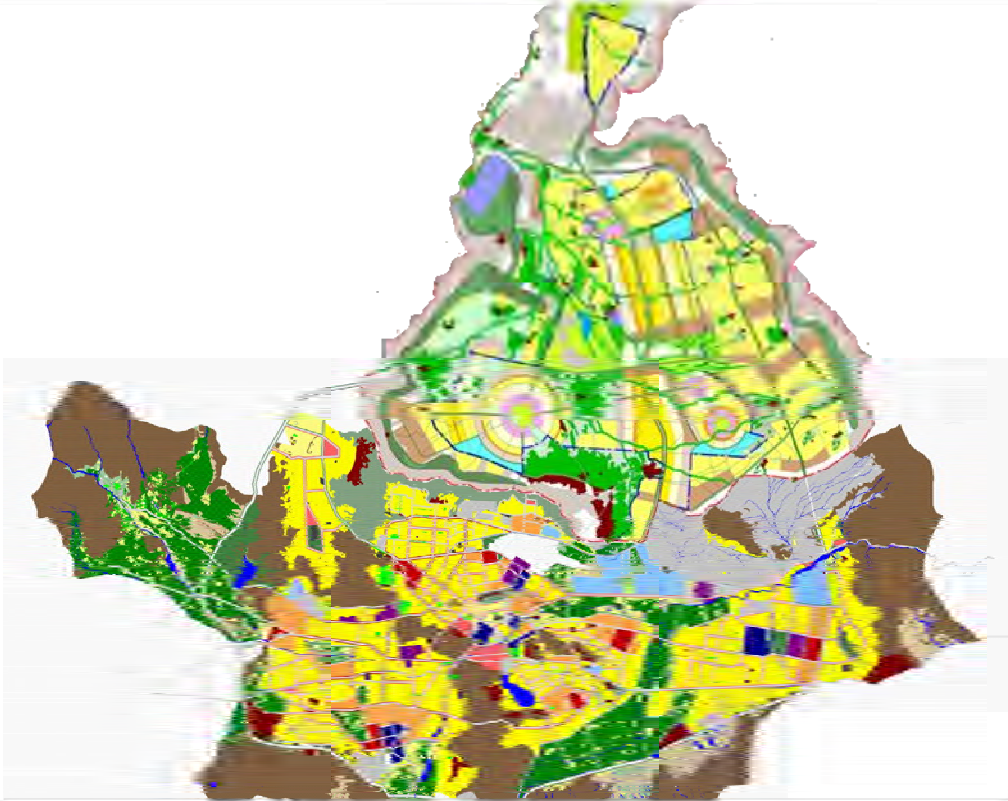


Japan International Cooperation Agency (JICA)

Dehsabz City Development Authority (DCDA)
Ministry of Urban Development (MoUD)

**THE STUDY FOR THE DEVELOPMENT
OF THE MASTER PLAN
FOR THE KABUL METROPOLITAN AREA
IN THE ISLAMIC REPUBLIC OF AFGHANISTAN**



**FINAL REPORT
PROJECT REPORT**

September 2009

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Yachiyo Engineering Co., Ltd.
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Currency Equivalents (average Interbank rates for May 27-June 26, 2009)
US\$1.00=AFN 52.450 (over 31 days)
US\$1.00=JPY 96.720 (over 31 days)
JPY 1=AFN 1.851 (over 31 days)
Source: OANDA.COM, <http://www.oanda.com>

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Abbreviations

ACCI	Afghanistan Chamber of Commerce and Industry
AISA	Afghanistan Investment Support Agency
BDS	business development services
BRT	bus rapid transit
CAWSS	Central Authority for Water Supply and Sewerage
DCDA	Dehsabz City Development Authority
est.	estimate(d)
FS	feasibility study
JICA	Japan International Cooperation Agency
KCIRR	Kabul city inner ring road
KCORR	Kabul city outer ring road
KfW	Kreditanstalt für Wiederaufbau (German Development Bank)
KM	Kabul municipality
KMA	Kabul metropolitan area
LRT	light rail transit
MAIL	Ministry of Agriculture, Irrigation and Livestock
MoCI	Ministry of Commerce and Industry
MoEW	Ministry of Energy and Water
MoLSA	Ministry of Labour and Social Affairs
MOM	Ministry of Mines
MoPW	Ministry of Public Works
MOT	Ministry of Transport
MoUD	Ministry of Urban Development
NGO	nongovernmental organization
O&M	operations and maintenance
SDF	Skills Development Fund
SME	small and medium sized enterprise
STP	sewage treatment plant
USAID	United States Agency for International Development
WTP	water treatment plant
WTS	water transmission station
/d	per day
/s	per second
/y	per year

Units of Measure

ha	hectare
km	kilometer
kV	kilovolt
LCD	liter per capita per day
m ²	square meter
m ³	cubic meter
MCM	million cubic meter
mm	millimeter
NTU	nephelometric turbidity units
PCU	passenger car unit
t	ton

INTRODUCTION

The Project Report contains the profiles of most projects and programs proposed by the KMA development master plan. They have been prepared as handy reference materials for the proposed projects and programs, which may be used by implementing government agencies, private investors and donors to examine possible implementation and supports.

