

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF INFRASTRUCTURE DEVELOPMENT (MOID)
MONGOLIAN COMMUNICATIONS ASSET COMPANY (MCAC)

THE STUDY
ON
TELECOMMUNICATIONS NETWORK
IN
ULAANBAATAR CITY
FINAL REPORT
VOLUME - IV
SUPPORTING DOCUMENTS

JULY 1996

JICA LIBRARY



J1130554 (7)

JAPAN TELECOMMUNICATIONS ENGINEERING
AND CONSULTING SERVICE (JTEC)

NIPPON TELECOMMUNICATIONS CONSULTING CO., LTD (NTC)

TOKYO, JAPAN

SSS

JR

96-100



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF INFRASTRUCTURE DEVELOPMENT (MOID)
MONGOLIAN COMMUNICATIONS ASSET COMPANY (MCAC)

THE STUDY
ON
TELECOMMUNICATIONS NETWORK
IN
ULAANBAATAR CITY

FINAL REPORT
VOLUME - IV
SUPPORTING DOCUMENTS

JULY 1996

JAPAN TELECOMMUNICATIONS ENGINEERING
AND CONSULTING SERVICE(JTEC)

NIPPON TELECOMMUNICATIONS CONSULTING CO., LTD(NTC)

TOKYO, JAPAN

SSS
JR
96-100



1130554 (7)

CONTENTS

- Chapter 1. Scope of Works/Minutes of Meetings**
 - Chapter 2. Telecommunication Act of Mongolia**
 - Chapter 3. Procedure of Telephone Demand Forecast**
 - Chapter 4. History of Mongolian Telecommunications Sector**
 - Chapter 5. Technical Standard for Quality of Service**
 - Chapter 6. Personal Handy-Phone System**
 - Chapter 7. Financial, Economic and Social Analyses**
 - Chapter 8. Frequency Allocation Plan**
 - Chapter 9. Alternative Case of ATC-6 Project**
-

CHAPTER 1

Scope of Works/Minutes of Meetings

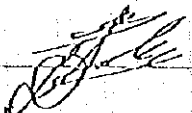
Scope of Work

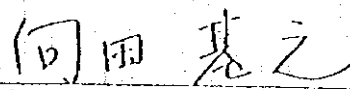
SCOPE OF WORK
FOR
THE STUDY
ON
TELECOMMUNICATIONS NETWORK
IN
ULANBAATAR CITY

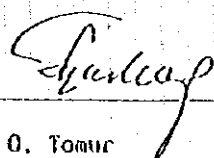
AGREED UPON BETWEEN

MINISTRY OF INFRASTRUCTURE DEVELOPMENT /
MONGOLIAN TELECOMMUNICATIONS COMPANY
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Ulaanbaatar, 22 June 1995


Mr. G. Battur
Director General
Telecommunication Department
Ministry of Infrastructure
Development


Mr. Motoyuki HUKODA
Leader of the Preparatory
Study Team
Japan International
Cooperation Agency


Mr. O. Tomur
Director General
Mongolian Telecommunications
Company

I. INTRODUCTION

In response to the request of the Government of Mongolia, the Government of Japan has decided to implement the Study on Telecommunications Network in Ulaanbaatar city (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of Mongolia.

The present document sets forth the scope of work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are the followings:

1. To formulate a basic plan for the development of telecommunications network in Ulaanbaatar city - (PHASE I Study).
2. To conduct a feasibility study for the identified priority project(s) based on the PHASE I Study - (PHASE II Study).

III. Study Area

The Study will cover the Ulaanbaatar city (administrative area) as shown in the ANNEX-1.

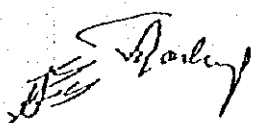
IV. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Study will cover the following items.

(PHASE I)

1. Basic Study

- (1) Collection and review of data/information
 - a) Social and economic conditions and statistics
 - b) National Development Plans



(10) 111

- c) Previous studies on telecommunications
- d) Relevant studies of telecommunications services
- e) Development plans and on-going projects for telecommunications services
- f) Existing laws, regulations and technical standards related to telecommunications services
- g) Present situations of operation and management of telecommunications services
- h) Present situations of telecommunications facilities and networks
- i) Other data/information related to the Study

(2) Field survey

- a) Social and economic conditions
- b) Existing telecommunications facilities and services
- c) Other surveys related to the Study

(3) Analysis and evaluation

- a) Demand and traffic forecasts
- b) Trend of new technologies and new telecommunications services
- c) Planning framework (target year, planning area, service level)

2. Basic planning for telecommunications development

- (1) Telecommunications network plan
- (2) Facilities plan
- (3) Operation and maintenance plan
- (4) Human resource development plan
- (5) Organization and institutional plan
- (6) Project evaluation
- (7) Implementation plan
- (8) Identification of the priority project(s)

[PHASE II]

3. Feasibility study on the priority project(s)

- (1) Confirmation of the planning framework
 - a) Target year
 - b) Planning area
 - c) Service level
- (2) Facility improvement and expansion plan

J. S. Galup

(17) (17)

- a) Transmission systems
- b) Switching systems
- c) Outside plant
- d) Cable networks
- (3) Operation and maintenance plan
- (4) Human resource development plan
- (5) Institution, organization and management plan
- (6) Cost estimation
- (7) Project evaluation
 - a) Financial analysis
 - b) Social and economic analysis
- (8) Project implementation programme

V. STUDY SCHEDULE

The Study will be carried out in accordance with the tentative work schedule attached in the ANNEX-2.

VI. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Mongolia.

1. Inception Report

Twenty (20) copies at the beginning of the first work in Mongolia.

2. Progress Report

Twenty (20) copies at the end of the first work in Mongolia.

3. Interim Report

Twenty (20) copies at the beginning of the second work in Mongolia.

4. Draft final Report

Twenty (20) copies at the beginning of the third work in Mongolia.

The Government of Mongolia shall submit its comments within one (1) month after the receipt of the Draft Final Report.

5. Final Report

Forty (40) copies within two (2) months after JICA's receipt of the said comments on the Draft Final Report.

For *Sandy*

12/10

VII. UNDERTAKING OF THE GOVERNMENT OF MONGOLIA

1. To facilitate smooth conduct of the Study, the Government of Mongolia shall take necessary measures within the laws and regulations in force in Mongolia:

- (1) to secure the safety of the Japanese Study Team (hereinafter referred to as "the Team"),
- (2) to permit the members of the Team to enter, leave and sojourn in Mongolia for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,
- (3) to exempt the members of the Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of Mongolia for the implementation of the Study,
- (4) to exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study,
- (5) to provide necessary facilities to the Team for remittances as well as utilization of the funds introduced into Mongolia from Japan in connection with the implementation of the Study,
- (6) to secure permission for entry into private properties or restricted areas for the implementation of the Study,
- (7) to secure permission for the Team to take all data and documents (including maps, photographs) related to the Study out of Mongolia to Japan, and
- (8) to provide medical services as needed. Its expenses will be chargeable on the members of the Team.

2. The Government of Mongolia shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.

3. Ministry of Infrastructure Development (hereinafter referred to as "MOID") and Mongolian Telecommunications Company (hereinafter referred to as "MTC") shall act as a counterpart agency to the Team and also as a coordinating body in relation with other governmental and non-governmental organizations

adler *Shy*

(17) (17)

concerned for the smooth implementation of the Study.

4. HOID and HTC shall, at its own expense, provide the Team with the following, in cooperation with other relevant organizations concerned:

- (1) available data (including photographs and maps) and information related to the Study,
- (2) counterpart personnel,
- (3) suitable office space with necessary equipment and furniture,
- (4) credentials or identification cards, and
- (5) appropriate number of vehicles with drivers.

VIII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

- (1) to dispatch, at its own expense, the Team to Mongolia, and
- (2) to pursue technology transfer to the Mongolian counterpart personnel in the course of the Study.

IX. CONSULTATION

JICA, HOID and HTC shall consult with each other in respect of any matter that may arise from or in connection with the Study.

Handwritten signature

(12) III

1. Khan-Uul district
2. Songino khairkhan district
3. Bayangol district
4. Sukhbaatar district
5. Chingeltei district
6. Bayan zurkh district
7. Partizan
8. Kalaikh
9. Gatsuurt
10. Summer camp area
11. Baganuur
12. Bagakhangai

[Handwritten signature]

(2) 10

TENTATIVE WORK SCHEDULE

MONTH DESCRIPTION	1	2	3	4	5	6	7	8	9	10
WORK IN MONGOLIA										
WORK IN JAPAN										
REPORT PRESENTATION	△ IC/R			△ P/R		△ IT/R		△ DF/R		△ F/R
PHASE I	←-----→									
PHASE II	←-----→									

IC/R : Inception Report
 P/R : Progress Report
 IT/R : Interim Report
 DF/R : Draft Final Report
 F/R : Final Report

File

Shoji

(2) 10

MINUTES OF MEETINGS ON THE SCOPE OF WORK
FOR
THE STUDY ON TELECOMMUNICATIONS NETWORK
IN ULAANBAATAR CITY

Japan International Cooperation Agency (JICA) Preparatory Study Team (hereinafter referred to as "Japanese side") and Ministry of Infrastructure Development and Mongolian Telecommunications Company (hereinafter referred to as "Mongolian Side") had meetings from 15th to 21st June, 1995 at the Ministry of Infrastructure Development in Ulaanbaatar City.

A list of participants for the meetings is given in Attachment to this minutes.

At the opening session, Dr. Ph. S. GANBAATAR, Deputy Director General of Telecommunication Department in Ministry of Infrastructure Development Mongolia welcomed Japanese side and expressed his gratitude for cooperation of the Government of Japan and stressed necessity of urgent rehabilitation of telecommunications network in Ulaanbaatar City. Mr. Motoyuki MUKODA, Leader of Japanese side, appreciated the hospitality extended by Mongolian side.

During the meetings, the document entitled "SCOPE OF WORK FOR THE STUDY ON TELECOMMUNICATIONS NETWORKS IN ULAANBAATAR CITY (DRAFT)" was discussed. Both sides agreed on it considering the followings in the series of discussions.

1. Although the project title stated in the formal request submitted by the Government of Mongolia to the Government of Japan was "THE STUDY OF ULAANBAATAR CITY TELECOMMUNICATION NETWORK", the Japanese side proposed a new title, "THE STUDY ON TELECOMMUNICATIONS NETWORK IN ULAANBAATAR CITY". Both sides confirmed the title as proposed.
2. Mongolian side proposed that the counterpart agencies of the Study should be both of Ministry of Infrastructure Development and Mongolian Telecommunications Company. Japanese side agreed on it.
3. The Study will cover the Ulaanbaatar City (administrative area) and the area is described on a list prepared by Mongolian side. Both sides agreed on them.

Syarking

(17) 10

[Signature]

4. Mongolian side requested to include broadcasting in the Study. However through discussion, both sides agreed that general broadcasting service would not be included in the Study.
5. Mongolian side proposed and both sides agreed that human resources development plan should be included in the Study.
6. Mongolian side requested that target year of PHASE I Study is to be ten (10) years and that of PHASE II Study is to be five (5) years. Japanese side replied that the periods of them should be discussed and decided at the beginning of the Study. Mongolian side agreed on the matter.
7. Japanese side explained that it would require ten (10) months to complete the Study and stated that the date of commencement of the Study was not formally decided. However, it would be commenced in around October 1995. Both sides confirmed the schedule as it is.
8. Japanese side agreed that data and documents provided by Mongolian side should be restricted usage within the Study.
9. Both sides confirmed that the final report could be disclosed in consultation with the Government of Mongolia.
10. Japanese side requested Mongolian side to assign a supervisor and an appropriate number of counterpart personnel for smooth execution of the Study and effective technology transfer. Japanese side also expressed that counterparts should have expertise in the fields of demand forecast, network planning, switching system, transmission system, outside plants, radio system, economic and finance, organization management, operation and maintenance. Mongolian side accepted the request.
11. Mongolian side requested the "UNDERTAKING OF THE GOVERNMENT OF MONGOLIA" should be executed according to the laws and regulations of Mongolia. Japanese side agreed on the matter.

Mongolian side promised to provide the Team, in order to carry out the Study, with an appropriate office space with desks, chairs, cabinets, a facsimile terminal, telephone sets, telephone lines for IDD and facsimile and arrangement of appropriate number of vehicles with drivers for the Study and to make an

Sydney

16/10

[Signature]


arrangement for issuing ID cards for the Team. Mongolian side requested that charges for international telephone calls and vehicles with drivers should be paid by the Team. And Mongolian side also requested that a photocopier to be used for the Study would be prepared by the Team. Both sides confirmed these arrangements.

12. Japanese side advised that necessary application procedures to the Government of Japan should be taken by the Government of Mongolia through Embassy of Japan in Mongolia and explained that only one (1) trainee could be acceptable at present. Mongolian side expressed that they would nominate trainee(s) from the counterpart personnel in consultation with the Team.

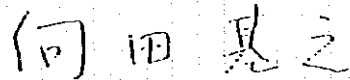
13. Mongolian side emphasized projects aimed at achieving the following objectives to be taken up for the Study on a priority basis:

- (1) Rehabilitation and expansion of cable network in Ulaanbaatar City
- (2) Improvement of telephone density in Ulaanbaatar City
- (3) Improvement of the coverage of telephone service in suburban areas of Ulaanbaatar City

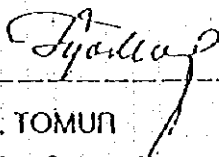
Ulaanbaatar, 22nd June, 1995



Mr. G. BATTUR
Director General
Telecommunication Department
Ministry of Infrastructure
Development



Mr. Molyuki MUKODA
Leader of the Preparatory
Study Team
Japan International
Cooperation Agency



Mr. O. TOMUN
Director General
Mongolian Telecommunications
Company

LIST OF PARTICIPANTS

1. Mongolian side

(1) Ministry of Infrastructure Development Mongolia

Mr. G. BATTUR	Director General, Telecommunication Department
Dr. Ph. S. GANBAATAR	Deputy Director General, Telecommunication Department
Dr. B. SUKHBAATAR	Assistant Professor/ Adviser to Minister
Mr. G. BASANJAV	Officer, Telecommunication Department
Mr. L. OSGON	Officer, Telecommunication Department
Mr. D. BANSUREN	Legal Assistant

(2) Mongolian Telecommunications Company

Mr. O. TOMUR	Director General
Dr. G. BAYARSUREN	Chief, Technological Planning Division; Project Manager, P. I. U.
Mr. B. JARGALSAIKHAN	Manager, International Cooperation Division

(3) Communication Research and Production Institute

Ms. D. DOIGORSUREN	Head of Telecommunication Section
Ms. Sh. BAT-CHIMEG	Engineer

(4) Embassy of Mongolia (in Japan)

Ms. L. NASANDUYAN	Attache (Commercial and Economic)
-------------------	-----------------------------------

2. Japanese side

Mr. Motoyuki MUKODA	Leader/ Preparatory Study Team
Mr. Osamu MAKINO	Network Plan
Mr. Takashi SUGAWARA	Project Officer
Mr. Masami MURATA	Switching Plan
Mr. Masao KATO	Cable Plan
Mr. Ryo OTSUKA	Interpreter (Mongolian/ Japanese)

Minutes of Meetings
The Study on Telecommunications Network
in Ulaanbaatar city

(September 28 to October 4, 1995)

Japan International Cooperation Agency (JICA) Study team (hereinafter referred to as "Team"), Ministry of Infrastructure Development (hereinafter referred to as "MOID") and Mongolian Communications Asset Company (hereinafter referred to as "MCAC") had meetings on September 28 through October , 1995 at the headquarters of MOID and MCAC in Ulaanbaatar.

A list of participants for the meetings is given in Attachment 1 to this Minutes.

At the opening session, Mr. Ts. Damiran, Vice Minister of MOID welcomed the Team, expressed his gratitude for the cooperation of the Government of Japan, and stated that he is in great expectation of the Study of the Team. Mr. M. Mukoda, Chairman of the Advisory committee of JICA appreciated the hospitality extended by MOID and MCAC. Mr. Y. Takahashi, Leader of the Team introduced the Team members.

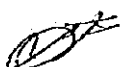
In the meeting on September 28, the Team submitted 20 copies of the Inception Report on "The Study on Telecommunications Network in Ulaanbaatar city" (hereinafter referred to as "the Study") to MOID and MCAC.

1. Mr. M. Mukoda stated as follows:

The Inception Report was prepared in accordance with the results of the preparatory study in June, 1995. However, as we heard that Mongolian Telecommunications Company was divided, the contents of the Inception Report should be changed in line with the results of our coming meetings.

2. Mr. M. Mukoda asked the followings:

- (a) The responsibilities of MCAC and the new company, respectively,
- (b) The relationship between the two companies,
- (c) Counterpart body(s) of the Team.



BS

高橋

岡田

3. Mr. Ts. Damiran explained the changes in the organization structure since the last preparatory study in June, 1995 as follows.

(a) In line with the Mongolian telecommunications sector's reform, Mongolian Telecommunications Company was divided into MCAC and new Mongolian Telecommunications Company (hereinafter referred to as "MTC") remaining the telecommunications network as the Government asset.

MCAC, a state-owned company, owns the telecommunications network and leases it to MTC. MCAC is responsible for the rehabilitation and expansion of the network. MTC provides telecommunications services using the facilities owned by MCAC. The relationship between MCAC and MTC is based on the lease agreement. The shares of MTC were planned to be owned by the Government (50%), MTC's staffs (10%) and a foreign investor (40%). But now, the shares owned by the Government exceed 50%.

(b) Invitation letters for bidding MTC shares were sent to 160 entities of all over the world.

(c) MOID and MCAC are appointed as counterpart bodies for the Team. In case that the Study should be related to MTC, the Team will contact with MTC through MOID or MCAC.

