



**The Capital City's  
Governor's Office**

## **“CITIZENS’ PARTICIPATION - TOMORROW’S CITY”**

*Deliberative Polling*

**Ulaanbaatar  
2015**



Dear Citizen of Ulaanbaatar,

I am writing to you to ask for your support with some very important decisions regarding the future of your city. As you know, Ulaanbaatar is facing many different challenges relating to transportation; infrastructure, housing and environment. At the same time, there are also opportunities for Ulaanbaatar to improve its business environment; become a greener city and enhance its tourist and recreational facilities. To address these challenges and seize these opportunities, the Ulaanbaatar City Municipality is planning to undertake 14 different projects over the coming years. However, as these projects will impact your city, the Ulaanbaatar City Municipality wants to consult with you as a citizen of Ulaanbaatar to help us prioritize which projects are the most important ones for the future of Ulaanbaatar as a sustainable, inclusive and green city.

Therefore on Saturday, December 12 and Sunday, December 13, 2015 the Ulaanbaatar City Municipality is organizing a deliberative poll at Government House. During the deliberative poll, 400 citizens of Ulaanbaatar selected from a random sample will be convening to discuss the 14 different projects that the City is planning to implement over the coming years. Citizens will meet in small groups for discussion facilitated by a moderator to review the projects, express their views on them and identify key questions that they have in relation to the projects. These questions will be put forward to a panel of City Municipality policy makers, staff and other experts, who will seek to provide an answer to your questions. After that you will be interviewed separately, to obtain your individual views on the importance, feasibility and priority of projects, which will help us in our long term strategic planning for Ulaanbaatar as a city. In order for the deliberative poll to be a success, you will be required to attend on both December 12 and 13.

In order to be able to participate in discussions and form a view on the projects, it is crucial that you familiarize yourself beforehand with them by reading these briefing documents very carefully and if you wish to make notes on them. On the day itself, these briefing documents will form the basis of the discussions of Government house.

I understand that giving up time to read these briefing documents and to participate in the deliberative poll over a weekend is a significant commitment of your time and as the Ulaanbaatar City Municipality we are highly appreciative of your preparation and participation in the deliberative poll this upcoming Saturday and Sunday. We will listen carefully to your views and your opinions will guide our decision-making regarding the planning and implementation of the 14 selected projects.

Again let me thank you for agreeing to participate. I look forward to seeing you at Government House on December 12 and 13!

Mr. Bat-Uul Erdene

Capital City Governor and Mayor of Ulaanbaatar

## **This is What Happens at a Deliberative Poll**

You are one of 400 citizens of Ulaanbaatar from all walks of life who have been invited to participate in Mongolia's first ever deliberative poll which is to be held in Ulaanbaatar on **December 12-13, 2015 at Government House**. The deliberative poll is being conducted by the Ulaanbaatar City Municipality with the support of The Asia Foundation and the technical assistance of the Center for Deliberative Democracy of Stanford University in the United States and made possible through the generous funding of the Government of Australia.

The Ulaanbaatar City Municipality has initiated this deliberative polling process to consult with its citizens on issues critical to its development. Specifically the city has asked the citizens gathered to deliberate on the appropriate prioritization of major infrastructure projects being considered by the city. As these projects are likely to impact your daily lives, it is important for the city administration to hear your thoughts and opinions after you have had the chance to learn, think, and talk about the issues relating to Ulaanbaatar's future as a sustainable and inclusive city. We believe you'll find the experience, interesting, worthwhile and enjoyable and your contribution will be important for the future development of your city.

You may not think on a daily basis about the issues that these projects are seeking to address such as lack of housing, strains on water and the environment and logistics, and you may not think of yourself as an expert on these issues; but we are not looking for experts. What's important to us is that you are a representative member of the public. We are interested to hear about your values, opinions and experiences.

You were selected as a member of a random sample chosen to represent all citizens of Ulaanbaatar. Collectively, the sample's opinions will provide a reasonable prediction of what citizens of Ulaanbaatar as a whole would say if it were possible to invite the entire city to the event on December 12-13.

The deliberative polling process allows you to gather information, discuss the options with fellow citizens in small groups, meet with the whole sample to ask questions of different city policy makers, staff and external experts with diverse viewpoints, and then give back your considered opinions through individual interviews on regarding which projects should be prioritized. The small groups and the sessions with the policy makers, experts and staff are led by moderators, who have been trained to be neutral, keep the process moving and punctual, and to see that everyone gets a chance to participate.

There are no right or wrong questions or answers. Different choices have advantages and disadvantages. You may come to favor some options, other participants may favor others. We seek no group decision or consensus; we only want to know what you individually think after discussing and considering these issues.

During day 1 (December 12), there will be two rounds of small group and plenary discussions. During day 2 (December 13), there will be one round of small group and plenary discussions. After lunch on the second day, interviewers will be interviewing you individually to obtain your views and opinions. While people are being interviewed, for those that have to wait entertainment will be provided in the plenary room of the Government house. **Your full attendance for both days will be required.**

We look forward to seeing you at the Government house on December 12 and 13, 2015.

### **IMPORTANT NOTICE:**

- 1. Please bring your invitation, identity card, badge and briefing materials and follow the instructions on the invitation.**
- 2. Upon arrival at the Government house, please register and follow the instructions to find the group that you are assigned based on the number of your badge**

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## **Executive Summary for Deliberative Polling Briefing Materials**

The city of Ulaanbaatar has initiated this deliberative polling process to consult with its citizens on issues critical to its development. Specifically the city has asked the citizens gathered to deliberate on the appropriate prioritization of major infrastructure projects being considered by the city. There are a large number of challenges being faced by Ulaanbaatar caused by rapid urbanization. A lack of housing, strains on water and the environment, traffic congestion and the need to create jobs just to name a few. The Ulaanbaatar Masterplan lays out a vision for how the city might manage its growth going forward to overcome these challenges, and develop into a prosperous city that can offer a high quality of life to its citizens. While the masterplan lays out strategies to manage the cities continued growth and development, many of the ideas for infrastructure included in that plan will be expensive and time consuming. While all projects are important and offer great advantages to the city, some prioritization will be needed in deciding where to focus the city's limited human and financial resources.

Prioritization is only becoming more critical as an issue given the increasingly challenging fiscal situation that both the country and city are facing. The scale of the projects being considered mean that most projects to be discussed will affect almost all citizens of Ulaanbaatar broadly. When making major decisions such as where to invest limited resources, the city government recognizes that it is critical both to consider technical analysis in decision making, but also to make sure the values and expectations of citizens are considered. Deliberative polling is a method that will allow the city to consult citizens, but to do so in a thoughtful way. The materials presented in this packet give good information about each project to be discussed and prioritized. These materials should help raise the quality of citizen deliberation that will have during the two day event on December 12-13, 2015.

The briefing materials in this booklet include three overview briefings that introduce the main challenges facing the city, the overall focus of the Ulaanbaatar Masterplan, and finally a quick review of the city's finances. The materials then walk through the specific projects to be considered during this deliberative polling process. The criteria for selected projects to deliberate on generated by the city included three main factors. First the list is of projects introduced in the approved master plan. Second the projects are all significant enough that they will impact a large population within the city and UB as a whole. Third the projects selected for selection will most likely all need the city to take on debt to execute the plans.

Applying these criteria the city has selected 14 projects for discussion at the deliberative polling event. These projects are presented in the table below which groups the briefing materials including in this packet according sectoral groupings. These same groupings will be used to break apart the discussion of projects at the actual deliberative polling event into 4 sessions.

Briefing Materials Included In This Document				
Briefing Number	Briefing Name	Estimated Project Cost	Estimated Project Completion Time	Page #
<b>Session I – Overview Briefing Materials</b>				
	Ulaanbaatar's Challenges	N/A	N/A	3
	Ulaanbaatar's Masterplan	N/A	N/A	6
	Ulaanbaatar's Finances	N/A	N/A	9
<b>Session II – Projects Related to Economic Growth and Industry</b>				
	Construction Material Production and Technology Park Project	135 billion MNT	5 years	14
	Mongol Naadam Complex	190 billion MNT	25 years	17
	Project to Build a Freight Transport Logistics Center to the East of Ulaanbaatar City	293 billion MNT	6 years	20
	Light Industry Manufacturing and Technology Park Project	421 billion MNT	3 years	23
<b>Session III – Projects Related to Water and Environmental Protection</b>				
	Construction Work for Renovation and Improvement of Tuul and Selbe Rivers Basins	2,300 billion MNT	15 years	27
	Tuul River Water Reservoir – Dam Complex	552 billion MNT	4 years	30
	Project to Supply Ulaanbaatar with Petroleum Gas	300 billion MNT	5 years	33
	Project to Build an Ecological Corridor	6 billion MNT	6 years	36
	Eco-Recycling Park Project	800 billion MNT	5 years	38
<b>Session IV – Projects Related to Transportation and Upgrading of Buildings</b>				
	Teardown and Replanning of Old Buildings in Baga Toiruu Area	2,233 billion MNT	15 years	42
	School and Kindergarten Building Insulation and Heating Technology Renovation Project	60 billion MNT	5 years	45
	Tuul Highway Project	634 billion MNT	2-3 years	49
	Project to Reduce Heat Loss of Prefabricated Panel Buildings	807 billion MNT	10-15 years	51
	Ulaanbaatar Metro Project	2,985 billion MNT	6 years	55

# SESSION I – OVERVIEW BRIEFING MATERIALS

## BACKGROUND MATERIAL: ULAANBAATAR OVERVIEW

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### BACKGROUND:

Ulaanbaatar Capital Region comprises Ulaanbaatar City and a number of regional towns. It is the cultural, political and economic capital of the country. The population of the Ulaanbaatar Capital Region has grown substantially in recent years as the result of migration from people from other aimags within Mongolia, significantly increasing the proportion of the Mongolian population residing in Ulaanbaatar. As Mongolia had made the transition to a democracy with a market based economy, several factors including removal of restrictions on movement, dzuds, growth of economic opportunities in Ulaanbaatar, infrastructure challenges in many areas, etc. all have contributed to a process of rapid urbanization focused on Ulaanbaatar. In 1989 26.8 percent of Mongolia's population lived in Ulaanbaatar; by 2006 that number had risen to 38.1 percent, and by the 2014 census, 45 percent of Mongolia's population was living in Ulaanbaatar, with a total population of approximately 1.3 million. This trend is projected to continue, by 2030 the capital region population is expected to reach 1,750,000 and form more than 50% of the population of Mongolia. Growth has been focused on Ulaanbaatar city, resulting in a number of challenges for the city, as well as opportunities as the city grows and develops.

This influx of Mongolians to Ulaanbaatar has resulted in more than half of the city's area consisting of unplanned settlements, the ger areas, which house approximately half of the city's population. Dealing with the ramifications of such large settlements in unplanned locations and planning to effectively deliver services to all the city's residents is a significant challenge, especially because of the low density of the ger areas as well as the extreme cold, both which increase the costs related to extending public services. Beyond the ger areas, Ulaanbaatar has also seen an increase in wealth caused by the transition to a market economy and rapid growth for a number of years driven by mining activities across the country. Ulaanbaatar is a rapidly modernizing city, with new construction and new growth, new economic opportunities and dynamic changes in the skyline of the city have been easy to notice in recent years. The increasing population, maturing private sector markets, and more democratic governance create many opportunities for the city even as the challenges of urbanization and rapid expansion of the population must be recognized.

The growth and dynamism of the city and the opportunities that this creates, both for Ulaanbaatar to grow as a tourist destination, regional leader, and a more impressive symbol of Mongolia's growth is clear. Investment and focus on enhancing Ulaanbaatar for residents and visitors, must manage a number of clear challenges that are emerging due to the rapid urbanization that has been taking place. Some of the most critical challenges are listed here below.

### KEY CHALLENGES

Managing Ulaanbaatar's growth is crucial to the future living environment of the city. In recent years some of the most critical challenges that either have emerged or have been recognized for the near future that the city government must respond to include:

1. **Air pollution** – Air pollution during the winters in Ulaanbaatar is a problem of critical importance for the city. Causes of pollution include the coal burning power plants in the city, pollution caused by traffic on the roads, a significant amount of dust from unpaved roads, and most critically the burning of coal and wood in the ger area homes for heating. The table below shows roughly the percentage of the pollution being generated by these sources:

### Main Source of Key Air Pollutants

Major Sources	Air Pollutants ('000 t/year)			
	SO <sub>2</sub>	PM10	CO <sub>2</sub>	NO <sub>x</sub>
Combined Heat and Power Stations	13.28	14.11	50.82	13.48
Heat Only Boilers	1.68	2.94	5.71	0.36
Ger areas	4.68	3.65	151.13	2.01
Paved roads	0.20	0.20	32.00	5.11
Unpaved roads	0.07	0.07	10.48	1.67
Dry soil dust	-	9.27	-	-
<b>Total</b>	<b>19.91</b>	<b>30.24</b>	<b>250.14</b>	<b>22.64</b>

Source: Air Quality Agency of Ulaanbaatar, 2013

2. **Soil pollution** – The quality of soil in and around Ulaanbaatar is increasingly under strain given the pressures of rapid urbanization. The use of pit latrines in the ger areas are one cause, but various factories as well as ineffective disposal of solid waste are all contributing to this problem. This challenge can affect public health, cleanliness of groundwater sources, and the potential uses of land for agriculture in certain areas.
3. **Water supply and pollution** - Ulaanbaatar has, for most of its history, had an abundance of water resources. Water from the Tuul and Selbe rivers, and underground springs and reservoirs have provided the water for the population. All of Ulaanbaatar's drinking water comes from groundwater aquifers and river water, so the protection of these natural resources is critical. However the supply of water is threatened by problems with pollution as well as the facilities needed to protect water resources and treat waste are being strained. Soil pollution is affecting some underground resources, waste from factories and tanneries is affecting the river water quality, and the water treatment plant serving Ulaanbaatar is now under capacity for the needs of such a large city.
4. **Energy supply** – Ulaanbaatar is still mostly powered by 4 power plants constructed during socialist times. These facilities are now being strained to meet the city's needs and are in need of updating and renovation. Some estimates suggest that the city's current power supply will be unable to meet demand by 2017-2018 without further investment in the city. Plans for a new power plant and other energy investments are moving forward to mitigate this challenge.
5. **Congestion and transportation** – With the significant increase in population, Ulaanbaatar has also seen a rapid increase in the number of people who are moving about the city on any given day. This has led to both a strain on the available public transportation and transportation infrastructure, as well as a massive increase in the number of cars on the road. The current road network was planned in 1979 for a population with approximately 10,000 cars, by 2010 there were at least 67,000 registered cars in Ulaanbaatar with many more actually in the city. Road infrastructure is also limited, with many roads in the ger areas remaining unpaved, and even major boulevards being insufficient in size to meet the current traffic demand. Public transportation was also not modernized for many years, and the process of improving the efficiency of the system and providing enough supply of transportation to meet demand are ongoing.
6. **Housing Supply** – As of 2010, approximately 40% of residents were living in apartment buildings, meaning that the gap in housing supply was significant given the rapid growth of the population. Responding to many of the other challenges listed here, such as reducing pollution of the air and soil, improving transportation readiness and others will be dependent



on providing housing to allow more families to move into more dense and modern apartment blocks. Efforts from the private and public sector will be needed to close this gap in the demand for housing, especially low cost housing, and the supply.

7. **Disaster preparedness** – Ulaanbaatar is prone to harsh winters, flooding and has the potential to be affected by earthquakes. Disaster preparedness and resilience are limited by the outdated infrastructure that exists in many places. Flood management facilities like dams and reservoirs need updating, and earthquake readiness is limited in many of the older buildings throughout the cities. Construction of new facilities will need to be complimented by retrofitting efforts to improve the city's disaster preparedness.

