	12	12	12	12	13	14	16	18	20
70801	Morocelí	20	21	22	23	24	25	28	31	34	38	42
70901	Oropolí	20	21	22	23	24	25	28	31	34	38	42
71001	Potrerillos	2	2	2	2	2	2	3	3	3	4	4
71201	San Lucas	14	14	14	14	14	14	16	18	20	22	24
71301	San Matías	9	9	9	9	9	9	10	11	12	13	14
71401	Soledad	12	12	12	12	12	12	13	14	16	18	20
71501	Teupasenti	20	21	22	23	24	25	28	31	34	38	42
71601	Texiguat	10	10	10	10	10	10	11	12	13	14	16
71801	Yauyupe	8	8	8	8	8	8	9	10	11	12	13
71901	Trojes	40	41	42	43	45	47	52	58	64	71	79
71902	Cifuentes	5	5	5	5	5	5	6	7	8	9	10

Table 4.2.4-5 Telephone demand 1992-2002 (3/4)

Code	DEPARTMENT Community	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	FRANCISCO MORAZAN (08)											
80101	San Juancito	15	16	17	18	19	20	22	24	27	30	33
80301	Agalteca	3	3	3	3	3	4	4	4	5	5	6
80302	El Suyatal	4	4	4	4	5	5	5	6	6	7	8
80303	Cedros	20	21	22	23	24	25	28	31	34	38	42
80401	Curarén	18	19	20	21	22	23	26	29	32	35	39
80501	El Terrero	2	2	2	2	2	2	3	3	3	4	4
80502	El Porvenir	100	103	107	111	115	119	132	146	162	180	200
80901	Lepaterique	18	19	20	21	22	23	26	29	32	35	39
81001	Maraita	10	10	10	10	10	10	11	12	13	14	16
81101	Marale	21	22	23	24	25	26	29	32	35	39	43
81301	Ojojona	50	52	54	56	58	60	67	74	82	91	101
81401	Orica	15	16	17	18	19	20	22	24	27	30	33
81501	Reitoca	15	16	17	18	19	20	22	24	27	30	33
81601	Sabanagrande	100	103	107	111	115	119	132	146	162	180	200
81701	San Antonio de Oriente	3	3	3	3	3	4	4	4	5	5	6
81901	San Ignacio	35	36	37	38	39	40	44	48	54	60	67
82001	San Juan de Flores	30	31	32	33	34	35	39	43	48	53	59
82201	Santa Ana	10	10	10	10	10	10	11	12	13	14	16
82401	Jalaca	10	10	10	10	10	10	11	12	13	14	16
82501	Tatumbla	10	10	10	10	10	10	11	12	13	14	16
82701	Villa de San Francisco	30	31	32	33	34	35	39	43	48	53	59
82801	Vallecillo	42	43	44	46	48	50	55	61	68	75	83
	INTIBUCA (10)											
100201	Camasca	12	12	12	12	12	12	13	14	16	18	20
100301	Colomoncagua	9	9	9	9	9	9	10	11	12	13	14
100401	Concepción	9	9	9	9	9	9	10	11	12	13	14
100702	Jesús de Otoro	80	83	86	89	92	95	105	116	129	143	159
100801	Magdalena	12	12	12	12	12	12	13	14	16	18	20
100901	Masaguara	10	10	10	10	10	10	11	12	13	14	16
101501	Santa Lucía	9	9	9	9	9	9	10	11	12	13	14
101601	Yamaranguila	12	12	12	12	12	12	13	14	16	18	20
	LA PAZ (12)											
121201	San José	25	26	27	28	29	30	33	37	41	45	50
121401	San Pedro de Tutule	50	52	54	56	58	60	67	74	82	91	101
121701	Santa María	20	21	22	23	24	25	28	31	34	38	42
121801	Santiago de Puringla	60	62	64	66	68	70	78	87	96	106	118
	LEMPIRA (13)											
130301	Candelaria	15	16	17	18	19	20	22	24	27	30	33
130401	Cololaca	7	7	7	7	7	7	8	9	10	11	12
130501	Erandique	20	21	22	23	24	25	28	31	34	38	42
130601	Gualcince	8	8	8	8	8	8	9	10	11	12	13
130701	Guarita	15	16	17	18	19	20	22	24	27	30	33
130801	La Campa	8	8	8	8	8	8	9	10	11	12	13
131101	La Unión	16	17	18	19	20	21	23	26	29	32	35
131201	La Virtud	20	21	22	23	24	25	28	31	34	38	42
131301	Lepaera	50	52	54	56	58	60	67	74	82	91	101
131401	Mapulaca	30	31	32	33	34	35	39	43	48	53	59
131501	Piraera	18	19	20	21	22	23	26	29	32	35	39
132401	Tambla	7	7	7	7	7	7	8	9	10	11	12
132501	Tomalá	10	10	10	10	10	10	11	12	13	14	16
132601	Valladolid	7	7	7	7	7	7	8	9	10	11	12
	OCOTEPEQUE (14)											
140601	La Encarnación	30	31	32	33	34	35	39	43	48	53	59
140701	La Labor	25	26	27	28	29	30	33	37	41	45	50
140801	Lucerna	8	8	8	8	8	8	9	10	11	12	13
141101	San Francisco del Valle	15	16	17	18	19	20	22	24	27	30	33
141501	Sensenti	15	16	17	18	19	20	22	24	27	30	33
141502	Azacualpa	7	7	7	7	7	7	8	9	10	11	12
141503	San Antonio	3	3	3	3	3	4	4	4	5	5	6

Table 4.2.4-5 Telephone demand 1992-2002 (4/4)

Code	DEPARTMENT Community	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	OLANCHO (15)											
150101	Jutiquile	50	52	54	56	58	60	67	74	82	91	101
150102	Punuare	20	21	22	23	24	25	28	31	34	38	42
150103	Arimís	20	21	22	23	24	25	28	31	34	38	42
150301	San José de Río Tinto	8	8	8	8	8	8	9	10	11	12	13
150302	San Pedro	8	8	8	8	8	8	9	10	11	12	13
150801	Gualaco	40	41	42	43	45	47	52	58	64	71	79
150901	Guarizama	10	10	10	10	10	10	11	12	13	14	16
151301	La Unión	18	19	20	21	22	23	26	29	32	35	39
151501	Manto	15	16	17	18	19	20	22	24	27	30	33
151601	Salamá	21	22	23	24	25	26	29	32	35	39	43
151701	San Esteban	30	31	32	33	34	35	39	43	48	53	59
151801	San Francisco Becerra	45	47	49	51	53	55	61	68	75	83	92
151901	San Francisco de la Paz	200	207	214	221	229	237	263	292	324	359	398
152001	Santa María del Real	40	41	42	43	45	47	52	58	64	71	79
	SANTA BARBARA (16)											
160201	La Arada	30	31	32	33	34	35	39	43	48	53	59
160301	Atima	15	16	17	18	19	20	22	24	27	30	33
160401	Azacualpa	50	52	54	56	58	60	67	74	82	91	101
160501	Ceguaca	15	16	17	18	19	20	22	24	27	30	33
160701	Concepción del Sur	10	10	10	10	10	10	11	12	13	14	16
160901	El Níspero	20	21	22	23	24	25	28	31	34	38	42
161101	Ilama	20	21	22	23	24	25	28	31	34	38	42
161201	Sula	20	21	22	23	24	25	28	31	34	38	42
161202	La Flecha	20	21	22	23	24	25	28	31	34	38	42
161301	Naranjito	100	103	107	111	115	119	132	146	162	180	200
161401	Nuevo Celilac	8	8	8	8	8	8	9	10	11	12	13
161501	Pueblo Nuevo	9	9	9	9	9	9	10	11	12	13	14
161601	Protección	20	21	22	23	24	25	28	31	34	38	42
161701	Pinalejo	30	31	32	33	34	35	39	43	48	53	59
161702	Quimistán	45	47	49	51	53	55	61	68	75	83	92
161801	San Francisco de Ojuera	8	8	8	8	8	8	9	10	11	12	13
162101	San Francisco Valle	15	16	17	18	19	20	22	24	27	30	33
162201	El Porvenir	16	17	18	19	20	21	23	26	29	32	35
162301	San Pedro Zacapa	10	10	10	10	10	10	11	12	13	14	16
162401	San Vicente Centenario	20	21	22	23	24	25	28	31	34	38	42
162501	Santa Rita	17	18	19	20	21	22	24	27	30	33	37
162701	El Mochito	50	52	54	56	58	60	67	74	82	91	101
	VALLE (17)											
170106	Jícaro Galán	15	16	17	18	19	20	22	24	27	30	33
170202	Alianza	15	16	17	18	19	20	22	24	27	30	33
170401	Aramecina	12	12	12	12	12	12	13	14	16	18	20
170501	Caridad	11	11	11	11	11	11	12	13	14	16	18
170601	Goascorán	65	67	69	71	73	76	84	93	103	114	126
170602	El Amatillo	20	21	22	23	24	25	28	31	34	38	42
170701	Langue	50	52	54	56	58	60	67	74	82	91	101
170801	San Francisco de Coray	15	16	17	18	19	20	22	24	27	30	33
	YORO (18)											
180301	Jocón	20	21	22	23	24	25	28	31	34	38	42
180401	Agua Blanca Sur	50	52	54	56	58	60	67	74	82	91	101
180501	El Negrito	80	83	86	89	92	95	105	116	129	143	159
180601	Morazán	120	124	128	132	137	142	157	174	193	214	237
180602	Nueva Esperanza	15	16	17	18	19	20	22	24	27	30	33
180901	Sulaco	20	21	22	23	24	25	28	31	34	38	42
181101	Yorito	20	21	22	23	24	25	28	31	34	38	42

4.3 Public Telephone

According to the survey, the public telephones required in the subject areas are considered to have a particularly important role, that differs from that of public telephones in the urban areas. Hence a higher priority than usual should be given to public telephone lines in these areas. The total number of public telephones required is estimated to be 7% of the total telephone demand.

4.4 Other Services

The telegraph service in the subject areas is very important because of the lack of telephone services. Nevertheless the service level is low in quality and use is gradually decreasing. Consequently no more lines need to be installed for the telegraph service.

Other services such as telex, leased line, data communication and new additional functions will rarely be introduced to the areas, within the next decade.

Further, telephone lines can be used as the transmission media for these services, so these demands are not considered independently in the Study.

