

TABLE OF CONTENTS

A. GENERAL INFORMATION

B. PROJECT OBJECTIVES

C. SCOPE OF WORK

D. PROJECT INTRODUCTION:

E. RECEIVING SET (OUTCOME OF THE PROJECT)

F. REQUIREMENTS FOR FEASIBILITY STUDY AND DETAILED DESIGN

G. SPECIAL CONDITIONS

A. GENERAL INFORMATION

- Decree No. A/720 dated June 19, 2024 of the Governor of the Capital City and the Mayor of Ulaanbaatar
- Planned route: As part of the project, Ulaanbaatar City Ikh Toiruu Street Road / East Intersection - Sansar Roundabout Intersection - Bayanburd Roundabout Intersection - West Intersection – Narnii Bridge - Atar Urguu East Intersection - Intersection of 120 Myangat with Camel statues – Intersection of Ikh Mongol Street – Ikh Khuree Street, Narnii Road intersection/ are planned for re-engineering. According to this route, environmental and architectural planning will be conducted, including studies on land conditions, resettlement, landscape analysis, and mapping of alternative solutions and recommendations along the designated corridor. The architecture will align with the cross-sections and dimensions of the streets, roads, and road structures. In accordance with the planning framework, cross-sections will be classified into partial and prominent sections. In areas where the route intersects with engineering structures, highways, and road networks, an optimal solution for traffic management will be preliminarily developed. 3D renderings and background images will be created for key locations along the project’s route. Based on these plans, land surveys will be performed, and underground and aerial network data will be reviewed and clarified. It is also necessary to coordinate the proposed planning solutions with engineering network information to ensure consistency and integration across all project components.
- The selection of an international consulting firm specializing in road, infrastructure, urban public transport, and project management services will be organized to serve as the management Consultant for the “New Ring Road” Project of the Ulaanbaatar Capital City /Ikh Toiruu Street Re-planning Sub-Project/ by the decree of the Governor of the Capital city and the Mayor of Ulaanbaatar city. The consulting firm will provide professional and technical support throughout all stages of the project. It will also play a key role in addressing existing challenges in Ulaanbaatar's public transport and road sectors and effectively ensuring the seamless integration of public transport, road networks, and systems.

B. PROJECT OBJECTIVES

- The main objectives of the “New Ring Road” Project of the Ulaanbaatar Capital City /Ikh Toiruu Street Re-planning Sub-Project/ are:
 - To disperse traffic density
 - To evenly distribute the traffic congestion
 - To update the detailed design and feasibility studies of road congestion reduction projects and measures to the current conditions and increase efficiency
 - To reduce traffic congestion /The capacity of major intersections of the main streets of the city center will be increased by 7-23%/
 - To relocate utility lines along the main street to partial access canals
 - To integrate and implement multiple separate projects

C. SCOPE OF WORK

- Limits and Scope of planning:
 - Districts along the route alignment:
 1. Bayangol district /2, 3, 16, 24, 26th khoroo/
 2. Bayanzurkh district /1, 2, 3, 7, 15, 14, 18, 25, 26, 29, 36, 42nd khoroo/
 3. Khan-Uul district /1, 2, 3, 15, 18, 19, 20th khoroo/
 4. Chingeltei district /2, 5, 6, 9th khoroo/
 5. Sukhbaatar district /6, 7, 8, 9, 10, 11th khoroo/
 - Streets and roads along the route alignment:
 1. Namyanju Street
 2. Niislel Khuree Avenue
 3. Ikh Khuree Street
 4. Chinggis Avenue
 5. Engels Street
 6. Narnii Bridge
 7. Undsen Huuli Street
 8. Enkhtaivan Avenue
 9. S. Amarsanaa Street
 10. L. Enebish Avenue
 11. Ikh Toiruu Street
 - Major intersections along the route alignment:
 1. East Intersection
 2. South-west intersection of Narantuul International Trade Center Market
 3. Southeast intersection of Emart Khan-Uul branch
 4. Intersection of 120 Myangat with Camel statues
 5. Intersection on the left side of Atar Urguu LLC
 6. MUST, the intersection of the north-west side of the School of Mechanical Engineering and Transport
 7. West Intersection
 8. Northeast intersection of the Grand Plaza
 9. Intersection with the statue of L. Enebish
 10. Tasganii Owoo Intersection
 11. Bayanburd Roundabout Intersection
 12. Dulguun Lake Intersection
 13. Ulzii Center intersection

14. 100 Ail Intersection
15. Dari-Ekh Intersection
16. Sansar Roundabout Intersection
17. East side intersection of Sansar Tunnel