## **BACKGROUND MATERIAL: THE ULAANBAATAR 2020 MASTERPLAN AND DEVELOPMENT APPROACHES FOR 2030**

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### **BACKGROUND AND CORE STRATEGY:**

The Ulaanbaatar 2020 Comprehensive Plan and Development Approach for 2030 were approved through a resolution passed in the Great Khural in February, 2013. As an official document of the Great Khural, this plan is to be implemented by the Government and will guide many decisions on legislation, policies, fundraising and approaches. This Master Plan provides a number of broad approaches to developing the city, as well as some specific projects that the government will seek to undertake. The Master Plan does not specifically prioritize within these projects and strategies, but it does offer a vision and some broad strategic priorities to help guide government decisions. The vision and priorities guide the thinking on how Ulaanbaatar should develop through 2030. The vision provided in the Master Plan is that:

*Ulaanbaatar will be the capital city of Mongolia that respects the Nomadic Heritage which has endured many centuries, values its people, embraces its geographical characteristics, is environmentally friendly, has industries and economy that are globally competitive, and technologically advanced, and is a smart city with a unique Mongolian character.*

For the 2020 Master Plan, in order to make progress towards the vision for the city, the plan defines the following six priorities for focused efforts in the coming years:

1. Ulaanbaatar will be a safe, healthy and green city that is resilient to climate change.
2. Ulaanbaatar will provide a livable environment for its residents through appropriate land use planning, infrastructure, and housing.
3. Ulaanbaatar will be a city with good governance and a developed legal environment that serves the general public and private sector.
4. Ulaanbaatar will encourage the further development of settlements, towns and satellite cities outside the city center.
5. Ulaanbaatar will be one of Asia's tourist destination cities.
6. Ulaanbaatar will have an internationally competitive business center and be developed as world-standard capital city.

### **OVERALL APPROACH AND DETAILS ON THE SEVEN STRATEGIES**

Managing Ulaanbaatar's growth is crucial to the future living environment of the city. The Masterplan tries to shift strategies. In the past growth has been focused on Ulaanbaatar City, going forward the plan tries to shift that focus towards developing satellite cities around Ulaanbaatar through a policy of equal development of Ulaanbaatar City and its surrounding satellite cities. An urban growth boundary will be used to achieve a somewhat more compact Ulaanbaatar City while targeted growth will be supported beyond the city boundary in the expansion of existing towns and development of new satellite cities within the Capital Region. The goal is to quadruple the population of these surrounding towns and cities to more than 350,000 people. This will require an emphasis in investing in housing, services and economic opportunities in these cities as well as a greater focus on transportation within the region.

The broader changes to the Capital City Region will be complimented with plans for Ulaanbaatar City itself. There will be efforts to transition from a city with a single center for services, commerce and political activity to a city with multiple centers. This will decongest the city, and allow for greater quality of life and convenience for residents. Achieving this vision within the city will require investments in housing, transportation, socio-economic and hard infrastructure to be successful.

Further details on the 7 main strategies within the masterplan are included here below:

1. **Mitigate the centralized settlements by administrative units restructuring:** The Masterplan calls for ten regional towns and 3 satellite cities in total. Investments made to spur on growth in each town will focus on identifying a specialized agricultural, manufacturing, industrial or logistics focus. The three satellite cities to be developed will be Baganuur, Bagakhangai, and Aerocity. To both limit urban expansion as well as add to environmental protection efforts and the overall livability of the city, the Masterplan also proposes to create a greenbelt around Ulaanbaatar. This will also help in disaster management efforts (related to flooding), protection of drinking water sources, and maintaining opportunities for recreation (summer and tourist camps) and small scale agriculture.

Within central Ulaanbaatar these regional efforts will be matched with initiatives to reduce concentration and congestion. Efforts again will focus on decongestion and deconcentration, aiming to move Ulaanbaatar from having one city center where most activities and services are focused, to a structure with six new sub-city centers. These six district centers will encompass district level government services, retail centers, as well as apartment complexes.

2. **Improve the City's administration of the planning system by introducing land-use zoning codes:** These efforts will require an introduction of a land use zoning system in Ulaanbaatar that will include 7 zones: residential, commercial, industrial, open space, mixed use, engineering infrastructure and special purpose. City zoning will provide a critical tool for controlling new development in the city. This will be complimented by more local planning processes within the city. District centers (khoroolol) will be divided into a planning unit and will have a public center as well. Finally local community centers will be developed in an even more decentralized format to provide everyday services within walking distance of residential neighborhoods.

3. **Improve and extend the road and public transportation network:** A critical component of the Masterplan is investment in regional transportation. This will involve major national government projects such as the construction of a new international airport, along with investments planned and led by Ulaanbaatar. Plans include a 170km rail line that goes around downtown Ulaanbaatar, improved road networks to the new towns and satellite cities, and the creation of several logistics centers to allow for the flows of goods to be more efficient and safe.

There will also be significant investment in transportation within central Ulaanbaatar city, allowing for restructuring within the city. The Masterplan proposes investments in improving the road network, a new highway to allow traffic to bypass the city center, and investments in public transportation. Public transportation investments will include a Bus Rapid Transit (BRT) system and other potential improvements such as a metro, in addition to improving the existing bus system.

4. **Improve the existing condition of the socio-economic infrastructure:** Recognized as critical to the city's development, the Masterplan proposes to invest heavily in increasing the number of school seats, kindergarten seats and hospital beds. The table below shows the targets set:

5.

Items	2010 (Existing)	2020 (Planned)	2030 (Planned)
Secondary School Seats	179,693	306,811	344,612
Kindergarten Openings	46,552	153,405	172,306
Hospital Beds	1,776	13,806	15,868

Additional efforts will also include investments in recreational facilities. Significant investment is also envisioned for cinema seats, museum area and capacity, expansion of the cultural palace, and expansion of sport complexes.

6. **Re-develop the ger areas in stages, incorporating new apartment complexes and continued development of apartment areas:** A critical focus for investment described in the Masterplan is the investment in housing, and increasing the percentage of the city's population living in apartment buildings. Significant investment in building new neighborhoods (khoroolol) that link new housing to social infrastructure like schools and hospitals, as well as commercial and recreation spaces are core components of the plan. The goal is to have 70% of households living in apartment buildings by 2030, this is illustrated in the table below.

Indicators	2010 (Existing)			2020 (Planned)			2030 (Planned)		
	Household	Population	%	Household	Population	%	Household	Population	%
Total Households	266,457	1,051,564	100	333,900	1,235,500	100	388,900	1,400,000	100
Total Households Living in Apartments	116,067	438,650	42	195,300	722,600	59	280,249	980,872	70

A significant effort within the drive to increase modern housing available in Ulaanbaatar includes a process of Ger Area Redevelopment. Reducing the percentage of citizens living in the ger areas going forward will be critical to reducing air pollution and extending public services to all citizens. The plan will be to develop high-rise and mid-rise apartments in in the centrally located ger areas. For mid-tier ger areas the goal will be to develop mid to low-rise apartment buildings. Finally in the fringe ger areas the ambition will be to build low rise developments and detached houses with individual utility connections. Centrally located and mid-tier developments will be linked to the central utility network, while the fringe areas will need to develop self-sustaining utilities. The main principles of this process will be to make every step of the redevelopment efforts participatory. Citizens and communities will lead this process, as success will require effective cooperation and shared investment between the city government, the private sector, and private citizens.

7. **Improve the basic infrastructure such as utilities and telecommunications:** Increasing demand on the existing heat, electricity, potable water and sewage systems all will require attention. Given population projections the Masterplan anticipates investments in high-speed fiber optic network for telecommunications, infrastructure for flood management, upgrading of current wastewater treatment facilities and additional investment in new facilities, improvement to existing Power Plant 5 combined with a hydro-power plant and wind farm, and a new power plant. These will all be complemented by significant investments in transmission lines, water and heating pipes, and other key infrastructure to allow additions to the network.
8. **Establish sustainable environmental management:** The Masterplan proposes to establish water-front open space along Ulaanbaatar's three major rivers, creating a combined set of connected parks and green space. Overall, a significant investment in green spaces is anticipated.

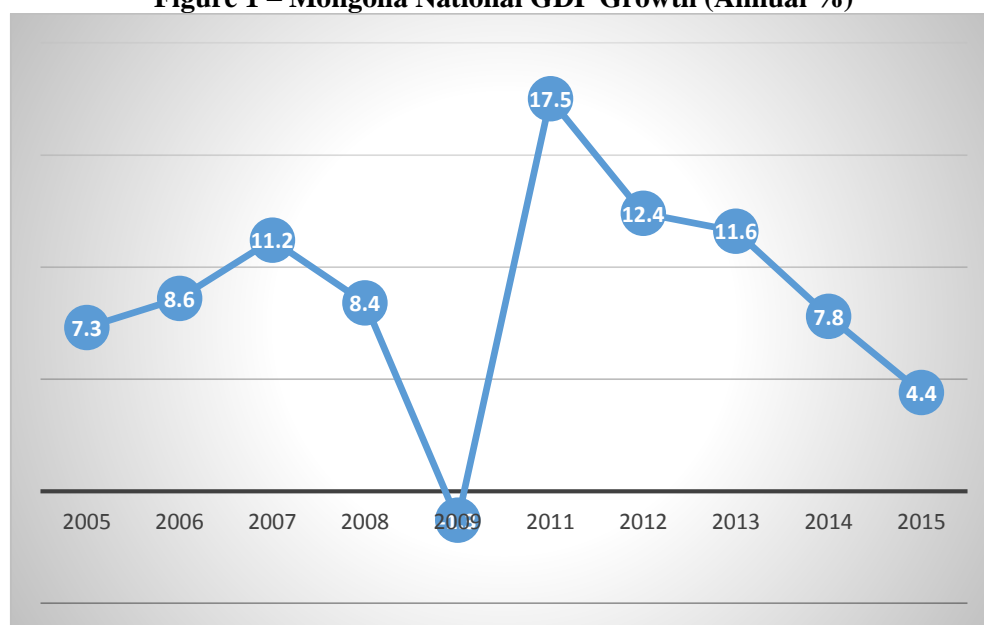
## BACKGROUND MATERIAL: ULAANBAATAR FINANCE OVERVIEW

### BACKGROUND:

Ulaanbaatar Capital Region has been at the center of Mongolia's dynamic economy over the last decade. The significance of Ulaanbaatar's economy in Mongolia is clear. The city's contribution to the national GDP has increased rapidly from slightly more than 50 percent in 2007 to 64 percent in 2012. As Mongolia's economy more than doubled since 2005 in real terms, growing by 9.2 percent per annum, largely driven by the mining and non-tradeable sector, Ulaanbaatar's rate of growth actually was higher than the national average, increasing 10.4% per annum over that same timeframe.<sup>1</sup> This impressive growth story has resulted in increased personal wealth and larger budgets for Ulaanbaatar, which have enabled investments in services and infrastructure to be made. This role at the center of the economy has also, however, made Ulaanbaatar suffer economic downturn more acutely than many regions of the country.

In 2015 Mongolian GDP growth is now projected to be only 2.3-4.4%<sup>2</sup>, and early estimates for 2016 are similarly low at 3-5%. This is a steep decline from 17.5% growth in 2011, and even 7.8% growth in 2014. The table below shows the recent trends.

**Figure 1 – Mongolia National GDP Growth (Annual %)**



*Source: The World Bank – 2015 figures are estimates as of November 2015.*

This slowing down of the economy creates a number of challenges. First it negatively impacts the amount of money that government has to spend. In 2015 government revenues decreased by 5.5% in the first 7 months compared with the previous year as value-added tax receipts and nontax revenue fell. Plans generated during periods of growth to guide government spending and investment were also made during times of faster growth, resulting in more optimistic expectations of what revenues would be, and how much debt the government could take on. This reality has led to rapid expansion of Mongolia's debt. According to IMF and World Bank reports Mongolia's external debt rose to 180 percent of GDP in June 2015, from

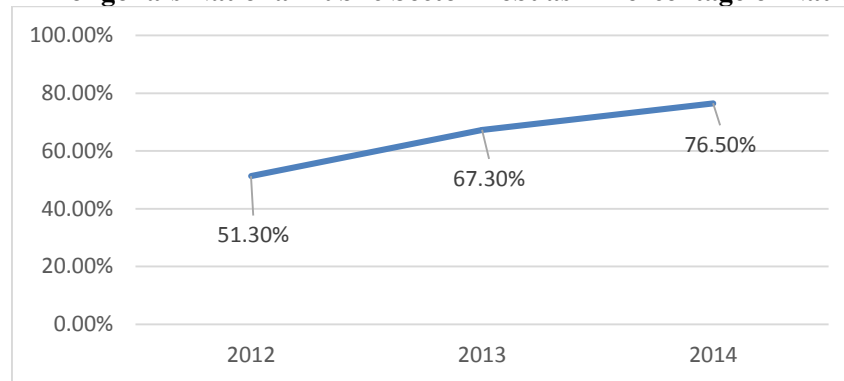
<sup>1</sup> Real growth rate is based on IMF's 99BVPZF series and the real sectoral decomposition also uses nominal sectoral shares reported by the NSO.

<sup>2</sup> According to ADB estimates the figure projects to be 2.3%, World Bank estimates are slightly more positive at 4.4%

162 percent in June 2014. The public debt to GDP ratio jumped to 62 percent from 45 percent during that same timeframe. These high levels of debt put the country in a more vulnerable position, more exposed to exchange rate risks and volatility in the international financial market. An expected deficit in 2015 and the need to start financing debt from various sources mean that public debt is expected to increase further in the near term.

The amount of money needed to repay debts is becoming increasingly burdensome on the budgetary situation of the economy. From 2012 to 2014 the percentage of the government that had to go towards service public debt quadrupled to more than 28% of the budget according to IMF statistics. In 2017 when the repayment period for the Chinggis Bonds begins, this will be a significant challenge for budgeting and prioritizing within the current public sector expenditures. This debt situation will potentially improve once national growth starts again, but short term trends that do not stem the growth off the external debt could have negative consequences for the country's economy.

**Figure 2 – Mongolia's National Public Sector Debt as A Percentage of National GDP**

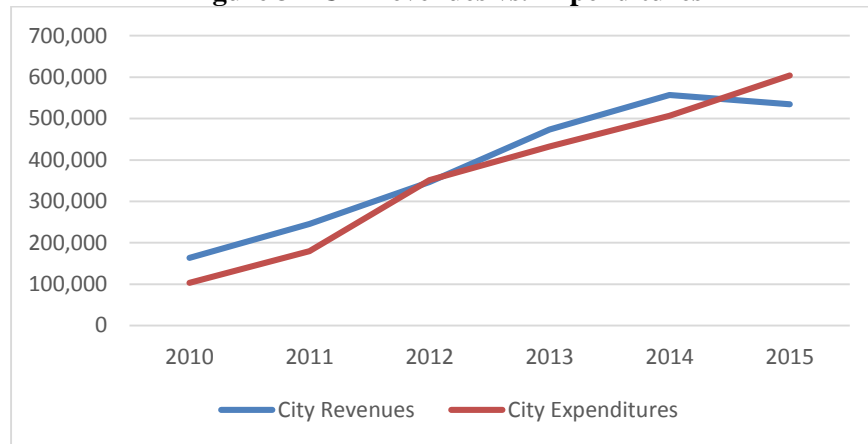


## ULAANBAATAR FINANCIAL OUTLOOK

Ulaanbaatar's economic outlook is linked to that of the national economy. Mongolia is a unitary state which has a centralized budget system, with a general budget consisting of four major pieces: the central budget, local budgets, the human development fund budget, and the social security fund budget. The central budget covers expenditures by the central government, local budgets are focus on expenditures at the aimag, the capital city, the soum, and the district levels.

In Ulaanbaatar the local budget consists of the combined budgets of the aimag, the capital city, and the districts. According to this system UB government and its districts draws their finances from a) own tax, non-tax and capital revenues specified in the Integrated Budget Law of 2011; b) shared revenue with the Central Government; and c) Intergovernmental fiscal transfers. Almost all tax bases and the rates, except a few, are legislated by the central government. The tax base on Ulaanbaatar is relatively variable, revenues can shift dramatically given the overall economic situation of the country, so the economic slowdown in Mongolia directly affects the city's revenue streams and total possible budget. The figure below shows the annual revenues and expenditures of Ulaanbaatar city, with the anticipated 2015 budget being the first decrease in budget year on year for a long time due to the national economic slowdown.