CHAPTER 5 TRAFFIC FORECAST

CHAPTER 5 TRAFFIC FORECAST

5.1 Base of Traffic Forecast

5.1.1 Characteristics of collected data

It is preferred to forecast the rural telephone traffic in the future based on factors given through analysis of existing data, though these data are not available in a classified form in many cases. The raw data are then collected to estimate the factors. The dispersion of telegrams is also helpful if obtainable, in case the telephones have not penetrated the rural areas well.

Accordingly, based on the recognition of the telecommunications situation in Honduras, an effort was made to look for raw data of the rural public telephones and telegrams. Reliable raw data in the form of communications tickets for the rural public telephones and telegrams were obtained in addition to the partial statistic data for the telephone exchanges in the urban network. Useful statistics for the rural network traffic were not obtained.

5.1.2 Reflection of collected data

The traffic for the rural network was forecast based on factors obtained through an analysis of the collected raw data. In some cases values shown in the CCITT GAS 6 were also referred to for the estimation to supplement the collected data. Statistics on urban network traffic were also referred to in some instances.

The analysis result was reflected to the forecast in the following ways.

Table 5.1.2-1 Analysis Results Reflection

Analysis Results	Reflected to
1) Calling rate of rural public telephones	Calling rate of public telephones
2) Dispersion of rural telephone calls and telegrams	Percentages by call categories
3) Calling rate of urban exchanges	Calling rate of subscriber telephones

5.2 Traffic on the Existing Network

5.2.1 Rural public telephone traffic

1) Study of rural public telephones

Data on rural public telephones are helpful to calculate the traffic intensity or the calling rate.

Rural telephones are located at about 200 HONDUTEL offices throughout the country. Completed calls are all registered with communication tickets at each public telephone service office and the tickets are sent to a control section of its superintendent organization. However, statistics indicating call duration, intensity, and time could not be obtained.

Therefore, complete communication tickets were looked for and tickets for the following five public telephones shown in Table 5.2.1-1 were obtained and analyzed. In addition, traffic data from the Tegucigalpa manual board indicating the date and destination of calls were obtained.

The five public telephones are as follows. Four of them are located at HONDUTEL offices in Comayagua Department and the rest in La Paz Department; both in the central part of Honduras. The population of the five studied communities ranges from 1,800 to 3,700 while the population in 67% of the 223 subject rural community areas ranges from 1,000 to 4,000. Accordingly, the studied communities have a average population in relation to the 223 community areas.

Table 5.2.1-1 Studied Offices of Rural Public Telephone Service

HONDUTEL office	Department	Abbreviation	Population
Villa de San Antonio	Comayagua	AN	3,741
Ajuterique	Comayagua	AJ	3,734
Lejamani	Comayagua	XW	2,861
El Rosario	Comayagua	SA	1,843
Yarumera	La Paz	YR	2,152

Note: The populations are according to the National Census 1988, except for Yarumera, which is an estimation of HONDUTEL for the year 1990.

Villa de San Antonio, Ajuterique, Lejamani, and El Rosario are the capitals of the similarly named municipalities of Comayagua Department. While Yarumera is a community located in the La Paz Municipality of La Paz Department.

All the HONDUTEL offices with those public telephones are located within a distance of 20Km or less from Comayagua or La Paz. The terminals were all magnetic telephones. The quality of communication of those telephones was very poor. Through interviews, it was found that those wanting better communication quality preferred to use public telephones in Comayagua and/or La Paz.

2) Traffic data for rural public telephones

Traffic data for the rural public telephones were obtained through analysis of communication tickets made at the five HONDUTEL offices. The communication tickets were those made for communication over a one month period from January 16, 1992 to February 15, 1992. The total number of calls made during this period was 438 as shown in Table 5.2.1-2 below. The raw data are presented in the Appendix.

Table 5.2.1-2 Collected Rural Public Telephone Calls (by office)

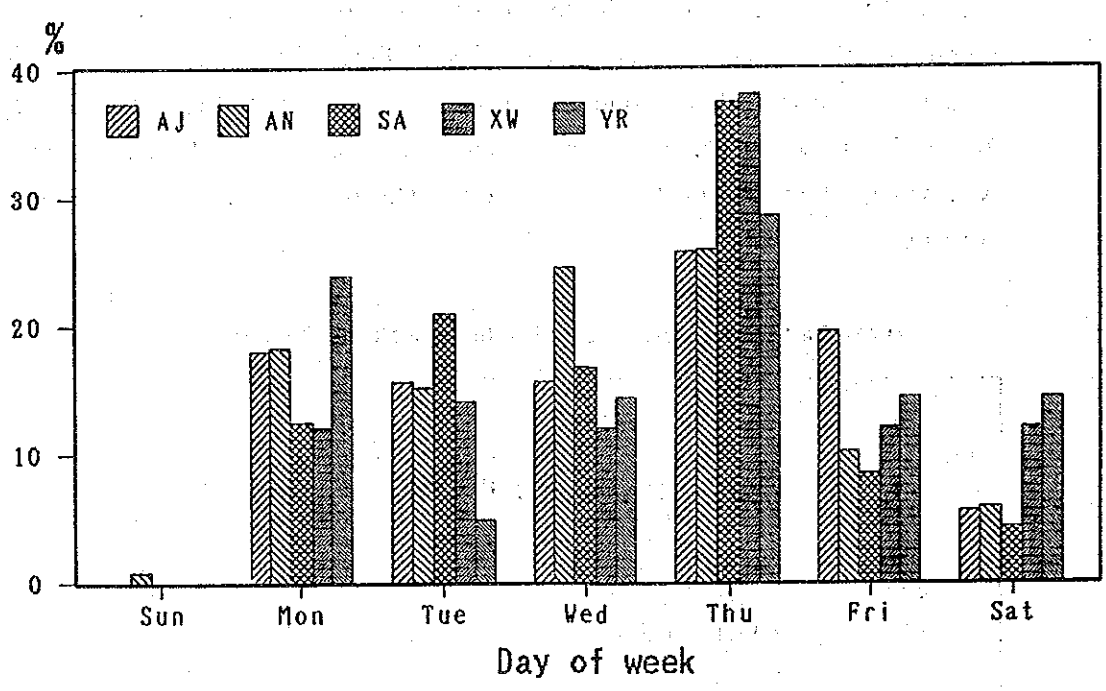
Code	HONDUTEL office	Calls	(%)
AN	VILLA DE SAN ANTONIO	186	42.5
AJ	AJUTERIQUE	149	34.0
XW	LEJAMANI	55	12.6
SA	EL ROSARIO	26	5.9
YR	YARUMERA	22	5.0
	Total	438	100.0

In order to know which day was the peek day in a week, calls made over exactly four weeks from Thursday 16th of January to Wednesday 12th of February were selected. These calls numbered 382 as shown in Table 5.2.1-3 below. Calls by day of week expressed in percentages are shown in Figure 5.2.1-1. Through this classification, it was found that the day with the highest traffic was Thursday.

Table 5.2.1-3 Number of Calls of Rural PublicTelephones (by day of week)

Month	Day	AJ	AN	SA	XW	YR	Total
	Sunday	0	1	0	0	0	1
January	Monday	23	29	3	6	5	66
	Tueday	20	24	5	7	1	57
to	Wednesday	20	39	4	6	3	72
	Thursday	33	41	9	19	6	108
February	Friday	25	16	2	6	3	52
	Saturday	7	9	1	6	3	26
	Total	128	159	24	50	21	382

Figure 5.2.1-1 Percentages of Calls of Rural Public Telephones (by day of week)



In order to find the busies traffic hour, communication tickets over the four weeks from January 16 were classified by hour of day. The result indicated that about 19% of one-day traffic was concentrated in the hour starting from 8:00 in the morning. Figure 5.2.1-2 shows the percentages of calls made during this period. The details are shown in Table 5.2.1-4.

Figure 5.2.1-2 Percentages of Calls of Rural Public Telephones (by hour)

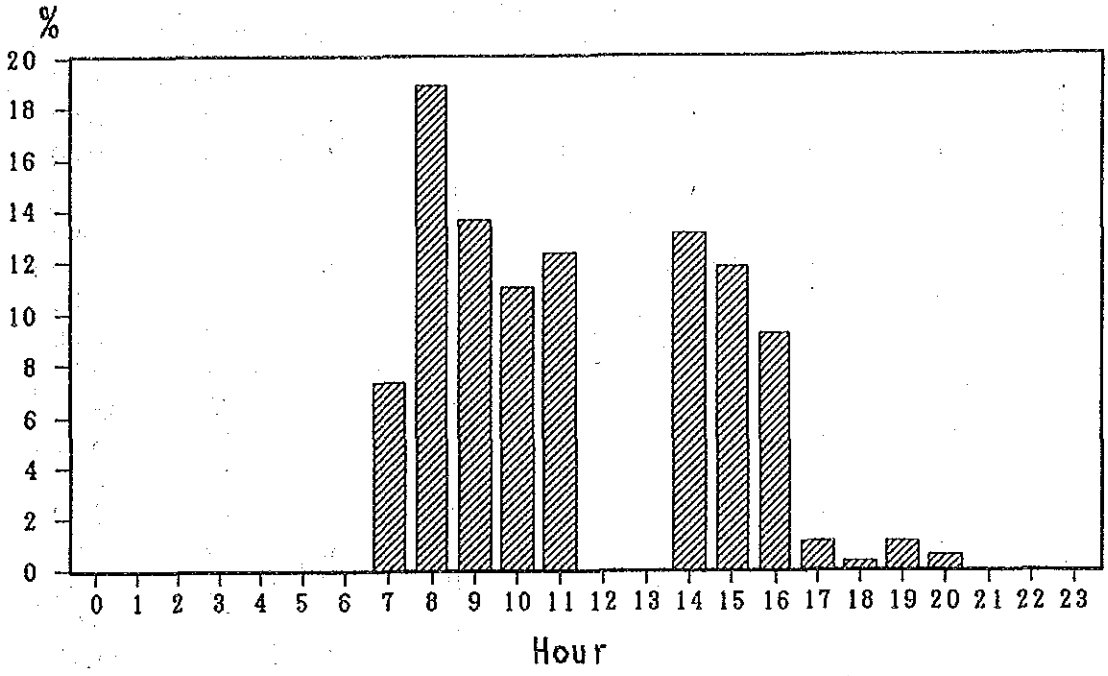


Table 5.2.1-4 Number of Calls of Rural Public Telephones (by hour)

Hour	AJ	AN	SA	XW	YR	Total Number	(%)
0	0	0	0	0	0	0	0.00
1	0	0	0	0	0	0	0.00
2	0	0	0	0	0	0	0.00
3	0	0	0	0	0	0	0.00
4	0	0	0	0	0	0	0.00
5	0	0	0	0	0	0	0.00
6	0	0	0	0	0	0	0.00
7	13	8	1	4	2	28	7.33
8	24	30	5	13	0	72	18.85
9	11	23	2	10	6	52	13.61
10	14	20	5	0	3	42	10.99
11	18	17	5	6	1	47	12.30
12	0	0	0	0	0	0	0.00
13	0	0	0	0	0	0	0.00
14	14	24	3	5	4	50	13.09
15	14	21	2	7	1	45	11.78
16	17	11	1	4	2	35	9.16
17	1	1	0	0	2	4	1.05
18	0	1	0	0	0	1	0.26
19	1	2	0	1	0	4	1.05
20	1	1	0	0	0	2	0.52
21	0	0	0	0	0	0	0.00
22	0	0	0	0	0	0	0.00
23	0	0	0	0	0	0	0.00
Total	128	159	24	50	21	382	100.00

In conclusion, the analysis results indicated that the day with the highest traffic was Thursday, and the peak hour was over one hour starting from 8:00 in the morning.