4. When the Study relates to the organizations other than MOID, MOID is responsible for the arrangement.

5. Through a series of meetings, MOID, MCAC and the Team discussed the contents of the Inception Report, and the report was accepted with modifications from X1 to X16 shown in Attachment 2.

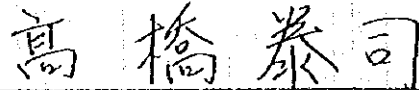
6. On the item in (4), 3) of Chapter 5, Undertaking of MOID and MCAC regarding "appropriate number of vehicles with drivers", Mongolian side requested that the Team hire appropriate number of vehicles with drivers at its own expense. The Team agreed on it.

7. Mongolian side requested the Team that a photocopier of the Team be donated to the Mongolian Government after the end of the Study. The Team agreed to convey the request to JICA Headquarters in Tokyo.
8. Mongolian side requested the Team to accept one trainee in each Japanese fiscal year during this Study. The Team agreed to convey the request to JICA Headquarters in Tokyo. The Team explained the possibility that one trainee would be accepted from January to February 1996.

Ulaanbaatar, October 4, 1995



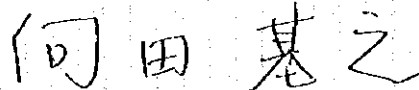
Dr. B. Sukhbaatar
General Director
Department of Communications
Ministry of Infrastructure
Development



Mr. Yasushi Takahashi
Leader of the Study Team
Japan International Cooperation Agency



Mr. G. Battur
General Director
Mongolian Communications
Asset Company



Mr. Motoyuki Mukoda
Chairman of the Advisory Committee
Japan International Cooperation Agency

List of Participants for the Meetings

1. Ministry of Infrastructure Development (MOID)

- | | | |
|----|-------------------|---|
| 1) | Mr. Ts.Damiran | Vice Minister |
| 2) | Dr. B.Sukhbaatar | General Director, Department of Communications |
| 3) | Mr. S.Sonomdagva | Head, Department of Economic and International Cooperation |
| 4) | Mrs. B.Purevsuren | Senior officer, Department of Communications |
| 5) | Mr. U.Odgerel | Officer, Department of Communications |
| 6) | Mr. L.Osgon | Officer, Department of Communications |
| 7) | Mr. G.Basanjav | Officer, Department of Communications |
| 8) | Mr. D.Naranpurev | Officer, Department of Economic and International Cooperation |

2. Mongolian Communications Asset Company (MCAC)

- | | | |
|-----|-----------------------|------------------------------|
| 1) | Mr. G.Battur | General Director |
| 2) | Mr. N.Nansaljav | Deputy Director General |
| 3) | Mrs. B.Tungalag | Deputy Director General |
| 4) | Mr. N.Baatarsuren | Expert, Rural Communication |
| 5) | Mr. B.Davaatseren | Expert, Switching |
| 6) | Mr. M.Naranbaatar | Expert, Radio System |
| 7) | Mr. Ts.Ganbold | Expert, Outside Plant |
| 8) | Mrs. T.Ojunchuluun | Expert, Finance and Planning |
| 9) | Mr. Ch.Amarbayasgalan | Officer, Human Resource |
| 10) | Mrs. D.Sarantuya | Clerk |

3. Research & Development Institute of Telecommunications

- | | | |
|----|--------------------|---------------------------------|
| 1) | Mrs. D.Dolgorsuren | Head, Telecommunications Sector |
| 2) | Mrs. Sh.Batchimeg | Engineer |

4. **Mongolian Telecommunications Company (MTC)**

- 1) Mr. D.Dorjsuren Chief Engineer, Switching, O&M Centre
- 2) Mrs. Ts.Altantsetseg Engineer, Outside Plant

5. **Communication Office of the Government**

- 1) Mr. B.Tumursukh Head, Communication Office of the Government
- 2) Mr. G.Sharavdemberel Head, Telecommunication Group

6. **JICA Advisory Committee**

- 1) Mr. Motoyuki Mukoda Chairman
- 2) Mr. Osamu Makino Member
- 3) Mr. Kazuhiro Fukuda JICA, Task Management

7. **JICA Study Team**

- 1) Mr. Yasushi Takahashi Team Leader / Service Plan
Operation & Maintenance
- 2) Mr. Yuichi Ito Assistant Team Leader / Network Plan
- 3) Mr. Naoto Matsuda Demand Forecast / Traffic Forecast
- 4) Mr. Yuji Oishi Local Network Plan / Outside Plant Facilities Plan
- 5) Mr. Masayuki Ito Administrative Support





5

高橋

岡田

- X1. On the cover page, 3rd line

"MONGOLIAN TELECOMMUNICATIONS COMPANY (MTC)" was changed into "MONGOLIAN COMMUNICATIONS ASSET COMPANY (MCAC)".

- X2. On the page 2-1, in the item

"2.2 Present Status of Telecommunications Services", the paragraph was changed as follows.

The telecommunications services in Ulaanbaatar city were provided by MTC and some other companies. A considerable change in telecommunications sector structure took place in August 1995. A new state-owned enterprise, Mongolian Communications Asset Company (MCAC) was established. MTC, the main telecommunications services provider, was privatized and converted into a shareholding company. MCAC owns Mongolian telecommunications assets.

For the purpose of providing local, domestic and international telecommunications services, MTC leases telecommunications assets from MCAC on the basis of Lease Agreement signed between them. MTC provides the basic telecommunications services such as telephone, telegram, telex and facsimile. Data communication and paging services are provided by other companies and cellular mobile telephone service is planned by another private company.

- X3. On page 2-1

"(1) MTC" was changed into "(1) MCAC / MTC".

- X4. On page 2-1 in the new item (1) MCAC / MTC, the paragraph was changed as follows.

MCAC is the single owner of Mongolian telecommunications network and leases its network to MTC for providing telecommunications services.

Telephone subscribers and telephone waiters in whole Mongolia and Ulaanbaatar city in recent years are shown in the table below.

Attachment 2 (2/3)

- X5. On page 2-2
(2) Other entities in the paragraph, all "MTC" were changed into "MCAC".
- X6. On page 2-3, in the item (5) Management, operation and maintenance,
"MTC" was changed into "MCAC / MTC".
- X7. On page 2-4, in the title of the item,
"(6) Network run by other than MTC" was changed into
"(6) Network run by other than MCAC".
- X8. On page 2-5, in the item (3) Framework of the planning target,
"MTC" was changed into "MCAC".
- X9. On page 2-5, in the item (4) Consistency with the on-going and planned
projects

"MTC's" was changed into "MCAC's".
- X10. On page 3-4,
Figure 3-4, in the box in the upper part of the page,

"Reporting of 2nd Study in Mongolia Discussion with MTC / MOID" was
changed into "Reporting of 2nd Study in Mongolia Discussion with MCAC /
MOID".
- X11. On page 3-8, in the item
(8) Organization and management plan,

"..... in MOID and privatization in MTC" was changed into "..... MOID,
MCAC and other entities".
- X12. On page 3-10
3.7 Preparation of Final Report,

All "MTC" were changed into "MCAC".

Attachment 2 (3/3)

X13. On page 3-11, in the column of Interim Report
Interim Report (10)

*“Institutional issue of MOID / MTC” was changed into
“Institutional issue of MOID / MCAC and other entities”.*

X14. On page 4-1
In the left hand box.

*“Mongolian Telecommunications Company” was changed into
“Mongolian Communications Asset Company”.*

X15. On page 5-1, “MTC” in (3) was changed into “MCAC”.

X16. On page 5-2, “MTC” in (4) was changed into “MCAC”.

MINUTES OF MEETING
DISCUSSION OF PROGRESS REPORT
"THE STUDY ON TELECOMMUNICATIONS
NETWORK IN ULAANBAATAR CITY"
(November 30, 1995)

Japan International Cooperation Agency (JICA) Study team (hereinafter referred to as "Team"), Ministry of Infrastructure Development (hereinafter referred to as "MOID") and Mongolian Communications Asset Company (hereinafter referred to as "MCAC") had a meeting on November 30, 1995 in Ulaanbaatar city.

The list of participants for the meeting is given in Attachment 1 to these Minutes.

It was reported that prior to this meeting, the Team has submitted 20 copies of Progress Report on "The Study on Telecommunications Network in Ulaanbaatar City" (hereinafter referred to as "the Study") to MOID / MCAC on 28 November, 1995.

It was observed the Team had conducted series of meetings with the counterparts and other officials. MOID, MCAC and the Team discussed the contents of the Progress Report, and the report was generally accepted. Results of the first study in Ulaanbaatar city, mainly consisting of demand forecast and development framework was discussed and following observations were noted.

1. Planning periods and target years of the basic plan are as follows:
 - (1) A basic plan up to the year 2010.
 - (2) Up to the year 2010, short-term target to the year 2000, medium-term target to the year 2005, and long-term target to the year 2010.

2. Model II explained in Chapter 6 has been agreed to calculate the telephone demand for Ulaanbaatar city. The result of the calculation by Method II shows the approximate telephone demand of 163,000 at the end of the year 2010.

G. Zakhshari

M. Coenen



3. It was agreed that any comments / observations in regard to the Progress Report should be compiled and sent to the Team by Mr. G.Battur, Chief of Counterparts, before mid January 1996.

Yasushi Takahashi

Mr. Yasushi Takahashi
Leader of the Study Team
Japan International Cooperation Agency

U. Sonomdagva

Mr. Sh.Sonomdagva
Head of International Cooperation
& Economy Division
Ministry of Infrastructure Development

G. Battur

Mr. G.Battur
General Director
Mongolian Communications
Asset Company

Ulaanbaatar city
Mongolia
30 November 1995

List of Participants for the Meeting

MOID / MCAC side

- | | |
|---------------------------|--|
| 1. Mr. Sh.Sonomdagva | Head, International Cooperation & Economy Division, MOID |
| 2. Mr. L.Lantuu | Chairman, Communications Sector Regulator Body |
| 3. Mr. Baatarhuu | Senior Officer, Communications Department, MOID |
| 4. Mr. G.Battur | General Director, MCAC |
| 5. Mr. N.Nansaljav | Deputy General Director, MCAC |
| 6. Ms. B.Tungalag | Financial Director, MCAC |
| 7. Ms. B.Purevsuren | Officer, MCAC |
| 8. Mr. Enhbayar | Officer, Communications Department, MOID |
| 9. Mr. N.Baatarsuren | Rural Communication Expert, MCAC |
| 10. Mr. B.Davaatseren | Switching Expert, MCAC |
| 11. Mr. M.Naranbaatar | Radio System Expert, MCAC |
| 12. Mr. Ts.Ganbold | OSP Expert, MCAC |
| 13. Mr. Sh.Ganbold | OSP Expert, MCAC |
| 14. Ms. Ch.Amarbayasgalan | Personnel Officer, MCAC |
| 15. Ms. T.Oyuunchuluun | Finance, Economy & Planning Expert, MCAC |
| 16. Ms. Sarantuya | Office Manager, MCAC |

Y. Takahashi

U. Oshiro

[Signature]

JICA Study Team

- | | |
|--------------------------|---|
| 1. Mr. Yasushi Takahashi | Team Leader |
| 2. Mr. Yuichi Ito | Network Plan |
| 3. Mr. Naoto Matsuda | Demand Forecast / Traffic Forecast |
| 4. Mr. Masahiro Satake | Transmission Network / Facility |
| 5. Mr. Kaoru Kushida | Switching Facilities Plan / Traffic Forecast |
| 6. Mr. Yuji Oishi | Local Network Plan / Outside Plant
Facilities Plan |

Y. Takahashi

M. Cosman

[Signature]

MINUTES OF MEETINGS
DISCUSSION OF INTERIM REPORT
"THE STUDY ON TELECOMMUNICATIONS
NETWORK IN ULAANBAATAR CITY"
(February 28 through March 5, 1996)

Japan International Cooperation Agency (JICA) Study team (hereinafter referred to as "Team"), Ministry of Infrastructure Development (hereinafter referred to as "MOID") and Mongolian Communications Asset Company (hereinafter referred to as "MCAC") had meetings from February 28 through March 5, 1996 in Ulaanbaatar city.

The list of participants for the meeting is given in Attachment 1 to these Minutes.

In the meetings on February 28, the Team submitted 20 copies of Interim Report on "The Study on Telecommunications Network in Ulaanbaatar city" (hereinafter referred to as "the Study") to MOID and MCAC.

The Team had conducted series of meetings with MOID / MCAC and other officials. MOID, MCAC and the Team discussed the contents of the Interim Report, and the report was generally accepted.

At the meeting with MOID, Mr. Ts. Damiran, Vice Minister, explained the current status and the future plan of organizations of MOID, MCAC and MTC.

It was agreed that the Feasibility Study should be conducted on the Project number 1 (ATC-6 Area Network Expansion) and the Project number 36 (Radio Subscriber System for Ger Area) stipulated on page S-16 of the Interim Report. However as to project number 36 it was recognized that in case high precision map (1:50,000) is not available by March 8, geographical study area would be limited.

U.C.

1

高橋

[Handwritten signature]


同用

It was proposed from Mongolian side that following projects are considered to have high priority.

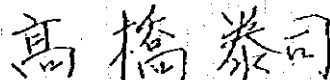
- Project number 1 (ATC-6 Area Network Expansion)
- Project number 35 (Government Network Rehabilitation)
- Project number 36 (Radio Subscriber System for Ger Area)
- Project number 6 (ATC-7 Area Network Installation)

It was confirmed that the final report would be sent out from Japan at the end of June, 1996.

Ulaanbaatar, March 5, 1996



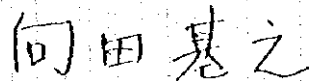
Mr. Sh. Sonomdagva
Head of International Cooperation
& Economy Division
Ministry of Infrastructure Development



Mr. Yasushi Takahashi
Leader of the Team
Japan International Cooperation Agency

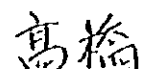


Mr. G. Battur
General Director
Mongolian Communications
Asset Company



Mr. Motoyuki Mukoda
Chairman of the Advisory Committee
Japan International Cooperation Agency

u.c



List of Participants for the Meetings

1 Ministry of Infrastructure Development (MOID)

- | | | |
|----|-------------------|---|
| 1) | Mr. Ts. Damiran | Vice Minister |
| 2) | Mr. S. Sonomdagva | Head, International Cooperation and Economy Division |
| 3) | Mr. J. Baatarkhuu | Deputy General Director of Telecommunications
Department |
| 4) | Mr. D. Naranpurev | Officer, International Cooperation and Economy Division |
| 5) | Mrs. B. Narantuya | Officer |
| 6) | Mrs. L. Banzragch | Officer |

2 Mongolian Communications Asset Company (MCAC)

- | | | |
|-----|---------------------|--|
| 1) | Mr. G. Battur | General Director |
| 2) | Mr. N. Nansaljav | Deputy Director General |
| 3) | Mrs. B. Tungalag | Deputy Director General |
| 4) | Mrs. B. Purevsuren | International Cooperation Senior Officer |
| 5) | Mr. Sh. Ganbold | Network Planning Expert |
| 6) | Mr. M. Naranbaatar | Radio System Expert |
| 7) | Mr. Sh. Batchemeg | Engineer |
| 8) | Mr. B. Dabaatseren | Switching Expert |
| 9) | Mr. B. Tumennasan | Expert |
| 10) | Mr. Ts. Ganbold | OSP Expert |
| 11) | Mr. D. Dolgorsuren | Engineer |
| 12) | Mrs. T. Oyunchuluun | Finance, Economics and Planning Expert |

3 Mongolian Telecommunications Company (MTC)

- 1) Mr. E. Munkhbat Director of Human Resource and Administration Department
- 2) Mr. D. Dorjsuren Chief Engineer of Ulaanbaatar Switching Department
- 3) Mr. T. Ochir Senior Engineer, Network Plan
- 4) Mrs. Ts. Altantsetseg Engineer, Outside Plant

4 JICA Advisory Committee

- 1) Mr. Motoyuki Mukoda Chairman
- 2) Mr. Osamu Makino Member

5 JICA Study Team

- 1) Mr. Yasushi Takahashi Team Leader
- 2) Mr. Yuichi Ito Network Plan
- 3) Mr. Masahiro Satake Transmission Network Plan/ Transmission and Radio facility Plan
- 4) Mr. Kaoru Kushida Switching Facility Plan/ Traffic Forecast
- 5) Mr. Yuji Oishi Local Network Plan/ Outside Plant Facility Plan
- 6) Mr. Haruo Yamane Economic/ Financial Analysis

u.c.

MINUTES OF MEETINGS
DISCUSSION OF DRAFT FINAL REPORT
"THE STUDY ON TELECOMMUNICATIONS
NETWORK IN ULAANBAATAR CITY"
(June 8 through June 13, 1996)

Japan International Cooperation Agency (JICA) Study team (hereinafter referred to as "Team"), Ministry of Infrastructure Development (hereinafter referred to as "MOID") and Mongolian Communications Asset Company (hereinafter referred to as "MCAC") had meetings from June 8 through June 13, 1996 in Ulaanbaatar city.

The list of participants for the meetings is given in Attachment I to these Minutes.

At the opening session, Mr. R. Sandalkhan, Minister of Infrastructure Development, welcomed the Team, expressed his gratitude for the cooperation of the Government of Japan.

In the meetings on June 5, the Team submitted 20 copies of Draft Final Report on "The Study on Telecommunications Network in Ulaanbaatar city" (hereinafter referred to as "the Study") to MOID, MCAC, Communications Regulatory Body and National Development Board.

It was observed that the Team had conducted series of meetings with the counterparts and other officials. MOID, MCAC and the Team discussed the contents of the Draft Final Report, and the Report was generally accepted. Results of the third work in Ulaanbaatar city, are as follows;

1. MOID, MCAC and the Team discussed the cost used for Project Implementation Plan written in Chapter 8, Volume II of the Draft Final Report. It was concluded that the Team will review the cost after returning to Japan, will revise the cost using six items (equipment cost, installation cost, transportation cost, consultant fee, tax/duty and contingency), and will send the result to MOID/MCAC before making the Final Report. The Team is requested to reflect the percentage of consultant fee, tax/duty and contingency in the Final Report.