The project profiles are arranged by sector as follows:

1. Socio-culture
2. Agriculture
3. Industry
4. Water resources development
5. Water supply and sewerage
6. Power and energy supply
7. Solid waste management
8. Transportation

1. SOCIO-CULTURAL PROJECTS

Project SC-1: Kabul Museum Restoration Project	
Location	District 6, Kabul city
Implementing body	Ministry of Culture and Youth; Kabul municipality
Objectives	(1) To restore the existing Kabul museum buildings (2) To restore the existing art collection (3) To increase the art collection
Expected effects	- Enhanced people's awareness and pride in Afghan history and culture - Opportunities for Afghan people to communicate one another through appreciation of cultural diversity and national identity - Promotion of international tourism
Phasing	Phase 1
Investment cost	US\$2.83 million
Description	
<p>The existing Kabul museum was heavily damaged during the civil war and the restoration works have not been underway. A new Parliament complex is to be established in the southern part of District 6 close to the Kabul museum. There are also hospitals and other social facilities in the area. The area is planned to become a high-grade urban area with administrative, commercial and business, and high-end residential complex as well as the existing and new socio-cultural facilities.</p> <p>As part of initial efforts to make the area a high-grade urban area, the Kabul museum should be restored together with its art collection. Additional display spaces may also be created in the subsequent stage to increase the art collection including those from other regions. The Kabul museum should become the nationally most significant socio-cultural center, displaying the rich Afghan history and culture that all the Afghan people are proud of.</p>	

Project SC-2: Dehsabz New Cultural Creation Center Project	
Location	Central part of new city
Implementing body	Ministry of Culture and Youth; DCDA
Objectives	(1) To develop physical environment for creating new culture to enrich Afghan culture (2) To prepare programs to promote activities by Afghan artists, musicians and citizens participating in various cultural activities and communicating with other people of diverse background
Expected effects	- Spiritual core of the new city development established - Revitalized cultural heritage of Dehsabz residents - New types of Afghan culture created through communications among people from different backgrounds - Understanding of the Afghan culture by foreigners promoted
Phasing	Phase 2
Investment cost	US\$117 million
Description	
<p>Dehsabz has rich cultural heritage, which is not widely known. The new city development would provide opportunities to re-vitalize the cultural heritage as people from different socio-cultural backgrounds would move into the new city. Participation in various cultural activities and communications with people of different backgrounds would stimulate the development of new types of Afghan culture as well.</p> <p>The project would create such an environment that would allow the creation of new culture. It</p>	

should provide halls for stage performance such as music, dances and dramas, art gallery and buildings for art workshops and music/performance rehearsals. Specifically, the following may be provided:

- Large hall with seating capacity of 1,500
- Medium hall with seating capacity of 700
- Small hall with seating capacity of 300
- Art gallery with floor area of 20,000m²
- Building for art workshops and music/performing arts rehearsals with total floor area of 3,150m²

Project SC-3: Dehsabz Sport Park Project	
Location	Central part of new city
Implementing body	Ministry of Culture and Youth; DCDA
Objectives	(1) To develop physical environment for promoting various sporting activities (2) To prepare programs to promote various sporting activities by both professional athletes and ordinary citizens
Expected effects	- Establishing spiritual core for new city development - Re-energizing citizens' spirit by promoting participation in various sporting activities - Concentrating energy of Afghan nationals, especially the youth, on peaceful activities away from radical movements
Phasing	Phase 2
Investment cost	US\$96 million
Description	
<p>The project is to develop a physical environment for promoting various sporting activities, both traditional and modern, in the central park of the new city so that the park would become the spiritual core of the new city just like Central Park in New York City. It would provide the following facilities:</p> <ul style="list-style-type: none"> - Stadium with seating capacity of 30,000 - Gymnasium with floor area of 15,000m² - Sporting field with 300,000m² area - Training/lecture building with floor area of 1,650m² 	

2. AGRICULTURAL PROJECTS

Project AG-1: Kabul Home Gardening Promotion Program	
Location	Farm household compounds, Kabul city
Implementing body	Agriculture, Irrigation and Livestock Directorate of Kabul Province
Objectives	(1) To enhance the land productivity of farm household compounds to prevent conversion to urban use (2) To increase the income levels of farm households (3) To contribute to maintaining greenery in Kabul city
Expected effects	- Well maintained productive greenery in Kabul city - Increased availability of fresh vegetables and other products in city's urban market - Improved income and diet of farm households
Phasing	Phase 2
Investment cost	US\$9.42 million

Description	
<p>Of the estimated 218,000 houses existing in Kabul city, about 15% have opportunities for home gardening or growing vegetables in the backyards with respect to space, water availability and atmosphere. To promote home gardening, supports should be provided for improving water availability, procurement of improved seed/saplings, quality agro-chemicals and durable implements.</p> <p>To provide a package of support measures consistently, a section should be established in the Directorate of Kabul Province Agriculture, Irrigation and livestock. The package consists of both software (guidance for better farming practices, pest control, etc.) and hardware (improved seeds and implements).</p>	

Project AG-2: Cold Storage Construction Project	
Location	Dehsabz and Barikab
Implementing body	MAIL
Objectives	<ul style="list-style-type: none"> (1) To prevent farm products from spoilage (2) To ensure the availability of farm products in market throughout the year (3) To establish KMA as distribution center for agro-products from other regions
Expected effects	<ul style="list-style-type: none"> - Increased availability of farm products in market - Contribution to more balanced diet and health of people - KMA as agro products distribution center and export base
Phasing	Phase 2
Investment cost	US\$18.84 million
Description	
<p>To avoid the spoilage of farm products at peak harvest and to ensure their availability in market throughout the year, cold storage facilities should be provided in Dehsabz and Barikab. They should be constructed with latest international standards and layout equipped with modern instruments for efficiency and durability. The provision of 20,000t storage capacity is proposed for each cold storage. An efficient mechanism for communication between the two storages in Dehsabz and Barikab should be established to utilize the storage spaces effectively. Additional storage capacity may be provided in the subsequent stage as increasing amount of agro products are supplied from other regions for marketing in the KMA urban and export.</p>	