3) Dispersion of rural telephone calls

Traffic data showing the date and destination, from September 1991 to January 1992, of rural public telephones of 12 HONDUTEL service offices located in Francisco Morazán Department were obtained through a report related to the manual boards of Tegucigalpa. About 50 records were collected from each of the 12 telephones, except for Ojojona and San Buenaventura. The total number of calls was 538.

These data were classified by destination in order to discover the tendency in traffic dispersion. According to the result of the analysis, most of the calls were directed to D.C. (Distrito Central, or the Metropolitan Area) of Francisco Morazán Department. On average, the calls to D.C. accounted for 89% of the total, while those to other communities in Francisco Morazán Department accounted for 3% with the other 8% going out of the Department. Figure 5.2.1-3 shows the percentages by destination. This analysis was made only for the area of Francisco Morazán because of lack of information for other areas. The matrix of calls between the calling service stations and the destinations is shown in Table 5.2.1-5. The raw data are presented in the Appendix.

Figure 5.2.1-3 Dispersion of Rural Public Telephone Calls in Francisco Morazán

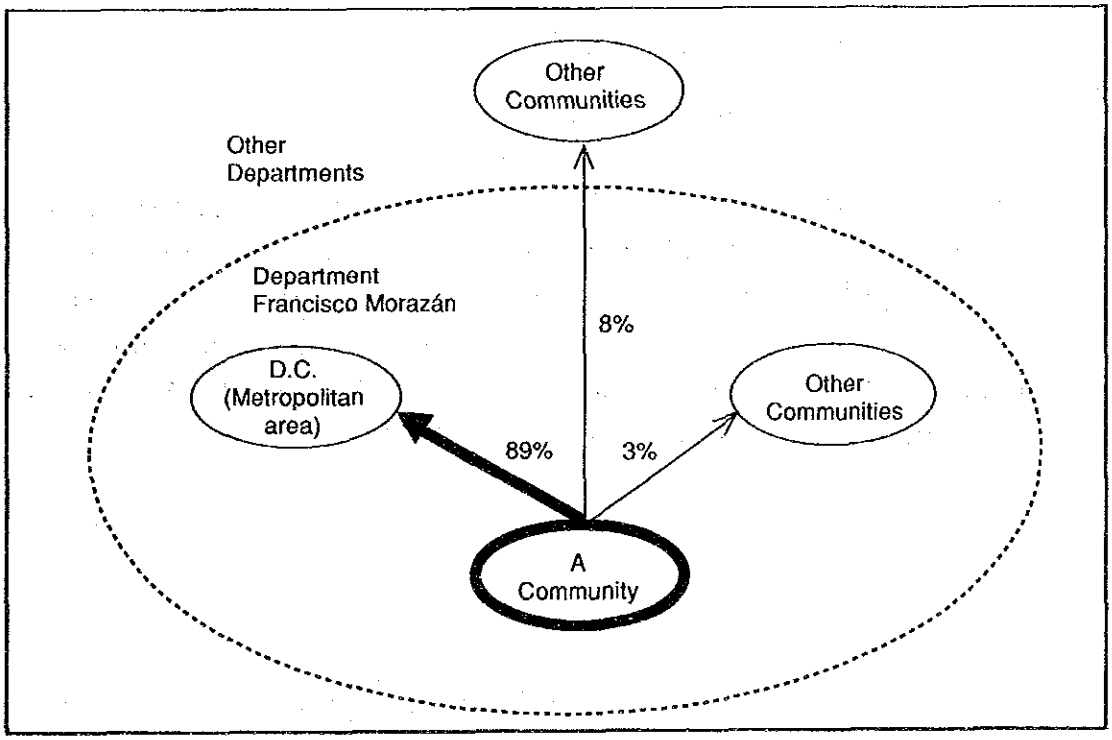


Table 5.2.1-5 Call Dispersion of Tegucigalpa Manual Board Calls

To / From (Office)	Francisco D.C.	Morazán Others	Cor.	Oco.	Int.	Com.	Cho.	Yoro	Ola.	Pro.	Val.	Others	Total
Catarranas	46		1	1		1	1						50
Cedros	51	6	2			3			1				63
Cofradía	49					1							50
Gualmaca	42				2	1	1		1	1	1		49
Lepaterique	49								1				50
Tatumbla	42	4				2		1		1			50
Ojojona	20	1											21
Sabanagrande	44		2			1	3						50
San Juancito	43	3	1			1			1	1			50
San Buenaventura	5												5
Santa Lucía	43		1						3	1	2		50
Talanga	46						1		2			1	50
Total	430	14	7	1	2	10	6	1	9	4	3	1	538
Percentages	89.22	2.60	1.30	0.19	0.37	1.86	1.12	0.19	1.67	0.74	0.56	0.19	100.00

Note: No call was made for Atlántida, Colón, Copán, Gracias a Dios, Islas de la Bahía, La Paz, and Lempira during the period of this Study.

4) Calling rate of rural public telephones

In order to find the origination calling rate of the rural public telephones, calls made on five Thursdays during the period from January 16 to February 13 were analyzed. Calls made over one hour starting at 8:00 in the morning in this period numbered 20 and the total duration was 73 minutes. Since this was the number made by five telephones, the calling rate came up to 0.049 erl. (or 73 x 60 / 5 / 5 / 3,600 = 0.049). The duration of each call is shown in Table 5.2.1-6.

Table 5.2.1-6 Busy Hour Traffic of Rural Public Telephones

MONTH 1992	DAY	START HOUR	START MIN.	END HOUR	END MIN.	HOLDING TIME (MIN)	CALLING PARTY (EXCHANGE)
JAN.	16	8	11	8	18	7	AJ
JAN.	16	8	24	8	27	3	AJ
JAN.	16	8	47	8	50	3	AN
JAN.	16	8	36	8	39	3	AN
JAN.	16	8	30	8	33	3	AN
JAN.	16	8	42	8	45	3	AN
JAN.	16	8	24	8	30	6	SA
JAN.	16	8	42	8	45	3	SA
JAN.	16	8	0	8	3	3	XW
JAN.	16	8	5	8	9	4	XW
JAN.	23	8	50	8	53	3	AN
JAN.	30	8	58	9	2	4	XW
JAN.	30	8	9	8	12	3	XW
FEB.	6	8	33	8	42	9	AJ
FEB.	6	8	47	8	50	3	AJ
FEB.	13	8	38	8	40	2	AJ
FEB.	13	8	35	8	37	2	AJ
FEB.	13	8	24	8	27	3	AN
FEB.	13	8	19	8	22	3	AN
FEB.	13	8	16	8	19	3	XW
Total						73 (Minutes)	

5.2.2 Telegram traffic

1) Studied areas

Telegram data were collected to calculate the dispersion tendency of communication from a community. Telegram service is offered at about 350 HONDUTEL offices located in the country. Telegram forms were filled at each HONDUTEL office and sent regularly to a section of its superintendent organization. However, statistic data processed in line with the purpose of this Study were not found. Therefore, data of ten HONDUTEL offices shown in Table 5.2.2-1 were collected and analyzed. These offices were selected out of those that were available to present such data, taking into consideration the spread of the subject rural community areas, so that the data could be collected from different offices scattered throughout the country.

Table 5.2.2-1 Selected HONDUTEL Offices of Telegram Service

Office	Department	Population
Limón	Colón	2,174
Minas de Oro	Comayagua	2,937
La Entrada	Copán	9,570
Corquín	Copán	3,397
Santa Cruz de Yojoa	Cortés	5,144
Triunfo	Choluteca	4,670
Magdalena	Intibucá	721
San Francisco de la Paz	Olancho	4,344
San Marcos	Santa Bárbara	3,229
Langue	Valle	2,921

Note: The populations are according to the National Census 1988, except for that of La Entrada, which is an estimation of HONDUTEL for the year 1990.

The communities studied were selected to represent the spread of the subject rural community areas in nine Departments. The communities studied, except La Entrada, are all subjects of this Study.

The subject areas are mostly similar as stated in Section 5.2.2. The communities studied are not exceptional but are very typical of the rest of the subject community areas, except Limón and La Entrada.

Limón is a community located along a beach in the north-east part of Honduras at a distance of 50 Km from the nearest city Trujillo. Few communities are found around Limón. The community is isolated as there are few houses along the may there, in comparison with the other subject rural community areas.

La Entrada is not a subject rural community area but located at the central part of the spread of the subject rural community areas. 19 subject community areas are located around La Entrada. It is a pivotal point for car traffic entering the western part of Honduras, situated at the entrance to a world famous sight-seeing spot called "Copan Ruins".

2) Telegram dispersion

Analyzing telegrams is more adequate as long as it is used to forecast traffic dispersion of a community area, because the telegram is more available than telephone calls in a number of destinations. In order to obtain the tendency of traffic dispersion from rural communities, 50 telegram forms were collected from each of the studied HONDUTEL offices of telegram, out of those made in December 1991 and January 1992. However, some were found to be incomplete and were deleted. Therefore, for two of the ten offices, 49 cases were analyzed. No more data were available for Limón because the number of telegrams was small. The raw data are presented in the Appendix.

According to the analysis results, on average, those directed to destinations within its own Department accounted for 19.4%, those to Francisco Morazán, where the capital is located, accounted for 23.44%, those to Cortés, where San Pedro Sula, the second largest city of Honduras is located, accounted for 13.3% of the total, and the rest were directed to different points in the country. Figure 5.2.2-1 shows the average of the dispersion of telegrams dealt for those ten offices studied. Table 5.2.2-2 shows the details by destination.

