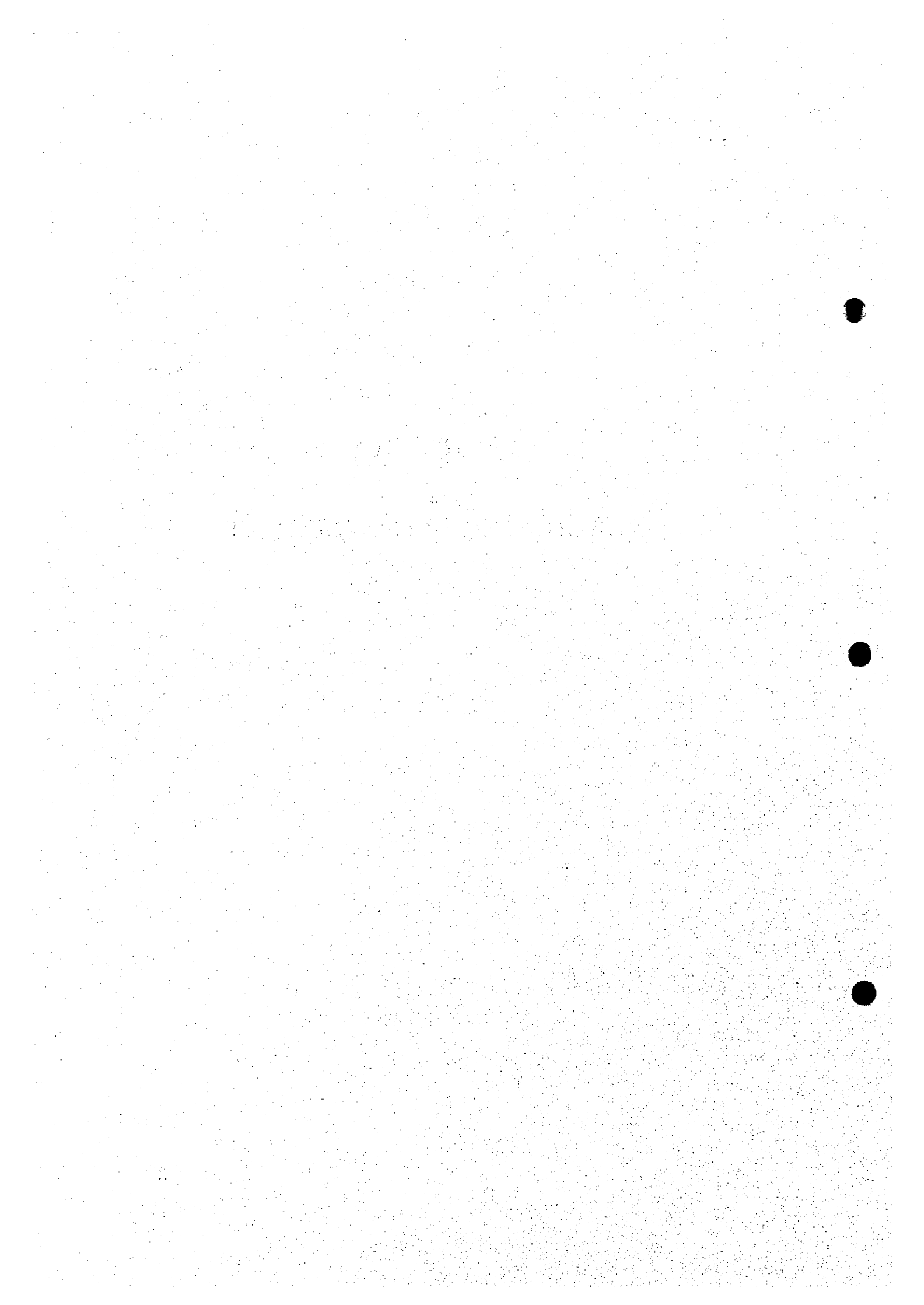


CHAPTER 5

NUMBERING MANAGEMENT



CHAPTER 5 NUMBERING MANAGEMENT

VNPT will be no more monopoly for the telecommunication services in Vietnam. DGPT planned to open up telecommunication market to outside companies. First step in ending the monopoly in telecommunication service was taken back in 1996, granting of licenses for the operation of two joint stock companies. VIETEL and SAIGON POSTEL got the license in 1996 for various telecommunication services including fixed telephone service. Since receiving its 1996 license, they have been developing infrastructure project for its WLL and mobile network. And right now, more than two companies are competing each other for cellular service in nationwide. Under these competitive environment, independent regulatory authority for numbering administration should be established somewhere in DGPT.

5.1 Numbering Administration Under Competitive Environment

5.1.1 Transition of Numbering Administration from VNPT to DGPT

(1) **Smooth Transition of Numbering Administration from the State-owned Carrier (VNPT) to the Independent Regulatory Authority (DGPT)**

In order to identify the function of numbering administration to be maintained by the authority before its establishment and to prepare for its full functioning from the start, it is necessary that the present numbering administration by the state-owned carrier is fully grasped by the body which is to become the secretariat of the independent regulatory authority.

In case that necessary cooperation by the state-owned carrier is not assured, responsibility for smooth transition should be made apparent for the body and the state-owned carrier, respectively. That is to say, authority of investigation should be given to the body and on the other hand obligation to present information concerning numbering administration shall be imposed on the state-owned carrier.

(2) **Administration of Numbering Plan by the State-owned Carrier (VNPT) for the Period until the Establishment of the Independent Regulatory Authority in DGPT**

The administration of numbering plan by the state-owned carrier for the period until the establishment of the independent regulatory authority shall be based on the notion of fairness under the multi-carrier environment. In addition it is desirable that the outcome of the numbering plan shall be examined by the neutral body.

(3) **Establishment of Administration System for Numbering in the Independent Regulatory Authority in DGPT**

For the establishment of appropriate numbering administration system in the independent regulatory authority under the multi-carrier environment, it is desirable to take the following factors into consideration.

- codification of regulation (Ex. Japan)
 - definition of telecommunication numbers
 - principle for the use of telecommunication numbers
 - numbering plan
 - designation procedure of numbers to carriers
- establishment of the study group
 - study of domestic numbering plan
 - contribution to the study in international arena
- improvement of competence for numbering administration in the secretariat

5.1.2 Guideline of Numbering Plan on Telecommunications Networks and Services

On November 12, 1997 the Government promulgated Decree No. 109/1997/ND-CP. The DGPT guides the implementation of the provisions on telecommunications networks and services in Circular No.04/1998/TT-TCBD. In this Circular, the DGPT recognizes and manages the Numbering as follows;

- (1) The national numbering plan embraces the plans for numbering various types of networks and services such as the public-services telephone network (PSTN), multi service data networks (MSDN), public-service data network (PSDN), telex network, exclusive telecommunications networks, ground mobile networks (PLMN) and mobile satellite system (MSS).
- (2) The GDPT promulgates and manages the numbering plan according to the following principles:
 - Ensuring the development of subscription and services according to the long-term development strategy;
 - Ensuring that each subscriber has a dialing number of his/her/its own, that may conveniently dial directly to any other subscribers to national and international telecommunications networks;
 - Ensuring the optimum use of telecommunications networks and equipment;
 - Abiding by the ITU-T's recommendations on numbering;

- Ensuring the optimum and economical distribution and use of numbers stores;
 - Ensuring the equality in interests between telecommunications service-providing enterprises and service users.
- (3) Basing itself on the national numbering plan, the DGPT shall decide the distribution of numbers stores to telecommunications services-providing enterprises.
- (4) The telecommunications services-providing enterprises shall have to:
- Participate in the elaboration of the national numbering plan;
 - Carry out procedures applying for codes and numbers according to the regulations of the DGPT;
 - Draw up plans for the use of area codes and numbers allocated by the DGPT according to the national numbering plan;
 - Report on the plans and situations on the use of codes and numbers to the DGPT periodically once every six months and extraordinarily when requested.
- (5) The management, allocation, and use of codes and numbers of public telephone networks shall comply with the "plan for numbering the public telephone networks of Vietnam" promulgated together with Decision No.585/QD-CSBD of the DGPT on May 11, 1995.
- (6) The DGPT shall manage and decide the allocation of initial numbers of domestic and international calls, area codes, network codes, service codes, signal location codes, the length and number range of subscription numbers. The services-providing enterprises shall elaborate plans and designate the subscription numbers in the allocated number range.
- (7) The number range of the public telecommunications networks must not be used for reallocation to exclusive telecommunications networks or private branch exchanges (PBX).

5.1.3 Policy and Regulations on Telecommunication Numbers in Japan

In 1985, Japan introduced competition into all areas of telecommunications market and privatized the Nippon Telegraph and Telephone Public Corporation (NTT) at the outlet of the reform titled "First Info-communications Reform". This led to about 5,000 new

entrants entering the market, resulting in the diversification of services and reduction of price through vigorous competition.

The bill of telecommunications business law came into force in April, 1985. In the notification based on the ordinance, the numbers used for connection between carriers were specified in order that users can easily use them. Based on the telecommunications business law, regulations on telecommunication numbers were enforced in November 1997. Followings were main points of regulations concerning the telecommunication numbers.

(1) Telecommunication Business Law

(The Condition of Telecommunication Number)

Article 48-2.

- (1) Telecommunication carriers must assure that the telecommunication number (A telecommunication number shall be the number, sign or other mark which a telecommunication carrier, in its delivery of telecommunication services, uses for the identification of telecommunication facilities in order to connect between the place of transmission and the place of reception, or for the identification of the type of content of transmission the telecommunication facility is to deliver.) shall conform to the conditions specified by appliance ordinances of the Ministry of Posts and Telecommunications.
- (2) The conditions provided by the preceding paragraph shall include specifications by which following items will be secured.
- i) By using the telecommunication number, telecommunications carrier and the user shall clearly and easily identify telecommunication facility or the type of contents of the telecommunication service.
 - ii) To firmly secure the necessary telecommunication number which is needed for the supply of telecommunication service.
 - iii) To avoid as much as possible the change of telecommunication number.
 - iv) To ensure fair and efficient use of telecommunication number.