Project AG-3: Barikab Agricultural Research Station Project	
Location	Barikab
Implementing body	MAIL
Objectives	<ul style="list-style-type: none"> (1) To conduct research and experiments on plant adaptation (2) To introduce new superior crop varieties suited to KMA
Expected effects	<ul style="list-style-type: none"> - Increased agricultural production with higher value-added and diversity - Innovative farmers to support the urban/suburban agriculture in KMA, producing superior crop varieties - KMA as a model agriculture region
Phasing	Phase 1-2
Investment cost	US\$2.83 million
Description	
<p>To support the KMA to become a model region for high value agriculture, research and experiment functions should be much strengthened. The project is to establish an agricultural research station to realize this. Specifically, the following facilities would be provided:</p> <ul style="list-style-type: none"> - Experimental plot of 6,000m² 	

- 2 glass structures, 500m² each, for experiments on greenhouse effects
- Laboratory with floor area of 200m²
- Climatology station to collect climatic data
- Library (60m²), 5 offices (20m² each), dining hall (200m²), storage (75m²), lodging facilities with four rooms of 10m² each, two complexes for prayer, bathroom, toilet, laundry machine, and auxiliary lot (2,100m²) for parking and equipment yards

Project AG-4: Sanitary Harvest and Fruit Polishing Project

Location	Dehsabz
Implementing body	MAIL
Objectives	(1) To prevent farm products from spoilage (2) To ensure the availability of farm products in market throughout the year (3) To improve the quality of farm products for higher income
Expected effects	- Increased availability of farm products of good quality in market - Increased income to farmers - KMA as agro-products distribution center and export base
Phasing	Phase 1
Investment cost	US\$2.83 million
Description	
<p>Despite the inherent high quality of farm products (e.g., grapes and fruits), their prices are not as high as should be due to improper initial handling of the products (e.g., improper washing and removal of damaged products). Fruit polishing is a process to sort harvested fruits into goods for different market segments.</p> <p>Initial cleaning, separation and grading, and mass packing of harvested fruits should be promptly done at the farms to assure the freshness and timely transport to market or cold storage. To facilitate these operations, a platform should be installed, furnished with a long table and chairs to accommodate some 30 persons together with restrooms. Transport equipment may also be provided. Shelter for ripening and conversion of grapes into raisins are also provided.</p>	

Project AG-5: Livestock and Poultry Compounds Establishment Project

Location	Barikab
Implementing body	MAIL
Objectives	(1) To provide livelihood opportunities for women by livestock/poultry raising (2) To ensure the regular availability of dairy and poultry products in market (3) To establish sustainable livestock and poultry under the land and water constraints
Expected effects	- Stable availability of livestock and poultry products of good quality in market - Increased income to farmers/women - Sustainable livestock and poultry for diversified economies
Phasing	Phase 1
Investment cost	US\$2.83 million
Description	
<p>Compounds for raising livestock and poultry should be established in lower grade land not suitable for crop production. In the livestock compounds, a mixed population of local and hybrid milking cows are reared to reduce the risk of occurrence and spread of diseases. The compound for poultry eggs and meat is set separately from the livestock compound. Indigenous and hybrid poultry are introduced to produce products of different tastes.</p> <p>Livestock and poultry manures should be collected and used in farming area, after composting.</p>	

Livestock may be partly fed with plant residues generated in farmland to reduce the operating costs of the compound.

Project AG-6: Dehsabz Water Saving Irrigation Project

Location	Dehsabz
Implementing body	MAIL
Objectives	(1) To change the irrigation method from furrow and flood/inundation irrigation to piped irrigation system (2) To enhance efficiency of irrigation (3) To establish KMA as a model region for water saving irrigation
Expected effects	- Minimization of seepage, evaporation losses of water, and weed growth - Minimization of water related diseases - Better availability of limited water for productive urban uses
Phasing	Phase 1-2
Investment cost	US\$28.2 million
Description	
<p>Currently furrow and inundation irrigation methods are used in Dehsabz. They should be changed to more water saving irrigation methods. Specifically, a hybrid of surface and drip irrigation methods is recommended, whereby water is transported from streams in steps by pipes of different size to plants. Valves furnished in this system would allow the control and regulation of water supply and prevention of water losses.</p>	

3. INDUSTRIAL PROJECTS

Project IN-1: Rehabilitation of Pule Charkhi Industrial Park (Phase 1) – Road Pavement

Location	District 9
Implementing body	MoCI, Kabul municipality, donor agencies, private sector
Objectives	(1) To introduce industries which had shut down or relocated from this park in past years (2) To strengthen the core industrial zone in Kabul city (3) To empower and diversify the manufacturing sector with high value-added
Expected effects	- Creation of employment and community vitalization - Contribution of local and national economic growth
Phasing	Phase 1
Investment cost	US\$20 million (for construction)
Description	
<p>Construction of the first phase of the park took place in 1973 in District 9 by MoCI under the assistance of the Indian government. The total development area of the park is about 290 ha. The current factory lots amounted to 273.</p> <p>As of May 2008, however, only 83 firms are operating. The number of employees appropriate for these firms was 2,400. At the beginning of year 2009, operating firms decreased to about 70.</p> <p>The road condition in the park is poor. More than 80% of the road in the park is not paved. Power supply by city power will be gradually stabilized, although many factories have own generators.</p> <p>Consequently, rehabilitation of the road in this industrial park is proposed to attract firms that have already relocated from this park or suspended the operation. The total area of the road for pavement is estimated at about 58ha. Also, it is estimated that about 100ha of the existing site will be reoccupied by firms.</p>	