D. PROJECT INTRODUCTION:

1. Concept of the Project

1. The role of the Project Management Consultant (PMC) is to provide professional consulting services for development of the Feasibility study, Foundation study, and design to Project Implementation Unit (PIU).
2. Designing and handing over the design of the sub-project of re-planning the Ikh Toiruu Street Road.
3. Develop planning solutions with multiple options, discuss and agree with relevant organizations. For example:
 - a. To design bridge structures and interchange along the planned route;
 - b. To design major intersections as multi-level structures, and widen and upgrade straight road sections at the same level along the planned route;
 - c. To design solutions which will be implemented at a single level as well as in combination with above-ground and underground structures along the planned route;
 - d. To design certain sections as bridge structures, while others will be combined with tunnel structures at the same level along the planned route;
 - e. To research and plan the route of new road construction in areas of the city that require development in terms of social, economic, and engineering infrastructure, expand Ulaanbaatar's road network, support the economic potential of residents in ger districts, and minimize land acquisition.
4. It is necessary to pre-estimate the following risks that may arise during the implementation of the project, to determine possible solutions for the complicated parts of the engineering infrastructure in accordance with the actual situation, and to work on developing a solution method (not limited to this). Including:
 - a. To cooperate with relevant organizations to maintain the normal conditions of use of above-ground and below-ground engineering networks along the planned routes and coordinate them with the conditions of buildings and structures;
 - b. To properly organize the automobile flow, public transport, and traffic of pedestrians to be safe and comfortable during the work of the project, since the planned route is in the area of Ulaanbaatar city with high population and traffic density;
 - c. To develop a plan ensuring the normal operation of enterprises and the safety of residents along the planned route;
 - d. To pay attention to the transportation and logistics planning and applicable regulations, taking into account the project construction period and the limited space of the temporary work area;
 - e. To develop a plan and methodology to take measures to prevent complications that may arise, taking into account the sensitivity to vibrations that may occur during the construction of highways and road structures in buildings located along the route. Additionally, to follow the relevant laws and regulations of paleontology, archeology and ethnographic research;

Turnabout coordinates every 100 meters

	X	Y		X	Y
1	640265.362	5306147.087	56	641499.3184	5309672.493
2	641555.305	5306822.355	57	641408.6794	5309630.27
3	645327.19	5305958.969	58	641318.6408	5309586.761
4	645178.5258	5309120.962	59	641228.6022	5309543.252
5	645086.6231	5309592.081	60	641216.7335	5309477.508
6	645178.5258	5309120.962	61	641231.6596	5309379.005
7	645220.9756	5308126.162	62	641240.2415	5309279.374
8	645022.0585	5307270.111	63	641248.8235	5309179.743
9	641479.4377	5307208.409	64	641257.4054	5309080.112
10	641574.0506	5308184.261	65	641274.5693	5308880.849
11	641265.9874	5308980.48	66	641283.1513	5308781.218
12	641590.4818	5309713.594	67	641291.7332	5308681.587
13	642507.7832	5310093.544	68	641300.3152	5308581.956
14	643497.6505	5310235.4	69	641308.8971	5308482.325
15	644486.6518	5310242.219	70	641376.8665	5308432.819
16	644675.5811	5310176.383	71	641475.3488	5308415.463
17	644581.0754	5310209.255	72	641565.7418	5308383.062
18	645163.3072	5309199.501	73	641570.2267	5308283.936
19	645144.284	5309297.675	74	641601.4974	5308089.014
20	645125.2609	5309395.849	75	641602.0076	5307989.043
21	645105.9886	5309493.974	76	641602.0076	5307889.043
22	645067.2577	5309690.188	77	641592.7259	5307789.504
23	645047.8922	5309788.295	78	641581.4995	5307690.143
24	645026.8498	5309886.053	79	641563.222	5307592.145
25	645004.9894	5309983.595	80	641527.9818	5307498.731
26	644952.6766	5310063.694	81	641488.9947	5307406.676
27	644863.6128	5310108.721	82	641475.0634	5307308.314
28	644769.9923	5310143.639	83	641483.812	5307108.505
29	644388.4241	5310260.09	84	641488.1863	5307008.601
30	644289.6905	5310275.954	85	641492.5606	5306908.696
31	644191.1687	5310293.081	86	641499.1469	5306809.201
32	644092.4368	5310308.181	87	644610.247	5307099.643
33	643992.5806	5310305.291	88	644653.4151	5307114.868
34	643893.0617	5310295.779	89	644745.5936	5307153.638
35	643794.1824	5310280.885	90	644837.7721	5307192.409
36	643695.3385	5310265.723	91	644929.9506	5307231.179
37	643596.4945	5310250.562	92	645113.2968	5307311.045
38	643398.8066	5310220.239	93	645204.535	5307351.979
39	643299.853	5310205.814	94	645255.0849	5307428.53
40	643200.8766	5310191.542	95	645242.8881	5307527.783
41	643101.9003	5310177.271	96	645233.1454	5307627.293
42	643002.9239	5310162.999	97	645224.5764	5307726.925
43	642903.9476	5310148.727	98	645216.0074	5307826.557