(Compliance Order)

Article 48-3.

When the telecommunication number that telecommunication carrier uses in making connection of telecommunication facilities with other telecommunication carriers, is deemed not to comply with applicable conditions specified in the ministerial ordinance of the Ministry of Post and Telecommunications provided by

first paragraph of preceding article, (except the case of a General Type II telecommunications carrier with interconnection of telecommunications facilities with other General Type II telecommunications carriers), the Minister of Posts and Telecommunications may order a change in the telecommunication numbers to meet with relative conditions or may prohibit its usage.

(2) Regulations on Telecommunication Numbers

[Chapter 1, General Provisions]

- ① Purpose of the regulations (Article 1)
- ② Definition of the terminology used in the regulations (Article 2)
- ③ Obligation of the telecommunications carriers to comply (Article 3)
Telecommunication numbers for the networks of Type I ^(Note 1)
- ④ Conditions of Number to which telecommunications carriers shall conform (Article 4)
 - Numbers shall only be used for offering telecommunications service.
 - Numbers shall identification of telecommunication facilities or the type or content of the telecommunication service offered.
 - Numbers shall be used efficiently.
 - Fair assignment of numbers to users shall be guaranteed.
 - Numbers designated by MPT shall be utilized in accordance with the procedures as provided in Chapter 3.

[Chapter 2, Telecommunication Numbering Plan]

- (1) Numbers for general public telecommunications networks (Article 5 to 11).
 - ① Numbers for the networks of Type I
 - ② Numbers for the networks of Type II
 - ③ Numbers for international signaling points
 - ④ Terminal identification codes for land mobile stations
 - ⑤ Numbers for terminal transmission line facilities
 - ⑥ Numbers to identify type or content of telecommunications services.
 - ⑦ Emergency communications (110 and 119)
- (2) Numbers for public data communication networks (Article 12) (→ to be specified in a notification)
- (3) Numbers for electronic mail networks (Article 13)

[Chapter 3, Procedures for Designation of Telecommunication Numbers]

Procedures are provided for telecommunications carriers to apply for telecommunication numbers to be designated by the Minister of Posts and Telecommunications (MPT), and for a telecommunications carriers to report when use of telecommunication numbers are abolished. See Figure 5.1.2-1. (Articles 14 to 17)

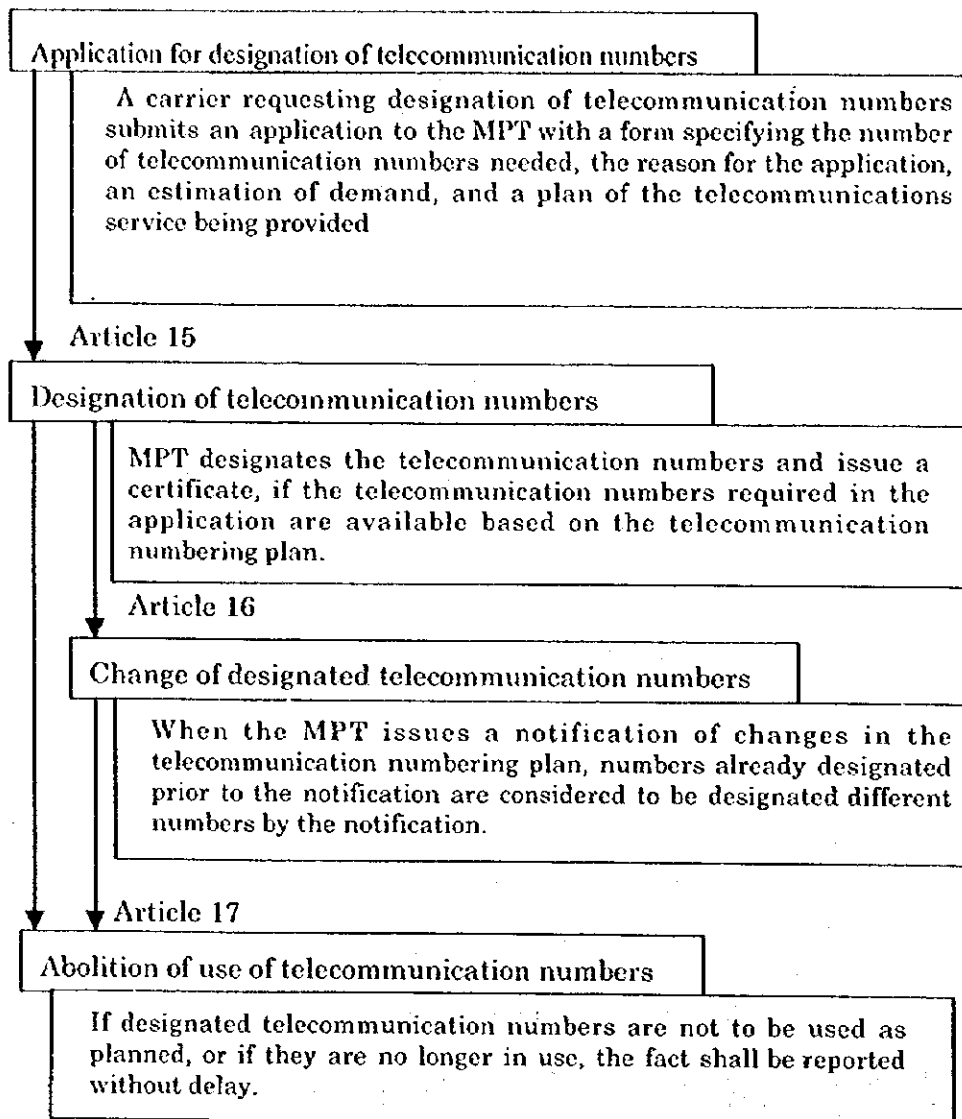


Figure 5.1.2-1 Procedures for Designation of Telecommunication Number

Note 1: Type I and Type II of Telecommunications Business

According to the Telecommunications Business Law, the telecommunications business is classified into Type I and Type II telecommunication business. Type I business involves telecommunications service provision over telecommunications facilities established on its own.

On the other hand, Type II businesses, which are telecommunication business other than Type I telecommunications businesses, providing telecommunication services by leasing telecommunications circuits and facilities from Type I telecommunication business.

5.2 Numbering Plan under the Competitive Environment

5.2.1 Fixed Telephone Service

As for numbering administration in the situation where competitive carriers enter the field of fixed communication service, the following should be taken into consideration.

- Reviewing the numbering plan which is not susceptible to large modification
- Making the best use of routing and charging function in the network
- Making effective use of numbering space
- Securing fairness for access number by carriers

At present, a numbering structure for fixed telephone service in Vietnam is as follow;
Trunk Prefix (0)+ Area Code (1, 2 or 3 Digits)+ Subscriber Number (7 or 6 digits)

0 + 4 + XXX+XXXX (Hanoi)
0 + 31 + XXX+XXX (Hai Phong)
0 + 350 + XXX+XXX (Nam Dinh)

In case that the present allocation of area code is considered to be maintained, strings of digits following trunk prefix plus area code need to be designated to each carrier.

As for the block size of numbers to be allocated to each carrier, ten thousand (4 digits) seems to be appropriate if competitive carrier's entry is allowed in the fixed communication market. Each carrier uses the number of "0ABCD" for their service areas by district by district basis because of charging identification.

Example:

0 + 4 + XXX₁+XXXX (Hanoi: VNPT)
0 + 4 + XXX₂+XXXX (Hanoi: New Carrier)
0 + 35 + XX₁+XXXX (Hai Phong: VNPT)
0 + 35 + XX₂+XXXX (Hai Phong: New Carrier)

Although the number of subscriber lines is less than 2 million at present, the numbering plan which accommodate tens of million number should be made in the near future considering the telephone diffusion rate of one lines per two persons (Telephone density is 50.). Since the present numbers consist of 8 digits (excluding trunk prefix), 80 million numbers can be theoretically accommodated. (The number "2" to "9" is used for the first digit of the area code.) Even the regulator (DGPT) may designate the numbers effectively, the number of digits would need to be increased to 9 in the future because of separation loss based on block allocation of numbers per area and per carrier and other factors.

A Province is a closed numbering areas, where dialing without trunk prefix(0) plus area code is allowed. The maximum capacity of each province number is;

Ha Noi, HCMC : 5,600,000 (8,000,000 X 70%)

Other Province : 560,000 (800,000 X 70%)

In case of maintaining the present closed numbering areas, the trigger by which the number of digits should be increased, could be exhaustion of numbers in some provinces. By increasing the figure by one digit the maximum capacity of number in each province will be;

Hanoi, HCMC : 56,000,000 (80,000,000 X 70%)

Other Province : 5,600,000 (8,000,000 X 70%)

Detailed studies of numbering capacity were conducted in Section 5.4.1 "Decision on numbering Capacity". In some provinces, numbering capacity is not enough to cater for new subscribers by 2020.

As for the method to increase the number of digits, one digit after area code would be added. There is no choice, because it is not realistic to divide the area (Province) into two.

Following Table 5.2.1-1 shows the example of number's composition for fixed service in Asian countries.