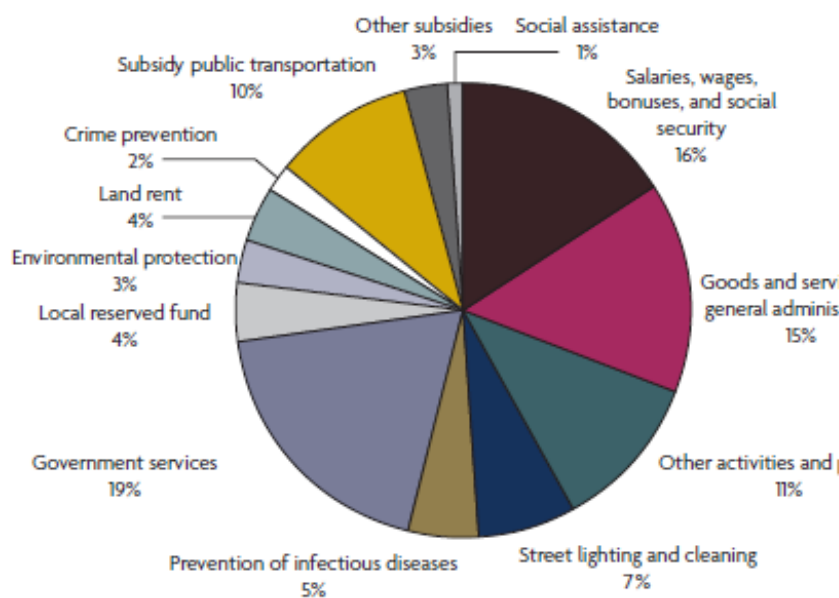
**Figure 3 – UB Revenues vs. Expenditures**



## FINANCING INFRASTRUCTURE

The significant need for infrastructure improvements in Ulaanbaatar are clear, however the efforts to rapidly develop the city are necessarily limited by financial constraints. There is no hard-and-fast rule to guide cities on the issues of how much should be spend on capital expenditures every year or within a given timeframe, also there is no consistent guidance on a limit for how much of a city’s operational budget should be spent on debt servicing. Clearly to maintain a fiscally sustainable budget, operational costs can only be cut so much without seriously affecting the delivery of various services. The graph below shows some of the major categories Ulaanbaatar had in its 2011 budget. 19% of the budget went to government services, 10% went to transportation subsidies, and other significant expenses included staff costs as well as general administration costs. Some of these kinds of costs can be flexible or variable, but cuts in many would have a significant impact on the management of the city.

**Figure 4 – Breakdown of 2011 Ulaanbaatar City Budget**



Source: The World Bank “City Finances of Ulaanbaatar” report on research conducted in 2013.

If the city is taking out loans to fund infrastructure projects, the costs of repaying that debt will need to come out of some part of the budget or be met by users of the project. Currently Ulaanbaatar is spending 0% of its budget annually on servicing its debts. The national government would take loans on the city's behalf and pay for debt servicing out of the national budget. Recently this is starting to change for many projects, and the city will increasingly be asked to repay debts from their own budget. In 2016 for example the city will start making repayments on a concessional loan from the Asian Development Bank. In 2016 this repayment amount will come to 12,228 million MNT. This would be 2% of the expected city budget for 2016. While this level of debt servicing will be managed by the city and has been planned for, adding additional projects would increase this burden and at some point begin to affect the amount of money that can be put forward to public services or other major expenditures. If projects are selected, however, that create cost savings or new revenue for the city government, the revenue or savings will enable fiscally prudent borrowing.

## **TYPES OF FINANCING FOR INFRASTRUCTURE**

Given the challenge of funding all projects needed in Ulaanbaatar, multiple methods of sourcing financial support will need to be employed. Creative engagement of the private sector especially will be critical in order to overcome limits on the city's budget and capacity to absorb loans, even heavily discounted loans from international development partners. In generating investments in infrastructure in a city, there is a continuum of capital investments ranging from those fully owned and run by the public sector, to those delivered fully to the private sector. There are many creative models for financing projects that Ulaanbaatar might consider, but primarily there are four main categories of mechanisms the city might consider to pay for major infrastructure investments.

1. **Loans (concessional on-lending)** – The most common way that a city will fund major infrastructure improvements are loans. In the case of Ulaanbaatar it can access concessional loans from international development partners for certain types of projects. These loans are discounted from the private sector rates, but the city cannot receive loans directly. The Ministry of Finance will receive loans directly from the source. The city will pay interest to the Ministry of Finance, which will in turn pay additional interest to the originator of the loan. Currently the city has access to concessional loans that can have interest rates (included interest paid to the MoF) of approximately 4%.
2. **Bonds (public debt)** – Governments often have the option of issuing bonds to generate resources. The City of Ulaanbaatar is not currently able to make a bond offering, it will first have to establish a credit rating from an international agency and work out legal challenges with the national government. So this option is not currently available to Ulaanbaatar, but if changes are made it might become an option in the future.
3. **Public-Private Partnerships (PPPs)** – PPPs are partnerships between government entities and private sector actors to allocate the tasks, obligations and risks between partners in an optimal way. Effective PPPs recognize that the public and private sectors each have certain advantages in performing specific tasks, and so each contributes in their own way to a project. The government might contribute capital for investment, a transfer of assets like land, or other commitments or in-kind contributions that limit the risk or costs of the private sector partners. The private sector will then apply their expertise in commerce to manage, operate or run a business linked to that investment and reduce the financial burden on the public sector partners. In some cases the private sector might repay the public sector over time for capital investments, in other cases they might simply operate public-owned infrastructure, there are many ways that these kinds of deals can be structured. A key characteristic is that payment to the private partner is linked with



performance and the private partner is exposed to the risk of financial penalty for poor performance. Payments to the private partner may be paid by users of the service, or by the government on behalf of users, or by a mix of users and government. There is always risk for both the public sector and the private sector, but that risk is shared in these arrangements. The private sector needs to accept some risk and make clear contributions in order for these arrangements to be successful. . Only some projects are suited to delivery as a PPP and they need to be selected with care. A public partner should only proceed with a PPP if its demonstrated to be superior to delivery as a conventional project; i.e., the PPP should offer better value-for-money. The private partner will only proceed with a PPP if there is reasonable confidence that its costs can be recovered, while banks and other sources of finance will only provide finance if the project is bankable.

4. **Special Assessments** – This term refers to specific taxes or fees that the city can link to specific capital investments. This mode of financing is not currently being considered for most projects in Ulaanbaatar, but is a common tool in many contexts for those projects or particular need.

## SESSION II – PROJECTS RELATED TO ECONOMIC GROWTH AND INDUSTRY

### CONSTRUCTION MATERIAL PRODUCTION AND TECHNOLOGY PARK PROJECT

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<b>ESTIMATED COST:</b>	<b>135.3 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>5 YEARS</b>

#### PROJECT DESCRIPTION:

The project goal is to provide a favorable business environment with adequate infrastructure for construction material production as well as trade centers and markets. This will be done by concentrating these businesses in the same location, in order to support production of construction materials which can replace imported products, introduce and domesticate competitive high-tech innovations and advances, and decrease traffic congestion in the city. This will be accomplished by establishing a large industrial and trade center in Nalaikh district.

This construction material production and technology park would cover an area of 120 hectares, and would be located in the 3<sup>rd</sup> khoroo of Nalaikh district located 35km from Ulaanbaatar. According to the project plan, the park would include concrete material production factories, flat-board production factories, metal material production factories, water based paint production factories, polished brick production factories, plastic waste processing and recycling plants, synthetic and fiber rod production factories, hydrate limestone processing factories, a park administration building, business service center, research and development center, logistic centers and other buildings and service centers to facilitate and ensure a favorable production environment and maintain environmentally-friendly practices and business operations.

This industrial, technological, trade and service complex will support the introduction of latest advanced technologies for local businesses operating in the construction materials sector, stimulate the production of local products that can replace imported goods through modern industrial and production infrastructure and favorable business environment conditions. This project would also concentrate construction material production and trade centers in one location, which are currently spread out throughout the central area of Ulaanbaatar. This move would result in positive impacts for the Nalaikh district economy, decreasing levels of unemployment and contributing to the development of Nalaikh as a satellite town in a manner consistent with the decentralization plan for the Capital City Region.

The park is planning to develop eight concrete construction material factories, five flat-board production factories, three metal materials production factories, and five other types of factories. In total 21 factories have been selected to be included in the scope of the project. 15 of the factories will be newly built, and up to 1,500 new jobs will be created in the process. The industrial, technological, trade and service complex will be established according to international standards while meeting social, economic and environmental requirements will significantly contribute to the development of construction sector of Mongolia.

## **SECTOR ASSESSMENT AND STATEMENT OF NEED:**

Implementation of the general plan to develop Ulaanbaatar city includes support for development of remote districts, employment opportunities for residents, favorable living conditions and decrease of costs and expenses related to construction and development of housing and public service buildings and facilities. In order to achieve these objectives the construction material production sector needs to be strengthened and a strong production base must be established.

Strong development of our country's construction material production based on raw material resources by the Nalaikh construction material factory technology park will not only support successful implementation of the "State policy to provide the entire population with housing" but might also result in an overall decrease in construction costs.

Currently in the Mongolian business environment, there are over 800 registered construction material producers and about 300 unregistered companies in the same line of business. As there are 7 construction material plants in the close vicinity of the city's center; and as 80% to 90% of all construction raw materials are imported from China, and all the goods move throughout the city in trucks, which significantly contribute to traffic congestion. Creating a technology park and a construction cluster of companies working in the near proximity will reduce procurement, logistics and transportation costs for these companies and create operating synergies on many levels of co-operation, supporting the already existing working force of about 21,000 people.

These existing Mongolian firms are small to medium sized operational factories which produce and manufacture construction binding and fastening materials, cement, construction lime, sound and heat insulation materials (vermiculate, perlite, doors, windows, plumbing and electrical materials).

In the construction material production industry of today, it is necessary to develop market competitiveness of construction material factories, meet modern requirements for technological innovations and advances of construction material production, introduce research and development findings into the construction material production industry, develop and strengthening professional human resource capacity of the sector through temporary and informal training sessions for employees.

A large construction material factory complex, an industrial technology park and a professional training center might stimulate this sector of the economy. The construction material production and technology park has a vision to become a network of construction companies offering a complete line of construction material products and sourcing for primarily domestic construction market. It also aspires to build its long term competitiveness on technological innovations, development and quality.

## **DESCRIPTION OF COSTS AND FINANCING PLANS:**

Funding sources for implementation of the project will be some combination of a concession, local and foreign direct investment, state and city budget, bonds and development bank funding. Total investment required for construction of buildings, facilities and infrastructure of the project is 135.3 billion MNT and construction of infrastructure will be funded by state and capital city budget. Major costs will include:

- Engineering infrastructure (heating, electricity and water supply, sewage system, communications);
- Road and landscaping (roads, green);
- The main buildings and facilities (Business center, laboratories, research and development center, transportation and logistics center, waste processing factory).

ARGUMENTS FOR THE PROJECT	ARGUMENTS AGAINST THE PROJECT
<ul style="list-style-type: none"> <li>Develops an economic foundation for Nalaikh district to become a city.</li> </ul>	<ul style="list-style-type: none"> <li>Delays and lack of private sector investment due to economic conditions.</li> </ul>
<ul style="list-style-type: none"> <li>Increased business opportunities for SME owners.</li> </ul>	
<ul style="list-style-type: none"> <li>Development of the park will lead to creation of new jobs.</li> </ul>	<ul style="list-style-type: none"> <li>Relocation of plants and factories might result in protests and resistance.</li> <li>Movement of industry might temporarily result in disruption to earning capacity of those businesses.</li> </ul>
<ul style="list-style-type: none"> <li>Positive impact on reduction of urban concentration and reduce traffic congestion central area of the city.</li> </ul>	
<ul style="list-style-type: none"> <li>Reduction of environmental pollution.</li> </ul>	
<ul style="list-style-type: none"> <li>Geographically located along railway tracks and roads.</li> </ul>	

**Figure 1: Construction material production and technology park layout plan**



## MONGOL NAADAM COMPLEX

<b>ESTIMATED COST:</b>	<b>190.2 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>25 YEARS</b>

### PROJECT DESCRIPTION:

This project proposes to develop a “Mongol Naadam” national sports complex located 35km from Chinggis Square in the Khui Doloon Khudag valley of the 21<sup>st</sup> khoroo of Songinokhairkhan district of the capital city and Argalant soum of Tuv aimag. The complex will consist of a stadium capable of hosting international sporting events and competitions all-year round as well as winter and summer sports complex villages. Project construction will include exhibitions/convention halls and cultural palaces for organizing international conferences, seminars and cultural events. In addition, a recreational and tourist zone will be established with a total area of 13644 hectares and a capacity of 500 thousand visitors which will include green areas, hotels and service centers. Construction and development of the complex will be implemented in several stages until 2040.

The main goal for the construction of “Mongol Naadam” complex will be to build the capacity to: organize Mongolian traditional sports and cultural events on a regular basis, through which the national tradition and customs can be promoted to foreign tourists; hosting continental and world class sports competitions; as well as providing local citizen and foreign tourists with a comfortable and convenient recreational area to spend their free time and make contributions to the tourism sector of Mongolia.

### SECTOR ANALYSIS AND STATEMENT OF NEED:

As the Mongolian economy rapidly develops and living standards improve, more and more people are increasingly looking for comfortable and convenient places to rest, play sports and generally spend their free time with family and friends. This issue is becoming more difficult for citizens of the capital city where almost half of the country’s population has settled. Despite the fact that in recent years, through state and local budget investment, sports complexes have been built in every district, these facilities still do not meet growing needs and demands of the population. This rising demand from domestic tourism and use of facilities by residents will enable the proposed complex to operate year-round during non-Naadam periods.

In addition, shows, performances, exhibits and other cultural and sports events can be organized during non-Naadam periods to attract interest from foreign and domestic tourists and contribute greatly to overall development of the tourism sector. Currently, due to a lack of adequate buildings, facilities, service centers and complexes built according to international standards and norms for organizing large-scale international events and hosting foreign tourists, Mongolia’s tourism industry cannot reach its full potential in terms of impacting the economy and attracting foreign tourists. In addition the platform for sharing Mongolian culture and sport are thereby limited.

Moreover, opportunity to organize “Mongolian National Festival – Naadam”, the biggest and most widely watched event for promoting Mongolian national history, culture and traditions to the world, as well as its three main events, traditional wrestling, archery and horse racing at one location will contribute greatly to

the development of the tourism industry. On the other hand, three main events mentioned above are sports disciplines representing Mongolia on the global stage and thus promote national sports to the world. This base for the facilities will also provide an opportunity to host large scale international sports events and competitions in Mongolia and further develop sports disciplines in our country.

#### **DESCRIPTION OF COSTS AND FINANCING PLANS:**

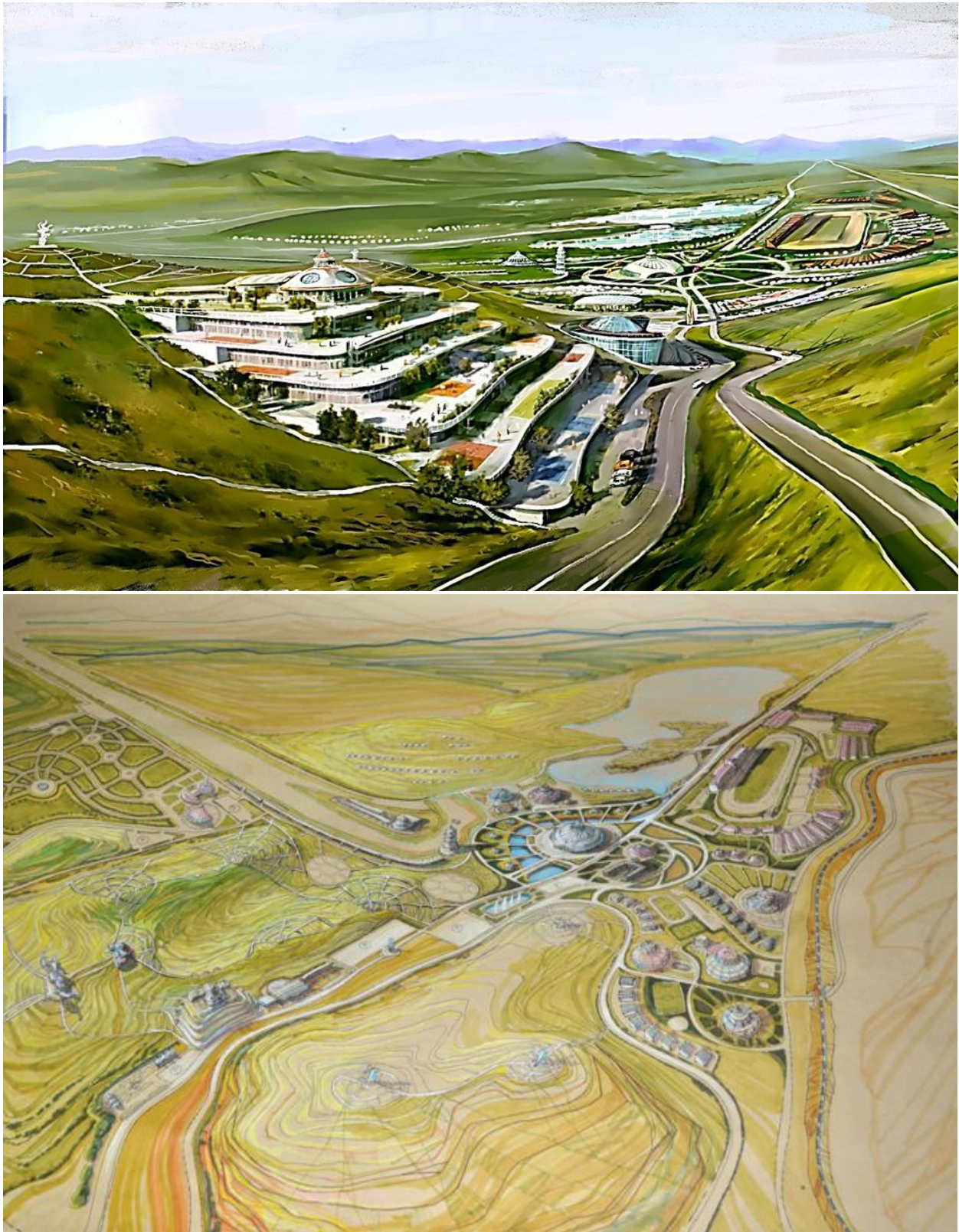
Establishment of the “Mongol Naadam” complex will initially require construction and development of the infrastructure including water supply, sewage, electricity, road network, streets and other forms of public spaces, and a large stadium, these costs would be funded from the state budget. According to preliminary estimates construction and development of infrastructure will require approximately 190.2 billion MNT.