44	642804.9712	5310134.456		99	645213.0528	5307926.319
45	642705.9948	5310120.184		100	645217.0142	5308026.24
46	642606.9755	5310106.228		101	645224.9246	5308226.084
47	642408.5909	5310080.86		102	645228.872	5308326.006
48	642310.9508	5310060.093		103	645232.8194	5308425.928
49	642220.9721	5310017.525		104	645236.7668	5308525.85
50	642131.631	5309972.635		105	645240.7142	5308625.772
51	642041.7225	5309928.858		106	645240.5304	5308725.761
52	641951.814	5309885.081		107	645231.7879	5308825.17
53	641861.9055	5309841.303		108	645214.4446	5308923.645
54	641771.9969	5309797.526		109	645196.5679	5309022.034
55	641681.6452	5309754.694				

6. Project's General items are shown in the Table 1.

Table – 1: General items

1	Project Name	"New Ring Road" Project of the Ulaanbaatar Capital City /Ikh Toiruu Street Re-planning Sub-Project/
2	Client	Governor's Office of the Capital City
3	Project Implementation Unit	Integrated Project Implementation Unit of the Capital of Ulaanbaatar for Traffic Congestion Reduction
4	Project Contractor	Through selection
5	Project Period	12 months after the conclusion of the contract
6	Funding Sources	State budget
7	Client address	Governor's Office of the Capital City, 23 Khoroo, Khan-Uul District, Ulaanbaatar City

7. Expected impact and outcomes of the project:

a. Traffic:

To investigate the causes and conditions of traffic congestion and delays and implement measures to eliminate them;

b. Transportation:

Implementation of the Government policy on auto transport, development of optimal structure of all types of transport and efficient integrated transport network;

c. Green Transportation:

Establishing a green transportation network in the central region of Ulaanbaatar (Green transportation consists of environmental friendly public transportation and non-motorized transportation, such as bicycle paths and pedestrian paths. Along with the development of the city and the growth of the population, the right lifestyle, health, needs, and concentration of people development of non-motorized transport networks based on escape and interest);

d. Engineering infrastructure and access channels:

By combining engineering networks and placing them in access channels, the coordination of utility organizations will be improved, the proper planning of underground use of buildings, the safety of urban engineering networks, ensuring safe working conditions, economic efficiency, low operating costs, and advanced technology will be used to perform work and fulfill the requirements for ease of maintenance.

e. To integrate and implement multiple separate projects:

8. Duration of work: Shown in the Table -2.

Table – 2.

Title	Duration period	Date
To start the Consultant's work	1 month	December 2024
To develop the Feasibility study and Technical Design	8 months	August 2025
To let the draft of the Feasibility study to be discussed by the Science and Technology Council under the Ministry of Road and Transportation of Mongolia and present at the meeting of the Science, Technics, and Technology Council of the Ministry of Construction Urban Development.	1 month	September 2025
To complete the Feasibility study and the set of design in Mongolian and English versions and hand over to the Client (1 original, 3 copies, in PDF, DWG and 3D images formats, videos in hard and soft copies as well)	1 month	October 2025
To develop tender documents for the selection of EPC contractor, Terms of reference (TOR)	1 month	November 2025

E. RECEIVING PACKAGES (RESULTS)

One. FEASIBILITY STUDY:

Formation of written documents (Written details):

- Current situation analysis and report of demand assessment;
- Basic studies and case studies of urban planning;
- Geodetic measurements, surveys, and analyses;
- Engineering-Geological Survey, Analysis (certified by the State expertise);
- Environmental Assessment and analysis;
- Detailed Environmental Assessment (to be approved by an authorized agency);
- Land Usage, Land vacation, Real Estate, and Resettlementn Surveys, Estimates, and Plans;
- Hydrogeology measurement, survey, calculation, and water infrastructure planning solution;
- A version of a solution for planning of drainage system and, calculation and survey;
- Project Concept , a version of an urban spatial analysis and planning solutions;
- Traffic Intensity, Traffic Capacity, and Traffic Safety Analysis, Calculation, and Planning Solution Options;
- Transportation Demand and Supply Analysis, Calculation and Modeling;
- Within the research framework to establish the connection between the complex social, economic and environmental issues of Ulaanbaatar city, by assessing their current level and define the development policy planning and risk assessment by the method of system dynamic modeling;;

- Correspond with the research on Ulaanbaatar City Sustainable Transport Strategy with the Project Study Ulaanbaatar city;
- Coordination with the feasibility study of updating the smart transportation system of Ulaanbaatar city;
- Coordination with the Strategic Planning of Public Transport implemented by the Sustainable Roads and Transport Project Unit of Ulaanbaatar city;
- Financial, investment, and expense accounting;
- Based on Mongolia's economic growth forecast, study the scope and opportunities of financing and prioritize the stages of implementation according to the possibility of implementation;
- Computing FAR and BCR of adjacent environment, buildings-facilities and affected units, relocation market valuation, environmental conditions, solar radiation, environmental buildings;
- Evaluation, analysis, and recommendations /carry out technical and economic studies, evaluations, calculations, analyses, and analyses to determine the economic impact of the project/;
- Analysis of gravel, rock, and sand deposits /Designing to minimize the transportation distance from the project location for each filler material to be used in road construction/;
- Implementation Action Plan;
- Develop network graphics and scheduling for the construction work;

