No.

The Study on City Master Plan and Urban Development Program of Ulaanbaatar City (UBMPS)

FINAL REPORT / Volume 1

Summary

March 2009

ALMEC Corporation

Oriental Consultants Co., Ltd.

Aero Asahi Corporation

UBMPS

EID

JR

09-022

JAPAN INTERNATIONAL COOPERATION AGENCY
MINISTRY OF ROADS, TRANSPORTATION,
CONSTRUCTION AND URBAN DEVELOPMENT
ULAANBAATAR CITY GOVERNMENT

THE STUDY ON
CITY MASTER PLAN AND URBAN
DEVELOPMENT PROGRAM
OF
ULAANBAATAR CITY
(UBMPS)

Final Report

Volume 1: Summary

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Tugrug (Tg.) 1 = 0.081 Yen
US$ 1 = 95.37 Yen
US$ 1 = 1,177 Tg.
(exchange rate of December 2008)

PREFACE

In response to a request from the Government of Mongolia, the Government of Japan decided to conduct a study on The Study on City Master Plan and Urban Development Program of Ulaanbaatar City in Mongolia and entrusted to the study to the Japan International Cooperation Agency(JICA).

JICA selected and dispatched a study team headed by Dr. Shizuo IWATA of ALMEC Corporation and consist of ALMEC Corporation, Oriental Consultants Co., Ltd. and Aero Asahi Corporation between February, 2007 and March, 2009.

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

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

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

March 2009

Eiji HASHIMOTO,
Deputy Vice President
Japan International Cooperation Agency

March 2009

Eiji HASHIMOTO

Deputy Vice President

Japan International Cooperation Agency

Tokyo

Subject: Letter of Transmittal

Dear Sir,

We are pleased to formally submit herewith the final report of the Study on City Master Plan and Urban Development Program of Ulaanbaatar City.

This report compiles he results of the study which was undertaken both in Mongolia and Japan from February 2007 to March 2009 by the Team comprising ALMEC Corporation, Oriental Consultants Co., Ltd., and Aero Asahi Corporation.

We owe a lot to many people for the accomplishment of this report. First, we would like to express our sincere appreciation and deep gratitude to all those who extended their extensive assistance and cooperation to the Team, in particular Ministry of Roads, Transportation, Construction and Urban Development in Mongolia and Ulaanbaatar City Government.

We also acknowledge the officials of your agency, and the Embassy of Japan in Mongolia for their support and valuable advice in the course of the Study.
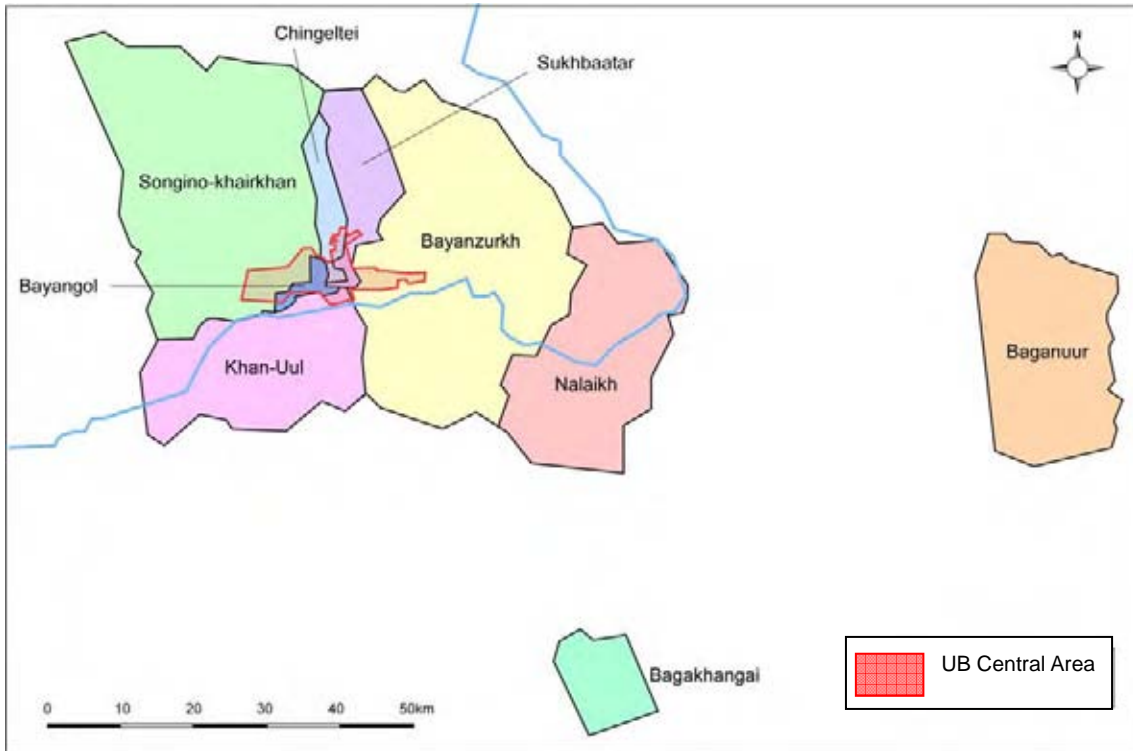
We hope the report would contribute to the sustainable development of Ulaanbaatar City.

Very truly yours,

IWATA Shizuo

Team Leader

Study on City Master Plan and Urban Development Program of Ulaanbaatar City (UBMPS)
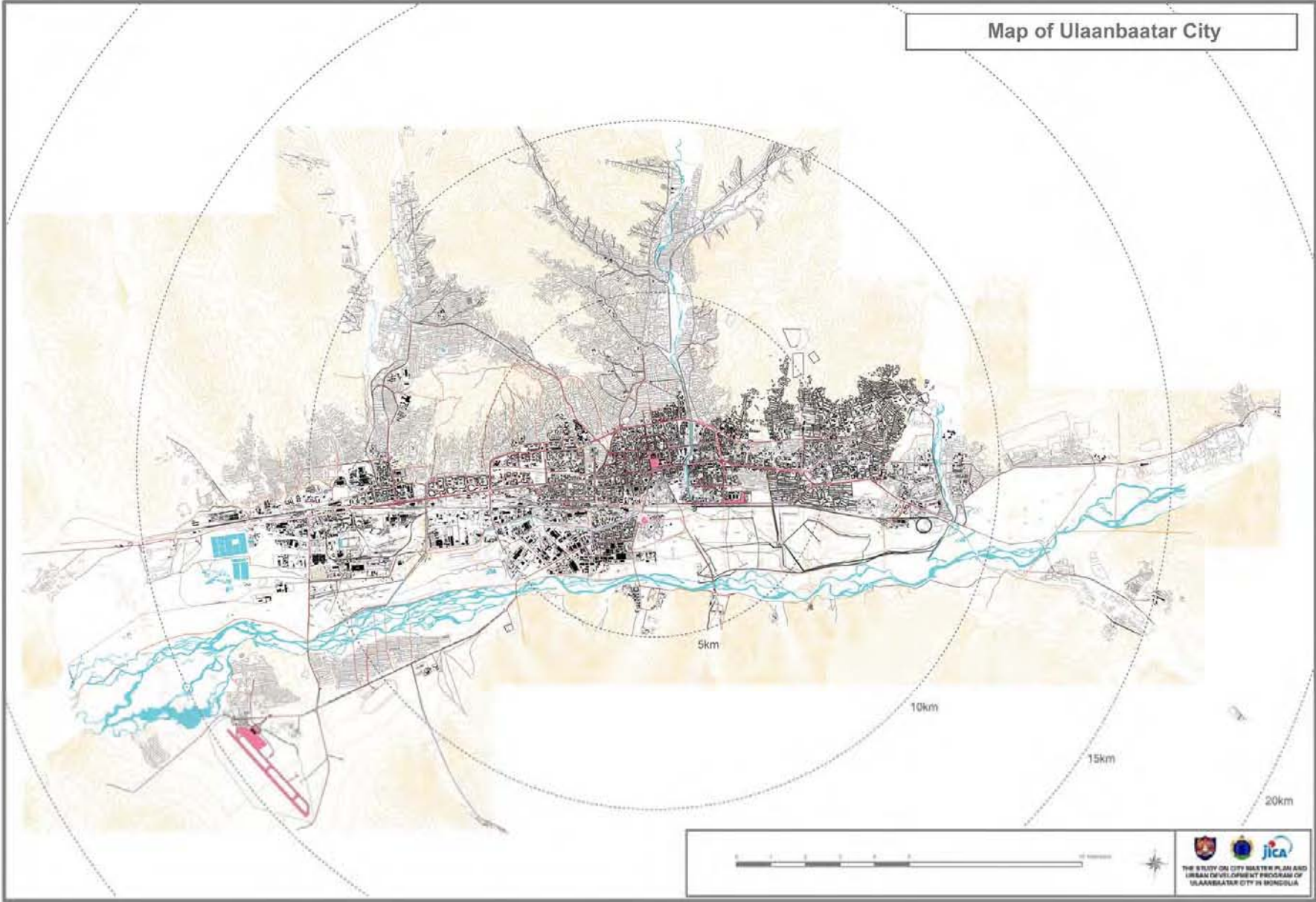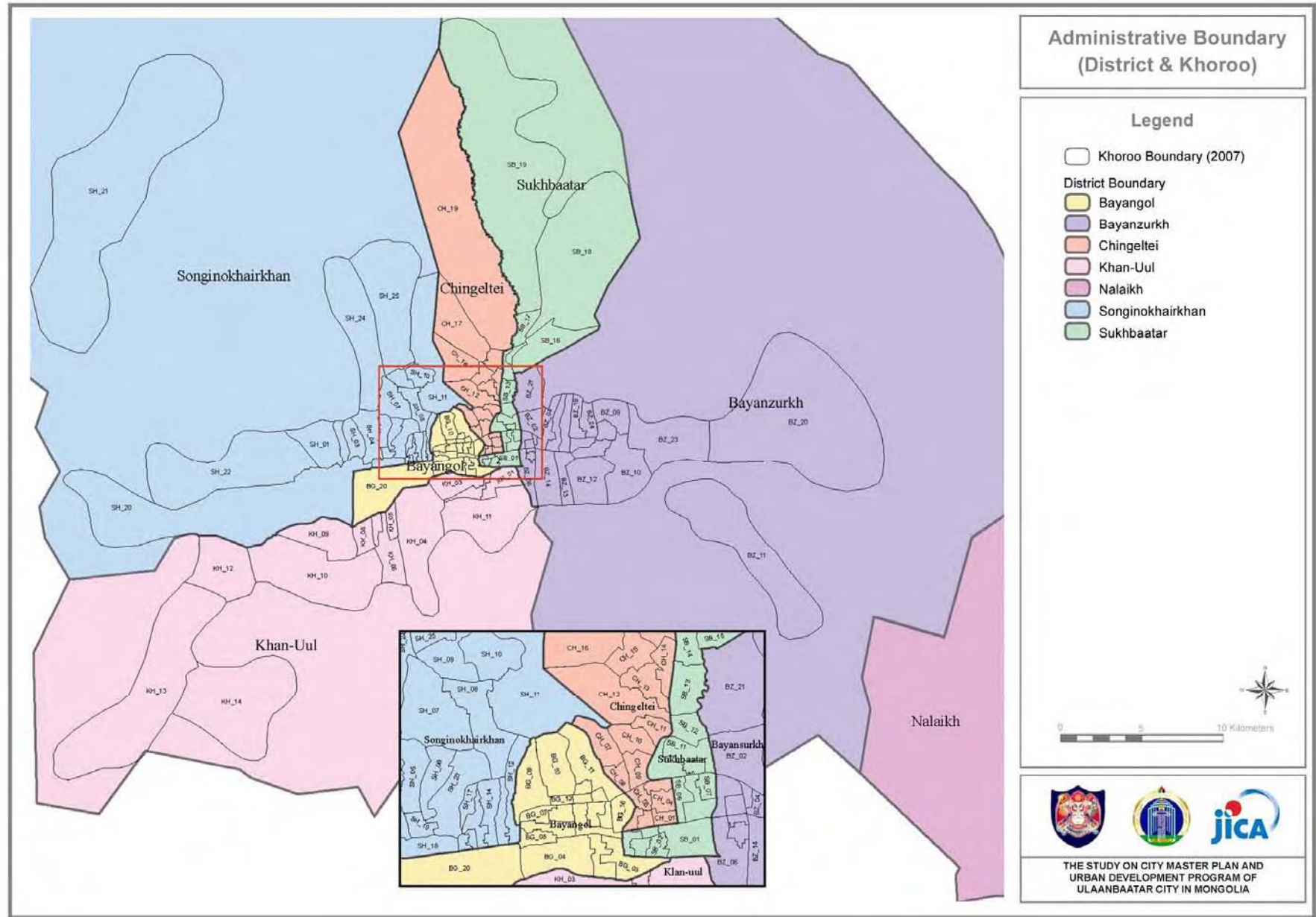
District Location Map
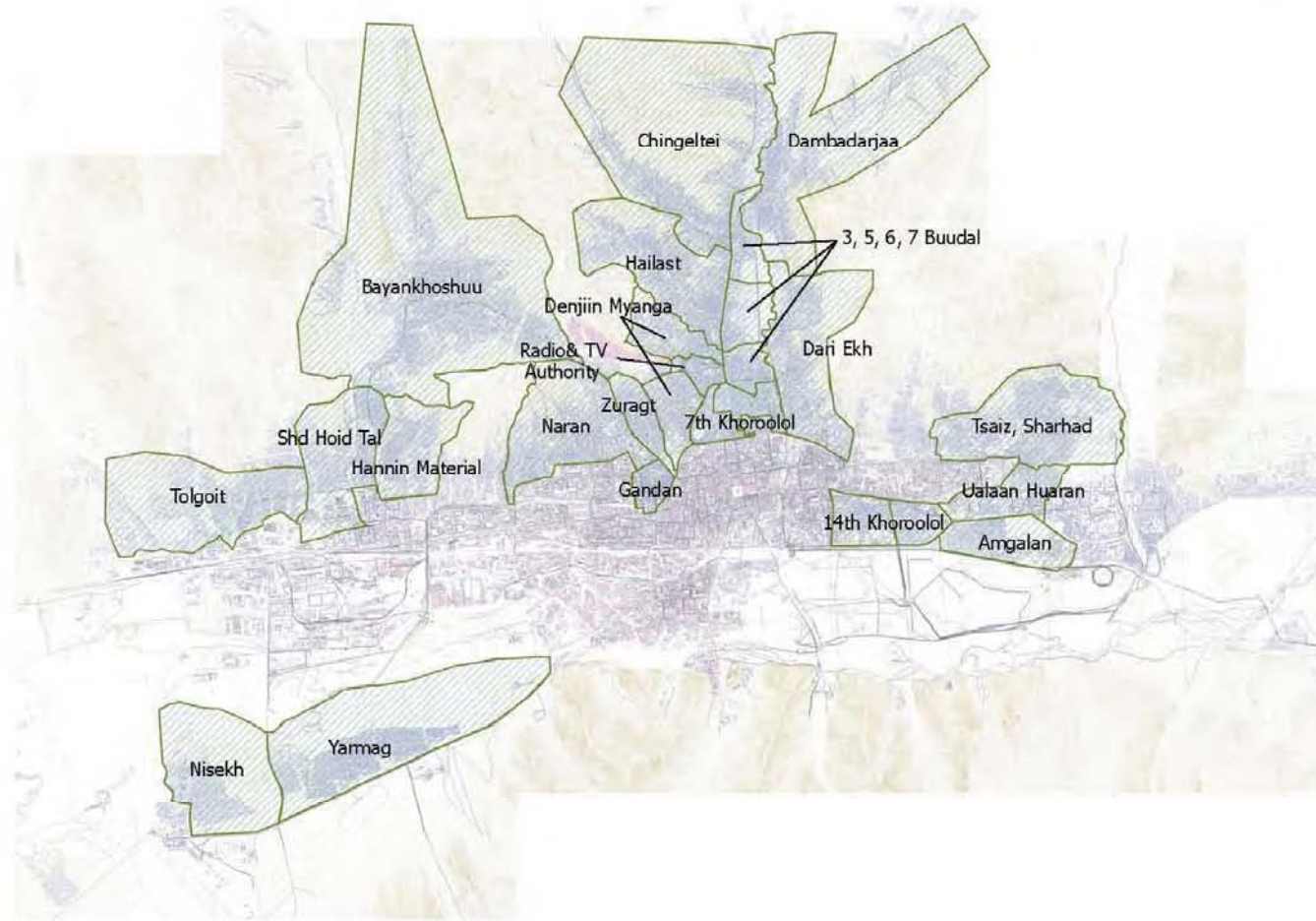

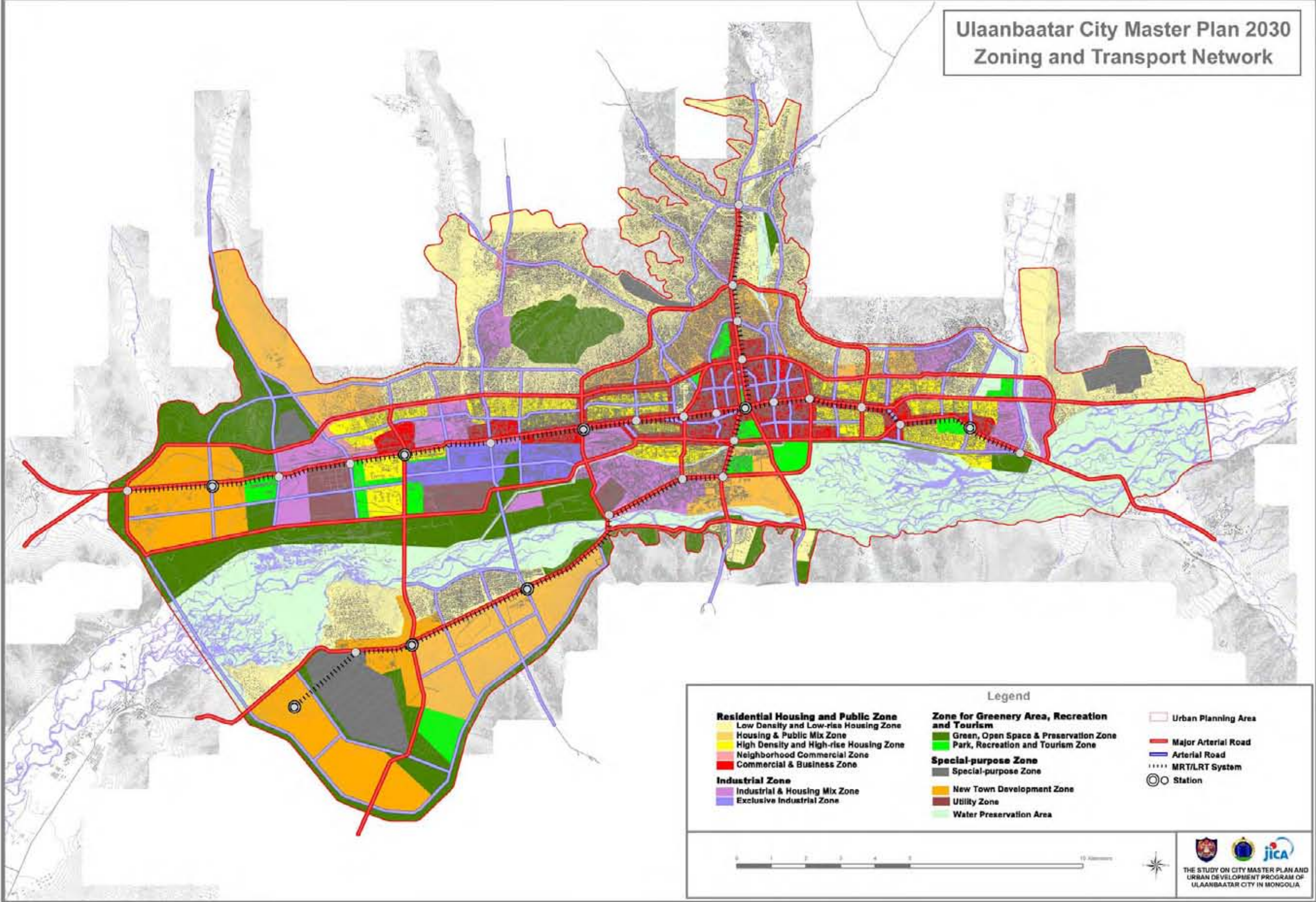
Satellite City Location Map
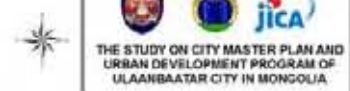
Map of Ulaanbaatar City