As for construction and development of hotels, service centers and recreational buildings and facilities which will be built on the infrastructure funded by the by state budget, funding from private sector and foreign investment would be mobilized to heavily support the development of the complex. Improved use of public-private partnership can be used as a financing mechanism. There is some interest in this project as the income generation potential is high for businesses in the sports, tourism and services industries.

<b>ARGUMENTS FOR THE PROJECT</b>	<b>ARGUMENTS AGAINST THE PROJECT</b>
<ul style="list-style-type: none"> <li>• Opportunity to strengthen cultural displays as well as conservation, protection and development of Mongolian traditional cultural heritage and promotion worldwide.</li> </ul>	<ul style="list-style-type: none"> <li>• Project will need sustained and long-term investment throughout the lifetime of the project.</li> </ul>
<ul style="list-style-type: none"> <li>• More opportunities for citizens to spend their free time with family and friends at sports and recreational facilities.</li> </ul>	<ul style="list-style-type: none"> <li>• Due to lack of experience in construction and development of large stadiums and sports complexes international partnership and cooperation will be required.</li> </ul>
<ul style="list-style-type: none"> <li>• Establishment of sports facilities to organize and host sports events will increase overall interest among youth and national success on international level.</li> </ul>	<ul style="list-style-type: none"> <li>• Will require all-year round management and creative approaches to generating regular income from local residents and tourist events outside of Naadam.</li> </ul>
<ul style="list-style-type: none"> <li>• Opportunity to host and organize and international conferences, seminars, exhibitions and various cultural events at regular basis</li> </ul>	<ul style="list-style-type: none"> <li>• Will require feasibility studies and actual estimation of economic benefits, profits and revenues.</li> </ul>
<ul style="list-style-type: none"> <li>• Overall increase in both foreign and domestic tourists and further development of the tourism industry.</li> </ul>	<ul style="list-style-type: none"> <li>• Will need to clearly define mechanism and management for ensuring full participation of the private sector.</li> </ul>
<ul style="list-style-type: none"> <li>• Promote Mongolian traditional sports to the world.</li> </ul>	<ul style="list-style-type: none"> <li>• Negative impact on the environment and natural wilderness.</li> </ul>
<ul style="list-style-type: none"> <li>• New business opportunities and new jobs.</li> </ul>	



**Figure 1: Bird's-eye view of the Mongol Naadam Complex (from the entrance)**



## **PROJECT TO BUILD A FREIGHT TRANSPORT LOGISTICS CENTER TO THE EASTERN SIDE OF ULAANBAATAR CITY**

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<b>ESTIMATED COST:</b>	<b>293 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>6 YEARS</b>

### **PROJECT DESCRIPTION:**

This project aims to reduce traffic congestion in Ulaanbaatar as it would gradually close 17 smaller terminals currently operating in the center of the city and move the majority of trucking and logistics operations to the east of the city. It would also improve the overall efficiency of trade and logistics operations and create 3,500 new jobs. In addition, safety would be improved in the central area of the city as potentially hazardous materials will not be transported through the city center.

The completion of this project would optimize the freight transport network, enhance state and customs control and monitoring and improve urban planning and land usage. The planned location of the logistics center is between Bayan and Bumbat train stations located to the east of the 11<sup>th</sup> khoroo of Bayanzurkh district. Approximately 130 ha of land will be needed to complete this project.

The freight transport logistics center will transport, handle and process all types of cargo including cargo transported by open freight train cars, bulk or commodity cargo and other types of large sized goods and equipment. The long term vision of establishing a centralized city logistics system is to improve Mongolian competitiveness in the trade and transportation logistics sector and produce higher and positive impacts to the economic growth of the country. The proposed center will handle all consumer and industrial cargo destined for Ulaanbaatar.

Project's preliminary calculated investments will have numerous economic benefits, and it will contribute income for the national budget as well as create new jobs.

### **SECTOR ANALYSIS AND STATEMENT OF NEED:**

In recent years, the volume and circulation of Mongolia's foreign trade have increased significantly and Ulaanbaatar has become the main junction of foreign and local trade, freight transport and logistics activities. Growth of the Mongolian economy has been connected with a strong increasing demand for freight transport and handling, especially in Ulaanbaatar city, which serves as the major transportation and distribution hub for all regions of the country and for most of the international transportation. The current situation of freight handling in Mongolia and Ulaanbaatar is not satisfactory. The World Bank ranked the performance of the logistics industry (including customs and infrastructure) of Mongolia on place 141 out of 155 in 2010. Therefore, it has become necessary for Ulaanbaatar city to optimize its freight transport network in order to provide an adequate environment and efficient infrastructure for state and customs authorities to improve control and monitoring of supply and distribution of goods and products.

Given that all cargo terminals are located inside Ulaanbaatar city, cargo coming in via railway and roads is being transported within the city which creates numerous problems such as traffic congestion and road deterioration, as well as the entering of hazardous materials into the city center. Therefore in order to decrease transportation time, support business development, improve safety and optimize urban planning



and land usage, a new transport logistics center should be established outside the city. This solution will not only reduce environmental impact but also limit wear and tear on the infrastructure of the city.

One of the key benefits of the project is that it replaces the activities of as much as 17 smaller cargo terminals in the center of the city and freeing 74,000 m<sup>2</sup> of territory; these locations can be redeveloped with new businesses or real estate development and benefit both the city and the wider community of the city.

#### **DESCRIPTION OF COSTS AND FINANCING PLANS:**

According to feasibility study of the “Freight transport logistics center of Ulaanbaatar city” project, implementation of the project will initially require 293 billion MNT which will be repaid in 6 years. According to the study this is completely feasible. Implementation of the project will be financed by a blend of private sector investment and government and city’s involvement, mainly in providing basic infrastructure on site (energy, water, transportation access); probably through a PPP or concessional modality.

The private investment includes general infrastructure, logistics infrastructure, buildings and equipment. Initial studies suggest that this project would become rather quickly profitable, forecasted to be sometime around the 2018-2019. The planning for potential implementation led by private sector investment would revolve around a public-private partnership between the city authority, private investors and a new Mongolian consortium of logistics companies operating in the city. This financing structure means that the city would ultimately have to bear a limited portion of the overall investment to build the logistics center.

<b>ARGUMENTS FOR THE PROJECT</b>	<b>ARGUMENTS AGAINST THE PROJECT</b>
<ul style="list-style-type: none"> <li>• Reduced traffic congestion and traffic load within the city.</li> </ul>	<ul style="list-style-type: none"> <li>• Relocation of existing cargo terminals operating in Ulaanbaatar city is expected to have higher costs.</li> </ul>
<ul style="list-style-type: none"> <li>• Create employment opportunities and new jobs.</li> </ul>	<ul style="list-style-type: none"> <li>• Resettlement challenges may cause further time delays and cost overruns.</li> </ul>
<ul style="list-style-type: none"> <li>• Increase efficiency and effectiveness of railway and road transport organization and increased volume and circulation of cargo</li> </ul>	<ul style="list-style-type: none"> <li>• Risk if some logistics centers in the city now do not close, it will create competition that could adjust the market analysis conducted in the first study.</li> </ul>
<ul style="list-style-type: none"> <li>• Land used by existing cargo terminals can be used in a more economically profitable way.</li> </ul>	<ul style="list-style-type: none"> <li>• Phasing relocation to avoid any short term disruption of the flow of goods and services will require careful planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Improved customs control and monitoring.</li> </ul>	
<ul style="list-style-type: none"> <li>• Improved public safety as some hazardous materials will no longer be transported into the city center.</li> </ul>	

**Figure 1: Freight transport logistics center**



## LIGHT INDUSTRY MANUFACTURING AND TECHNOLOGY PARK PROJECT

<b>ESTIMATED COST:</b>	<b>421.1 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>5 YEARS</b>

### PROJECT DESCRIPTION:

A light industry manufacturing and technology park is planned to be established in the Emeelt area (13<sup>th</sup> khoroo of Khan-Uul District and 20<sup>th</sup> khoroo of Songinokhairkhan District) located 42 kilometers away from central Ulaanbaatar. Enterprises working in the production of leather, wool, and cashmere will be concentrated in the area. The light industry and technological park will consist of two primary zones: an industrial area and a settlement area.

The project has multiple goals including providing a favorable environment for the businesses, introducing new and comfortable population settlements to reduce downtown congestion, and using new and updated technology for environmentally friendly production of light industrial products. 160 hectares of land have been allocated for project implementation according to the initial plan. The Industrial and settlement areas of the project will be separated by a green buffer zone that will also be available for recreational purposes.

The Industrial zone would have a total area of 140 hectares and be used for all types of leather, wool and cashmere processing plants and factories for by-products, raw materials, as well as factories of consumer goods produced from leather, wool and cashmere such as shoes and clothes. The plan includes not only factories but also additional infrastructure to support these factories including a science and technology innovation center, a research and development center, an information center and logistics facilities. These additions will help to introduce new technology, promote testing and experimenting, and provide modern facilities for inventory, storage, transportation and logistics to meet the needs and demands of the industries. This project will enable growth of these critical industries, which rank high in importance to the Mongolian economy.

Implementation of the project to open this industrial zone will facilitate relocation of leather, wool and cashmere processing plants and factories operating in Ulaanbaatar. Approximately 6000 residents would be able to reside in the settlement area of the park, which would have an area of 20 hectares. In order to ensure comfortable living conditions for this population buildings and facilities such as apartment buildings, school, hospital, cultural center, fire station, garage and other public service facilities would be built.

A wastewater treatment plant with capacity of 20,000m<sup>3</sup>/day will be constructed at the industrial zone for the industrial, commercial and residential buildings and facilities, where discharged wastewater will be treated. This will be a critical component of the project as it will contribute to the protection of environment as well as sanitation and hygiene of the residents.

## **SECTOR ANALYSIS AND STATEMENT OF NEED:**

Besides the population growth of Ulaanbaatar, many residential areas have been developed in the current leather, wool and cashmere production zones in the recent years, forming a mixed residential and industrial zone. This causes health risks for the population of the area. Along with concentration and growth of the population, the number of leather, wool and cashmere factories is also expected to grow, which will potentially worsen this problem.

Raw material processing plants and factories located in the center of the city causes negative impacts on public health and environment. Raw materials of animals contain approximately 20 types of bacteria, which can increase risks for the spread of infectious diseases. In addition, wastewater, which contain heavy metals, from the tanneries and leather processing plants burdens the Central Wastewater Treatment Plant's capacity. Therefore, relocating the tanneries, leather, wool and cashmere production factories with primary processing technology from the Ulaanbaatar city is necessary.

Currently, there are 32 tanneries and 25 wool and cashmere processing plants operating in Ulaanbaatar city. Implementation of the project to centralize processing plants and factories in a single location will result in optimizing primary raw material processing system, introducing new technologies, increasing capacities of the plants and factories, increasing sales, creating value added products for the market, providing better conditions for exporting the products, and creating a favorable business environment. In order to increase production of this sector, mobilize its technological development, start new businesses and dominate in economic sector, it is necessary to cluster factories, which would enable entities and companies to use the raw materials efficiently and become more competitive in the process. The cluster of animal raw materials processing businesses will potentially stimulate industry growth and development in Mongolia.

In addition, this project will establish a new settlement area. This will build towards broader plans to decongest the central area of Ulaanbaatar, and help citizens move to satellite cities with comfortable residences and job opportunities.

Another core element of the project is the waste water treatment plant. Moving these industries will reduce environmental pollution and reduce the overall workload of the Central Wastewater Treatment Plant of Ulaanbaatar. The high concentration of pollutants in the wastewater generated from tanneries, wool and cashmere factories burden the treatment function the CWWTP, and deteriorate the water quality. Thus, moving these factories will mitigate the strain placed on current treatment functions of CWWTP.

Consequently this project would enable the development by the year 2030, of the factories, logistics and warehousing as well as the provision of a cargo terminal and industrial development as one part of capital city satellite town, which meets the environmental standards set.

## **DESCRIPTION OF COSTS AND FINANCING PLANS:**

This project is planned to be funded by a public-private partnership. Construction and development of engineering and social infrastructure such as road network, water supply, water treatment, and electrical power supply, heating supply, streets and other public space will be funded by state and the capital city budget.

State and the capital city budget investments in construction and development of infrastructure will reduce risks for private sector investors to invest in the project. This will increase the possibilities for local and foreign investment for construction and development of apartment buildings, service buildings and industrial buildings and facilities. Project budget estimates include all of the construction and development components mentioned above.

ARGUMENTS FOR THE PROJECT	ARGUMENTS AGAINST THE PROJECT
<ul style="list-style-type: none"> <li>Relocation of leather, wool and cashmere processing plants and factories away from Ulaanbaatar city will reduce environmental pollution and positively impact health, and living conditions of the citizens.</li> </ul>	<ul style="list-style-type: none"> <li>Relocation of plants and factories to a remote location away from Ulaanbaatar city can result in loss of experienced staff, also might generate some resistance.</li> </ul>
<ul style="list-style-type: none"> <li>Improve business environment for leather, wool and cashmere processing and production sector.</li> </ul>	<ul style="list-style-type: none"> <li>Relocation of factory workers and settlement of population might require substantial amount of time.</li> </ul>
<ul style="list-style-type: none"> <li>Increase opportunities to produce value added products and meet environmental standards for certain export markets.</li> </ul>	<ul style="list-style-type: none"> <li>Relocation of existing plants and factories will require significant costs and expenses that will require additional funding of incentives for private sector investors to make the project a success.</li> </ul>
<ul style="list-style-type: none"> <li>Decentralizing the over-population in downtown Ulaanbaatar.</li> </ul>	<ul style="list-style-type: none"> <li>Relocation of plants and factories might result in protests and resistance.</li> </ul>
<ul style="list-style-type: none"> <li>Planned location of the project does not require any resettlement as it is currently unused, so it can be used immediately.</li> </ul>	
<ul style="list-style-type: none"> <li>Reducing the central water treatment plant overloading.</li> </ul>	
<b>Direct economic impacts</b> <ul style="list-style-type: none"> <li>Increasing the tax revenues.</li> <li>Bringing the raw materials and products into the market and enhancing the conditions for exporting.</li> </ul>	<ul style="list-style-type: none"> <li>Mechanism for private sector investment must be formed.</li> </ul>
<b>Indirect economic impacts</b> <ul style="list-style-type: none"> <li>Adaptation of latest technology.</li> <li>Increasing the opportunities for small and medium-sized enterprises.</li> </ul>	

**Figure 1: Light Industry manufacturing and Technology Park map**



## **SESSION III – PROJECTS RELATED TO WATER AND ENVIRONMENTAL PROTECTION**

### **CONSTRUCTION WORK FOR RENOVATION AND IMPROVEMENT OF TUUL AND SELBE RIVERS BASINS**

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<b>ESTIMATED COST:</b>	<b>2.3 TRILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>15 YEARS</b>

#### **PROJECT DESCRIPTION:**

The project aims to preserve the ecosystem balance of Tuul River basin and to improve and restore the flow of Tuul, Selbe rivers and their tributary streams in the territory of Ulaanbaatar. This project will facilitate better protection from floods and both clean up the river and limit environmental pollution of surface water sources going forward. A final component of the program will be to rehabilitate the river shores to create a natural environment for people to walk and relax in a natural setting.