Formation of drawing documents:

- Description (volume);
- Outline of the location and development of the territory of Ulaanbaatar city M1:25000;
- Current Status and Environmental Outline M1:5000;
- Current version of mapping (ground plan) with the M1:500;
- ORTHO /aerial imaging method/, DME /altitude modeling/ image with M1:1000;
- Project Spatial Planning Solution Model M1:2000;
- M1:500 map of the intersection/route/ of the project area;
- Model Street, Road Network and Traffic Planning Solution M1:2000;
- Transport Planning Solution Model M1:2000;
- Model Planning Solution for Bridges, tunnel, and Multi-Level Intersections, Figure M1:2000;
- Water Facilities and Engineering Grid Planning Solution Model M1:2000;
- General Plan Framework M1:2000;
- Urban Development, Land Usage and Zoning Planning M1:2000;
- Road Network (Roads, Cycle Paths, Footpaths) Layout M1:2000;
- Transport network (public transport, freight etc.), high-capacity stops planning M1:2000;
- Green Facilities and landscape Planning M1:2000;
- History, Culture, Tourism and Recreation Planning M1:2000;
- Land Vacation and Resettlement Planning /Social and Engineering Infrastructure, Roads, Bridges, Water Planning Red Lines, Protected Lines/ M1:2000;
- Waste Management Planning M1:2000;
- Disaster Management Planning M1:2000;
- Engineering Preparation, Altitude, Red Line M1:2000;
- Heat Supply Line Network Planning M1:2000;
- Water Supply and Sanitation Pipeline Network Planning M1:2000;
- Electricity Supply Planning M1:2000;
- Communications Network Planning M1:2000;
- Model;
- Visibility, 3D Dimensional Graphics and Motion Graphics /Video Animation/;

Two. DESIGN:

- Cover sheet;
- Drawing list, description;
- Technical requirement;
- Location scheme;
- Overview of environment M1:5000;
- Ground plan M1:500;
- Longitudinal section – horizontal M1:1000, vertical M1:100;
- Cross section M1:100;
- Cross road, section M1:500;
- Structure M1:20

- Compartments M1:10
- Construction general plan M1:500;
- Distance and measurement M1:500;
- Cartograms M1:500;
- Elevation M1:500
- Pavement estimation (selection of pavement layers structures and base layer, lower layer thickness calculation);
- Quantification of work and work classification;
- Work performance instruction

Three. DEFINING TECHNICAL UTILIZATION LEVEL:

- Assessment report of technical utilization level;
- Comprehensive research and conclusions on the geometric dimensions of highways, road structures, and bridge structures, as well as their strength, load capacity, technical specifications, and their impact on traffic;
- Design;
- Description

Four. BUDGET:

- Budget
- Estimating the budget for each design (both detailed and by unit price), and create a total budget;
- Defining the consulting services' budget;
- Conducting budget of temporary buildings, and technological road and bridge;
- Economic estimation and budget should be calculated by the special program/software that are permitted by the authorized State organizations according to the Mongolian laws and regulations;
- Budgeting phases in line with the implementation action plan;

F. REQUIREMENT OF FEASIBILITY STUDY AND TECHNICAL DESIGN

Requirement of developing the feasibility study:

One. Base feasibility study;

- Situation analysis;
 - Study and analysis of macro-economic situation;
 - Demographic study;
 - Situation analysis of project implementation sectors and sub-sectors (Situation analysis of project implementation sectors and sub-sectors; Policy study of project implementation sectors and sub-sectors);
 - Situation analysis of project implementation regions, and local area (General information, Development of the regions that will benefit from the project, Project implementation sectors and sub-sectors' regional development);
 - Analysis of the legal framework;