Table 5.2.1-1 Numbering Plan for Fixed Services in Asia

Nation (Country Code)	Trunk Prefix	Area Code	Subscriber Number		Location
			Exchange Code	Subscriber Number	
Philippines (+63)	0	A	B C D	- E F G H	Manila
		X	X X X	- X X X X	Others
		AB	C D E	- F G H I	
Thailand (+66)	0	A	B C D	- E F G H	Bangkok
		A B	C D E	- F G H I	Others
Indonesia (+62)	0	A B	C D E	- F G H I	Jakarta
		A B C	D E F	- G H I J	
Japan (+81)	0	A	B C D E	- F G H I	Tokyo, Osaka
		A B	C D E	- E G H I	Yokohama
		A B C	D E	- F G H I	local cities
		A B C D	E	- F G H I	
		A B C D E	F G H I		

5.2.2 Mobile Communication Service

At present the numbers of "09X" (X=1, 0) plus six (6) digits are used for mobile communication service. "9X" following trunk prefix "0" can be regarded as the area code whose area is nationwide and also regarded as the identification code for mobile communication services.

The digit "X"s should be designated to each competitive carrier in such a manner as those are designated for fixed communication service. At present "90" is used for VMS (MobiFone) and "91" is used for GPC (VinaPhone). The block size of numbers to be allocated to each carrier could be larger than that of fixed communication services, as separation loss is eased in the mobile networks.

As for capacity of the number, the present six (6) digits theoretically accommodates one million lines. In the future the number of subscribers of mobile communication service could increase to the compatible amount to that of fixed communication service. Therefore the numbering plan should accommodate the number up to ten million.(Refer Section 5.4.1 (6) Numbering Capacity for Mobile Service).

As a result 10 million numbers will be accommodated in the new numbering plan. As for the method to increase the figure, it is appropriate to add one digit after "09X" from the view point of user's convenience.

Examples of numbering composition for Mobile Services in Asian countries are as follows.

Table 5.2.2-1 Numbering Plan for Mobile Service in Asia

Nation	Access Number	Subscriber Number	Note
Philippines	0 9 X X	A B C - D E F G X X X - X X X X	
Thailand	0 1	A B C - D E F G	
Indonesia	0 8 X X	A B C - D E F G	
Japan	0 9 0 0 7 0	A B C - D E F G H A B C - D E F G H	Cellular PHS

Note(Japan): The initial 3 digits (0x0) will be unified respectively for cellular phone and for PHS. "090" will be allocated to cellular phone, and "070" to PHS. Three digits number "ABC"s will be allocated to each telephone company (Operator), and other 5 digits number will be assigned to each subscriber.

Note(Philippines): 09XX will be assigned to each operator.

5.2.3 Long Distance Service and International Service

In case that carriers enter the long distance service and/or international service, Carrier Identification Code (CIC) should be designated to each carrier in order for users to select a carrier for their calls.

In general followings are the dialing procedures to select a carrier using CIC;

Long distance service

CIC + trunk prefix(0) + area code + Subscriber Number

International service

CIC + international prefix(00) + country code + national number

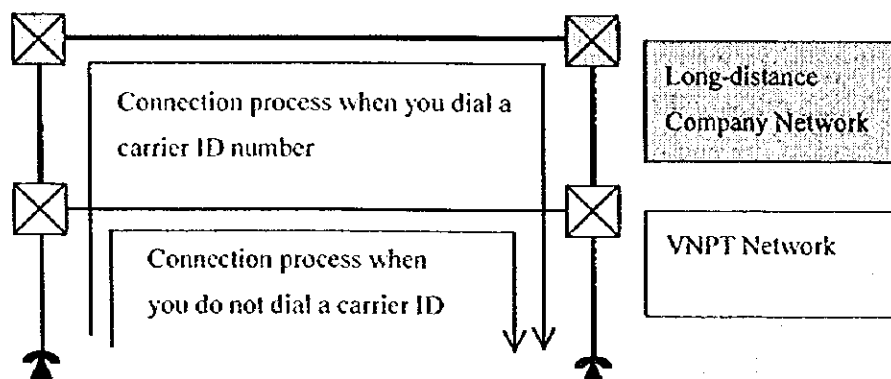


Figure 5.2.3-1 Connection Process between Carriers

For long distance calls, dialing of CIC in addition to the present dialing, which seems to be inconvenient for the users being accustomed to dialing without CIC, becomes necessary. Carrier pre-selection, which is a function provided by a local carrier for connecting carrier, enable users to make a call through the connecting carrier without dialing it's carrier ID, if the users registered the connecting carrier beforehand to the local carrier.

Carrier pre-selection has already been introduced in the US, Australia, Canada, Korea, Germany etc., and EU has also decided to introduce it by Jan. 2000. Carrier pre-selection is considered very important as a condition for fair competition in telecommunications field. In Japan also, pre-selection system will be introduced in year 2001, using international prefix of code "010".

The candidates of CIC are as follow;

the shortest CIC starting with 1 : 12XX(X)

the shortest CIC starting with 0 : 010XX(X)

Here 100 CIC's are available in 12XX or 010XX and 1,000 CIC's are available in 14XXX or 010XXX.

(1) Case Study for Interconnection in Japan

Until 1985 in Japan, telecommunication services were exclusively provided by NTT and KDD (Kokusai Denshin Denwa Co., Ltd.). The former covered domestic telecommunications and the latter, international services. In 1985, new operators entered telecommunication business, who have come to be known generically as NCCs (New Common Carriers). The NCCs include operators who domestically provide long-distance network service, local services, and international service. When more than one operator provide telecommunication services through their own network, it is desired that these networks be interconnected to enable subscribers and/or users to make calls with any of these networks include NTT and KDD.

A brief description will be given below of the CIC that enables NTT subscribers to use other operators's networks. Fig. 5.2.3-2 shows the configuration of interconnection among networks of NTT and NCCs.

- i) When only NTT network is involved, the number composition employed.
- ii) When an international network is involved, the "00X + international number" system is employed. Here, "X" is a prefix that identifies a communication operator or a type of service and is categorized as follows.

- 001: For KDD network with call charge information
- 002: For KDD network without call charge information
- 003: For ITJ (International Telecom Japan Inc.) network
- 006: For IDC (International Digital Communications) network

- iii) If an NCC long distance network is used, the "00Z₁Z₂ + national number" is employed. Here, 00Z₁Z₂ is an NCC prefix, and a number between 0070 and 0099 is assigned.
- iv) For interconnection configurations such as ④ ⑤ ⑥ in Figure 5.23-2, it is planned to use the "00Z₁Z₂ + national number", but the specific assignment of numbers are shown in Table 5.2.3-1.

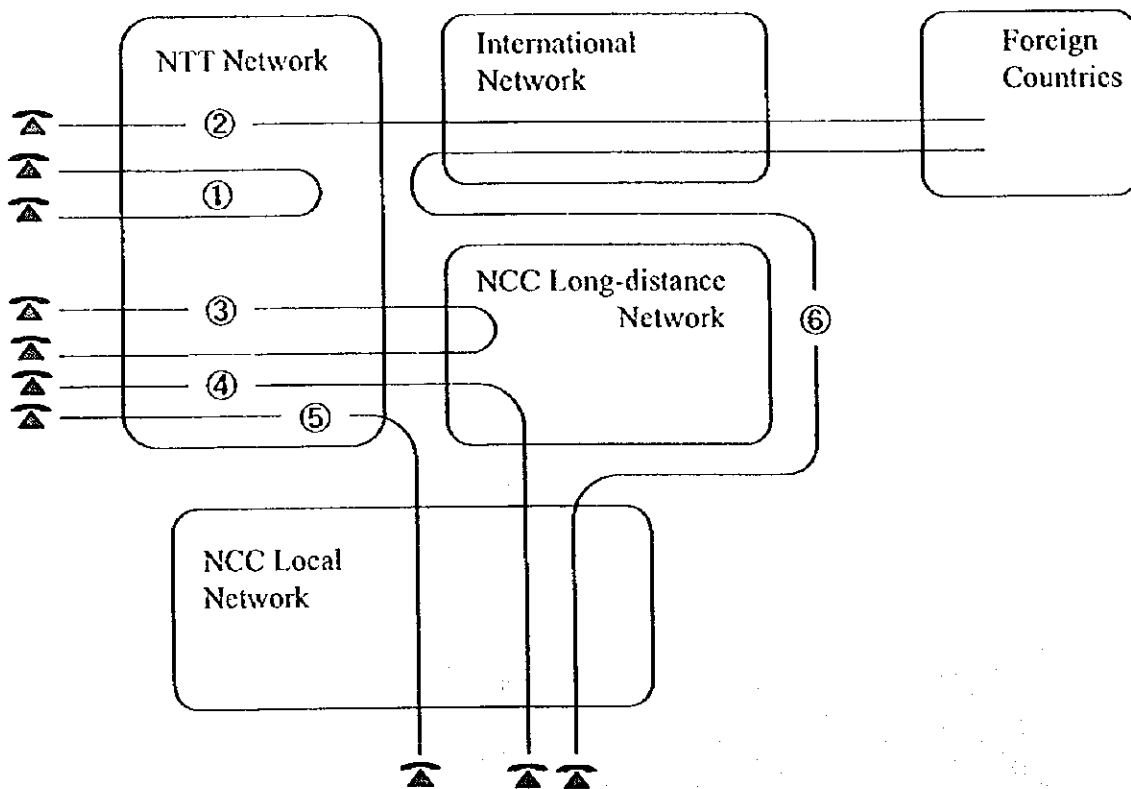


Figure 5.2.3-2 Configuration of Interconnection

Table 5.2.3-1 Assignment of 00XY Numbers in Japan

As of April 1, 1999

X	Y	0	1	2	3	4	5	6	7	8	9
1						KDD					
2											
3			KDD Note 2		NTT WN	NTT WN	NTT			KDD Note 1	KDD Note 2
4			JF	JF	JF	JF	JF				
5			KDD	KDD	KDD	KDD	KDD	KDD	KDD	KDD	KDD
6			IDC	IDC	IDC	IDC	IDC	IDC	IDC		
7		TWJ	WC	WC			BT	BT	DDI	DDI	
8			TINet					QTnet		JF	
9			Typell								

Note 1: until September 30, 1999

Note 2: until March 31, 2000

(2) **Examples in Major Countries**

Following table shows the International Prefix and Dialing Procedure in Each Country.