Administrative Boundary

Location of Ger Areas

Ulaanbaatar City Master Plan 2030
Zoning and Transport Network

Legend

Residential Housing and Public Zone
- Low Density and Low-rise Housing Zone
- Housing & Public Mix Zone
- High Density and High-rise Housing Zone
- Neighborhood Commercial Zone
- Commercial & Business Zone

Industrial Zone
- Industrial & Housing Mix Zone
- Exclusive Industrial Zone

Zone for Greenery Area, Recreation and Tourism
- Green, Open Space & Preservation Zone
- Park, Recreation and Tourism Zone

Special-purpose Zone
- Special-purpose Zone
- New Town Development Zone
- Utility Zone
- Water Preservation Area

- Urban Planning Area
- Major Arterial Road
- Arterial Road
- MRT/LRT System
- Station

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Abbreviations

ADB	Asian Development Bank
AH	Asian Highway
ATC	Area Traffic Control
BCR	Building Coverage Ratio
BPO	Business Process Outsourcing
BRT	Bus Rapid Transit
CBD	Central Business District
CBO	Community Based Organization
CCTV	Closed-circuit Television
CDM	Clean Development Mechanism
CF	Community Finance
CODI	Community Organizations Development Institute
CO_2	Carbon Dioxide
ECOSAN	Ecological Sanitation System
FA	Financial Assistance
FAR	Floor Area Ratio
FDI	Foreign Direct Investment
FIDP	Fiscal Investment& Loans Program
FIRR	Financial Internal Rate of Return
Gcal	Giga calorie
GDP	Gross Domestic Product
GIS	Geographic Information System
GRDP	Gross Regional Domestic Product
GOM	Government of Mongolia
GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit (German Technical Cooperation)
HDF	Housing Development Fund
HDFI	Housing Development Financing Institute
HIS	Household Interview Survey
HRD	Human Resource Development
ICT	Information Communication Technology
IMF	International Monetary Fund
JICA	Japan International Cooperation Agency
kWh	Kilowatt hour
LLC	Limited Liability Company
LP	Land Pooling
LR	Land Readjustment
MC	Mortgage Corporation
MCUD	Ministry of Construction and Urban Development
MDF	Mongolian Development Fund
MDG	Millennium Development Goal
MECS	Ministry of Education, Culture and Science
MET	Ministry of Environment and Tourism
MFALI	Ministry of Food, Agriculture and Light Industry
MFE	Ministry of Fuel and Energy (then)
MHFC	Mongolian Housing Finance Corporation
MIK	Mongolian Mortgage Corporation
MME	Ministry of Minerals and Energy
MNE	Ministry of Nature and Environment (then)
MNT	Mongolian National Tugrug / Tg.
MOF	Ministry of Finance
MOSA	Mongolia Software Industry Association
MRT	Mass Rapid Transit
MRTCUD	Ministry of Road, Transport, Construction and Urban Development

MRTT	Ministry of Road, Transport and Tourism (then)
MW	Megawatt
NADEP	Neighborhood Area Development Plan
NDS	National Development Strategy
NGO	Non-Governmental Organization
NHA	National Housing Authority (in Thailand)
NOx	Nitrogen Oxide
NSO-UNFPA	National Statistical Office and United Nations Population Fund
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
O&M	Operation & Maintenance
PCU	Passenger Car Unit
PFI	Private Finance Initiative
PPP	Public Private Partnership
R&D	Research and Development
SFC	Social Housing Corporation
SWM	Solid Waste Management Master Plan
TA	Technical Assistance
TPS	Thermal Power Station
UB	Ulaanbaatar
UB-METS	Ulaanbaatar Metro-Transit System
UBIFC	Ulaanbaatar Infrastructure Financing Corporation
UBMP-2020	Exiting Ulanbaatar Master Plan targeting the year 2020
UBMPS	Study on City Master Plan and Urban Development Program of Ulaanbaatar City in Mongolia
UCA	Urban Control Area
UK	United Kingdom
UN-HABITAT	United Nations Human Settlements Program
UPA	Urban Promotion Area
UPRDI	Urban Planning, Research and Design Institute
USA	United States of America
USAID	United States Agency for International Development
USUG	Ulaanbaatar Water and Sewerage Authority
UTS	Ulaanbaatar Transit System
VOC	Volatile Organic Compounds
WWTP	Wastewater Treatment Plant
WWWMP	Water & Wastewater Master Plan

2nd Steering Committee (October 2007)	1st Donor Meeting (October 2007)
Learning Session (July 2007)	Workshop on Infrastructure, Ger area improvement and Environment (June 2008)
Model Project on Ger Area Improvement Residential Meeting in Unur (June 2008)	Model Project on Ger Area Improvement Residential Meeting in Dambadarjaa (Feb. 2009)
Final Seminar (February 2008)	4th Steering Committee (February 2009)

This Summary Report compiles only essences of outcomes of the Final Report with a purpose to facilitate constructive discussions among all officials and stakeholders concerned. Viewing the target years 2020 and 2030, basic concepts on structuring Ulaanbaatar City are comprehensively presented in this report, covering key planning issues. Further technical aspects may be referred to Volume 2: Main Text and Volume 4: Technical Appendices.

1. INTRODUCTION

1.1 Background

Mongolia has been witnessing a rapid reform toward market economy and this has brought a huge change in the structure of the Ulaanbaatar Capital Region since the collapse of the socialist regime in 1992. For one, the population of Ulaanbaatar City has grown rapidly. In 1935 it was around 10,000; in 1944 after World War II it reached about 30,000; and in 1998 it was 650,000. At present the population has grown to more than 1 million at an average growth rate of more than 4.0% p.a. during the period between 2000 and 2007.

The Master Plan for Ulaanbaatar City was officially launched in 2001 with the target year 2020 (often referred to as UBMP-2020 in this Report). The Master Plan is well organized and adopts international planning methodologies. It also provides a clear insight into the causes and effects of rapid urbanization in Ulaanbaatar City toward the year 2020 and offers appropriate vision on physical urban development based on a rational projection of rapid motorization and on environmental measures to reserve watershed and water resources. However, overall urban growth management and land-use control remain to be issues that need further study.

Various donors and nongovernmental organizations (NGOs) have cooperated with Ulaanbaatar in terms of individual infrastructure and housing programs and projects including Ger area improvement. However, it seems that the Ulaanbaatar City government, as well as the ministries concerned, has not made the best use of these assets, know-how, and experiences gained from these projects/programs to carry out their daily administrative services. Although the coordination of donor contributions is inherently a task of the Mongolian side, a common insight into urban planning issues should be shared among donor organizations.

Under such circumstances, the Mongolian government requested the Japanese government to conduct "The Study on City Master Plan and Urban Development Program of Ulaanbaatar City." In response to its request, the Japan International Cooperation Agency (JICA) selected a consultant team, led by ALMEC Corporation under JICA's procurement regulations. The consultant team, or JICA Study Team, headed by Dr. Shizuo Iwata, was dispatched to Mongolia to commence the study in March 2007.

1.2   Objectives

The objectives of the study, which were mentioned in the Scope of Work agreed upon by both governments, are threefold, as follows:

- To revise the current master plan (i.e., UBMP-2020) for the target years of 2020 and 2030 to include measures against expanding Ger areas in response to rapid socio-economic changes;

- To prepare action plans and make recommendations to agencies in implementing the revised master plan; and

- To transfer technology to improve the capacity for city planning of implementing agencies.

1.3   Overall Schedule of the Study

This Final Report compiles the outcomes of the study which the JICA Study Team carried out from March 2007 to February 2009.   The Study Team completed: (1) Analysis of urbanization trend and urban problems; (2) Assessment of existing conditions; (3) Evaluation of administrative capacity; (4) Planning concepts addressed in the revised plan; (5) Draft proposals for a master plan toward 2030; and (6) Development program containing the recommended projects.   Figure 1.1 shows the overall schedule of the study.

Figure 1.1   Overall Schedule of the Study
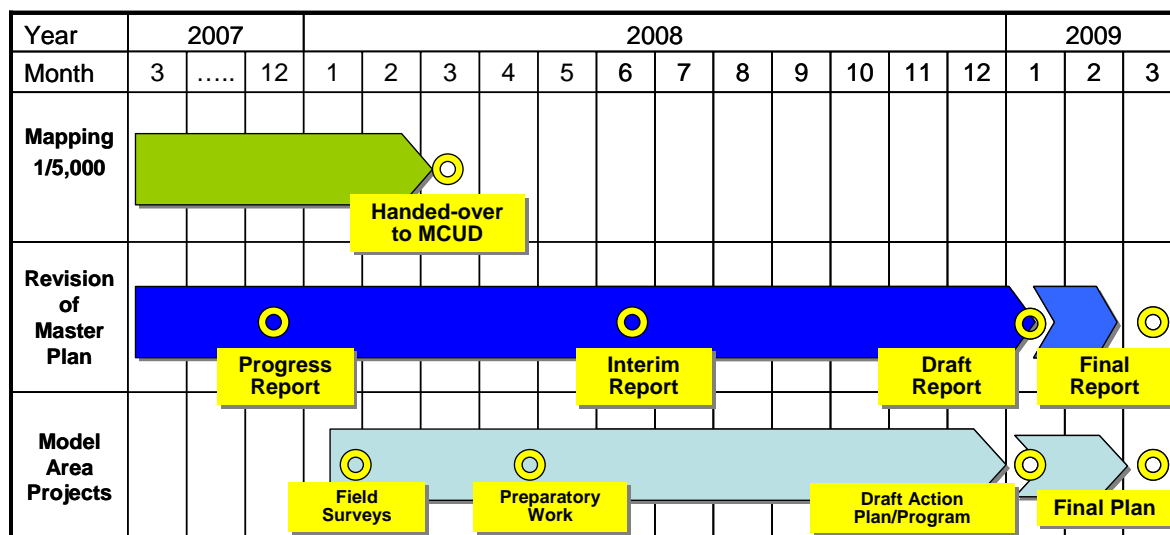
Source: JICA Study Team

At the beginning of the Study, the Household Interview Survey was conducted. A total of 4,500 households and their members were interviewed to determine their socio-economic characteristics and opinions on existing urban services, such as access to urban services, transport conditions, and others, as well as future development orientations. The results of analysis were utilized to identify current situation, problems and issues, as well as to develop future vision and plans of Ulaanbaatar City.

In the course of the Study, the Study Team conducted a Learning Session, entitled "Urban Planning Theory and Technologies and Japanese Experiences" during the summer holiday season 2007, as intensive workshops for counterpart personnel and all those responsible for urban planning. The JICA Study Team provided more opportunities to discuss the study's draft proposals with local experts, relevant key informants, and international donors, who were deeply interested in improving Ulaanbaatar City. As a result, sectoral workshops on issues, such as land use and zoning policy; housing policy; transportation sector strategies; infrastructure, environment and Ger improvement, were occasionally conducted during planning.

The Final Report is expected to be fully utilized in revising the existing Master Plan 2020 along with the legal process stipulated in the Urban Development Law.

1.4   Structure of Final Report

A number of separate volumes of reports were prepared for compilation of outcomes of the Study, as follows:

Vol.1:   **Summary**   **(English, Mongolian and Japanese)**

Vol.2:   Main Text   (English)

Vol.3:   Project Profiles   (English)

Vol.4:   Technical Appendices   (English)

Vol.5:   GIS Maps and Drawings for Urban Planning (English)

"Vol.4 Technical Appendices" includes: (1) Data-book on the result of the Household Interview Survey HIS), (2) Technical Findings on Transport Analysis in use of "STRADA ", a JICA-tailored transport analytical model, and (3) Learning Session Materials.

2. VISION AND STRATEGIES

2.1 Urban Development Visions

The existing Ulaanbaatar Master Plan targeting the year 2020 (referred to as UBMP-2020 hereinafter) was created based on analytical research and insights into the reality way back in 2000. Since then, however, many social and economic changes have occurred, bringing to fore the shortcomings of the UBMP-2020 in terms of its effectiveness as a guide for urban growth management.

Five (5) future visions for the city of Ulaanbaatar by 2020 are offered in the UBMP-2020, as follows:

1. **First Vision:** For the city to be a well-developed capital city of international standard; to have a vibrant economy; to be a world-class business center having a competitive edge in the areas of education, information, science. and technology;

2. **Second Vision:** For the city to have an appropriate policy on land management and urban development, including developing areas with appropriate infrastructure and for improving the housing conditions of all its citizens;

3. **Third Vision:** For the city to be healthy, to have a safe environment, an active social life, and a progressive legal framework;

4. **Fourth Vision:** For the city to have a responsive and efficient public administration, having a participatory approach involving the community and the private business sector in civic services; and

5. **Fifth Vision:** For the city to be an attractive tourist destination in the Asian region.

These visions addressed in the UBMP-2020 are all appropriate and appreciated. Therefore, this JICA study is looking at the same visions over the same planning horizon and is pursuing very similar goals.

Two weak points, however, appear in the planning visions of the UBMP-2020: one is the insights into financing capability. A new concept needs to be employed to encourage the private sector to participate in the provision of public services and infrastructures through a public-private partnership (PPP) scheme. Another point to be noted is the development of the legal framework to materialize these visions.

2.2   Planning Objectives

The UBMP-2020 stipulates several planning objectives, as follows:

1.   To determine the basic approach to establish comfortable living conditions for the present or future residents and support sustainable city development in new socio-economic situations;

2.   To maintain the equilibrium within natural beautiful places, national parks and the ecological system of the fauna and flora;

3.   To create a comprehensive environment in conformity with territorial boundaries, space, and characteristics through traditional methods of urban planning;

4.   To meet the safety requirements of transportation and engineering infrastructure;

5.   To re-develop Ger areas and residential districts and increase housing supply;

6.   To enhance industrial zoning structures and improve land use; and

7.   To establish interconnected community centers and improve social infrastructure.

No doubt these objectives are all relevant and appropriate for urban planning, and the same have been adopted in this JICA study. But in addition to these, the following have been further examined in the JICA study:

8.   To build new urban agglomerations or towns in a planned manner to accommodate increasing housing demand and economic requirements including those of the industrial and service sectors, and looking beyond 2020;

9.   To vitalize commerce, recreation/tourism and urban services in the central business district (CBD) even in winter season;

10.   To improve people's mobility with more energy- and time-efficient public transportation systems along significant corridors;

11.   To develop an effective urban planning legal framework in conformity with the Civil Law, Land Law, and other relevant acts/regulations; and

12.   To develop a comprehensive housing financing system to help improve the housing conditions of low- and middle-income households.

Figure 2.1   UB Vision 2020 and Refined UB Vision 2030

UB Vision 2020

1: **World-class business city**, providing with knowledge-based business opportunities

2: **Livable city** with appropriate land management, infrastructure and housing conditions

3: **Health city** with safe environment, well social life and progressive legal framework

4: **International tourist city** with attractive natural and life-cultural assets in Asia

5: **Well-governed city** with efficient and responsive public administration for citizens and business sector

Refined UB Vision 2030

Following the same visions

+

Two more insights need to be addressed:

Financing Capability should be enhanced, encouraging the private sector's participation in provision of public services and infrastructures through a PPP scheme.

Legal framework: as the tool for growth management and materialization of the Master Plan.

3. SOCIAL AND ECONOMIC PERFORMANCE & DEVELOPMENT FRAMEWORK

3.1   Socio-economic Conditions in Mongolia and Ulaanbaatar

In imagining the future perspective of Ulaanbaatar City, a major planning issue to address is determining how big the urbanization will be in the future and how long it will last. Hence, inasmuch as urbanization is affected by social and economic conditions, such as the performance of the national economy and migration patterns which in turn also directly affect Ulaanbaatar's population, it is necessary to come up with the social and economic projections for the city. Before doing so, however, Ulaanbaatar's current social and economic performance is briefly reviewed.

1)   Population Growth in Mongolia and Ulaanbaatar City

Over the past 18 years the national population increased from 2.1 million to 2.6 million. In the beginning of the 1990s, the annual growth rate decreased gradually from 1.6% to 1.3% after the turmoil of the economic transition.   Meanwhile, the population of Ulaanbaatar City increased by 440,000 in the same period, from 590,000 to 1,030,000. Although the population growth rates were less than 1% until 1992, it jumped to 3 to 4% p.a. after 1993 and has continued at a similar rate up to the recent year (see Table 3.1).

By the end of the 1990s and the beginning of the 2000s, Mongolia experienced some heavy Zud (snow) damages. Together with an unchecked immigration to Ulaanbaatar City, the capital's population growth rate recorded a high of 6.4% in 1999. After that year, however, growth rates kept at more than 4%, that is 5.5% in 2003, 4.2% in 2002, and 4.0% in 2005. Recently, some interesting phenomena took place: growth rates dropped from 4.0% to 3.0% in 2006, but it increased again to 3.7% in 2007 due to subsidies given to children that year, believed to be a lucky one according to the oriental zodiac calendar.