Project IN-2: Development of Pule Charkhi Industrial Park (Phase 2)	
Location	District 9 and 18
Implementing body	MoCI, AISA, Kabul municipality, donor agencies, private sector
Objectives	(1) To strengthen the core industrial zone in Kabul city (2) To empower and diversify the manufacturing sector with high value-added
Expected effects	- Creation of employment and community vitalization - Contribution of local and national economic growth
Phasing	Phase 2-3
Investment cost	Phase 2: US\$17.9 million (for construction) Phase 3: US\$39.9 million (for construction)
Description	
<p>Development of the new phases in the park has been planned since the early time, although it was not realized under the long difficult situations. (Originally, the new phases are called as the second and third phases, but in this Master Plan Study, the new phase is simply called as the second phase.)</p> <p>According to the General Department of Industrial Parks of MoCI, the current plan, which is jointly formulated by Kabul municipality, covers about 200 ha. The net industrial area will be 145 ha in total. The site will be developed in a stepwise manner; 45 ha in Phase 2 period (2016-2020) and 100 ha in Phase 3 period (2021-2025).</p> <p>Development cost is estimated at US\$57.8 million. Also, the number of employment opportunities is estimated at 29,200 in 2025 at the factories reoccupied by rehabilitation and those located in the second phase. It is expected that construction material manufactures, chemical and plastic industries, textile and apparel industries and food industries will locate there.</p>	

Project IN-3: Development of Bagrami Industrial Park (Phase 2)	
Location	District 16 (next to Coca Cola bottling plant, 7.5km east of downtown Kabul along the road to Bagrami village)
Implementing body	AISA, MoCI, donor agencies, private sector
Objectives	(1) To develop the core industrial zone in Kabul city (2) To promote empowered and diversified manufacturing sector with high value-added
Expected effects	- Creation of employment and community vitalization - Contribution of local and national economic growth
Phasing	Phase 1
Investment cost	US\$4.4 million (for construction)
Description	
<p>The first phase was almost completed in 2007 by the assistance of USAID under AISA's supervision. The development cost for infrastructure on the first phase amounted to US\$6.9 million. At the planning stage, two phases with 24 ha are taken into account, but only the first phase (9ha gross; net 6.7ha) was developed with 34 plots. The second phase development has been suspended. As of July 2008, 11 firms are operating with approximate 500 employees.</p> <p>The second phase development should be undertaken without delay since the first phase lots are fully sold and the demand for land with clean titles seems to be high. AISA currently requests World Bank to develop the second phase. The cost of Phase 2 development (15ha gross; net 11ha) is estimated at US\$4.4 million by the JICA Study Team. Based on the estimate, the number of employment opportunities in the second phase reaches about 1,500 and food & beverage industries and textile & apparel industries and chemical & plastic industries are mainly expected to come to this site.</p>	

Project IN-4: Development of Kamari Industrial Park (Phase 1-Phase 3)	
Location	District 22
Implementing body	- Phase 1-2: AISA, MoCI, World Bank, private sector - Phase 3: AISA, MoCI, donor agencies, private sector
Objectives	(1) To develop the core industrial zone in Kabul city (2) To empower and diversify the manufacturing sector with high value-added
Expected effects	- Creation of employment and community vitalization - Contribution of local and national economic growth
Phasing	Phase 1-2: Phase 1 and Phase 2 development Phase 3: Phase 3 development
Investment cost	Phase 1-2: US\$35.9 million (for construction) Phase 3: US\$51.8 million (for construction)
Descriptions	
<p>This industrial park is located in District 22, east of Kabul city. Based on the existing plan by AISA, the park has two phases with 135 ha of industrial area, which is comprised of 45 ha in Phase 1 and 44 ha in Phase 2.</p> <p>According to AISA, the preliminary study has already been completed through the assistance of the World Bank. The technical design study will be completed by March 2010, followed by the physical construction that should take place in the region for 2 years. The total investment requirement for infrastructure except power supply and transmission system is estimated at US\$32 million by the preliminary study and at US\$36 million by the JICA Study Team.</p> <p>Sub-sector industries to be located are considered to be i) food processing, ii) leather garments, iii) carpet weaving, and iv) light engineering industries. The estimated number of workers is about 10,000 by the preliminary study.</p> <p>The land for Kamari Industrial Park is government-owned, which covers about 600ha in total. To utilize the land efficiently and effectively, it is proposed to develop Phase 3 in this industrial park. The net industrial area for Phase 3 will be 130ha. Several types of sub-sectors such as food, non-metallic minerals products and machinery will be located in a balanced mixture. The estimated number of workers is about 15,000.</p>	

Project IN-5: Development of West Kabul Industrial Park	
Location	- District 5 - East and/or south of warehouses operated by Kabul municipality in “company” area at western edge of District 5 along the road to Ghazni and Kandahar; North of Paghman River
Implementing body	MoCI, Kabul municipality, donor agencies, private sector
Objectives	(1) To promote balanced industrial development in Kabul (2) To empower and diversify the manufacturing sector with high value-added
Expected effects	- Creation of employment and community vitalization - Contribution of local economic growth
Phasing	Phase 2
Investment cost	US\$6 million (for construction)
Description	
<p>This Industrial park will be located along Kandahar Road in District 5 at the western gate of Kabul municipality. Its area will be 15ha. Major sub-sector industries expected to be located include wearing apparel and electrical and other machinery. Linkage with the existing vocational training institutes and universities is expected. Those industries that require a large amount of water for production are not suited due to the limitation of water supply in the area. The total employment</p>	

opportunities are estimated at 2,500.

