

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

DEPARTMENT GENERAL OF POSTS AND TELECOMMUNICATIONS (DGPT)  
THE SOCIALIST REPUBLIC OF VIETNAM

**THE STUDY  
ON  
TELECOMMUNICATIONS DEVELOPMENT  
IN  
THE SOCIALIST REPUBLIC OF VIETNAM**

**FINAL REPORT**

**VOLUME II**

**TELECOMMUNICATIONS MANAGEMENT**

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**AUGUST 1999**

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**TOKYO JAPAN**

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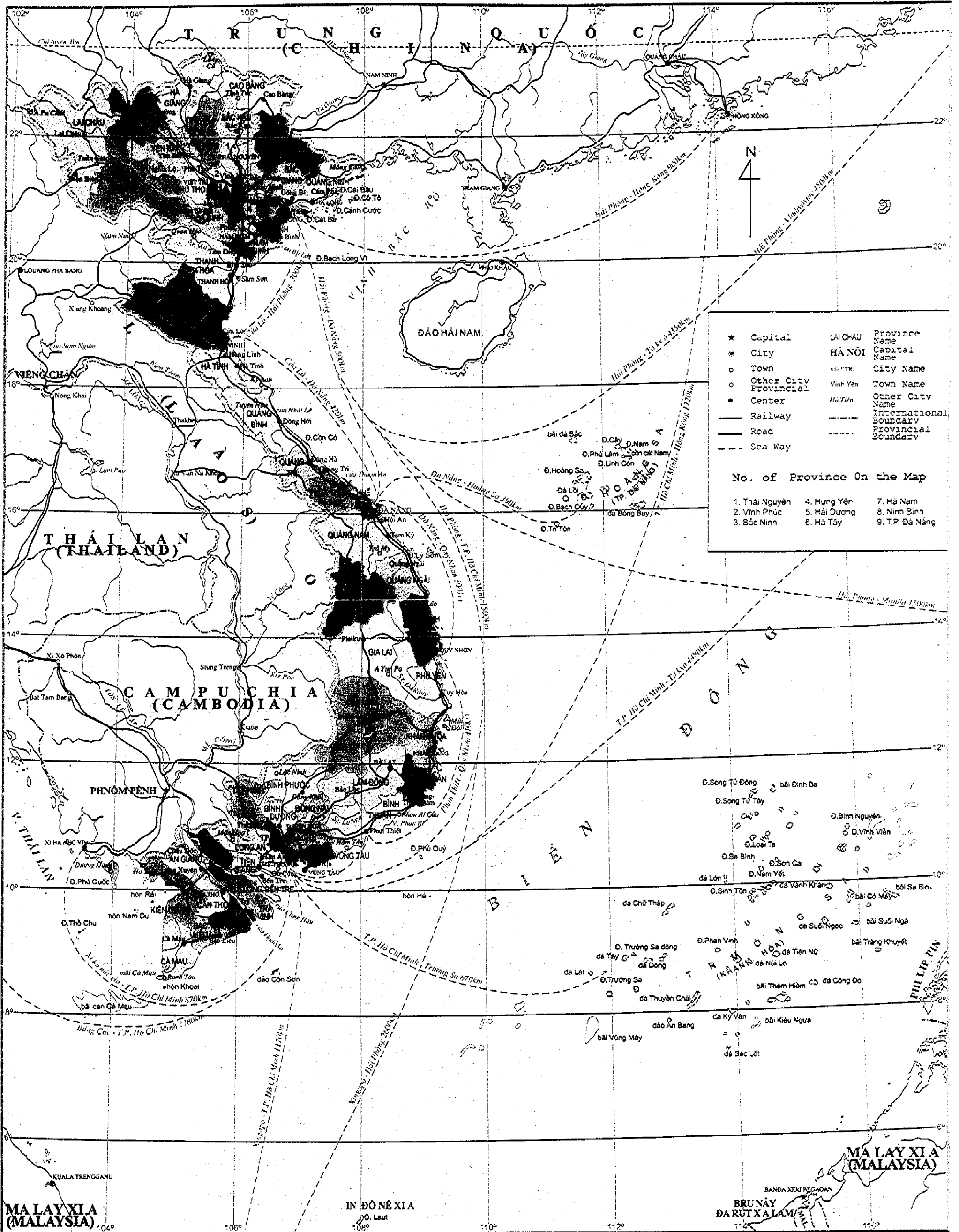
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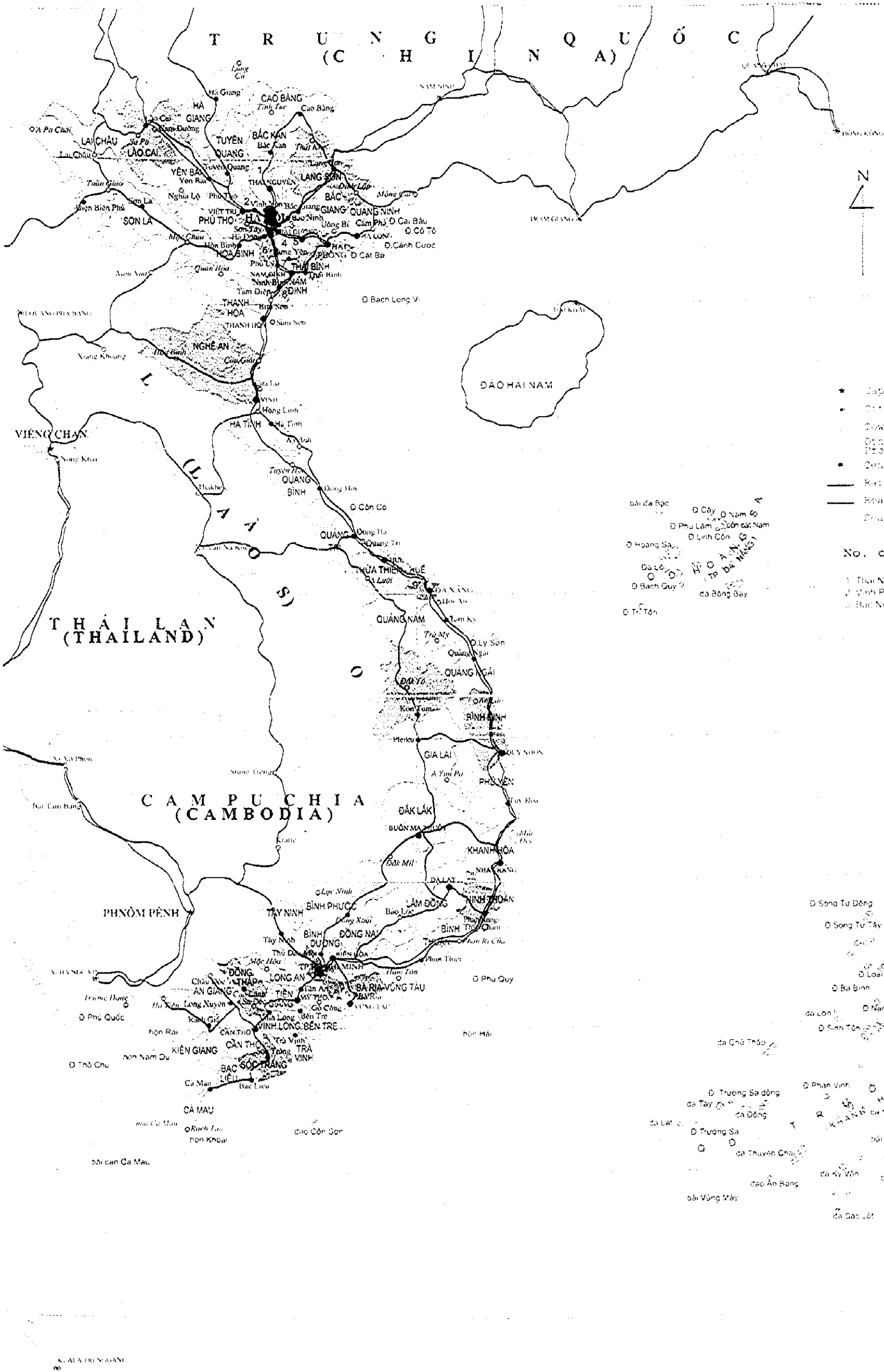
# THE SOCIALIST REPUBLIC OF VIETNAM



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# THE SOCIALIST REPUBLIC OF VIETNAM



- ★ Capital
- City
- Town
- Special City
- Provincial
- District
- Railway
- Road
- Ship Way

No. of Province On the Map

- |                |             |                |
|----------------|-------------|----------------|
| 1. Thái Nguyên | 4. Hưng Yên | 7. Hà Nam      |
| 2. Vĩnh Phúc   | 5. Hà Dương | 8. Ninh Bình   |
| 3. Bắc Ninh    | 6. Hà Tây   | 9. TP. Đà Nẵng |

MALAYXIA (MALAYSIA)

IN ĐÔNEXIA  
Đ. Lào

BRUNAY  
ĐARUTXALAM

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MALAYXIA (MALAYSIA)

## PREFACE

In response to the request from the Government of the Socialist Republic of Vietnam, the Government of Japan decided to conduct a master plan study on Telecommunications Development in the Socialist Republic of Vietnam and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Shiro Tamura of NTT International Corporation to Vietnam, three times between July 1998 and June 1999. In addition, JICA set up an advisory committee headed by Mr. Takayuki Hatazoe, Deputy Director, International Cooperation Division, International Affairs Department, Ministry of Posts and Telecommunications (MPT) between July 1998 and August 1999, which examined the study from specialist and technical points of view.

The team held discussions with the officials concerned of the Government of Vietnam and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Vietnam for their close cooperation extended to the Team.

August, 1999



Kimio Fujita  
President

Japan International Cooperation Agency



August 1999

Mr. Kimio Fujita  
President  
Japan International Cooperation Agency

Letter of Transmittal

It is our pleasure to submit to you the study report on Telecommunications Development in the Socialist Republic of Vietnam.

This report was conducted by NTT International Corporation, under a contract to JICA, during the period of July 1998 to August 1999. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Vietnam, and formulate the most appropriate master plan up to the year 2010, covering the whole territory of Vietnam, including state management for telecommunications, network plans, operation and maintenance plan, project evaluation, and recommendations.