GB

JK

岡田

高橋

2. Materials concerning Government network will be sent by June 16.

3. JICA Study team explained to MOID the following:

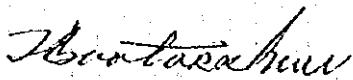
In principle, the documents of Official Development Aid of Japan should be disclosed. Therefore, the Final Report of this Study is also requested to be disclosed.

MOID explained that the conformity of this matter with legislation of Mongolia regarding national secrets should be examined, and the examined result should be formally informed to the Team by July 4, 1996.


Both sides agreed that in case the examined result is not informed by MOID by July 4, the Final Report would be disclosed in Japan.

4. It was agreed that in case MOID/MCAC have any comments to the Draft Final Report, the comments should reach the Team by the noon of July 4, 1996.

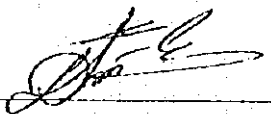
Ulaanbaatar, June 13, 1996



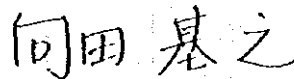
Mr. J. Baatarkhuu
General Director
Department of Communications
Ministry of Infrastructure Development



Mr. Yasushi Takahashi
Leader of the Team
Japan International Cooperation Agency



Mr. G. Battur
Executive Director
Mongolian Communications
Asset Company



Mr. Motoyuki Mukoda
Chairman of the Advisory Committee
Japan International Cooperation Agency

List of Participants for the Meetings

1 Ministry of Infrastructure Development (MOID)

- | | | |
|----|--------------------|---|
| 1) | Mr. R. Sandalkhan | Minister |
| 2) | Mr. J. Baatarhuyu | General Director, Department of Communications |
| 3) | Mr. Sh. Sonomdagva | Head, Division of International Cooperation and Economy |
| 4) | Mrs. L. Banzragch | Officer |
| 5) | Mr. O. Odgerel | Officer |
| 6) | Mr. L. Osgon | Officer |

2 Communications Regulatory Body

- | | | |
|----|---------------|----------|
| 1) | Mr. L. Lantuu | Chairman |
| 2) | Mr. Shukhbold | Officer |
| 3) | Ms. U. Tamir | Officer |

3 Mongolian Communications Asset Company (MCAC)

- | | | |
|-----|---------------------|--|
| 1) | Mr. G. Battur | Executive Director |
| 2) | Mr. N. Nansaljav | Deputy Executive Director |
| 3) | Mrs. B. Purevsuren | International Cooperation Senior Officer |
| 4) | Mr. Sh. Ganbold | Network Planning Expert |
| 5) | Mr. M. Naranbaatar | Radio System Expert |
| 6) | Mr. Sh. Batchimeg | Engineer |
| 7) | Mr. B. Davaatseren | Switching Expert |
| 8) | Mr. B. Tumennasan | Datacommunication Expert |
| 9) | Mr. Ts. Ganbold | OSP Expert |
| 10) | Mrs. D. Dolgorsuren | Engineer |
| 11) | Mrs. T. Oyunchuluun | Finance, Economics and Planning Expert |
| 12) | Mr. N. Baatarsuren | Transmission Systems Expert |

Jb

- 13) Mr. G. Demberel Radio Systems Expert
- 14) Mr. N. Enebish Small Size Enterprises Expert
- 15) Mr. M. Mend-Ochir Radio Systems Expert
- 16) Mrs. B. Battengel Human Resource Officer

4 Mongolian Telecommunications Company (MTC)

- 1) Mr. D. Boldbaatar Engineer
- 2) Mrs. Ts. Altantsetseg Engineer, Outside Plant

5 Government Communication Office

- 1) Mr. Tumursukh Director
- 2) Mr. Sharavdemberel Senior Engineer

6 JICA Advisory Committee

- 1) Mr. Motoyuki Mukoda Chairman
- 2) Mr. Osamu Makino Member

7 JICA Headquarters

- 1) Mr. K. Fukuda Task Management

8 JICA Study Team

- 1) Mr. Yasushi Takahashi Team Leader
- 2) Mr. Yuichi Ito Network Plan
- 3) Mr. Kaoru Kushida Switching Facilities Plan / Traffic Forecast
- 4) Mr. Yuji Oishi Local Network Plan / Outside Plant Facilities Plan
- 5) Mr. Haruo Yamane Economic / Financial Analysis

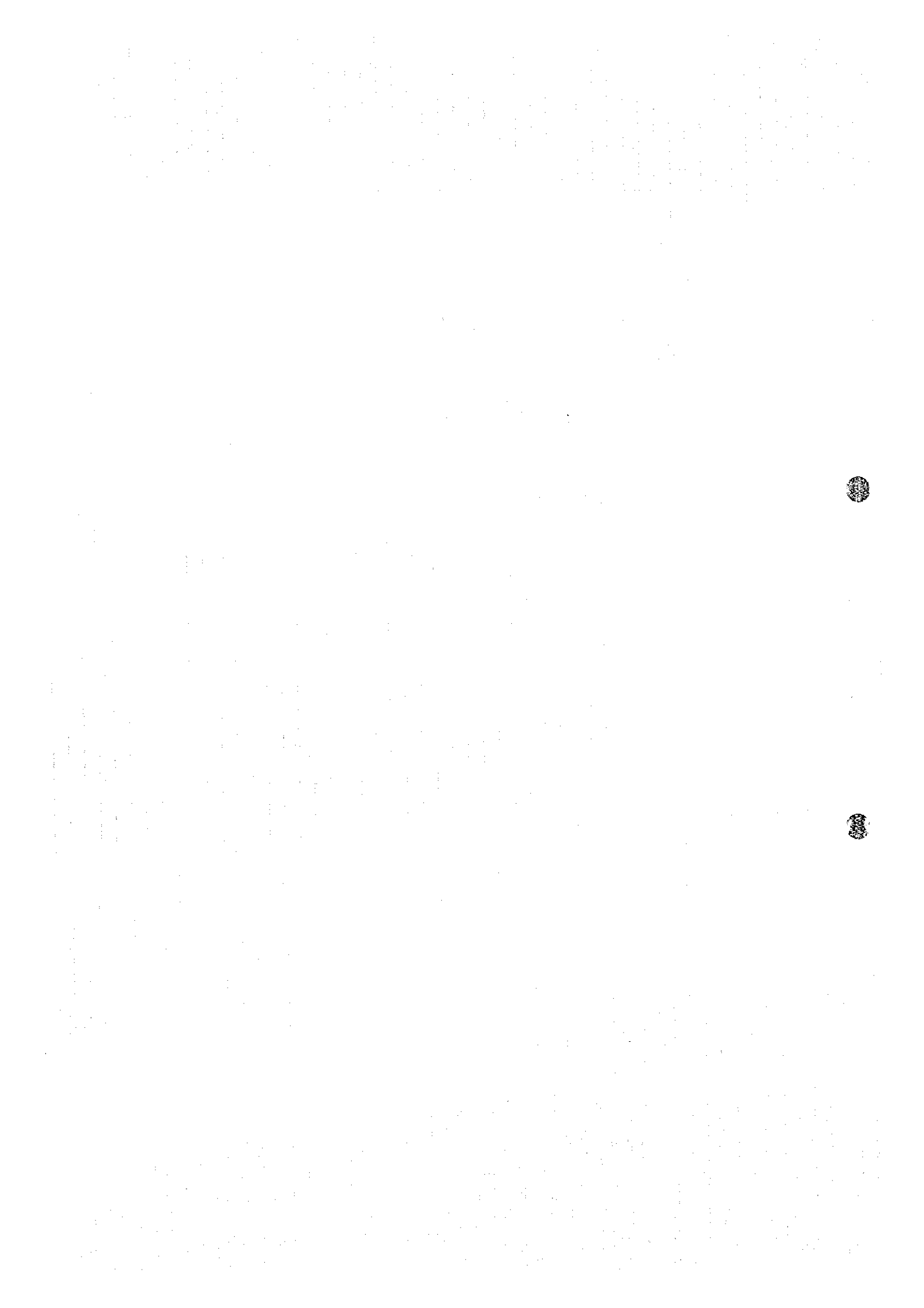
GB

As

何田 高橋

CHAPTER 2

Telecommunication Act of Mongolia



TELECOMMUNICATIONS ACT OF MONGOLIA

Chapter one:

General Provisions

Article 1. Purpose of the Act

The purpose of this Act is to regulate the relations between the Government, service provider, economic entities and individuals emanating from and in connection with the creation, utilization and protection of telecommunications network in Mongolia and various telecommunication services delivered to the customers.

Article 2. Telecommunication legislation

1. Mongolian telecommunication legislation shall consist of the Constitution of Mongolia, this Act and other legislative acts.
2. If international agreements that have been ratified by Mongolia stipulate regulations that are different than those in the current Act, the international agreements shall prevail.

Article 3. Definitions

In this Act, the following definitions are used:

1. Line means any conductors (wire, space etc.) used for broadcasting, transmitting and receiving information and insulators, ducts, poles, towers and other types of materials employed for their protection.
2. Network means a set of lines and technical equipment used for transmitting and receiving information and a system set up for receiving, sorting, transporting and delivering of the mail.
3. Operation means necessary repair, maintenance, test and adjustment in telecommunication network to ensure its normal and smooth functioning.
4. Telecommunication service and operator means a service provided by means of communication network to meet the customers; an entity in charge of communications' operation and service.
5. Demarcation point means the point at which an interconnection between operators or between the operator and customer occurs.
6. "Postal items" means letter post items, parcels and other items stamped by post office and sent by mail.

7. "Postal address and index" means the address of the customer (person, economic entities and other organizations) including the name of their place of residence or location (name of the aimag, city, somon, district, bag, khoroo, town, village and street) and the operator number.

8. "Postal securities" means post stamp and envelopes, postcards with printed post stamps at.

Chapter two: Regulation of Communications operation, service and manufacturing:

Article 4. Rights of the Governmental Body in communications

Governmental Body in communications shall be entitled to the following rights:

1. Formulate and ³⁴implement policy on the development of communications sector
2. Take measures for creating fair competitive conditions in the communication sector
3. Plan radio spectrum and issue license for frequency utilisation and control over its implementation.
4. Set up and standards for telecommunication network equipment and services and get approval and issue a license on carrying out communications operation, service and manufacturing and take control over the implementation.
5. Approve a stamp of mail and sealing wax
6. Elaborate a policy on producing and realizing of postal securities and create a state fund of post stamps.
7. To maintain the reliability, efficiency and quality of the communications service and take control over protection of the privacy of correspondence.

Article 5. Regulatory Body

1. In the communications sector there shall work a non-staff Regulatory Body with duties to create efficient and fair competitive environment for entities or organizations of all property type or form, to draft their mutual working conditions, terms and rules, and to make a professional evaluation and recommendations.
2. The Regulatory Body shall be represented by the Governmental Body in charge of communications and economic entities or organizations of all property types and forms carrying out communications operation, service and manufacturing.
3. Minister in charge of communications shall determine the composition of the Regulatory Body and its charter shall be approved by the Government

Article 6. Rights of the Regulatory Body

The Regulatory Body shall be entitled to the following rights:

1. Elaborate proposals on the Government policy of developing the communications sector and submit to the authority:
2. Take proposals and recommendations to the Governmental Body in charge of communications on granting a license for communications operation, service and manufacturing
3. Set up technical conditions and requirements for type approval of the network equipment of all property types or forms and customer's premise equipment connected to the basic communications network
4. Establish and regulate the principle of interconnecting operators and revenue sharing and general terms of the agreement and rules:
5. Define the methodology for setting up communications services charges.

Article 7. Powers of All Level Governors

1. Governors of all levels shall exercise the following powers:

1/ Work out a policy on the improvement of communications service in their territory and bringing it to the population and to implement it in cooperation with the related organization:

2/ Control and regulate the schedule of the mail delivery on their territory:

3/ For the efficiency of communications to take measures to provide with definite addresses all streets, areas, buildings, apartments, gers in aimags, the capital city, districts, somons bags, horoos, cities and villages.

4/ Render an assistance in organizing operation to eliminate breakages caused by natural disasters and other calamities.

2. Install and use local radio and television network

Article 8. License

1. A license for carrying out communications operation, service and manufacturing (hereinafter called as "license") shall be issued in the following cases:

1/ Install a basic communications network and maintain its operation and service;

2/ run public service through the network for internal use

3/ Utilize radio frequencies

4/ Manufacture technical and electronic facilities for information and communications;

5/ Produce the postal securities

2. A license shall be granted to the following person who satisfies the requirements stipulated in the legislation:

1/ An entity, organization or citizen of Mongolia;

2/ An entity with foreign investment founded under the laws of Mongolia

3. A license to a foreign legal person to carry out communications operation, service and manufacturing shall be granted by the Governmental Body in charge of communications upon the Government permission. 4. If an entity, organization or citizen wish to run other types of operation, service and manufacturing except those given in paragraph 1 of this article they shall inform and register with the Governmental Body in charge of communications or organization authorized by it.

Article 9. Applying for License

1. A person interested in shall apply for a license to the Governmental Body

2. The following documents shall be enclosed to the application for a license:

1/ Financial, economic, technical and professional potential of the staffs;

2/ Guideline of the activities and experience

3/ About operation to be fulfilled:

a/ Location and range of service

b/ Technology

c/ Proposal on service tariffs;

d/ Proposal on cost of a license

Article 10. Duration of License

1. A license shall be granted for a period up to 20 years.

2. The extension of the license period shall be decided by Governmental Body in charge of communications

Article 11. Basis for Expiration of License

1. The period of the license shall expire on the following working day after the originally fixed date if the bearer does not apply for its extension.

2. The license period shall be considered terminated before the fixed time of its expiration in the following cases:

1/ The legal person bearing the license is dissolved

2/ The operation is not conducted as stipulated in the license within 1 year since the license has been obtained

3/ The authority revokes the license alone or upon the licensee's request due to his/her failure to fulfill the duties committed under the Act and agreement.

3. In case of termination of the license an authority, which granted it, shall inform the registration organization about it.

Article 12. Revocation of License

1. The authority which has issued a license is entitled to revoke the license alone if a licensee commits the following violation:

1/ Has not implemented his/her obligation on establishment, operation and protection of the communications network stipulated in the Act and agreement;

2/ Has operated other activities than specified in the license.

2. The license may be annulled on the licensee's request before the date of its expiration if he/she fully completed his/her duties committed in agreement.

3. The licensing authority shall not be liable for damages caused by the annulment of the license on the basis given in paragraph 1 of this article.

4. A licensee may apply his/her complaints to the court if he/she disagrees with the decision on the license annulment.

Article 13. State Control over Communications Operation, Service & manufacturing

1. The state inspectorate of communications and its state inspector shall provide professional control and audit over the execution of the legislation and technological regulations by the related person in the communications operation, service and manufacturing.

2. Besides the powers stipulated the Law of the state control and audit the state inspectorate of communications and its state inspectors shall exercise the following powers:

1/ To control over the execution of the communications Act, licensing and its realization

2/ To audit the implementation of technological regulations, necessary for the communications operation, service and manufacturing, established standards and technical conditions as well as the other requirements reflected in this Act.

3/ To halt the activities if the communications operation, service and manufacturing are carried out without a license and radio frequencies are used without registration.

Chapter three:

Communications network

Article 14. Types of communications network

Communications network shall comprise telecommunications, postal and radio and TV broadcasting and other data communications networks and they shall be classified as a public, internal and special network according to their purposes.

Article 15. Telecommunications Network

1. Telecommunication network shall comprise of lines, equipment and facilities assigned for transmitting and receiving sign, signal, sound, images and any other all kind of information and accommodation specially equipped for this purpose as well.

2. The basic telecommunication network shall consist of international, trunk, local transmission and switching equipment and it shall cover the whole country's territory and be designed for public service.

3. Telecommunication core network shall have an integrated technological management and smooth functioning.

Article 16. Postal network

1. The postal network shall consist of a system designed for receiving, sorting, transporting and delivering postal items.

2. Postal core network shall consist of the postal network used for international and domestic mail exchange.

3. The activities of the basic postal network shall be regulated by the Government.

4. Time-schedule for mail delivery shall be determined by:

1/ agreement concluded with foreign countries for international mail delivery,

2/ decision of the Minister in charge for domestic mail delivery between aimag, somon centres and cities

3/ decision of related local government for local mail delivery inside the capital city, districts, somons bags, towns and villages.

5. An economic entity, organization and citizen who obtained a license for passenger transportation shall convey mail between aimag, the capital city, somons, cities and bags on the basis of contract signed with the postal organization.

Article 17. Radio and TV Broadcasting network

1. The radio TV broadcasting network shall comprise equipment and technical devices for receiving and transmitting radio and TV broadcasting.

2. A set of equipment and lines used for delivering radio and TV program to the customers throughout the country shall form radio and TV broadcasting core network.

3. Mongolian radio and TV broadcasting network shall operate according to the order and time-table of the organization which produces the programs.

Article 18. Communications Network for Special Purpose

1. A communication's network for special purpose may be set up for needs of Mongolia's defence, security, maintenance of public order observation, Governmental and local governing organizations.

2. The communications network for special purpose shall be under the Government protection.

3. The Government shall ratify regulations on establishment and operation of the communications network for special purposes.

4. Circuits and technical facilities of the basic telecommunications network for needs of the communications for special purposes shall be provided at a cost.

Article 19. Communications Network for internal Purpose

1. Any economic entity and organisation may establish and use internal communication for their internal purpose and technological management and operative co-ordination.

2. On the basis of the license granted by the Governmental Body in charge of communications a network for internal purpose may be connected to the basic telecommunications network and used for public service.

Article 20. Connection to basic telecommunications network

Funding and supply with additional lines and other equipment to be installed in the network till the demarcation point or at the demarcation point for connection of the internal and special communication network to the public communication network shall be responsibility of the owner of the internal or special communication network. Location of the demarcation point shall be determined by the Governmental Body in telecommunications with consent of the Regulatory Body.