Project IN-6: Development of Dehsabz Industrial Parks (No. 1-No. 3)

Location	Dehsabz area, new city
Implementing body	AISA, MoCI, donor agencies, private sector
Objectives	(1) To develop the core industrial zone in Kabul city (2) To empower and diversify the manufacturing sector with high value-added (3) To promote medium and high-tech industries with knowledge-based service sector
Expected effects	- Creation of employment and community vitalization - Contribution of local economic growth
Phasing	Phase 3
Investment cost	US\$60 million each (for construction), US\$180 million in total
Description	
<p>In Dehsabz area, three industrial parks are proposed as follows.</p> <p>(1) Dehsabz First Industrial Park is to be located in Dehsabz North area with industrial area of 150ha. Its target sub-sectors are food and beverage industries. The number of employment opportunities is estimated at about 21,000.</p> <p>(2) Dehsabz Second Industrial Park is to be located in Dehsabz South area with industrial area of 150ha. Its target core sub-sector is wearing apparel for domestic consumption and exports. The estimated number of employment opportunities is about 20,000.</p> <p>(3) Dehsabz Third Industrial Park is to be located in Paymonar area with industrial area of 150ha. Its target sub-sector is high and medium-high technology manufacturing such as electrical machinery and manufacturers of medical, precision and optical instruments. Also this park is expected to have the feature of industrial research park or multifunctional industrial park with other sectors such as knowledge-based service sector including health and education. The total amount of employment is estimated at about 18,000.</p>	

Project IN-7: Development of Barikab Industrial Park

Location	Barikab area, new city
Implementing body	AISA, MoCI, donor agencies, private sector
Objectives	(1) To develop the core industrial zone in Kabul city (2) To empower and diversify the manufacturing sector with high value-added (3) To stimulate agricultural development
Expected effects	- Creation of employment and community vitalization - Contribution of local and national economic growth
Phasing	Phase 3
Investment cost	US\$80 million (for construction)
Description	
<p>This park is to be located in the Barikab area with industrial area of 200ha. It features resource-based food processing industries with easy access to main roads for facilitating direct marketing of produce for the KMA and other domestic areas and exports. The number of employment opportunities is estimated at 24,000 approximately.</p> <p>In the area, establishment of new vineyard and orchards is proposed since the soils are suitable for grape, almond, apricot, apple and other fruit trees. In accordance with land suitability, plots for growing commercial flowers, melons and vegetables will also be delineated and planted with superior varieties, using the most efficient cultivation methods. Moreover, durable greenhouses for mass</p>	

production of vegetables in off-season are to be established.

Project IN-8: Relocation of Clustered Small Businesses (Construction of Standard Factories)	
Location	District 9 (within Pule Chakrhi industrial park or industrial zone)
Implementing body	MoCI, Kabul municipality, donor agencies, private sector
Objectives	(1) To provide efficient and effective workplace for workers in small clusters (2) To create comfortable environment for urban residents
Expected effects	- Enhanced productivity and income increase for workers in small clusters - Better urban living environment
Phasing	Phase 1
Investment cost	US\$2.5 million (for construction of standard factories)
Description	
<p>In Kabul city, similar types of small businesses (e.g., wood products and furniture in Districts 8 and 16 and metal products in District 8) are clustered along the roadside or in the residential and commercial areas. Although some of these businesses might be satisfied with the current conditions (e.g., access to markets and customers), if they could, most of them would like to relocate due to land problems and poor infrastructure and utilities. Also, those small businesses cause environmental problems such as untreated wastewater and noises in the residential area. Therefore, it is proposed to relocate such clustered businesses to an industrial park or zone. The candidate site is the Pule Chakrhi industrial park or industrial zone in District 9.</p> <p>Construction of standard factories or readily available and fully serviced industrial apartments for rent in the industrial park/zone should be considered an option to attract the firms. Target sub-sectors are wood products/furniture and metalworking shops. The site will have several hectares in which three standard two-story factories with 120 lots (40 in each factory) will be constructed. The standard lot size should be 100m².</p> <p>MoCI and Kabul municipality should promote the relocation through the following steps with workshops and meetings for the stakeholders.</p> <ol style="list-style-type: none"> Clarification of benefits for relocation (e.g., clean land title, developed infrastructure, common facilities, cooperative marketing, group vocational training, etc.) Formulation of the development board and the association Formulation of the implementation plan including acquisition or rent of land/standard factory Financial arrangements Formulation of sales and marketing plan of the products 	

Project IN-9: Formulation of the Comprehensive SMEs Development Program	
Location	-
Implementing body	AISA, MoCI, donor agencies, private sector
Objectives	(1) To promote activities of SMEs (2) To establish legal and institutional system for SMEs
Expected effects	- Strengthening of basis of SMEs - Creation of employment and community vitalization - Contribution to local economic growth
Phasing	Phase 1-2
Investment cost	-
Description	
<p>In Kabul city, there are many small/household manufacturers (e.g., carpets/rugs, pottery, confectioneries/bakeries, building materials, and furniture). Some of them are informal, unregistered and untaxed. Through the Industry Survey issues on regulations (tax and incentives), market (local,</p>	

import and export) access and financial constraints widely perceived by SMEs were identified in addition to those associated with land and power (electricity). These issues are interrelated and difficult to solve independently. To solve them, a comprehensive SME development program should be formulated by MoCI, AISA, ACCI, and other relevant agencies. The program should cover the following.

(1) Business development: This component includes business development services (BDS), promotion of marketing, capacity building, and strengthening of business associations. Some of international NGOs and donor agencies such as USAID have already undertaking these tasks.

(2) Development of finance system: Establishment of an official fund or bank for SMEs should be taken into account in the program. The fund or bank, which provides a loan with preferential interest rates, can support firms holding an expansion or rehabilitation program on the middle or long-term basis.