Table 5.2.3-2 International Prefix and Dialing Procedure in Each Country

Country	International Prefix	Dialing Procedure
US	011	CIC(10xxx or 101XXXX) + 011 + CC + NN
UK	00	CIC(1XXX) + 00 + CC + NN
Australia	0011	CIC(14XX) + 0011 + CC + NN
Japan	00	CIC(00XX) + CC + NN
Philippines	00	CIC(1XX) + 00 + CC + NN

Note: NN: National Number

5.2.4 Number Portability

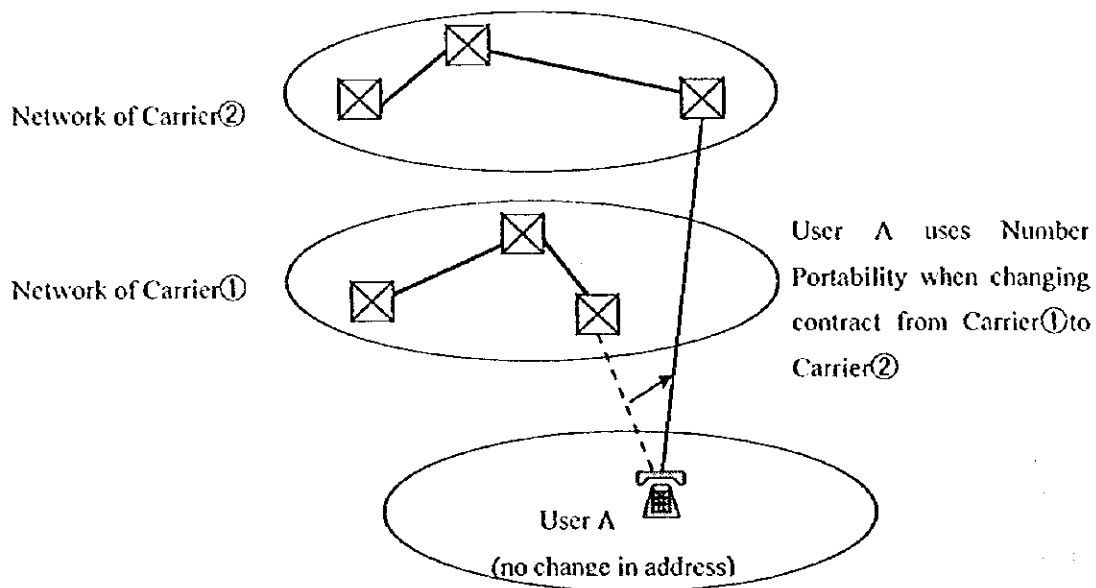
Studies towards recommendations on number portability are underway in ITU-T SG2 (International Telecommunications Union, Telecommunications Standardization Sector, Study Group 2). The draft of the recommendations as of March 1998 classifies portability into the following three types.

- (1) Enabling the end user to continue using the same telephone number as before, even

when changing the contracted service provider (service provider portability)

- (2) Enabling the end user to continue using the same telephone number as before, even when changing address (location portability)
- (3) Enabling the end user to continue using the same telephone number as before, even when changing the contracted service (service portability)

Number portability (portability between carriers) means that users will be able to continue using their old telephone numbers even when they change the telecommunications carrier to which they subscribe.



※ Even when entering a new agreement with Carrier ②, User A can continue to use the same telephone number as during the agreement with Carrier ①

Figure 5.2.4-1 Conceptual Diagram of Number Portability

At present, whenever users change their carriers, they have no choice but to change their telephone numbers, and notifying people of this change is quite burdensome. Number portability means that numbers will no longer need to be changed each time the carrier is changed. It has the aim of improving user convenience and promoting competition between carriers, by essentially assuring user freedom in the choice of carriers.

Here is the study in Japan. In Japan, proposal to introduce number portability was made

in the Telecommunications Council Report "Basic Rules for Interconnection" in December 1996. Another proposal concerning number management when number portability is implemented was made in the "FY1996 Telecommunication Numbers Study Group Report" in May 1997.

The respective proposals are summarised below.

(1) Proposal included in "Basic Rules for Interconnection"

(a) Tariff systems for interconnection

For interconnections to essential facilities (facilities that are indispensable to the provision of services of other providers and subject to the application of special interconnection rules), it should be made obligatory from the point of view of securing transparent, fair, quick, and reasonable interconnections to make tariffs for interconnection conditions such as charges and technological requirements, and to obtain ministerial authorization of such tariffs.

In this case, the conditions stipulated in tariffs should be drawn up so as to satisfy the following criteria, from the point of view of guaranteeing that they facilitate reasonable connection conditions as well as fair and effective competition.

When the user of a designated carrier changes to another carrier, the user in question should be assured of keeping the same number (referred to below as "number portability").

However, if the other carrier does not provide number portability to the designated carrier, it should be possible to refuse applications for the provision of number portability from other carriers.

(b) Specific details of number portability

- i) The numbers for which number portability ought to be secured should be general subscriber telephone numbers, ISDN numbers, and free-phone service numbers.
- ii) Portability for general subscriber telephone numbers and ISDN numbers should be restricted to cases in which users change carriers but remain at the same address.
- iii) The Ministry of Posts and Telecommunications, with the cooperation of relevant carriers and others, should study specific methods of implementation, cost sharing, etc., with a target of two years following the report, and aims to introduce portability as soon as possible no more than

two years after the conclusion of the studies (target year 2000).

iv) The specific method of implementation should satisfy the following conditions:

- When introducing number portability, the existing network services, functions, and capabilities should be provided as before.
- Steps should be taken for the efficient use of number resources.
- When introducing number portability, the quality of services provided by carriers and the reliability of networks should not suffer any unreasonable decline.
- No unreasonable gap should arise between users who have received the provision of number portability and other users, in terms of service quality or network reliability.

(2) Proposals included in the "FY1996 Telecommunication Numbers Study Group Report" in Japan

- Management of numbers when implementing number portability

As a method of managing numbers when number portability is implemented for ordinary subscriber telephones and ISDN, the method of allocating local exchange number for each regional carrier should preferably be adopted. This is because it is important to ensure that number allocation and other aspects (including management of numbers not using number portability) are carried out efficiently and routing processing is reduced.

Carriers that have been allocated a local exchange number should, among other things, manage data on transfer destinations for the numbers of users who have transferred to other carriers using number portability, and re-utilize such numbers whenever they are no longer used in the transfer destination.

In the case of "0120" numbers (number starting with four digits "0120") for free-phone numbers, it would be preferable to allocate 3-digit DEF numbers (free-phone service as "0120-DEF-GHI") following "0120" for each carrier as a method of managing numbers when number portability is implemented.

(3) Outline of the Study Group Report on Implementing Number Portability

This Study Group has been studying methods of implementing number portability for ordinary subscriber telephone/ISDN and free-phone services. When conducting the study, we were mindful that the scale of network modification should not be unrealistic if number portability were to be introduced at the earliest possible juncture. This was based on our recognition that number portability will be an

important element in promoting competition between carriers and improving user convenience.

The following three may be cited as elements that characterize methods of implementing number portability for ordinary subscriber telephones and ISDN.

- (a) Carrier to obtain data showing transfer destinations using number portability
- (b) Carrier to commence line allocation to the transfer destination carriers (carriers with which subscribers are newly contracted after transfers using number portability) based on the data obtained
- (c) The method when returning lines up to the point of commencement of line allocation to the transfer destination carrier (the method of allocating return line (using doubled lines for the return portions) or the method of freeing line backwards)

After comparing the proposed methods determined by these three elements, the study group considered the following method to be most suitable.

- (a) The optimal line reallocation method

A method whereby the transfer source carrier obtains data showing the transfer destination, frees the line backwards as required within the transfer source carrier, and commences line allocation to the transfer destination carrier (see in Figure 5.2.4-2).

Moreover, if agreement can be reached between the relevant carriers, it would be suitable to partially change this method and adopt the following.

- (b) Options for the optimal line reallocation method

A method whereby the transfer source provider obtains data showing the transfer destination, frees the line backwards up to the preceding carrier (transmitting carrier or relaying carrier), and the preceding carrier commences line allocation to the transfer destination carrier (see Figure 5.2.4-3).

Furthermore, it would be appropriate if the transfer destination carrier notifies the transfer source carrier of one of the following as data showing the transfer destination:

- Data to identify the transfer destination carrier in the form of "area code + representative local exchange number used by transfer destination provider"
- Data to identify the subscriber exchange of the transfer destination carrier in the form of "area code + local exchange number"
- Data to identify the subscriber line of the transfer destination carrier in the form of "area code + local exchange number + subscriber number"

Moreover, the IN (Intelligent Network) method, whereby an enquiry is made by the transmitting carrier (or relaying carrier) to a database to obtain data showing the receiving destination for all calls, will require network modification on a large scale and is thus considered unrealistic from the point of view of early introduction. However, it would cause no problem if a specific carrier were to implement this once the aforementioned method had been achieved.