On the other hand, the population growth rate of Mongolia has been stable at around 1.2% to 1.3% since 2002. In 2007, the rate rose to 1.6% due again to the belief that children born that year would be lucky.   The share of Ulaanbaatar's population to Mongolia increased by 8.6 points in 10 years, from 30.5% in 1998 to 39.1% in 2007, as shown in Table 3.1.

Figure 3.1   Changes in the Population of Mongolia and Ulaanbaatar City
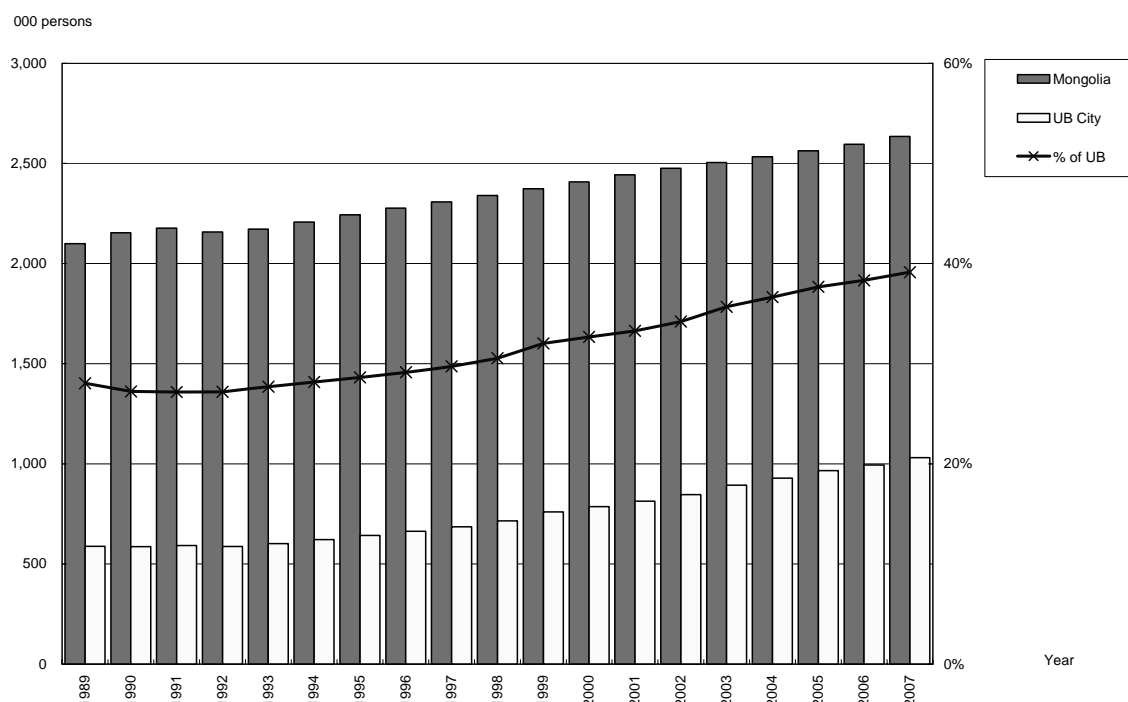
Source: Mongolian Statistical Yearbook 2006 and 2005, "Mongolia in a Market System" Statistical Yearbook 1989 - 2002

Table 3.1   Changes in the Population of Mongolia and Ulaanbaatar since 1998

(Unit: 000 persons)

	Mongolia	Ulaanbaatar City	Growth Rate of Mongolia (%)	Growth Rate of UB (%)	% of UB	Influential Events
1998	2,340	715	1.4	4.2	30.5	Free migration of people
1999	2,374	760	1.4	6.4	32.0	Zud
2000	2,408	787	1.4	3.5	32.7	Zud
2001	2,443	813	1.5	3.3	33.3	
2002	2,475	847	1.3	4.2	34.2	Land privatization (*Ger* area)
2003	2,504	893	1.2	5.5	35.7	Zud
2004	2,533	929	1.2	3.9	36.7	
2005	2,562	965	1.2	4.0	37.7	
2006	2,595	994	1.3	3.0	38.3	
2007	2,635	1,031	1.6	3.7	39.1	Land privatization (Summer house)

Source: Mongolia Statistical Yearbook

Looking at the 2000 population, as shown in Figure 3.2, shows that the percentages of working age population (i.e., from 15 to 40 years old) in Ulaanbaatar City were higher than those in Mongolia. It can be said that Ulaanbaatar City had younger populations.

Figure 3.2   Distribution of Population by Age Groups in 2000
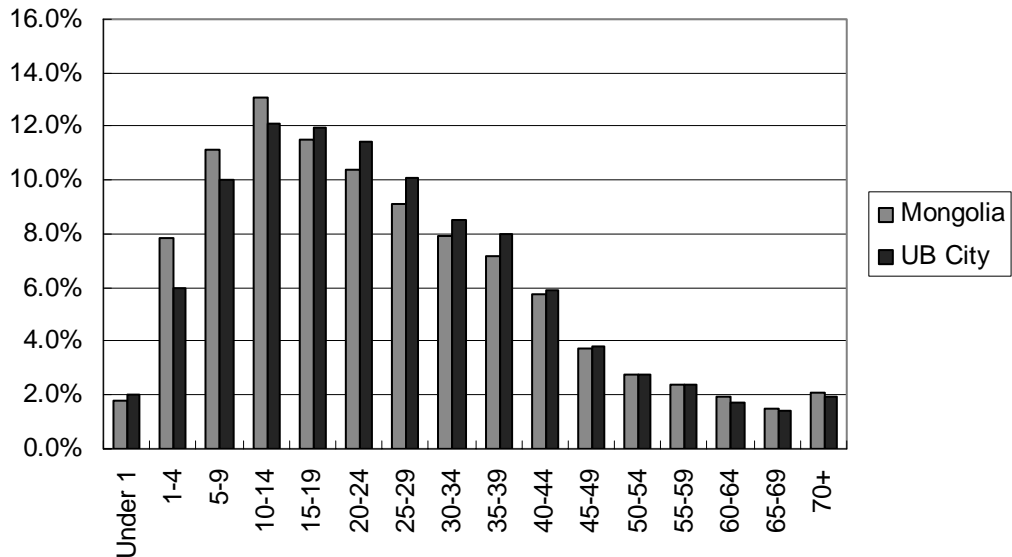
Source: Mongolian Statistical Yearbook 2006, "Mongolia in a Market System" Statistical Yearbook 1989 - 2002, Statistical Handbook Ulaanbaatar

Such a rapid population growth in Ulaanbaatar is influenced by a momentum of immigration. Figure 3.3 shows the changes in migration patterns in Ulaanbaatar City. In the first half of the 1990s, as migration was basically controlled, the numbers of in-migrants stayed within a limit. However, after the introduction of free migration in 1997, the number jumped to 15,000 in 1998, and reached 69,000 in 2004.

Figure 3.3   In-migration and Out-migration Patterns
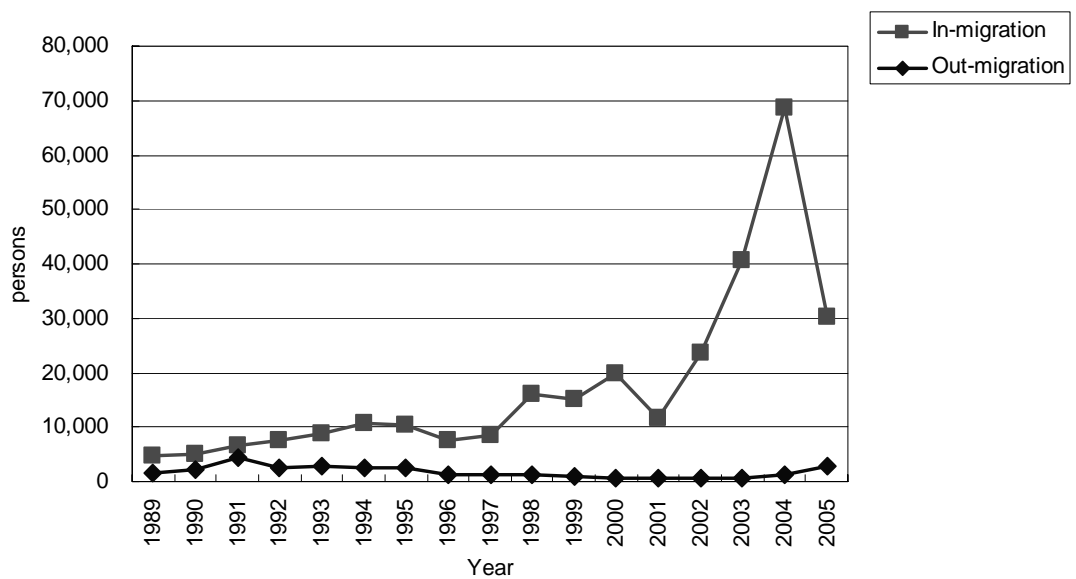
Source: Statistical Handbook of Ulaanbaatar 3rd Edition, Ulaanbaatar City, 2006

Looking into population changes by district, although the population steadily increased in all six (6) districts in the city, Songinokhairkhan (5.2%) and Bayanzurkh (5.5%) posted higher rates than the average (4.2%) over the last five years. The two districts are the located west and east, respectively, of Ulaanbaatar City. The growth rate in Bayangol, or the central district, was 2.6% in the same period.

Figure 3.4   Population Changes in Ulaanbaatar City by District
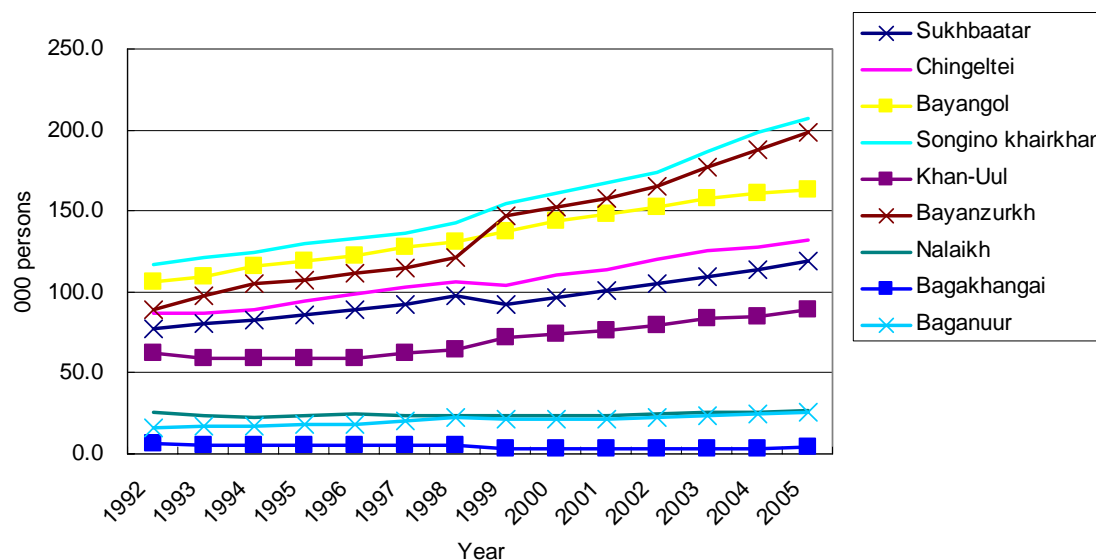
Source: Mongolian Statistical Yearbook 2006 and 2005, "Mongolia in a Market System" Statistical Yearbook 1989 - 2002, Statistical Handbook Ulaanbaatar 3rd Edition

2)   Economic Performance of Mongolia and Ulaanbaatar City

(1)   GDP and GDP per Capita

In the process of shifting toward a market economy in the 1990s, Mongolia's economy stagnated. Only since 2002, did the Mongolian economy start to grow. Figure 3.5 shows the changes in the country's GDP and Ulaanbaatar City's GRDP since 1999.[1] The average annual growth rate of GDP from 1999 to 2007 was 6.1%; on the other hand, that of Ulaanbaatar City was 7.0%, which is slightly higher than the national rate.

However, from 2004 to 2007, the average GDP growth rate of Mongolia was 9.0%, and that of Ulaanbaatar was recorded at 5.1%, which shows a lower rate than the national. This situation implies that the current economic boom in Mongolia in the past years came from the high growth in agriculture as well as in the copper and gold mining industries, which are located outside Ulaanbaatar City. Meanwhile, the share of the city's GRDP to Mongolia increased from 47% in 1999 to 58% in 2003; but it dropped to 50% in 2006.

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[1] The nominal GDP of Mongolia in the Mongolian Statistical Yearbook was revised in the 2006 and 2007 editions, and each edition shows the GDP in the recent four years. This is why it is difficult to get the medium and long-term time-series data on GDP now.

In the last four (4) years, the average annual growth rate of GDP per capita of Mongolia was 7.7%, but that of Ulaanbaatar City was only 1.3%. Increased number of migrants into Ulaanbaatar City resulted in such a low growth rate.

Figure 3.5   Changes in Economic Activities and Per-capita Products
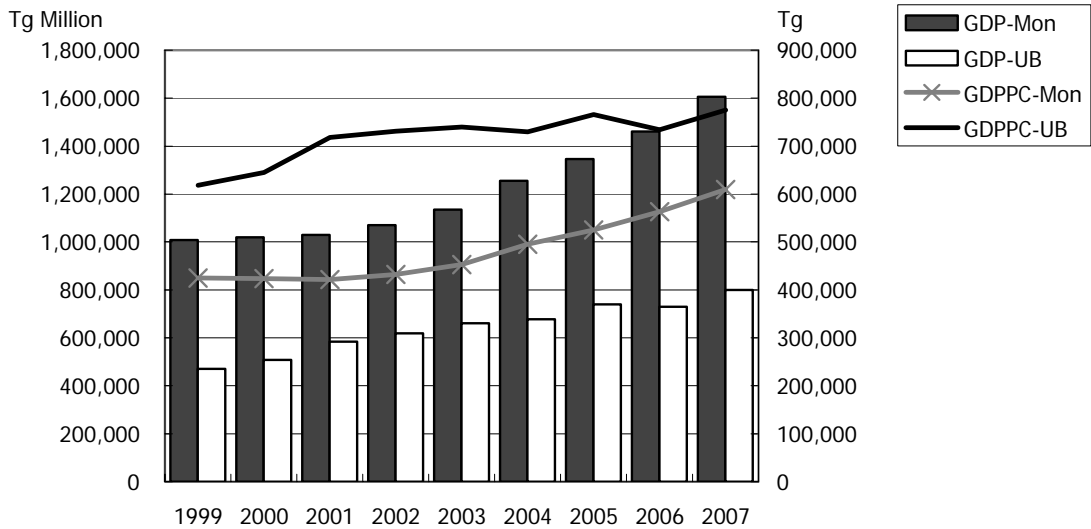
Source: Mongolian Statistical Yearbook 2006 and 2005, "Mongolia in a Market System" Statistical Yearbook 1989 - 2002

The contributions of industries to GDP growth are shown in Figure 3.6. The share of the tertiary sector is the most predominant and constant, ranging from 3.6% to 4.6%. The share of the secondary sector is also constant, ranging from 1.6% to 2.1%. In 2007, the primary sector recorded a 3.4% contribution to the GDP. This is the reason why the real GDP growth rate recorded as high as 9.9%.

Figure 3.6   Contribution of Industries to GDP Growth
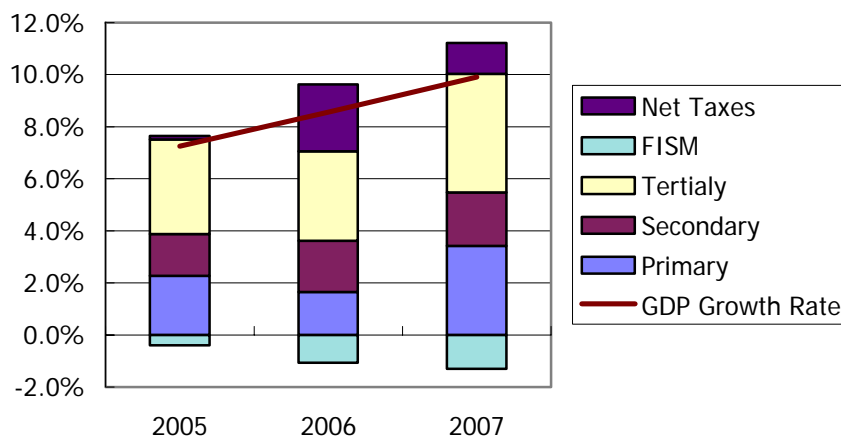
Source: Mongolian Statistical Yearbook 2006 and 2005, "Mongolia in a Market System" Statistical Yearbook 1989 - 2002

Figure 3.7 shows the distribution of Ulaanbaatar City's GRDP by industry from 2002 to 2005. In 2005, the percentage of the primary sector was marginal, and that of the manufacturing sector increased to 30% from 20% in 2002. The combined shares of

the trade and transport-related sectors show more than 50% of the GRDP in four (4) years.

Figure 3.7　Distribution of GRDP by Industry
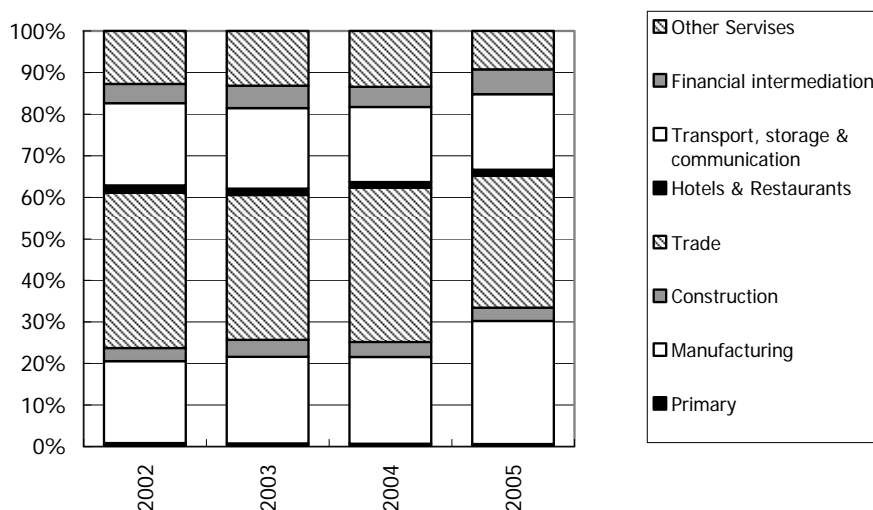
Source: Statistical Handbook Ulaanbaatar 3rd Edition 2006

(2) Business Enterprises

Figure 3.8 shows the changes in the number of business enterprises in Ulaanbaatar City. The number of enterprises in the trading sector increased by 4.8 times from 2,697 in 1997 to 13,025 in 2005, and its percentage increased from 36% to 51%.　While the percentage of the manufacturing sector decreased by 8 points, from 16% to 8% of the total.