- Develop a study of street and highway networks, public transport routes, timetables, and passenger transportation services;
- Research on the intensity of road traffic, research on the intensity of pedestrian traffic on public streets, squares, parks and service organizations with a high concentration of human traffic and make conclusions and recommendations;;
- Analyzing environmental, landscape, and green facilities;
- Conduct a survey of units and public lands related to land ownership, possess, and usage, and develop a cost estimate associated with land vacate;
- Conducting exploration and research by professional organizations in paleontology, archaeology, and ethnicity and obtain a permission;
- Conducting flood hazards and risk assessments;
- Develop a solution to facilitate the movement of citizens in the recreation area;
- Conduct investigations, analyses, and recommendations on how to operate within the framework of applicable laws and regulations regarding the conduct of research and construction work in the river basin;
- Develop a plan for the removal of rain and snow water from towns, villages, and roads, based on the Capital Highway Master Plan and the Drainage Line Master Plan related to the planning of the storm water drainage line network;
- Determination of storm water drainage network and facility layout and feasibility studies, and determination of the location of lift pumps and pumping stations;
- Complete assessment on urban development;
- Engineering geology and climatic comprehensive research;
- Conducting an environmental assessment;
- Study of trees, shrubs, and plants for use in green areas;
- Animal and plant research;
- Engineering infrastructure research;
- Workplace research;
- To determine whether the existing roads, road facilities, engineering network infrastructure can be used for the project;
- Surveys from citizens and the public;
- To collect Citizen Public Opinions by a Classifications mentioned below:
 - Polling by affected citizens from enterprises /enterprises organizations, citizens and residents located along the highway/;
 - Get opinions on the project effectiveness, appearance, and whether to support it /by random selection/;
 - From the persons who use the road to be implemented under the project /citizens with vehicles, enterprises and organizations providing transportation and delivery services/ e.g.
- To provide suggestions and recommendations on how to organize citizen involvement in projects and events;
- To determine the possibility of interrelation of previously developed urban planning documents, feasibility studies, and design in the project area;
- Evaluate and evaluate current research;

Two. Planning, estimation:

- Develop planning solutions for roads, bridges, and engineering network facilities at technical design level and coordinate with relevant organizations;
- Alignment of the city of Ulaanbaatar with the General Development Plan until 2040 (coordination with the Department of Urban Planning and Urban Standards of the Capital, "Institute of Urban Planning and Research of the Capital");
- Develop proposals for road and road infrastructure planning, traffic management, and intensity management;
- Develop climate-appropriate solutions by researching technologies that include solutions for the infiltration, absorption, storage, and purification of surface water in road and road structures;
- Development of green solutions with a low proportion of solid surface occupancy that meets the conditions for natural water absorption to reduce flood risk;
- Develop estimates of the number, capacity and route of public transport service stops;
- Selective planning of the use of canals and tunnels for access to engineering networks, highways, railroads, intersections, and places where it is essential;
- Develop options for creating a workforce resource; A detailed calculation of social and economic impacts;
- Conducting research on environmentally friendly and modern advanced technologies and making directions on how to localize them;
- Research similar projects and programs successfully implemented in foreign countries, to compare technical and technological methods, to make calculations and analyses related to choices, solutions, and to consider the best solutions, as well as to determine the relationship between the technological process, its facilities, the organization of the work area, and the distribution of products and services by each category or classification.
- Identify other relevant solutions that are not mentioned above, depending on the specifics of the project;

Three. Analysis of Economic, Social Development, and Environmental Change;

Four. Implementation Action Plan:

- Develop land vacation and resettlement plans and cost estimates of land vacation;
- Identify implementation measures and management;
- Identify additional plans that will be made based on the specifics of the project;

Five. Financial investment estimation of project:

- Determine the initial investment estimate for the project;
- Develop project financial calculations;
- Identify sources of funding;
- Reflect comparative calculations and analysis that determine the ability to compete in the market.

Six. Financial and Economic Benefit Analysis of the Project:

- Analysis of the effectiveness of financial investments;
- Economic Impact Analysis;

Seven. Risk analysis

- Project risk analysis;
- Develop a project risk management plan;

Six. Requirement for the project:

One. Auto road, road facilities

- To calculate the width of the auto road strip and the width of the control lane in accordance with the relevant laws and regulations, and to reflect the design of the line to the construction in accordance with the norms;
- To conduct a study of the existing road network in accordance with the proposed highway route/route/, as reflected in the general plan and policy documents of the city of Ulaanbaatar, to determine the location and capacity of road entrances, exits, intersections, multi-level intersections, bicycle paths, sidewalks, bridges and tunnel, in accordance with the norms and regulations, and to determine the solutions and quantities for the expansion and renewal of existing bridge facilities;
- Development of a planning plan that connects the green transport network of Ulaanbaatar with bicycle paths and pedestrian paths, entrances and exits, with an independent solution and connects it with other roads of the city;
- When planning bicycle lanes/path (at least one row 1.5-2.25 meters, passenger space 1.2 meters), it is necessary to coordinate the urban structure, transportation, public transport, pedestrians, and safety. Bicycle facilities should be as comprehensive as possible (signs, markings, traffic lights, searchlights, railings, directional devices, parking, rest points, lighting, etc.) Bicycle facilities should be as comprehensive as possible (signs, markings, traffic lights, low lattice fence, traffic barrier, guardrails, parking, rest points, lights, etc.);
- Make sidewalks (width of pedestrian sections) at least 1.5 to 2.25 feet, and plan for sidewalks to be at least 4.0 feet wide in downtown and high-traffic areas. Sidewalks must be easy to walk, equipped with landscape, with walking rest points, signs, markings, and lighting standards, no physical signs, light poles or other objectives that directly impede traffic on the sidewalk, and meet the requirements of the accessibility or living environment of the disabled citizen;
- Planning of lines for the removal of rain and snow water from the fields of roads and road facilities, connection to the integrated drainage line (collector line), expansion and renewal of necessary sections;
- Planning and commenting to ensure that pedestrians do not slip and fall and do not slip in wet conditions with extremely smooth surfaces;
- Planning and ensuring accessibility of public transport and integrated car parks for multiple uses (e.g., open, underground, multistorey, large capacity etc.);
- Planning of noise separation and green spaces in residential and ger district areas;
- Integrated traffic management of intersections with other auto road and road structures;
- Develop a detailed traffic plan based on current and long-term traffic dynamics for the multi-level intersections to be built within the scope of the project, and determine

whether the associated main street, roads will be widened, rehabilitated, or re-engineered;