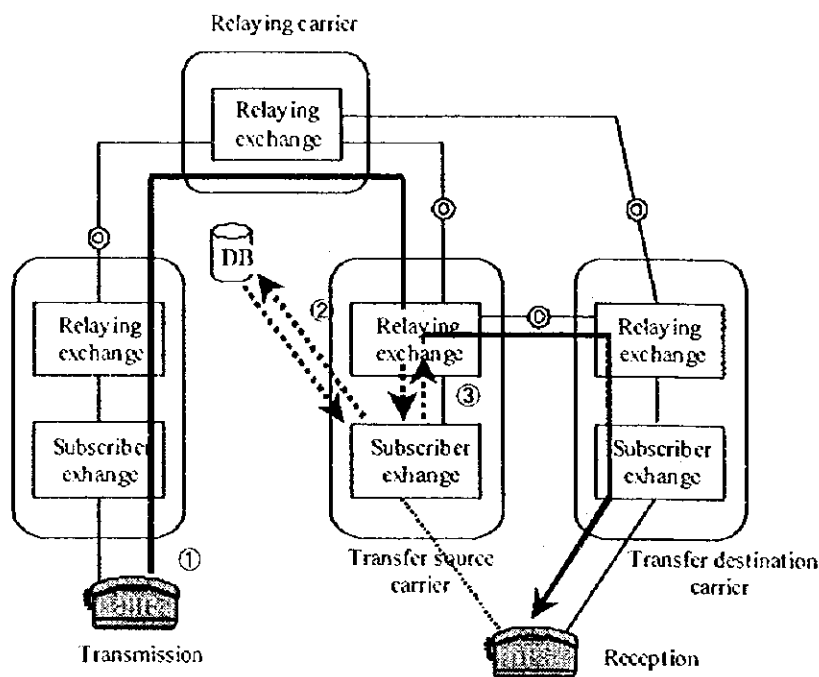


Figure 5.2.4-2 Optical Line Reallocation Method

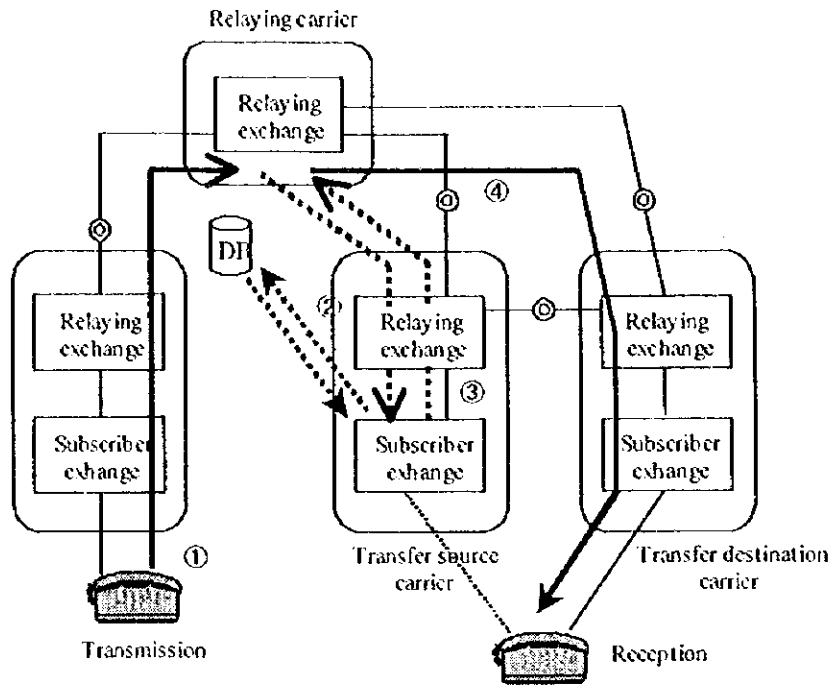


Figure 5.2.4-3 Options for Optical Line Reallocation Method

5.2.5 Numbering Plan for No.7 Signaling Network

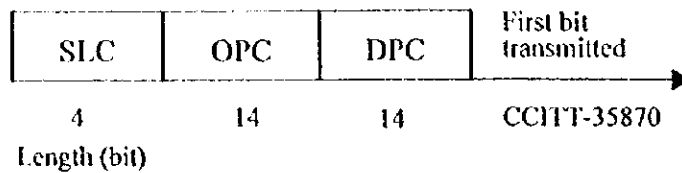
Every signaling point (signaling end point and signaling transfer point) will be allocated in its own unique point code. The numbering plan should be determined to have the sufficient number of SPs(signaling point) at the final stage of the network and to make easy routing.

(1) Point Code

A point code is assigned by a single number (universal access number) to a signaling point.

(2) Bits

The CCITT Rec. Q704 assigns 14 bits for a signaling point code as shown in Figure 5.2.5-1.



- SLC (Signaling Link Code) indicates the signaling link, connecting the destination and originating points, to which the message is related.
- OPC Originating Point Code
- DPC Destination Point Code

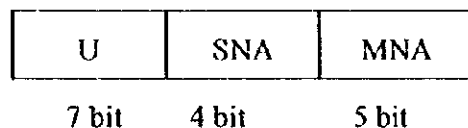
Figure 5.2.5-1 Standard Level Structure (Figure 14/Q.704, CCITT)

Since 14 bits allow the maximum of 16,384 (2^{14}) point code combination, it is sufficient for the Vietnam network.

(3) Format of Point Code

Considering to simplify the translation from point codes to routes, it is recommended that the codes of 14 bits are subdivided into 2 or 3 subdivisions. This allows to divide the signaling network into a few geographical areas, carrier code and networks.

Figure 5.2.5-2 shows example of code format of NTT in Japan.



- MNA Main Numbering Plan Area of Signal
- SNA Sub Numbering Plan Area of Signal
- U Unit code of SPs

Figure 5.2.5-2 Code Format Example

(4) Numbering Administration for No.7 Numbering Plan

Under the competitive environment, independent authority for numbering administration of DGPT should manage the numbering and mediate between carriers. For interconnection, No.7 numbering is commonly used between carriers. The numbering plan of SP's of interconnection point should be opened to other carriers.

5.3 Numbering Plan in Vietnam

5.3.1 Introduction

Numbering plan should be established logically with flexibility. The numbers are used not only as interfacing conditions for controlling connections between subscribers and networks, but also for identification for call charges. The following considerations should be taken in establishing a numbering plan.

- Numbering plan should remain unchanged for a very long period. It must have a sufficient numbering capacity to accommodate demand increases over the next 50 years or longer, as well as such new services as cellular telephones.
- The same number should be commonly used throughout the country to call a subscriber regardless of the location of the calling party.
- Numbering plan should be simple and easy to use for subscribers. The number length should be minimized as much as possible, because a number length that exceeds the maximum number length recommended by ITU would preclude international call.
- In terms of switching, the numbering plan should not involve overly complicated procedures for translation of route and charging prefixes.

VNPT's number composition will be described here and also examples of procedures for numbering plan will be described.

5.3.2 Number Composition

(1) General Consideration in Number Composition

The following considerations should be taken along with ITU-T recommendations.

- "0" should preferably be used for the trunk prefix.
- "00" should preferably used as the international prefix.
- The number of digits for an international number should be 12 or fewer (for ISDN, it should be 15 or fewer).
- The country code should consist of one, two or three digits (a list compiled by ITU is available).

(2) National Number

VNPT employs an open numbering system for national numbers and a closed

numbering system for a provincial area. A subscriber's number has seven digits in Hanoi and HCMC, and six digits in other provinces. "0" is used for trunk prefix. When a national number is expressed by the eight letters of A, B, C, D, E, F, G, and H, "0" cannot be used for the first digit "A". This is because "0" is used for trunk prefix.

Table 5.3.2-1 National Number Composition

Area Code	Subscriber Number	Application Area
A	B C D E F G H	Hanoi, HCMC
A B	C D E F G H	Hai Phong
A B C	D E F G H I	Da Nang, Quang Nam

Source: DGPT

(3) Special Numbers

Special numbers are used when subscribers dial the operator or use special services other than for an ordinary telephone call. These numbers are given when it is deemed desirable to use a unified number throughout the country in view of the nature of the services. These numbers should preferably be composed of a small number of digits for subscribers' convenience. DGPT employs three digits for special numbers shown in Table 5.3.2-2.

Table 5.3.2-2 Subscriber Special Number

Code	Service
101	Long distance domestic telephone service
102	National long distance call – operator support
105	Domestic paging service (English)
106	Paging service inquiries (Information)
107	Domestic paging service (Vietnamese)
108	Information service
110	International call – operator support
113	Police
114	Fire brigade
115	Ambulance
116	Directory Inquiries
117	Time inquiries
118	Bell checking (Ring back test)
119	Telephone repair service
120	HCD (Home Country Direct)
125	125X: VDC Access Code (dial up)
133	Ha Noi ABC paging service
141	VinaPhone paging service
142	International telephone service rate
143	International telephone service inquiries

Source: DGPT

(4) Numbers for Various Services

To meet such diversified needs as cellular telephone, paging service, absence-information service, facsimile communication service, etc., DGPT needs some principals of numbering system.

The "0AB(C)" numbering system should be used for expansion services such as cellular telephones which is interconnected to telephone network (PSTN). "0AB(C)" should also be used for service such as the free dialing service offered to every subscriber.

The "1XY" numbering system should be used for additional services offered to facilitate communications in telephone network. The function-button numbering system should be employed for services that are only available on push-button dial telephone sets.

5.4 Review of the Numbering Plan in Vietnam

Existing numbering capacity will be reviewed considering the numbers of areas (province), demand forecast at 2010, 2020 and the future when the telephone diffusion rate of one line per two persons, separation loss based on block allocation of numbers per area and per carrier and other factors. In this section, numbering capacity for Area Code and Subscriber Number in existing numbering plan in Vietnam will be reviewed.