The development of the wholesale and retail trade and repair industry is supported by individual consumption. Rapid inflow of foreign direct investment (FDI) to the mining industry and remittances from overseas workers[2] seem to stimulate household spending in the automobile and housing markets. In fact, industries such as wholesale and retail trade, as well as construction, are stimulating the economy of Ulaanbaatar City. Since these industries will not be an engine of the city's economy in the long term, it will be necessary to promote productive industries which will lead the national economy and earn foreign currency.

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[2] According to the Mongolian Statistical Yearbook 2007, the net amount of overseas workers' remittances was US$ 83.9 million (credit: US$174.3 million and debit: US$90.3 million) in 2007.　However, since every urban household has on average one member working abroad, real spending in the automobile and housing markets is believed to be bigger than official statistics.

Figure 3.8   Number of Business Enterprises by Industry
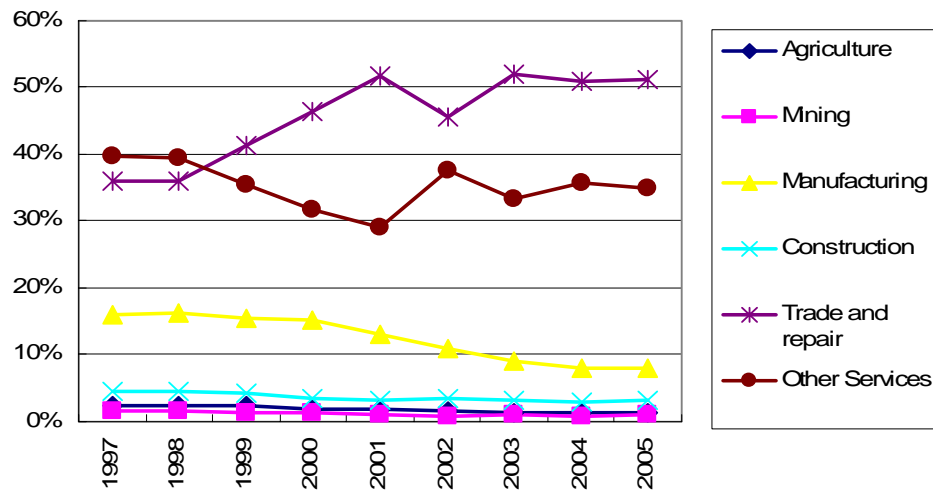
Source: Statistical Handbook of Ulaanbaatar 3rd Edition

(3) Unemployment

According to Mongolia Statistics Yearbook 2007, the national unemployment rate is only 2.8%. Although in the past, it recorded a high of 9.0%, it has continuously dropped. The unemployment rate of Ulaanbaatar City is only 1.7% in 2006. These unemployment rates were calculated from "registered unemployment" or official un-employment rates. Actual unemployment rates, however, seem to be higher than this figure; it is pegged at more than 30% in remote districts, based on interviews done in these areas. Also, according to an interview at a garment factory, the number of em-ployees in the garment industry decreased from 30,000 to 5,000 workers in the last five (5) years due to termination of quotas to China.

(4) Foreign Trade

Table 3.2 shows the export and import activities in Mongolia. The exported amount increased 2.2 times from US$ 870 million to US$ 1,942 million in the last four (4) years. Copper and gold, which are the major export items from Mongolia, accounted for 54% of the total in 2007. On the other hand, the imported amount increased by 2.1 times from US$ 1,021 million to US$ 2,170 million in the same period, resulting in a trade imbalance of US$ 228 million in 2007. Major import items were mineral fuels (29%), machinery and transport equipment (28%), and manufactured goods (15%). Thus, Mongolia is a typical resource-based country, exporting raw materials, while importing processed and manufactured ones.

Table 3.2   Major Export and Import Items

(Unit: %)

Commodity group	Export			Import		
	2005	**2006**	**2007**	**2005**	**2006**	**2007**
Total (US$ million)	**1,065**	**1,543**	**1,942**	**1,184**	**1,486**	**2,170**
Food and live animals	1.2%	1.7%	1.7%	10.3%	9.6%	9.6%
Beverages and tobacco	0.0%	0.0%	0.0%	1.8%	1.9%	1.9%
Crude materials, inedible, except fuels	48.5%	64.6%	70.4%	0.7%	0.7%	0.7%
of which: Copper concentrate	*30.6%*	*41.2%*	*41.8%*			
Mineral fuels, lubricants and related materials	3.8%	4.6%	4.6%	26.6%	29.3%	29.3%
Animal and vegetable oils, fats and waxes	0.0%	0.0%	0.0%	0.9%	0.6%	0.6%
Chemicals and related products	0.1%	0.1%	0.1%	5.0%	5.5%	5.5%
Manufactured goods classified chiefly by material	4.4%	4.3%	4.3%	17.5%	15.0%	15.0%
Machinery and transport equipment	0.7%	1.1%	1.1%	31.4%	28.3%	28.3%
Miscellaneous manufactured articles	10.2%	6.0%	6.0%	5.9%	9.3%	9.3%
Not classified elsewhere in the SITC	31.1%	17.5%	12.1%	0.0%	0.0%	0.0%
of which: Gold unwrought or in semi-manufactured forms	*31.1%*	*17.5%*	*12.1%*			

Source: Mongolian Statistical Yearbook 2006 and 2007

(5) Foreign Direct Investment

Tables 3.3 and 3.4 indicate FDI by industry and country, respectively.   In 2006, almost half of FDI was invested in the mining industry, followed by the trading industry (wholesale and retail trade), sharing 18%. This was reflected by a consumption boom in recent years.   Looking into FDI source by country, China ranks first, sharing 47% of the total. Chinese FDI seems to be invested in a wide range of industries, while investment from Canada and the United States is for the mining industry. They made large investments in 2006.

Table 3.3   Foreign Direct Investment by Industry

(Unit: US$ 000)

Industry	1990-2004	2005	2006	Total (1990 - 2006)	Share (%)
Geology, Mining, Prospecting, Oil Sector	493,973	183,962	195,390	873,325	48.4
Trade, Public Catering	162,764	53,377	103,388	319,529	17.7
Engineering Facilities, Construction Materials Production	55,238	773	1,792	57.802	3.2
Banking, Financing Activity	67,105	9,671	11,983	88,759	4.9
Light Industry	85,002	1,792	1,454	88,248	4.9
Others	256,813	67,265	52,536	376,614	20.9
Total	1,120,895	316,839	366,544	1,804,278	100.0

Source: Data from Foreign Direct Investment Committee

Table 3.4   Foreign Direct Investment by Country

(Unit: US$ thousand)

Source	1990-2004	2005	2006	Total (1990 - 2006)	Share
China	441,786	227,912	171,879	841,578	46.6
Canada	174,207	1,542	72,180	247,929	13.7
South Korea	85,180	19,004	16,435	120,619	6.7
USA	45,725	5,564	37,166	88,455	4.9
Japan	66,208	5,841	4,728	76,777	4.3
Others	307,788	56,975	64,156	428,920	23.8
Total	1,120,895	316,839	366,544	1,804,278	100.0

Source: Data from Foreign Direct Investment Committee

3.2   Long-term Prospects of Socio-economic Development of Mongolia

1)   Mongolian National Economic Development Targets in Middle and Long Term

Currently, there are two scenarios on the future economic development of Mongolia, i.e. the "Millennium Development Goal Based National Development Strategy" (MDG-based NDS) approved by the Parliament which sets very ambitious economic growth targets until 2021 and the GDP growth prospect presented in the IMF Staff Report for 2006 Article IV Consultation.   The latter views a more moderate economic growth than the former, as shown in Table 3.5.

Table 3.5   Target Average Growth Rates in MDG-based NDS and IMF Report 2006

	2007 - 2015	2015-2021
MDG-based NDS	14 %	12 %
	2007 - 2011	2012-2026
IMF Staff Report for the 2006 Article IV Consultation	7.5 %	5.1 %

Source: Millennium Development Goal Based National Development Strategy, Staff Report for the 2006 Article IV Consultation

The economic development described in the MDG-based NDS targets an average GDP growth rate of no less than 14% and a GDP per capita at US$ 5,000 until 2015. Moreover, the average growth rate between 2015 and 2021 would be no less than 12%, and the GDP per capita would be no less than US$ 12,000, thereby leading Mongolia to becoming a middle-income country by 2021.

Meanwhile, the IMF Staff Report, which was based on the economic performance of Mongolia since 2002, predicts that a strong economic performance (i.e., 7% growth)

will continue until 2009 and by 2010 record an 11% growth due to the development of a new mining site (i.e., Oyu Tologoi Mine). After 2010, the GDP growth rate will go down gradually from 6 to 5.5% between 2011 and 2014, and reach 5% by 2015. As a result, the average GDP growth rate will be 7.5% from 2007 to 2011. After 2015, service industries will provide a major role in the national economy. That is why the average GDP growth rate after 2015 will be at 5.1% per annum.

2) Population Forecast for Mongolia

The national population forecast for Mongolia was prepared by the National Statistical Office and the United Nations Population Fund (NSO-UNFPA) based on the 2000 Census. The forecast consists of three (3) scenarios from three (3) different fertility rates, that is the high scenario with an annual population growth rate of 1.3%, the medium scenario with a 1.2% growth rate, and the low scenario with a 1.1% growth rate, as shown in Table 3.6.

Table 3.6   Population Scenarios Prepared by NSO-UNFPA

(000 persons)

	2000	2005	2010	2015	2020	2025	Average Growth Rate
High	2,390	2,573	2,764	2,966	3,160	3,330	1.3%
Medium	*2,390*	*2,562*	*2,742*	*2,919*	*3,087*	*3,230*	*1.2%*
Low	2,390	2,552	2,720	2,884	3,039	3,168	1.1%

Source: Population Forecast until 2025, NSO-UNFPA

As of 2005, the population of Mongolia was 2,562 thousand, following the medium scenario until 2008; thus, the medium scenario will be appropriate for the national population forecast.

3.3   Socio-economic Development Framework 2020 and 2030 for Ulaanbaatar City

1)   GRDP of Ulaanbaatar City

Since 2002, Mongolia entered a new economic growth period after the economic slump of the 1990s. GDP growth accelerated in recent years, with average growth rates increasing from 6.9% in the 2002–2004 period to 8.6% in the 2005 - 2007 period. The growth rate of GDP per capita also increased from 5.6% to 7.2% in the same periods.

The existing UBMP-2020 and MP 2015 stated economic development targets for Ulaanbaatar, as shown in Table 3.7.

Table 3.7   Average Annual Growth Rates in UBMP-2020 and MP 2015

	Until 2010	Until 2020
UBMP-2020	9.0%	10.5%
	Until 2010	**Until 2015**
MP 2015	7.5%	7.7%

Sources: UBMP-2020, MP 2015

The JICA Study Team projected the average annual GDP growth rates for Mongolia and Ulaanbaatar until 2030, as indicated in Table 3.8. Since prices of copper and gold are higher and more stable than the IMF report estimated, the JICA Study Team projected a 7% GDP growth for Mongolia which will continue for a longer period. However, the development of new mining sites was not considered due to its high uncertainty. The JICA Study Team expects the benefit from the mining industry will take place in the diversification of the Mongolian economy, stimulating other industries which will also contribute to national economic growth after 2011.

In the short term, the growth rate of Ulaanbaatar City is expected to be lower than that of the national GDP due to recent activities in the mining industry and the agriculture sector. However, in the middle and long term, the growth rate of Ulaanbaatar City will exceed that of the country, because the urban economy in Ulaanbaatar will lead the national economic development after 2011.

The percentage of Ulaanbaatar's GRDP to the national GDP will decrease from 49.7% in 2007 to 47.9% by 2010; but it will start to increase again afterwards, hitting 49.7% by 2030.

Table 3.8   Assumed Growth Rates of Mongolia's GDP and Ulaanbaatar's GRDP

	Mongolia	Ulaanbaatar City	Perspective and Assumption
2008-2010	8.3%	7.0%	Economic development scenario prepared by the IMF Staff Report 2006 is applied to this period. GDP growth rates will record 7% in 2008 and 2009, and increase to 11% due to the operation of a new mining site (Oyu Tolgoi) by 2010. However, the impact of national economic development on Ulaanbaatar's GRDP will be limited, and it will follow the recent growth rates (7%). That is why the average growth rate of Ulaanbaatar will be lower than the average growth rate of Mongolia.
2011-2015	7.0%	7.5%	Mining industry will continue contributing to GDP growth. On the other hand, GRDP growth rate of Ulaanbaatar will accelerate due to development of urban industries and urban economy. The growth rate of Ulaanbaatar City will exceed that of Mongolia.
2015-2020	7.0%	7.5%	GDP/GRDP growth rates will follow the same trend in 2011-2015.
2027-2030	6.4%	6.8%	Growth rates of Mongolia and Ulaanbaatar will slow down due to a decrease in population growth and maturing of the economy. Growth rate of Ulaanbaatar City will still be higher than that of Mongolia because of a concentration in population and industries.

Source: JICA Study Team

Figure 3.9   Economic Projections for Mongolia and UB City

	2007~2030
Mongolian GDP	4.7 times
UB GRDP	4.9 times
UB GRDP Per Capita	2.7 times
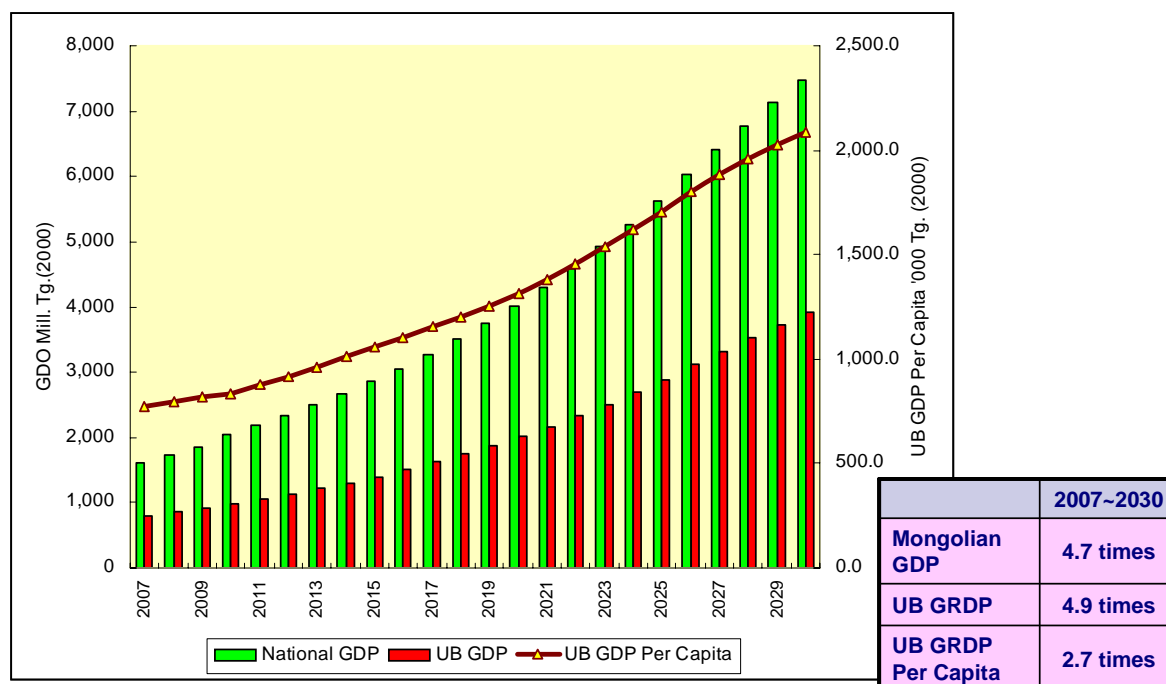
Source: JICA Study Team

2)   Population Forecast for Ulaanbaatar City

Three (3) population forecasts for Ulaanbaatar City are available, that is NSO–UNFPA, UBMP–2020, and MP 2015, as shown in Table 3.9. The NSO–UNFPA forecast is part of the national population forecast until 2025 and predicts a population of 1.35 million by 2015 at an average annual growth rate of 2.1%. In UBMP-2020, the population by 2020 will be 1.65 million at an average annual growth rate of 4.2%.   MP 2015 projected a population of 1.16 million at 2.0% growth.

All forecasts were prepared before 2005 when the population growth rate of Ulaanbaatar City was fluctuating heavily. The JICA Study Team recognizes that a push effect (Zud and difficult economic situation in remote areas), and a pull effect (economic development and job opportunity in Ulaanbaatar City) worked very much in the period.

Based on the assessment of these forecasts, the JICA Study Team projected the average annual growth rates from 2008 to 2030, as shown in Table 3.10, to decrease gradually from 4.2% during the 2001─2005 period to 2.0% during the 2020─2025 period, and to keep this level until the next five-year period (2026─2030). In the forecast, the population of Ulaanbaatar City will account for 1.57 million and 1.87 million by 2020 and 2030, respectively. Meanwhile, the city's population share to the nation will grow from 37.7% in 2005 to 55.5% by 2030.

Table 3.9   Existing Population Forecasts for Ulaanbaatar City

(Unit: thousand persons)

	2005	2010	2015	2020	2025	Average Annual Growth Rate (%)
NSO – UNFPA	894.3	1019.3	1,141.1	1,253.5	1,350.6	2.1
UBMP-2020	890.0	1,135.0	-	1,650.0	-	4.2
MP 2015	942.2	1093.4	1,164.7	-	-	2.0

Source: Population Forecast 2025, UBMP–2020, MP 2015

Table 3.10   New Population Forecasts for Ulaanbaatar City until 2030

	2007	2010	2015	2020	2025	2030
Population (000 persons)	1,031.2	1,173.2	1,325.1	**1,537.8**	1,695.8	**1,870.0**
Central UB (6 Districts)	973.2	1,107.2	1,250.6	**1,437.8**	1,585.5	**1,739.1**
3 Remote Districts	58.0	66.0	74.5	**100.0**	110.3	**130.9**
Ave. Annual Growth Rate (%)	4.0*	4.0	3.2	2.3	2.0	2.0
Proportion to National Population (%)	37.7	42.8	47.1	49.8	52.5	55.5

Note: * Average growth rate from 2002 to 2007.
Source: JICA Study Team

Figure 3.10   Population Growth of Ulaanbaatar City

000 persons
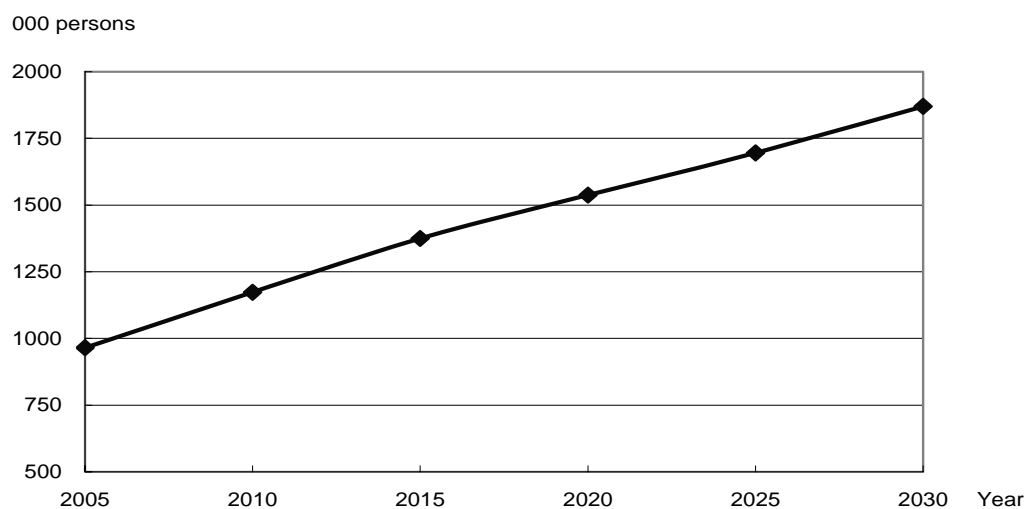
Source: JICA Study Team

As for the size of households in Ulaanbaatar City, it dropped from 5.4 persons per household in 1989 to 4.6 persons in 2006. This trend will continue up to a certain level until 2030, due to the trend toward the nuclear family. As a result, the number of households will increase more than twice from 224,000 in 2007 to 480,000 by 2030, as shown in Table 3.11.