Figure 5.2.2-1 Dispersion of Telegrams

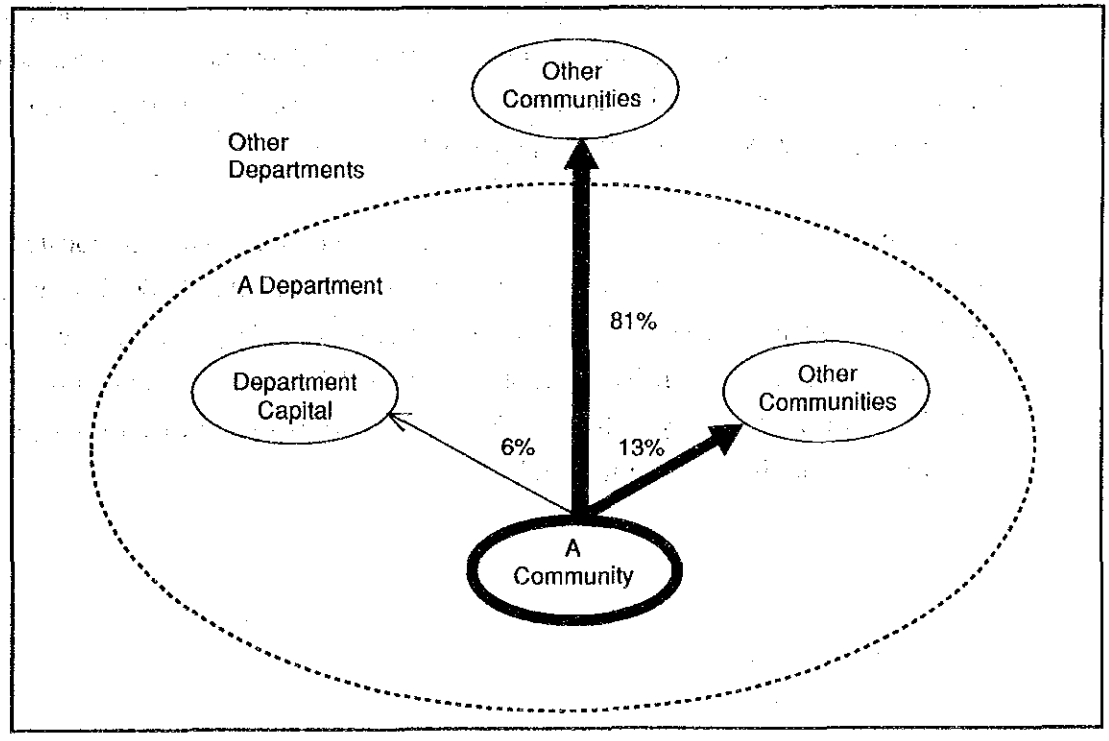


Table 5.2.2-2 Dispersion of Telegrams

Destination	Percentages	Destination	Percentages
Within the department		Comayagua	
Capital	6.04	Comayagua	0.60
Others	13.35	Others	3.22
Francisco Morazán		Copán	
D.C.	18.14	Santa Rosa de Copán	1.00
Others	5.27	Others	3.20
Cortés		Choluteca	
S.P.S.	5.97	Choluteca	0.80
Others	7.33	Others	0.40
Atlántida		Others	
La Ceiba	4.07	Others	29.60
Others	1.00	Total	100.00

5.2.3 Automatic telephones in the urban telecommunications network

1) Calling rate

Urban telephone traffic data were collected for the purpose of finding a tendency in the calling rate of subscriber telephones, the same as in the case of the rural telephones. Data relating to the calling rate of 12 exchanges in the urban telecommunications network were obtained. They were PRI-II, MIR, TON, DAN, JUT, CAT, CHO, COM, SIG, PAR, PAZ, and SLO.

Among them, PRI-II, MIR, and TON are exchanges with a big capacity located in the Metropolitan Area. Others are exchanges in local cities. PAR, PAZ, SLO are all small size exchanges. Their subscribers numbered 284, 297 and 288 respectively, in 1991. The telephone density of those cities were 2.17, 2.64, 2.03 main lines per 100 inhabitants respectively, in the year 1991. The calling rate of each exchange in 1990 and 1992 is shown in Table 5.2.3-1.

Table 5.2.3-1 Automatic Exchange Calling Rate

Exchange	Year 1990	1991
PRI-II	0.86	0.13
MIR	0.26	0.10
TON	—	0.07
DAN	0.03	0.06
JUT	0.06	0.07
CAT	0.08	0.07
CHO	0.07	0.07
COM	0.05	0.07
SIG	0.03	0.06
PAR	—	0.02
PAZ	—	0.02
SLO	—	0.02

Source: Presented by HONDUTEL for this Study.

2) Monthly fluctuation of traffic

Information relating to the traffic fluctuation for the existing exchanges in the year 1990 was obtained. Among them, Juticalpa and Catacamas were presented with full year data and others with partial data. According to the data, the traffic intensity of Juticalpa and Catacamas was mostly flat through the year except November and December, though an apposite tendency was recognized on PRI-II and TON in November and December. The monthly fluctuations of Juticalpa and Catacamas are shown in Figure 5.2.3-1. Total offered traffic in the year 1990 is shown in Table 5.2.3-2.

Figure 5.2.3-1 Total Offered Traffic of Juticalpa and Catacamas (1990)

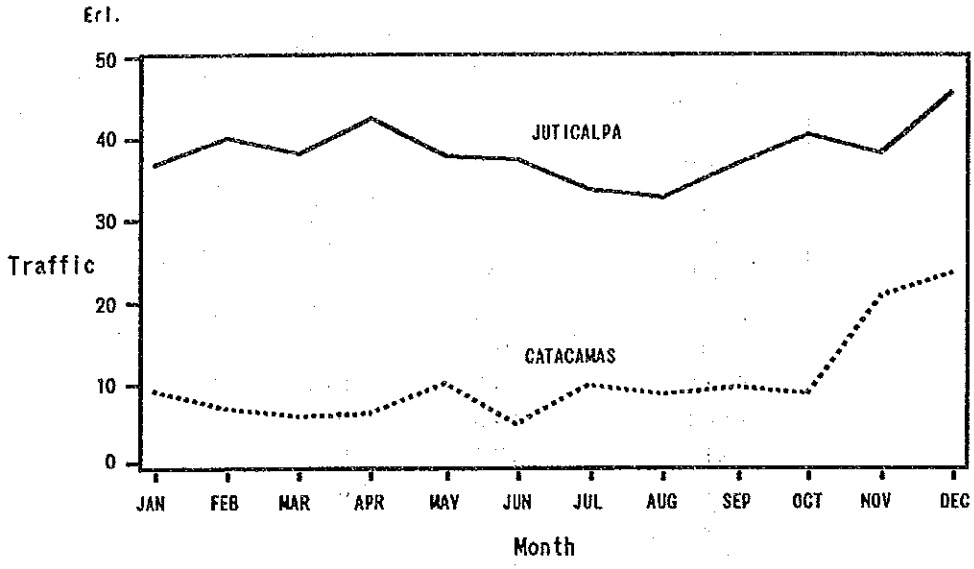


Table 5.2.3-2 Total Offered Traffic (1990)

(Unit: erlang)

	PRI-II	MIR	TON	JUT	CAT	COM	SIG	CHO	DAN
Jan.	*	**	**	36.89	9.32	**	**	**	**
Feb.	*	915.25	728.56	39.95	7.08	**	35.38	**	**
Mar.	*	900.35	698.45	38.09	6.06	**	30.15	**	**
Apr.	*	898.98	712.34	42.45	6.61	84.35	27.05	88.75	30.45
May	2,179.89	905.11	710.22	37.70	10.20	93.22	28.90	89.65	32.00
Jun.	2,204.24	897.25	732.54	37.45	4.99	94.27	37.24	90.20	30.90
Jul.	2,261.81	1,127.45	704.12	33.40	9.90	88.90	41.51	87.30	41.90
Aug.	2,371.82	1,129.00	703.29	32.70	8.70	83.03	39.65	90.40	30.45
Sep.	2,412.42	1,167.28	476.05	37.00	9.70	89.13	44.90	88.50	39.10
Oct.	2,448.11	1,253.64	541.15	40.43	8.90	68.15	50.80	95.92	38.10
Nov.	2,556.84	1,247.30	713.30	38.20	20.84	74.84	59.61	99.79	42.14
Dec.	1,224.51	1,311.04	576.65	45.85	24.00	65.00	53.26	107.12	40.79

Note:

PRI-II * : Lack of information. Dec.: Date not indicated.
MIR ** : Measuring error. Jul to Nov: Lack of measurement of INT-D.
COM ** : Not measured.
SIG ** : Not measured.
CHO ** : Not measured.
DAN ** : Not measured.

Source: Presented by HONDUTEL for this Study.

5.3 Traffic Estimation Factors

5.3.1 Calling rate

The average origination calling rate of studied rural public telephones was 0.049 erl. per line. For the termination calling rate, 10% of the origination calling rate was applied using the value of exchange model of GAS 6 of CCITT as useful data were not available. This total came up to 0.0539 erl.

The calling rate goes up in general with conversion from the manual service to automatic service, as the service quality is improved. At the same time, the traffic may increase by the ability to use the telephone line in place of the old telegraph device. The obtained calling rate was to be revised based on this prospect. However, reliable data for this point could not be obtained. Then it was modified to 0.10 erl. as the total, or double the obtained value by referring to CCITT GAS 6.

The calling rate of subscriber telephones was determined with reference to the data of urban network subscribers, reference values shown in CCITT GAS 6, and the method of using the telephone in the future. It was fixed to a total of 0.05 erl. including the origination and termination traffic.

The calling rate ranged from 0.02 to 0.07 erl. in the urban network in the year 1991 as shown in Table 5.2.3-1, excluding the three exchanges of PRI-II, MIR, and TON, which are located in the capital. The average without those three exchanges was about 0.05 erl. Those three exchanges were excluded from the average calculation as they were located in a place for ahead of the others in commercial activity and not adequate as models for rural traffic calculation. The reference value of a residential telephone is 0.04 erl. per line and the exchange average including other telephone types is 0.06 erl. per line approximately in the case of very small exchange in CCITT GAS 6.

As for using the telephone lines for data communication and/or facsimile communication, the influence is considered negligible because the diffusion of such services is still very low even in the urban areas.