5.4.1 Decision on Numbering Capacity

(1) Period of Numbering Plan

Once a numbering plan is established, subsequent changes in the plan involve great difficulties. It is necessary, therefore, that the number of digits and other parameters are based upon an accurate telephone demand forecast lest a shortage of number occur. Consequently, the telephone demand forecast should take into account for future increases. In reality, it is difficult to make an accurate demand forecast on a long-term basis. Nonetheless, a numbering plan should be developed in such a manner that once brought into practice, it would require no change for at least 50 years.

(2) The Number of Digits and Numbering Capacity

The numbering capacity depends upon how many digits are used for numbering. The capacity represents the upper limit of the total of subscribers and/or terminals that can be accommodated in an appropriate area. For example, if four digits are used for number, it will theoretically make 10,000 numbers available, ranging between "0000" and "9999". This means that the numbering capacity is 10,000. But actually not all of these numbers can be used for numbering because a margin is required for trunk and international prefixed and special numbers.

For example, the following limitations must be considered.

- (a) "0" and "1" cannot be used for the first digit of local numbers. This is because "0" is used for the trunk prefix and "1" is used for the first digit of special numbers.
- (b) "0" cannot be used for the first digit of a trunk code because "0" is used for international prefixes.

- (c) The country code for Vietnam is "84", being two digits. The subtraction of two digits from the total 12 digits leaves 10 digits. But at present, numbering is made up to eight or nine digits, leaving a margin of one or two digits.

Taking into account the above limitations, a numbering capacity of $9 \times 8 \times 10^7 = 720$ million is available. Given that the current number of subscribers is 3 million in Vietnam, there is a large numbering capacity scope on a national basis.

(3) Decision of the Number of Digits

The number of digits should be decided taking into account that the numbering requirements should cover special numbers as well as those to be assigned to subscribers.

For instance, assuming the future demand to be 9 million, the number of digits are decided in the following manner.

(a) Precondition

- "0" should be used for the trunk prefix.
- The "IXY" system should be used for special service numbers.
- The country code should be two digits.

(b) Limitation on use of figures

- Nine digits ranging from 1 to 9 but excluding 0 should be used for the first digit of the trunk code.
- Eight digits that range from 2 to 9 but excluding 0 and 1 should be used for the first digit of the exchange code.

(c) Subtraction of the two digits for the country code from the total of 12 digits leaves ten digits. Accordingly, we can use up to ten digits for the national number.

- Assuming seven digits, the numbering capacity is calculated as follows.
 $9 \times 8 \times 10^5 = 7,200,000$
- Assuming eight digits, the numbering capacity is calculated as follows.
 $9 \times 8 \times 10^6 = 72,000,000$

Consequently, eight digits should be used to meet the demand of 9 million.

(4) **Splitting Loss in Numbering Capacity**

Consideration should furthermore be given to splitting losses in numbering capacity associated with the establishment of a numbering area. For example, a local service area with a demand of 8,000 should be assumed. To illustrate the concept of splitting losses, a comparison will be made between a case in which an area is served by a single exchange office, and when an area is served by two different exchange office.

(a) If the area is served by a single exchange office:

- "2" will be assigned for the exchange code.
- If a subscriber number contains four digits, the numbering capacity will be 10,000, which will satisfy the future demand of 8,000. Subtraction of the future demand of 8,000 from the numbering capacity of 10,000 leaves an unused capacity of 2,000.

(b) If the area is served by two different exchange offices:

- This local service area is split into Area A and B.
- For Area A, the future demand is assumed at 5,000, and "5" is assigned for the exchange code.
- For Area B, the future demand is assumed at 3,000, and "6" is assigned for the exchange code.
- Four digits are acquired for the subscriber number. A numbering capacity of 10,000 will be assigned to each of Area A and B. The total required numbering capacity is 20,000. Subtraction of the future demand of 8,000 from this 20,000 leaves an unused capacity of 12,000.

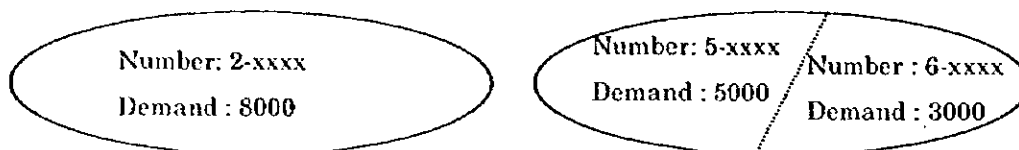


Figure 5.4.1-1 Concept of Splitting Losses in Numbering Capacity

The exclusively large unused capacity indicated in case (b) seems attributable to inappropriate assignment of the numbering area. The example cited above might be an extreme case. It illustrates the possibility, however, that trunk (area) codes and/or district codes may run short unless the number of digits is decided with a full scope of numbering capacity. Furthermore, if there is too much demand in a local

service area, more than one exchange may be used in the single area. In that case, a splitting loss in exchange code should also be taken into account.

Another splitting loss will happen when new operator enter in the local telephone service. New operator needs new code for its subscriber. Telephone number should be discriminate with VNPT subscribers within the first two or three digits of subscriber number.

There is another problem. If the demand forecast figures change drastically, numbering capacity loss will happen. That is why there should be enough spare capacity for assigning numbering capacity to each local area.

(5) Numbering Capacity for Subscriber Number

Subscriber numbers are given to subscribers in the provinces. The number of digits for the subscriber number should be decided by taking into account the number of districts and exchanges installed in the closed numbering area as well as the telephone demand. In Vietnam, 7 digits for Hanoi and HCMC and 6 digits for other provinces are assigned for subscriber number.

Subscriber numbering capacity is assumed here that 70 % of the numbering capacity will be used because of splitting loss mentioned above. The limit of capacity for 6 digits and 7 digits subscriber number is calculated as follows;

$$7 \text{ digits } 8 \times 10^6 \times 0.7 = 5,600,000$$

$$6 \text{ digits } 8 \times 10^5 \times 0.7 = 560,000$$

Table 5.4.1-1, Table 5.4.1-2 and Table 5.4.1-3 show the results of numbering capacity shortage considering the demand in 2010, 2020 and demand in the future. This study result indicates that number capacity shortage is expected to occur in the province of Hai Phong, Hai Duong, Dong Nai and An Giang between 2010 and 2020, and many provinces in future (See Table 5.4.1-3). The only way to increase the capacity is to add one additional digit on the top of the subscriber number.

(6) Numbering Capacity for Mobile Service

The number of mobile subscriber at 2010 will be 1,600,000. In addition, new mobile system will be introduced and new carriers would enter into this market. Therefore a large scale of numbering system must be designed. At present the number of network service carriers is two, VMS and GPC, and the numbering capacity for the mobile telephone service is estimated according to the present numbering plan as shown in Table 5.4.1-3. The present numbering plan cannot support mobile subscribers before 2010 considering the mobile demand estimated in Table 5.4.1-4.

Table 5.4.1-3 Numbering Plan for Mobile Service

Numbering Plan	Carrier	Capacity
090-ABCDEF	VMS	$8 \times 10^5 = 800,000$
091-ABCDEF	GPC	$8 \times 10^5 = 800,000$
092-- 099	spare	

Table 5.4.1-4 Demand Forecast of Mobile Service

Year	Demand Forecast	Required Digits(capacity)
1998	150,000	6 digits (800,000)
2010	1,600,000	7 digits (8,000,000)
2020	3,800,000	7 digits (8,000,000)

To accommodate the subscribers in 2010, 7 digits of mobile numbers are required. In order to simplify the numbering style for both customers and service carriers, it is recommendable to accommodate a carrier identification code (CIC) for identifying the network, considering equal access to new carriers in the future. The candidate number would be "094X_n-XXXXXXX".

Table 5.4.1-1 Numbering Capacity by 2010

	Province	Demand 2010	No. of Digit	Number Capacity	Limit (%)	Note
1	Ha Giang	8,912	6	560,000	2	
2	Tuyen Quang	35,033	6	560,000	6	
3	Cao Bang	10,203	6	560,000	2	
4	Lang Son	52,456	6	560,000	9	
5	Lao Cai	28,715	6	560,000	5	
6	Yen Bai	14,140	6	560,000	3	
7	Bac Can	9,233	6	560,000	2	
8	Thai Nguyen	67,477	6	560,000	12	
9	Quang Ninh	102,300	6	560,000	18	
10	Phu Tho	85,676	6	560,000	15	
11	Vinh Phuc	59,863	6	560,000	11	
12	Bac Giang	29,417	6	560,000	5	
13	Bac Ninh	25,838	6	560,000	5	
14	Lai Chau	30,509	6	560,000	5	
15	Son La	39,361	6	560,000	7	
16	Hoa Binh	41,155	6	560,000	7	
17	HA NOI*	1,033,515	7	5,600,000	18	
18	HAI PHONG*	279,477	6	560,000	50	
19	Ha Tay	173,397	6	560,000	31	
20	Hai Duong	211,603	6	560,000	38	
21	Hung Yen	108,306	6	560,000	19	
22	Thai Binh	39,566	6	560,000	7	
23	Ha Nam	13,455	6	560,000	2	
24	Nam Dinh	97,891	6	560,000	17	
25	Ninh Binh	36,110	6	560,000	6	
26	Thanh Hoa	135,635	6	560,000	24	
27	Nghe An	217,518	6	560,000	39	
28	Ha Tinh	21,751	6	560,000	4	
29	Quang Binh	59,745	6	560,000	11	
30	Quang Tri	26,201	6	560,000	5	
31	Thua Thien- Hue	98,446	6	560,000	18	
32	DA NANG*	158,606	6	560,000	28	
33	Quang Nam	45,399	6	560,000	8	
34	Quang Ngai	60,888	6	560,000	11	
35	Binh Dinh	133,727	6	560,000	24	
36	Phu Yen	38,136	6	560,000	7	
37	Khanh Hoa	160,057	6	560,000	29	
38	Ninh Thuan	37,716	6	560,000	7	
39	Binh Thuan	83,433	6	560,000	15	
40	Gia Lai	42,034	6	560,000	8	
41	Kon Tum	13,350	6	560,000	2	
42	Dac Lac	114,602	6	560,000	20	
43	Lam Dong	80,206	6	560,000	14	
44	HO CHI MINH*	1,710,517	7	5,600,000	31	
45	Binh Duong	163,931	6	560,000	29	
46	Binh Phuoc	43,478	6	560,000	8	
47	Tay Ninh	57,054	6	560,000	10	
48	Dong Nai	208,361	6	560,000	37	
49	Ba Ria- Vung Tau	111,509	6	560,000	20	
50	Long An	107,772	6	560,000	19	
51	Dong Thap	69,720	6	560,000	12	
52	An Giang	257,887	6	560,000	46	
53	Tien Giang	81,217	6	560,000	15	
54	Ben Tre	94,109	6	560,000	17	
55	Vinh Long	61,458	6	560,000	11	
56	Tra Vinh	32,048	6	560,000	6	
57	Can Tho	117,105	6	560,000	21	
58	Soc Trang	68,080	6	560,000	12	
59	Kien Giang	212,613	6	560,000	38	
60	Bac Lieu	68,807	6	560,000	12	
61	Ca Mau	57,547	6	560,000	10	
	Total	7,684,267				