Table 3.11   Household Characteristics in Ulaanbaatar City from 2007 to 2030

Year	2007	2010	2015	2020	2025	2030
Number of Households ('000)	224.2	260.3	315.8	365.6	417.2	479.5
Size of Household	4.6	4.5	4.3	4.2	4.0	3.9

Source: JICA Study Team

3.4   Potential Industries to Lead Ulaanbaatar's Economic Growth

Industries that can contribute to a sustainable development of Ulaanbaatar's economy need strategic policies to realize their potential.

1)   Promising Industries

Five (5) leading industries, which are endowed with great potential to make a mark in the global market, are tentatively identified, as follows:

- Mining and related industries;
- Tourism and related service industries;
- Cassimere production;
- Information and communications technology (ICT) and business process out-sourcing (BPO); and
- Agricultural products and food processing industries.

The **mining industry** is important to the Mongolian economy now and in the future. Currently, it shares 12% of the GDP and 60% of exports, and employs 4% of the labor force. Although copper and gold mines are located outside of Ulaanbaatar City (Erdenet and South Gobi), supporting services such as logistics, administration, insurance, spare parts procurement, etc. are provided in Ulaanbaatar City.

Tourism is already an important industry for Mongolia. During summer, large numbers of foreign tourists visit the country. Tourist arrivals to Mongolia more than doubled in 6 years (from 158,000 in 2000 to 395,000 in 2006) with an average length of stay of 12 nights and an average spending of **US$ 106 per day per person**. Based on these factors, the total earnings accounted for about US$ 572 million (Tg.670 billion). Assuming that about 60% of the total earnings circulated within the Mongolian economy, local earnings are calculated at about **Tg. 400 billion** which is equivalent to 25% of the national GDP.

Thus, the tourism sector contributes significantly to foreign currency earnings. It is necessary for Ulaanbaatar City to enhance its gateway function through the development of tourist sites, the development of tourism routes, and the improvement of services. Tourism as a seasonal income earner is an issue that has to be tackled to ensure a stable income from this sector. Tourism products need to be developed in collaboration with both private and public sectors.

The value-added production of cassimere is also a promising industry for Ulaanbaatar City from the point of value-added earnings and employment generation. This industry has been supported by its long-term tradition. Although at present this business is still unstable, it has a big potential because Mongolia is and can be the biggest raw material supplier in the world. The industry merely needs a boost in terms of contemporary design development, quality management, and aggressive marketing,.

ICT and BPO are newly developing businesses in the country. There are 30 companies belonging to the Mongolia Software Industry Association (MOSA), and 5 to 6 companies work as BPOs. These companies provide outsourcing services to Japanese companies and businesses from other countries. Since many Mongolians are well-educated, have good foreign language fluency, and easily adapt to foreign cultures, characteristics which bode well for working in BPOs, these businesses will provide a big employment potential to younger generations.

Agricultural products and food processing industries should be strongly supported by the government under an import substitution policy. Fresh and safe perishable foods are highly in demand by people who have become more health conscious. Agricultural activities should be encouraged in suburban areas in Ulaanbaatar City, with farming business being given tax incentives and subsidies for seeds procurement. Processing industries for agricultural products, such as meats and dairy products, may be located in designated industrial zones in Ulaanbaatar City.

Through market forces, the development and growth of these promising industries will affect and stimulate other industries and services, which will in turn spur new businesses and services. This is the process to vertically deepen and horizontally widen the urban economy, thereby leading to a robust urban economy in Ulaanbaatar City. Related and/or derived industries are: (1) **Commercial** activities for wholesale, retail, and trading; (2) **Banking and insurance**; (3) **Construction** and construction materials manufacturing; and (4) research and development (**R&D**).

2) Government Strategies and Support

The Mongolian government and the Ulaanbaatar City government should jointly formulate policies to facilitate the growth potential of such potential industries. This concept is illustrated in Figure 5.1. The government should provide preferential to such treatment to such industries mentioned above in the form of incentives, deregulation, human resource development (HRD), and R&D. For related industries, the public sector should allow market forces to drive their growth. Meanwhile, from the private sector, support will be needed in HRD and R&D.

Figure 3.11 Necessary Government Support for Leading Industries

Leading Industries:
- Foreign currency earning
- Targeting international market

-Support Industries for Mining
-Tourism
-Processing of Cashmere
  -ICT and BPO
-Agricultural products and food
  processing

Spillover effect

Other Industries:
- Job creation
- Targeting Ulaanbaatar city

- Wholesale and Retail Trade
- Construction
- Construction Material
- Others commercial /service
  activities

Common Government Support:
 - Human resource development
 - Technical and financial support to start-up firms

Special Support for Leading Industry:
-    Improvement of tourist information provision and
     beatification of tourist sites (Tourism)
-    Consolidation of land use and improvement of
     infrastructure (Cashmere)
-    Provision of ICT service projects (ICT and BPO)

Source: JICA Study Team

4. REGIONAL DEVELOPMENT STRUCTURE

4.1 Existing Regional Framework

The existing urban master plan, the **UBMP-2020**, was planned within the national and regional development context. It also considered Ulaanbaatar City and its surrounding area as an independent zone for development planning. Since the city needs to alleviate population concentration by developing satellite cities, the following concepts were proposed:

- Further development of the existing towns of Songino, Tuul, Ulziit, Khonkhor, Gatsuurt, Jargalant, and Terelj;

- New-town development in Argalant, Rashaant, Bayanzurkh, and Bayangol; and

- Free trade zone development around Nalaikh Town.

Communications and utilities were planned to be developed in satellite cities together with the development of small and medium enterprises, thereby leading to the creation of satellite cities in integrated settlement clusters.

Meanwhile, the **National Development Strategy** addressed the priority outcomes of regional development in the Phase I period of 2007─2015 as follows:

- Establish industrial and technological parks in regional pillar centers and free economic and trade zones in the regions and make them operational, and

- Create the foundation for a knowledge-based economy.[3]

To this end, the implementation strategy for Ulaanbaatar Region includes industrial development in its three remote districts.

Ulaanbaatar Region Development Program (2005–2015) [4] provides the basic principle to develop satellite cities and villages around Ulaanbaatar City to reduce the over-concentration of population and migration to Ulaanbaatar City. In pursuit of this, the development of satellite cities was expected as a result of the relocation of industries from Ulaanbaatar Region.

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[3] The Government of Mongolia, "Millennium Development Goals Based Comprehensive National Development Strategy (CNDS) of Mongolia (Draft)," Ulaanbaatar City, 2007, p. 95.
[4] This program was approved under the Resolution of the Government of Mongolia, No. 197, dated 16 August 2006.

4.2   Conceptual Scheme of the UB Metropolitan Area

The UB Metropolitan Area encompasses the area within a **50-kilometer (km)** radius, and includes *Nalaikh*, *Zuunmod*, and the planned **New International Airport**. The following concept is proposed to develop the UB Metropolitan Area (see Figure 4.1).

Figure 4.1   Conceptual Scheme of the Ulaanbaatar Metropolitan Area
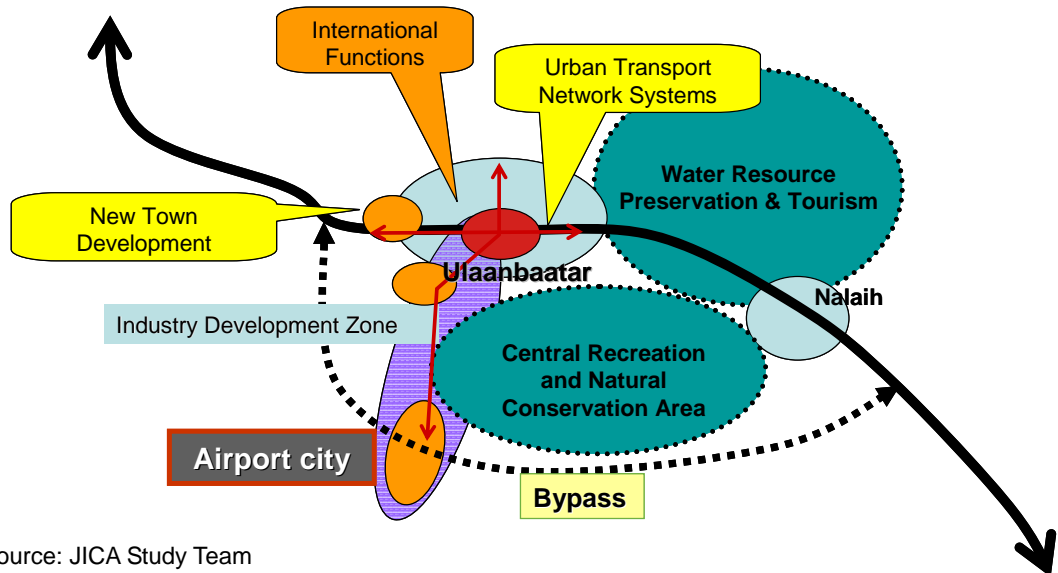
Source: JICA Study Team

Major urban activity centers are needed to be linked with functional **trunk roads** such as **AH-3**, **Airport Access**, and **Railway**.

The New Airport Access Highway should be developed along with the opening schedule of the New International Airport whose construction has been committed by the Mongolian government with Japanese official development assistance (ODA). Some public-private partnership (PPP) model needs to be explored for the development and operation of this airport access. Given a scheme to combine the construction of the Airport Access Highway with the development of the Airport City, the scheme must be attractive to the private sector.

The "**Airport City**" should accommodate new economic and business activities to be strengthened by locational advantages, i.e. the area faces the international gateway, based on a long-term perspective. Three types of business opportunities are promising in the airport city. These are:

- Tourism and related businesses;

- Aviation businesses such as maintenance workshops for aircraft, air-cargo logistics center, aircraft-parts distribution center, catering centers, etc.; and

- ICT and knowledge-based businesses.

The "**Railway Bypass**" will be developed so as to pass through the new international airport and will function as an **international freight line** to connect to China and Russia. "Regional Logistics Centers" are proposed to be located near the divergent

points of the railway bypass, or **Nalaikh** in the east and **Tolgoit** in the west.

Ulaanbaatar City will be served by a well-functioning urban transport system which will be connected to regional and international transport facilities.

4.3 Economic Functions of Remote Districts

As shown in Table 4.1, three remote districts in Ulaanbaatar City hold their own characteristics and attributes. Nalaikh can be regarded as part of the Ulaanbaatar Metropolitan Area, but the other two districts are distant, Bagakhangai and Baganuur are 90 and 140 km away from central Ulaanbaatar, respectively. Therefore, the two districts should enhance their peculiar functions to become engines of socioeconomic development.

Table 4.1   Development Directions for Three Remote Districts in Ulaanbaatar City

Remote Districts	Direction of Development	Km from UB Central	Population		
			2007	2020	2030
Nalaikh	**New Industrial Promotion Park & Logistic Center**	**30 Km**	28,152	55,000	78,500
Baganuur	**UB Metropolitan Industrial and Energy Center**	**140 Km**	25,969	39,000	45,800
Bagakhangai	**Agro-industrial Center**	**90 Km**	3,864	6,000	6,500
Total			57,985	100,000	130,900

Source: JICA Study Team

Nalaikh will be able to become part of the Ulaanbaatar Metropolitan Area, inducing a variety of industrial activities. This district will be an industrial incubator where new industrial and technological undertakings and tests will be encouraged. To facilitate the economic development of this satellite city, domestic and foreign investments need to be attracted. The **"Logistic Center"** is another important function to be attached to this town. The population of Nalaikh District is forecast to be 78,500 by 2030, or 2.8 times the 2007 population of about 28,000,.

Baganuur is rich in mineral resources, such as coal, and is close to Herlen River where water is plentiful. Based on these characteristics, Baganuur has a great potential of becoming an "**Energy Production Center**" as well as a resource-based industrial center. District population is expected to reach 45,800 by 2030, compared to the present 26,000 level. However, should industrial location be promoted, the future population will easily surpass this projection.

Bagakhangai is located at the railway junction and can be regarded as the southern gateway to the Ulaanbaatar Metropolitan Area. Because of such a locational advantage, this district has a potential for attracting agro-processing industries in the future,

targeting at the Ulaanbaatar market. The government should exert its best effort to induce such development of agro-related industries and business by providing incentives for investments in such sectors. Otherwise, this small township would not be able to realize its potential.

Figure 4.2 Proposed Development Structure for Ulaanbaatar Metropolitan Area
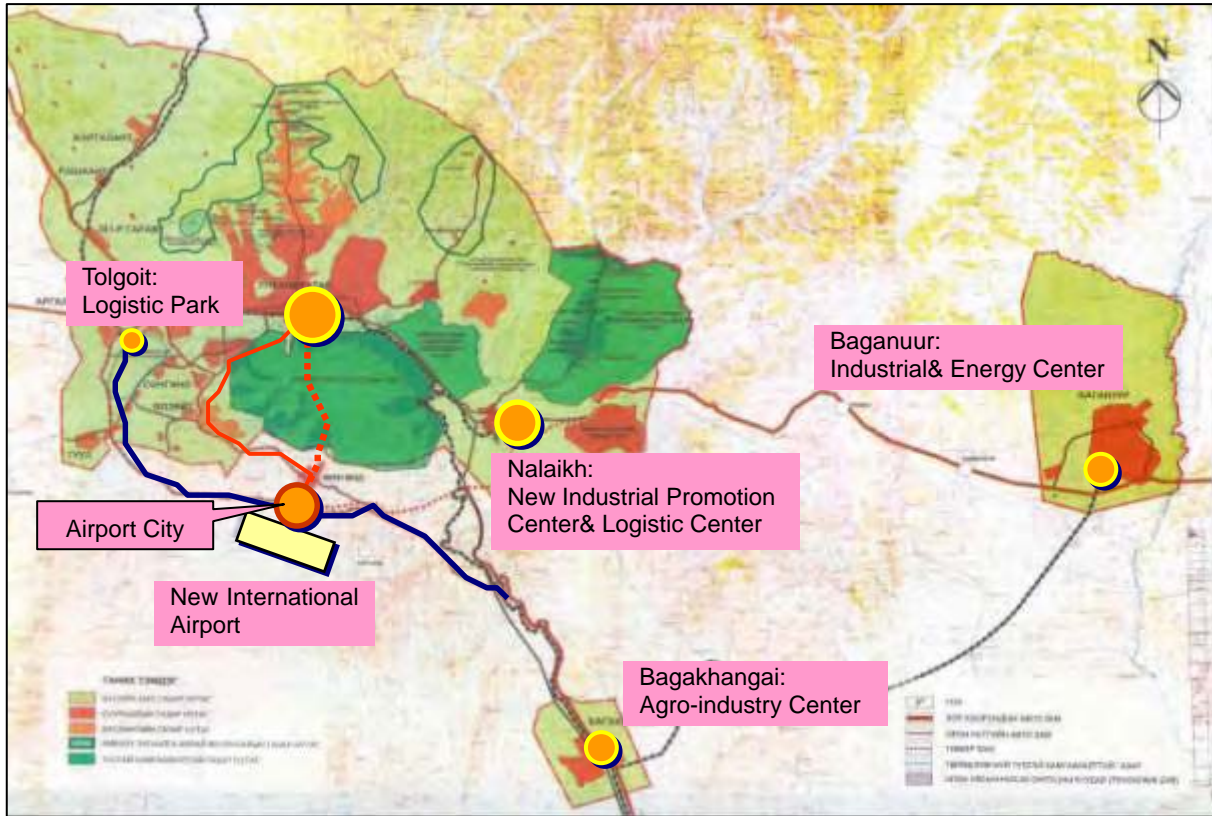
Source: JICA Study Team

5. LAND USE AND ZONING

5.1 Proposed Land Use Concepts

The current urbanization trend which is taking place toward the upper stream of the Tuul River tends to increase the damage to its environment, and such a trend should be controlled. To do so, however, the land use of Ulaanbaatar City should be determined based on the following basic strategies.

1. Strictly conserve the watershed and other protected areas which are assessed as environmentally sensitive such as:

   ・ Eastern areas along the upper stream of *Tuul River;*

   ・ Northern hilly areas toward the upper stream of *Selbe River* and *Tolgoit River*; and

   ・ Bogdkhaan Uul Special Protected Area.

2. Control development in land unsuitable for urbanization, including steep land and flood-prone areas;

3. Conserve fertile lands suitable for agriculture;

4. Conserve the "ecological network" by:

   ・ Maintaining and improving existing natural networks of forests, waterways, and green areas, and

   ・ Maintaining the migration routes of animals called "*biological corridors*"

Taking into account all the conditions abovementioned, the urbanization process should be restricted in the east, north, and south. Massive land development activities for housing and commercial purposes in these three directions should therefore be controlled through legal means (as discussed in the following section). The only suitable direction of urban expansion is toward the west, as seen in Figure 5.1.