We wish to take this opportunity to express our deep gratitude to the officials concerned of the Japan International Cooperation Agency and other authorities concerned of the Government of Japan. We would like to express our gratitude to the officials concerned of the DGPT, VNPT and other authorities concerned of the Government of Vietnam, the JICA Vietnam Office, and the Embassy of Japan in Vietnam for their cooperation and assistance extended to the study team in connection with the execution of their duties.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



Shiro Tamura

Team Leader

Study on Telecommunications  
Development in the Socialist  
Republic of Vietnam



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## Acronyms

### **A**

ADM	: Add-Drop Multiplex
ADS	: Active Double Star
ADSL	: Asymmetric Digital Subscriber Line
AFTA	: ASEAN Free Trade Area
AM	: Account Management
AMA	: Automatic Message Accounting
AMPS	: Advanced Mobile Phone Service
AN	: Access Node
ANSI	: American National Standards Institute
AP	: Affordability Parity
APEC	: Asia-Pacific Economic Cooperation
APT	: Asia Pacific Telecommunity
ARPANET	: Advanced Research Program Agency Network
ASEAN	: Association of South-East Asian Nations Conference
ASTAP	: Asia-Pacific Telecommunity Standardization Program
ATC	: Army Telecommunications Company
ATM	: Asynchronous Transfer Mode
AUC	: Authentication Center

### **B**

BCC	: Business Cooperation Contract
B-ISDN	: Broad-band Integrated Services Digital Network
BOT	: Build, Operate and Transfer
BRI	: Basic Rate Interface
BSC	: Base Station Controller
BSMS	: Base Site Management System
BTS	: Base Transceiver Station

### **C**

CAD	: Computer Aided Design
CAGR	: Compounded Annual Growth Rate
CAP	: Carrierless Amplitude/Phase modulation
CAPEX	: Capital Expenditure
CATV	: CAble TeleVSION
CBO	: Congressional Budget Office
CBR	: Constant Bit Rate
CC	: Country Code
CCR	: Call Completion Rate
CDMA	: Code Division Multiple Access
CDR	: Call Data Recording
CIC	: Carrier Identification Code
CIF	: Cost, Insurance and Freight
CIETECO	: Vietnam Telecommunication Equipment Co.
CKEY	: Central Key Economic Region
CLR	: Circuit Loudness Rating
CMTS	: Cellular Mobile Telephone Service
COKYVINA	: Post and Telecommunications Equipment Import-Export Service Corporation
CPE	: Customer Premises Equipment
CPI	: Consumer Price Index

CR	: Calling Rate
CRE	: Corrected Reference Equivalent
CSS	: Customer Service System
CTC	: Community Teleservice Centers
<b>D</b>	
DACOM	: Data Communications Corporation of Korea
DAMA	: Demand Assigned Multiple Access
D-AMPS	: Digital AMPS
DAN	: Da Nang Earth Station
DCF	: Discounted Cash Flow
DCN	: Data Communications Network
DEURAS	: Detect Unlicensed Radio Stations
DGPT	: Department General of Posts and Telecommunications of Socialist Republic of Vietnam
DLC	: Digital Loop Carrier
DMT	: Discrete Multi-Tone
DNC	: Destination Network Code
DOTC	: Department of Transportation and Communications
DP	: Distribution Point
DRMASS	: Digital Radio Multiple Access Subscriber System
<b>E</b>	
EC	: Electronic Commerce
EIRR	: Economic Internal Rate of Return
EPZ	: Export Processing Zone
ERMES	: European Radio Message System
ES	: Errored Second
ESR	: Errored Second Ratio
ETSI	: European Telecommunications Standards Institute
ETSIP	: Electronics and Telecommunications Standards Institute of the Philippines
<b>F</b>	
FCC	: Federal Communications Commission of the United States of America
FDI	: Foreign Direct Investment
FIRR	: Financial Internal Rate of Return
FLEX	: FLEXible paging system
FM	: Facilities Management
FOB	: Free on Board
FPT	: Financing and Promoting Technology
FR	: Frame Relay
FRB	: Federal Reserve Board
FTP	: File Transfer Protocol
FTTB	: Fiber-To-The-Building
FTTC	: Fiber-To-The-Curve
FTTCab	: Fiber-To-The-Cabinet
FTTH	: Fiber-To-The-Home
FTTZ	: Fiber-To-The-Zone
FY	: Fiscal Year
<b>G</b>	
GDP	: Gross Domestic Product
GMDSS	: Global Maritime Distress and Safety System



GMPCS	: Global Mobile Personal Communications System by Satellite
GNP	: Gross National Product
GOJ	: Government of Japan
GOS	: Grade of Service
GOV	: Government of Vietnam
GPC	: GSM, Paging and Card
GSM	: Global System for Mobile Communications
GW	: Gateway

## **II**

HAN-1A	: Standard-A earth station in Ha Noi
HCD	: Home Country Direct
HDSL	: High-bit-rate Digital Subscriber Line
HDTV	: High Definition Television
HF	: High Frequency
HLR	: Home Location Register
HRD	: Human Resource Development
HRX	: Hypothetical Reference Configuration
HSD	: High Speed Digital Transmission Service

## **I**

IAP	: Internet Access Provider
ICP	: Internet Content Provider
IDC	: Insulation Displacement Contact
IDD	: International Direct Dialing
IJJ	: Internet Initiative Japan
IMF	: International Monetary Fund
IMT-2000	: International Mobile Telecommunications 2000
IN	: Intelligent Network
INMARSAT	: the International MARitime SATellite service
INS	: Information Network System
INTERIX	: Internet Index
IOR	: Indian Ocean Region
IP	: Internet Protocol
IPLC	: International Private Leased Circuit
IRR	: Internal Rate of Return
IRU	: Indefeasible Right of User
ISC	: International Switching Center
ISDN	: Integrated Services Digital Network
ISP	: Internet Service Provider
ISTCC	: Indonesia Singapore Technical Coordination Committee
ISUP	: ISDN User Part
IT	: Information Technology
ITC	: International Telecommunications Center
ITS	: Integrated Transceiver System
ITSP	: Internet Telephony Service Provider
ITU	: International Telecommunications Union
ITU-T	: International Telecommunications Union Telecommunications Standardization Sector
IZ	: Industrial Zone

**J**

J/V : Joint Venture  
 JICA : Japan International Cooperation Agency  
 JTM : Jabatan Telecom Malaysia (Department of Telecommunications Malaysia)

**K**

KEY : Key Economic Region  
 KII : Korean Information Infrastructure  
 KT : Korean Telecom

**L**

LAN : Local Area Network  
 LDC : Less Developed Country  
 LE : Local Exchange  
 LEO : Low Earth Orbit  
 LES : Land Earth Station  
 LESO : Land Earth Station Operator  
 LLDC : Least among Less Developed Country  
 LR : Loudness Rating  
 LS : Lotus Station  
 LTM : Local Tandem Switch

**M**

MC : Maintenance Center  
 MD : Mediation Device  
 MDF : Main Distribution Frame  
 MEO : Medium Earth Orbit  
 MIC : Ministry of Information and Communications  
 MMAC : Multimedia Mobile Access Communication system  
 MOBIX : Mobile Index  
 MPI : Ministry of Planning and Investment (Vietnam)  
 MPT : Ministry of Posts and Telecommunications (Japan)  
 MRA : Mutual Recognition Arrangement on Conformity Assessment for  
 Telecommunications Equipment  
 MRI : Mitsubishi Research Institute  
 MS : Mobile Station  
 MS : Multiplex Section  
 MSC : Mobile service Switching Center  
 MSDN : Multi Service Data Network  
 MSS : Mobile Satellite System  
 MSU : Main Switch Unit  
 MSU : Multi Subscriber Unit  
 MT : Mini Terminal  
 MTBF : Mean Time Between Failure  
 MTP : Message Transfer Part  
 MW : Microwave System

**N**

NCC : New Common Carrier  
 NDC : National Destination Code  
 NE : Network Element  
 NII : National Information Infrastructure  
 N-ISDN : Narrow-band Integrated Services Digital Network

NKEY : Northern Key Economic Region  
 NMF : Network Management Forum  
 NMS : Network Management System  
 NPV : Net Present Value  
 NTC : National Telecommunications Commission  
 NTT : Nippon Telegraph and Telephone Corporation  
 NTTI : NTT International Corporation

**O**

OAM : Operation, Administration and Maintenance  
 OAN : Optical Access Network  
 ODA : Official Development Assistance  
 ODF : Optical Distribution Frame  
 OECD : Organization of Economic Cooperation Development  
 OFC : Optical Fiber Cable System  
 OLR : Overall Loudness Rating  
 OLT : Optical Line Termination  
 OMC : Operation and Maintenance Center  
 ONT : Optical Network Termination  
 ONU : Optical Network Unit  
 OPEX : Operating Expenditure  
 OPMC : Outside Plant Management Center  
 OPS : Optical Power Splitter  
 OS : Operation System  
 OSI : Open System Interconnection  
 OSP : Outside Plant

**P**

P & T : Posts and Telecommunications  
 PARTNER : Productive and Reliable Telecommunications Network for Radio Stations  
 PBX : Private Branch Exchange  
 PC : Personal Computer  
 PC : Primary Center  
 PCMC : Postal Construction Material Company  
 PCO : Public Call Office  
 PCS : Personal Communications Service (System)  
 PDC : Personal Digital Cellular  
 PDCA : Plan, Do, Check, Action  
 PDH : Plesiochronous Digital Hierarchy  
 PDS : Passive Double Star  
 PHS : Personal Handyphone System  
 PIP : Public Investment Program  
 PLMN : Public Land Mobile Network  
 POCSAG : Post Office Code Standardization Advisory Group  
 POI : Point Of Interface  
 PON : Passive Optical Network  
 POR : Pacific Ocean Region  
 POTMASCO2 : Posts and Telecommunications Material Supply Company 2  
 POTS : Plain Old Telephone Service  
 PRC : Primary Reference Clock  
 PRI : Primary Rate Interface

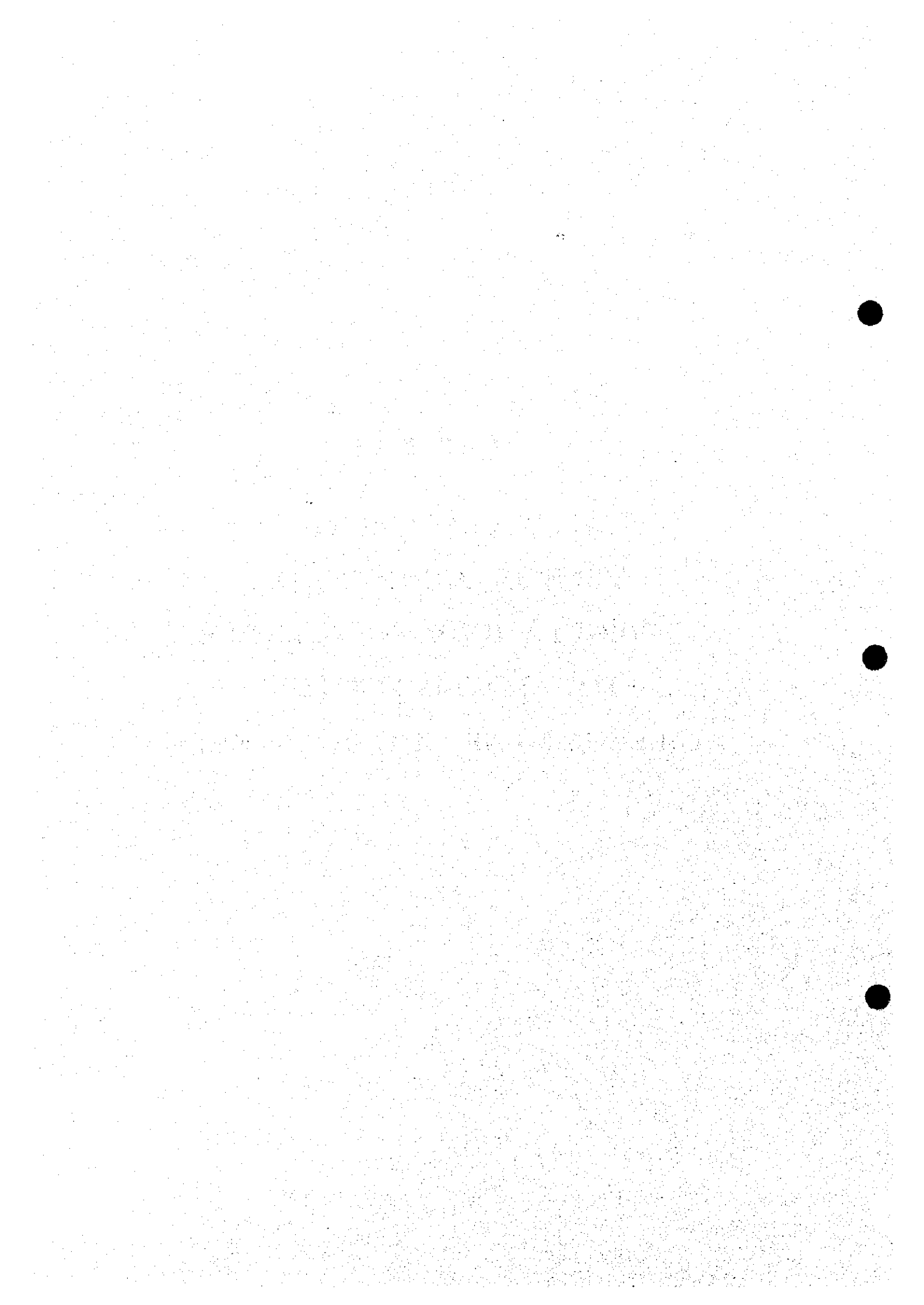
PSDN	: Public Service Data Network
PSPDN	: Public Switched Packet Data Network
PSTN	: Public Switched Telephone Network
PTD	: Post and Telegraph Department
PTIT	: Posts and Telecommunications Institute of Technology
PTO	: Post and Telecommunications Organization
PVC	: Permanent Virtual Circuit
<b>Q</b>	
QA	: Q Adapter
QOS	: Quality Of Service
<b>R</b>	
RB	: Radiocommunication Bureau
RE	: Reference Equivalent
RFD	: Radio Frequency Department
RGDP	: Regional Gross Domestic Product
RLR	: Receive Loudness Rating
RR	: Radio Regulations
RSU	: Remote Subscriber Unit
RU	: Repeater Unit
<b>S</b>	
SACOM	: Telecom Material & Cable Factory
SAIGON POSTEL	: Saigon Posts and Telecommunications Service Corporation
SASE	: Stand Alone Synchronization Equipment
SBE	: Standard-A earth station in Song Be City
SBV	: The State Bank of Vietnam
SCF	: Standard Conversion Factor
SCM	: Supply Chain Management
SCPC	: Single Channel Per Carrier
SCR	: Successful Call Rate
SDC	: Software Development Company
SDH	: Synchronous Digital Hierarchy
SDM	: Space Division Multiplexing
SDSL	: Symmetric Digital Subscriber Line
SE	: Secondary Center
SEA-ME-WE3	: South East Asia-Middle East-Western Europe Fiber Optical Submarine Cable Phase 3
SES	: Severely Errored Second
SESR	: Severely Errored Second Ratio
SKEY	: Southern Key Economic Region
SLA	: Service Level Agreement
SLR	: Send Loudness Rating
SMDS	: Switched Megabit Data Service
SMW3	: SEA-ME-WE3
SN	: Subscriber Number
SO	: Service Order
SOE	: State Owned Enterprise
SOHO	: Small Office / Home Office
SONET	: Synchronous Optical NETWORK
SS7	: Signaling System No.7