The defined territory of the project pertains to the Tuul River basin and its additional tributary streams including Selbe, Gachuurt, Uliastai, Khul, Tolgoit, Bayan, Turgen and Bukheg rivers, all of which pour into and belong to the Tuul river basin that is so critical to the Capital City.

The plan includes a component to rebuild the Tuul River dams for protection against incidents of flooding, and also to help efforts to eliminate pollution elements along the rivers. This project will also facilitate plans to clean the contaminated areas, and to build the stream adjustments so that there is an accumulation of surface water that can be managed to improve the river's flow. Part of the projects work will focus on the areas surrounding the river as well, and investments will be made to renew the protection zones with 93.5 km in length along the banks of the river, adding an area of 1428.1 hectares into the special protection status. A further 3856 hectares of valley lands will undergo environmental rehabilitation including efforts to plant trees that create a favorable environment of natural landscapes, and also provide natural areas for people to walk and relax along the Tuul and Selbe and other tributary rivers.

#### **SECTOR ANALYSIS AND STATEMENT OF NEED:**

Migration and settlement of populations into protected areas in the Tuul River basin as well as at the mouths of river and streams flowing into Tuul River is negatively impacting the environment, increasing the level of pollution in rivers and reducing the current flow of the rivers. In addition, inappropriate usage and consumption of water resources has been increasing which can create the risk of water supply deficiency throughout the city. Therefore, it is important to address this increasing issue of protecting water reserves and restoring river flows which is becoming more and more critical with each passing year in a context of a rapid urbanization process that will only increase the need for water in the capital city area.

Climate change is an additional factor in these growing challenges managing the city's water resources. A recent study completed in partnership with the World Bank on flood risk assessment in Ulaanbaatar city assessed and mapped current and future flood hazards, exposure, vulnerability and risk to the city. The



underlying conclusion was that Ulaanbaatar is prone to extensive flooding, a situation which may become worse under extreme weather events exacerbated through climate change. So infrastructure to support the better management of water resource will necessarily help Ulaanbaatar prepare to adapt to changes in its climate and be prepared to face any additional challenges.

This is a serious challenge due to lack of capacity as well as degradation of flood dams constructed according to outdated plans, the current infrastructure in place does not provide adequate protection from floods, especially with heavy construction and development that is happening near river basin areas. Therefore, river banks need appropriate landscaping and dam construction to improve flood protection.

Finally as the economy grows and living standards improve, citizens are increasingly seeking convenient locations to spend their free time for recreational purposes. Ulaanbaatar city still lacks enough of these types of locations and areas. For this reason Ulaanbaatar city is aiming to increase urban green zones and establish recreational areas, efforts under this project to use the natural environment characteristics of Tuul and Selbe river basins fit this goal perfectly.

## **DESCRIPTION OF COSTS AND FINANCING PLANS:**

Total investment of construction and development project for renovation and improvement of Tuul and Selbe river basins will require approximately 2.3 trillion MNT. The project will include complete renovation of river basins, rehabilitation of the environment, construction of flood protection dams and construction of a road network. These components of the projects are planned to be funded by the international environmental conservation funds such as the WWF and the Climate Fund.

<b>ARGUMENTS FOR THE PROJECT</b>	<b>ARGUMENTS AGAINST THE PROJECT</b>
<ul style="list-style-type: none"> <li>• Reduction of water contamination and soil pollution along the city's major waterways.</li> </ul>	<ul style="list-style-type: none"> <li>• Due to relative cold climate of Mongolia and harsh winter seasons landscaping and maintenance work along the river might be ruined and damaged.</li> </ul>
<ul style="list-style-type: none"> <li>• Improvements of water flows of Tuul and Selbe rivers.</li> </ul>	<ul style="list-style-type: none"> <li>• Results and outcomes of a long-term projects will require substantial amount of time.</li> </ul>
<ul style="list-style-type: none"> <li>• Water supply of the city will be enhanced.</li> </ul>	<ul style="list-style-type: none"> <li>• Need to create or find funding sources for this project.</li> </ul>
<ul style="list-style-type: none"> <li>• Will create favorable environment for people to spend their quality time in the nature.</li> </ul>	<ul style="list-style-type: none"> <li>• Reestablishment of protected zone around the river banks might require some existing structures to be removed.</li> </ul>
<ul style="list-style-type: none"> <li>• Reduction of flood risk.</li> </ul>	



Figure 1: Planning of the project to renovate and improve Tuul and Selbe river basins



## **TUUL RIVER WATER RESERVOIR – DAM COMPLEX**

<b>ESTIMATED COST:</b>	<b>552 BILLION 220 MILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>4 YEARS</b>

### **PROJECT DESCRIPTION:**

Currently 42 percent of Ulaanbaatar's citizens are living in apartment buildings, with the remaining 58 percent residing in ger district areas. Daily water consumption per person in the ger areas fluctuates between 8-25 liters, this number is 150-210 for a person living in an apartment. Rising overall population, sustainable growth for manufacturing industry, agriculture and livestock husbandry, and increasing demand for comfortable housing and a transition of ger area residents to apartment buildings mean that water consumption can be expected to increase significantly in the coming years. Since this growing consumption of citizens cannot be supported by current underground water reserves, there is a need to create additional sources of drinking and household water.

Therefore, in order to solve Ulaanbaatar city's issue of growing water demand, this project would construct a multi-purpose water reservoir complex in the south-east of the city. This development would allow combined usage of underground and surface water supply of Tuul river valley by artificially accumulating underground water and regulating the flow of the Tuul and Terelj rivers. This complex would include water treatment facilities to produce water for domestic use, but also provide the opportunity to produce electricity to contribute a renewable energy source. The reservoir itself can be turned into a popular destination for tourism and recreational fishing. The location selected for project is the Tuul and Terelj river valley located between the 6<sup>th</sup> khoroo of Nalaikh district and Erdene soum of Tuv aimag.

### **SECTOR ANALYSIS AND STATEMENT OF NEED:**

More than half of our country's population is currently residing in Ulaanbaatar city, located in Tuul river valley which covers only 3.16 percent of Mongolia's area. Total population of Ulaanbaatar city increased by 2.2 from 590,000 in 1990 to 1,314,486 in 2014. This growth is putting stress on the water resources for the city. According to findings of research conducted by Geo-ecological institute of Mongolian Academy of Sciences, the Tuul River became the most polluted river in Mongolia with the highest usage load as well. Many research reports mention that the Tuul River has deteriorated beyond natural recovery where it flows through the capital city due to degradation of riverbed and pollution from waste water. There is also some evidence of climate change having a negative impact on the water flow of the rivers.

As the government develops its plans to improve water infrastructure in the ger districts and move some of the dwellers to modern housing, domestic water usage will rise. At the same time, additional water will be needed to cater to the city's growing industrial and economic activities. According to studies, total water usage is set to double by 2030 and triple by 2040. Ulaanbaatar city's water consumption is expected to reach 530 thousand cubic meters per day by 2030 and 720 thousand cubic meters per day by 2050, so all signs point to increasing stress on existing resources.

The current and future state of Ulaanbaatar city's water supply is directly dependent on quality and quantity of underground water of Tuul river valley and protection of ecological system of Tuul River. Therefore one of the strategies to ensure Ulaanbaatar city with stable and reliable supply of water in the future is to construct a multi-purpose flow-regulated dam on Tuul River. Project implementation will require an environmental impact assessment according to Law of Mongolia on Environmental Impact Assessment.

## DESCRIPTION OF COSTS AND FINANCING PLANS:

Since 1980 preliminary research of the project has been conducted several times by various local and foreign professional organizations. According to preliminary fiscal and economic research conducted for the project, the summary estimates show the total investment of 552 billion 220 million MNT is required for construction of the water reservoir complex including buildings, infrastructure, water treatment plants, cleaning and purifying facilities as well costs associated with relocation activities.

The total volume of the water reservoir will be 273.9 million cubic meters, estimated water consumption 27.4 cubic meters per second and annual production capacity of electric power energy will be 43.1 million kW hour. 40 percent of the total investment will be allocated for the first year, another 40 percent for the second year and the remaining 20 percent for the last year. It is possible to implement the project through a public-private partnership to reduce some costs to the public sector.

ARGUMENTS FOR THE PROJECT	ARGUMENTS AGAINST THE PROJECT
<ul style="list-style-type: none"> <li>Ulaanbaatar city will have a new source of water supply and continuous supply of drinking and household water supply can be ensured.</li> </ul>	<ul style="list-style-type: none"> <li>There might be delays due to evacuation and clearing the area.</li> </ul>
<ul style="list-style-type: none"> <li>New jobs and employment opportunities created for local citizen.</li> </ul>	<ul style="list-style-type: none"> <li>Project will face issues related with local citizen such as resettlement of certain local people and negotiation with local administration.</li> </ul>
<ul style="list-style-type: none"> <li>Surface water will be used and included in the economic circulation.</li> </ul>	<ul style="list-style-type: none"> <li>Adding a new source of water will not reduce the challenge of extending pipelines to new users.</li> </ul>
<ul style="list-style-type: none"> <li>Production of electricity from water energy</li> <li>Protection of Ulaanbaatar city from flood risks and ability to regulate flow and current of Tuul River.</li> </ul>	<ul style="list-style-type: none"> <li>It is difficult to produce electricity during winter seasons.</li> </ul>
<b>Direct economic impact</b>	<ul style="list-style-type: none"> <li>Cleaning and purifying surface water will require additional expenses for each cubic meter of water.</li> </ul>
<ul style="list-style-type: none"> <li>Combined usage of underground and surface water.</li> </ul>	<ul style="list-style-type: none"> <li>High initial costs and expenses related with construction of buildings and facilities.</li> </ul>
<ul style="list-style-type: none"> <li>Low utilization costs.</li> </ul>	<ul style="list-style-type: none"> <li>Selection of piping routes and additional engineering facilities and equipment.</li> </ul>
<ul style="list-style-type: none"> <li>Water accumulated by the dam can be delivered to the city by its own flow.</li> </ul>	





## PROJECT TO SUPPLY ULAANBAATAR CITY WITH PETROLEUM GAS

<b>ESTIMATED COST:</b>	<b>300 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>5 YEARS</b>

### PROJECT DESCRIPTION:

Ulaanbaatar city's air pollution has become one of the most critical issues facing Mongolia that needs to be addressed as soon as possible. Ulaanbaatar city administration and Government of Mongolia have been taking numerous measures to decrease the level of air pollution in the city.

According to Ulaanbaatar's Masterplan, the city is divided into 4 zones based on heat supply. A smoke-free solution is needed to solve the heating supply issue of ger district areas or zones which are not connected to the central heating system, where the majority of air pollution is generated by the burning of coal or other combustibles for household heating and cooking. One option for reducing this air pollution is to introduce new kinds of fuel to meet the heating and cooking needs. This project would explore ways to establish a sustainable petroleum gas supply network with accessible gas stations throughout the ger district areas and to promote usage of gas for household purposes.

Currently, liquefied petroleum gas is being used in several industrial and production sectors of Ulaanbaatar city. For example, for boilers, water heaters and heating systems of household and public food sectors and other industries such as auto transportation, production and manufacturing. More than 10 business entities are providing liquefied petroleum gas supply services. As of 2013, the total reservoir capacity of petroleum gas facilities is estimated at 2,850 cubic meters. Currently, international standards and norms are being translated and efforts to localize them have been initiated. Mongolia is preparing to issue permits for retail sale and transportation of liquefied petroleum gas in small packages for household and domestic purposes.

Broadly this project will help develop a system to import gas in large volumes from abroad and store it in several strategically placed gas storage installations from where LPG gas tank distribution and filling and distribution of smaller portable tanks can be organized. This will need efforts to stimulate local demand as well. This project will facilitate initial steps to explore options and make larger investments on a more dramatic path forward once further information is available.

### SECTOR ANALYSIS AND STATEMENT OF NEED:

Air pollution is becoming one of the most critical issues facing Ulaanbaatar city. Although there are several factors contributing to air pollution of Ulaanbaatar city such as desertification dust, lack of green zone and number of vehicles, the primary factor is the number of households burning coal for domestic heating. It has been estimated that coal consumption or burning of coal for household purposes in ger district areas is responsible for generating 80 percent of certain types of total air pollution. Negative impacts of bad air quality affects the susceptible and vulnerable part of the society the most. Infant morbidity, chronic bronchitis, airborne and cardiovascular diseases are becoming more and more common as number of people going to hospitals increases each day. According to research conducted by Public Health Institute of Mongolia, mortality due to respiratory diseases has increased in recent years.

Currently, there are 175 thousand households burning sulfuric coal for domestic heating and cooking purposes, with this number growing each day. As migration and settlement towards the city increases, level of pollution increases and quality of air becomes even worse, creating an urgent need in ger district areas which are not connected to the central heating system for new source of energy and supply of electricity based on latest technological advances which does not depend on burning coal. One possible solution for energy supply is the implementation of a project to supply the city with petroleum gas.

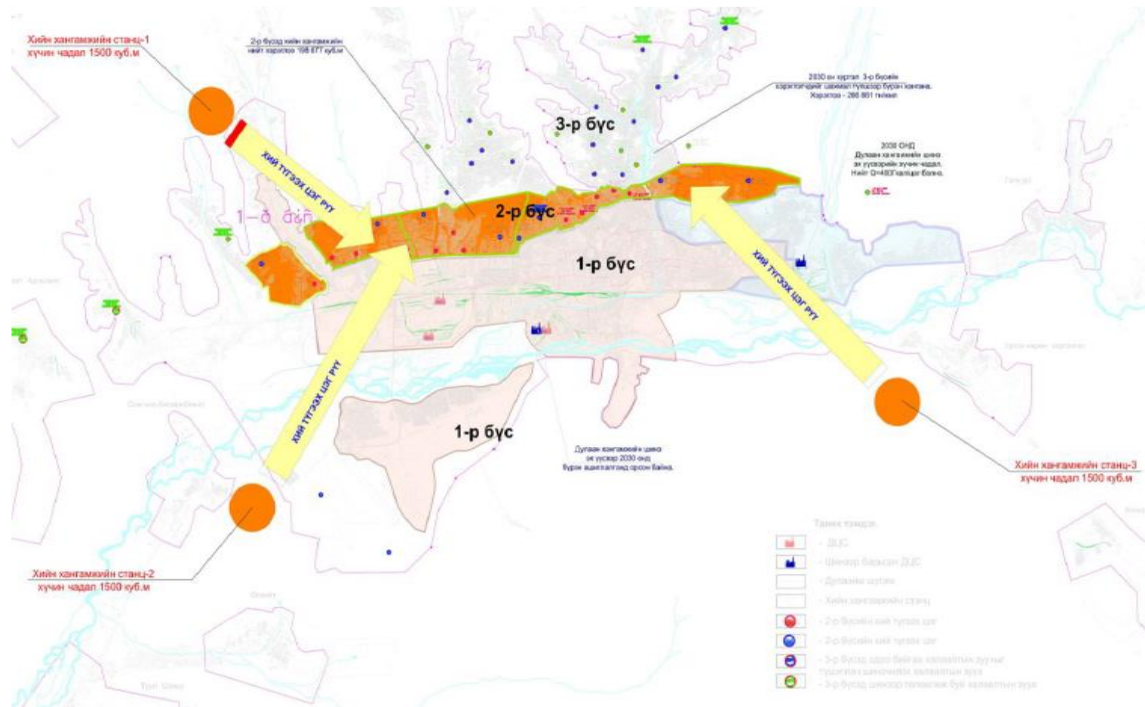
There is an urgent need to decrease the level of air pollution in Ulaanbaatar city, decrease the level of pollution coming from usage of raw coal in ger district areas and exhaust emissions of vehicles, solve the heating issue of remote schools, kindergartens, clinics, hospitals, police stations and ger district area consumers, decrease the initial investment required for heating systems, increase and promote the usage of liquefied petroleum gas among citizen and to develop a infrastructure and delivery system for natural gas.

## **DESCRIPTION OF COSTS AND FINANCING PLANS:**

Research is being conducted on establishment of a supply network to provide gas to 175,000 households residing in ger district areas. According to preliminary estimates, approximately 300 billion MNT will be required to finance the project. This includes state and capital city budget investment for infrastructure, and private sector involvement and active participation in acquisition and supply of equipment and machinery as well as various subsidies and discounts from the government in supply and provision of petroleum gas. Currently the petroleum prices are quite high relative to coal or other heating sources. For this reason to stimulate the local demand, some analysis on financial incentives or subsidies might need to be considered to stimulate the demand among households.