In conclusion the calling rate was fixed at 0.10 erl. per line for the public telephone lines and 0.05 erl. per line for subscriber lines.

5.3.2 Percentages of traffic categories

1) Calls directed to the same community area

For the traffic terminating in its own community area, no data were available. Therefore, using the case of the smallest exchange of the exchange model of CCITT GAS 6, 25% of the total origination traffic was applied to the traffic terminating in its own community area.

2) Others

Percentages of traffic categories, other than that terminating in its own community area, was decided in accordance with the analysis results of telegram dispersion and traffic of rural public telephones connected to the Tegucigalpa manual board. The former was used to decide the call dispersion of Departments other than Francisco Morazán and the latter for Francisco Morazán.

For the Departments other than Francisco Morazán, the traffic going to its Department capital, to other communities in the same Department, and going out of the Department were determined, by applying the average value shown in Figure 5.2.2-1, to be 6%, 13%, and 81%, respectively, of outgoing traffic, as the 25% of the total origination traffic is consumed as that terminating in the own community. For the Francisco Morazán Department, they were determined, applying the value shown in Figure 5.2.1-3, to be 89%, 3%, and 8%, respectively, of outgoing traffic.

5.3.3 Holding time

HONDUTEL's measured average holding time is as follows. Those values should be referred to in making a system design.

- Local call: 180 seconds
- Toll call: 264 seconds
- International call: 306 seconds

CHAPTER 6 BASIC TELEPHONE NETWORK PLAN

CHAPTER 6 BASIC TELECOMMUNICATIONS NETWORK PLAN

6.1 General

The new national telecommunications network will be developed as one which incorporates the rural telecommunications network in it. The main part of the existing telecommunications network should not be changed but should incorporate the rural telecommunications network to provide telephone service in rural areas of the national telecommunications network. In other words, the rural telecommunications network will be added to the national telecommunications network as parts to develop the latter, being structured compatible technically with the existing national telecommunications network.

6.2 Structure of National Telecommunications Network

The existing national telecommunications network places the national center, or the international switch at the top of the network hierarchy. Secondary centers, primary centers, and local exchanges are placed under the national center to form a pyramid shape. All of the exchanges are classified according to this hierarchy. Figure 6.2-1 shows the basic structure of the national telecommunications network and Figure 6.2-2 shows the corresponding position of each exchange in the hierarchy of the existing national telecommunications network.

Figure 6.2-1 National Telecommunications Network Structure

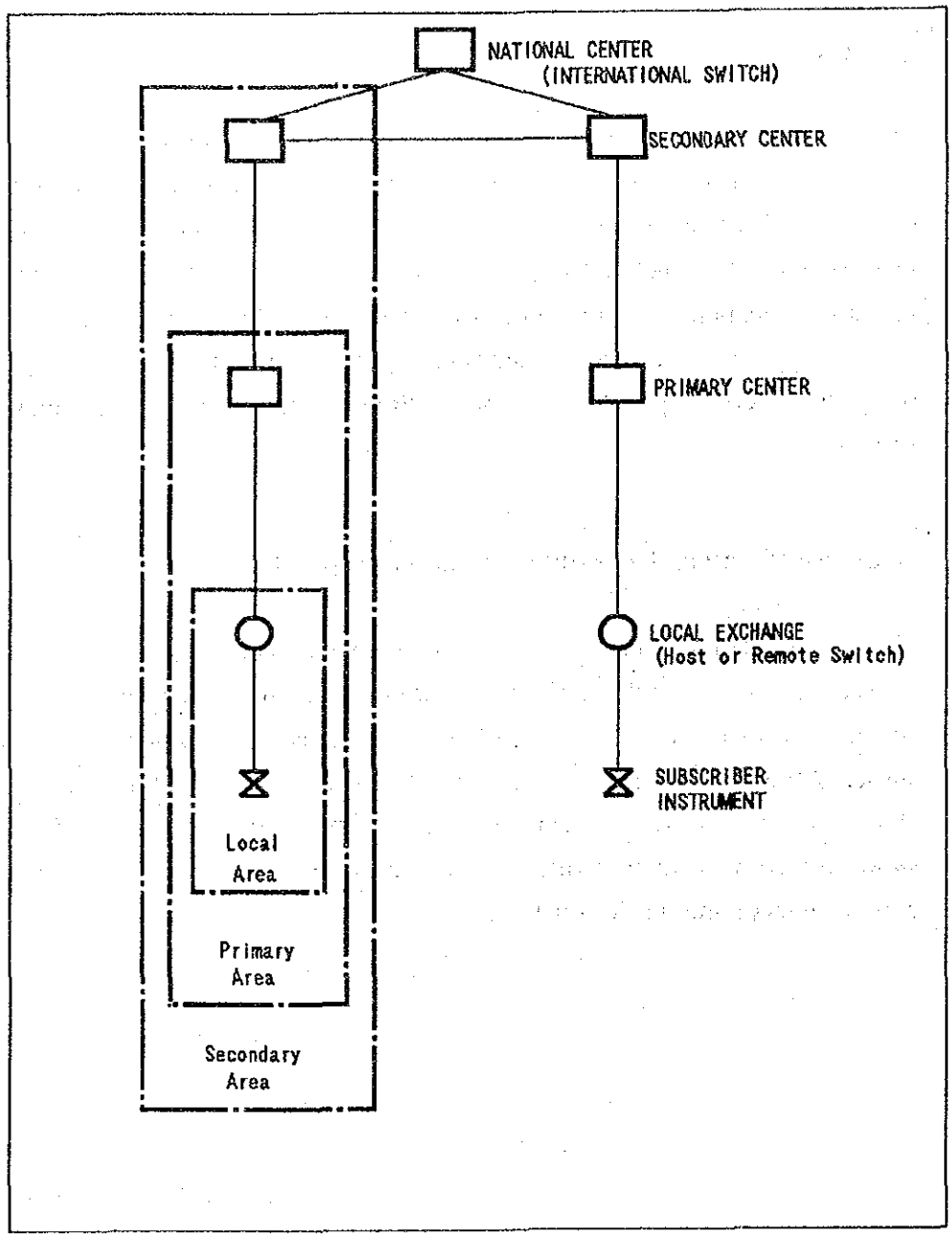
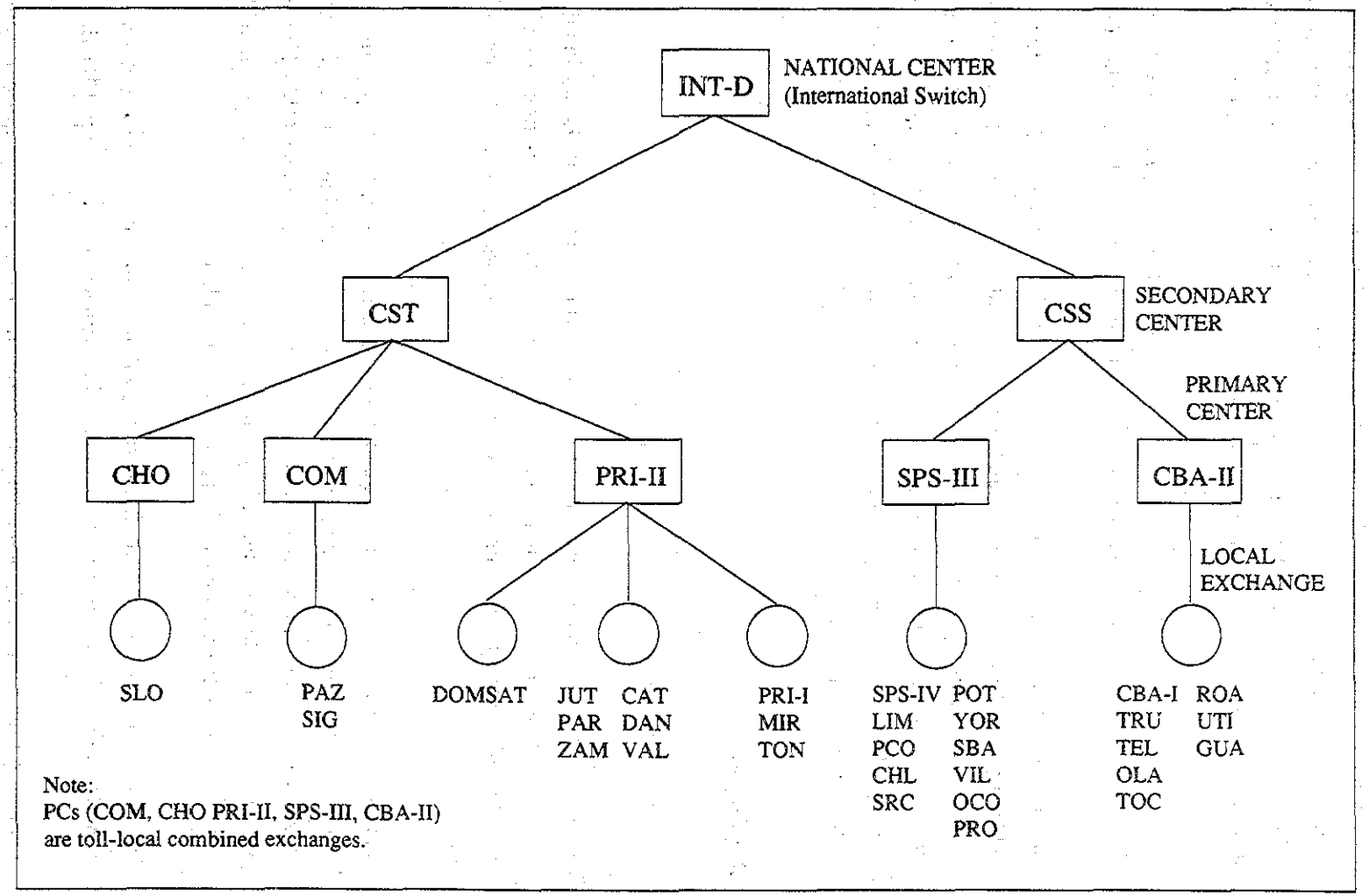


Figure 6.2-2 Exchange Hierarchy



The international switch is placed in the national capital Tegucigalpa. The secondary centers are located in two cities; Tegucigalpa and San Pedro Sula. The service area of the secondary center is called the secondary area. The primary centers are located in Tegucigalpa, San Pedro Sula, La Ceiba, Comayagua, and Choluteca. The service area of the primary center is called the primary area. The local exchanges are located in major cities in the country. Local exchange service area is called the local area.