Two. Bridge structure

- Inspecting the actual conditions of use of the existing “road facilities” and collecting complete information on technical and operational parameters, analyzing and stopping the wear and tear of buildings and structures, developing plans for repairs, expansions, renovations and demolitions.;
- Coordination with the existing pedestrian bridge structures of the Ikh Toiruu Road or the planned route;
- Development of drawing assignments detailing additional requirements during feasibility study;
- Perform the construction installment rapidly , that there is a short-term closure of traffic, and that the structure is /Lego-style/ assembled. The structure are likely to be less difficult to transport due to their size and weight.
- Conducting a study of the existing road network along the proposed road route/route/, as reflected in the general plan and policy documents of the city of Ulaanbaatar, and making connections for the use of road facilities (bridge facilities);
- Planning intersections and bridges at multiple levels in a way that is lightweight and not massive in line with the environmental conditions;

Three. Interior design

- To study and evaluate the features and spatial conditions of the proposed road /route/ and to come up with solutions on how to improve the current traffic through the implementation of the project;
- Development of green solutions with a low percentage of solid surface occupancy that meets the conditions for natural water absorption to reduce flood risk;
- Develop solutions for the identification, protection, restoration, and improvement of historical, cultural monuments and cultural heritage characteristics;
- Develop a solution for the construction of the tunnel system along with flood protection facilities;
- Clarification and coordination of the planning of the sections where landscape , auto roads, road facilities, bridge facilities, bicycle paths and sidewalks have been designed;
- Planning bus stops and passenger rest areas;
- Drafting sketches and drawings for the construction of the start and end stations;
- Defining the purpose of tourism and recreational destinations, classifying them into categories, and studying their potential;
- To include in detail in the Feasibility Study potential locations the green area and landscaping under the bridge;
- Investigate the location and capabilities of commercial services and incorporate them into the planning of the public event area with space dedicated to commercial passenger services;
- Develop and reflect management planning for the establishment of waste disposal, centralization and transportation points;

- Planning of a sanitation facilities and connect them to the centralized engineering system;
- Creating a comfortable environment for people with disabilities to travel and rest obstacle free;

ИНЖЕНЕРИЙН ДЭД БҮТЭЦ

Four. Flood protection facilities

- Determine the cost of potential flood hazards, calculate the estimated cost in accordance with BNbD 33-01-03, and plan new flood protection facilities;
- Planning for a complex set of amenities along the route with amenities such as green area, ponds and basin in conjunction with existing flood protection facilities;
- Planning of flood water reception facilities, power outages, and sedimentation facilities during spring and summer rains;
- Calculation of flood canals and stormwater drainage lines and inlets, including inlets, conduits, and fixtures, and determination of solids quantities;
- Identification of the level of use of the existing flood canal in the proposed construction site and the design of the intersection;
- Planning flood protection facilities in accordance with urban planning norms and regulations in conjunction with green infrastructure, road networks and bridges;
- Calculation of technical solutions, quantities, and stabilizations for the construction of floats and sediments (hidden basin);
- Calculation of sediment , basin volume and structure;
- Determining the design and size of the wastewater disposal facility;
- Taking into account measures to protect against flooding and water formed over melting ice and under;
- Planning for the city's green facilities to have a network of lines for use in the irrigation system;
- Designation of protection, containment, restriction zones, flood dams, natural resources, prohibitions and restrictive zones;

Five. Tunnel system/ Partially/:

- To determine the location of the tunnel system planning through integrated planning based on the feasibility requirements of the project and the feasibility study of the non-transferable engineering line network that is impacted by the project;
- The tunnel system will be fully cast and reinforced concrete. Explore the feasibility of using precast concrete and reflect the work map;
- To plan the tunnel with a size of not less than 2.4 x 3.0 meters, to be able to change the size in accordance with norms and rules in consultation with relevant organizations during the design process;
- Computing the output of the tunnel system in relation to the distribution network;
- Reflecting the cost of access canals load capacity under roads and railways;
- Planning of lighting, air conditioning, and fire alarm systems;
- Planning the tunnel with entrance and exits and maintenance;
- Planning groundwater and floodwater intrusion and drainage systems;