Article 21.. Mobilization of Communications Network

In case of commandant situation and major military action the communication network shall be mobilised in accordance with the provisions stipulated in corresponding Mongolian legislation.

Chapter four:

Rights and duties of communication operators and customers.

Article 22. Mutual duties and liabilities of the operator and customers

Mutual obligations and liabilities of the operator and customers shall be defined by a contract according to the Civil Code.

Article 23. Rights and duties of the operator

1. An operator enjoys the following rights besides the ones stated in the contract:

1/ to establish communications services charges in accordance with the methodology adopted by the Regulatory Body.

2/ to halt services and terminate the contract, if a customer does not fulfill his/her obligation stated in the contract.

2. An operator assumes the following obligations besides the ones said in the contract:

1/ to provide customers with reliable and efficient communications services without any discrimination pursued within license:

2/ to observe standards, technical and technological terms and regulations of communications operation, service and manufacturing;

3/ to provide customers with notice in advance of planned restructure, extension of the communications equipment service changes and temporary interruptions of services;

4/ to protect the privacy of all types of information transmitted through the communications network;

5/ to let others to use the network without any delay in case of natural disasters and other unexpected accidents in accordance with the legislation

6/ Not to interrupt the communication service in the cases except natural disasters and other unexpected accidents.

3. Staffs of the operator shall get a permission from the related organization in order to maintain and repair their communications lines and network located in the premises of an entity or organization under state protection.

4. An operator shall establish a commission and draw a protocol on the undelivered postal item which does not bear a definite address and keep for 6 months since receiving it

5. If the postal item contains a definite address inside its delivery shall be arranged at that address.

6. The national and foreign currencies and valuable items found in the unsealed postal item shall be transferred to the public treasury and the civil documents to the civil registration and information authority respectively.

7. In case of identifying addressee of the postal item the contents of it shall be returned from the public treasury and if it is not possible to return them the losses shall be recovered.

8. The Governmental Body in charge shall establish the rules of keeping and unsealing postal item without a definite address.

Article 24. Rights & Duties of the Customers

1. Besides the rights stipulated in the Contract the customers are entitled to the following rights:

1/ to choose and use equipment (telephone, telex, facsimile, radio set their supplementary devices) which meet the technical standards and requirements of communications.

2/ to require timely repair of a fault occurred in the communications network and be informed about it

3/ to have compensated any losses under the Civil Code in case of discontinuity of services due to other reasons excluding natural disasters and other unexpected accidents, failure to operate equipment, loss or damage of postal items.

4/ to have post boxes in the post offices

2. A customer's obligations besides the ones formulated in the contract are as follows;

1/ to protect the communications network and equipment located in his/her house and area of own possession and inform the operator of their present and future accidents and violations;

2/ to make payments of communications services charges in due time fixed by a contract;

3/ get a license from the Governmental Body in charge on installation and utilisation of communication equipment generating over 9 KHz frequency, register it and not to cause a hindrance to smooth functioning of others' equipment

Chapter five:

Protection of communications network

Article 25. Common Duties of Citizen, Economic Entity & Duties

A citizen, economic entity and organization shall take the following common duties:

1/ to get a permission from the owner of communications lines and network on making an investigation of engineering lines and networks and construction of buildings, lines and networks and bear costs for relocation if relocation is needed.

2/ to reflect the activities essential to satisfy the communications demands in designing construction of new buildings according to the appropriate norms.

3/ an economic entity, organization and citizens shall obtain addresses and codes from the postal organization and have changes if any;

4/ to refrain from mailing by post explosive (weapons, gun-powder, bullets, etc.), flammable (gasoline, fuel, spirits, acid, alkali, etc.) substances and items prohibited by the customs office.

Article 26. Rights of way

1. Communications rights of way means a part of land and space for the communications network from the assigned land fund of Mongolia.

The dimensions of the rights of way shall be as follows:

1/ open wire lines: 10 metres on each side

2/ cables lines: 5 meters on each side

3/ space in line of sight between microwave stations or between satellite and earth station for space communication has the radius of 300 metres from each side of the particular station

4/ Size of a sanitation protection zone (area determined to be harmful to human body) depending on the capacity of the radio and TV transmitting station equipment.

The size of the rights of way stipulated in Nos.1 and 2 of paragraph 1 of this article may vary within a city and village.

2. The operator who has got a license for running communications service and operation through the communications network shall possess the rights of way in accordance with legislation.

3. All issues connected with the rights of way of communications lines shall be solved by the Governmental Body in charge of communications and local governments within the range of their powers.

Article 27. Protection of rights of way

1. The communications rights of way shall be under the ownership of the operator.

2. Signs, showing the rights of way shall be put along the communication line

3. The following actions shall be prohibited within rights of way:

1/ Rights of way shall remain free of all obstructions of any kind, including, buildings, gers, fences and trees,

2/ Rights of way shall not be used for disposal of any kind of heavy items and chemical caustic substances which may cause damage to the cable.

3/ Excessively tall loads shall not be transported within or across a rights of way

4. Any land developing actions shall be permitted within a rights of way on the basis of prior permission from the operator. After having executed any action within the rights of way, the concerned entity shall restore the natural environment of the right of way at his cost.

Article 28. Liability for the violation of the legislation.

If the actions of any person violated to the Communications Act have no feature of crime they shall be liable to the following administrative punishment imposed by the communications inspector:

1/ If Offender has caused a damage to the communication facilities installed in the places of common use the offender shall be fined from 5000 to 25000 tugrigrs, if the offender is an economic entity, organisation it shall be fined from 30000-150000 tugrigrs.

2/ If the offender has caused a damage to the communication lines and network (communication cable, open wire line, subscriber cable box, built- in wire, transformer, ducts, post box ets) due to carrying out investigation and designing construction of buildings and engineering lines he/she shall be fined from 5000 to 35000 tugrigrs and if the offender is economic entity it shall be fined from 50000 to 250000 tugrigrs.

3/ If the offender has taken down or erased marks put along the communication lines and caused a damage to the telecommunication poles and left extraneous matters in cable boxes or manholes and ducts, post boxes he/she shall be fined from 3000 to 10000 tugrigrs and if the offender is an economic entity it shall be fined from 30000 to 150000 tugrigrs.

4/ If the offender has operated or manufactured equipment generating radio frequencies without any permission or registration and entered into connection with the communication lines and listen to or record information passing through them without permission, shall be fined from 5000 to 35000 tugrigrs and if the offender is an economic entity, it shall be fined from 50000 to 250000 tugrigrs.

5/ If the offender contravenes the provisions 3,4 of article 27 of this Act, he/he shall be fined from 2000 to 35000 tugrigrs and if the offender is an economic entity, it shall be fined from 50000 to 250000 tugrigrs.

6/ If the offender has sent or received to send by post prohibited items or he has sent more number of items than that is permitted, or has not followed the schedule of mail delivery, lost, damaged and unsealed the postal items he/she shall be fined from 1000 to 35000 tugrigrs if the offender is an economic entity, it shall be fined from 50000-250000 tugrigrs

7/ If the offender violates the paragraph 2, item 6 of article 23 of this Act he/she shall be fined from 5000 to 35000 tugrigrs. and if the offender is an economic entity it shall be fined from 50000 tugrigrs to 250000 tugrigrs.

8/ If the offender violates the paragraph 2, item2 and 4 of article 23 of this Act he/she shall be fined from 2000-25000 tugrigrs, if the offender is an economic entity, it shall be fined from 30000-200000 tugrigrs.

Article 29. Compensation of the loss

The concerned victim shall have a right to claim a compensation of the loss caused by contravention of communication legislation from the offenders.

CHAPTER 3

Procedure of Telephone Demand Forecast

CHAPTER 3

PROCEDURE OF TELEPHONE DEMAND FORECAST

1. Introduction

In this study, to forecast telephone demand in Ulaanbaatar city up to 2010, Three Method were made by the Study Team, i.e., Method I : Macroscopic forecast method, Method II : Semi-macroscopic forecast method and Method III : Microscopic forecast method. Finally, Method II was adopted for implementation plan in this basic plan. This chapter will describe the procedure of Method II in details to understand how to reach the final demand and how to distribute the final demand to each exchange. The following figure shows the procedure of demand forecast and demand distribution in this study.

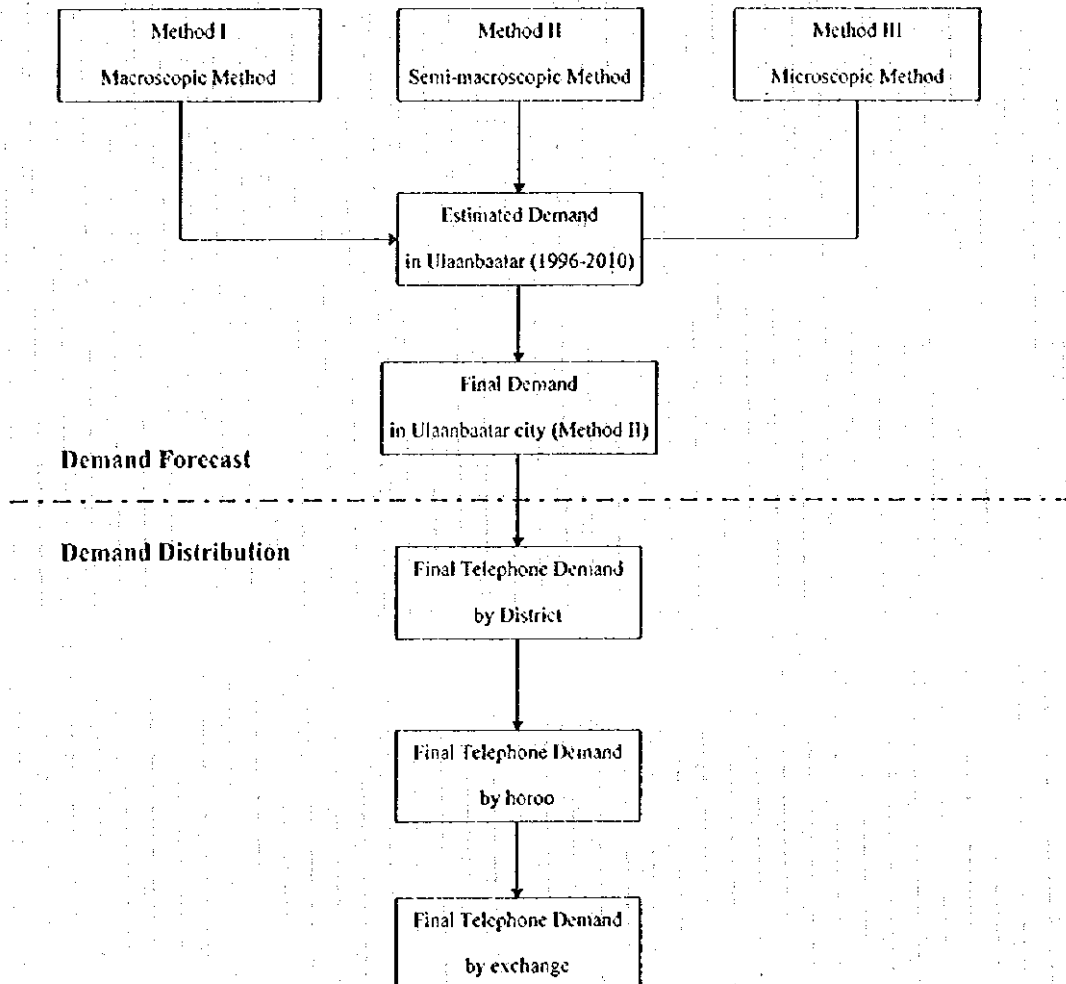


Figure 3-1-1 Procedure of Demand Forecast and Demand Distribution

2. Demand Forecast

3.2.1 Semi-macroscopic Forecast Method (Method II)

Semi-macroscopic demand forecast method and the result of it were described in the Volume II Chapter 5 Demand Forecast (Telecommunication Basic plan up to 2010 in Ulaanbaatar city). To supplement the above mentioned description for more understanding with some data using in this study, detail procedure of semi-macroscopic demand forecast which finally decided to use for the implementation plan in the basic plan was described in this section. Figure 3-2-1 presents the procedure of semi-macroscopic demand forecast method (Method II).

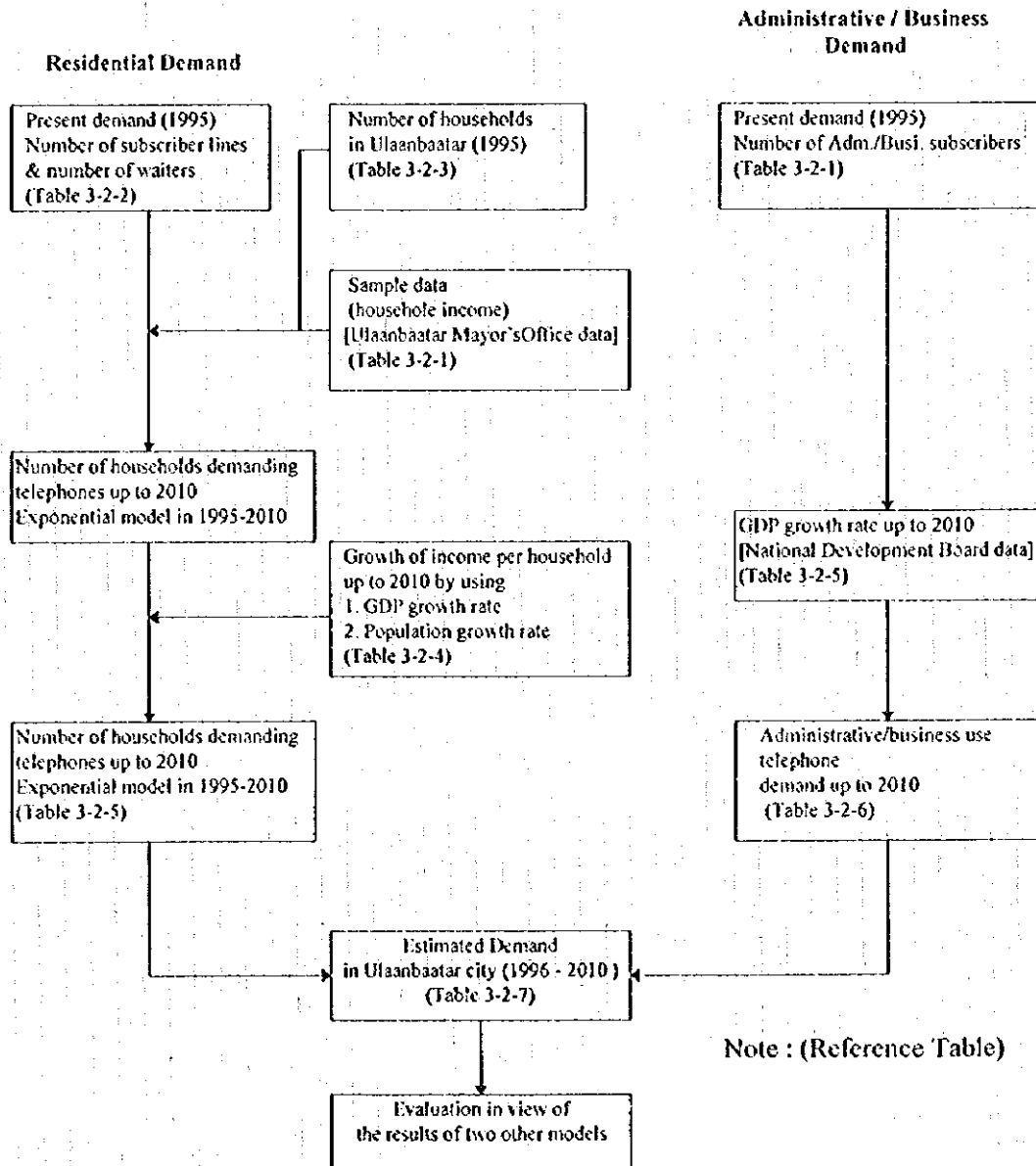


Figure 3-2-1 Semi-Macroscopic Forecast Method Procedure

3.2.2 Residential Demand

At present, the total residential telephone demand in Ulaanbaatar city is 54,259 consisting of the number of the existing residential subscriber lines and that of waiters (30,285 and 23,974 respectively), while the number of households is 137,600 according to the Mayor's Office in Ulaanbaatar city. The concept of residential demand forecast in Method II shows Figure 3-2-1. The sample data of household income in Ulaanbaatar city surveyed by Ulaanbaatar Mayor's Office is shown in Table 3-2-1 (1/4)-(4/4) in next page.