SSU	: Single Subscriber Unit
SSU	: Synchronization Supply Unit
ST	: Singapore Telecommunications Pte. Ltd.
STM	: Synchronous Transfer Mode
STP	: Signal Transfer Point
STP	: Switched Transit Plan
STS	: Site Transmission System
SU	: Subscriber Unit
SUS	: Site Utility System
<b>T</b>	
TAS	: Telecom Authority of Singapore
TCM	: Time Compression Multiplexing
TCU	: TDM Control Unit
TDM	: Tandem
TDMA	: Time Division Multiple Access
TM	: Telekom Malaysia Sdn. Bhd.
TMN	: Telecommunications Management Network
TOK	: Test OK
TTA	: Telecommunications Technology Association
TTC	: Telecommunication Technology Committee
T-V-H	: Thai-Vietnam-Hong Kong Fiber Optical Submarine Cable
<b>U</b>	
UIHF	: Ultra High Frequency
UNDP	: United Nations Development Program
UR	: Unavailability Ratio
USD	: United States Dollar
<b>V</b>	
V.A.T.	: Value Added Tax
VBR	: Variable Bit Rate
VDC	: Vietnam Data Communication Company
VDSL	: Very high-bit-rate Digital Subscriber Line
VDU	: Visual Display Unit
VHF	: Very High Frequency
VIETEL	: Military Electronic and Telecommunications Company
VINAMARINE	: Vietnam Maritime Bureau
VINSAT	: Vietnam Telecommunications Satellite
VISHIPEL	: Vietnam Maritime Communications and Electronics Company
VLR	: Visitors' Location Register
VMS	: Vietnam Mobile Service
VND	: Vietnam Dong (Currency Unit)
VNPT	: Viet Nam Posts and Telecommunications
VOD	: Video On Demand
VoIP	: Voice-over-IP-networks
VPN	: Virtual Private Network
VSAT	: Very Small Aperture Terminals
VTI	: Vietnam Telecom International Company
VIN	: Vietnam Telecom National Company
<b>W</b>	
WAC	: WLL Access Controller

W-CDMA	: Wide-band Code Division Multiple Access
WCS	: WLL Cell Station
WDM	: Wavelength Division Multiplexing
WLL	: Wireless Local Loop
WRC	: World Radiocommunication Conference
WS	: Work Station
WSU	: WLL Subscriber Unit
WTO	: World Trade Organization
WTX	: Wireless Telephone Exchange
WWW	: World Wide Web
<b>X</b>	
xDSL	: Digital Subscriber Line

**CHAPTER 1**

**STATE MANAGEMENT FOR  
TELECOMMUNICATIONS  
= REGULATIONS AND POLICIES  
TOWARD COMPETITIVE  
TELECOMMUNICATIONS MARKET=**





**CHAPTER I STATE MANAGEMENT FOR TELECOMMUNICATIONS  
= REGULATIONS AND POLICIES TOWARD COMPETITIVE  
TELECOMMUNICATIONS MARKET =**

**1.1 Outlines of Telecommunications Regulations in Vietnam and Neighboring Countries**

**1.1.1 Law and Regulations in Vietnam**

**(1) Law and Regulations**

Decree No.109/1997/ND/CP, released by the Government on November 12, 1997, governs all relationships in respect of post and telecommunications in order to enhance the effectiveness of State management, results in a rapid development and an effective operation of the post and telecommunications network and services to meet the demand for information and communications of the whole society. All post and telecommunications activities and all related activities of both Vietnamese and foreign organizations or individuals in Vietnam shall comply with the Decree.

The Decree consists of following chapters;

- I. General Provisions
- II. Post
- III. Telecommunications
- IV. Distribution of the Radio Frequencies and Radio Broadcasting Apparatus
- V. Post and Telecommunications Rates, Charges and Postage
- VI. Petitions and Compensation for Damage in Relation to Post and Telecommunications
- VII. Production, Assembly and Import of Post and Telecommunications Equipment and Materials
- VIII. Construction of Post and Telecommunications Works
- IX. Post and Telecommunications Enterprises
- X. Inspection and Dealing with Breaches

Other important legislation for understanding basic regulative structure are;

- Decision 85/1998/QD-TTg,
- Decision 99/1998/QD-TCBD (Prices and Charges),
- Decision 547/1998/QD-TCBD (Interconnection),
- Circular 1/1998/TT-TCBD (Quality),

- Circular 4/1998/TT-TCBD (Network and service) and
- Circular 3/1999/TT-TCBD (Tariff and Charge).

We would like to attach Decision 547/1998/QD-TCBD and Circular 4/1998/TT-TCBD for the convenience to understand main guideline for regulation as Appendix II-1-1 and Appendix II-1-2.

Appendix II-1-3 shows whole telecommunication related legislation in Vietnam

(2) Telecommunications Authority

The Department General of Posts and Telecommunications of the Socialist Republic of Vietnam (DGPT) is a Ministry of the Vietnamese Government. Until July 1995, it possessed undivided authority over the areas of telecommunications regulation and operation. In July 1995, the regulatory and operational roles were separated so that another body, the Vietnam Posts and Telecommunications Corporation (VNPT), was established and endowed with operational power.

The Government is in the process of carrying out administrative reforms, intended to eradicate bureaucracy and aid the introduction of a "one-stop-shop" policy. There have been three stages of reform in the investment approval process: the simplification of documents, no longer requiring a full study of feasibility but rather a statement of economic viability.

Industrial estates formed in order to reduce the post-licensing procedures. Approvals are to take piece between 15 and 20 days; and the granting of the license will be given within 60 days of application or within 30 days for small projects.

It was during the process of administrative reforms that reorganization occurred within the posts and telecommunications sector, resulting in the separation of the functions of telecommunications regulation and operation.

(3) Trends of Private / Foreign Sector Participation

In 1992, the National Assembly promulgated the Law of Private Business, Chapter One, Item Four of this law says that: "the State recognizes the long-term existence and development of Limited Responsibility Companies or shareholding companies". Since then, nearly 200,000 new private businesses have been established. The private sector has been involved in the telecommunications' network in Vietnam for many years through the medium of Business Corporation Contracts (BCCs'). One example of such an involvement is that of the Australian company, Telstra. It operates in Vietnam utilizing a BCC for the provision of international services and

some domestic services. The private sector has also been involved in the installation of switching equipment and transmission links.

The National Assembly of the Socialist Republic of Vietnam, at its eighth legislature, second session, has approved foreign investment in Vietnam, Chapter One, Article One of this law said that Vietnam "welcomes and encourages foreign organizations and private persons to invest capital and technology in Vietnam on the basis of respect for the independence and sovereignty of Vietnam, observance of the Laws of Vietnam, equality and mutual benefit. The State shall guarantee the ownership of the invested capital and other rights of foreign investors, and extend to the latter favorable conditions and easy formalities."

Chapter Two, Article Four says that foreign organizations and private persons may invest in Vietnam as any one of the following forms:

- A contractual business cooperation venture;
- A joint-venture enterprise or company, both referred to as a joint-venture; or
- An enterprise with 100 per cent foreign capital.

As of 1995, as direct consequence of this legislation, more than 1,500 projects have been granted licenses to invest in Vietnam. They are established as joint venture companies; fully foreign owned companies; BOT companies; and BCC companies.

The government continues to pass new legal and economic reforms in order to protect the interests of foreign investors.

The regulation on Posts and Telecommunications announces the state's encouragement for the promotion of Vietnamese and foreign investment in the construction and delivery of post and telecom services and in the manufacture of equipment in Vietnam.

(4) Outline of Standardization in Vietnam

Technical standard list is attached below:

**Table 1.1.1-1 Technical Standards in Vietnam**

No	Technical Standard	Code: year
1	Communication Cables - Technical Standard	TCN 68-132:1994
2	Fax equipments - Technical Standard	TCN 68-133:1994
3	Automatic Telephone - Technical Standard	TCN 68-134:1994
4	Protection of telecommunications plants agents lightning discharges	TCN 68-135:1994
5	PABX - Technical standard	TCN 68-136:1995
6	Digital microwave equipment - Technical standard	TCN 68-137:1995