Figure 5.1   Basic Strategy for Land Use & Urban Expansion in Ulaanbaatar City
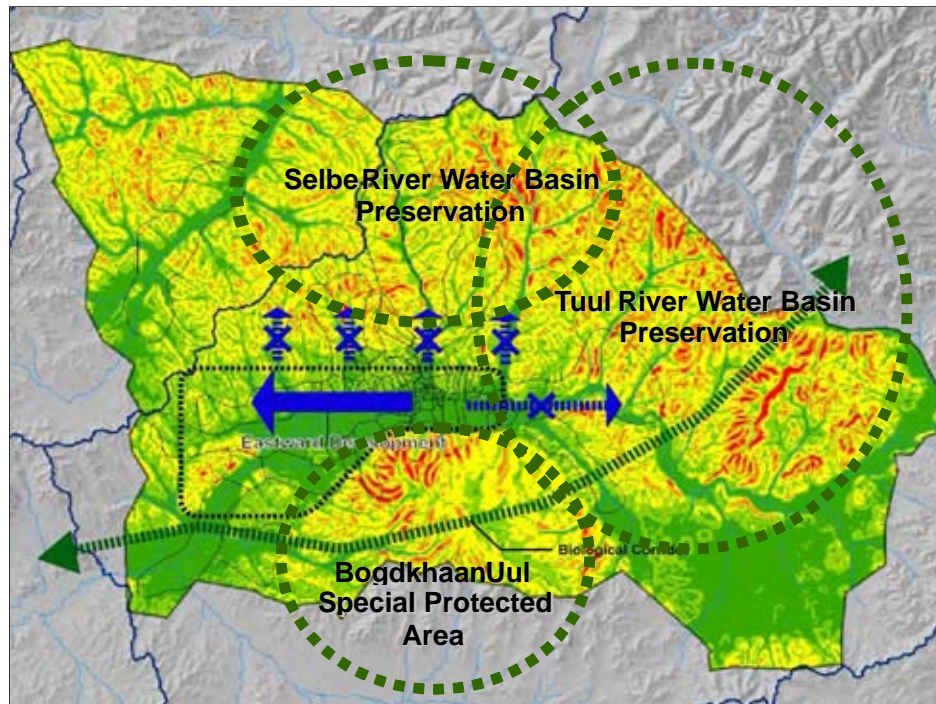
Source: JICA Study Team

5.2   Proposed Institutional Framework for Land Use Management

Urban planning administration aims to formulate appropriate rules, norms, guidelines, for and incentives to development activities which may be shared by citizens and governments.   Urban planning decisions should comply with legal rationales; therefore, major decisions and procedures need to be clearly stipulated in laws in the comprehensive legal system.

Figure 5.2 shows the proposed hierarchical planning system and the institutional relationships of the city master plan with higher-level plans such as the National Development Plan and the Regional (Capital Region) Development Plan.

The important task of urban planning is to guide the administrative territory to be of the most suitable land use. This requires a legally mandated administrative tool for urban growth management or urban development control. To this end, the first planning action must be to evaluate an area's land potential and suitability, and divide it into two categories: (1) urbanization promotion areas UPAs), and (2) urbanization control areas (UCAs).

Figure 5.3 shows a conceptual procedure of a legal framework to determine UCAs and UPAs to ensure appropriate land use. To identify UCAs, forest and green areas ideal for use in "**watershed protection**" should be given top priority in Ulaanbaatar City, followed by forest reserves, natural parks, natural conservation areas, and flood-prone areas. Those suitable for agriculture may also be protected from urban development.

Residual areas, or those not categorized as conservation areas, will thus be considered suitable for urban development. Therefore, parts of the residual areas will be designated as UPAs, where urban development activities should be encouraged provided they comply with land-use rules and regulations. For instance, a "**Zoning System**" will be applied within designated UPAs.

In this process, the most important factor is the institutionalization of the separation of territories into UCAs and UPAs under the Urban Development Law or a related sub-law; otherwise, the concept of boundary will not have any sense in enforcing land-use controls. Because there is normally a great difference in value of land inside and outside the boundary, its designation must be politically sensitive and needs a transparent procedure under the legal system.

Figure 5.2   Overall Structure of Planning System and City Master Plan
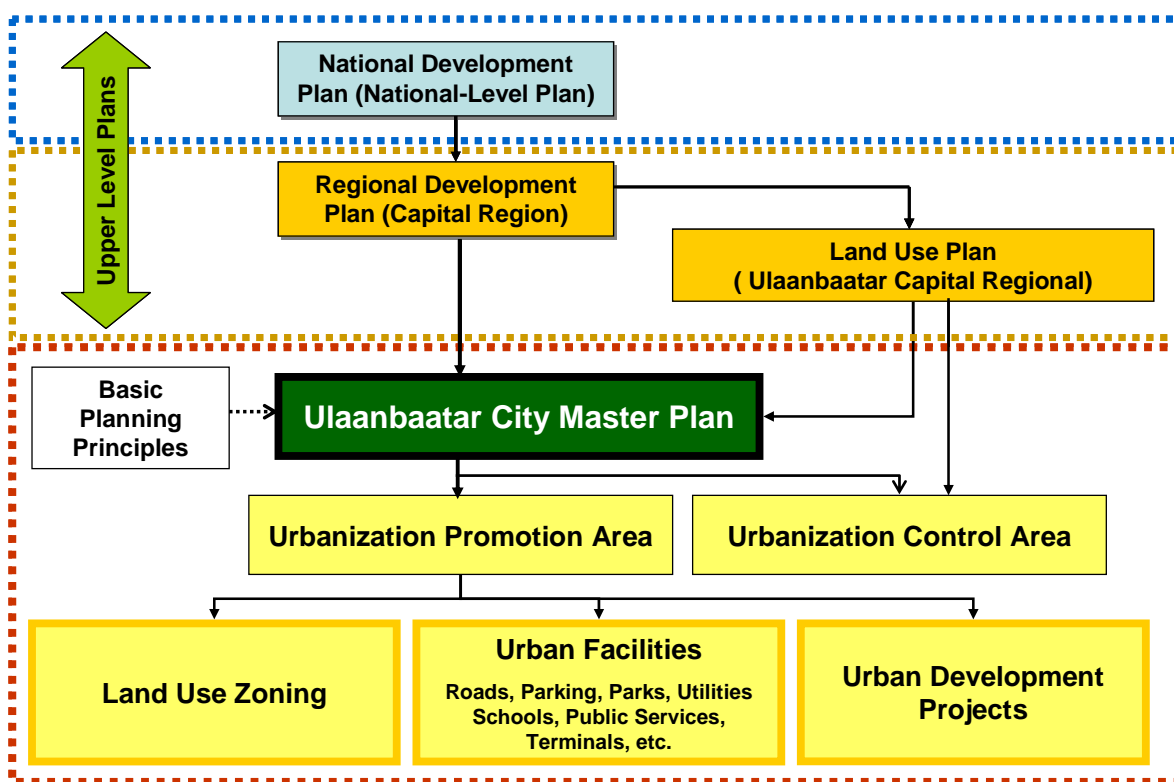
Source: JICA Study Team

Figure 5.3   Legal Framework for Land-use Management

Forest-reserved Area

Nature Park Area

Nature Conservation Area

Disaster-prone Area

Water Resource Prevention Area

Agricultural Area

Rest of the area

Urbanization Control Area (UCA):
Urban development and urban landuse are prohibited or less-prioritized

Urbanization Promotion Area (UPA)

Land Use Zoning

To be designated, based on "Urban Development Law"

Urbanization Control Area (UCA)

Urbanization Promotion Area (UPA)

Source: JICA Study Team

5.3   Overall Land Evaluation

1)   Land Suitability Analysis

The land-use potential of the area was evaluated in a rational and systematic way from three dimensions: (1) Natural conditions, (2) Infrastructure conditions, and (3) Socioeconomic conditions. The area was scored in consideration of its strengths and weaknesses in each dimension. For example, as natural conditions are considered as constraints to land utilization, theoretically scores to be given are negative. Development suitability and unsuitability of land types are explained in Table 5.1. Meanwhile, since infrastructure conditions contribute to land development, these conditions are evaluated as positive.

Based on the methodology abovementioned, the evaluation scores per dimension were superimposed on a map using geographic information system (GIS) (see Figure 5.4). The resulting map indicated the distribution of land suitable or unsuitable for urban development (see Figure 5.5). This result was used in determining whether or not an area fell under the category of urbanization promotion area.

Figure 5.4   GIS-based System for Evaluating Land Development Suitability
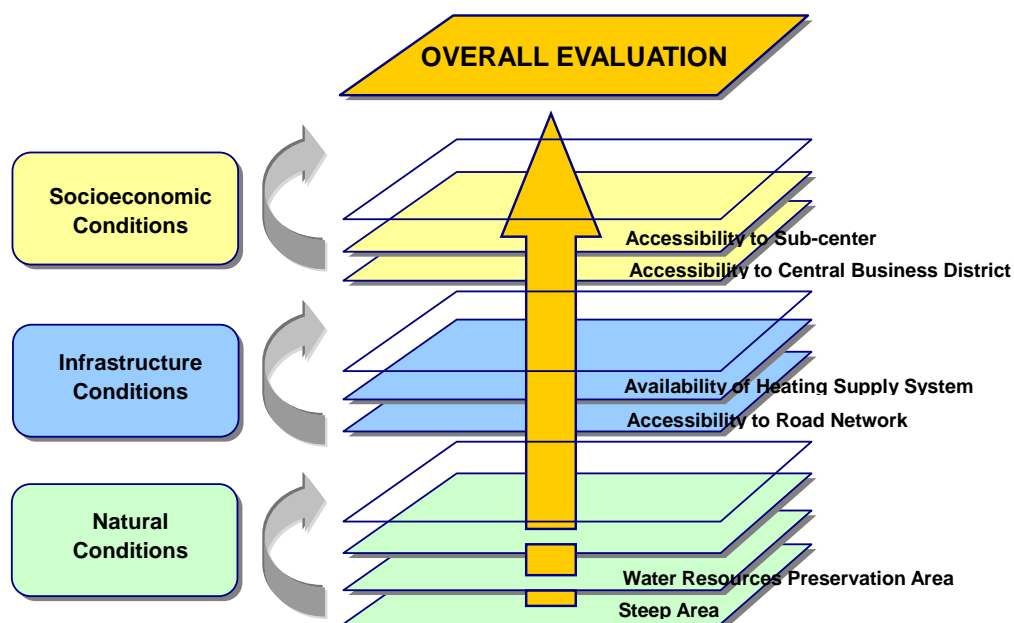
Source: JICA Study Team

Table 5.1   Development Suitability Scores of Land Types

Land Type	Score						
	- 10	**- 5**	**- 4**	**- 3**	**- 2**	**- 1**	**0**
Steep Land	More than 16°	13 - 16°	10 - 13°	7 - 10°			
Watershed	Inside Riverbed	Buffer of Riverbed					Other Areas
Water Cultivation Area	Inside						Other Areas
Groundwater Contamination-prone Area				Above Groundwater Stream		Buffer of Ground water Stream	
Natural Reserves (Legally Designated)	Inside						Other Areas
Fertile Land Suitable for Agriculture		Inside					Other Areas
Forest Land		Inside					Other Areas
Flood-prone Area		Inside					Other Areas

Source: JICA Study Team

Figure 5.5   Land Development Suitability based on Natural Conditions (UB Metropolitan Area)
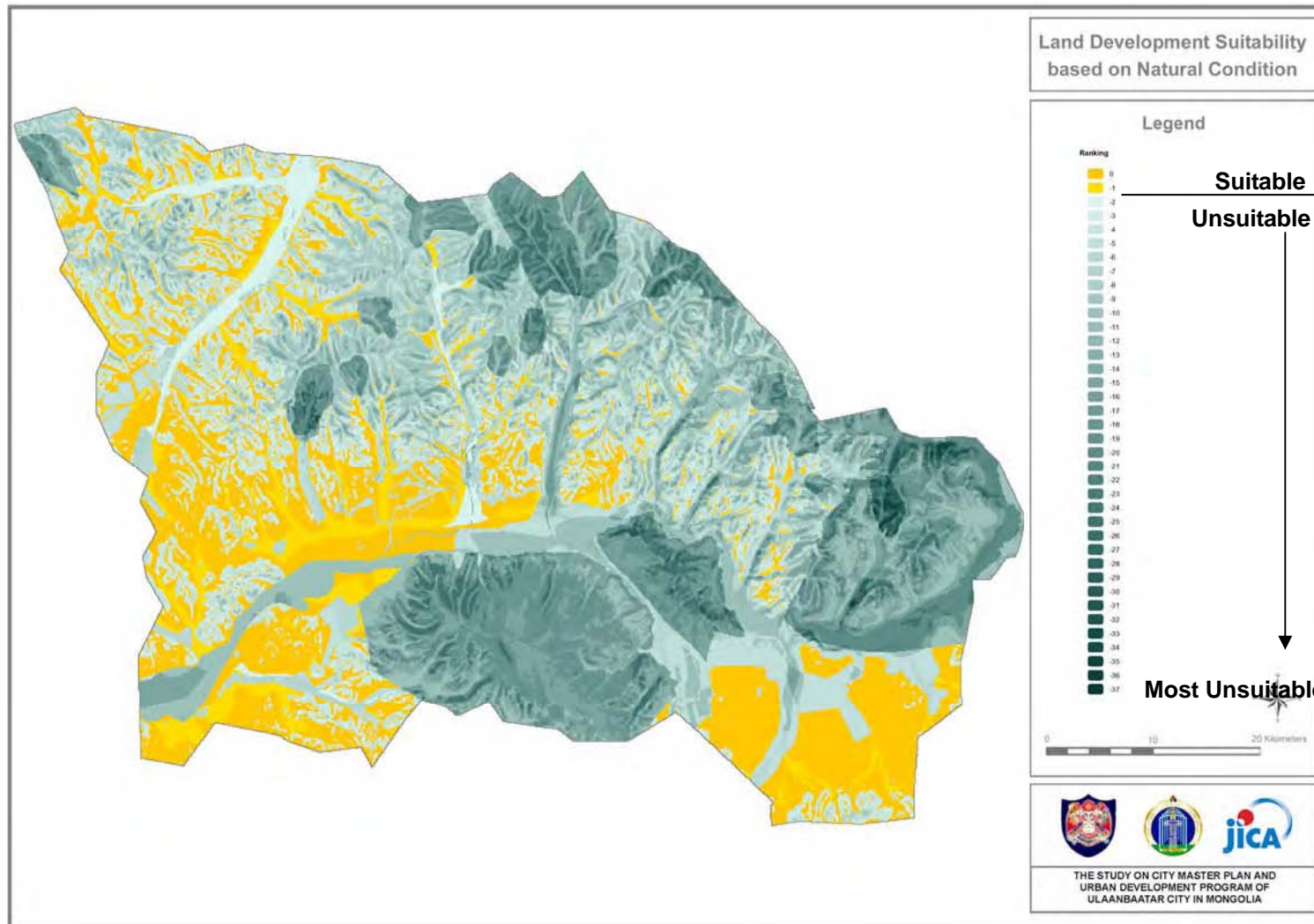
Source: JICA Study Team

2) Development Potential Based on Efficient Land Utilization

Development potential was also evaluated based on the extent of land utilization. Efficient land utilization is considered to be achieved when areas are fully utilized, taking advantage of their natural conditions as well as existing urban services and infrastructure. This contributes to minimizing environmental loss and development cost for infrastructure and public services. The analytical result is shown in Figure 5.6. In this figure, areas with higher potential are colored in darker red.

These results will be employed to determine urbanization promotion areas in consideration of the results of land development suitability and urbanization trend analyses.

5.4 Enacted and Proposed Zoning Systems

The Urban Development Law, which was recently amended in May 2008, stipulates a zoning system as shown in Box. The zonal categories are seven (7). Residential, commercial, and public land uses are combined into one zone, and no functional distinctions are recognized. This is epoch-making because it is the first enactment of a "**Zoning System**". This law, like the human being, will gradually grow and mature from now on.

However, the JICA Study Team will propose a new zoning system, which is not necessarily different from the enacted one, but can be regarded as a detailed institution under the enacted framework, applicable for Ulaanbaatar City in particular.

The zoning system aims to formulate a rational urbanization pattern allocating different urban functions in an orderly structure, taking into account the attributes and characteristics of urban areas. Therefore, it is a basic concept that a zoning system shall be applied to the designated urban promotion area, as discussed in the preceding section.

The zones within a zoning system are a controversial planning issue. In principle, there are three (3) major zones, that is *Housing*, *Commercial*, and *Industrial*. Several subzones may then be given to each major zone. Table 5.2 presents a proposal for fifteen (15) zones, of which thirteen (13) zones are sub-categorized based on the seven (7) zones stipulated in the amended Urban Development Law, and two (2) additional zone categories. The 15 zones are not necessarily too many, taking into account the complexity of urban activities in the capital city of Ulaanbaatar.

Another important proposal is the "**Special Policy-based Zoning System**", which should be associated with the zoning system. The zoning system articulates the desired land uses and/or building uses, while the special policy-based zoning system articulates special urban planning policies or measures to be taken for the designated zone. A policy-based zone can be overlaid with a land-use zone. This system aims to promote appropriate land use with special considerations such as environmental conservation, historical and cultural assets preservation, parking control, and so on, as shown in Table 5.3.