- Calculate the level of the tunnel system in accordance with the road layout, plan the road surface in accordance with the requirements for the layout of pedestrian and bicycle paths;
- Develop a drawing to ensure that the lines in the tunnel system are kept at temperatures above 5 degrees Celsius to prevent freezing;
- Meet the requirements of applicable standards and regulations;

Six. Heating Supply

- Development of integrated planning solutions for the tunnel system;
- Develop a design for the relocation of the existing line network and, if necessary, plan to install it in the tunnel system;
- Do not plan an open network inside the dam in coordination with the transfer of the existing network;
- Develop a plan to transfer existing heating supply lines and install them in the tunnel system if necessary;
- To develop a design for the protection of the network of users supplied by the central heating lines to be installed in the tunnel system along the proposed highway route/route, to coordinate with the owner organizations and, if necessary, to develop a work plan for the transfer of the linear network;
- Selecting heat lines to reflect modern technological solutions;

Seven. Water supply, sewerage system;

- Planning for installation in the tunnel system if necessary to develop a design for the relocation of the existing line network;
- Do not plan for an open line network within the dam in coordination with transfer of the existing line network;
- Planning of fire and water lines in accordance with other relevant planning regulations;

Eight. Electricity supply;

- Develop a design for the relocation of the existing line network and, if necessary, plan to install it in the tunnel system;
- Do not plan an open line network within the dam in coordination with the transfer of the existing line network;
- Determination of the charging location of electric cars, obtaining technical specifications from the relevant authorities, taking into account the required electrical energy load, and the preparation of design;
- Developing solutions to provide road lighting using renewable energy;
- Develop appropriate diagrams of power supply lines and networks in the planning area, identify and coordinate with the distribution organization, and conduct transfer location research and calculations;
- Planning and budgeting for access to power lines, networks, and intersections under highways;
- Perform surface illumination calculations according to the characteristics of the project, and design highway, landscape, sidewalks, and bicycle lanes/path with a foundation design that meets the requirements of a high standard such as protection.

- Budgeting for the cost of improvements and rehabilitations along the power lines;

Nine. Communication;

- Develop a design for the transfer of the existing line network and, if necessary, plan to install it in the tunnel system;
- Do not plan for an open line network inside the dam in coordination with the transfer of the existing network;
- Conduct data communication network and fiber cable surveys along the proposed highway routes, and plan an information and communication network in conjunction with the new road;
- Connect to an integrated network by identifying the location of the RFID device installation by connecting it to an existing RFID system;
- Conduct a study on the placement of water level sensors in the flood facility area and design a water level information system in conjunction with the construction of new flood dams and ponds (underground);
- Installation of surveillance systems to ensure surrounding safety, and the Internet and surveillance cameras have backup systems;
- Planning wireless wi-fi zones;
- Perform information planning in conjunction with the current disaster notification system:

G. SPECIAL CONDITIONS

- Earthquake impact calculations;
- Develop traffic management and system, equipment design and road safety audited;
- To calculate the risks of soil water fluctuations based on engineering geological analyses and to plan protection measures in accordance with relevant norms, rules and instructions;
- Reflect in the design and monitoring budget the costs incurred for taking the necessary additional measures in each case of intersection or overlap with underground or other engineering structures;
- Reflect design for a comprehensive solution to the traffic control system along the proposed highway route;
- Facilities along the planned road that ensure the safety of road users (to plan e.g., equipment, vehicle noise, noise damming, protection, different level crossings);
- Noise protection measures are a mandatory to be reflected in the design, whilst selecting technology equipment for installation and construction work, operational technology, the priority is given to low-noise equipment which sound specification complies with the MNS 0012-1-016 standard;
- Installation of equipment to mitigate noise in building areas and workplaces by using an effective architectural planning solution;
- Compute noise separation calculations for building architecture solutions and develop related design solutions based on calculations of vibration and sound separation from engineering equipment;
- Obtain and reflect technical specifications from engineering and network organizations;