7	GSM Telephone terminal - Technical standard	TCN 68-138:1995
8	Optical fiber communication system - Technical standard	TCN 68-139:1995
9	Protection of telecommunications lines and equipment against overvoltages and overcurrents - Technical standard	TCN 68-140:1995
10	Earthing of telecommunication constructions - Technical standard	TCN 68-141:1995
No	Technical Standard	Code: year
11	Technical standard for low speed modem over PSTN	TCN 68-142:1995
12	Cordless telephone equipment - Technical standard	TCN 68-143:1995
13	Rigid Polyvinyl Chloride pipes for underground cables - Technical standard	TCN 68-144:1995
14	PCM - 30 and PCM.120 equipments - technical standard	TCN 68-145:1995
15	Small digital exchange - Technical standard	TCN 68-146:1995
16	Paging systems - Technical standard	TCN 68-147:1995
17	CT2/CT2 PLUS equipments - technical standard	TCN 68-148:1995
18	Telecommunications equipment generic climatic environmental requirements	TCN 68-149:1995
19	RAX - 12B Exchange regulations on operation and maintenance	TCN 68-150:1995
20	Radio and industrial interference - protection procedures	TCN 68-151:1995
21	Network termination for NB-ISDN- Technical standard	TCN 68-152:1995
22	Cable duct and cable connected box - Technical standard	TCN 68-153:1995
23	Very low bit rate videophone - Technical standard	TCN 68-154:1995
24	ISDN telephone set - Technical standard	TCN 68-155:1995
25	34 Mbit/s microwave equipment - Technical standard	TCN 68-156:1995
26	140 Mbit/s microwave equipment - Technical standard	TCN 68-157:1995
27	140 Mbit/s microwave equipment - Technical standard	TCN 68-158:1995
28	34 Mbits/s digital multiplex equipment - Technical standard	TCN 68-159:1995
29	Optical fiber cables - Technical standard	TCN 68-160:1995
30	Protection of telecommunication systems against interference from electric power lines - Technical standard	TCN 68-161:1995
31	48 DCV Power plant for telecommunication equipment - Technical standard (TS)	TCN 68-162:1996
32	Signaling system No.7 - specification (Basic document)	TCN 68-163:1997
33	Signaling system No.7 - Specification (message transfer) -	TCN 68-163A:1997
34	Signaling system No.7 - specification ( For ISDN-ISUP users)	TCN 68-163B:1997
35	Bit error rate and jitter of digital transmission links - Technical standard and measurement procedures	TCN 68-164:1997
36	Digital circuit multiplexer - Technical standard	TCN 68-165:1997
37	Card payphone system - technical standard	TCN 68-166:1997
38	Protecting devices against overvoltages and overcurrent from lightning discharges and electric power lines - Technical standard	TCN 68-167:1997
39	VSAT earth station - Technical standard	CN 68-168:1995
40	Specification of signaling system R2 - Technical standard	CN 68-169:1998
41	Telecommunication Network Performance Technical Requirement.	TCN 68-170:1998
42	Timing characteristics of primary reference clock Technical Requirement	TCN 68-171:1998
43	Interfaces for Interconnection Technical Requirement	TCN 68-172:1998
44	Optical Interfaces for Equipments and Systems Relating to the Synchronous Digital Hierarchy Technical Requirements.	TCN 68-173:1998
45	Code of Practice for Lightning Protection and Earthing for Telecommunication Plants	TCN 68-174:1998
46	Physical / Electrical Hierarchical Digital Interfaces Technical Requirement	TCN 68-175:1998
47	Telecommunication Service on the PSTN QoS Standard.	TCN 68-176:1998
48	Optical Fiber and Microwave Transmission System base on the Synchronous Digital Hierarchy Technical Requirement	TCN 68-177:1998
49	Multipair Metallic Telephone Cables for Local Networks Technical Requirement (Replace TCN 68-132:1994)	TCN 68-132:1998

## 1.1.2 Trends of Telecommunications Policies for Competition in East Asian Countries

### (1) Overview

Since late 1980's to late 90's, Asian countries experienced higher economic growth rather than developed countries. That economic growth caused strong demands for telecom services. Asian countries are proceeding deregulation and development of infrastructure to catch up those demands. Particularly, mobile communication sector is growing all over Asia.

However, monetary crisis that is spreading over this region since July 1997 effects East Asian telecomm sector. Slow down of economic growth should bring shrink of demands for telecomm services. This section set key words "privatization," "competition" and "advanced telecommunications infrastructure" for describing trends in East Asian telecommunications sector.

### (2) Privatization

There are some steps for privatization of telecommunications carriers. These are separation of regulatory body and business organization, public corporatization, equitization, initial public offering and private own of majority stocks. In late 1980's, developed countries separated postal and telecom services and privatized their Postal and Telecommunications Organizations (POTs). East Asian countries follow that trend of deregulation.

Japan equitized Nippon Telegraph and Telephone in 1985. Malaysia equitized Telekom Malaysia Sdn. Bhd. (TM) in 1987. Indonesia equitized PT Telekomunikasi Indonesia in 1991. Singapore equitized Singapore Telecommunications Pte. Ltd. (ST) in 1992. These governments reduce stocks gradually that government own. In 1997, Korea and Taiwan take step to initial public offering of their Korean Telecom (KT) and Chunghwa Telecom Co., Ltd.

Because many Asian economies privatized their POTs, main state 100 percent owned telecom carriers are China Telecom, Telephone Organization of Thailand and Communications Authority of Thailand, Vietnam Posts and Telecommunications.

Some East Asian countries re-organize their regulatory body for enhancing transparency of regulation, and optimizing of regulation and preparing convergence of telecommunication and broadcasting in Multimedia ages.

Table 1.1.2-1 Trends of Privatization in East Asian Incumbent Telecom Carriers

As of August 31, 1998

Country	Carrier	Separation of Regulative and Business Organizations	Separation of Regulative and Policy Making Bodies	Separation of Telecom and Postal business Organizations	Deregulation for Connection of Customer Premises Equipment	Public Corporatization	Equitization	Initial Public Offering	Selling of Majority Stocks
Indonesia	PT Telkom	Done	Not Yet	Done	Done	Experienced	Done	Done	Not Yet
	PT Indosat	Done	Not Yet	Done	Done	Experienced	Done	Done	Not Yet
Malaysia	Telekom Malaysia	Done	Legislated	Done	Done	Experienced	Done	Done	Not Yet
Philippines	PLDT	Done	Done	Done	Done	-	Done	Done	Done
Singapore	S'pore Telecom	Done	Not Yet	Done	Done	Experienced	Done	Done	Not Yet
Thailand	TOT	Done	Planned	Planned	Done	Done	Planned	Planned	Not Yet
	CAT	Done	Planned	Planned	Done	Done	Planned	Planned	Not Yet
Vietnam	VNPT	Done	Not Yet	Not Yet	Not Yet	Not Yet	Not Yet	Not Yet	Not Yet
China	China Telecom	Done	Not Yet	Done	Not Yet	Not Yet	Not Yet	Not Yet	Not Yet
Hongkong	HK Telecom	Done	Done	Done	Done	-	Done	Done	Done
Taiwan	Chung-Hwa T.	Done	Planned	Done	Done	Experienced	Done	Done	Not Yet
Japan	NTT	Done	Not Yet	Done	Done	Experienced	Done	Done	Not Yet
	KDD	Done	Not Yet	Done	Done	Experienced	Done	Done	Done
Korea	Korean T.	Done	Not Yet	Done	Done	Experienced	Done	Done	Not Yet

Note: This is a trial to see deregulation in East Asia in a table. It is difficult to distinguish "Done" or "Not Yet" in some items. For example, "Separation of Regulative and Policy Making Bodies" in Singapore is classified "Not Yet." However, some ministry other than Telecom Authority of Singapore set some policy matters like National Computer Board and Ministry of Information. "Public Corporatization" in Vietnam is also difficult to classify.

Korean government has formed Ministry of Information and Communication in 1995, re-organized former Ministry of Posts and Telecommunications and Ministry of Information.

China decided to create the new Ministry of Information Industry that will absorb Ministry of Posts and Telecommunications, Ministry of Electronics Industry and parts of Ministry of Radio, Film and Television in March 1998. The re-organization will mean major staff reductions in the national telecom bureaucracy.

Malaysian parliament passed Communication and Multimedia 1998 Bill in July. The law provides policy-making authority to Ministry of Information and Ministry of Energy, Post and Telecommunications. However, newly forming Communication and Multimedia Commission will have regulatory authority. Indonesian government has moved Department General of Post and Telecommunication from Ministry of Tourism, Post and Telecommunication to Ministry of Transportation. Then the government renamed the ministry as Ministry of Communications. Thai government arranges Telecommunications master plan that includes newly establishing independent National Telecommunication Commission would regulate telecommunications sector.

### (3) Competition

Next section of this report considered funding for development of telecommunications infrastructure. Many countries adopt competition in telecommunications sector for endowment of private and foreign capital. Easily becoming competing telecom markets are sectors that have difficulties caused technological development in service supplies by the government, for example value added services. There is reason to bring up New Common Carriers (NCCs) for reducing telecom charges and enhancing telecom services in strong incumbent carrier existing market. In Asia, with divergence in degree by countries' competition is usually introduced first in value added services or data communications services, then in mobile communications services, then it finally expanded into fixed telecommunications services. Since World Trade Organization (WTO) regime has successfully opened basic telecommunications service market and competitive policy dominates the world, pressure for deregulation is surged.

In Korea, 1991, Data Communications Corporation of Korea (DACOM) became a competitive telecom carrier in data and international telephony market. DACOM was also permitted to serve domestic long distance telephony in 1995. Shinsegi

Telecom Inc. has been licensed as second mobile telephone carrier in 1994. Korea Mobile Telecom, former subsidiary of KT, sold majority equities to private sector. That company was renamed as SK Telecom Inc. After 1996, Korean government de-regulate telecom market widely, ONSI Telecom Inc. become domestic long distance and international telecom carrier, HANARO Telecom Inc. would enter local telephony market, 3 companies enter into PCS market. Telecommunications Business Act that will enact at 1 January 1999 allows foreign direct investment into facility based Korean telecom carriers and foreign majority ownership except KT.

In Malaysia, Malaysian government prepared competitive environment for telecom carriers in early 90's. The government issued six basic telecom licenses and seven cellular licenses since 1993. In 1996, the government would like to limit number of full service provider to three. But that attempt failed. The government increased limit of foreign direct investment from 30 percent to 49 percent in February 1998. If foreign telecom carriers increase their investment, it spurs merge and acquisition in Malaysian telecom market. Malaysia introduced sweeping capital control measures that imposed restrictions on foreign trading of Malaysian shares in October 1998. However, the company that has Multimedia Super Corridor Status should not affect these new limitations. Malaysia would like to keep pace for development of Information Technology sector.

In Taiwan, there is heated discussion about competition in fixed network market after 2001. National Telecommunications Commission plans to issue two full service carrier licenses, two long distance carrier licenses and three international carrier licenses. There are six cellular telephone service providers in Taiwan. Limit of foreign direct investment to telecom sector will be increased from 20 percent.

In Hong Kong, there are three basic telecom service providers, four cellular telephone service providers and six PCS service providers. China allows second service provider, Rien-ton (China Unicom), in long distance and some cellular telephone markets.

In Philippine, Philippine Long Distance Telephone Company monopolized Philippine telecom market. However, after Philippine Telephone Corp. (Piltel) was licensed mobile telecom market in 1991, Philippine government arranged competitive market environment in all telecom service sectors. National Telecommunications Commission divided Philippine in 11 regions and licenses to second service providers in 1993. The commission issued one more telephone service license in each region. The government aims to speed up delayed development of telecom infrastructure in some regions. If the government aims



work, licensees that can not lay contracted line numbers gave up their license or merge with other carriers.

In Indonesia, The government permits duo-poly by PT Indosat and PT Satelit Palapa Indonesia competition in international telecom markets and limited competition in cellular telephone market.

In Thailand, the Chuan Cabinet approved Telecommunications Master Plan in November 1997. In line with this Plan, two public companies, TOT and CAT, will be equitized and release 49 percent of their stocks that includes 25 percent strategic selling to foreign telecom carrier. IMF put Thailand conditionalities for bailing out that require privatization and competition in telecom market.

In Singapore, second fixed network service provider, StarHub Plc., will compete with Singapore Telecom Plc. (ST) after April 2000. The government plans to invite another carrier in year 2002. Mobile One Plc. have already competed with ST by services and tariffs in mobile telecom market since April 1997.