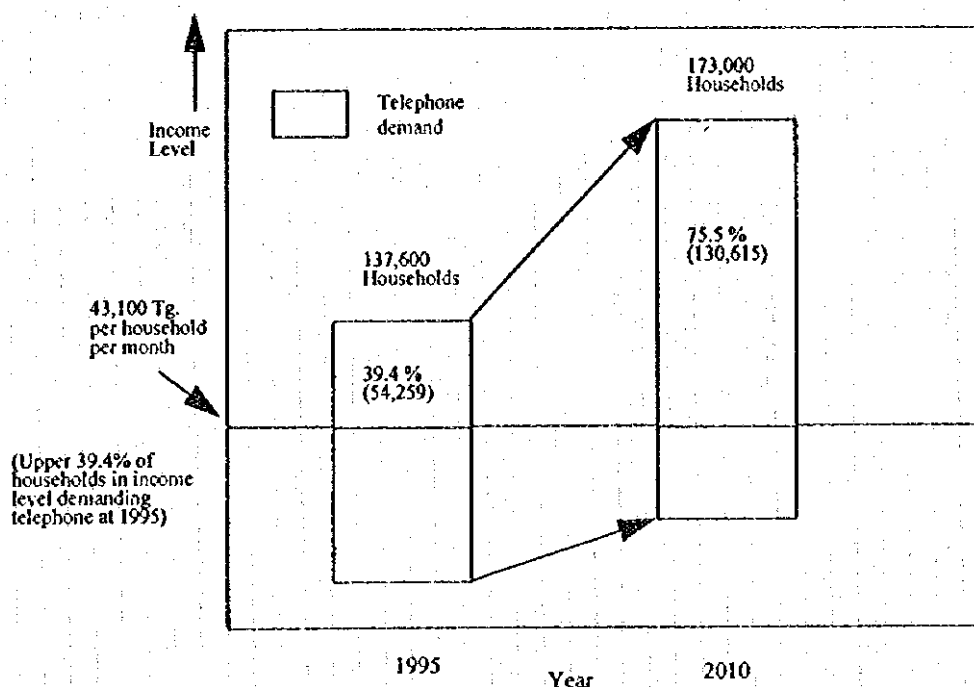


Figure 3-2-1 Concept of Residential Demand Forecast in Method II (applying socio-economic indices)

Two factors of increasing demand:

- (1) increase of the number of households (1.54% per year)
- (2) increase in household income (4.3% per year derived from 5.9% per year growth of the economy and 1.54% per year growth of population)

The percentage of the richest portion of the households demanding telephones in 1995 is calculated as follows:

Table 3-2-1 Monthly Household Income in Ulaanbaatar in September 1995 (485 samples) (1/4)

No. of Sample	Monthly income in order (Tg./month/household)	Cumulative %	No. of Sample	Monthly income in order (Tg./month/household)	Cumulative %
1	630,000	0.21	61	77,000	12.58
2	531,029	0.41	62	75,000	12.78
3	503,000	0.62	63	75,000	12.99
4	453,600	0.82	64	75,000	13.20
5	317,000	1.03	65	75,000	13.40
6	307,820	1.24	66	74,770	13.61
7	305,000	1.44	67	74,130	13.81
8	270,000	1.65	68	73,447	14.02
9	257,500	1.86	69	72,800	14.23
10	243,802	2.06	70	71,500	14.43
11	220,000	2.27	71	70,170	14.64
12	192,000	2.47	72	70,000	14.85
13	185,558	2.68	73	67,630	15.05
14	176,600	2.89	74	67,303	15.26
15	172,330	3.09	75	67,000	15.46
16	169,200	3.30	76	66,676	15.67
17	167,315	3.51	77	66,600	15.88
18	146,198	3.71	78	65,250	16.08
19	145,000	3.92	79	65,182	16.29
20	145,000	4.12	80	65,540	16.49
21	143,750	4.33	81	64,450	16.70
22	143,068	4.54	82	63,000	16.91
23	142,000	4.74	83	62,528	17.11
24	140,280	4.95	84	62,460	17.32
25	137,425	5.15	85	62,300	17.53
26	133,800	5.36	86	62,130	17.73
27	131,021	5.57	87	62,000	17.94
28	124,500	5.77	88	62,000	18.14
29	122,100	5.98	89	61,900	18.35
30	119,564	6.19	90	61,700	18.56
31	116,750	6.39	91	61,600	18.76
32	102,622	6.60	92	61,000	18.97
33	100,000	6.80	93	61,000	19.18
34	100,000	7.01	94	61,000	19.38
35	100,000	7.22	95	60,702	19.59
36	97,510	7.42	96	60,600	19.79
37	96,000	7.63	97	60,600	20.00
38	95,000	7.84	98	60,450	20.21
39	93,400	8.04	99	60,238	20.41
40	93,112	8.25	100	60,000	20.62
41	91,500	8.45	101	60,000	20.82
42	89,450	8.66	102	60,000	21.03
43	89,000	8.87	103	59,780	21.24
44	88,200	9.07	104	59,020	21.44
45	85,820	9.28	105	58,988	21.65
46	85,230	9.48	106	58,675	21.86
47	85,200	9.60	107	58,291	22.06
48	84,470	9.90	108	58,250	22.27
49	84,250	10.10	109	58,000	22.47
50	83,100	10.31	110	57,811	22.68
51	81,770	10.52	111	57,430	22.89
52	81,600	10.72	112	57,000	23.09
53	80,877	10.93	113	56,600	23.30
54	80,868	11.13	114	56,560	23.51
55	80,585	11.34	115	56,550	23.71
56	80,200	11.55	116	56,340	23.92
57	79,600	11.75	117	56,222	24.12
58	79,460	11.96	118	56,100	24.33
59	77,500	12.16	119	56,000	24.54
60	77,394	12.37	120	55,400	24.74

Table 3-2-1 Monthly Household Income in Ulaanbaatar in September 1995 (485 samples) (2/4)

No. of Sample	Monthly income in order (Tg. / month / household)	Cumulative %	No. of Sample	Monthly income in order (Tg. / month / household)	Cumulative %
121	55,280	24.95	181	41,080	37.32
122	55,008	25.15	182	44,000	37.53
123	55,000	25.36	183	43,763	37.73
124	54,990	25.57	184	43,724	37.94
125	54,753	25.77	185	43,584	38.14
126	54,500	25.98	186	43,408	38.35
127	54,435	26.19	187	43,270	38.56
128	54,427	26.39	188	43,257	38.76
129	54,000	26.60	189	43,252	38.97
130	53,900	26.80	190	43,200	39.18
131	53,890	27.01	191	43,166	39.38
132	53,684	27.22	192	43,000	39.59
133	53,628	27.42	193	42,700	39.79
134	53,495	27.63	194	42,667	40.00
135	53,000	27.84	195	42,646	40.21
136	52,300	28.04	196	42,436	40.41
137	52,000	28.25	197	42,250	40.62
138	52,000	28.45	198	42,180	40.82
139	51,875	28.66	199	42,050	41.03
140	51,031	28.87	200	42,000	41.24
141	50,966	29.07	201	41,980	41.44
142	50,788	29.28	202	41,890	41.65
143	50,650	29.48	203	41,800	41.86
144	50,290	29.69	204	41,380	42.06
145	50,000	29.90	205	41,361	42.27
146	50,000	30.10	206	41,128	42.47
147	50,000	30.31	207	41,000	42.68
148	50,000	30.52	208	40,800	42.89
149	50,000	30.72	209	40,300	43.09
150	49,199	30.93	210	40,100	43.30
151	49,050	31.13	211	40,088	43.51
152	49,170	31.34	212	40,054	43.71
153	48,500	31.55	213	40,000	43.92
154	48,438	31.75	214	40,000	44.12
155	48,000	31.96	215	40,000	44.33
156	47,600	32.16	216	40,000	44.54
157	47,490	32.37	217	39,860	44.74
158	47,380	32.58	218	39,800	44.95
159	47,340	32.78	219	39,714	45.15
160	47,300	32.99	220	39,600	45.36
161	47,200	33.20	221	39,550	45.57
162	47,000	33.40	222	39,230	45.77
163	46,950	33.61	223	39,000	45.98
164	46,150	33.81	224	39,000	46.19
165	46,000	34.02	225	38,770	46.39
166	46,000	34.23	226	38,725	46.60
167	45,950	34.43	227	38,622	46.80
168	45,810	34.64	228	38,373	47.01
169	45,640	34.85	229	38,150	47.22
170	45,455	35.05	230	38,045	47.42
171	45,450	35.26	231	38,037	47.63
172	45,340	35.46	232	37,978	47.84
173	45,110	35.67	233	37,845	48.04
174	45,100	35.88	234	37,800	48.25
175	45,000	36.08	235	37,700	48.45
176	45,000	36.29	236	37,086	48.66
177	44,700	36.49	237	37,002	48.87
178	44,640	36.70	238	36,680	49.07
179	44,456	36.91	239	36,590	49.28
180	44,400	37.11	240	36,380	49.48

Table 3-2-1 Monthly Household Income in Ulaanbaatar in September 1995 (485 samples) (3/4)

No. of Sample	Monthly income in order (Tg. / month / household)	Cumulative %	No. of Sample	Monthly income in order (Tg. / month / household)	Cumulative %
241	36,330	49.69	301	30,650	62.66
242	36,000	49.90	302	30,000	62.27
243	36,000	50.10	303	30,000	62.47
244	35,900	50.31	304	30,000	62.68
245	35,700	50.52	305	30,000	62.89
246	35,650	50.72	306	30,000	63.09
247	35,490	50.93	307	30,000	63.29
248	35,278	51.13	308	30,000	63.51
249	35,000	51.34	309	30,000	63.71
250	35,000	51.55	310	29,970	63.92
251	35,000	51.75	311	29,900	64.12
252	35,000	51.96	312	29,624	64.33
253	35,000	52.16	313	29,550	64.54
254	35,000	52.37	314	29,530	64.74
255	35,000	52.58	315	29,400	64.95
256	34,600	52.78	316	29,250	65.15
257	34,562	52.99	317	29,000	65.36
258	34,465	53.20	318	29,000	65.57
259	34,450	53.40	319	29,000	65.77
260	34,179	53.61	320	28,780	65.98
261	34,000	53.81	321	28,750	66.19
262	34,000	54.02	322	28,611	66.39
263	34,000	54.23	323	28,390	66.60
264	33,490	54.43	324	28,360	66.80
265	33,343	54.64	325	28,200	67.01
266	33,170	54.85	326	28,176	67.22
267	33,090	55.05	327	28,175	67.42
268	33,016	55.26	328	28,000	67.63
269	33,000	55.46	329	28,000	67.84
270	32,968	55.67	330	27,928	68.04
271	32,870	55.88	331	27,753	68.25
272	32,850	56.08	332	27,620	68.45
273	32,550	56.29	333	27,400	68.66
274	32,500	56.49	334	27,370	68.87
275	32,400	56.70	335	27,650	69.07
276	32,400	56.91	336	27,000	69.28
277	32,300	57.11	337	27,000	69.48
278	32,250	57.32	338	27,000	69.69
279	32,050	57.53	339	26,972	69.90
280	32,000	57.73	340	26,900	70.10
281	32,000	57.94	341	26,580	70.31
282	32,000	58.14	342	26,490	70.52
283	31,450	58.35	343	26,000	70.72
284	31,338	58.56	344	26,000	70.93
285	31,320	58.76	345	26,000	71.13
286	31,270	58.97	346	25,000	71.34
287	31,100	59.18	347	25,800	71.55
288	31,100	59.38	348	25,600	71.75
289	31,000	59.59	349	25,500	71.96
290	31,000	59.79	350	25,428	72.16
291	31,000	60.00	351	25,214	72.37
292	31,000	60.21	352	25,070	72.58
293	30,914	60.41	353	25,000	72.78
294	30,450	60.62	354	25,000	72.99
295	30,390	60.82	355	25,000	73.20
296	30,390	61.03	356	24,820	73.40
297	30,230	61.24	357	24,810	73.61
298	30,211	61.44	358	24,700	73.81
299	30,140	61.65	359	24,650	74.02
300	30,059	61.85	360	24,643	74.23

Table 3-2-1 Monthly Household Income in Ulaanbaatar in September 1995 (485 samples) (4/4)

No. of Sample	Monthly income in order (Tg. / month / household)	Cumulative %	No. of Sample	Monthly income in order (Tg. / month / household)	Cumulative %
361	24,450	74.43	424	15,980	87.42
362	24,000	74.64	425	15,806	87.63
363	24,000	74.85	426	15,834	87.84
364	23,500	75.05	427	15,800	88.04
365	23,400	75.26	428	15,592	88.25
366	23,167	75.46	429	15,500	88.45
367	23,000	75.67	430	15,500	88.66
368	23,000	75.88	431	15,470	88.87
369	23,000	76.08	432	15,452	89.07
370	22,900	76.29	433	15,262	89.28
371	22,825	76.49	434	15,250	89.48
372	22,760	76.70	435	15,016	89.69
373	22,673	76.91	436	15,000	89.90
374	22,590	77.11	437	14,800	90.10
375	22,450	77.32	438	14,430	90.31
376	22,292	77.53	439	14,000	90.52
377	22,250	77.73	440	13,950	90.72
378	22,200	77.94	441	13,800	90.93
379	22,150	78.14	442	13,284	91.13
380	22,108	78.35	443	13,100	91.34
381	22,000	78.56	444	13,000	91.55
382	22,000	78.76	445	12,864	91.75
383	22,000	78.97	446	12,500	91.96
384	21,990	79.18	447	11,152	92.16
385	21,826	79.38	448	10,340	92.37
386	21,600	79.59	449	10,204	92.58
387	21,600	79.79	450	10,200	92.78
388	21,550	80.00	451	10,190	92.99
389	21,430	80.21	452	10,065	93.20
390	21,148	80.41	453	10,000	93.40
391	21,087	80.62	454	10,000	93.61
392	21,000	80.82	455	10,000	93.81
393	21,000	81.03	456	10,000	94.02
394	21,000	81.24	457	9,900	94.23
395	21,000	81.44	458	9,700	94.44
396	20,884	81.65	459	9,600	94.64
397	20,852	81.85	460	9,600	94.85
398	20,741	82.06	461	9,500	95.05
399	20,540	82.27	462	9,000	95.26
400	20,300	82.47	463	9,000	95.46
401	20,266	82.68	464	8,924	95.67
402	20,000	82.89	465	8,618	95.88
403	19,829	83.09	466	8,400	96.08
404	19,795	83.30	467	8,345	96.29
405	19,070	83.51	468	8,000	96.49
406	18,670	83.71	469	8,000	96.70
407	18,500	83.92	470	8,000	96.91
408	18,485	84.12	471	7,600	97.11
409	18,012	84.33	472	7,368	97.32
410	18,000	84.54	473	7,332	97.53
411	18,000	84.74	474	6,870	97.73
412	18,000	84.95	475	6,500	97.94
413	17,900	85.15	476	6,270	98.14
414	17,664	85.36	477	6,200	98.35
415	17,556	85.57	478	5,750	98.56
416	17,003	85.77	479	5,603	98.76
417	17,000	85.98	480	5,645	98.97
418	16,800	86.19	481	5,600	99.18
419	16,665	86.39	482	4,716	99.38
420	16,195	86.60	483	4,260	99.59
421	15,100	86.80	484	4,000	99.79
422	16,000	87.01	485	2,363	100.00
423	16,000	87.22			

a) Present residential demand in Ulaanbaatar city

Number of subscriber in 1995	:	30,285
Number of waiters in 1995	:	23,974
Total residential telephone demand in 1995	:	54,259

Definition of demand is that all the present subscribers and waiter are regarded as effective demand (those who can actually afford telephone possession) as shown in Table 3-2-2.

Table 3-2-2 Number of Subscriber lines and Waiters in Ulaanbaatar City by District

At the end of 1995

District (Dureg)	Subscriber Lines		Waiters	Demand	Remarks
	Admin / Busi.	Resident			
Suhbaatar	3,081	4,554	3,943	11,578	ATC73
Chingeltei	4,040	3,139	4,183	11,362	ATC73
Bayangol	1,099	7,159	6,072	14,330	
Songinohaihan	1,513	5,037	3,663	10,213	Jargalant, ICC
Bayansurh	1,642	5,805	3,378	10,825	Gachuurt, Honhor
Khan-Uul	1,808	2,275	2,109	6,192	Bio, Shuvuu
Nalaib	239	701	171	1,111	
Baganuur	327	1,600	* 655	2,582	
Bagahangai	48	15	0	63	
Subtotal	13,797	30,285	24,174	68,256	
Total		44,082	24,174	68,256	

Note : Bio - Biokombinat, Shuvuu - Shuyun Fabric, ICC - International Children's Center Jargalant (Partizan)

* 200 waiters out of 655 in total are those for administrative/business use telephones.

b) Average household size

According to the Ulaanbaatar Mayor's Office, the number of households in 1995 is 137,600.

Table 3-2-3 Population and Household in Ulaanbaatar city at Present

District (Dureg)	Population	No. of households	Remarks
Suhbaatar	80,200	16,822	ATC73
Chingeltei	90,400	21,088	ATC73
Bayangol	111,700	24,822	
Songinohaihan	124,300	27,485	Jargalant, ICC
Bayansurh	105,300	23,400	Gachuurt,
Khan-Uul	60,900	13,533	Bio, Shuvuu
Nalaib	23,400	5,200	
Baganuur	16,900	4,150	
Bagahangai	6,200	1,100	
Total	619,300	137,600	

$$619,300 \text{ (population)} / 137,600 \text{ (household)} = 4.5 \text{ persons / household}$$

It is assumed that average household size of Ulaanbaatar is same as the national average.

c) Income level of household demanding telephone

$$54,259 \text{ (total demand)} / 137,600 \text{ (households)} = 39.4 \%$$

Minimum income level of highest 39.4% household : 43,100 Tg. /month/household

It is assumed that the upper portion of all the households demand telephone.

d) Income growth assumptions

It is assumed that Ulaanbaatar's economy will growth at the same rate as the nation until 2010.