Table 5.4.1-2 Numbering Capacity by 2020

No.	Province	Demand 2020	No. of Digit	Number Capacity	Limit (%)	Note
1	Ha Giang	19,058	6	560,000	3	
2	Tuyen Quang	84,853	6	560,000	15	
3	Cao Bang	21,833	6	560,000	4	
4	Lang Son	120,063	6	560,000	21	
5	Lao Cai	61,932	6	560,000	11	
6	Yen Bai	30,239	6	560,000	5	
7	Bac Can	23,894	6	560,000	4	
8	Thai Nguyen	162,702	6	560,000	29	
9	Quang Ninh	299,595	6	560,000	53	
10	Phu Tho	209,201	6	560,000	37	
11	Vinh Phuc	155,001	6	560,000	28	
12	Bac Giang	62,909	6	560,000	11	
13	Bac Ninh	55,253	6	560,000	10	
14	Lai Chau	71,337	6	560,000	13	
15	Son La	87,505	6	560,000	16	
16	Hoia Binh	88,858	6	560,000	16	
17	HA NOI*	1,817,883	7	5,600,000	32	
18	HAI PHONG*	749,166	6	560,000	134	Shortage
19	Ha Tay	409,826	6	560,000	73	
20	Hai Duong	718,407	6	560,000	128	Shortage
21	Hung Yen	376,488	6	560,000	67	
22	Thai Binh	92,659	6	560,000	17	
23	Ha Nam	31,509	6	560,000	6	
24	Nam Dinh	231,644	6	560,000	41	
25	Ninh Binh	85,449	6	560,000	15	
26	Thanh Hoa	319,529	6	560,000	57	
27	Nghé An	511,114	6	560,000	91	
28	Ha Tinh	50,938	6	560,000	9	
29	Quang Binh	141,326	6	560,000	25	
30	Quang Tri	61,359	6	560,000	11	
31	Thua Thien-Hue	288,357	6	560,000	51	
32	DA NANG*	446,928	6	560,000	80	
33	Quang Nam	132,951	6	560,000	24	
34	Quang Ngai	178,350	6	560,000	32	
35	Binh Dinh	315,176	6	560,000	56	
36	Phu Yen	89,570	6	560,000	16	
37	Khanh Hoa	348,456	6	560,000	62	
38	Ninh Thuan	88,360	6	560,000	16	
39	Binh Thuan	195,750	6	560,000	35	
40	Gia Lai	89,971	6	560,000	16	
41	Kon Tum	28,553	6	560,000	5	
42	Dac Lac	247,282	6	560,000	44	
43	Lam Dong	187,848	6	560,000	34	
44	HO CHI MINH*	3,618,663	7	5,600,000	65	
45	Binh Duong	457,329	6	560,000	82	
46	Binh Phuoc	112,757	6	560,000	20	
47	Tay Ninh	133,675	6	560,000	24	
48	Dong Nai	610,330	6	560,000	109	Shortage
49	Ba Ria- Vung Tau	326,603	6	560,000	58	
50	Long An	255,885	6	560,000	46	
51	Dong Thap	163,572	6	560,000	29	
52	An Giang	654,951	6	560,000	117	Shortage
53	Tien Giang	190,476	6	560,000	34	
54	Ben Tre	282,326	6	560,000	50	
55	Vinh Long	144,494	6	560,000	26	
56	Tra Vinh	75,073	6	560,000	13	
57	Can Tho	275,209	6	560,000	49	
58	Soc Trang	206,925	6	560,000	37	
59	Kien Giang	515,385	6	560,000	92	
60	Bac Lieu	178,298	6	560,000	32	
61	Ca Mau	134,963	6	560,000	24	
	Total	18,125,995				

Table 5.4.1-3 Numbering Capacity in the Future

No	Province	Population	Demand in Future	Digit	Number Capacity	Limit (%)	Note
1	Ha Giang	757	379,000	6	560,000	68	
2	Tuyen Quang	912	456,000	6	560,000	81	
3	Cao Bang	747	374,000	6	560,000	67	
4	Lang Son	977	488,000	6	560,000	87	
5	Lao Cai	792	396,000	6	560,000	71	
6	Yen Bai	923	461,000	6	560,000	82	
7	Bac Can	425	213,000	6	560,000	38	
8	Thai Nguyen	1,337	668,000	6	560,000	119	Shortage
9	Quang Ninh	1,241	621,000	6	560,000	111	Shortage
10	Phu Tho	1,723	861,000	6	560,000	151	Shortage
11	Vinh Phuc	1,457	728,000	6	560,000	130	Shortage
12	Bac Giang	1,982	991,000	6	560,000	177	Shortage
13	Bac Ninh	1,263	631,000	6	560,000	113	Shortage
14	Lai Chau	747	374,000	6	560,000	67	
15	Son La	1,134	567,000	6	560,000	101	Shortage
16	Hoa Binh	1,031	515,000	6	560,000	92	
17	HA NOI*	3,636	1,818,000	7	5,600,000	32	
18	HAI PHONG*	2,262	1,131,000	6	560,000	202	Shortage
19	Ha Tay	3,167	1,584,000	6	560,000	283	Shortage
20	Hai Duong	2,266	1,133,000	6	560,000	202	Shortage
21	Hung Yen	1,447	724,000	6	560,000	129	Shortage
22	Thai Binh	2,401	1,201,000	6	560,000	214	Shortage
23	Ha Nam	1,094	547,000	6	560,000	98	
24	Nam Dinh	2,564	1,282,000	6	560,000	229	Shortage
25	Ninh Binh	1,213	607,000	6	560,000	108	Shortage
26	Thanh Hoa	4,762	2,381,000	6	560,000	425	Shortage
27	Nghé An	3,846	1,923,000	6	560,000	343	Shortage
28	Ha Tinh	1,764	882,000	6	560,000	158	Shortage
29	Quang Binh	1,083	542,000	6	560,000	97	
30	Quang Tri	755	377,000	6	560,000	67	
31	Thua Thien-Hue	1,384	692,000	6	560,000	124	Shortage
32	DA NANG*	894	447,000	6	560,000	80	
33	Quang Nam	1,849	925,000	6	560,000	165	Shortage
34	Quang Ngai	1,648	824,000	6	560,000	147	Shortage
35	Binh Dinh	1,978	989,000	6	560,000	177	Shortage
36	Phu Yen	1,032	516,000	6	560,000	92	Shortage
37	Khanh Hoa	1,328	664,000	6	560,000	119	Shortage
38	Ninh Thuan	648	324,000	6	560,000	58	
39	Binh Thuan	1,273	637,000	6	560,000	114	Shortage
40	Gia Lai	1,278	639,000	6	560,000	114	Shortage
41	Kon Tum	357	178,000	6	560,000	32	
42	Dac Lac	1,972	986,000	6	560,000	176	Shortage
43	Lam Dong	1,224	612,000	6	560,000	109	Shortage
44	HO CHI MINH*	7,237	3,619,000	7	5,600,000	65	
45	Binh Duong	915	457,000	6	560,000	82	
46	Binh Phuoc	757	378,000	6	560,000	68	
47	Tay Ninh	1,246	623,000	6	560,000	111	Shortage
48	Dong Nai	2,914	1,457,000	6	560,000	260	Shortage
49	Ba Ria- Vung Tau	1,036	518,000	6	560,000	93	
50	Long An	1,684	842,000	6	560,000	150	Shortage
51	Dong Thap	2,065	1,033,000	6	560,000	181	Shortage
52	An Giang	2,719	1,360,000	6	560,000	243	Shortage
53	Tien Giang	2,277	1,138,000	6	560,000	203	Shortage
54	Ben Tre	1,873	937,000	6	560,000	167	Shortage
55	Vinh Long	1,463	732,000	6	560,000	131	Shortage
56	Tra Vinh	1,321	661,000	6	560,000	118	Shortage
57	Can Tho	2,505	1,252,000	6	560,000	224	Shortage
58	Soc Trang	1,678	839,000	6	560,000	150	Shortage
59	Kien Giang	1,947	974,000	6	560,000	174	Shortage
60	Bac Lieu	1,048	524,000	6	560,000	94	
61	Ca Mau	1,450	725,000	6	560,000	129	Shortage
		102,707	51,357,000				

5.4.2 Decision on Numbering Areas

To decide numbering areas in a rational manner, it is desirable to ensure consistency with numbering capacity, and between local service areas and charging areas. Failure to ensure such consistency would give rise to the following problems.