**Table 1.1.2-2 Competitions in Telecom Service Markets in East Asia**

Country	1996 Main Line Penetration Rate (Cellular)	Local	Long Distance	International	Cellular Telephone
Indonesia	2.10 (0.28)	Monopoly	Monopoly	Duo-poly	Competition
Malaysia	18.32 (7.39)	Competition	Competition (3)	Competition (3)	Competition
Philippines	2.58 (1.38)	Competition	Competition	Competition	Competition
Singapore	47.85 (10.25)	Monopoly (2 from 1999)	-	Monopoly (2 from 1999)	Duo-poly (3 from 1999)
Thailand	6.99 (2.50)	Monopoly	Monopoly	Monopoly	Competition (4)
Vietnam	1.58 (0.10)	Monopoly	Monopoly	Monopoly	Competition (3)
China	4.46 (0.56)	Monopoly	Duo-poly	Monopoly	Duo-poly
Hongkong	53.25 (12.97)	Competition (4)	-	Monopoly	Competition
Taiwan	46.60 (4.52)	Monopoly	Monopoly (Planning)	Monopoly (Planning)	Competition (6)
Japan	48.80 (8.15)	Competition	Competition (5)	Competition (4)	Competition (5 + 3PHS)
Korea	43.26 (7.02)	Duo-poly	Competition (3)	Competition (3)	Competition (2 + 3PCS)

(4) Activities of Standardization

(a) Reformation for Standardization Activities in ITU

An approval process of recommendations in both the standardization sectors in ITU is permissible only for Member States, by voting in the special cases, so far. On the other hand, there is a clear recognition that Sector Members have been leading the work to create recommendations based on their technical resources. However, the participation of Sector Members in approval process could not be provisionally admissible. This brought into Sector Members such a fact that it should be difficult to draft recommendations in favor with them and at the same time, ITU has been playing no role as a charming standardization organ to them for a long term, further adding to take much time by the completion of recommendations. In this line, it looks like naturally indispensable destination that Sector Members are going to transfer their energy to the regional or forum standardization activities, consequently "de dure" standard in ITU are being slighted.

In order to defeat this tendency, ITU approved during the Plenipotentiary Conference held in Kyoto, Japan, 1994, two Resolutions 14 and 15 which resolve a recognition and review of the rights and obligations of all Sectors Members. Based on two resolutions and Resolution 39 defining to strengthen the financial base in ITU, ITU-2000 was organized to examine above-mentioned resolutions and the reform of ITU. Recommendations submitted to the Minneapolis Plenipotentiary Conference from ITU-2000 were unanimously approved after having been examined and rearranged, and provided as Resolution COM 5/12 in the final act of the conference. The summary of the resolution is as follows:

- (i) each Sector may adapt its own working methods and procedures for the approval of Questions and Recommendations to meet its needs;
- (ii) Member States and Sector Members on the cooperative basis may take procedures for the approval of Questions and Recommendations excluding matters which have policy or regulatory;
- (iii) the prime role of Members States in all Sectors is in approving Questions and Recommendations on matters which have policy or regulatory implications.

The rights able to participate in approval process which were newly granted to Sector Members reflect such a practical status that the work for standardization no longer can carry out without the cooperation of Sector Members. However, ITU, in return, is expecting with privatization effect that this measure must be

epoch-making in order for ITU to conform to the present technology innovation era as well as a motivation of calling back to the standardization activities in ITU, Sector Members who are moving their activities to the regional or forum standardization organs.

(b) Standardization Policy in developed countries

(i) Standardization Policy in USA

Technologies in USA which developed during the east-west tension were gradually released to private sectors and especially, in the telecommunications field, hardware and software relevant to computers remarkably progressed. At present, as a result, Internet became a system well known in the world which must able to call it "de facto" standard. This fact stems from such US policy that the standardization activities in the private sectors should be activated by US aiming at a small government and completely being an assistant.

As mentioned above, it seems like indispensable trace that US would not go to "de dure" standard which the state plays a significant role for standardization but to "de facto" standard centering forum activities.

(ii) Standardization Policy in Europe

EU schemed as one state and one market has commenced its movements and is aiming to promote prosperity over the region under the common legislation and restriction to all habitants and companies such as free of transportation, free of tax, common of certificates, beginning with the use of common currency.

Concerning standardization on telecommunications, ETSI (European Telecommunications Standardization Institute) was established based on a concept being common to the region. At present, EU is newly creating its own standard as regional one and technical developments through the ETSI's activities.

Standard settled by ETSI significantly affects the adoption of standard in South and Central America countries, and South-East Asia countries through the relationship between the suzerain states and colonies in the past. The acquisition of ETSI's standard is more unavoidable than ITU's to deploy the telecom businesses in there regions. In order to succeed in the businesses in EU, it will be dispensable for the companies to have technical sites in the region.

(iii) Standardization Policy in Japan

Japan is continuing its standardization activities under a fundamental telecommunications policy for standardization which strengthens an organization on implementation and cooperation in forum activities.

On the other hand, APT (Asia-Pacific Telecommunity) has recently established the ASTAP (APT Standardization Program) as a principal body to promote the cooperative relationship on standardization activities in the Asia-Pacific region. However, ASTAP doesn't seem to aim not only at drawing up a regional standard in the Asia-Pacific and submitting it to ITU but at an integrated market strategy in the region. Although Japan is financially supporting ASTAP to the future prospective, it has already started with any kind of concern.

Based on these aspects, it will be real situation that Japan, no having world-widely used products which may be assigned to "de facto" standard, cannot help carrying out the standardization activities and telecom businesses centering "de dure" standard in ITU.

(c) Standardization Trend in the Asia

(i) Korea

As a member of NIES, Korean was in remarkable economical situation in the past and achieved to enter OECD for some period consisting of only the developed and industrialized countries. However, although it encountered Asian financial concern in 1997 and went back again to the rank of the developing countries, the infrastructure in all kind of fields are much consolidated which cannot compare with that in other Asia countries. An index indicating the present status of telecommunications industries such as "R&D and HRD", "Production techniques", "Privatization and telecom business" and "Standardization activities" is located on the highest position. Korea well recognizes that the standardization activities would greatly affect telecom businesses so that it established TTA (Telecommunications Technology Association) in the year of 1988 in order to promote a technical improvement in telecommunications industries and economical activities all over the country. At present, TTA consist of the full members of 99 companies, 19 observers and 8 supporting organizations, and is deploying vital activities.

(ii) Malaysia

Malaysia will be situated as the most advanced one among the ASEAN

countries except Singapore in relation to a domestic consolidation status of various infrastructures, industrial activities trend and so on. However, it is true that an implementation demand in domestic telecom network is supplied in large part by products overseas. Malaysia, in order to acquire a know-how on the specification of international standard and the implementation of products, is tackling the establishment of a standardization system and the allocation of the staffs. Malaysia understands that the standardization must be unavoidable process in order for the domestic industries to bring near to the world and has just started its standardization activities in the view of stopping a technical gap with the world.

Taking into account of these present status, Malaysia established in 1996 the ITU Malaysia (called also ITU Forum) suitable for the information and telecommunications era in the 21 century to encourage the domestic telecom industries. ITU Malaysia has three Working Groups, they are in charge of ITU-T, ITU-R and ITU-D, respectively. Under the system, Malaysia is aiming to submit contributions to ITU as a up-stream and on to settle domestic standard as a down stream. However, no contributions have submitted to ITU yet.

Among the system, Working Groups 1, 2, and 3 are in charge of the matter on ITU-R, ITU-T and ITU-D, respectively. JTM (Jabatan Telecom Malaysia), TM (Telecom Malaysia) and Celcom (one of new common carrier) are responsible for the management and operation of Working Groups 1, 2 and 3, respectively. Each of the Working Groups has the same number of SGs in ITU to cope with each study. Contributions drafted in the Working Groups are submitted to ITU through consideration in ITU-Malaysia. The Director General of JTM is designated as the chairman of the steering committee.

In 1998, the Malaysia administrations have announced to reform its organizations. The communications and multimedia commission will manage the ITU Malaysia from April 1st, 1999.

On standards and certification system for radio equipment, JTM (Department of Telecommunications Malaysia) is in charge of all management and operations such as testing of equipment, grant of certificates, and so on. Imported radio equipment certified by foreign certification body have to be certified again by the certification body in Malaysia. In addition, mutual recognition with other countries of test

data and certification is under the status of no recognition.

(iii) Indonesia

The present status of telecom industries in Indonesia reported in 1996 that "R&D and IIR" is fairly active, "Production techniques" is being supplied by a various kind of home products, "Privatization and telecom business" is fully active and "Standardization activities" begins the down-stream and up-stream activities. However, the consolidation of domestic telecom networks, as same as in Malaysia, is almost supplied by the products overseas. IIR program for standardization is being promoted to understand their specification and to settle the domestic standard in conformity to the products overseas.

Taking an occasion when the operators overseas were admitted to participate in telecom market in Indonesia, Indonesia established in 1996 a standardization promotion system and enthusiastically carried out to encourage domestic telecom industries and to ensure its position on telecommunications in the world.

KTT-SGT which is organized to implement the standardization management on consists of a several number of specialized committees. Concerning telecommunications, TELKOM committee is in charge of its matters under which the working groups responsible for Study Groups of ITU-T and ITU-R are assigned. The management and coordination of each of the committees and working groups are also controlled by KTT-SGT.

In the case of the up-stream, contributions nationally approved by KTT-SGT are proposed to ITU passing through DGPOSTEL. On the contrary, in the case of the down-stream, after ITU recommendations are first accepted by DGPOSTEL, they are informed to telecom operators through KTT-SGT and each of the committees. Domestic standard is regulated by KTT-SGT and announced by DGPOSTEL.

Indonesia has already passed the stage of only the down-stream since 1995 and entered the stage of the up-stream, actively proposing their contributions and dispatching the delegates to a various kind of the ITU meetings. At the same time, R&D which assists the standardization activities, is also remarkably functioning.

DGPOSTEL provides decrees on certification and the labeling of telecommunications equipment. Based on the decree, DGPOSTEL's Decree No.34/1995, all telecommunications including radio

communications equipment must have the certificates before used in Indonesia. Terminal equipment is not permitted to be used without type approval certificate and suppliers may not sell the terminal equipment not having the type approval markings (label).

Indonesia has set up the bilateral cooperation between Indonesia-Singapore which is known Indonesia Singapore Technical Coordination Committee (ISTCC) and one of cooperation matters is that DGPOSTEL gives a recognition of the test result from Telecom Authority of Singapore (TAS) for ISDN terminal equipment. This procedure is also allowed by the above decree. In the near future, Indonesia has a plan to establish its own laboratory facilities for certification process with a higher priority to execute the testing.

(iv) Thailand

The Director General of the Post and Telegraph Department (PTD) is assigned as the national telecommunications regulatory and licensing authority. Concerning a standardization program in Thailand, because of mainly promoting the national telecommunications network consolidation by means of a fund from the overseas, Thailand has devoted the program to the down-stream standardization activities since the past. By this reason, Thailand's own standardization activities and R&D are greatly behind compared to other Asian countries similar to economic situation. Up to the present, announcement on the establishment of a system for standardization or its inauguration and R&D is not informed.

Concerning standard and certification system for radio equipment, PTD is responsible for the issuance of various type of licenses to all the radio communication equipment. The Communications Engineering Section under PTD undertakes pre-licensing tests on equipment fabricated in Thailand and imported from the overseas. Before introducing any equipment for use either as a stand alone item or as part of links or networks, type approval certificate by PTD is necessary for them. Mutual recognition process with other countries of test data and certifications is not implemented yet.

(v) Philippines

The Department of Transportation and Communications (DOTC) and the National Telecommunications Commission (NTC) are entrusted to all the matters on telecommunications in the Philippines.

The Philippines established in 1994 the ETSIP (Electronics and

Telecommunications Standards Institute of the Philippines) to launch a standardization program. However, because of economic stagnation for a long time, ETSIP was in no fully functioning situation. Recently, accompanied with the political situation being stabilized, the Philippines starts to verify the standardization program and actively promotes the invitation of seminars from the overseas to meet the program.