<b>ARGUMENTS FOR THE PROJECT</b>	<b>ARGUMENTS AGAINST THE PROJECT</b>
<ul style="list-style-type: none"> <li>Smoke-free, does not produce waste or ash when burnt, which will reduce pollution and costs of waste management.</li> </ul>	<ul style="list-style-type: none"> <li>Given that liquefied petroleum gas was not used in Mongolia before so there is a lack of technical and scientific knowledge and expertise in this field. Close cooperation with experienced countries and organizations will minimize the risks.</li> </ul>
<ul style="list-style-type: none"> <li>Saves time, small, portable and clean.</li> </ul>	<ul style="list-style-type: none"> <li>Higher costs of liquid petroleum mean that more analysis and measures to stimulate household demand will be needed.</li> </ul>
<ul style="list-style-type: none"> <li>Does not pollute the environment as much and does not cause damage for health.</li> </ul>	<ul style="list-style-type: none"> <li>Plans to import the gas, at least at first, will create an additional import dependency on a neighboring country.</li> </ul>
<ul style="list-style-type: none"> <li>Modern high-rise panel buildings, private houses, public buildings, factories and service facilities located remotely from centralized infrastructure can solve their heating and energy needs through an implementation of a self-sufficient independent system</li> </ul>	<ul style="list-style-type: none"> <li>Petroleum gas will limit certain kinds of air pollution currently affecting Ulaanbaatar, but it is still not as clean as renewable energy sources like wind, solar and hydropower.</li> </ul>

**Figure: Map of petroleum gas supply plan**



**Figure 1. Location of 3 gas stations according to General Planning Authority of the capital city**



## PROJECT TO BUILD AN ECOLOGICAL CORRIDOR

<b>ESTIMATED COST:</b>	<b>6 BILLION 155 MILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>8 YEARS</b>

### PROJECT DESCRIPTION:

Population settlement and urbanization including the construction of transportation infrastructure in the form of train tracks and roads, have obstructed and blocked natural migration and movement of animals and plants in the area of Ulaanbaatar. This has created a huge risk to their feeding habits, which makes the population numbers unstable and ultimately can lead to animal or plant species becoming endangered. In order to mitigate these risks and protect the natural balance of flora and fauna, many countries including the USA, Australia and Singapore have developed ecological corridors.

This project would build a 1400 meter wide and 4-5km long elevated strip of wooded area over train tracks and motorway road connecting Kharganat pass of Bogdkhan Mountain with Middle pass of Bayanzurkh Mountain with two exits for train tracks and motorway road. Currently the ecological corridor strip is planning to cover a total area of 2290.9 hectares. The project will also include efforts to rehabilitate the natural environment in the designated areas through measures including reforestation, and increase protection measures through fences, signs and other relevant means.

The purpose of this project is to maintain the ecological and environmental balance of capital city area, create a condition for natural rehabilitation and restoration, to protect and support the breeding of endangered species of animals and plants as well as facilitate the exchange of isolated wildlife population through migration.

### SECTOR ANALYSIS AND STATEMENT OF NEED:

A landscape is a large area composed of ecosystems (the plants, animals, other living organisms, and their physical surroundings). Landscapes often contain patches of both human development and wildlife habitat, a combination which can have a negative effect on wildlife and nature protection. Another way of looking at a landscape is as a mosaic of patches across which organisms move, settle, reproduce, and die. A corridor is a landscape linkage that unites different areas of a habitat and can be critical to an ecosystem. Natural and human-designed corridors can connect two or more patches of habitat. Maintaining or creating corridors in order to link patches that have been artificially disconnected by human developments can increase the use of wildlife habitats, provide avenues for dispersal and migration, facilitate gene flow between populations, and increase likelihood the patches will be inhabited. According to “biological time cycle”, natural migration and movement of wildlife is supposed to be year round, covering all four seasons where feeding, breeding and reproduction of animals and plants is a continuous process.

Species in the Ulaanbaatar region that are under threat due to limited habitat and distribution near urban areas include red deer, moose, musk deer, wild boar, sable, lynx, tabby cat, brown bear, sable, black squirrel, grey wolf, wild goat, mountain goats and musk deer all of which pass through or live in the Bogd Mountain area. Due to human incursions these species are seeing declines in populations, and could potentially become endangered in the Ulaanbaatar region if no changes are made.



According to observations made by wildlife experts, the natural migration corridor of these wild animals goes through Khustai mountain range, along Turgen River, through Bogdkhan Mountain protected area, past Bayanzurkh Mountain to Khan Khentii mountain range protected area. However, the migration path has been blocked by urban infrastructure such as a motorway road and train tracks leading to Nalaikh district which creates an ecological island isolating habitat area for migratory animals, shrinking the habitat and distribution area, restraining natural selection, breeding and reproduction process, creating negative effects of inbreeding and reducing genetic diversity that might lead to the local extinction of certain species.

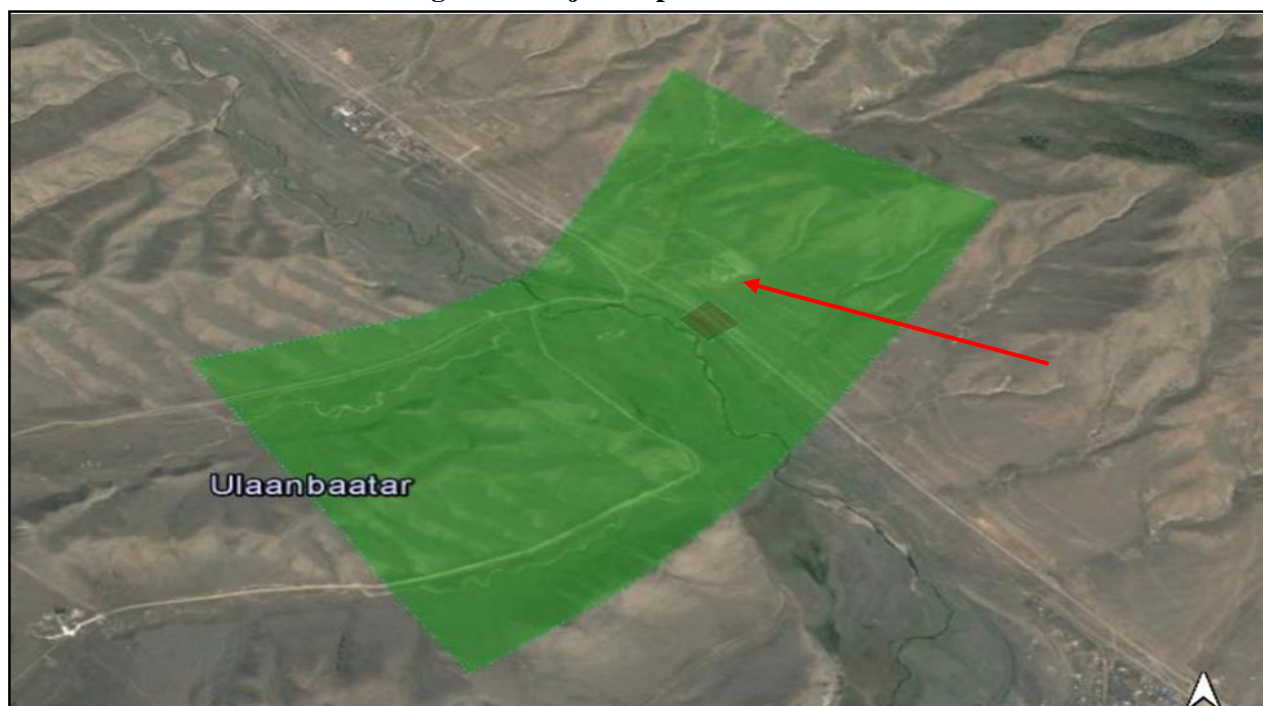
Therefore in order to create a favorable environment for natural selection, breeding and reproduction process for animals and plants, ecological or wildlife corridor must be built connecting Bogdkhan Mountain and Khan-Khentii mountain range to allow migration and movement for wildlife.

#### **DESCRIPTION OF COSTS AND FINANCING PLANS:**

For the implementation of this proposed project, relevant studies and planning must be made in partnership with international environment and wildlife conservation organizations including WWF and Wildlife Conservation Society. Grounded in the findings, funding for construction of the ecological corridor could be raised from international wildlife and environmental conservations.

ARGUMENTS FOR THE PROJECT	ARGUMENTS AGAINST THE PROJECT
<ul style="list-style-type: none"> <li>• Creation of a protected zone will help limit urban expansion and meet expectations set in environmental targets set in the masterplan.</li> </ul>	<ul style="list-style-type: none"> <li>• Because the project is aimed at maintaining ecological and environmental balance it will not generate any profits and revenues, in addition, afforestation and other maintenance costs will put a burden on annual operational expenses.</li> </ul>
<ul style="list-style-type: none"> <li>• Environmental protection programs can often receive significant international support.</li> </ul>	
<ul style="list-style-type: none"> <li>• Maintain ecological and environmental balance of capital city area, improve migration and movement of wildlife and protect endangered species from extinction.</li> </ul>	

**Figure 1. Project implementation area**



**Figure 2. Ecological corridor**



## ECO-RECYCLING PARK PROJECT

<b>ESTIMATED COST:</b>	<b>246.0 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>5 YEARS</b>

### PROJECT DESCRIPTION:

This project aims to provide small businesses working in the recycling industry with new business opportunities by developing two existing landfill sites into parks that include modern infrastructure for sorting and recycling waste. The Eco Parks would be built at the locations of two existing landfills: “Tsagaandavaa” landfill (24<sup>th</sup> khoroo of Bayanzurkh district) which has an area of 92.6 hectare and “Narangiin Enger” landfill (26<sup>th</sup> khoroo of Songinokhairkhan) which has an area of 174.6 hectare.

The project plans to build a complex of plants and factories that recycle waste and raw materials. Specific businesses will focus on the sorting and recycling of waste, as well as recycling of paper, plastic and metal waste into various consumer products. Establishment of the park will enable both sorting and recycling of waste, in addition to manufacturing products for economic circulation that turn waste into income sources. This will have positive environmental impacts including prolonging the usage of materials, and reducing the amount of waste landfill sites and decreasing the pollution of the soil and water.

Establishment of the park will allow for the launch of 20 waste recycling and processing plants in Ulaanbaatar that will produce products with strategic significance such as energy and fuel. Sorting is the first step towards introducing such technologies, and will bring the city closer to the goal of ensuring that 80 percent of overall solid waste to be recycled and processed in the future.

### SECTOR ANALYSIS AND STATEMENT OF NEED:

Along with rising population due to migration to the city, and expansion of the new settlements and residential zones in the capital city, the amount of the waste generated in the city has increased, and keeps increasing at a rapid speed every year in Ulaanbaatar. By the year of 2030, the city will generate approximately 18 to 20 million tons of solid waste. To solve this problem, immediate planning and investment are necessary. In addition, during this time period, an estimated 5.4 to 6 million tons of recyclable waste will be generated, which could offer economic development potential if managed well.

Currently, all solid waste is collected and dumped without formal sorting and recycling in the landfills of Ulaanbaatar city. And they are directly buried through the use of landfill technology. This increases the soil and water pollution. Last year, 1.4 million tons of waste dumped in the landfill site was buried into the ground according to existing landfill technology.

With the increase of waste at collection sites the landfill, designated areas, capacity and resources have been diminishing, which necessitates a decrease in waste generation. Waste recycling processing plants need to be built to reduce the amount of waste. Therefore, waste sorting, recycling and reusing regulations should be developed in a comprehensive manner as medium-term activities. This is important for environmental management as overstretched landfills can create environmental and ultimately health problems.

As the waste at the landfills decompose and degrade, and rainfall penetrates into the waste, and seeps deeply into the soil. These liquids, known as leachate, can contain organic and inorganic contaminants, including heavy metals, and pose a significant threat to health and environment. Leachate can percolate through the sides of the waste piles, and pollute water source, which is even more dangerous. Polluted groundwater can be extracted through wells and can be consumed by people causing illness.

Currently there are approximately 30 small to medium waste recycling and processing plants operating in Ulaanbaatar, which recycle and process waste in order to produce semi-processed or fully-processed products from waste. The proposed eco-park will support small and medium enterprises in the private sector. Currently, the waste recycling and processing businesses that operate on their own financial capitals operate in limited space, and they are located in residential areas, which makes expanding and developing business operations difficult. In addition, there's a lack of integrated management for collecting and receiving recyclable materials. This project can create a solution for comprehensive waste management policy to develop all the recycling industry, which builds recyclable waste collection points, sort, recycle and neutralize waste at their recycling and processing factories.

#### **DESCRIPTION OF COSTS AND FINANCING PLANS:**

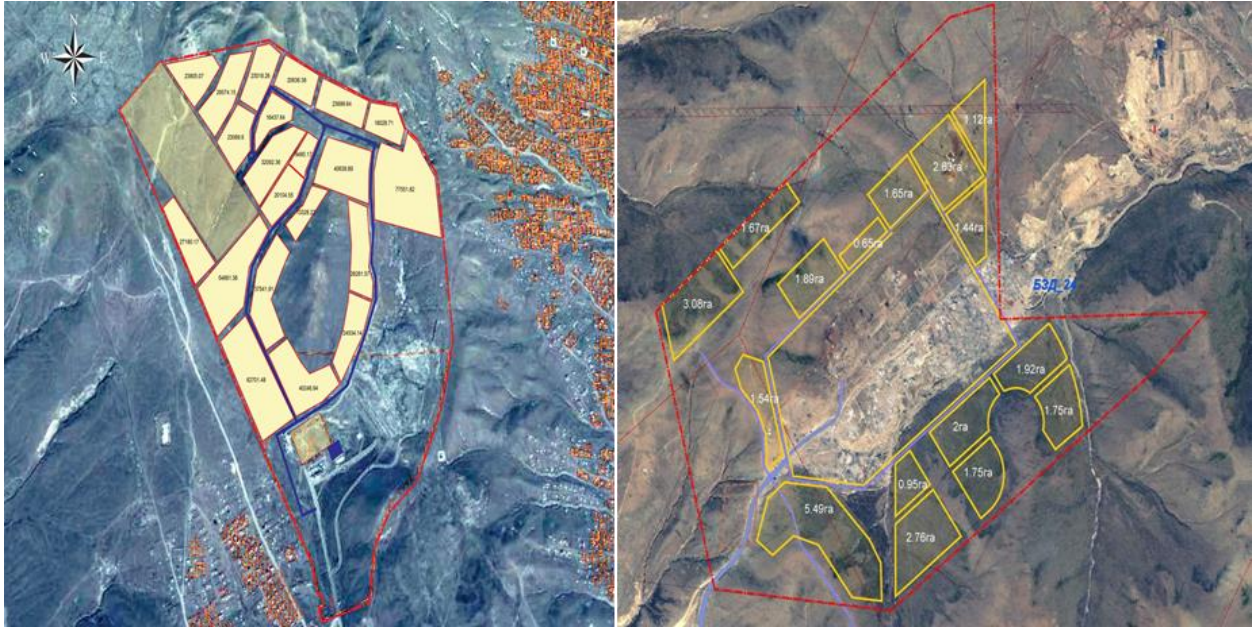
A total of 246 billion MNT investment is required for construction of waste processing plant and its infrastructure in the planned location.

According to the project plan, those larger portions of investment including the construction of a waste processing plant, waste incineration and energy production facilities would be funded by state and capital city budget as well as foreign loans and financial assistance. Segmented schedules and the development of infrastructure of the general facilities will be funded by the state and capital city budgets. In addition, certain private sector funding would be mobilized to develop the factories or other buildings relevant to the specific businesses.

<b>ARGUMENTS FOR THE PROJECT</b>	<b>ARGUMENTS AGAINST THE PROJECT</b>
<ul style="list-style-type: none"> <li>Will reduce environmental impact of soil contamination by burying the waste into the open land.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of knowledge and experience in the field of waste recycling technology.</li> </ul>
<ul style="list-style-type: none"> <li>Will be consistent with green growth priorities of the city.</li> </ul>	<ul style="list-style-type: none"> <li>Further study is needed to fully understand growth potential of relevant businesses.</li> </ul>
<ul style="list-style-type: none"> <li>The eco-production and manufacturing will be developed.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of qualified human resources skilled in the field of waste recycling.</li> </ul>
<b>Direct economic impacts</b>	<ul style="list-style-type: none"> <li>Recycling by private collectors might limit the value of those recyclables actually reaching the landfill.</li> </ul>
<ul style="list-style-type: none"> <li>Will reduce the cost of burying the waste.</li> </ul>	
<ul style="list-style-type: none"> <li>Will increase the employment opportunities</li> </ul>	



**Figure 1: ECO Park planning map**



**Figure 1.** Map of Eco Park located at the “Narangiin Enger” landfill. Red lines depict primary borders of the area. Yellow areas represent locations planned for construction and development of factories and plants. However this is a preliminary map and the final version of the detailed map is being developed by Urban Design Institute of Ulaanbaatar.