Population will grow at a rate assumed by the Mayor's Office (1.54% / year)

d-1) Economic growth rate of Ulaanbaatar (same as nation)

GDP (US\$ Constant Price in 1992)

1,212.61 Million US\$ in 1995

2,854.34 Million US\$ in 2010 (Based on the data of National Development Board)

$$10^{(\text{LOG}(2,854.34 / 1,212.61) / 15)} - 1 = 0.058731 \text{ (approx. 5.9 \%)}$$

d-2) Population growth rate of Ulaanbaatar city

Population in Ulaanbaatar city

619,300 in 1995

778,700 in 2010 (Based on the data of the Mayor's Office in Ulaanbaatar city)

$$10^{(\text{LOG}(778,700 / 619,300) / 15)} - 1 = 0.015386 \text{ (approx. 1.54 \%)}$$

e) Per household income growth rate

$$\begin{aligned} & (((1.058731^{15}) / (1.015386^{15}))^{(1/15)} - 1) \times 100 \\ & = ((1.058731 / 1.015386) - 1) \times 100 = 4.265767 \% \text{ (approx. 4.3 \%)} \end{aligned}$$

1.058731 : Average Economic Growth Rate yearly between 1995 and 2010

1.015386 : Average population Growth Rate yearly in Ulaanbaatar city

15 : 15 years between 1995 and 2010

f) Income level in 1995 that will reach 43,100 Tg. in 2010

Tg. $43,100 / (1.04265767^{15}) : 22,022.91$ Tg. / month / household in 1995

% share of household with more than approx. Tg. 22,023 income in 1995

g) Number of household in 2010 and telephone demand

778,700 (population in 2010) / 4.5 (average household size) : 173,044 (approx. 173,000)

Telephone demand in 2010 : 173,000 x 75.5% = 130,615

(residential telephone demand in 2010)

Table 3-2-4 Share of household demanding Telephone

Year	Population	Household (POP/4.5 in round)	GDP Growth Rate	Population Growth Rate	Income level of demanding telephone (samples in 1995)	Share of household demanding telephone * (samples in 1995)	Residential Demand
1995	619,300	137,600	3.5%		(a) 43,100 Tg./M/H	39.4%	54,259
1996	628,822	139,700	(b) 5.3%	(c) 1.54%	(d) 41,560 Tg./M/H	41.9%	58,534
1997	638,491	141,900	5.5%	1.54%	39,999 Tg./M/H	44.5%	63,146
1998	648,309	144,100	5.5%	1.54%	38,497 Tg./M/H	46.8%	67,439
1999	658,277	146,300	5.8%	1.54%	36,946 Tg./M/H	48.9%	71,541
2000	668,400	148,500	6.0%	1.54%	35,391 Tg./M/H	50.9%	75,587
2001	678,698	150,800	6.0%	1.54%	33,902 Tg./M/H	54.2%	81,734
2002	689,155	153,100	6.0%	1.54%	32,476 Tg./M/H	56.5%	86,502
2003	699,773	155,500	6.0%	1.54%	31,109 Tg./M/H	59.0%	91,745
2004	710,554	157,900	6.0%	1.54%	29,801 Tg./M/H	64.1%	101,214
2005	721,500	160,300	6.0%	1.54%	28,547 Tg./M/H	66.4%	106,439
2006	732,594	162,800	6.0%	1.54%	27,345 Tg./M/H	68.7%	111,841
2007	743,858	165,300	6.0%	1.54%	26,194 Tg./M/H	70.5%	116,537
2008	755,296	167,800	6.0%	1.54%	25,091 Tg./M/H	72.4%	121,487
2009	766,909	170,400	6.0%	1.54%	24,035 Tg./M/H	74.4%	126,778
2010	778,700	173,000	6.0%	1.54%	23,023 Tg./M/H	75.5%	130,615

Note * : These percentage were obtained by the checking on the Table of household income sample data.

Sample calculation : $(d) = (a) / ((1 + (b)) / (1 + (c)))$

$$41,560 \text{ Tg.} = 43,100 \text{ Tg.} / ((1 + 0.053) / (1 + 0.0154))$$

h) Modification of Residential Demand

Table 3-2-5 Modified Residential Demand in Ulaanbaatar City

Year	Original Residential Demand			Modified Residential Demand		
	Demand	Share of household Demanding telephone	Growth Rate (each 5 years)	Demand	Share of households Demanding telephone	Growth Rate (each 5 years)
1995	54,259	39.4%		54,259	39.40%	
1996	58,534	41.9%		57,836	41.40%	
1997	63,146	44.5%		61,585	43.40%	
1998	67,439	46.8%	from 1996	65,421	45.40%	from 1996
1999	71,541	48.9%	to 2000 in share	69,346	47.40%	to 2000
2000	75,587	50.9%	11.5 %	73,359	49.40%	10.0 %
2001	81,734	54.2%		78,114	51.80%	
2002	86,502	56.5%		82,980	54.20%	
2003	91,745	59.0%	from 2001	88,013	56.60%	from 2001
2004	101,214	64.1%	to 2005 in share	93,161	59.00%	to 2005 in share
2005	106,439	66.4%	15.5 %	98,424	61.40%	12.0 %
2006	111,844	68.7%		104,550	64.22%	
2007	116,537	70.5%		110,817	67.04%	
2008	121,487	72.4%	from 2006	117,225	69.86%	from 2006
2009	126,778	74.4%	to 2010 in share	123,847	72.68%	to 2010 in share
2010	130,615	75.5%	9.1 %	130,615	75.50%	14.1 %
		refer to sample data of income survey	from 1996 to 2010 in share (36.1%)	Note		from 1996 to 2010 in share (36.1%)

Note : The upper portion of all the households demand telephone in Ulaanbaatar city.(%)
 In 2010, 75.5% in the all households in Ulaanbaatar city will reach more than 43,100 Tg. / month in their income, namely, they will demand telephone in 2010.

i) Exponential Model

The Study Team estimated the residential telephone demand is to be 130,615 in 2010 and made the following exponential formula to meet the above modified residential demand in 2010 from the residential demand in 1995, i.e., 54,259.

$$RD_t = 376.82 \times PH_t^{1.357}$$

RD_t : The number of Residential Demand in period t

PH_t : The Percentage of Households in Ulaanbaatar city whose income will reach 43,100 Tg. / month / household in period t

It is assumed that income distribution pattern in 1995 will remain unchanged until 2010.

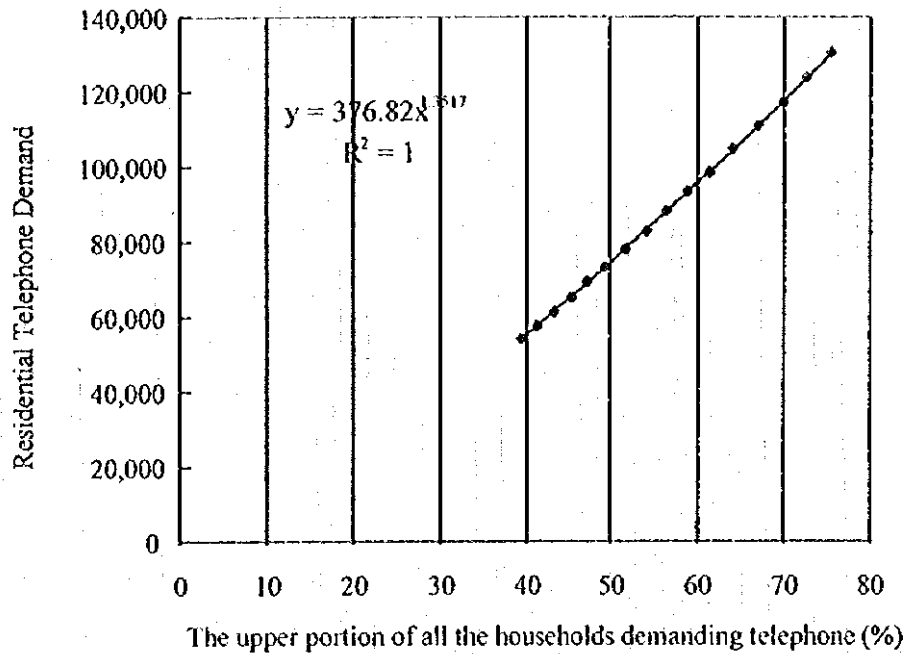


Figure 3-2-2 Exponential Formula for Residential Demand Forecast

3.2.3 Administrative/Business Demand

Administrative/business demand was assumed to increase in line with the economic activity growth in Mongolia. Then, administrative/business demand forecast was made by using the GDP growth rate in Mongolia up to 2010, and the demand in 1995, i.e., 13,997 (13,797 subscriber lines and 200 waiters in Baganuur).

Table 3-2-6 Administrative/Business Demand

Year	Demand	GDP growth rate	Year	Demand	GDP growth rate	Year	Demand	GDP growth rate
1996	14,739	5.3%	2001	19,501	6.0%	2006	26,097	6.0%
1997	15,549	5.5%	2002	20,671	6.0%	2007	27,663	6.0%
1998	16,405	5.5%	2003	21,912	6.0%	2008	29,323	6.0%
1999	17,356	5.8%	2004	23,226	6.0%	2009	31,082	6.0%
2000	18,398	6.0%	2005	24,620	6.0%	2010	32,947	6.0%

3.2.4 Final Telephone Demand up to 2010 (Method II)

Final telephone demand in Method II is shown in Table 3-2-7.

Table 3-2-7 Final Telephone Demand in Ulaanbaatar city up to 2010 (Method II)

Items	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Population	619,300	628,822	638,491	648,309	658,277	668,400	678,698	689,155	699,773	710,554	721,500	732,594	743,858	755,296	766,909	778,700
Household	137,600	139,700	141,900	144,100	146,300	148,500	150,800	153,100	155,500	157,900	160,300	162,800	165,300	167,800	170,400	173,000
GDP Growth Rate	3.5%	5.3%	5.5%	5.5%	5.8%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Pop Growth Rate	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%
Upper Income Household demanding Telephone (%)	39.4%	41.0%	44.5%	46.8%	48.9%	50.9%	54.2%	56.5%	59.0%	64.1%	66.4%	68.7%	70.5%	72.4%	74.4%	75.5%
Income/Month/Household in 1995 income base (Tg)	43,100	41,560	39,999	38,497	36,946	35,391	33,902	32,476	31,109	29,801	28,547	27,345	26,194	25,091	24,035	23,023
Residential Demand	54,259	58,534	63,146	67,439	71,541	75,587	81,734	86,502	91,745	101,214	106,439	111,844	116,537	121,487	126,778	130,615
Administrative/Business Demand	13,997	14,739	15,549	16,405	17,356	18,398	19,501	20,671	21,912	23,226	24,620	26,097	27,663	29,323	31,082	32,947
Original Total Demand	68,256	73,273	78,695	83,843	88,897	93,984	101,235	107,173	113,657	124,440	131,059	137,941	144,200	150,810	157,860	163,562
Upper Income Household demanding Telephone (%)	39.40%	41.40%	43.40%	45.40%	47.40%	49.40%	51.80%	54.20%	56.60%	59.00%	61.40%	64.22%	67.04%	69.86%	72.68%	75.50%
Residential Demand	54,259	57,836	61,585	65,421	69,346	73,359	78,114	82,980	88,013	95,161	98,424	104,550	110,817	117,225	123,847	130,615
Administrative/Business Demand	13,997	14,739	15,549	16,405	17,356	18,398	19,501	20,671	21,912	23,226	24,620	26,097	27,663	29,323	31,082	32,947
Modified Total Demand	68,256	72,575	77,134	81,826	86,702	91,757	97,615	103,651	109,925	116,387	123,044	130,647	138,480	146,548	154,929	163,562

3. Demand Distribution and Combination

3.3.1 Procedure of Demand Distribution and Combination

Telephone Demand obtained by Method II in Ulaanbaatar city was distributed to each exchange. In this way, the results of demand forecast in Method III (micro demand forecast method) was used to distribute telephone demand in Ulaanbaatar city to each district. Then, each district demand were distributed to each horoo based on the Study of the basic data of the Ulaanbaatar city telephone network [N.Nansaljav, D.Dolgorsuren, Sh.Ganbold and M.Naranbaatar]. Horoo is minimum administration unit in Ulaanbaatar city. Finally, these horoo demand was combined into each exchange based on new exchange boundaries planed in "Network Development Plan" in this study. Procedure flow of demand distribution and combination are shown in Figure 3-3-1.

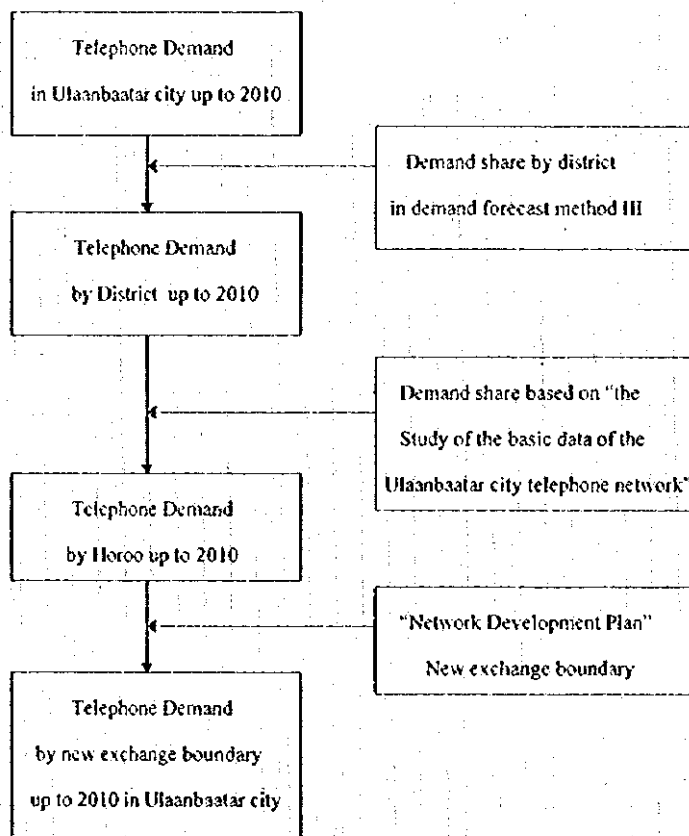


Figure 3-3-1 Procedure of Demand Distribution and Combination

3.3.2 Distribution Demand from Ulaanbaatar Level to District Level

Table 3-3-1 for administrative/business demand and Table 3-3-2 for residential are shows the telephone demand by district up to 2010 respectively.

Table 3-3-1 Administrative/Business Telephone Demand by District

Administrative/Business Demand (Method III)																	
No	District Name	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Suchbatar	3,081	3,200	3,333	3,468	3,618	3,770	3,947	4,123	4,307	4,699	4,699	4,999	5,127	5,355	5,504	5,843
2	Chingello	4,040	4,166	4,370	4,540	4,745	4,956	5,172	5,408	5,649	5,900	6,163	6,437	6,724	7,023	7,336	7,663
3	Bayangol	1,090	1,142	1,189	1,237	1,290	1,348	1,408	1,471	1,536	1,604	1,676	1,751	1,828	1,910	1,995	2,084
4	Songsochauban	1,513	1,573	1,637	1,704	1,777	1,857	1,939	2,026	2,116	2,210	2,309	2,411	2,519	2,631	2,748	2,870
5	Bayaneurh	1,642	1,706	1,776	1,849	1,928	2,014	2,104	2,197	2,295	2,397	2,504	2,616	2,732	2,854	2,981	3,114
6	Khandul	1,803	1,879	1,956	2,036	2,123	2,218	2,316	2,420	2,527	2,639	2,757	2,880	3,008	3,142	3,282	3,428
7	Nalath	239	248	259	269	281	293	306	320	334	349	365	381	398	416	434	453
8	Bayaneur	527	548	571	598	629	648	677	707	739	772	806	841	879	918	959	1,001
9	Bayahansai	48	50	52	54	56	58	61	64	67	70	73	76	79	83	87	91
	Total Demand	13,997	14,547	15,141	15,760	16,418	17,171	17,915	18,736	19,570	20,440	21,352	22,302	23,294	24,332	25,416	26,547
Administrative/Business Demand (Method II)																	
No	District Name	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Suchbatar	3,081	3,264	3,422	3,610	3,820	4,048	4,292	4,549	4,833	5,112	5,418	5,744	6,089	6,453	6,841	7,252
2	Chingello	4,040	4,254	4,487	4,735	5,010	5,310	5,626	5,966	6,325	6,704	7,107	7,533	7,985	8,464	8,971	9,511
3	Bayangol	1,090	1,157	1,221	1,288	1,362	1,441	1,531	1,623	1,720	1,823	1,933	2,049	2,171	2,302	2,440	2,586
4	Songsochauban	1,513	1,594	1,681	1,774	1,876	1,960	2,108	2,235	2,369	2,511	2,662	2,821	2,991	3,171	3,361	3,562
5	Bayaneurh	1,642	1,729	1,824	1,925	2,036	2,158	2,288	2,424	2,570	2,724	2,887	3,061	3,244	3,439	3,645	3,865
6	Khandul	1,804	1,904	2,008	2,119	2,241	2,377	2,518	2,676	2,839	2,998	3,179	3,370	3,572	3,787	4,014	4,254
7	Nalath	270	251	266	280	297	314	333	353	374	397	421	446	473	501	531	562
8	Bayaneur	527	555	586	618	655	694	736	780	827	877	929	984	1,044	1,106	1,172	1,242
9	Bayahansai	48	51	53	56	60	62	64	71	75	80	84	90	94	100	106	113
	Total Demand	13,997	14,719	15,549	16,405	17,356	18,398	19,501	20,671	21,912	23,226	24,620	26,097	27,663	29,323	31,082	32,947

Sample Calculation $3,264 = 3,202 + 14,547 \times 14,739$ (Suchbatar Demand of Method III / Total Demand of Method III) x (Total Demand of Method II)