NTC is mandated to establish, promulgate, implement and enforce technical standard as well as rules and regulations for the effective use of telecommunications facilities. To carry out this mandate, the Equipment Standards Division enforces the NTC technical standards by performing type approval tests on radio communications equipment which are to be used in the country. These technical tests are performed at the Equipment Standards Laboratory.

Imported communications equipment with certificates overseas is necessary to take again the Philippines' certificates. Concerning mutual recognition with other countries of test data and certification, it is being implemented but not yet on a large scale. In addition, mutual recognition is still being discussed and deliberated upon a policy level.

(5) **Advanced Telecommunications Infrastructure**

East Asian countries target to promote information technology (IT) industry as a leading industry of next century. Some countries are planning and developing National Information Infrastructure.

Korean government plans to construct Korean Information Infrastructure (KII) before 2015. The KII is including two net works. One of them is the New Korean Net Government that connects central government, local government and non profit organizations. Another one is New Korean Net Public that will be installed by telecom carriers.

Singapore government has pushed IT2000 plan since 1980's. Core of the project is Singapore ONE, wide bandwidth multimedia network, that Telecom Authority, telecom carriers and CATV company are installing. ONE starts their pilot services in June 1998. Malaysia is developing Multimedia Super Corridor in Kuala Lumpur area. The project links new administrative city, new airport and IT industrial park. The government prepares some incentives for the companies would like to invest in the MSC.

Indonesia and Thailand also plan IT infrastructure development project that called NUSANTARA-21 and GI-Net each.



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## 1.2 Environment of State Management for Telecommunications

### 1.2.1 Competition and Legal Framework

#### (1) Reasons for Introducing Competition

There is necessity of private capital participation to develop the telecommunications sector. The market entry is the most radical means to endow private capital into the sector. New private corporations that have licenses to provide telecom services should compete with former state-owned corporation in the sector and each other. Liberalization and deregulation are key to the competition in the telecom market, the development strategy and enhancing the process of distribution or redistribution of telecommunications services.

We would like to start this section with considering reasons for introducing competition in the sector. Examples are derived from the most competitive telecom market, the United States of America. There are at least two reasons for concern about the pace of competitive entry in the telecommunications industry.

The first is the obvious. Economic and other benefits to consumers results from access to new products and services. New products, such as wireless telephone connections, are replacing older ones and offering enhanced services as in the case of wireless telephony, mobility, and improved data transmission. Some of the newer services may prove particularly beneficial to individuals interested in living and working in remote areas. For example, Internet access is quickly demonstrating its ability to help create new business. Through the process known as "telecommuting", employees can work at home or at remote sites without losing effectiveness. Entire new businesses, like direct marketing centers or data processing centers, are now more easily located in rural areas and connected to the entire country through modern telecommunications. Moreover, simply giving consumers new choices expand their horizons in both their personal lives. Many expect competition in local phone or cable service to improve quality of service, and competition in the provision of like services, such as long-distance telephony, can also lower prices.

A serious problem is that regulation can and does sometimes delay introduction of new technologies. The classic case of this phenomenon is the nearly two-decade delay in Federal Communications Commission of the United States of America

(FCC) licensing of cellular telephony. That delay costed the American economy over \$85 billion in foregone growth and consumption by one estimate. The regulatory gridlock that afflicted cellular telephony in the 1970s also locked in technology choices that were outdated and highly inefficient by the time they reached the broad markets in the mid- 1980s. Television and cable TV were long in coming to the US market after the Second World War, and in the current environment, personal communications services (PCS) and advanced TV have been slowed from general market entry by the FCC's extreme caution in licensing procedures. Digital radio signals from satellites broadcast to cars and homes have also not yet been approved for service by the FCC.

Second, there are measurable economic benefits to be derived from efficient and timely introduction of new technologies. These benefits are both microeconomic and macroeconomic, and both static and dynamic. Unreasonable delays in the introduction of new telecommunications technologies or distortions in investment due to regulation of prices result in the economy's functioning at less than maximum efficiency moreover deprive consumers of the convenience. In some cases, like that of analog-cellular telephony, slow implementation of new systems also results in deployment of technologies that are out-dated or inefficient by the time they are widely used. Hindering the full deployment of new technologies may also reduce the growth rate of the industry and the overall economy. Costs associated with so-called dynamic effects are likely to be greater than the "static" welfare costs in many instances.

American businesses now spend well over \$200 billion per year on capital investments in telecommunications and information technology hardware, and many more tens of billions on related software and training. Annual investment in these new technologies now almost doubles the \$130 billion devoted by American companies to new industrial machinery. The payoff of these enormous inputs is higher productivity and increased corporate profits.

Innovations in means to produce goods and services are now of greater value and analytic significance in the modern economy than the simple act of producing goods itself. Ideas are becoming a more important element of the modern economy than the simple production of material goods. Ideas can be transmitted easily through modern telecommunications but also through mechanisms such as foreign investment, in which ideas understood as better ways of producing things are a

valuable part of the package. It is not only that new ideas can help us produce old goods more efficiently or create entirely new classes of goods desired by consumers; the process of rapid innovation itself has an extremely beneficial impact on the way the economy functions and grows.

The digital revolution will leave us with valuable information processing tools for the future. Because searching will be cheaper, market incentives will cause us to search more. Technological change and economic growth therefore will be more rapid. The best example of growth is in the information industry. The rapid advance in the processing speed, memory capacity, and communications abilities of computers has "induced" software producers such as Microsoft and Netscape to create new software and new uses for the vast new processing capacities, which are made available at increasingly lower prices. In turn, the new user-friendly applications dreamed up by businessmen and hackers then maintain a feedback mechanism to hardware producers to produce bigger and faster machines and to push additional innovations and stoke the spiral of success in the industry.

We are now starting to see a process in the telecommunications industry as the two becoming increasingly intertwined. As switching and transmission capacities grow in step with computer power and new digital-transmission technologies, new services are emerging, and their prices are falling. New services such as high-capacity data and video services in many ways are a response to transmission-capacity additions and the concomitant decline in the prices of transmitting digital bits.

## (2) The Role of Regulator in the Competitive Market

### (a) Crucial Role of the Regulator

Regulator has crucial role to form competitive telecom market. Rule setting should affect structure of the market. In the country where has European type Post and Telecommunications Organization (PTO) regime, like Vietnam and Japan, most important regulators' role is to set conditions of competition between former state owned monopolistic carrier and new common carriers. Regulator of the telecommunications sector should (i) set and maintains conditions for fair and effective competition and (ii) removes harmful influences from large and monopolistic incumbent carrier.

This direction toward competitive telecommunications market improves

efficiencies of management in the incumbent carrier, former monopolistic PTO. Improved incumbent carrier brings benefits to the people. The telecommunications carrier that managed efficiently is very attractive for investors from private sector and foreign countries. Efficient management with cutting cost and lowering service charges brings benefits to the customer. At last, efficient managed telecommunications networks realize economic development like described in 1.2.1.

(b) Check points for regulator

In general, there are two main tasks for regulator. The first is regulation to form fair and effective telecommunications market. The second is policy to spread benefit of telecommunications on all of the people in the country. Later task is able to replace another expression, "universal service".

Toward forming competitive market in telecommunications sector, there are some check point to be considered by the regulative authorities that have PTO in the market.

(i) Progression toward separation of subsidiaries

Regulator should separate incumbent carrier and its subsidiaries to set conditions that improve fair and effective competition and to rationalize the cooperate structure. Each company should disclose their balance of accounts.

(ii) Smooth inter-connection

Regulator should guide incumbent carrier to set points of inter-connection and set conditions to smooth inter-connection between incumbent and new carriers.

(iii) Creation of open network architecture

Regulator should make conditions for inter-connection clear from both view points of technical side and economical side. For fair and effective competition, subsidiaries of incumbent carriers and new common carriers could connect with incumbent network in same terms.

(iv) Observation of cross-subsidies

Regulator let incumbent carrier to unbundle their network costs and specify the each cost. Regulator also should prohibit cross-subsidization to competitive services from other services. Incumbent carrier should specify terms of service provision to subsidiaries and provide them to new common carriers in same terms.

(v) Protection of management information of new carriers

Incumbent carrier can have management information of new carriers through negotiations for inter-connection. Regulator should take measures to keep this confidential information.

(vi) Openness of available data and information

Incumbent carrier has accumulation of data and information through long time business experience. Regulator let incumbent carrier to open their data and information, such as basic technical information of the network, information concerning standardization, research and development reports.

(vii) De-regulation of customer premises equipment (CPE)

Regulator should simplify regulation of customer premises equipment and connect them to network by only type approval test. This simplification stimulates the market of CPE.

(3) Demerits of Competition

Private capital, whether domestic or foreign, will be invited into competitive market. Behavior of private corporations has decided by the profitability. Private capital does not prefer to enter non-profitable market. For example, rural area does not have many households that can afford telecom services, poor and squalid populated urban area also can not afford telecom services, provision of telecom service to remote area costs large amount of investment, these areas dose not bear much profits to the service operator. That is the problem who installs telecom facilities of non-profitable sectors or areas.

The government should owe responsibility that provides telecom service to all people. The government consider the way to provide telecom services for these non-profitable areas. Universal service obligation is an answer for this question. We consider universal service in later section.

In generally, the public sector has to develop telecom infrastructure till certain telephone penetration rate achieved. Governments or public organizations of developing countries can not afford to finance these projects by their capital. Therefore telecom development projects should use foreign capital to install telephone networks. However, the government should control these capitals to match with national economic development strategy.

## 1.2.2 Inter-Connection and Access Charge

### (1) Overview: Pricing and Inter-Connection

Technological and economic underpinnings of the telecommunications industry will change drastically in the competitive markets. Reliance on market forces is necessary, if a truly efficient interconnected network is to evolve. New investment is to take place at the proper rate, and customers are to receive the full benefits of the dynamic new technologies. A central conundrum facing regulators since the inception of competition will be what terms and conditions should be required - where one of the firms is sufficiently dominant that its voluntary cooperation cannot be relied upon- for access between firms that compete with each other but also use each other's services and/or facilities to round out their own. New competitors will be using competitors' facilities, as well as (perhaps) their own to provide service to customers.

For most customers of telecommunications companies, the ability to reach other customers anywhere, anytime, and regardless of which service provider(s) those other customers have chosen to deal with is a critical element of service. If a provider was unable to deliver a full service to its own customers, the competitive handicap would be crippling - even if that firm was the most efficient provider for its particular set of services and/or customers. This reality was recognized at the earliest stages of long-distance competition in the United States of America. Precisely because Congress recognized the importance of a unified over-all network to competitors and customers alike, the Telecommunications Act of 1996 imposes on all carriers a broad duty to interconnect with other carriers. The development of competition in the interstate long-distance marketplace, with its lengthy and disputatious access-charge proceedings and ultimate requirement of structural separation for the former Bell system, illustrates the complexity and difficulty of managing network-interconnection issues where a portion of the interconnecting market remains a monopoly. The Telecommunications Act of 1996 itself has extended its requirements beyond a general duty to interconnect with other networks and service providers. It has also imposed requirements for re-selling incumbents' services and for making available on an unbundled basis the elements of the incumbents' networks.

### (2) Pricing Inter-Connection

Pricing Inter-Connection require important regulatory actions and, increasingly, a

willingness to refrain from detailed regulation as opportunities for reliance on market forces become evident. To understand better what is required of regulators as competition begins to unfold, we consider the basis for discussion of pricing, access, and interconnection policies.

The attraction of a free and competitive market has stemmed from its ability to marry the demands of customers to the supply decisions of producers in a manner that realizes potential efficiencies as completely as possible. In an efficiently functioning market, the right mix of products and services is produced and consumed in the right quantities. The cost/value is reflected in the price. Both producers and consumers base their consumption, production, and, indirectly, investment decisions on price. Considerable attention must be paid to whether prices reflect real values and alternatives in the product and services markets.