- Include in the design the resettlement or reconstruction of roads, road facilities, engineering networks, landscape, enterprise fences, buildings, open and underground/ network, and engineering facilities along the proposed road routes;
- Special consideration on planning for the aesthetic aspects of the road for the installation of dams and excavation sides;
- Designing roads and bridges, bridges, walls, viaducts, recreation areas, parking lots, and amenities with architectural solutions that reflect the national style appropriate to the characteristics of the tourism region and urban areas Design road, road bridge structures, overpasses, retaining walls, viaducts, rest areas, parking lots, landscaping with architectural solutions that reflect the national style appropriate to the characteristics of tourism regions and urban areas;
- Planning (if necessary) the movement of the Road Traffic Monitoring and Toll Collection Point (THC) facility in accordance with international standards;
- Include in the design the matter of planting trees along roads and creating green zones in order to reduce air pollution in the city and reduce the negative impact on the environment;
- Standardized planning of road lights, traffic light, signs, markings, equipment and continuous strip cutting on dangerous sections of the road that ensure the safety of vehicle traffic;
- Planning all intersections with highways in a coordinated manner /developing and comparing at least 3 options in one location and linking them to the network of engineering lines on the ground and below/;
- Consideration on planning of traffic safety and convenience for the proposed road which will comply with international standards;
- Selection of road routes and development of detailed engineering designs , taking into account the complete measures to preserve soil stability, protect against migration and collapse without compromising urban design (adherence to urban color and aesthetic standards in planning and development);
- Evaluate the Capital City's traditional style on the basis of criteria for non-modifying,retaining when selecting a planning solution for the planned route;
- Architectural style planning include appropriate ornaments, decorations, relief textures, and other aesthetic elements;
- Planning solutions along the proposed routes:
 - o "Smart" bus stops;
 - o Wider walking lanes/path;
 - o Buses, taxis, and ambulances lanes/path;
 - o Bicycle and electric scooter paths;
 - o Standard unified Street Light Poles;
 - o Considerable public transport networks and green infrastructure;
 - o Integrated Color, Standard Expansion, Addressing and Green facility;
 - o Underground engineering line network tunnel systems and rainwater drainage tunnels;
 - o Electric car charging points and parking lots;
- Calculation of engineering facilities /heating, power, water facilities, lighting, etc./

- Develop a detailed environmental assessment and be approved by the Ministry of Environment and Climate Change;
- Calculation of drainage facilities /surface/;
- Artificial Infrastructure Estimates /Drainage Pipes and Bridges/;
- Task Execution Methodology /Comparison of Task Execution Methods in Complex Areas with More Than 2 Options/;
- Study of gravel, rock, and sand deposits /To consider each filler material to be used in road construction and to minimize the transportation distance along the roads/;
- Estimates and designs other than those specified in the Terms of reference of this Consulting Service are required to be made in accordance with the specifics of the project, therefore the report is not limited to the provisions of the terms of reference;

One. Additional Scope of Engineering-Geological Survey:

- Within the scope of the work site, the soil parameters necessary for the development of water construction drawings, such as soil water level, seepage coefficient, and yield, will be determined during dry and wet periods;
- Experimentally determine the surge coefficient and flow at several points in the event of marshy and groundwater areas along the route of the water facility;
- Determination of groundwater seepage coefficient for each soil layer;
- Determination of the soil sweeping coefficient at the planned location of groundwater sequestration and depletion facilities based on the results of the experiment;
- Development of risk mitigation facilities in line with the planned direction/route/, and in conjunction with the flood hazard and risk mapping of the city of Ulaanbaatar /UB 2040 HET/;
- Perform hydrogeological experiments to determine water flow and flow;
- Detailed coordinated hydrogeological detailed mapping and planning of the Selbe River;
- Make engineering-geological requests for necessary locations;
- Perform SPT testing at the necessary location /to be assigned by the company performing the design work/;
- Conduct CBR testing in the necessary location /to be assigned by the company performing the working desing/;
- Drill in time if additional measurements are required from the Water Facilities team during the course of the work;

Two. Additional Scope of Engineering-Geodetic Survey Work:

- Develop numerical elevation models with a precision of 1 m including river beds, flood dams, and river beds for flood propagation modeling;
- Cross-section measurements at the proposed bridge construction points;
- Measurement of intersections at side drains and flood channels where highways (construction sites) are introduced;
- Marking and specifying the boundaries and yard boundaries of the enterprises and households to be included in the descriptive line.

Three. Geospatial Diagram (Scale 1:500)

- Measurements of the elevation of location points and the dimensions of bridges during geodetic surveying work and the development of cross-section maps for bridges;
- A clear description of the enterprises and buildings within the yard and the floor of the building or building that is included in the description line;
- The total area of the layout includes the location and elevation markers of the roads, railroads, existing grounds, underground engineering lines, and networks. These include:
 - o Clean water lines and wells;
 - o Sanitation pipelines and wells;
 - o Groundwater lines and wells;
 - o Road-field stormwater lines and wells;
 - o Power transmission lines and wells;
 - o Underground power cables;
 - o Communication Lines and Wells (Obtaining clarification from each unit that provides communication services);
- Classifying, measuring, and detailing trees and shrubs along the length of the planned route;
- A different marking of the accumulated sediment along the planned route;
- At least one point per 2-4 km of the geodetic dots to be used during the construction work;
- The scope of the engineering and geodetic survey within the scope of the water facility work shall be 100 m 2 to 2 from the road axis along the planned route. At least 200 m in 2-way positions. At the junction of the ditch and floodplain there must be at least 500 m;
- Providing orthographic information and linking to the grid;
- To carry out the surveys in accordance with the relevant norm and regulations; to submit and get an approval by an act by the Land Administration and Management, Geodesy and Cartography, Urban Planning and Urban Standard Administration;
- Make measurements and simulations on the basis of time if additional measurements are required from the Water Facilities team during the course of the work.