(3) Linkage with legal and institutional reforms: The government makes efforts to construct legal and regulatory frameworks such as the Law on Private Investment of Afghanistan and other commercial laws for private sector development. The program should incorporate the progress of the legal and institutional reforms.

Project IN-10: Strengthening of Vocational Training System	
Location	-
Implementing body	MoCI, MoLSA, Kabul municipality, donor agencies, private sector
Objectives	(1) To upgrade technical level of employees of SMEs (2) To promote activities of SMEs
Expected effects	- Enhanced productivity and income increase for SME workers - Contribution to local economic growth
Phasing	Phase 1-2
Investment cost	-
Description	
<p>It was found by the Industry Survey that only 21% of the respondents had paid for vocational training (in textile, construction, machinery, furniture, and plastic production). Of the respondents, 77% did not provide any kind of training to their employees. The vocational training system should be strengthened to raise technical skills of SME employees in cooperation with the central and local governments, donor agencies and the private sector.</p> <p>Establishment of Skills Development Fund (SDF) is an option to strengthen the system for technical training. The SDF aims to provide financial assistance to SME employers for training and upgrading of their skills. The SDF financial resources may be supported by the government and the private sector. In Yemen, the government levies a sort of vocational training tax on firms with a certain number of employees and pays 50-80% of training fees for business owners who provide their employees with vocational training.</p>	

Project IN-11: Development of New Wholesale Markets	
Location	Yet to be determined (on periphery of Kabul municipality)
Implementing body	Kabul municipality, MoCI, private sector
Objectives	(1) To strengthen traders in Kabul through integration and clarification of flow of foodstuff and other products in markets (2) To promote commercial and trade activities in Kabul
Expected effects	- Improved efficiency of commercial and trade activities - Increased convenience for urban residents
Phasing	Phase 1: One market for foodstuff

	Phase 2: One market for foodstuff and another for other products
Investment cost	US\$14 million each (for construction), US\$28 million in total
Description	
<p>Development of two wholesale markets is proposed for foodstuff (e.g., meat, fruits and vegetables) and other products (e.g., household goods, building materials, auto parts and spare parts of electrical appliances). The land area for the markets will be 10ha each. These wholesale markets will be able to integrate and clarify the flow of goods from the viewpoints of networking and hierarchy of markets in Kabul city. The markets development will be implemented by Kabul municipality, MoCI, ACCI, and the private sector. The markets have the following facilities:</p> <ul style="list-style-type: none"> - Parking lots - Administrative buildings including meeting rooms for business transactions and offices for trading information - General warehouse - Cold storage warehouses - Packaging and processing space - Small exhibition space - Customs office 	

4. WATER RESOURCES DEVELOPMENT PROJECTS

Project WR-1: Shatoot Dam for KMA Urban Water Supply	
Location	<ul style="list-style-type: none"> - Water sources: Shatoot Dam around Tangi Saidan station on Maidan River and Kabul River after confluence with Logar River - Water supply: Kabul city
Implementing body	MoEW, CAWSS and Kabul municipality
Objectives	To prepare water sources for water supply for domestic and industrial use for the existing Kabul city
Expected effects	<p>The following volume of water would be developed:</p> <p>(1) 51.5MCM/year from Shatoot Dam (49.5MCM/year for domestic use and 2.0MCM/year for industrial use)</p> <p>(2) 7.1MCM/year from Kabul River (intake point after confluence with Logar River, natural flow abstracted)</p>
Phasing	Entire project to be completed in one phase
Investment cost	US\$130 million (for construction only) O&M cost: US\$1.3 million/year
Description	
<p>The water resources development plan for water supply in the KMA has been formulated employing the “basin approach”. For the supply of urban water in the existing Kabul city, water resources in the Kabul River basin where the existing Kabul city is located have been considered. The aquifer in and around Kabul city has a potential of 36.2MCM/y (as in the case of Shatoot Dam construction), which is currently under development by the KfW project.</p> <p>The next realistic project for water resources development in this area is Shatoot Dam and a weir and an intake on the Kabul River (see the figure below). Key features of the structures are as follows:</p> <ol style="list-style-type: none"> 1) Shatoot dam: Dam height=81m; total storage volume =185MCM; effective storage volume=170MCM 2) Conveyance pipeline from Shatoot dam to water treatment plant: Discharge capacity =2.3m³/s with 10km in total length by gravity 3) Weir and intake structure in the Kabul river after confluence with the Logar river <p>It should be noted that a water treatment plant and transmission line for water supply are included in a</p>	

separate project for water supply. Also, a feasibility study for Shatoot dam is ongoing, which will be completed by March 2010.



Source: JICA Study Team

Project WR-2: Panjshir Fan Aquifer for KMA Urban Water Supply	
Location	- Water source: Panjshir fan aquifer (around confluence point of Panjshir and Ghorband rivers) - Water supply: New city area (including Barikab area)
Implementing body	MoEW, MOM and CAWSS
Objectives	To prepare water sources for water supply for domestic and industrial use for the new city area (including Barikab area)
Expected effects	44.6MCM/y in total (37.6MCM/y for domestic use and 7.0MCM/y for industrial use)
Phasing	Phase 1: 22.3MCM/y for 2015 Phase 2: 22.3MCM/y for 2018
Investment cost	US\$220 million (for construction, US\$110 million in each phase) O&M cost: US\$10 million/year (after project completion)
Description	
<p>The water resources development plan for urban water supply to the KMA has been formulated employing the “basin approach”. Water resources in the Panjshir River basin have thus been considered for the supply of urban water to the new city located in the Panjshir River basin. According to the water supply plan in the present plan for the KMA, the water supply to the new city for the target year 2025 will be mainly shared by two water treatment and transmission stations. One will be located in the Dehsabz North area and another is located in Paymonar area. Of these, it has been proposed to supply Dehsabz North area by urban water from the water resources of the Panjshir fan aquifer (see the figure below). The plan is considered to be realistic for urgent implementation.</p> <p>Key features of the structures proposed in the Project are as follows:</p> <ol style="list-style-type: none"> 1) Infiltration galleries for extraction of sub-surface water in the Panjshir fan aquifer 2) Conveyance pipelines from Panjshir fan aquifer to a water transmission station in Dehsabz North area: Total discharge capacity = 2.1m³/s with 38km in total length 3) Pump stations for conveyance of water: necessary total pump head = 330m 	

It should be noted that a water transmission station and transmission line for water supply are included in a separate project for water supply. An FS has yet to be conducted.