Table 3-3-2 Residential Telephone Demand by District

Residential Demand (Method III)																	
No.	District Name	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Suchbhear	8,711	9,057	9,199	9,518	9,842	10,171	10,513	10,870	11,228	11,592	11,962	12,330	12,746	13,146	13,554	13,955
2	Chingwet	7,256	7,498	7,833	7,954	8,299	8,424	8,759	8,923	9,305	9,689	9,834	10,241	10,655	10,820	11,246	11,680
3	Bavangol	13,237	13,618	14,087	14,565	15,050	15,544	16,064	16,592	16,848	17,389	17,923	18,519	19,109	19,708	20,316	20,933
4	Songmoharhan	8,698	8,916	9,360	9,504	9,941	10,090	10,533	10,718	11,195	11,365	11,856	12,370	12,593	13,092	13,290	13,834
5	Bavensurh	9,031	9,271	9,659	9,808	10,206	10,612	10,780	11,209	11,645	11,821	12,270	12,743	13,225	13,429	13,924	14,428
6	Khan-Uoi	4,384	4,537	4,607	4,810	4,892	5,110	5,339	5,422	5,638	5,744	5,987	6,082	6,339	6,461	6,700	6,970
7	Nalaih	872	940	1,018	1,088	1,159	1,288	1,365	1,445	1,525	1,608	1,692	1,841	2,056	2,213	2,430	2,604
8	Bavenuur	2,055	2,107	2,182	2,238	2,335	2,369	2,451	2,514	2,610	2,705	2,792	2,883	2,927	3,020	3,116	3,213
9	Rayhengei	15	33	56	91	116	153	178	217	245	311	354	389	414	446	479	540
	Total Demand	54,259	56,007	58,001	59,605	61,841	63,761	66,076	67,935	70,268	72,224	74,685	77,412	80,034	82,476	85,065	87,957
Residential Demand (Method II)																	
No.	District Name	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Suchbhear	8,711	9,255	9,768	10,447	11,036	11,702	12,441	13,278	14,064	14,952	15,764	16,680	17,648	18,685	19,733	20,426
2	Chingwet	7,256	7,743	8,312	8,730	9,307	9,895	10,397	10,905	11,654	12,498	12,960	13,931	14,754	15,379	16,373	17,344
3	Bavangol	13,237	14,062	14,958	15,886	16,876	17,884	19,002	20,266	21,103	22,430	23,640	25,012	26,459	28,012	29,579	31,086
4	Songmoharhan	8,698	9,228	9,938	10,432	11,148	11,699	12,480	13,092	14,022	14,660	15,624	16,706	17,395	18,608	19,350	20,544
5	Bavensurh	9,031	9,574	10,256	10,765	11,445	12,210	12,751	13,691	14,586	15,248	16,170	17,210	18,311	19,087	20,273	21,425
6	Khan-Uoi	4,384	4,685	4,891	5,289	5,485	5,879	6,316	6,623	7,087	7,409	7,890	8,214	8,777	9,342	9,755	10,330
7	Nalaih	872	981	1,081	1,194	1,300	1,482	1,615	1,765	1,910	2,074	2,230	2,486	2,847	3,145	3,551	3,867
8	Bavenuur	2,055	2,174	2,317	2,428	2,614	2,756	2,899	3,095	3,286	3,489	3,679	3,884	4,053	4,293	4,536	4,771
9	Rayhengei	15	34	59	100	130	175	211	265	307	401	467	517	573	634	697	802
	Total Demand	54,259	57,836	61,585	65,421	69,346	73,356	78,114	82,980	88,013	93,161	98,424	104,550	110,817	117,225	123,842	130,615

Sample Calculation: $9,255 = 9,057 + 0.057156 \times 9,057$ (Suburban Demand of Method III) / (Total Demand of Method II)

3.3.3 Distribution Demand from District Level to Horoo Level

The detailed field survey was conducted by the study of the basic data of Ulaanbaatar city telephone network in 1993 [N.Nansaljav, D.Dolgorsuren, Sh. Ganbold and M.Naranbaatar] in 6 districts except for Nalaih, Baganuur and Bagahangai. The Study team used these data for demand distribution from district level to horoo level by demand category, i.e., residential and administrative/business.

As a sample case, the following section describes how to calculate telephone demand in new ATC-6 exchange area which was selected one of objective area of feasibility study in this study.

Table 3-3-3, Table 3-3-7 and Table 3-3-11 show the results of detailed survey in 1993 as mentioned above. District demand was distributed based on the share of demand of this result to horoo by demand category. In these Tables, there are "Old site name" and "New Site Name" columns. Old site name means each horoo belonging under these exchange boundary in 1993 as well as in 1995. New site name means each horoo to be belonging under these exchange boundary as result of "Network Development Plan" in future. In this study, demand distribution pattern to horoo in 1993 will remain unchanged until 2010.

Table 3-3-4, Table 3-3-8 and Table 3-3-12 show distributed administrative/business demand in each district up to 2010.

Table 3-3-5, Table 3-3-9 and Table 3-3-13 show distributed residential demand in each district up to 2010.

Table 3-3-6, Table 3-3-10 and Table 3-3-14 show distributed total demand (administrative / business and residential) demand in each district up to 2010.

3.3.4 Combination Horoo Demand into Exchange Demand (ATC-6)

Based on New site name, i.e., new exchange boundary, horoo demand were combined into ATC-6 exchange demand. The results of combination were shown in Table 3-3-15, Table 3-3-16 and Table 3-3-17.

Table 3-3-3 Horoo Demand in Subbaatar District in 1993

No. of Horoo	Subbaatar District		in 1993							New Site Name	Old Site Name	Remarks
	Population	Household	Telephone				R + W	Demand				
			Admi. & Business	Resident	Waiter	Demand						
1	2,867	745	568	331	181	512	1,080	ATC-3	ATC-3			
2	3,798	967	55	350	328	678	733	ATC-3	ATC-3			
3	6,483	1,622	153	527	583	1,110	1,263	ATC-3	ATC-3			
4	3,981	8,202	38	568	60	628	666	ATC-3	ATC-3			
5	4,233	1,103	147	335	186	521	668	ATC-3	ATC-3			
6	3,884	973	169	386	27	413	582	ATC-3	ATC-3			
7	6,404	1,546	124	719	388	1,107	1,231	ATC-3	ATC-3			
8	11,171	1,895	662	85	612	697	1,359	ATC-3	ATC-3			
9	3,230	675	0	8	72	80	80	ATC-73	ATC-7	Ger		
10	6,031	1,394	59	86	20	106	165	ATC-73	ATC-7	Ger		
11	3,602	658	92	83	100	183	275	ATC-73	ATC-7	Ger		
12	4,294	1,057	2	5	34	39	41	ATC-73	ATC-7	Ger		
13	2,167	612	0	5	80	85	85	ATC-73	ATC-7	Ger		
14	3,119	785	6	5	100	105	111	ATC-73	ATC-7	Ger		
15	5,901	1,565	3	62	213	275	278	ATC-73	ATC-7	Ger (Summer camp)		
16	2,448	630	13	3	82	85	98	ATC-73	ATC-7	Ger		
Total	73,633	24,409	2,091	3,558	3,066	6,624	8,715					

Table 3-3-4 Horoo Demand (Administrative/Business) in Subbaatar District up to 2010

Subbaatar District : Business Demand																
No. of Horoo	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	837	882	929	981	1,038	1,100	1,166	1,235	1,310	1,389	1,472	1,561	1,654	1,753	1,858	1,970
2	81	85	90	95	100	106	115	120	127	134	145	151	160	170	180	191
3	225	237	250	264	279	296	314	333	353	374	396	420	445	472	500	531
4	56	59	62	66	69	74	78	83	88	93	98	104	111	117	124	132
5	217	228	241	254	269	285	302	320	339	359	381	404	428	454	481	510
6	249	262	277	292	309	327	347	368	390	413	438	464	492	521	553	586
7	185	192	203	214	227	240	254	270	286	303	321	341	361	383	406	430
8	975	1,027	1,083	1,143	1,209	1,282	1,359	1,440	1,526	1,619	1,715	1,819	1,928	2,043	2,165	2,295
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	87	92	97	102	108	114	121	128	136	144	153	162	172	182	195	205
11	136	143	151	159	168	178	189	200	212	225	238	253	268	284	301	319
12	3	3	3	3	4	4	4	4	5	5	5	5	6	6	7	7
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	9	9	10	10	11	12	12	13	14	15	16	16	17	19	20	21
15	4	5	5	5	5	6	6	7	7	7	8	8	9	9	10	10
16	19	20	21	22	24	25	27	28	30	32	34	36	38	40	43	45
Total	3,081	3,244	3,422	3,610	3,820	4,049	4,292	4,549	4,823	5,112	5,418	5,744	6,089	6,453	6,841	7,252

Table 3-3-5 Horoo Demand (Residential) in Subbaatar District up to 2010

Subbaatar District : Residential Demand																
No. of Horoo	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	673	723	755	807	853	905	962	1,026	1,087	1,156	1,218	1,289	1,364	1,444	1,525	1,579
2	892	957	1,000	1,069	1,130	1,198	1,273	1,359	1,440	1,530	1,614	1,707	1,806	1,912	2,020	2,091
3	1,460	1,568	1,637	1,751	1,849	1,961	2,085	2,225	2,357	2,505	2,642	2,795	2,958	3,131	3,307	3,423
4	826	887	926	990	1,046	1,109	1,179	1,259	1,333	1,418	1,495	1,582	1,673	1,771	1,871	1,936
5	685	736	768	822	868	920	979	1,045	1,106	1,176	1,240	1,312	1,388	1,470	1,552	1,607
6	543	583	609	651	688	730	776	828	877	932	983	1,040	1,100	1,165	1,230	1,274
7	1,456	1,563	1,632	1,746	1,844	1,956	2,079	2,219	2,350	2,499	2,634	2,788	2,950	3,123	3,298	3,414
8	916	984	1,028	1,099	1,161	1,231	1,309	1,397	1,480	1,573	1,659	1,755	1,857	1,966	2,077	2,149
9	105	115	118	126	133	141	150	160	170	181	190	201	213	226	238	247
10	139	150	156	167	177	187	199	213	225	239	252	267	282	299	316	327
11	241	258	270	289	305	323	344	367	389	413	436	461	488	516	545	564
12	51	55	58	62	65	69	73	78	83	88	93	98	104	110	116	120
13	112	120	125	134	142	150	160	170	180	192	202	214	226	240	255	262
14	138	148	155	166	175	186	197	211	223	237	250	264	280	296	313	324
15	362	388	406	434	458	486	516	551	584	621	654	693	733	776	819	848
16	112	120	125	134	142	150	160	170	180	192	202	214	226	240	255	262
Total	8,711	9,353	9,768	10,447	11,036	11,702	12,441	13,278	14,064	14,952	15,764	16,680	17,648	18,685	19,733	20,427

Table 3-3-6 Horoo Demand (Total) in Suhbaatar District up to 2010

Subbaatar District : Business + Residential Demand		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
No. of Horoo																	
1	1,510	1,605	1,684	1,788	1,891	2,005	2,128	2,261	2,397	2,545	2,690	2,850	2,997	3,018	3,197	3,383	3,549
2	973	1,042	1,090	1,164	1,230	1,304	1,386	1,479	1,567	1,664	1,757	1,858	1,966	2,082	2,200	2,200	2,282
3	1,685	1,805	1,887	2,015	2,128	2,257	2,399	2,558	2,710	2,879	3,058	3,215	3,403	3,603	3,807	3,807	3,954
4	882	946	988	1,056	1,115	1,185	1,257	1,342	1,421	1,511	1,593	1,686	1,784	1,888	1,995	1,995	2,068
5	902	964	1,009	1,076	1,137	1,205	1,281	1,365	1,445	1,535	1,621	1,716	1,816	1,924	2,033	2,033	2,117
6	792	845	886	943	997	1,057	1,123	1,196	1,267	1,345	1,421	1,504	1,592	1,686	1,783	1,783	1,860
7	1,639	1,755	1,855	1,960	2,071	2,196	2,355	2,489	2,656	2,802	2,955	3,129	3,311	3,506	3,704	3,704	3,844
8	1,891	2,011	2,111	2,242	2,370	2,513	2,668	2,837	3,006	3,192	3,374	3,574	3,785	4,009	4,242	4,242	4,444
9	105	113	118	126	133	141	150	160	170	181	190	201	213	226	238	238	247
10	226	242	253	269	285	301	320	341	361	383	405	429	454	481	509	509	532
11	377	401	421	448	475	501	533	567	601	638	674	714	756	800	846	846	883
12	54	58	61	65	69	73	77	82	88	93	98	105	110	116	123	123	127
13	112	120	125	134	142	150	160	170	180	192	202	214	226	240	253	253	262
14	147	157	165	176	186	198	209	224	237	252	266	280	297	315	333	333	345
15	366	393	411	439	463	492	522	558	591	628	662	701	742	785	829	829	858
16	131	140	146	156	166	175	187	198	210	224	236	250	264	280	296	296	307
Total	11,792	12,597	13,190	14,057	14,856	15,751	16,733	17,827	18,887	20,064	21,182	22,424	23,737	25,138	26,574	26,574	27,679

Table 3-3-7 Horoo Demand in Chingeltei District in 1993

Chingeltei District		in 1993							New Site Name	Old Site Name	Remarks
No. of Horoo	Population	Household	Telephone				Demand				
			Admi. & Business	Resident	Waiter	R + W					
1	3,312	881	568	500	129	629	1,197	ATC-3	ATC-3		
2	3,551	990	388	361	120	481	869	ATC-36	ATC-6		
3	4,146	1,259	96	545	173	718	814	ATC-3	ATC-3		
4	6,312	1,357	932	395	50	445	1,377	ATC-3	ATC-3		
5	4,965	1,222	105	260	303	563	668	ATC-3	ATC-3		
6	3,825	891	191	261	86	347	538	ATC-3	ATC-3		
7	3,434	804	1	50	125	175	176	ATC-36	ATC-6	Ger	
8	2,953	703	1	40	147	157	158	ATC-36	ATC-6	Ger	
9	3,908	922	10	2	137	139	149	ATC-73	ATC-7	Ger	
10	5,445	1,022	9	8	51	59	68	ATC-73	ATC-7	Ger	
11	2,905	680	20	8	87	95	115	ATC-73	ATC-7	Ger	
12	6,143	1,421	5	0	252	252	257	ATC-73	ATC-7	Ger	
13	4,839	988	4	0	136	136	140	ATC-73	ATC-7	Ger	
14	3,804	864	3	12	136	148	151	ATC-73	ATC-7	Ger	
15	5,059	1,268	3	10	323	333	336	ATC-73	ATC-7	Ger	
16	6,788	1,385	1	5	112	117	118	ATC-73	ATC-7	Ger	
17	5,070	1,480	1	5	316	321	322	ATC-73	ATC-7	Ger	
18	5,191	1,321	1	2	287	289	290	ATC-73	ATC-7	Ger	
Total	81,650	19,458	2,339	2,464	2,940	5,404	7,743				

Table 3-3-8 Horoo Demand (Administrative/Business) in Chingeltei District up to 2010

Chingeltei District : Business Demand																
No. of Horoo	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	980	1,033	1,090	1,150	1,217	1,290	1,367	1,448	1,535	1,628	1,726	1,830	1,940	2,055	2,178	2,310
2	670	706	744	786	831	881	934	989	1,049	1,112	1,179	1,250	1,325	1,404	1,488	1,578
3	166	175	184	194	206	218	231	245	260	275	292	309	328	347	368	390
4	1,609	1,696	1,788	1,887	1,997	2,117	2,244	2,376	2,520	2,671	2,835	3,002	3,182	3,372	3,574	3,790
5	181	191	201	213	225	238	255	268	284	301	319	338	359	380	403	427
6	330	347	366	387	409	434	460	487	516	547	580	615	652	691	732	777
7	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4
8	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4
9	17	18	19	20	21	23	24	25	27	29	30	32	34	36	38	41
10	16	16	17	18	19	20	22	23	24	26	27	29	31	33	35	37
11	35	36	38	40	43	45	48	51	54	57	61	64	68	72	77	81
12	9	9	10	10	11	11	12	13	14	14	15	16	17	18	19	20
13	7	7	8	8	9	9	10	10	11	11	12	13	14	14	15	16
14	5	5	6	6	6	7	7	8	8	9	9	10	10	11	12	12
15	5	5	6	6	6	7	7	8	8	9	9	10	10	11	12	12
16	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4
17	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4
18	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4
Total	4,040	4,254	4,487	4,735	5,010	5,310	5,629	5,966	6,325	6,704	7,107	7,533	7,985	8,464	8,971	9,511

Table 3-3-9 Horoo Demand (Residential) in Chingeltei District up to 2010

Chingeltei District : Residential Demand																
No. of Horoo	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	844	901	968	1,016	1,084	1,128	1,210	1,269	1,357	1,455	1,508	1,610	1,718	1,790	1,906	2,019
2	646	709	740	777	828	868	925	971	1,037	1,102	1,151	1,231	1,313	1,369	1,457	1,544
3	964	1,029	1,105	1,160	1,237	1,288	1,381	1,449	1,549	1,661	1,722	1,837	1,961	2,043	2,175	2,304
4	597	637	685	719	766	798	856	898	960	1,029	1,067	1,139	1,215	1,266	1,348	1,428
5	756	807	866	909	970	1,010	1,083	1,156	1,214	1,302	1,350	1,441	1,537	1,602	1,706	1,807
6	466	497	534	560	598	622	668	700	748	803	832	888	947	988	1,051	1,114
7	235	251	269	285	301	314	337	353	377	405	420	448	478	498	530	562
8	211	225	252	254	270	289	302	317	339	363	377	402	429	447	476	504
9	187	199	214	225	239	249	267	280	300	321	333	356	380	396	421	446
10	79	85	91	95	102	106	113	119	127	136	141	151	161	168	179	189
11	128	136	146	153	164	170	183	192	205	220	228	243	259	270	288	305
12	338	361	388	407	434	452	485	509	544	583	604	645	688	717	764	809
13	183	195	209	220	234	244	262	274	295	315	326	348	371	387	412	436
14	199	212	228	239	255	265	285	299	319	342	355	379	404	421	448	475
15	447	477	513	538	573	597	641	672	718	770	799	852	909	948	1,009	1,069
16	157	168	180	189	201	210	225	236	252	271	281	299	319	333	354	375
17	431	460	494	519	553	576	618	648	692	742	770	822	876	914	973	1,030
18	388	414	445	467	498	518	556	583	623	668	693	740	789	822	876	928
Total	7,256	7,743	8,317	8,730	9,307	9,692	10,397	10,905	11,654	12,498	12,960	13,831	14,754	15,379	16,373	17,344