The existing primary centers are all toll-local combined exchanges, using the same hardware. It is split into two parts: the local function part and the toll function part.

The new national telecommunications network will be integrated in a form which incorporates the rural telecommunications network with the existing telecommunications network. Accordingly, the existing telecommunications network will be made larger and remain substantially unchanged. Rural subscribers will be connected to a local exchange directly or incorporated into the new national telecommunications network via exchanges in urban areas.

6.3 Routing Plan

6.3.1 Existing routing plan

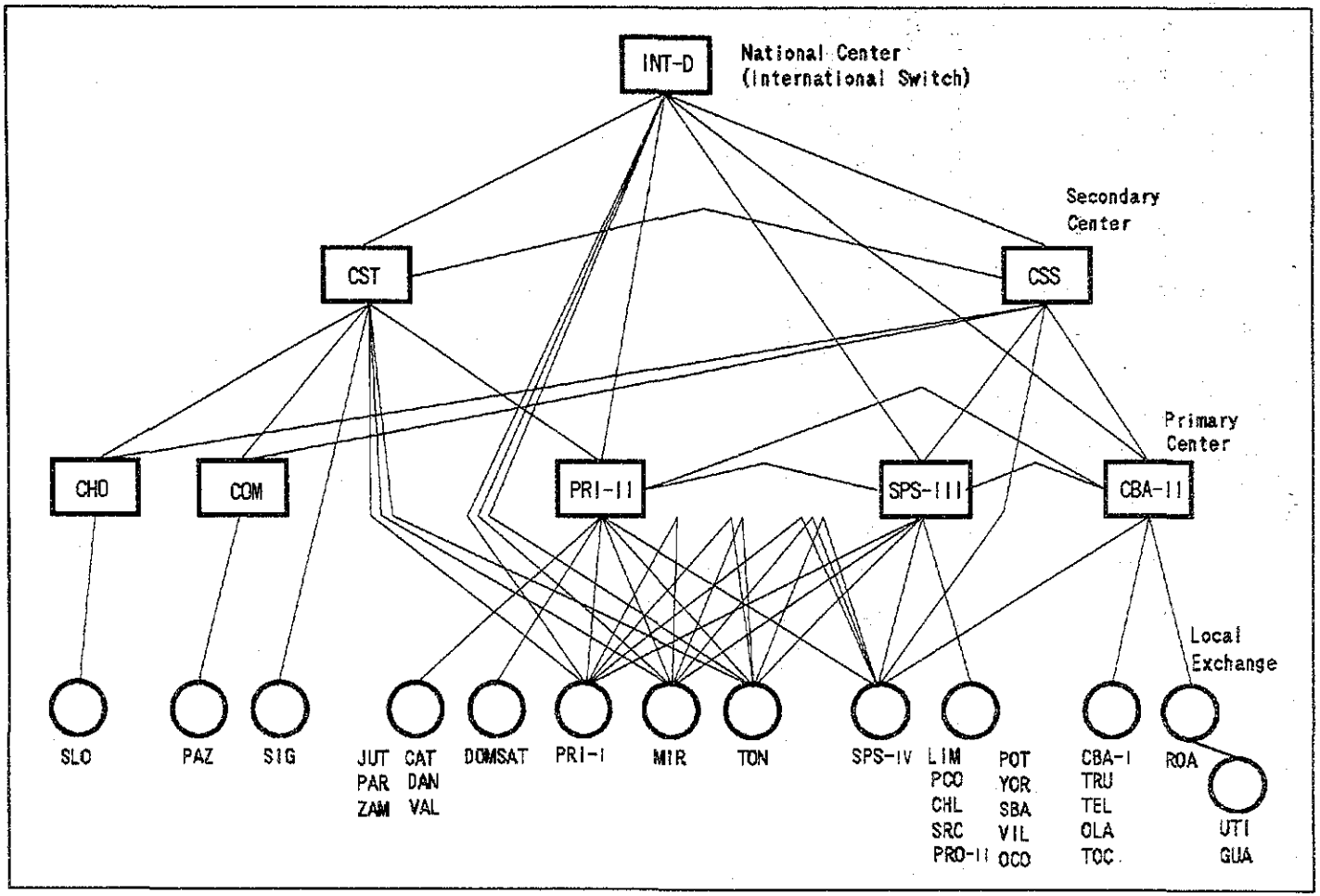
Honduran switching stages are structured into hierarchy levels of the national center, secondary center, primary center, and local exchange. All the exchanges are classified into one of these levels and connected to the other exchange by means of inter-exchange circuits.

Usually, the local exchange is connected to the primary center of its primary area. However, there are some exceptions in the existing routing plan. The local exchange Siguatepeque is not connected to the primary center of Comayagua COM of its primary area but to the secondary center of Tegucigalpa CST. The local exchanges in Tegucigalpa and San Pedro Sula have direct circuits each other.

The CST has inter-exchange circuits leading to all the primary centers except SPS-III and CBA-II, while CSS has these circuits to all the primary centers except PRI-II.

This routing plan is established taking into consideration the geographical conditions, traffic volume, and/or switching system functions. The existing routing plan is shown in Figure 6.3.1-1.

Figure 6.3.1-1 Existing Routing Plan



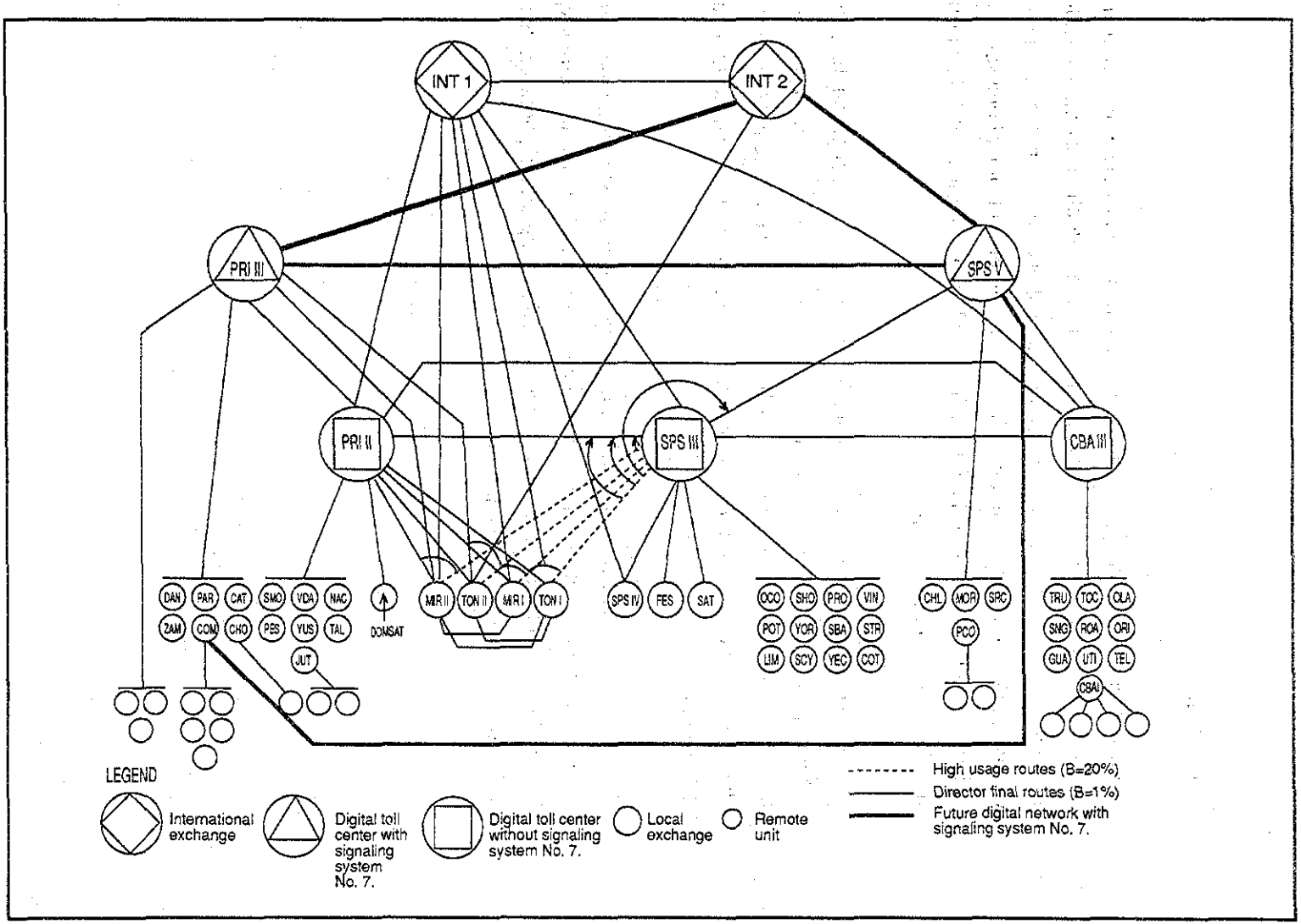
Presented by HONDUTEL

6.3.2 Future routing plan

HONDUTEL has an expansion plan for 1992-1996 which aims to introduce digital local exchanges (LE) and transit exchanges to make a modern national telecommunications network. In keeping with the digital exchange introduction, No. 7 Common Channel Signaling System will be introduced for linking the digital exchanges. Accordingly, the conventional analog network will coexist with the new digital network by means of the No. 7 Common Channel Signaling System. Figure 6.3.2-1 shows the national routing plan for the year 1996 that HONDUTEL has drawn up, in this context.

All the subject rural communities will be incorporated into the national telecommunications network and links will be established in addition to those illustrated in the figure. The links will be established between PC and exchanges to be introduced in rural areas. The subscribers in the rural areas not connected to the rural exchange will be connected directly to an LE in the urban telecommunications network by metallic pair cables or through a subscriber line extension system. The routing plan for the part to link the rural exchanges is presented in Chapter 7.