Figure 5.6   Development Potential based on Adequate Land Utilization (Ulaanbaatar City)
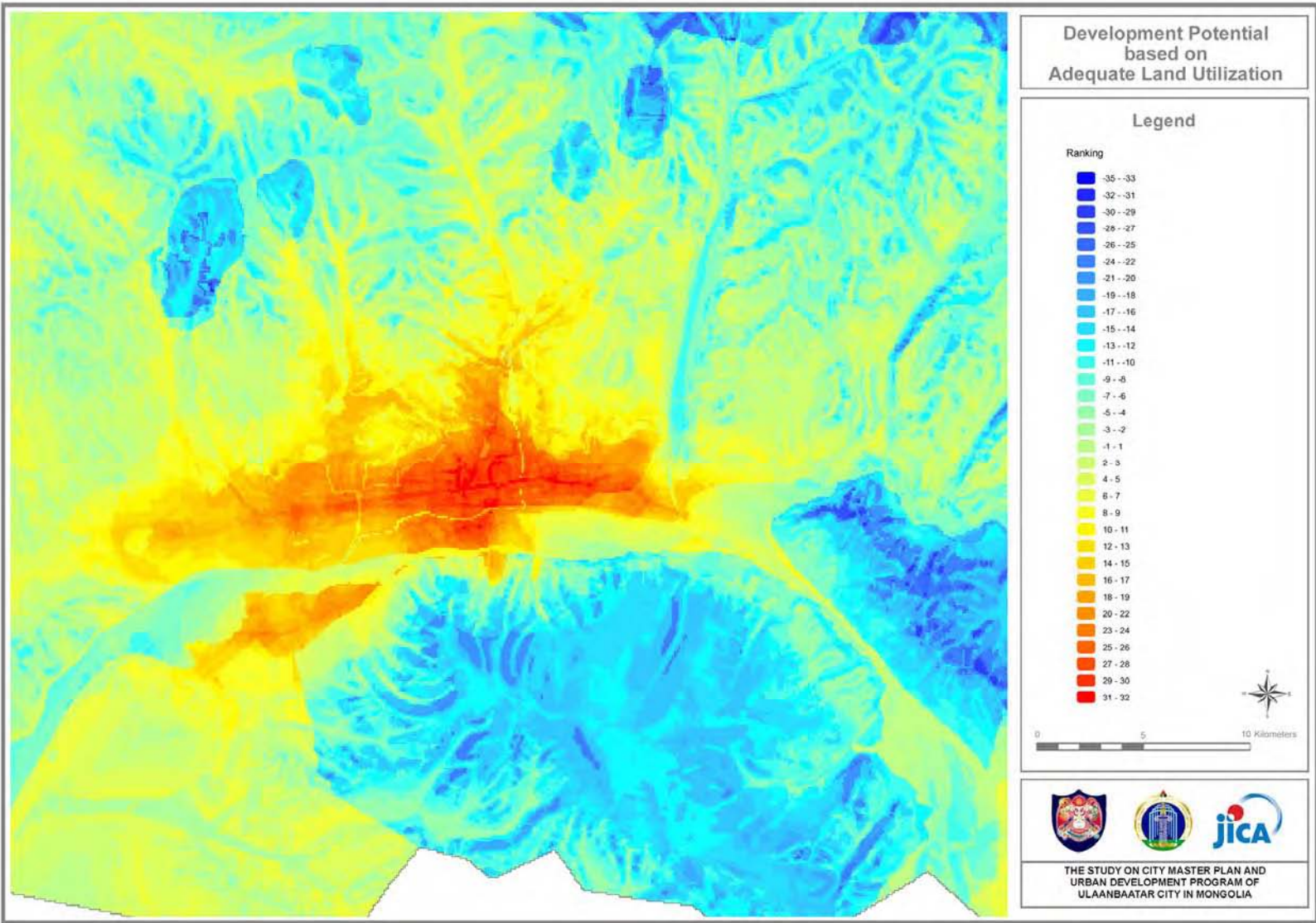
Source: JICA Study Team

Box   Newly Amended Mongolian Urban Development Law

In May 2008, the revised "Law on Urban Development" was passed by the parliament.   According to the amended Law, a Zoning System has been stipulated in Article No. 13: Zone Categories of Cities of Towns, and Article N0.14: Requirements for Territorial Zoning, as described below.

***

Article 13:   Zone Categories of Cities and Towns

13.1. Following zones of cities and towns shall be planned in accordance with the urban development norms, rules and regulations:

13.1.1. residential housing and public zone;

13.1.2. industrial zone;

13.1.3. engineering network and road and transportation zone;

13.1.4. greenery area, recreation and tourism zone;

13.1.5. agricultural zone;

13.1.6. **summer housing zone;**

13.1.7. special purpose zone.

Article 14:   Requirements for Territorial Zoning

14.1. Ensuring basic requirements to create healthy and safe requirement any residential buildings, which are planned in accordance with norms and rules relevant to the natural lighting and buildings and structures used for the purposes as training, cultural event, entertainment, science, hospital, sanatorium, recreation, sports, trade, public catering, public services, transport and communications shall be planned, but other buildings and structures, which might influence negatively in ensuring safe living environment shall be prohibited to be planned in the housing and public zones.

14.2. Buildings and structures used for the purpose of industry, public utilities and warehouses and infrastructural structures of engineering, road and transport, which ensure their activities, shall be planned in the industrial zone.

14.3. Buildings and structures of railroad, water and auto transport, air transport and engineering and supply network buildings /drinking and sewage water network, heating supply, communications and power supply network/   and structures shall be planned in the engineering network, road and transport zone.

14.4. Open spaces used for organizing recreational activities involving the public such as suburban forest area, protective strip of forest land, holiday camp, sanatorium, swimming pool, park, sports complex and solarium, strictly protected areas, natural beautiful places shall be included in the green space, recreational and tourist zone.

14.5. Land for running farming, intensified animal husbandry and territory to be used for locating agricultural-purpose buildings and structures and hay-field shall be planned in the agricultural zone.

14.6. Settlement territory without any central infrastructure that is located far from the city center and where the people are able to live temporary in the summer season shall be planned in the summer housing zone.

14.7. Buildings and structures used for civil defense and defense purposes, solid waste dumping site, and cemetery and corpse cremation except governmental reserved lands shall be planned in the special-purpose zone.

Table 5.2   Proposed Model for a Zoning System

Major Land Use	Zoning System in Amended Mongolian Urban Development Law	Proposed System	
		Zone	Vision and Objective
Residential	Residential Housing and Public Zone	Low-density and Low-rise Housing Zone	To develop housing areas with good environment and open space at low density.
		Housing & Public Mix Zone	To improve housing environment in association with a wide variety of urban services and commercial activities.
		High-density and High-rise Housing Zone	To develop intensive housing areas with mid- and high-rise housing buildings and spacious open space.
Commercial and Public		Neighborhood Commercial Zone	To activate a variety of commercial, business, and service activities for nearby communities.
		Commercial & Business Zone	To be intensively developed as pivotal commercial and business centers / sub-centers providing a variety of high-level urban services.
Industrial	Industrial Zone	Industrial and Housing Mix Zone	To accommodate a variety of small and medium-scale industrial and service activities, including manufacturing, warehouses, goods distribution facilities, workshops, etc. Land-use changes to housing areas may be allowed, given environmental improvement measures.
		Exclusive Industrial Zone	To accommodate exclusively large-scale industries and utility plants with well-functioning infrastructure to support such production activities.
Green & Recreational	Greenery Area, Recreation and Tourism Zone	Green, Open Space & Preservation Zone	To be protected from any kind of housing, commercial & industrial development. No buildings other than for public purposes are allowed.
		Park, Recreation and Tourism Zone	To be developed as parks and landscape areas for public recreation and tourism. No buildings other than for public purposes are allowed.
Others	Agricultural Zone	Agricultural Zone	To promote agricultural activities to supply city markets with fresh vegetables.
	Special-purpose Zone	Special-purpose Zone	To be designated as public graves, military-purpose facilities, and others.
	Engineering Network, Road and Transportation Zone	Utility Zone	Factories/plants for utilities and engineering facilities fall under the "Exclusive Industrial Zone."
	Summer Housing zone	Environmental Conservation Zone	To be managed within human settlements, minimizing negative impacts on the environment
	-	Water Preservation Area	To be strictly conserved for watershed protection.
	-	New Town Development Zone	To be developed as new towns driven by PPP integrated with special urban functions such higher education, knowledge-based industries, R&D, commercial and business, and recreational functions, giving full consideration to energy-saving utility systems.

Source: JICA Study Team

Table 5.3   Proposed Special Policy-based Zoning System

	Special Policy Zone	Objective and/or Target	Relevant Law/Regulation
S1	High-rise and Intensive Land-use Promotion Zone	To develop and/or redevelop CBD and sub-centers with intensive land use for business, commercial, and service functions. Within this zone, high-rise buildings over **80** meters in height are not allowed.	Building Code; Fire Protection Law
S2	Beautification Promotion Zone	To improve and revitalize historical buildings and urban amenities.	Historical and Cultural Assets Preservation Law
S3	Historical and Cultural Conservation Zone	To preserve assets and heritage for tourism development as well as citizens.	
S4	Parking Management & Control Zone	To develop parking lots/space with involving private sector participation and traffic management measures.	Traffic Management Law Building Code
S5	Airport City Development Zone	To designate the area adjacent to the New Ulaanbaatar International Airport. as the Airport City	Urban Development Law

Source: JICA Study Team

5.5   Proposed Zoning System for Ulaanbaatar City

The JICA Study Team proposes a zoning system for Ulaanbaatar City based on the legal framework of urban planning as discussed in the preceding Section 5.4.   The draft is depicted in Figure 5.7.

As summarized in Table 5.4, the area covered with this zoning system is approximately 27,680 ha in which the **Urbanization Promotion Area** (UPA) is 18,470 ha, or 66.7% of the total zoning area and the preserved area for "**Water Resource Prevention and Environmental Protection**" accounts for 9,200 ha, or 33.3%.

Meanwhile, the three (3) major zones, i.e. Residential Housing Zone, Commercial and Business Zone, and Industrial Zone, are allocated with 10,255 ha (37.1%), 2,303 ha (8.3%), and 1,990 ha (7.2%), respectively. It is noted that the zone for Greenery Area, Recreation and Tourism totals 4,316 ha, meaning the per capita green area is more or less **25 m^2** by 2030, a level which will satisfy the basic standard (20 m^2) for urban development as discussed in Table 8.1 in Chapter 8 of this Report.

This draft proposal should be further clarified with the authorities concerned and urban planners.

Some numerical indicators to regulate the physical and spatial form of buildings and facilities are popular in advanced countries in association with the zoning system. These are, for instance, floor area ratio (FAR % = total floor area/the land area), building coverage ratio (BCR % = ground floor area of the building/the land area), and maximum height of building, setback, so on.   The appropriateness of these numerical regulations on building construction should be further elaborated. For this purpose, it is recommended that a "**professional committee**" be organized at both the national and local government level to deliberate on these planning issues.

Table 5.4   Designated Areas in the Draft Zoning Map

| Major Land Use | Proposed Zoning Categories | Designated Area in Zoning Map | | | |
		Area (ha)	Share (%)	Total Area (ha)	Total Share (%)
Residential	Low-density and Low-rise Housing Zone	5,902	21.3%	10,255	37.1%
	Housing & Public Mix Zone	2,879	10.4%		
	High-density and High-rise Housing Zone	1,473	5.3%		
Commercial and Public	Neighborhood Commercial Zone	648	2.3%	2,303	8.3%
	Commercial & Business Zone	1,655	6.0%		
Industrial	Industrial and Housing Mix Zone	1,529	5.5%	1,990	7.2%
	Exclusive Industrial Zone	461	1.7%		
Green	Green, Open Space & Preservation Zone	3,645	13.2%	4,316	15.6%
	Park, Recreation and Tourism Zone	671	2.4%		
Others	Agricultural Zone	-	-	8,812	31.8%
	Special-purpose Zone	867	3.1%		
	Utility Zone	443	1.6%		
	Environmental Conservation Zone	-	-		
	Water Preservation Area	5,559	20.1%		
	New Town Development Zone	1,943	7.0%		
Total Area		27,676	100.0%	27,676	100.0%
Urbanization Promotion Area		18,472	66.7%	18,472	66.7%
Water Preservation Area and Environmentally Protected Area		9,204	33.3%	9,204	33.3%

Source: JICA Study Team

Figure 5.7   Proposed Zoning System for Ulaanbaatar City
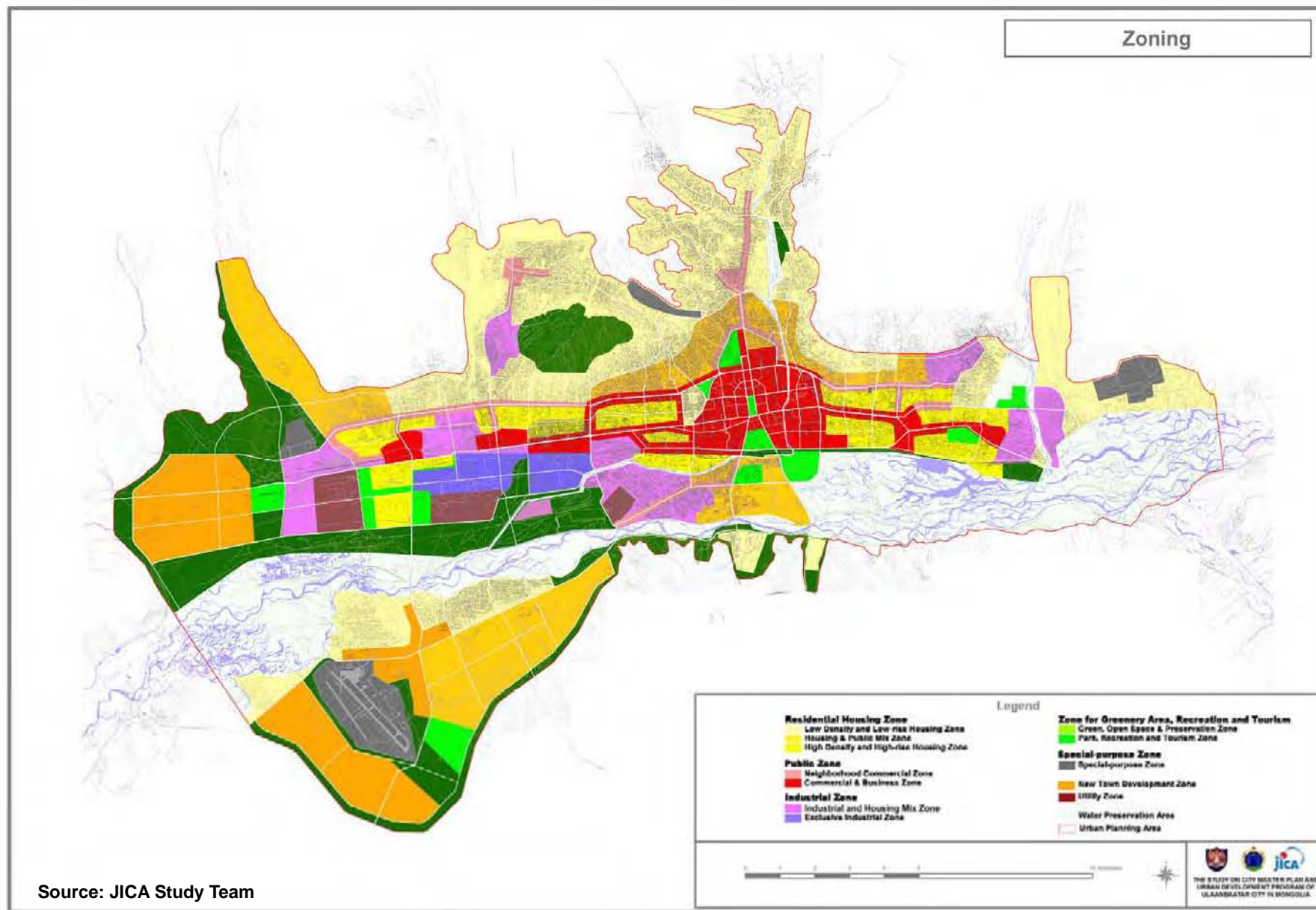
Source: JICA Study Team

5.6   Development of a Compact City

1)   Alternative Scenarios on Growth Management

Given a scenario of "***Do-Nothing***" in terms of land-use management during urbanization, urban sprawl will continue to take place in any available areas in Ulaanbaatar City.   Land occupation will be disorderly, thereby blighting the city and eroding its potentials for urban economic growth. Therefore, the ***management of urban growth*** will surely become crucial along with the growing urban economy.

Based on the same recognition as mentioned above, the UBMP-2020 proposed a controlled expanded urbanization pattern in association with the development of several new urban settlements. This approach would be appropriate given a well-functioning management system for land development and construction activities by the private sector.

Another scenario, which deserves to be pursued in revising the Master Plan, is the so-called "***Guided-growth approach***" in forming a ***Compact City***, which does not allow urban sprawl. Based on past experiences in other cities in the world, the public mass transit system will be an effective tool to guide urban development activities; so the compact city is regarded as the result of a mass-transit-led urbanization which integrates transport systems and land-use management.

2)   Urban Form of a "Compact City"

A "**Compact City**" can be defined in several ways depending on the characteristics of the city and the planning objectives. Nowadays, the compact city concept is often used as a planning approach to form an environmentally **sustainable urban system**, or an **energy-efficient urban structure** with a rapidly increasing urban population.

The first definition was made by Danzwik and Saaty (1978), which says that a compact city should have the following conditions and/or elements:

- High-dense settlements;
- Less dependence on automobiles;
- Clear boundary from surrounding areas;
- Mixed land use;
- Social equity;
- Self-sufficiency in daily life; and
- Independent governance.

In addition, the following planning issues should be addressed to materialize a compact city:

- **Quality Mass Transit Corridors:** An efficient public transportation system, comprising mass transit as backbone and effective feeder systems, is established.

- **Integrated Urban and/or Land-use Development and Revitalization of Inner City:** High-dense habitation and intensive land use for commercial and business activities

need to be promoted.

- **Efficient Supply of Social Infrastructure and Public Services:** Energy-saving/efficient and resource recycling-oriented urban systems are pursued.

- **Adequate Institutional Framework for Private Sector Investment:** Properly managed and active private sector participation in developing a compact city is essential.

Figure 5.8   From Urban Sprawl to a Compact City

Urban Sprawl   Compact City
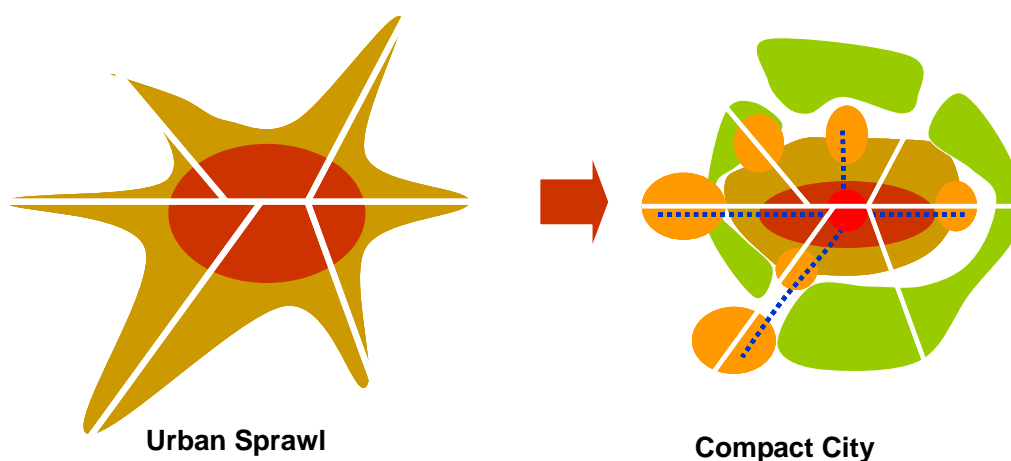
Source: JICA Study Team

3)   Urbanization Pattern under the "Compact City Scenario"

The Compact City Scenario requires smaller urbanization promotion area than that of Trend Scenario, because of higher densification of the existing urban areas and prevention of disorderly urban sprawl.

On average, the density of an existing urban area is about 60 persons/ha. The underlying issue in a compact city is how much the existing built-up area can accommodate newcomers or, in other words, how high the population density can become. Facilitation of urban redevelopment and/or renewal will be a prerequisite in pursuing the concept of a compact city.

An examination of future urbanization patterns by 2030 was made and the results are summarized in Table 5.5, presenting a comparison between Trend (Do-nothing) Scenario and Compact City Scenario in terms of population, urbanized area, and population density in four (4) categories of areas, i.e. 1) CBD; 2) Central area (within 5-km radius from the center); 3) Mid-urban area (within 10-km radius); and 4) Suburban area (beyond 10-km radius).