Table 3-3-10 Horoo Demand (Total) in Chingeltei District up to 2010

Chingeltei District : Business + Residential Demand																
No. of Horoo	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	1,824	1,934	2,058	2,166	2,301	2,418	2,577	2,717	2,892	3,083	3,234	3,440	3,658	3,845	4,084	4,329
2	1,316	1,395	1,484	1,563	1,659	1,744	1,859	1,960	2,086	2,224	2,333	2,481	2,638	2,773	2,945	3,122
3	1,130	1,204	1,289	1,354	1,443	1,506	1,612	1,694	1,809	1,936	2,014	2,146	2,289	2,390	2,543	2,694
4	2,206	2,333	2,473	2,606	2,765	2,915	3,100	3,274	3,480	3,700	3,900	4,141	4,397	4,638	4,922	5,218
5	957	998	1,067	1,122	1,195	1,248	1,336	1,404	1,498	1,603	1,669	1,779	1,896	1,982	2,109	2,234
6	796	844	900	947	1,007	1,056	1,128	1,187	1,264	1,350	1,412	1,503	1,599	1,679	1,783	1,891
7	237	253	271	285	303	316	339	356	380	408	423	451	481	502	534	566
8	213	227	244	256	272	284	304	320	342	366	380	405	422	451	480	508
9	204	217	233	245	260	272	291	305	327	350	363	388	414	432	459	487
10	95	101	108	113	121	126	135	142	151	162	168	180	192	201	214	226
11	163	172	184	195	207	215	231	243	259	277	289	307	327	342	365	386
12	347	370	398	417	445	463	497	522	558	597	619	661	705	735	783	829
13	190	202	217	228	243	253	272	284	304	326	338	361	385	401	427	452
14	204	217	234	245	261	272	292	307	327	351	364	389	414	432	460	487
15	452	482	519	544	579	604	648	680	726	779	808	862	919	959	1,021	1,081
16	159	170	182	191	203	212	227	239	255	274	284	302	322	337	358	379
17	433	462	496	521	555	578	620	651	695	745	773	825	879	918	977	1,034
18	390	416	447	469	500	520	558	586	626	671	696	743	792	826	880	932
Total	11,296	11,997	12,804	13,465	14,517	15,002	16,026	16,871	17,979	19,202	20,067	21,364	22,739	23,845	25,344	26,855

Table 3-3-11 Horoo Demand in Bayangol District in 1993

Bayangol District		in 1993									
No. of Horoo	Population	Household	Telephone			R + W	Demand	Old Site Name	New Site Name	Remarks	
			Admin. & Busi.	Resident	Waiver						
1	7,541	1,763	71	121	100	221	292	ATC-36	ATC-6		
2	3,853	902	29	68	76	144	175	ATC-36	ATC-6		
3	7,308	1,686	130	0	0	0	130	ATC-36	ATC-6		
4	7,882	1,858	156	295	0	295	451	ATC-36	ATC-6		
5	8,040	1,670	252	549	735	1,284	1,516	ATC-33	ATC-2		
6	5,030	1,156	0	269	427	696	696	ATC-36	ATC-6		
7	5,335	1,348	17	459	448	907	924	ATC-33	ATC-2		
8	7,467	1,988	30	684	569	1,253	1,283	ATC-36	ATC-6		
9	4,744	1,142	0	20	163	183	183	ATC-33	ATC-2	Ger / Apartment	
10	4,192	966	0	59	75	132	132	ATC-36	ATC-6	Ger / Apartment	
11	3,651	1,024	31	141	80	221	252	ATC-36	ATC-6	Ger	
12	3,828	950	0	60	105	165	165	ATC-36	ATC-6	Ger	
13	4,977	1,223	55	560	195	755	810	ATC-36	ATC-6		
14	5,384	1,365	50	644	331	975	1,025	ATC-36	ATC-6		
15	5,864	1,426	93	640	365	1,095	1,098	ATC-36	ATC-6		
16	4,195	1,030	25	30	71	101	126	ATC-36	ATC-6	Ger	
17	4,859	1,173	65	318	341	659	724	ATC-36	ATC-6	Ger / Apartment	
18	6,685	1,473	53	695	589	1,284	1,337	ATC-36	ATC-6		
19	6,239	1,959	31	604	502	1,106	1,137	ATC-36	ATC-6		
Total	107,056	26,082	1,068	6,216	5,170	11,386	12,454				

Table 3-3-12 Horoo Demand (Administrative/Business) in Bayangol District up to 2010

Bayangol District : Business Demand																
No. of Horoo	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	73	77	81	86	90	96	102	108	114	121	129	136	144	152	162	172
2	30	31	33	35	37	39	42	44	47	50	52	56	59	62	66	70
3	134	141	149	157	166	176	186	197	209	222	235	249	264	280	297	315
4	160	169	179	188	199	211	224	237	251	266	282	299	317	336	356	378
5	239	251	266	280	297	312	333	352	374	396	420	445	471	500	530	562
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	17	18	19	21	22	23	24	26	27	29	31	33	35	37	39	41
8	31	35	34	36	38	41	43	46	48	51	54	58	61	65	69	73
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	32	34	35	37	39	42	44	47	50	53	56	59	63	67	71	75
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	57	60	63	66	70	74	79	84	89	94	100	106	112	119	126	133
14	51	54	57	60	64	68	72	76	81	85	91	96	102	108	114	121
15	96	101	106	112	118	126	133	141	150	159	168	178	189	200	212	225
16	26	27	29	30	32	34	36	38	40	45	45	48	51	54	57	61
17	67	70	74	79	85	88	95	99	105	111	118	125	132	140	149	157
18	54	57	61	64	68	72	76	81	85	90	96	102	108	114	121	128
19	32	34	35	37	39	42	44	47	50	53	56	59	63	67	71	75
Total	1,099	1,157	1,221	1,288	1,362	1,444	1,531	1,623	1,720	1,823	1,933	2,049	2,171	2,302	2,440	2,586

Table 3-3-13 Horoo Demand (Residential) in Bayangol District up to 2010

Bayangol District : Residential Demand		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
No. of Horoo																	
1	257	273	290	310	328	347	369	395	410	435	459	485	514	544	574	603	603
2	167	178	189	202	215	226	240	256	267	284	299	316	335	354	374	395	395
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	343	364	388	414	437	465	492	525	547	581	612	648	688	726	766	805	805
5	1,495	1,586	1,687	1,803	1,903	2,017	2,143	2,286	2,380	2,530	2,666	2,821	2,984	3,159	3,336	3,506	3,506
6	809	860	914	977	1,032	1,095	1,162	1,239	1,290	1,371	1,445	1,529	1,617	1,712	1,808	1,900	1,900
7	1,054	1,120	1,192	1,274	1,344	1,425	1,514	1,614	1,681	1,787	1,883	1,992	2,108	2,231	2,356	2,476	2,476
8	1,557	1,642	1,739	1,859	1,987	2,128	2,281	2,430	2,522	2,677	2,802	2,922	3,052	3,192	3,335	3,421	3,421
9	213	226	240	257	271	287	305	326	339	361	380	402	425	450	475	500	500
10	153	163	173	185	196	207	220	235	245	260	274	290	307	325	343	360	360
11	257	273	290	310	328	347	369	395	410	435	459	485	514	544	574	603	603
12	192	204	217	232	245	259	275	294	306	325	343	362	383	406	429	451	451
13	878	932	992	1,060	1,119	1,186	1,260	1,344	1,399	1,457	1,568	1,659	1,754	1,857	1,962	2,061	2,061
14	1,134	1,204	1,281	1,369	1,445	1,532	1,627	1,735	1,807	1,921	2,024	2,142	2,266	2,399	2,533	2,662	2,662
15	1,168	1,241	1,320	1,411	1,489	1,579	1,677	1,789	1,862	1,980	2,087	2,208	2,335	2,473	2,611	2,744	2,744
16	137	125	153	142	150	159	169	180	187	199	210	222	235	248	262	276	276
17	766	814	866	925	977	1,035	1,100	1,175	1,221	1,298	1,368	1,448	1,531	1,621	1,712	1,799	1,799
18	1,495	1,586	1,687	1,803	1,903	2,017	2,143	2,286	2,380	2,530	2,666	2,821	2,984	3,159	3,336	3,506	3,506
19	1,286	1,366	1,453	1,552	1,659	1,737	1,846	1,969	2,050	2,179	2,296	2,430	2,570	2,721	2,873	3,020	3,020
Total	13,237	14,062	14,958	15,986	16,876	17,884	19,002	20,266	21,103	22,430	23,641	25,012	26,459	28,012	29,579	31,086	31,086

Table 3-3-14 Horoo Demand (Total) in Bayangol District up to 2010

Bayangol District : Business + Residential Demand		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
No. of Horoo																	
1	330	350	371	396	418	443	471	501	524	556	588	621	658	697	736	775	775
2	197	209	222	237	250	265	282	300	314	334	351	372	394	416	440	463	463
3	134	141	149	157	166	176	186	197	209	222	235	249	264	280	297	315	315
4	503	533	567	602	636	674	716	762	798	847	894	947	1,002	1,062	1,122	1,183	1,183
5	1,732	1,837	1,953	2,083	2,200	2,329	2,476	2,638	2,754	2,926	3,086	3,266	3,455	3,659	3,866	4,068	4,068
6	809	860	914	977	1,032	1,093	1,162	1,239	1,290	1,371	1,445	1,529	1,617	1,712	1,808	1,900	1,900
7	1,071	1,138	1,211	1,295	1,366	1,448	1,538	1,640	1,708	1,816	1,914	2,025	2,143	2,268	2,395	2,517	2,517
8	1,488	1,580	1,680	1,795	1,895	2,009	2,134	2,276	2,370	2,518	2,656	2,810	2,973	3,148	3,324	3,494	3,494
9	213	226	240	257	271	287	305	326	339	361	380	402	425	450	475	500	500
10	153	163	173	185	196	207	220	235	245	260	274	290	307	325	343	360	360
11	289	307	325	347	367	389	413	440	460	488	515	544	577	611	645	678	678
12	192	204	217	232	245	259	275	294	306	325	343	362	383	406	429	451	451
13	935	992	1,055	1,126	1,189	1,260	1,339	1,428	1,488	1,581	1,668	1,765	1,866	1,976	2,088	2,194	2,194
14	1,185	1,238	1,338	1,429	1,509	1,600	1,699	1,811	1,888	2,006	2,115	2,238	2,368	2,507	2,647	2,783	2,783
15	1,264	1,342	1,426	1,525	1,607	1,705	1,810	1,930	2,012	2,139	2,255	2,386	2,524	2,673	2,823	2,969	2,969
16	143	152	162	172	182	193	205	218	227	242	255	270	286	302	319	337	337
17	833	884	940	1,004	1,060	1,123	1,193	1,272	1,326	1,409	1,486	1,573	1,663	1,761	1,861	1,956	1,956
18	1,547	1,643	1,748	1,867	1,971	2,089	2,219	2,366	2,465	2,620	2,762	2,923	3,092	3,273	3,457	3,634	3,634
19	1,318	1,400	1,488	1,590	1,678	1,779	1,890	2,016	2,100	2,232	2,352	2,489	2,633	2,788	2,944	3,093	3,093
Total	14,336	15,219	16,179	17,274	18,238	19,328	20,533	21,889	22,323	24,253	25,574	27,061	28,630	30,314	32,019	33,672	33,672

Table 3-3-15 Administrative/Business Demand in ATC-6 (New Boundary)

District Name	Horoo No.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Subbaatar	5	217	228	241	254	269	285	302	320	339	359	381	404	428	454	481	510
	2	670	706	744	786	831	881	934	989	1049	1112	1179	1250	1325	1404	1488	1578
Chingeltei	7	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4
	8	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4
Sayangol	1	73	77	81	86	90	96	102	108	114	121	129	136	144	153	162	172
	2	30	31	33	35	37	39	42	44	47	50	52	56	59	62	66	70
	3	134	141	149	157	166	176	186	197	209	222	235	249	264	280	297	315
	4	160	169	179	188	199	211	224	237	251	266	282	299	317	336	356	378
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8	31	33	34	36	38	41	43	46	48	51	54	58	61	65	69	73
	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	11	32	34	35	37	39	42	44	47	50	53	56	59	63	67	71	75
	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13	57	60	63	66	70	74	79	84	89	94	100	106	112	119	126	133
	14	51	54	57	60	64	68	72	76	81	85	91	96	102	108	114	121
	15	96	101	106	112	118	126	133	141	150	159	168	178	189	200	212	225
	16	26	27	29	30	32	34	36	38	40	43	45	48	51	54	57	61
17	67	70	74	79	83	88	93	99	105	111	118	125	132	140	149	157	
18	54	57	61	64	68	72	76	81	85	90	96	102	108	114	121	128	
19	32	34	35	37	39	42	44	47	50	53	56	59	63	67	71	75	
Total		1,734	1,826	1,925	2,031	2,147	2,279	2,414	2,560	2,713	2,875	3,048	3,231	3,424	3,631	3,848	4,079

Table 3-3-16 Residential Demand in ATC-6 (New Boundary)

District Name	Moroo No.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Subbaatar	5	685	736	768	822	868	920	979	1,045	1,106	1,176	1,240	1,312	1,388	1,470	1,552	1,607
	2	646	689	740	777	828	863	925	971	1,037	1,112	1,154	1,231	1,313	1,369	1,457	1,544
Chingeltai	7	235	251	269	285	301	314	337	353	377	405	420	448	478	498	530	562
	8	211	225	242	254	270	282	302	317	339	363	377	402	429	447	476	504
Bayangol	1	257	273	290	310	328	347	369	393	410	435	459	485	514	544	574	603
	2	167	178	189	202	215	226	240	256	267	284	299	316	335	354	374	393
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	343	364	388	414	437	463	492	525	547	581	612	648	685	726	766	805
	6	809	850	914	977	1,032	1,093	1,162	1,239	1,290	1,371	1,445	1,529	1,617	1,712	1,808	1,900
	8	1,457	1,547	1,646	1,759	1,857	1,968	2,091	2,230	2,322	2,467	2,602	2,752	2,912	3,083	3,255	3,421
	10	153	165	173	185	196	207	220	235	245	260	274	290	307	325	343	360
	11	257	273	290	310	328	347	369	393	410	435	459	485	514	544	574	603
	12	192	204	217	232	245	259	275	294	306	325	343	362	383	406	429	451
	13	878	932	992	1,060	1,119	1,186	1,260	1,344	1,399	1,487	1,568	1,659	1,754	1,857	1,962	2,061
	14	1,134	1,204	1,281	1,369	1,445	1,532	1,627	1,735	1,807	1,921	2,024	2,142	2,266	2,399	2,533	2,662
15	1,168	1,241	1,320	1,411	1,489	1,579	1,677	1,789	1,862	1,980	2,087	2,208	2,355	2,473	2,611	2,744	
16	117	125	133	142	150	159	169	180	187	199	210	222	235	248	262	276	
17	766	814	866	925	977	1,035	1,100	1,173	1,221	1,298	1,368	1,448	1,531	1,621	1,712	1,799	
18	1,493	1,586	1,687	1,803	1,903	2,017	2,143	2,285	2,380	2,530	2,666	2,821	2,984	3,159	3,336	3,506	
19	1,286	1,366	1,453	1,553	1,639	1,737	1,846	1,969	2,050	2,179	2,296	2,430	2,570	2,721	2,873	3,020	
Total		12,254	13,031	13,858	14,788	15,625	16,534	17,583	18,726	19,562	20,808	21,903	23,190	24,530	25,956	27,427	28,821

Table 3-3-17 Administrative/Business & Residential Demand in ATC-6 (New Boundary)

District Name	Horoo No.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Subbaatar	5	902	964	1,009	1,076	1,137	1,205	1,281	1,365	1,445	1,535	1,621	1,716	1,816	1,924	2,033	2,117
	2	1,316	1,395	1,484	1,563	1,659	1,744	1,859	1,960	2,086	2,224	2,333	2,481	2,638	2,773	2,945	3,122
Chingeltei	7	237	263	271	285	303	316	339	356	380	408	423	451	481	502	534	566
	8	213	227	244	256	272	284	304	320	342	366	380	405	432	451	480	508
Bayangol	1	330	350	371	396	418	443	471	501	524	556	588	621	658	697	736	775
	2	197	209	222	237	250	265	282	300	314	334	351	372	394	416	440	463
	3	134	141	149	157	166	176	186	197	209	222	235	249	264	280	297	315
	4	503	533	567	602	636	674	716	762	798	847	894	947	1,002	1,062	1,122	1,183
	6	809	860	914	977	1,032	1,093	1,162	1,239	1,290	1,371	1,445	1,529	1,617	1,712	1,808	1,900
	8	1,488	1,580	1,680	1,795	1,895	2,009	2,134	2,276	2,370	2,518	2,656	2,810	2,973	3,148	3,324	3,494
	10	153	163	173	185	196	207	220	235	245	260	274	290	307	325	343	360
	11	289	307	325	347	367	389	413	440	460	488	515	544	577	611	645	678
	12	192	204	217	232	245	259	275	294	306	325	343	362	383	406	429	451
	13	955	992	1,055	1,126	1,189	1,260	1,339	1,428	1,488	1,581	1,668	1,765	1,866	1,976	2,088	2,194
	14	1,185	1,258	1,338	1,420	1,509	1,600	1,699	1,811	1,888	2,006	2,115	2,238	2,368	2,507	2,647	2,783
15	1,264	1,342	1,426	1,523	1,607	1,705	1,810	1,930	2,012	2,139	2,255	2,386	2,524	2,673	2,823	2,969	
16	143	152	162	172	182	193	205	218	227	242	255	270	286	302	319	337	
17	833	884	940	1,004	1,060	1,123	1,193	1,272	1,326	1,409	1,486	1,573	1,663	1,761	1,861	1,956	
18	1,547	1,643	1,748	1,867	1,971	2,089	2,219	2,366	2,465	2,620	2,762	2,923	3,092	3,273	3,457	3,634	
19	1,318	1,400	1,488	1,590	1,678	1,779	1,890	2,016	2,160	2,232	2,332	2,489	2,633	2,788	2,944	3,095	
Total		13,988	14,857	15,783	16,819	17,772	18,813	19,997	21,286	22,275	23,683	24,951	26,421	27,974	29,587	31,275	32,900