Figure 6.3.2-1 Routing Plan for the Year 1996



Presented by HONDUTEL

6.4 Exchange Location Plan

6.4.1 Local exchange

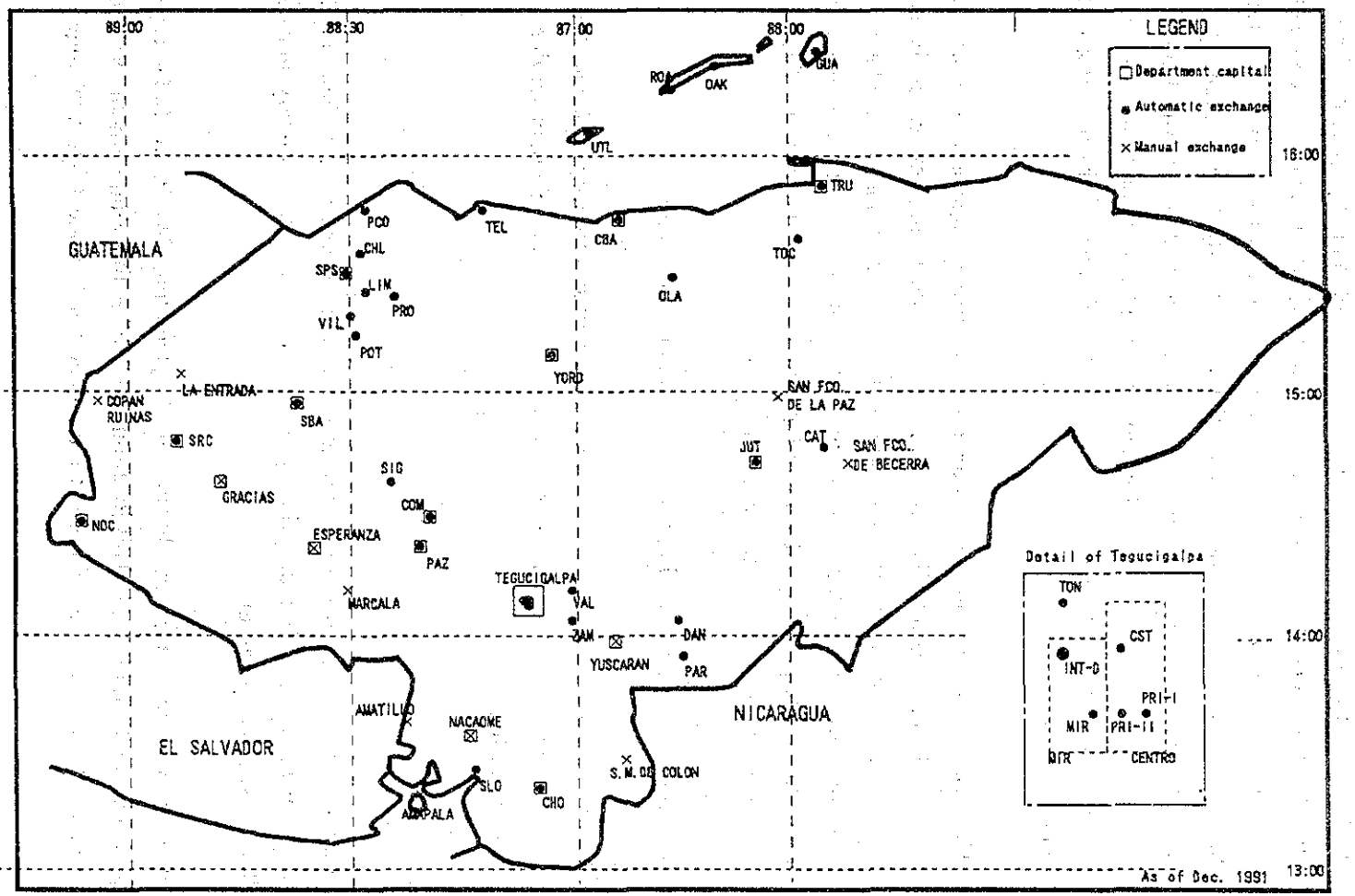
1) Service area

A local telephone exchange should be located in an area where a certain quantity of telephone traffic is found or foreseen. Otherwise, the telephone exchange should not be located and telephone users in such an area should be connected to the nearest exchange by a rural telecommunications system to provide telephone service. The existing location plan of exchanges, which is shown in Figure 6.4.1-1, was used in this Plan without modification.

The service area or subscriber lines of a local telephone exchange can be extended, from a technical point of view, to a distance of about 14 Km by means of ordinary metallic pair cables. Therefore, existing local telephone exchange service area should be extended up to this limit when connecting rural area subscribers around the exchange.

Rural area subscribers in an area without a telephone exchange should be connected to the nearest telephone exchange by means of a rural telecommunications system. In this case, the subscribers should be connected to a digital telephone exchange, in order to avoid problems in charging.

Figure 6.4.1-1 Exchange Location



2) Application criteria of a local telephone exchange

The local exchange is the hierarchical level in the telephone network. The local exchange hardware is a system of telephone switching equipment. Some of the switching systems are equipped with a function to perform switching completely by itself, while others are with partial function. When the two types of systems are used together to integrate a unified system, the former is called a host exchange and the latter is called the remote unit. The remote unit is placed away from the host exchange and the switching performance is controlled by the host exchange. Both the host exchange and the remote unit are realized generally by the same manufacturer.

The local exchange is provided by the full function exchange or the remote unit. The local exchange is primarily a full function exchange. In some cases the network consists of a host exchange and remote units. In this case, the host exchange should be located in a city with higher traffic than others in the area. The remote units should be located in areas with low traffic volume around the host exchange. These remote units lead the local traffic to the host exchange.

3) Telephone exchanges in the rural telecommunications network

The exchanges should be located in adequate places in accordance with demand forecast and taking into consideration the economical provision of service. This is stated in Chapter 7.

6.4.2 Toll exchange

The toll exchange is used to deal with toll and international traffic. The one for the primary area traffic is called the primary center and that for the secondary area traffic is called the secondary center.

The primary centers are now located in Tegucigalpa, San Pedro Sula, La Ceiba, Choluteca, and Comayagua. This location was used in this Plan without modification. The PCs in Comayagua and Choluteca are analog and connect one exchange respectively.

Toll connection boards are used to attend to the toll call connection of subscribers and to accept requests for toll call from public telephones. These boards are now located at

the primary centers. Telephone number information boards are located at secondary centers and the service traffic converges to those boards. The location plan of the toll board and the information board was used in this Plan without modification.

6.5 Numbering Plan

6.5.1 Principles

Telephone exchange codes or the toll codes were assigned in accordance with the following principles.

- Exchange codes are assigned, in succession to the existing numbering plan, not to bring about substantial change in the existing assignment of the codes.

- In principle, exchange codes are assigned in a pyramid-shaped structure, i.e., the first digit represents the zone in the numbering plan, the second represents the Department, and the third represents the Municipality. If necessary, the fourth digit also represents the Municipality.

- Codes and numbers are assigned to the Municipality or a group of Municipalities as a unit of area for charging.

6.5.2 Existing numbering plan

1) Number structure

The national telephone number consists of six digits. The prefix code for an international call is "00", while the discrimination code for a toll call is not used in the existing network. Accordingly, all local and toll calls are connected using 6-digit dialing.

The national telephone number is structured as shown below.

Case - 1: exchange with an installed capacity of 1,000 terminals or more.

+504 - A B - C D E F; or

Case - 2: exchange with an installed capacity of less than 1,000 terminals.

+504 - A B C - D E F.

Where,	+504:	Country code;
	AB and ABC:	Exchange code;
	CDEF and DEF:	Subscriber number.

2) Numbering capacity

The numbering capacity for subscribers with the existing numbering plan is 800,000 terminals. This is calculated below.

The existing telephone number consists of six digits or a combination of six digits. The combination of the six digits is made out of the range 000000 to 999999. Of these, those which start with the first digit "0" are assigned to international calls and "1" are assigned to special code services. Consequently, the range from 200000 to 999999 can be assigned to ordinary telephone numbers. In other words, 800,000 combinations are available for the telephone numbers.

3) Code assignment

Combinations starting with "0" are assigned for international calls and those with "1" are assigned for special code services as stated above. Accordingly, combinations starting with "2" to "9" are assigned for exchanges. Of these, "90" is assigned for cellular service and "98" for the DOMSAT network. The existing assignment of special service codes is shown in Table 6.5.2-1. Zone code assignment is shown in Figure 6.5.2-1. The exchange codes or toll codes are shown in Table 6.5.2-3.

Table 6.5.2-1 Special Service Codes (Present)

SERVICE	CODE
International operator (AT&T)	123
Conference	151
Call transfer (registration)	153
Call transfer (cancellation)	155
Busy holding (registration)	157
Busy holding (cancellation)	159
Subscriber line automatic test	187
Long distance operator assistance	191
National information	192
Official circuit information	193
Fault complaint	194
Correct time and weather	196
International operator assistance	197
Fire	198
Police	199

Table 6.5.2-2 Special Service Codes (Future)

SERVICE	CODE
Long distance operator (Tegucigalpa)	101
Long distance operator (San Pedro Sula)	102
International operator assistance (Analog)	103
International operator assistance (Analog)	104
Conference	151
Call transfer (registration)	153
Call transfer (cancellation)	155
Fault complaint	164
Bill complaint	165
Telegraph	174
Correct time and weather	176
Test desk	184
Maintenance center (exchange)	185
Line test equipment	187
Maintenance center (transmission)	188
Red Cross	190
Hospital	192
Social security	193
SANAA (water)	194
ENEE (electricity)	195
DNI (investigation)	196
Emergency	197
Fire	198
Police	199

Source: Information presented by HONDUTEL.