Interconnection itself will be utilized efficiently only to the extent that their prices accurately reflect their costs. Organizing the industry so as to produce telecommunications services depends as much on pricing that accurately reflects costs as on correct prices for customers in the final goods and services markets. Setting prices in ways that maximize economic efficiency has not always been the primary goal of regulators seeking what are "just and reasonable" rates. Considerations of equity and fairness and of economic development have combined over the years with sheer political considerations to generate prices that often have at best only a tenuous relationship to the underlying costs of providing service. Access, interconnection, and end-user charges have all been affected by such considerations.

The introduction of competition put considerable strain on traditional practices under the monopoly environment. The central point is that prices, whether they are set by competitive markets, by noncompetitive markets, by regulators, or by some other administrative structure, will drive the decisions of consumers and producers alike. Arbitrary decisions will have enormous consequences for efficiency in telecommunications markets, and frequently for the worse. The way access charges have led to seriously overpriced long-distance service and underpriced local service. These access charges, which long-distance companies pay exchange carriers for originating or terminating calls, are not set at levels reflecting the economic costs of providing this service. This and other deviations from economically efficient pricing can be sustained as long as there are sufficient



barriers to entry.

The lowering of barriers, as a result of changing technology on the one hand and changing policies on the other, sounds the death knell for cross subsidies and economically inefficient pricing. Although a competitive and technologically advanced telecommunications network promises great benefits to society in the aggregate and over time, in the short term and in particular situations some groups may experience reduced benefits. Virtually all aspects of telecommunications competition policy have been made more difficult by the "social" or "political" pricing practices.

(3) Access Policies and Regulated Competition

There are two policy problems to be addressed. The first is how to open and restructure the industry so that competition will have an opportunity to flower and yield the improvements in productive and allocative efficiency that the technological and organizational revolutions taking place can make possible. The second problem, very closely intertwined with the first, is how to manage both past and continuing subsidy flows as competition is introduced. The introduction of competition into all aspects of the telecommunications industry will bring efficiency benefits.

Local-exchange service is regulated and is frequently politically sensitive, or at least many regulators have believed this to be the case. Local rates directly affect virtually every subscriber in a very direct way. They are easy to focus on political problems. Although the formal justification of such policies is that low basic rates are necessary to maintain universally available access to the telephone system, it seems equally or more likely that the availability of a regulatory process and some notable successes in keeping local rates low have created in some segments of society the notion that low basic rates are a fundamental entitlement. There can be little doubt the force behind the idea of affordability has had a real impact on telephone pricing. Only the availability of a regulatory process that can create subsidies and is subject to political influence has made this possible.

Access charges are the other set of prices that has received considerable attention by regulators in recent years. These charges are above economic cost, but not because of either inefficiency or monopoly profits. Rather, these charges stem directly from policies designed to keep local-exchange rates low enough to meet

political needs. Access charges are used to keep local rates low -- that is, to cross-subsidize them. A coincidence of several factors has facilitated and encouraged this cross subsidy. First, barriers to entry into the industry made it possible for regulators and companies to set prices for individual services without regard to cost. Only the overall revenues had to be equal to the total cost of business in order to ensure the constitutionally mandated reasonable rate of return. Within that overall constraint there was an enormous amount of flexibility. Second, technological trends led to steadily falling real telephone prices over time. The cost reductions were particularly rapid in the long-distance area. This would have meant that those prices declined more sharply than local-exchange prices. The third factor explains the choice: toll usage was concentrated in a fairly small fraction of business and residential customers. In contrast, every customer used local service, and regulators --as well as telephone companies-- were quick to recognize where their political interests lay.

An obvious fact about telephone service is that to make or receive any calls at all, you must first be connected to the network. There is a real cost to establishing this connection even if you never make a call or receive one. By virtue of merely standing ready to do either, the subscriber imposes an identifiable cost on society. Cost-causative pricing principles, the principles that apply in competitive markets, would require that each subscriber pay the costs --that is, of being hooked up to the network-- that he or she has imposed on society. Local-exchange price levels are to be political and judgmental matters rather than an economic determination.

In the competitive market, prices will eventually be forced toward costs in the absence of a source of competitively neutral funding for underpriced services. In effect, the total cost of services was arbitrarily divided into local and long-distance, or inter- and intrastate, portions. The effects of inefficient pricing on stimulating a more efficient industry through competition are troubling as well. Underpricing of service at the local level, and particularly in rural areas where prices are often a great deal below costs, makes entry very unattractive to non-subsidized firms.

### **1.2.3 Universal Service and Universal Access**

#### **(1) What Service Will Be Classified in Universal Service?**

We start consideration of universal service with some definitions in some organizations.

International Telecommunication Union (ITU) recognizes universal service that "The services, the charges and the safeguards shall be the same for all users in each category of correspondence without any priority or preference."

European Committee states in their Green Paper that "universal service is taken to mean: 1. Provided with general geographical coverage; 2. Provided on demand to all users on reasonably the same terms regardless of the users' location within the service providers territory or franchise area and the cost of connection to the network."

Organization for Economic Co-operation and Development (OECD) conclude universal service as below.

Universal service then needs to be broken down into its constituent elements, each with its appropriate form of target and monitoring.

(a) Universal geographical access.

Under this heading an operator could be required to make available given standards of connection for a specified range of services in different regions and different sized population centers within a specified time scale. The extent to which certain regions were being prioritized, and the cost/benefits of such prioritization, could then at least be made transparent. Failure to meet targets could then, in a regulated commercial system, be subject to penalties and in a public system would be more open to political accountability;

(b) Universal affordable access.

As a policy goal this assumes that telecommunication services are not like other goods and services and thus as far as possible economic barriers to 100 per cent penetration should be removed. Operators could be required to plan investments and adopt pricing policies so as to achieve given penetration rates, within a given time-scale, region by region. The achievement of this goal could be monitored by penetration rates for given socio-economic groups. In addition the relation between telecommunication service tariffs, disposable income and telecommunication usage could be monitored. Explicit policy decisions could be taken within this framework as to whether to subsidize given user groups and if so how;

(c) Universal service quality.

Quality of service indicators could be agreed with the operator and agreed targets could be required and monitored, with failure to meet targets being subject to penalty, such as rebates to customers whether within a universal basic quality of service it was appropriate or feasible to have different levels of quality at different prices could then be considered and transparently administered;

(d) Universal tariffs.

Here as with quality of service the key question is to what extent price discrimination between market segments or geographical locations should be allowed. In particular should volume discounts to large users be seen as a breach of this principle? The regulatory question is to what extent, such price discrimination unfairly distributes system costs and benefits and the relation between such price discrimination and other universal service goals.

In all the above cases, even when applied to voice telephony, there is a need to be precise as to what is meant by access. Does it mean access to a domestic or business telephone on demand or is access to a public telephone sufficient?

The importance of making these distinctions is that policy makers can then decide that it is appropriate to deliver one form of universal service and not another, for instance universal geographical availability and not affordability. It also enables one to differentiate between different effects of liberalization.

(2) Why Rural ?

The reason to develop rural telecommunications is that communication should be a basic need of the people. All the people like to keep in touch with what is going on around them. Telecommunication network will help communication without commuting. Rural areas with a habitat of few people have the same legitimate to access to a telephone as their counterparts in urban areas.

Adding that reason of human basic needs, economic development now more often depends on human resources, telecommunications, and information-processing infrastructure. In the provision of goods and services, reliable telecommunications infrastructure makes geography and distance irrelevant. Rural education and medical services also face wrenching changes. Rural schools generally lack the funds to attract the specialized teachers necessary for courses like basic sciences

and foreign languages. To take these courses, rural students must be entered to larger regional schools.

When high-quality telecommunications is available in rural areas, for example, facsimile communication will be improve slow and unreliable mail delivery in rural areas. Data communication will realize access to centralized data bases, whether for libraries, inventory control and ordering, or updating of government records from remote areas. Electronic mail and computer conferencing should save time or travel costs. Demands for access to a wider range of educational opportunities under restricted educational budgets have led to growing interest in distance education using telecommunications.

### (3) Policy Setting for Universal Service

One of the most important, contentious, and poorly understood policymaking issue is how to update universal-service policy to meet the needs of a changing political, technological, and economic environment. This issue is another aspects of competition in the telecommunications market as set in 1.2.1.

In the United States, the Congress and the Clinton administration have emphasized the need to expand universal service. As a result, "universal service" contained in the Telecommunications Act of 1996 could result in a broad and costly expansion of the program.

Resolving the issue of universal service is vital to the success of the overall project of introducing more competition into the telecommunications industry and providing new and better services to telecommunications customers. To start, a great deal of money-direct and indirect subsidies to customers and suppliers, investment incentives, and distribution of revenues between segments of the industry is at stake. An aggressive subsidy program, furthermore, would undoubtedly render the job of deregulating prices more difficult as a political matter. And, if certain advanced services are mandated as part of the universal-service program in the absence of broad consumer acceptance, investment incentives could be weighted heavily toward economically inefficient or at least non-optimal technologies.

Historically, the social policy goal of universal service has been served through a system of massive intra-industry transfers of funds, with the primary flows being

from business and toll service users to basic residential subscribers, and from urban to rural exchanges. Before the competitive market formed, these transfers were accomplished largely within the corporate umbrella of the telecom carrier that have exclusive rights of business. Since then they have been maintained by a complex, gerrymandered set of rules governing transfers among carriers. System of transfer, rooted more in political compromise than economic logic, was sustainable when there was a single monopoly network. However, competition is the natural enemy of cross-subsidy and the emergence and continued growth of competitive suppliers makes it doubtful that current mechanisms for managing these transfers can be maintained much longer.

Former days, definition of the telecommunications infrastructure has largely reflected concerns with monopoly providers of common carrier services. The growth of competitive suppliers means that, for policy purposes, that definition must be expanded to incorporate the facilities and functionalities of new, increasingly diverse and competitive industry players. Most components of the traditional public telephone network either are, or soon will be, competitively supplied. For example, terminal equipment, toll services, and business services are all available from increasingly sophisticated competitive providers, and competition in residential services appears imminent.

(4) History of Universal Service

The historical background of universal-service policy is ill understood and has often been misstated in order to advocate certain policies. The current understanding of the term universal service dates only to the late 1960s or early 1970s. Milton Mueller defines the concept that "In contemporary policy discourse, universal service is virtually synonymous with government policies designed to pro-mote the affordability of telephone service and access to the network."

As currently applied under government policy, universal service refers to a system of direct and indirect subsidies that essentially maintains basic residential service at rates deemed affordable by regulatory authorities. Subsidized access at this time generally is limited to basic telephony and emergency services for individual consumers in the United States. The primary justification for this subsidized access is that "most Americans regard telephone service as a necessity."

Many economists believe that it might be "socially efficient to subsidize access to

the telephone network" because of various social and economic benefits that would accrue as a result. This is the "externality" argument, which attributes some economic value to having as many people as possible hooked up to the network in order to raise the value of the network to all users.

An origin myth, appealing as it may be to egalitarian instincts, lacks historical credibility. Instead, the term universal service was coined by the visionary head of AT&T, Theodore Vail, for the altogether mundane purpose of eliminating competition in telephone service and creating a monopoly for his company. Vail's inventive if self-serving creation marked the beginning of the end of a colorful chapter in American entrepreneurial history, one in which competition helped to spread the fruits of a new technology. The reality of the contemporary universal-service program, by way of contrast, reached maturity only in the late 1960s and early 1970s.