Source: JICA Study Team

Project WR-3: Gulbahar Dam for KMA Urban Water Supply	
Location	- Water source: Gulbahar Dam on the Panjshir River around Gulbahar-Panjshir hydrological station - Water supply: New city area
Implementing body	MoEW
Objectives	To prepare water sources for water supply for domestic and industrial use for the new city area
Expected effects	44.7MCM/y from Gulbahar dam (37.7MCM/y for domestic use and 7.0MCM/y for industrial use)
Phasing	- Sub-project 1: Construction of Gulbahar Dam by 2019 - Sub-project 2: Construction of conveyance pipeline and booster pumping station by 2021
Investment cost	US\$360 million (for construction) as follows: - Sub-project 1: US\$130 million (for urban water supply) cf. Total cost for Gulbahar dam = US\$400 million - Sub-project 2: US\$230 million O&M cost: US\$8.2 million/year (after project completion)
Description	The water resources development plan for urban water supply to the KMA has been established based on the principle of “basin approach”. Water resources in the Panjshir River basin have thus been considered for the supply of urban water to the new city located in the Panjshir River basin.

According to the water supply plan in the present plan for the KMA, the water supply to the new city for the target year 2025 will be mainly shared by two water treatment and transmission stations. One will be located in the Dehsabz North area and another is located in Paymonar area.

Of these, it has been proposed that the Paymonar area will be supplied by urban water from Gulbahar Dam on the Panjshir River. Gulbahar Dam is a multipurpose dam for urban water supply, irrigation use and hydropower generation. The plan is considered as the realistic ones for the start of the service in the medium term.

Key features of the structures proposed in the Project are as follows:

- 1) Gulbahar dam: Dam height=140m, total storage volume =156MCM, effective storage volume=121MCM
- 2) A conveyance pipeline from the Gulbahar dam to a water treatment plant in Paymonar in the new city area: Discharge capacity =2.1m³/s with about 82km in total length
- 3) A booster pumping station for water conveyance line: necessary total pump head = 220m



Source: JICA Study Team

It should be noted that a water treatment plant and transmission line for water supply are included in a project for water supply. An FS for the Gulbahar dam is currently underway. The study is scheduled to end in March 2010 but a delay is expected. No FS for the conveyance pipeline and booster pumping station has been conducted.

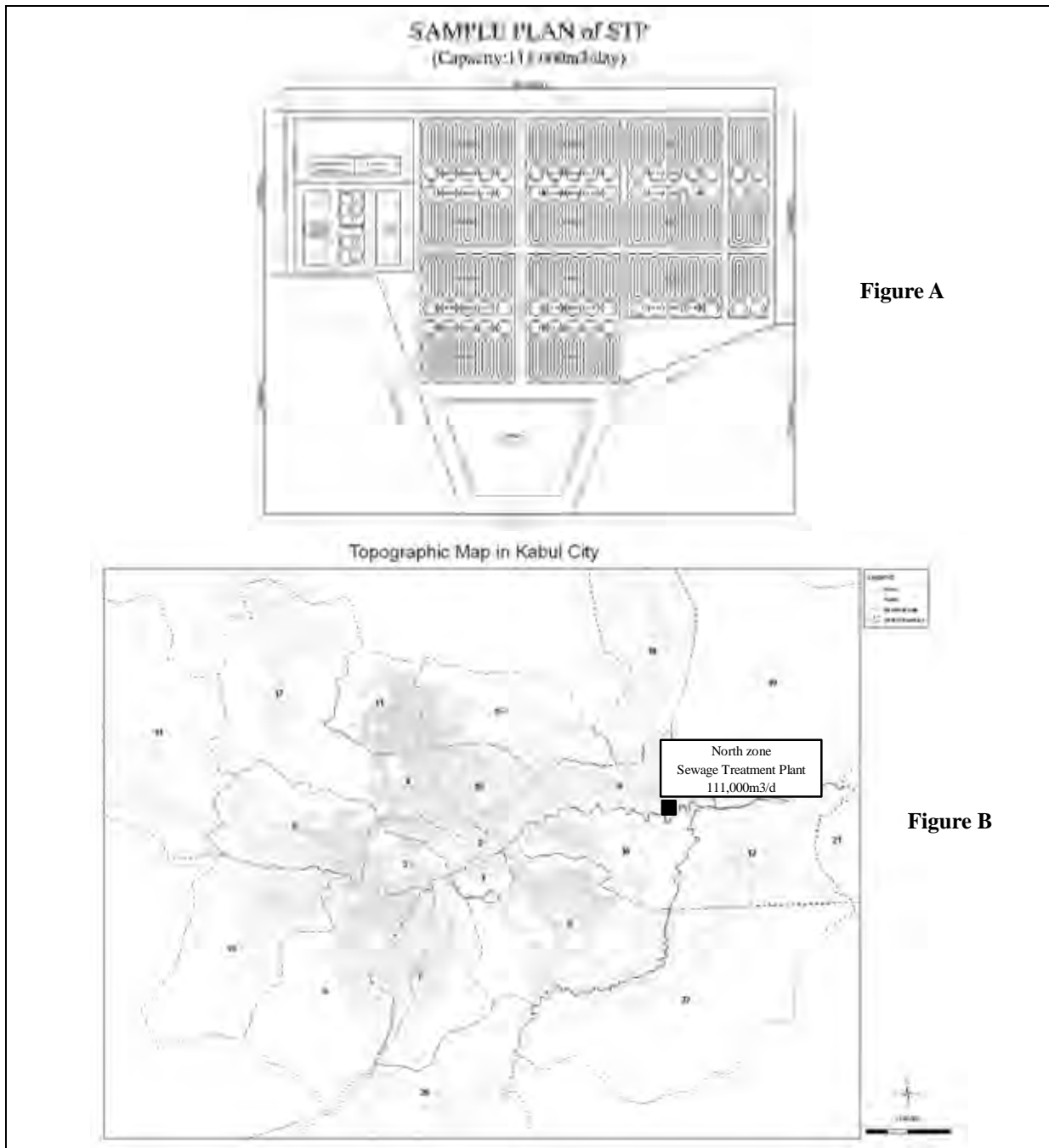
Project WR-4: Capacity Reconstruction of Geo-Engineering Laboratory