Figure 6.5.2-1 Zone Code Assignment

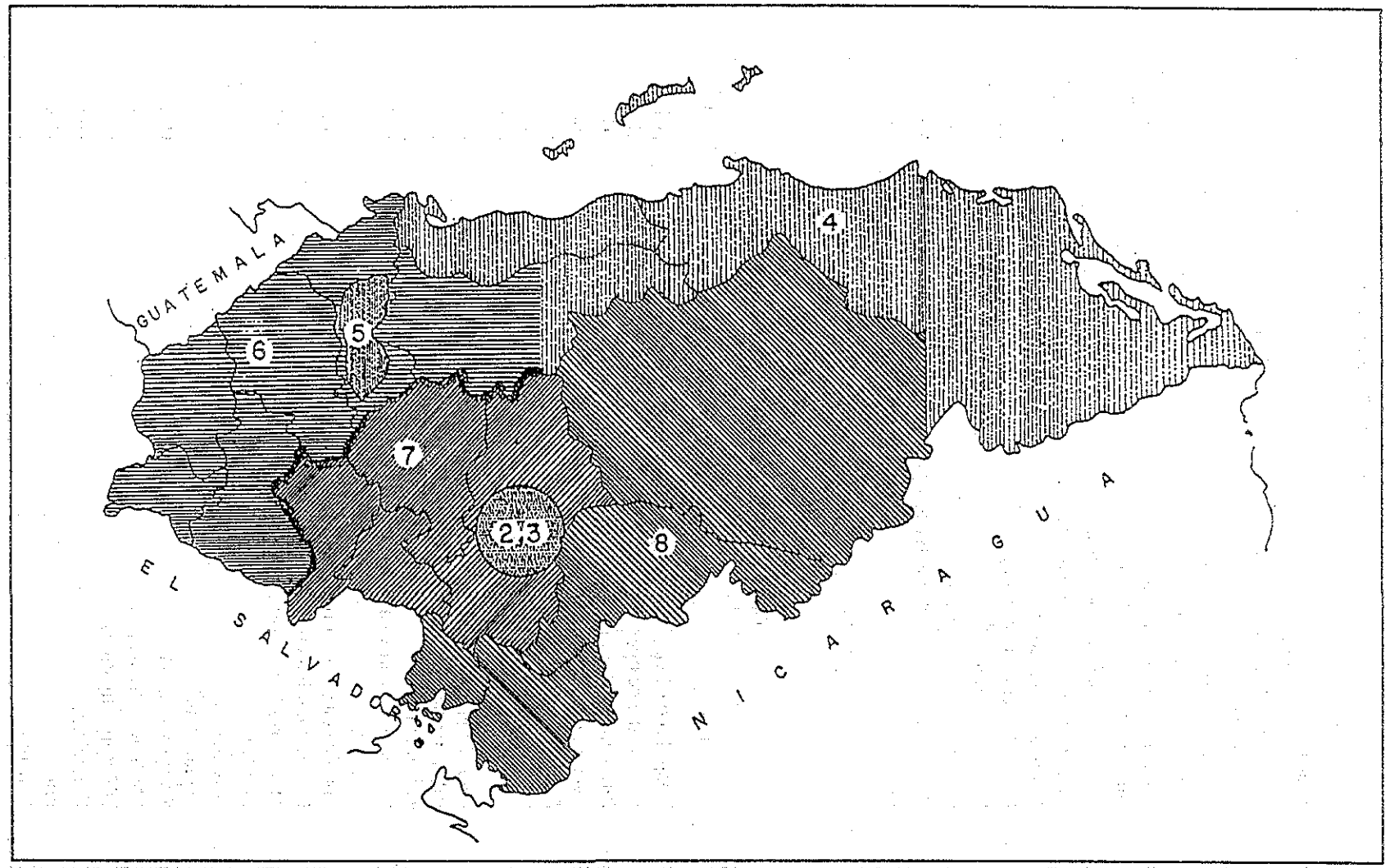


Table 6.5.2-3 Exchange Codes

As of December 1991

Zone	Prefix	Code	Exchange
		INT-D	International (digital)
		CST	CENTRO SECUNDARIO TEG
		CSS	CENTRO SECUNDARIO SPS
3	22	PRI-I	PRINCIPAL I
3	31-32	MIR	MIRAFLORES
3	33-34	TON	TONCONTIN
3	37-38	PRI-II	PRINCIPAL II
4	42	CBA-I	CEIBA I
4	43	CBA-II	CEIBA II
4	443	TOC	TOCOA
4	444	TRU	TRUJILLO
4	446	OLA	OLANCHITO
4	45	ROA	ROATAN
4	452	OAK	OAK RIDGE
4	453	UTI	UTILA
4	454	GUA	GUANAJA
4	482	TEL	TELA
5	52-53-54	SPS-III	SAN PEDRO SULA III
5	55	PCO	PUERTO CORTES
5	562	LIM	LA LIMA
5	563	CHL	CHOLOMA
5	57-58	SPS-IV	SAN PEDRO SULA IV
6	620	SRC	SANTA ROSA DE COPAN
6	63*	OCO	NUEVA OCOTEPEQUE
6	6338*	AGU	AGUA CALIENTE
6	6339*	SMO	SAN MARCOS OCOTEPEQUE
6	642	SBA	SANTA BARBARA
6	66	PRO	PROGRESO II
6	672	YOR	YORO
6	674*	VIL	VILLANUEVA
6	678*	POT	POTRERILLOS
7	72	COM	COMAYAGUA
7	732	SIG	SIGUATEPEQUE
7	742	PAZ	LA PAZ
7	762*	VAL	VALLE DE ANGELES
7	766	ZAM	EL ZAMORANO
8	812	SLO	SAN LORENZO
8	82	CHO	CHOLUTECA
9	932	DAN	DANLI
9	934	PAR	EL PARAISO
9	952	JUT	JUTICALPA
9	954	CAT	CATACAMAS

* Exchanges in the project stage.
Source: Presented by HONDUTEL.

Exchanges are given a certain range of numbering taking into consideration future demand so that a change of telephone numbers is avoided for as long as possible. The existing numbering range of major cities are as follows, the whole of this Plan is shown in the Appendix.

Numbering range of major cities:

Municipio del Distrito Central	98,000
San Pedro Sula	50,000
La Ceiba	20,000
El Progreso	10,000
Puerto Cortés	10,000
Choluteca	10,000
Choloma	10,000
Comayagua	10,000

6.5.3 New numbering plan

1) Number structure

The existing number structure was kept in this Plan without modification, since the rural network is minor in the national network. Hence the telephone number in the rural network was assigned in the same way as the existing subscribers in the urban network, using six-digit numbering.

2) Estimated numbering capacity

Future capacity in the year 2002 for the existing urban network will be around 452,000 terminals provided that the network is required to meet a telephone penetration density of up to 20 main lines per 100 inhabitants. Here the population is estimated to be 2,259,952 in those cities, in accordance with average growth rate obtained from the national census over the period 1974 to 1988. The DOMSAT network expects that the future capacity in the year 2002 will be around 15,000. This is based on the assumption that the numbering range will be expanded to three times the existing installed capacity. An estimation was made based on the above-mentioned conditions, and to preserve harmony with the numbering range in use now. This came up to 474,000 in the year 2002, as shown in Table 6.5.3-1.

The numbering capacity for the rural telecommunications network was estimated by multiplying the number of subject rural community areas, or 223 areas, by the assumed range of numbering provided that the telephone number is assigned in the same way as in the urban network. Each of the municipalities of subject rural areas was assigned a numbering range suitable for each of them. The average size for the numbering range of each community was assumed to be 300 for the calculation, or about six (6) times the demand average of 223 subject communities. The numbering range necessary in the year 2002 was calculated as follows:

$223 \times 300 = 66{,}900$. This was rounded up to 67,000.

Table 6.5.3-1 New Telephone Numbering Range

Exchanges	Installed capacity	Lines in service	Population in 2002 (Estimated)	Numbering (Now)	Range (Object Year)
URBAN NETWORK					
Catacamas	1,000	531	28,303	2,000	6,000
M.D.C.	54,000	46,604	908,500	98,000	180,000
Choloma	1,000	511	61,528	10,000	10,000
Choluteca	3,000	2,265	85,832	10,000	18,000
Comayagua	1,400	1,387	58,648	10,000	10,000
Danlí	1,000	979	45,727	4,000	10,000
El Paraíso	300	284	20,590	300	5,000
El Progreso	4,000	2,197	94,618	10,000	19,000
Guanaja	230	191	3,193	1,000	1,000
Juticalpa	1,000	897	30,913	10,000	10,000
La Ceiba	3,712	3,677	108,334	20,000	25,000
La Lima	1,000	985	45,220	6,000	10,000
La Paz	300	297	17,705	1,000	4,000
Nueva Ocotepeque	358	320	10,995	1,000	1,000
Oak Ridge	230	142	4,802	1,000	1,000
Olanchito	1,000	459	22,007	1,000	5,000
Puerto Cortés	2,500	2,071	49,762	10,000	10,000
Roatán	610	535	6,146	1,000	2,000
San Lorenzo	300	288	22,384	1,000	4,000
San Pedro Sula	27,000	22,278	452,705	50,000	90,000
Santa Bárbara	1,000	417	16,547	1,000	4,000
Santa Rosa de Copán	1,000	944	31,005	2,000	7,000
Siguatepeque	1,000	990	42,999	3,000	8,000
Tela	1,000	865	36,713	1,000	8,000
Tocoa	1,000	322	22,181	1,000	4,000
Trujillo	1,000	331	9,111	1,000	2,000
Utila	230	126	1,987	1,000	1,000
Valle de Angeles	300	300	4,188	1,000	1,000
Yoro	600	323	14,834	1,000	2,000
Zamorano	150	150	2,475	200	1,000
(URBAN NETWORK TOTAL)	111,220	91,666	2,259,952	259,500	459,000
(DOMSAT NETWORK TOTAL)	4,708			7,400	15,000
TOTAL	115,928			266,900	474,000

In conclusion, the numbering range necessary for the existing urban telecommunications network, DOMSAT network, and the rural telecommunications network was estimated to be 541,000 terminals in the year 2002. This quantity is 68% of the capacity of the existing numbering plan.

3) Assignment of exchange codes and numbering range

Assignment of exchange codes and numbering range was performed in conformity with the principles stated in Section 6.5.1. It was determined as follows:—

Care was taken in order to assign subject community areas the codes in a proper order for easier administration and more flexible network expansion in the future. Preserving harmony with the existing plan, the geographical location of the exchange or community, and the abundance of free range in the area were taken into consideration in forming a new assignment of exchange codes and numbering range.

In addition to these points, an effort was made to assign adjacent codes to municipalities near each other in as many cases as possible, so that the codes were not distributed irregularly. In principle, a policy was applied to assign a range of 1,000 terminals to one municipality. However, in many areas, a numbering range of 1,000 terminals was shared by two to three municipalities. With this type of number assignment, 4-digit translation is required to discern the areas to which the calling and the called party belong. A new plan of exchange code (or toll code) assignment and number-ing range is shown in the Appendix.

4) Measures for 7-digit telephone numbering

Measures for transferring the existing 6-digit telephone numbering system to a 7-digit system should be taken into consideration in case the growth of the telephone demand in the urban network accelerates in the future. The estimated demand for the telephone numbering range in the year 2002 is in the capacity of the existing numbering plan. It should be noted that free range of numbering is not abundant in Santa Bárbara area and Ocotepeque area.

The recommendable method to expand the 6-digit numbering to 7-digit numbering inserts one digit between the second and the third digit of the telephone number now in use, though some other methods can be presented. It will be realized in the following way.

Now (6-digit numbering)	43-3546
New (7-digit numbering)	43x-3546

where, x is one of 0, 1, ..., 9.