**Figure 2.** Map of Eco Park located at the “Tsagaandavaa” landfill. Red lines depict primary borders of the area. Yellow areas represent locations planned for construction and development of factories and plants. However this is a preliminary map and the final version of the detailed map is being developed by Urban Design Institute of Ulaanbaatar.

## **SESSION IV – PROJECTS RELATED TO TRANSPORTATION AND UPGRADING OF BUILDINGS**

### **TEARDOWN AND RE-PLANNING OF OLD BUILDINGS IN “BAGA TOIRUU” AREA**

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<b>ESTIMATED COST:</b>	<b>2,233.3 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>15 YEARS</b>

#### **PROJECT DESCRIPTION:**

This project would be a mechanism for outdated buildings of Sukhbaatar, Chingeltei districts in Baga-Toiruu area (an area covering 243.3 hectares) to be demolished and replaced by modern buildings, or renovated to ensure that city buildings with historical and cultural importance will be protected, so that the area would combine historical and modern architecture. This would ensure healthy and safe living conditions for Ulaanbaatar citizens.

The re-planning area is connected by the road network of Ikh Toiruu, Baga toiruu and Peace avenue streets, and according to a study total of 816 building are counted in the project area. Out of total area, apartment buildings and public lands account for 46.9%, engineering infrastructure zones account for 46.6%, and the remaining area is made of green area facilities and recreational parks.

Project activities and project components to be implemented until 2030 include improvement of land usage of the planned area, improvement of safety and quality of construction, detailed valuation of historical, architectural and city planning buildings and other significant items. This would require classification of buildings into first and second level of state and capital protection. In addition to efforts to restore and preserve buildings, an overall re-planning and renovation of buildings to improve land usage will be undertaken. A total of 128 buildings will undergo restoration and renovation during the project implementation, including 42 apartment buildings and 61 public buildings and facilities such as schools and kindergartens.

#### **SECTOR ANALYSIS AND STATEMENT OF NEED:**

According to survey studies, Baga-toiruu constructions are aging and the quality and workmanship fabrication are not meeting the safety requirements, violating the living norms for healthy standards of air, soil, dust, and noise. The streets and road network categories, as well as throughput traffic capacities are also not complying with required norms and standards. Outdated technology, pipeline and engineering infrastructure networks are no longer reliable.

From Professional Inspection Agency the 123 buildings which are built before 1970 have been determined to be inadequate to meet existing standards, and currently about 5000 households are living in such buildings. Therefore, re-planning will provide improvements in downtown land utilization and land management to create healthy, safe and favorable living conditions for people.

In other hand, city buildings under State protection with historical and cultural importance need to be maintained and reconstructed by retaining by retaining their original design, but with modern outfitting and renovations.

#### **DESCRIPTION OF COSTS AND FINANCING PLANS:**

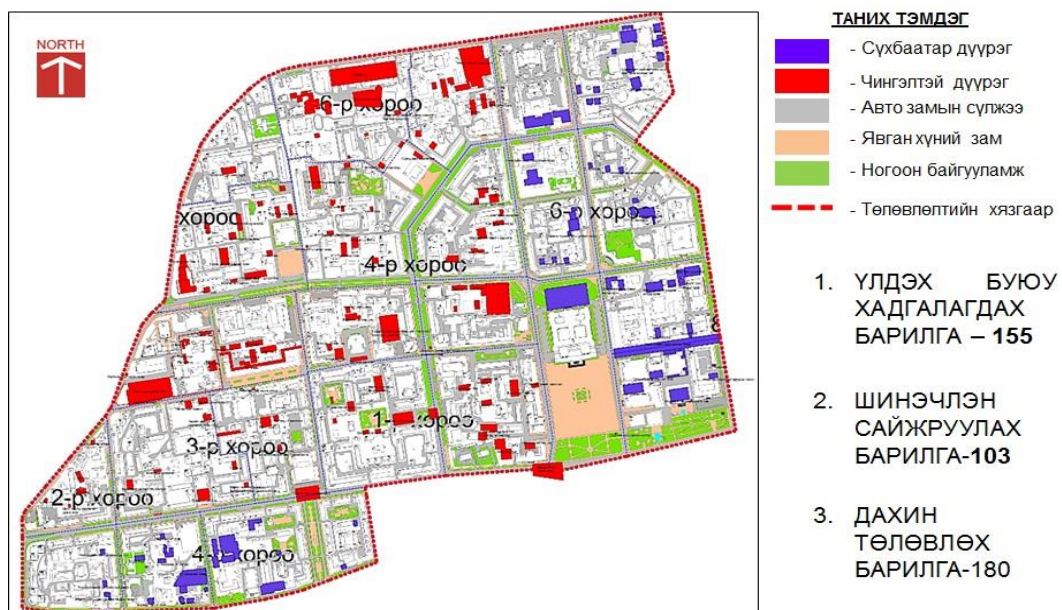
According to feasibility studies the financing amount required for redevelopment of the Baga-Toiruu region construction works are in total of 2233.3 billion MNT. According to the investment estimates: 80 percent or 1783.4 billion MNT of funds will be spent on the construction of buildings and maintenance works; 2 percent or 51.9 billion MNT will be spent for the infrastructure engineering provisions; and 18 percent or 397.9 billion MNT will be expended for road, surface areas, squares and landscaping.

By referring to investments and funding sources by the categories: The 10 percent of total investment or 226.43 billion MNT will be from the State Budget and the rest of 2006.8 billion MNT will be implemented by private sector investments.

<b>ARGUMENTS FOR THE PROJECT</b>	<b>ARGUMENTS AGAINST THE PROJECT</b>
<ul style="list-style-type: none"> <li>By renovation of old buildings the safe and healthy environment for living will be created for people.</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of old buildings by tall and high constructions is likely to increase the density of the population and potentially increase congestion.</li> </ul>
<ul style="list-style-type: none"> <li>The historic buildings and range of architectural spaces of Ulaanbaatar city will be restored for the development of tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Resettlement of apartment residents in the re-planning area can take a considerable amount of time.</li> </ul>
<ul style="list-style-type: none"> <li>Significant opportunities will be created for real estate developers, including foreign investors, to put capital into a key area of the city.</li> </ul>	<ul style="list-style-type: none"> <li>Ger district areas located in the northern part of the city center make the project area a high-level air pollution zone.</li> </ul>



**Figure 1. The Map of Project area**



**SCHOOL AND KINDERGARTEN BUILDING INSULATION AND HEATING  
TECHNOLOGY RENOVATION PROJECT**

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<b>ESTIMATED COST:</b>	<b>60.8 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>5 YEARS</b>

**PROJECT DESCRIPTION:**

This project will improve the insulation for 42 schools and 50 kindergartens. With each coming year the importance of improving energy efficiency is increasing as it is becoming more difficult to supply buildings and facilities of Ulaanbaatar city with heating through the district heating system. Therefore, the capital city has emphasized the need to address this issue by developing various projects to reduce heat loss and increase energy efficiency of old and government owned buildings and facilities.

There are currently 203 schools and 431 kindergartens operating in Ulaanbaatar, out of which 115 schools and 168 kindergartens are state-owned. Of these state-owned educational institutions, 33 percent of 115 schools (38 buildings) and 29.7 percent of kindergartens (50 buildings) are not connected to the district heating system. As for 50 kindergarten buildings not connected to the central heating system, 29 of them have their own heat only boilers, 4 buildings have electrical heaters and the remaining 17 receive heating from contacted suppliers. A majority of these heat only boilers are manufactured in China and Russia.

Research was conducted among state-owned school and kindergarten buildings and facilities to determine the current need for insulation and heating technology renovation. The initial project plan is to renovate 42 schools and 50 kindergartens. The study confirmed that the renovation of insulation and heating technology of schools and kindergartens will not only significantly improve the learning environment for students and children under school age, but also reduce heat loss and increase energy efficiency of state-owned organizations thereby decreasing operational costs and lessening the pressure on capital city budget.

Renovation of insulation and heating technology used in schools and kindergartens will include measures to reduce heat loss of buildings and facilities such as additional insulation for outside walls and roofs, replacement of old and flawed doors and windows allowing heat loss, replacement and insulation of pipes used for heat distribution and heating water circulation in the building and installment of heating energy meter. In addition, heat loss along network lines and pipes from water and heating central network to the buildings and facilities can be reduced. For those school and kindergartens unable to connect to the central heating system, investments in renewable energy will be needed to supply for the hot water and heating demand of schools and kindergartens with local heating systems.

It is estimated that total project construction time will require at least 5 years. To complete construction and maintenance work by 2020, all preliminary preparation work must be done by the end of 2016.

**SECTOR ANALYSIS AND STATEMENT OF NEED:**

There are currently 115 schools and 168 kindergartens which are state-owned. Despite the large number of these institutions, they are insufficient and do not meet the total demand of the city. Even though every year the government is increasing the number of kindergartens, schools, dormitories and sport centers in the country, total capacity, especially of those in the city and settlement areas, is not sufficient to meet the growing demands and needs.

In addition to insufficient number of schools and kindergartens, learning environment conditions of existing educational institutions are inadequate. In part this is due to the fact that the majority of school and kindergarten buildings and facilities suffer from challenges including leaky roofs, cracks and chinks in the wall and deteriorated floors and windows, deteriorated plumbing and pipes, deteriorated ventilation, old electrical wiring, and mold and mildew due to humidity and moisture.

Furthermore buildings of general education schools and kindergartens in Ulaanbaatar city display numerous difficulties such as an absence of any additional insulation on brick walls due to insulation and heating standards adhered at the time, incomplete insulation of roofs, mostly using steam boilers, absence of any water-protection which led to constant maintenance and repair work, poor air ventilation and prevention of heat loss, and use of double-framed wooden doors and windows that are very energy inefficient.

Those schools and kindergarten's which are not connected to the district heating system have high heating and energy consumption and costs due to high levels of building heat loss. These facilities are using coal for generating heat, which has negative impacts on the quality of air. Improvements for these schools to provide hot water and heat with local heating systems using renewable energy will not only significantly improve learning environment conditions of students and children, but also decrease emission of greenhouse gases and contribute to sustainable development.

Overall the high heat loss of Ulaanbaatar city's school and kindergarten buildings and facilities leads to condensation on outside walls in cold seasons. In harsh winter conditions of Ulaanbaatar, this will result in rapid degradation of buildings and uncomfortable living conditions. Also due to absence of any major overhaul repair and maintenance of buildings and facilities, heating systems deteriorate, plumbing lines and pipes are clogged or blocked, regulator valves and switches are faulty or broken which leads to either overheating or insufficient heating. All of these common defects in the building negatively impact on learning and working environment of teachers and students. These are number of reasons supporting the fact that renovation of insulation and heating technology of buildings and facilities must be initiated immediately.

## **DESCRIPTION OF COSTS AND FINANCING PLANS:**

Total maintenance and repair area of 42 schools and 50 kindergartens selected for the initial stage of the project is 259,509 square meters and given that the average cost for insulation and heating renovation for 1 square meter is approximately 290,000 MNT, total investment required to finance the project is 60.8 billion MNT.

Analysis conducted by the German Economic Cooperation and Development ministry funding calculated estimated expenses and potential cost-saving of renovation of insulation and heating technology. 2 types of kindergartens and 5 types of schools built in 1970-1990 according to the same blueprint were selected. Average cost of renovation per 1 square meter of area of a kindergarten building is approximately 260 thousand MNT. Renovation of 40 kindergarten buildings built according to the same blueprint will require 19.4 billion MNT. School building is a 4260.9 square meter building which was built according to the same blueprint in large numbers in Ulaanbaatar city and throughout Mongolia during 1970-1980. To reduce heating energy consumption of 22 school buildings in Ulaanbaatar city will require 22.5 billion MNT.

According to the financing plan, initial investment required to implement this renovation project will come from state and capital city budget, foreign loans and financial assistances as well as other source of funding.

Renovation of insulation and heating technology of school and kindergarten buildings built during 1970's, 1980's and 1990's is beneficial both in terms of investment and construction technological requirements.

Although there are subsidies and discounts granted by the state, heating expenses take up a substantial portion of total operational costs of public service buildings and facilities such as administrative buildings, schools, kindergartens and hospitals which creates a burden on state and local budget. Renovation of insulation and heating technology will significantly decrease heating expenses and greatly improve comfort and interior conditions of the buildings and facilities. Savings from payment based actual usage is not sufficient to cover the funding for renovation of insulation and heating technology, however there will be energy savings for the public budget once the project is completed. Renovation of insulation and heating technology in 42 schools and 50 kindergartens will save 38.3 million kW hour of energy or 4.65 billion MNT annually.

ARGUMENTS FOR THE PROJECT	ARGUMENTS AGAINST THE PROJECT
<ul style="list-style-type: none"> <li>• Positive impact on learning environment, health, hygienic and sanitary conditions of students and children under school age.</li> <li>• Reduction of air pollution which increases during cold seasons.</li> </ul>	<ul style="list-style-type: none"> <li>• Total cost of renovation of insulation and heating technology is very high.</li> </ul>
<b>Direct economic impact</b> <ul style="list-style-type: none"> <li>• Save heating energy.</li> <li>• Decrease operational costs of state budget organizations and lessen the burden on capital city budget.</li> <li>• New jobs will be created in the Mongolian construction sector during construction and development phase of the project.</li> </ul>	<ul style="list-style-type: none"> <li>• It is imperative that government makes necessary changes to support investment in field of renewable energy and energy-saving projects. On the hand, related laws and regulations must be enforced and control and monitoring of implementation and execution must be improved as well.</li> <li>• The envisaged financing of this project is not market-based and will require negotiation with donors to ensure that the full amount does not need to be covered by state budget.</li> </ul>
<b>Indirect economic impact</b> <ul style="list-style-type: none"> <li>• Visual appearance of the buildings and facilities will improve positively impacting overall aesthetics of the city.</li> <li>• Significantly extend the lifespan of buildings.</li> <li>• Usage of renewable energy in schools and kindergartens, for example solar energy can be used to supply hot water and create additional sources of heating for schools and kindergartens located in ger district areas.</li> </ul>	
<ul style="list-style-type: none"> <li>• Positive impact on environment by decreasing emission of CO2 or carbon dioxide pollutant</li> </ul>	

**Figure 1: School and kindergarten building insulation and heating technology renovation project**

In 2012, as part of the “Urban development support program” implemented by the German Society for International Cooperation 3 school buildings were selected for an insulation and heating technology renovation. One of the selected schools was the 63<sup>rd</sup> school of 4<sup>th</sup> khoroo of Khan-Uul district with total capacity of 320 students which was built in 1975.

**Figure 1. Khan-Uul district, 63<sup>rd</sup> school after insulation and heating technology renovation**



**Figure 2. Solar panels installed on the roof of the 63<sup>rd</sup> school for heating hot water**



## TUUL HIGHWAY PROJECT

<b>ESTIMATED COST:</b>	<b>634.3 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>2-3 YEARS</b>

### PROJECT DESCRIPTION:

This is a large scale road network infrastructure project to build a 33km highway along the north bank of Tuul River of Ulaanbaatar city, from Bayanzurkh tollbooth to Darkhan and Emeelt crossroad junction. It represents a horizontal connecting line from east to the west of the city.

The highway will pass through territories of Bayanzurkh, Khan-Uul, Bayangol, Songinokhairkhan districts of capital city and connect to Olympic street, Zaisan road, Chinggis avenue and Sonsgolon road via multi-level intersections and elevated bridges.

A Feasibility study for “Tuul highway project” to build a highway along north bank of Tuul River has already been completed. There is further planning to do on linking this highway to the broader transportation network of Ulaanbaatar, but it would add a higher speed option to those wishing to bypass the downtown area of the city and ultimately decrease some traffic congestion in the city.

### SECTOR ANALYSIS AND STATEMENT OF NEED:

The ongoing upward trend of concentration and migration of population in Ulaanbaatar city has put an enormous burden on its traffic with traffic congestions and jams on every intersection. The increase in vehicles far exceeded population growth: the number of cars per 1000 people has risen 1.6 times. This forecasted acute traffic congestion, which is expected, suggests that a large economic loss will occur. The average vehicle speed in the center part of the city was estimated to be as low as 14 km/h only a few years back. It is evident that Ulaanbaatar city urgently needs a complete reform of its road network and to create a high-level and high-speed road network that will meet the needs and requirements of its citizens. The proposed project is a major step in providing for these pressing needs.