It is obvious from Table 5.5 that the urbanized area of the compact city will be smaller than that of the Trend Scenario, totaling about 19,300 ha for the former and about 25,000 ha for the latter by 2030. Approximately 9,000 ha will be added from the 2007 area under the Trend Scenario, compared with about 5,700 ha under the Compact City Scenario. The average population density will be 90 persons/ha for the compact city, compared with 69.4 persons/ha for the Trend Scenario.

A comparison in area distributions of population and density are as shown in Figures 5.9 and 5.10. The Compact City tends to facilitate more densification in the central area with controlling urban sprawl over sub-urban areas, therefore benefits from the Compact City will lead to more efficient transportation, higher people's mobility, more efficient infrastructure network and cost-performance and less environmental load on the entire city.

Figure 5.11 shows a geographical pattern of population distribution examined as a development framework in 2030.

Table 5.5   Comparison of Urbanization between Trend and Compact City Scenarios

|	(A) Population			(B) Urbanized Area (ha)			(C) Population Density (A/B) (persons/ha)		
	Present 2007	Trend 2030	Compact 2030	Present 2007	Trend 2030	Compact 2030	Present 2007	Trend 2030	Compact 2030
CBD	77,800	107,200	134,900	540	570	570	144.1	188.1	236.7
Central	469,100	588,100	657,400	4,490	5,690	4,800	104.5	103.4	137.0
Urban	243,200	394,800	547,800	4,300	6,130	5,950	56.6	64.4	92.1
Sub-urban	155,600	648,900	398,900	6,590	12,670	8,010	23.6	51.2	49.8
Total	**945,700**	**1,739,000**	**1,739,000**	**15,920**	**25,060**	**19,330**	**59.4**	**69.4**	**90.0**

Note: Urbanized Area for "Compact City Scenario" includes urbanized area in the outside of Urbanization Promotion Area (UPA). Total area of UPA of Zoning Map is about 18,500 ha.
Source: JICA Study Team

Figure 5.9   Comparison of Population between Trend and Compact City Scenarios
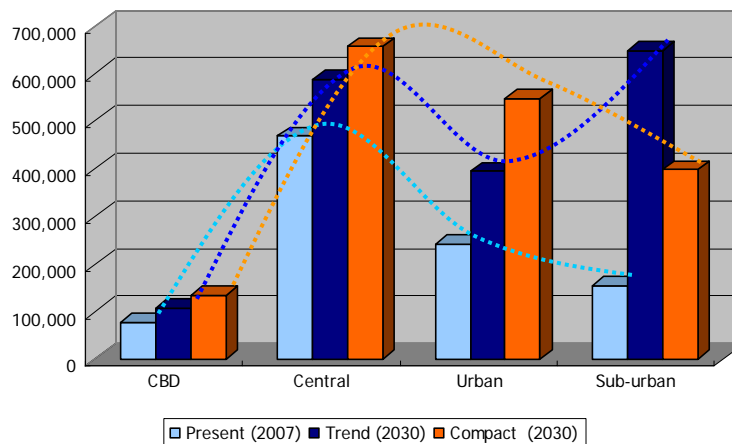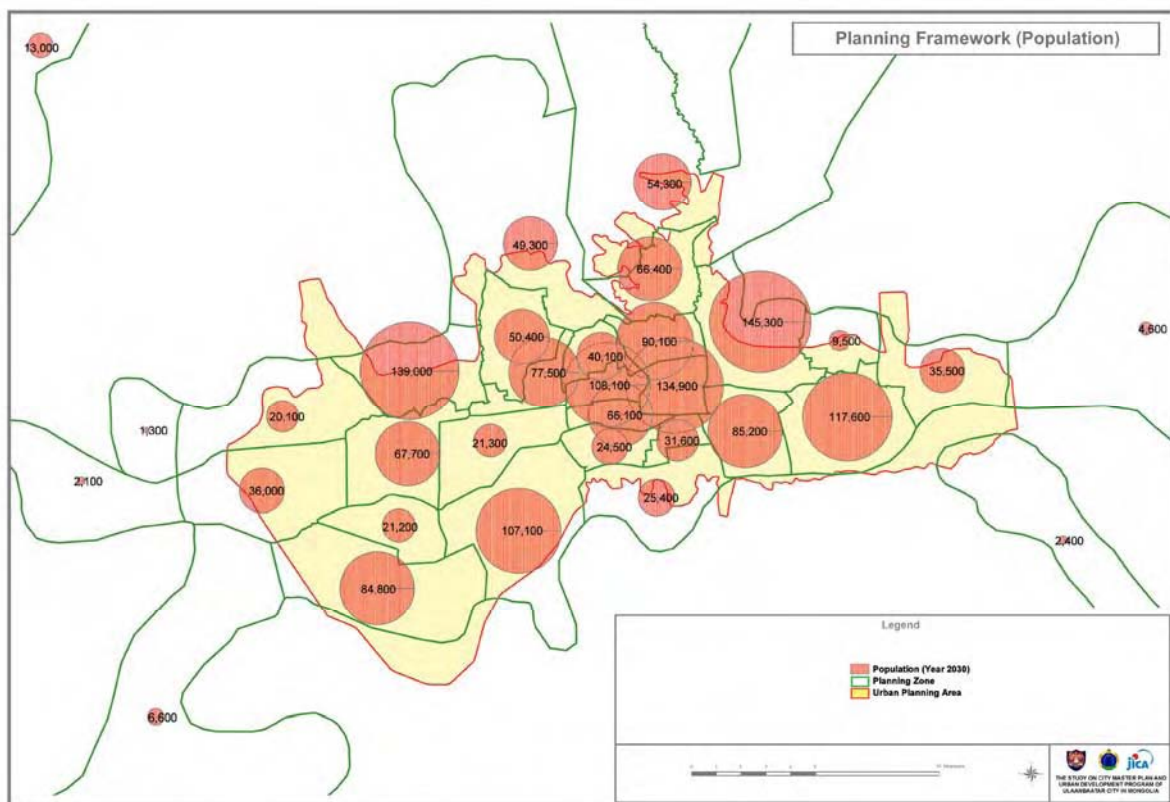

Source: JICA Study Team

Figure 5.10 Comparison of Population Density between Trend and Compact City Scenarios
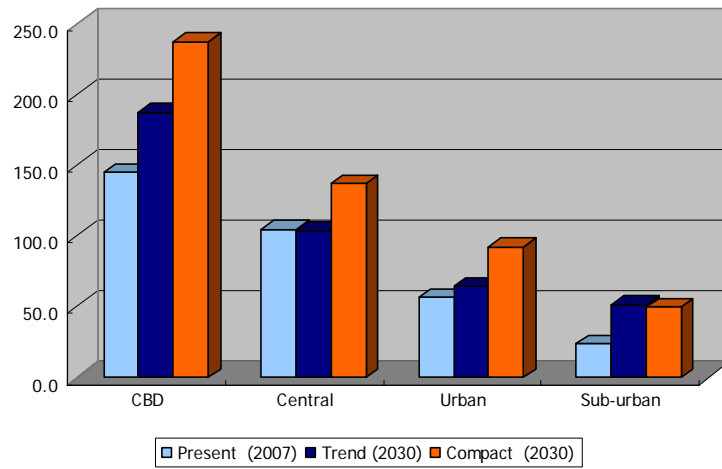
Source: JICA Study Team

**Figure 5.11   Population Distribution under a Compact City Concept by 2030**

Source: JICA Study Team

4) Urban Structure of a Compact City

A model of urban structure under the Compact City Scenario is shown in Figure 5.12. This land-use and urbanization pattern is provisional and based on several strategies and concepts, as follows:

- **Development of Unique New Towns:** Two different types of new towns will be developed, namely a "Science and Technology Town (Ulaanbaatar West)" and a "Knowledge City" to accommodate more or less 100,000 persons in new urbanization areas. These new towns will be located along two urbanization corridors, i.e. western and southwestern corridors, within a 20-km radius from the existing CBD;

- **Relocation of Higher Education Facilities Currently Located in the CBD:** The development of a "Science and Technology Town" and a "Knowledge City" will offer better places and opportunities to facilitate innovative education and academic R&D. Many universities and higher education institutions located mainly in the existing CBD will be moved to such unique new towns in suburban areas;

- **Restructuring of Existing Industrial Areas:** Existing industrial areas occupy extensive tracts of land and are inefficiently used. Environmental problems have been generated by their operation due to their proximity to the central area and the Tuul River. It can be observed that a number of factories are either not operating anymore or have poorly managed facilities. These factories and warehouses should be encouraged to relocate to the planned industrial parks or designated industrial zones. Vacated areas should be converted into a more efficient land use for housing and/or commercial uses.

- **Development of Mass Rapid Transit Systems:** Two lines of a rail-based public transportation system will be developed along the two urbanization corridors above mentioned. The first line, initially called the "Red Line," will run on Peace Avenue from the present east tram terminal and passing through the CBD to connect to the Knowledge City at a length of about 27 km.   The second line, initially called the "Blue Line," will run from the northern edge of the CBD through Peace Bridge to the proposed Science and Technology Town at a length of about 20 km.   Sections of both lines running through the CBD will be underground (approx. 5km). These new public transportation systems may be named "*Ulaanbaatar Transit System (UTS)*."

- **Redevelopment of Sub-centers Centered on Railway Stations:** Redevelopment of the surrounding areas of selected UTS stations for intensive land use should be promoted. A number of sub-centers whose development as commercial, service, and business centers will be included in the revised Master Plan. In addition, underground malls at railway stations at Sukhbaatar Square and Nomin Department will be developed to provide gathering places even under severe winter conditions in Mongolia, as illustrated on Figure 5.13.   This redevelopment will contribute to increasing the number of railway users and tourists.   Since people's mobility will not lessen even in winter, the urban economy will benefit from it.

Figure 5.12   Concept of a Compact Ulaanbaatar City

Source: JICA Study Team
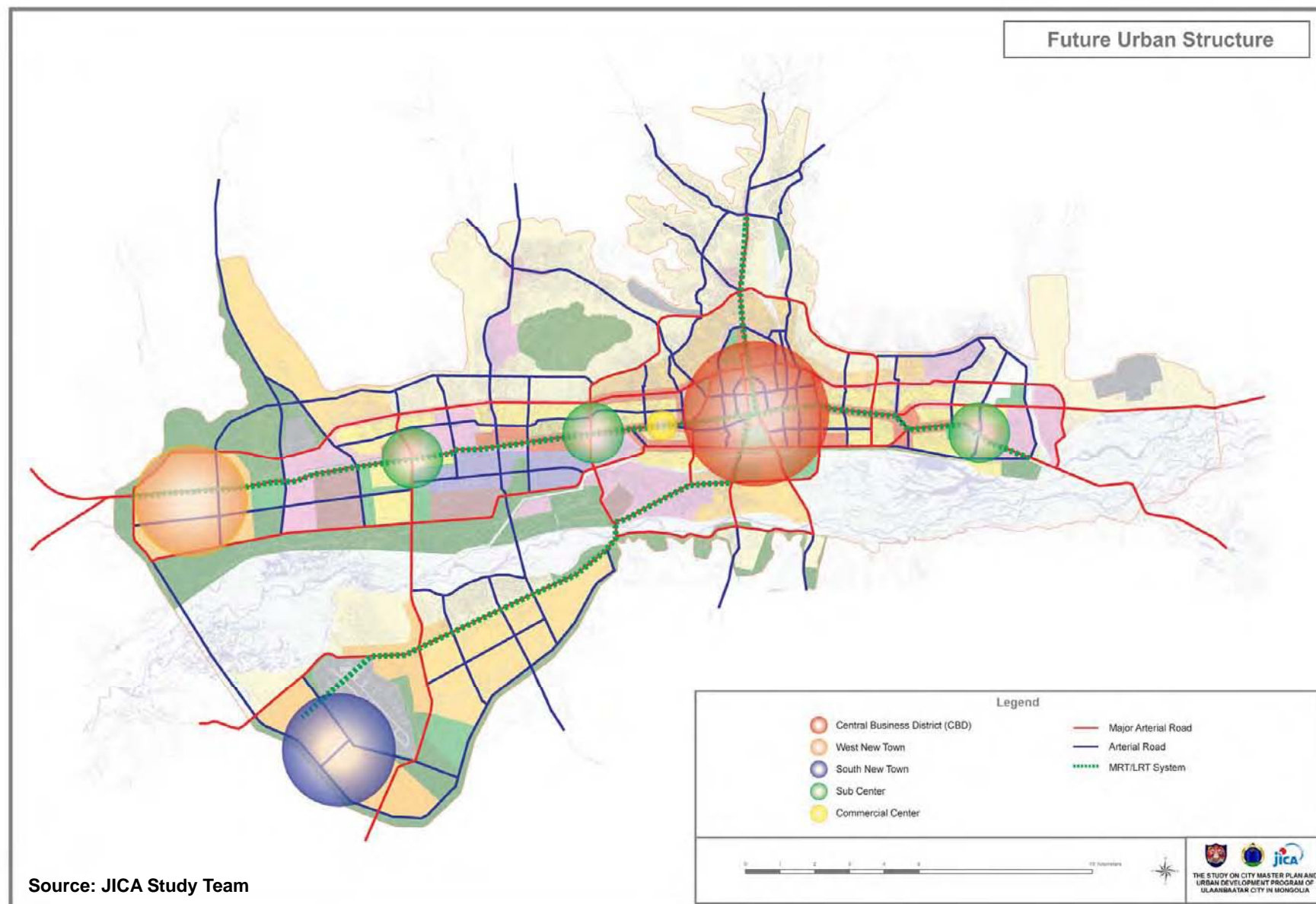
- **Restructuring and Improvement of Ger Areas/Ger Settlements:** Several measures/programs should be explored to improve Ger areas. Under a resettlement program, those who currently reside in flood-prone and hazardous areas in the northern hills should be relocated to urbanization promotion areas. A land readjustment program should also be introduced to improve community infrastructure and housing conditions. These programs need to be combined with the development of affordable social housing.

- **Protection from Floods and Landslides:** Roads on the northern hills will serve as boundaries of the urban promotion area. As such, road sections will be designed with the prevention of floods and landslides in mind.

- **Development of Green Belts:** Green belts will be developed between the existing urbanized areas and new towns. It will be integrated into a network of natural environment at the regional level.

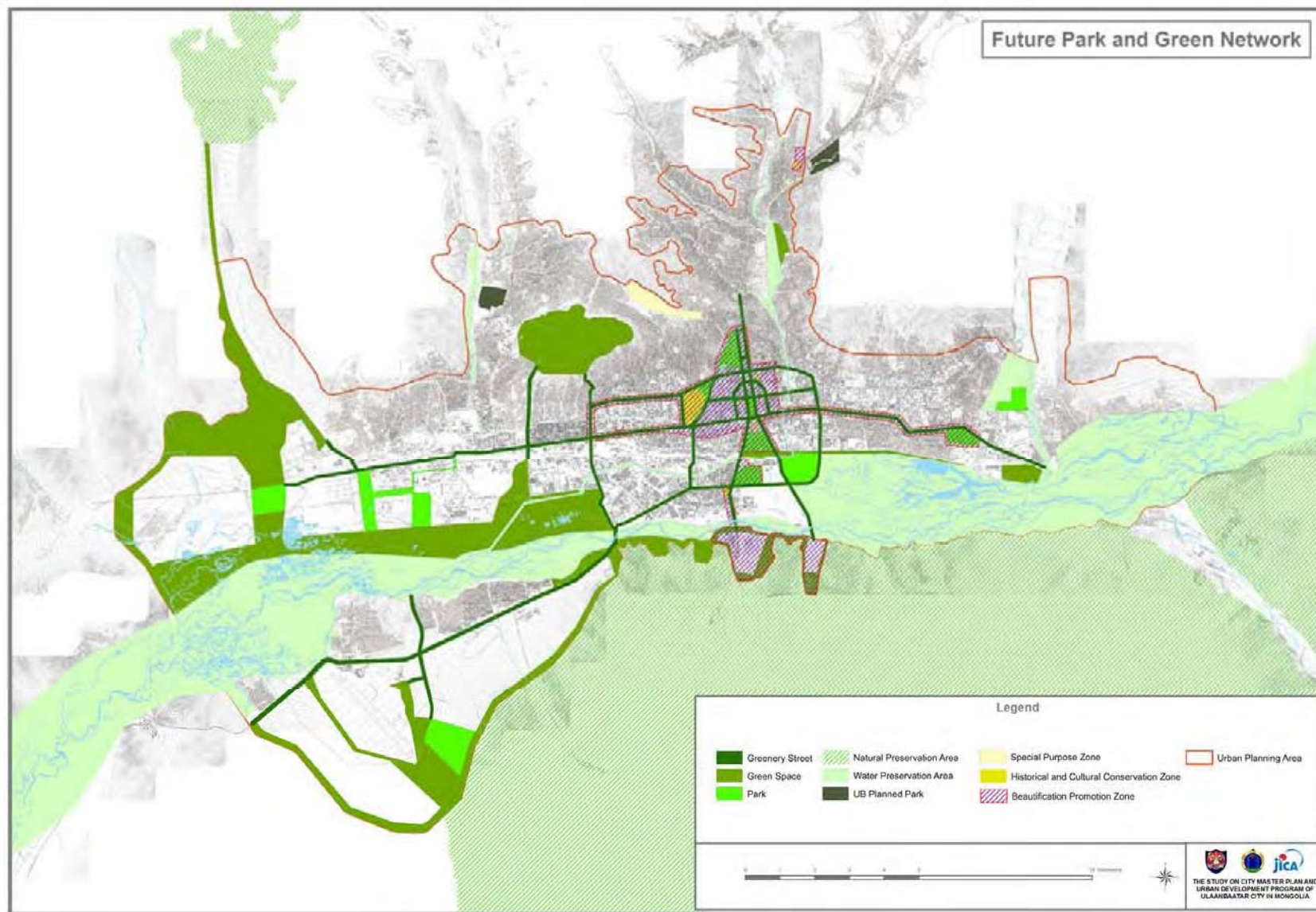**Figure 5.13   Image of Underground Malls at Railway Stations**

Source: JICA Study Team

5)   Green Network for a Compact City

Green space and parks are important elements to control the disorderly urban development expansion and to uplift urban environmental quality and livability.   Figure 5.14 shows the proposed green network to be incorporated into the structure of a compact city. Rivers, swamps, hills, open spaces, and roads/streets with greeneries will be networked to form a chain of greeneries that can function as biological corridors for insects and animals. For this purpose, design standards for greening roads/streets need to be formulated, and riverside recreational parks are also developed to conserve water resource potentials. In addition, underground reservoirs are recommendable to reserve rain water and to effectively supply water for planting in street greening, pocket parks, etc.

Figure 5.14   Proposed Green Network in Ulaanbaatar City

Source: JICA Study Team