After Alexander Graham Bell's early patents on telephone service expired, toward the end of the nineteenth century, vigorous competition in telephony flowered throughout most of the United States. In 1904, dual service was available in over 60 percent of American cities with populations larger than five thousand. Almost twenty-three hundred cities enjoyed competition in telephone service. The Bell systems tended to target the dense and lucrative markets, especially those with an ample supply of business customers. The smaller and more rural markets thus were available to the plethora of independent companies that sprang up to meet Americans' apparently insatiable demand for the novel service. Despite the comparatively high cost, by modern standards, of the new service, especially since most cities had two, separate wired systems, competition spurred rapid growth in subscribership. Dual service propelled both systems into a race to wire all parts of the country and attract as many customers as rapidly as possible. The early and vigorous competition in the U.S. market helped produce a broad expansion of telephone service at an early date, in contrast with the anemic rate of growth in Europe, where systems were state monopolies from the start.

In the first decade of the century, the Bell system began to contemplate a new growth strategy. This was to extol the practical and economic benefits of a single, unified service. Vail first started using the term "universal service" in about 1907. Businesses were beginning to see the benefits of unified service; Bell was beginning to tire of competition and also to see the tangible economic value of offering wider

access to its customers; and the new state regulators saw benefits in centralized control. Taking advantage of these circumstances to secure monopoly control of the system, Vail began to argue for the value of universal service. In his vision, "Universal service did not mean rate subsidies to make telephone service more affordable. It meant the elimination of fragmentation and the unification of telephone service by regulated local exchange monopolies."

Gradually over the next twenty years, the Bell system absorbed many of its competitors and offered interconnection to systems with which it did not compete. In 1934, US Government legislated Communications Act of 1934 and established Federal Communications Commission (FCC). However, the Act did not have either the explicit term or the echo of the contemporary concept of universal service. In the 1930s, sparked by the *Smith v. Illinois Bell* Supreme Court ruling, regulators began to allocate or "separate" certain fixed costs, in particular those associated with local loop connection to the network, into local and toll categories. This ruling marked the beginning of the complex system of cross subsidies still used today, although the modern concept of universal service was still not a factor in the cost-allocation decisions of regulators.

Household penetration rates continued to expand in the U.S. in the 1940s and 1950s, despite the lack of significant subsidies to support access. As rate regulation grew more complex with the growth of the industry and the increasing sophistication of services in the 1950s and 1960s, regulators gradually began to favor explicitly residential rates at the expense of long-distance and business rates. Thus was born the practice of "allocating" costs beyond real economic costs to long-distance services as a means to keep retail rates for local service reasonable, a practice that over time grew increasingly prominent in the theory and practice of regulators.

In 1970, after a series of federal-state cost-allocation disputes, the so-called Ozark plan for "separating" costs between various services finally capped the evolutionary process and enshrined the concept of subsidizing local service. It was reasonably simple for regulators to effect these subsidies, given the monopoly in the industry. It was also at about this time that the visionary and risk-friendly pioneers of microwave technology, Theodore Gockken and William McGowen, began to develop a competitive long-distance company that started out by marketing itself to business customers. Since the "separations" process kept long-distance rates much higher than their economic costs (which meant that prices did not fall as



rapidly as technological advance would have allowed), there was a ready market for the new competitive service. The new long-distance competitor grew rapidly after gaining a foothold, a process that complicated the cost-allocation practices used to support local subsidies.

The final step in the creation of the origin myth of universal service dates to this period of early and intense competition in the long-distance market. In 1975, Congress sought a legislative solution to the emerging competition in telecommunications. The situation was both taking business from AT&T and threatening to upset the cross-subsidy scheme favoring local telephone service. The Justice Department had, moreover, filed an antitrust suit to break up AT&T in 1974, and the company hoped that congressional action would deflect this threat as well. In this struggle the concept of universal service was redefined in a way that linked it to the practices of regulated monopoly. Regulated monopoly and its separations and rate regulation practices were retroactively credited with making telephone service universally available and affordable. The problem of long-distance and later, cellular, competition was solved by the 1979 FCC decision to impose interconnection charges in excess of economic costs on competitive providers for their access to the existing local network. In this manner, then, competitors to the old AT&T monopoly were required to contribute a share (unrelated to cost or usage) to the subsidy scheme now known as universal service.

After creating global competition in the telecommunications marketplace, Technology and technical advances played a vital enabling role. Developed and developing countries see a central role for information and telecommunications technologies in developing their economy. Paradoxically, in this vision of the information society, governments will have less control over the key technologies and their deployment, while their economic and social importance will have grown. The somewhat optimistic result would be a more caring society with a higher quality of life. Echoing statements by US Vice President Al Gore, there are warnings that:

The main risk lies in the creation of a two-tier society of haves and have-nots, in which only a part of the population has access to the new technology, is comfortable using it and can fully enjoy its benefits. There is a danger that individuals will reject the new information culture and its instruments. (Al Gore, 1994)

This will require physical access in the home or some nearby location. It also requires a willingness and knowledge of how to make use of the facilities. It is far from clear how these conditions will be satisfied.

The new entrants of the 1990s have not been subject to the same, often implicit, obligations to provide universal service. Nonetheless, many licensees have been required to build national coverage or at least significant coverage, for example, 90% of the population. In the UK, cable television companies are claiming success in selling telephony to those who have previously not had a telephone. They have over 1,000,000 telephone lines to residential and business customers.

Competition has reduced prices. Excessive tariffs have been challenged by the use of call-back, calling cards, International Simple Resale (ISR) and through the formation of the European Virtual Private Network Users Association. The result of these changes has been to undermine the position of PTTs and to drive out cross-subsidy, forcing them to re-balance their tariffs. The areas where tariffs have risen or may rise are in line rentals and in some instances for local calls which have important implications for universal service, since it most seriously affects the poor. Recent attempts to do this in Germany and Italy have faced vociferous resistance from consumers and the interventions of governments.

Following the lead of Japan and the United Kingdom, privatization has spread around the world. One result has been substantial cash flows to governments which have been used to pay off government borrowing and to reduce taxes; not the most obvious social benefits. It has also attracted massive investments by individuals in pursuit of profit from growing markets. In many cases this change from a state agency is providing difficult. Politicians have been reluctant to release control and regulators have taken time to assert their authority and independence. One of the problems has been to define the universal service obligation. The obligation is emphasized by regulated companies in the expectation of a reward for shouldering the burden of universal service; though it is by no means certain that it incurs a loss.

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*Telecommunicatins Sector Reform in Asia* (World Bank Discussion Paper 232), USA

### 1.3 Recommendations for Policies and Regulations

Toward establishment of competitive telecommunications market in Vietnam, there are many tasks that the government should solve. Vietnamese government just has been at the start point to transform monopolistic telecommunications market into competitive one. In another word, beginnings of 21st century is the transition period of telecommunications industry from monopoly to competition. The government should prepare many regulations and basic policies for smooth transition for competitive telecommunications market. But the government should take step by step approach for this transformation. Figure 1.3-1 shows issues of state management in this transitional period. Those issues spread over whole telecommunications sector. Vietnamese government should face those issues and decide solutions for transformation of telecommunications market. Structure of telecommunications authorities, legislation and policies become basis for regulations, industrial policy and resource management. Development of human resource and management also composes that basis.

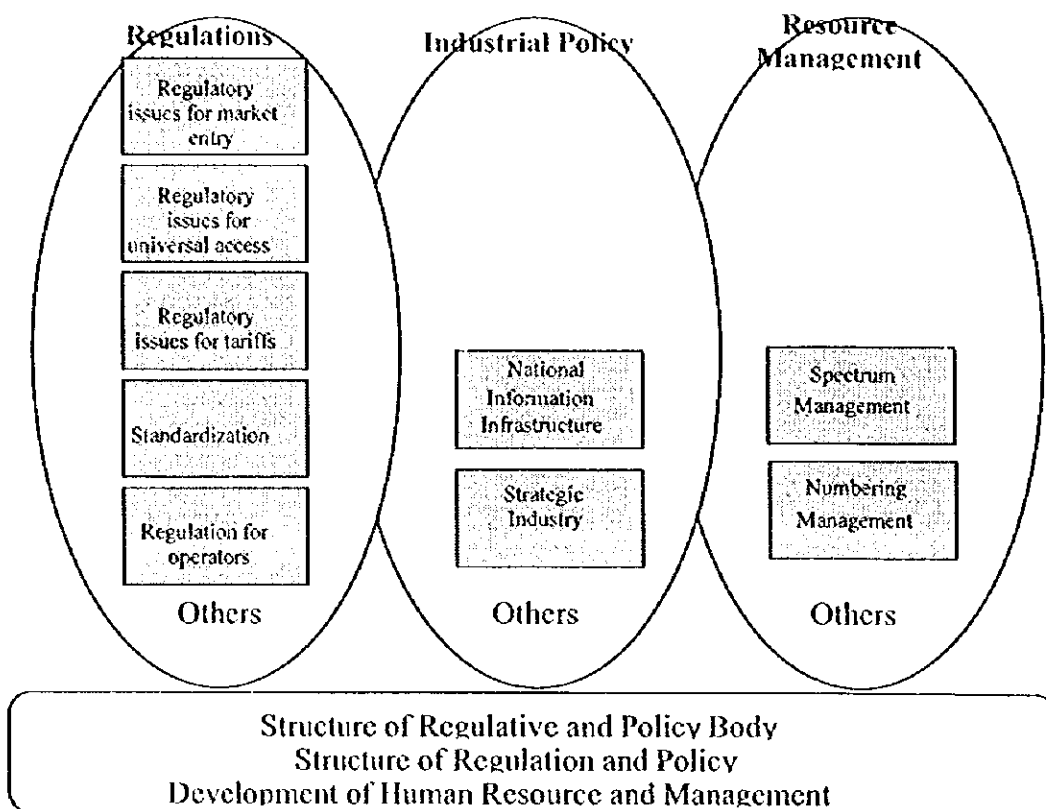


Figure 1.3-1 Issues of state management

This Volume II includes research and recommendations for State Management. This Chapter 1 mainly treats regulative and legislative issues in competitive telecommunications market. Fields of resource management, spectrum and numbering, have close relationship with government regulations. However, regulations for those fields heavily depends on technical matter. We would like to treat them separately in other Chapters, 4 and 5.

All policy and regulative settings are complied with “fair and clear” principles. Basically “fair” means that all decisions should adhere to non discriminative manner for all participants. Regulative authorities have to prepare firm criteria for judgment whether decision of the government will bring welfare to majority of the Vietnamese people. “Clear” means that all decisions should be made within directions of law and regulation. “Clear” also have equivalent meaning with “transparent” in another expression. These two principles should be required in competitive telecommunications environment. You can see those words ( fair and non-discriminatory, clear and transparent) almost all materials that treat policy and regulative improvement, not only in telecommunications sector.

Key provisions in the “reference paper” on regulatory principles in the 1997 WTO Telecommunications Agreement are spread those six areas; competitive safeguards, interconnection, universal service, licensing criteria, independent regulators, and allocation of scarce resources. Each provisions are shown in Table 1.3-1.

Recommendation items spreading below include all these WTO key provisions by direct or indirect manner.

**Table 1.3-1 Key Provisions of the Reference Paper**

Key Provisions of the Reference Paper	
Competitive Safeguards	Measures will be taken to prevent anti-competitive practices including cross-subsidization, abuse of information usage or availability
Interconnection	Interconnection will be ensured on a non-discriminatory and cost-oriented basis; procedures and a reference interconnection offer to be publicly available; independent dispute resolution mechanism to be put in place.
Universal Service	Universal Service Obligations to be administered in a transparent, non-discriminatory and competitively-neutral way.
Licensing Criteria	Licensing criteria, and terms and conditions to be made publicly available. Reasons for denial of a license to be given
Independent Regulators	Regulatory bodies to be separate from, and not accountable to, any supplier of basic telecommunications services. Decisions to be impartial.
Allocation of Scarce Resources	Assignment of frequencies, numbers and access to rights of way to be transparent and non-discriminatory.