Peace Avenue functions as the main street connecting Ulaanbaatar city from east to west. Although infrastructure development projects have been implemented such as the construction of roads parallel to main axis of the city Sun Road and Peace Avenue, these efforts have not been sufficient to solve the issue of rapidly increasing traffic congestion. Therefore, given that Ulaanbaatar city stretches from east to west, a road across the main axis needs to be constructed which will intersect with the existing main roads in order to decrease traffic congestion and improve traffic movement throughout the territory of the city.

Successful implementation of the project and full integration of this highway into broader plans to update the transportation network as a whole, will not only significantly decrease traffic congestion in center of the city and downtown areas, but will also decrease urban concentration and centralization, facilitate establishment of new settlement areas, decrease downtown air pollution, create new employment opportunities and improve living and working conditions of residents of the city.

### DESCRIPTION OF COSTS AND FINANCING PLANS:

The implementation period of the Tuul highway project is expected to take 2 to 3 years. Although it's a relatively short period of time for such a large scale project, with proper organization and coordination efforts in terms of project management the construction of the road can be completed before the deadline.



Funding sources for the project can include state budget investment and foreign loans and grants. According to the feasibility study implementation of the project will require 634.3 billion MNT. If the decision is made to make this a toll road, there will be the possibility to raise private capital for some portion of construction, or for the public sector to use income from a toll road to recoup some capital costs but not all. Clearly, there is a possibility to consider PPP or concessional, both operating and financing models in this project.

ARGUMENTS FOR THE PROJECT	ARGUMENTS AGAINST THE PROJECT
<ul style="list-style-type: none"> <li>Traffic load and traffic congestion of Ulaanbaatar city will decrease and road network will improve significantly.</li> </ul>	<ul style="list-style-type: none"> <li>Compensation related to relocation and evacuation activities and the complexity of this process would be significant.</li> </ul>
<ul style="list-style-type: none"> <li>Ulaanbaatar city will expand according to general plan and urban concentration and centralization will be reduced.</li> </ul>	
<ul style="list-style-type: none"> <li>Favorable conditions for business operations, trade and service providers along the highway will create employment opportunities and new jobs</li> </ul>	<ul style="list-style-type: none"> <li>Complaints and objections from citizens and business entities due to dust and noise pollution from construction and development work.</li> </ul>
<ul style="list-style-type: none"> <li>Some potential to use a PPP model if the decision is made to introduce this highway as a toll road.</li> </ul>	
<ul style="list-style-type: none"> <li>A range of beneficial spillover effects of major infrastructure spending to number of sectors of economy, such as engineering and construction companies, trade and service companies, logistic companies (to an extent).</li> </ul>	

**Figure 1: Highway planning map**





## TO REDUCE HEAT LOSS OF PREFABRICATED PANEL BUILDINGS

<b>ESTIMATED COST:</b>	<b>807.8 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>10-15 YEARS</b>

### PROJECT DESCRIPTION:

The majority of apartment buildings in Ulaanbaatar city are privatized prefabricated panel buildings constructed during the years of 1970 to 1990. The purpose of this project is to insulate and renovate the walls of 46,462 apartments in prefabricated panel buildings in 14 khorooolols of Ulaanbaatar city within 10-15 years. Prefabricated panel buildings lack proper insulation and thin concrete slabs used for walls are the main reason behind heat loss during cold seasons (8 months of heat supply) in Ulaanbaatar. The current heating rate system adopted by Mongolia is not an efficient mechanism to measure and charge for energy, and it does not create significant financial incentives for resident to invest in limiting their heat and overall energy consumption. Fixed rates are charged based on square meters or the total area of the apartment or house. Some of the residents use their own finances to insulate facades, outside walls, doors and windows in order to reduce heat loss of their apartments.

The renovation project will include the primary set of tasks such as 1) insulation of exterior façade of buildings, replacement of entrance doors 2) repair and maintenance of interior heating radiators, convectors, pipes and plumbing systems and installation of heat measurement and distribution units. The whole building will be insulated in order to improve living conditions by significantly reducing heat loss, preventing frosting and decreasing humidity. Necessary maintenance work will also be completed as part of the project.

Maintenance and renovation of insulation of prefabricated panel buildings can result in saving of 70.65 Gcal/hour of energy, which can be used to supply heat for 9404 apartment buildings. Implementation of the project will lead to saving of energy, reduction of CO<sub>2</sub> emission by 800 thousand tons per year and can be used as an important source of funding for a Clean Development Mechanism. It is estimated that 10-15 years will be required to complete construction and maintenance works.

### SECTOR ASSESSMENT AND STATEMENT OF NEED:

The Government of Mongolia has included energy efficiency strategic goals in its Millennium Development Goals, targeting “incorporating sustainable development principles into and implement national policy and programs, and clean up air pollution of settlements, especially in Ulaanbaatar city”. The current Building Law, Housing Law, and Urban Planning Law of Mongolia provides the necessary legal basis for the updating of the Mongolian building code energy efficiency provisions systems and in 2010 in new standards for the thermal performances were developed with international assistance.

There are 1077 prefabricated panel buildings in Ulaanbaatar city containing 46 thousand apartments where a total of 164 thousand residents live. Since none of these buildings have received any type of repair and maintenance on a professional level since their construction, they are currently in very bad shape and have become some of the worst quality buildings in the city. These buildings are very cold during winter seasons, and some of these buildings are starting to become unhygienic and harmful to health due to mold, mildew and fungus created from humid conditions.

The primary reasons behind this include low quality of construction, lack of any insulation for 30-35cm concrete slabs used for construction of walls, lack of repair and maintenance works and inferior doors and

windows which cannot be completely closed shut that allow air flow of up to 6 times more than required. Rubber fillings and paddings used in concrete slabs dry out, crack, break and creating gaps and holes in the walls causing frosting and disrupting the humidity balance of the apartments. Also, internal piping and plumbing systems of the buildings have deteriorated, with almost 50% of pipes requiring immediate repair and maintenance and constantly cause water leakages. These buildings require large scale major repair and maintenance. If such repair and maintenance works are not performed throughout the city, major part of apartments in Ulaanbaatar city will deteriorate and overall appearance of the city will decline as well.

A majority of prefabricated panel buildings are connected to the centralized heat supply network. Although certain parts of the heat supply network were renovated as part of a project funded by the ADB, there is significant heat loss due to aging buildings and lack of insulation. Therefore in order to save the total consumption of energy by Ulaanbaatar city, there is a need to insulate and winterize prefabricated panel buildings and perform technical renovation and maintenance works. This will not only improve current living conditions but prevent buildings from further deterioration as well.

Renovation of insulation and heating systems of prefabricated panel buildings is the lowest cost method to increase profitability, capacity, effectiveness and efficiency of Ulaanbaatar city's heat supply network. In addition, abovementioned renovation and maintenance works will not only significantly reduce heat loss it will also decrease total consumption of energy of households by 30%.

## **DESCRIPTION OF COSTS AND FINANCING PLANS:**

Implementation of the project to reduce heat loss of prefabricated panel buildings through heating and insulation renovation requires total investment of approximately 807.8 billion MNT, out of which 552.5 billion MNT is required for insulation of exterior façade and 255.3 billion MNT required for renovation of internal piping and plumbing system of buildings.

Required funding has been estimated for each of 14 khoroolols of 46,000 households, and on average approximately 17.8 million MNT is required for each apartment or household. Given that all of these apartments have been privatized, a specific mechanism needs to be clearly defined to facilitate state and capital city budget investment into private property.

The following alternatives can be considered to recompense the costs or repay the loans, based on repayment terms and conditions of the selected funding mechanism. They include, additional charges added to heating and utility bills, monthly fees collected from owners of renovated buildings, repayment of the loan by residents, annual grants and support from the City administration or the Government and Clean Development Mechanism funding.

Housing owners will be beneficiaries of the renovation project. Living conditions and comfortability will improve significantly. By addressing the issue of lack of major overhaul repair and maintenance work of buildings and facilities real estate sale and rent value will increase as well. Therefore, housing owners have a major role and accountability in terms of project funding. It is important that every year housing owners and residents contribute to compensation of initial investment made for the project. So a funding mechanism with small amount of financial burden on residents needs to be defined to successfully implement this project in a short amount of time. In order to define this mechanism, specific functions, roles and responsibilities of state authorities, housing owners associations and apartment owners need to be clearly defined as well.

The project is aimed at solving not only housing renovation issue but the issue of increasing energy efficiency as well.

ARGUMENTS FOR THE PROJECT	ARGUMENTS AGAINST THE PROJECT
<ul style="list-style-type: none"> <li>Better, warmer and more comfortable apartments and increased value of real estate.</li> </ul>	<ul style="list-style-type: none"> <li>Will create a financial burden on residents and it is uncertain how willing residents will be to participate.</li> </ul>
<ul style="list-style-type: none"> <li>Better insulation will lead to reduction of heat loss, noise pollution and dust.</li> </ul>	<ul style="list-style-type: none"> <li>Most apartments are in private ownership and specific regulatory framework related to these improvements of apartment buildings is not in place so there is a need for a regulatory and legal framework.</li> </ul>
<ul style="list-style-type: none"> <li>Will promote appropriate and rational consumption of energy.</li> </ul>	
<ul style="list-style-type: none"> <li>Decreased heating bills for residents.</li> </ul>	
<p><b>Direct economic impact</b></p> <ul style="list-style-type: none"> <li>Renovation and insulation of apartment buildings will save thermal energy that can supply heat to 9404 households.</li> <li>Total energy saved from prefabricated panel building in 14 khoroolols is estimated at 70.3 Gcal/hour or on average 31% of energy consumption.</li> <li>4275 job positions per year during the project.</li> </ul>	<ul style="list-style-type: none"> <li>Need to develop a model for residents to jointly opt in as renovation has to happen at the level of an entire apartment building rather than individual households.</li> </ul>
<p><b>Indirect economic impact</b></p> <ul style="list-style-type: none"> <li>Positive impact on the environment due to reduction of emission of CO<sub>2</sub>.</li> <li>Significant increase in overall quality of living conditions, repair and maintenance works on private and publicly-owned buildings can lead to increase in value of real estate.</li> <li>Extend the lifespan of buildings by 30-40 years.</li> </ul>	

### **Figure 1: Project to reduce heat loss of prefabricated panel buildings**

In 2007, renovation and insulation project was successfully implemented for building No. 8 located near Bayanburd (5 story prefabricated panel building). As a result of this pilot project, apartments in the building became warmer, energy efficiency increased by 30 percent and visual appearance of the building improved.



**Figure 1. 5<sup>th</sup> khoroo of Chingeltei district, building No. 8 after the renovation and insulation project**

## ULAANBAATAR METRO

<b>ESTIMATED COST:</b>	<b>2 TRILLION 985 BILLION MNT</b>
<b>ESTIMATED TIME FOR COMPLETION:</b>	<b>6 YEARS</b>

### PROJECT DESCRIPTION:

The Ulaanbaatar Metro Project would be Mongolia's first-of-its-kind urban rapid rail transit project, with large infrastructure, huge underground tunneling and elevated structural work. The Ulaanbaatar Metro Project proposes to build a one line metro system with 14 stations stretching from Tolgoit to Amgalan.

There would be 6 trains, initially running every 8-9 minutes during peak hours, and eventually running every 5 minutes for peak times. The metro is calculated to be able to carry 10,729 passengers moving a single direction during peak hours initially, and 17,767 passengers eventually. The planned line has no sharp turns and the distance between stations allows a maximum speed of 100 kmph. Total travel time from Amgalan station to Tolgoit station would be approximately 27 minutes.

The line will have underground stations in the city center, but will run over ground in the suburban areas. In the downtown area the underground stations will provide the opportunity to develop underground retail spaces. In the suburban areas the overground stations will contribute to plans to develop hubs of commercial activity outside of the city center that is part of the city's Master Plan for development.

### SECTOR ANALYSIS AND STATEMENT OF NEED:

The Ulaanbaatar city population of 590,000 in 1990 had almost doubled by 2015 to 1,300,000, and Mongolia's urban population rose from 27% in 1990 to 43.3% in 2015. This trend is continuing as migration into the capital Ulaanbaatar rises. The increase in vehicles far exceeded population growth.

Ulaanbaatar city transport currently is entirely vehicles (bus and trolleybus). An estimated 600,000 people use public transportation every day, with a total fleet of more than 1,000 vehicles currently operating on Ulaanbaatar's roads.

Over the last 35 years, some new roads had been built i.e. Sun Road and a parallel road along Peace Avenue (the main axes), but the network is still unable to cope with the growth in vehicles. Hugely increased traffic has resulted in congestion, while poor traffic control, a culture of poor driving habits and increased parking needs have added to the burden and increased congestion. The rise in the number of private vehicles has begun to overwhelm the main roads of Peace Avenue and Chinggis Khan Avenue. It is estimated that transport costs will increase by 1.6 times, of which travel time costs (TTC) will comprise two thirds, due to congestions. This traffic has negative environmental consequences including air and noise pollution, a bad effect on the economy as there is loss of productivity due to increased transit times, damage to roads and other infrastructure. There is also a social costs for families and residents losing time in traffic.

Without reform of the current road and transport network, traffic density will double by 2030. A metro would offer possibilities to reduce the number of people driving in the city center, while also creating economic opportunity both by stimulating the transportation sector in Mongolia, and as there would be significant potential for commercial and retail development to be stimulated along the metro line.

## DESCRIPTION OF COSTS AND FINANCING PLANS:

Estimated investment of US\$1.5 billion is required to implement the Ulaanbaatar Metro project. US\$1.3 billion would be needed for construction and infrastructure of the project. A further US\$200 million would be needed to purchase the rolling stock and operationalize the system.

According to the current feasibility study, the financing model would require foreign preferential loans and financial assistance for the infrastructure, and the infrastructure would be owned by the Government to lease to a company which operates the metro transportation. In other word, the private sector will purchase rolling stock and other necessary equipment, and operate the metro transportation system, and the Government will provide necessary and positive environment for operation. This is how the project will be implemented through a PPP arrangement.

Once the metro line becomes operational, income from the ticket sales is estimated to pay back the private investment, and local economic benefit would be 18.6-20.6%, according to the calculations.

ARGUMENTS FOR THE PROJECT	ARGUMENTS AGAINST THE PROJECT
<ul style="list-style-type: none"> <li>Underground location downtown will minimize impact on noise or visual appearance of downtown Ulaanbaatar.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for noise pollution and need to acquiring land for stations in sub-urban areas.</li> </ul>
<ul style="list-style-type: none"> <li>Creates opportunities for commercial retail spaces both in and around underground stations, as well as near overground stations.</li> </ul>	<ul style="list-style-type: none"> <li>Additional capital costs needed for development of infrastructure for commercial activity and landscaping.</li> </ul>
<ul style="list-style-type: none"> <li>Underground work on metro will provide opportunity to upgrade or renovate existing outdated utility networks in the city at lower cost than upgrading separately.</li> </ul>	<ul style="list-style-type: none"> <li>Long-term and stable source for financial investment is required.</li> </ul>
<b>Direct economic impact</b> <ul style="list-style-type: none"> <li>The real estate market along the Metro line will be stimulated.</li> <li>National and municipal revenue from taxes will increase.</li> <li>By 2030, 156,000 jobs will be created from the Ulaanbaatar Metro Project.</li> </ul>	<ul style="list-style-type: none"> <li>Mongolia lacks experience and know-how in this sector, as this metro rail would be the first-of-its-kind in Mongolia. This will require strong partnership with more experienced countries and entities to reduce risks.</li> </ul>
<b>Indirect economic impact</b> <ul style="list-style-type: none"> <li>Reduction in travel times, stimulating the economy.</li> <li>Downtown traffic congestion will reduce.</li> <li>Most up-to-date and advanced technology will be introduced, and experienced national human resource will be created.</li> </ul>	<ul style="list-style-type: none"> <li>The floating currency exchange rate also poses a risk for repayment, if the loan is acquired in foreign currency.</li> </ul>
<ul style="list-style-type: none"> <li>Easy travel to downtown impacts positively on livelihoods and stimulates urban center business.</li> <li>Fewer vehicle accidents, improvement in safety, reduction in social expenditure.</li> <li>Potential for synergies for other planned investments such as the North-South running Bus-Rapid Transit line that is being planned.</li> </ul>	<ul style="list-style-type: none"> <li>Amendment and improvement in existing national laws and regulations in relation to urban railway system is necessary.</li> </ul>
<ul style="list-style-type: none"> <li>Reduced CO2 emissions to help the environment (34,000 tons of CO2 and 1,754 of N2O in reductions).</li> </ul>	



**Figure 1: Planned Map for Metro**