- Different rates are applied to areas having the same trunk (area) code, and thus the charging system is unintelligible to users.
- When the provincial center accommodating areas are identical to the charging areas, the exchange can set up a charging index by identifying the trunk (area) code. If there is any inconsistency between local service areas and charging areas, the exchange must identify the exchange code to identify the charging area. This results in complicated exchange operations.

Numbering areas should preferably be decided to the full extent of the numbering capacity in accordance with a zoning system – such as by administrative district (Province, District) – which is familiar to users. In Vietnam, we can discriminate the location of district within the first 3 digits of subscriber number. Because the district area is the basis of charging for intra-provincial call.

(1) Area Code Capacity

Each province has its exclusive area code with one, two or three digits. Three digits were applied when a province was administratively divided into two. Though the existing area code allocation is not in order, it is difficult to change the allocation now. Combination of two and three digits of area code is unavoidable / inevitable, considering the number of provinces in Vietnam and future 0AB(C) numbering service such as cellular service, data service and new telephone services. In Vietnam, code “0125X” is used for access to data network (VDC), which is not recommendable. Because many private companies want to enter this kind of business such as ISP and should have the equal opportunity with VNPT(VDC).

Table 5.4.2-1 shows that 71 out of 90 “0AB” codes are already assigned. There are 19 spare codes which will be used for new services.

Table 5.2.2-1 0AB (Area Code) Numbering Plan

AB	Assignment	AB	Assignment
10	Spare	56	Binh Dinh
11	Spare	57	Phu Yen
12	125X: VDC access code (dial up)	58	Khanh Hoa
13	Spare	59	Gia Lai
14	Spare	60	Kon Tum
15	Spare	61	Dong Nai
16	Spare	62	Binh Thuan
17	Spare	63	Lam Dong
18	Hoa Binh	64	Ba Ria -- Vung Tau
19	Ha Giang	65	650: Binh Duong, 651: Binh Phuoc
20	Lao Cai	66	Tay Ninh
21	210: Phu Tho, 211: Vinh Phuc	67	Dong Thap
22	Son La	68	Ninh Thuan
23	Lai Chau	69	692-694: Ministry of Interior Network, 695-697: Ministry of Defence Network
24	240: Bac Giang, 241: Bac Ninh		
25	Lang Son	70	Vinh Long
26	Cao Bang	71	Can Tho
27	Tuyen Quang	72	Long An
28	280: Thai Nguyen, 281: Bac Can	73	Tien Giang
29	Yen Bai	74	Tra Vinh
30	Ninh Binh	75	Ben Tre
31	Hai Phong	76	An Giang
32	320: Hai Duong, 321: Hung Yen	77	Kien Giang
33	Quang Ninh	78	780: Ca Mau, 781: Bac Lieu
34	Ha Tay	79	Soc Trang
35	350: Nam Dinh, 351: Ha Nam	80	Spare
36	Thai Binh	81	Spare
37	Thanh Hoa	82-89	Ho Chi Minh City
38	Nghe An	90	VMS (MobiFone)
39	Ha Tinh	91	GPC (Vinaphone)
40	Spare	92	Spare
41	Spare	93	Spare
42-49	Ha Noi City	94	Vietel (Mobile)
50	Dac Lac	95	SPT (Mobile)
51	510: Quang Nam, 511: Da Nang	96	Spare
52	Quang Binh	97	Spare
53	Quang Tri	98	Spare
54	Thua Thien -- Hue	99	Spare
55	Quang Ngai	0X	International Call

Source: DGPT

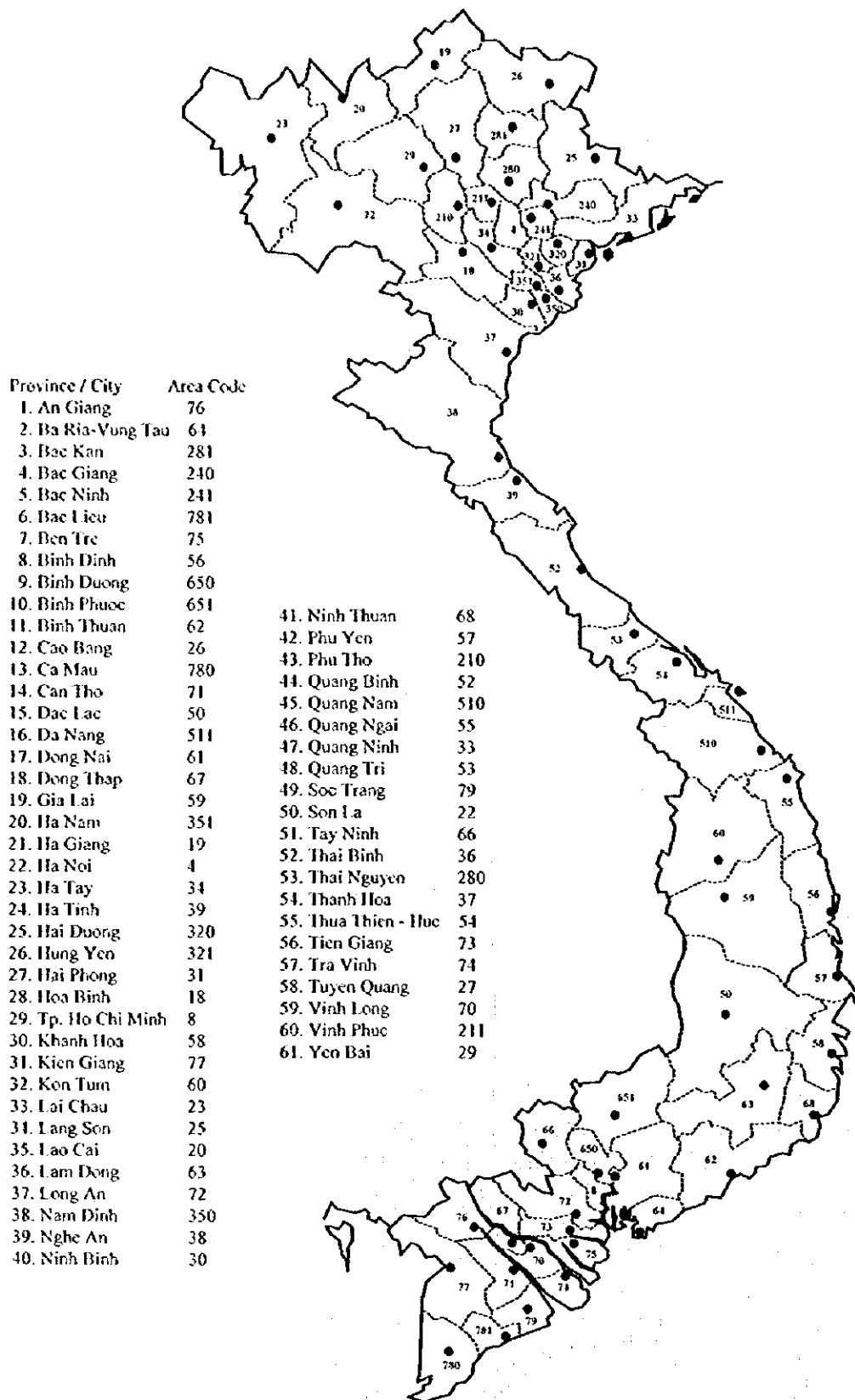


Figure 5.4.2-1 Area Code Allocation

5.5 Recommendation

5.5.1 Numbering Administration

DGPT planned to open up telecommunication market to outside companies. Under these competitive environment, it is recommended that independent regulatory authority for numbering administration should be established somewhere in DGPT and smooth transition of numbering administration from the State-owned Carrier (VNPT) to the independent regulatory authority (DGPT) should be made.

5.5.2 Numbering Plan Under Competitive Environment

It is recommended to review the numbering plan in Vietnam under the competitive environment. Guidelines of numbering plan for the following services are explained in this chapter; Fixed telephone service, Mobile communication service, Long distance and International service, and No.7 signaling numbering plan.

5.5.3 Numbering Plan in Vietnam

(1) Capacity of Subscriber Number

The number of digits for the subscriber number should be decided by taking into account the number of telephone demand in a closed numbering area (Province). The study result shows that subscriber number capacity shortage is expected to occur in some Provinces after 2010. The only way to increase the capacity is to add one additional digit on the top of subscriber number.

(2) Capacity of Area Code

Each province has its exclusive area code with one, two or three digits. Three digits were applied when a province was administratively divided into two. Though the existing area code allocation is not in order, it is difficult to change the allocation now. Combination of two and three digits of area code is unavoidable / inevitable, considering the number of provinces in Vietnam and the future "0AB(C)" numbering service such as cellular service, data service and new telephone services.

(3) Special Number

Three digits of special code are employed for special number. It is recommended

to review the special number in view of the nature of the service. For example, a Code "0125X" is used for access to data network (VDC), which is not recommendable. Because many private companies want to enter this kind of business such as ISP and should have the equal opportunity with VNPT(VDC). Equal access between the operators is a basic principle under competitive environment.

(4) Numbers for various services

To meet such diversified needs as cellular telephone, paging service, absence-information service, facsimile communication service, etc., DGPT needs some principles of numbering system. It is recommended that the "0AB(C)" numbering system should be used for expansion service such as cellular telephone which is interconnected to PSTN.

5.5.4 Number Portability

In order to introduce number portability at the earliest juncture, studies on the following matters (including study by standardization bodies involving the participation of the carriers) should be made among the carriers.

- (1) Standardization of signaling methods based on the method of implementation (including the signaling method for data concerning settlements among carriers)
- (2) Processing of applications from users for number portability
- (3) Processing among carriers in terms of the operation of number portability





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