Location	Geo-Engineering Laboratory, DGEH, MOM
Implementing body	DGEH
Objectives	(1) To reconstruct capacity in Afghanistan to conduct geo-engineering laboratory testing and field investigation on foundation of civil engineering

	structures in response to increasing demand for such investigative work in KMA development (2) To support the continued development of groundwater and other subsurface resources for socio-economic development of the KMA and Afghanistan
Expected effects	Capacity to provide reliable geo-engineering data for infrastructural feasibility studies and structural designing for development of KMA and Afghanistan
Phasing	Phase 1
Investment cost	US\$0.69 million consisting of: - US\$540,000 for equipment acquisition (US\$220,000 for soil/material testing equipment; US\$320,000 for drilling machine and samplers) - US\$150,000 for expertise consulting cost
Descriptions	
<p>For feasibility studies on the infrastructure proposed by the master plan (e.g., groundwater development of the Panjshir fan aquifer), geo-engineering data on the foundation of various structures are required. Further, as the construction of the infrastructure in the KMA accelerates in the near future, the demand for geo-engineering data and investigation will increase. Since private firms in geo-engineering are underdeveloped in Afghanistan, it is essential to reconstruct governmental capacity to carry out the testing and investigation required to respond to the demand.</p> <p>The geo-engineering section of DGEH was a leading governmental organization in Afghanistan with capacity to conduct geo-engineering tests and investigation (e.g., soil tests, construction material tests and foundation investigation). However the laboratory was destroyed during the civil war and its equipment has been destroyed or rendered obsolete. DGEH has already started to regain its capacity by its own budget procuring soil-testing apparatus in the last year. However, its capacity to conduct tests and the apparatus procured are still insufficient. This project is to assist DGEH in regaining its capacity by acquiring supplemental equipment and providing expertise consulting on testing and investigation.</p>	

5. WATER SUPPLY AND SEWERAGE PROJECTS

Project SK-1: North Zone Sewage Treatment Plant Construction	
Location	Kabul city
Implementing body	CAWSS
Objectives	To treat sewage generated in north sewerage zone
Expected effects	Improved sanitary conditions in north sewerage zone
Phasing	Phase 1-2
Investment cost	US\$114.0 million
Description	
<p>There is no centralized sewerage in Kabul city. Wastewater is presently managed by on-site sanitation. In addition to improper installation of on-site sanitation facility, high population density may cause pollution of shallow wells. Those areas where piped water supply is or will be extended should be covered by sewerage. Three sewerage zones should be extended in Kabul city: North Zone, South Zone and Zone District 12.</p> <p>The project is to treat the sewage generated in North sewerage zone. Its direct beneficiary is the area population of 1,588,000 (est.). The average wastewater flow is estimated at 85,000m³/d. To treat 85,000m³/d of sewage, a sewage treatment plant (STP) with capacity of 111,000m³/d is constructed (Figure A). The site for the STP is in front of the Pule Charkhi industrial park and in District 9 (Figure B). For treatment, an oxidation ditch is recommended. The project should be mainly conducted in Phase 1 and finished in Phase 2 at the same time as water supply improvement through Shatoot dam and Allaudin water treatment plant.</p>	



Project SK-2: South Zone Sewage Treatment Plant Construction	
Location	Kabul city
Implementing body	CAWSS
Objectives	To treat sewage generated in south sewerage zone
Expected effects	Improved sanitary conditions in south sewerage zone
Phasing	Phase 1-2
Investment cost	US\$63.5 million
Description	
There is no centralized sewerage in Kabul city. Wastewater is presently managed by on-site sanitation. In addition to improper installation of on-site sanitation facility, high population density may cause pollution of shallow wells. Those areas where piped water supply is or will be extended should be covered by sewerage. Three sewerage zones should be extended in Kabul city: North	

Zone, South Zone and Zone District 12.

The project is to treat the sewage generated in South sewerage zone (Figure A). Its direct beneficiary is the area population of 728,000 (est.). The average wastewater flow is estimated at 39,000m³/d. To treat 39,000m³/d of sewage, an STP with capacity of 51,000m³/d is constructed by the project (Figure B). For treatment, an oxidation ditch is recommended. Also, the existing STP for the Macrorayon housing complex is rehabilitated. The project should be mainly implemented in Phase 1 and finished in Phase 2 at the same time as water supply improvement through Shatoot dam and Allaudin water treatment plant.

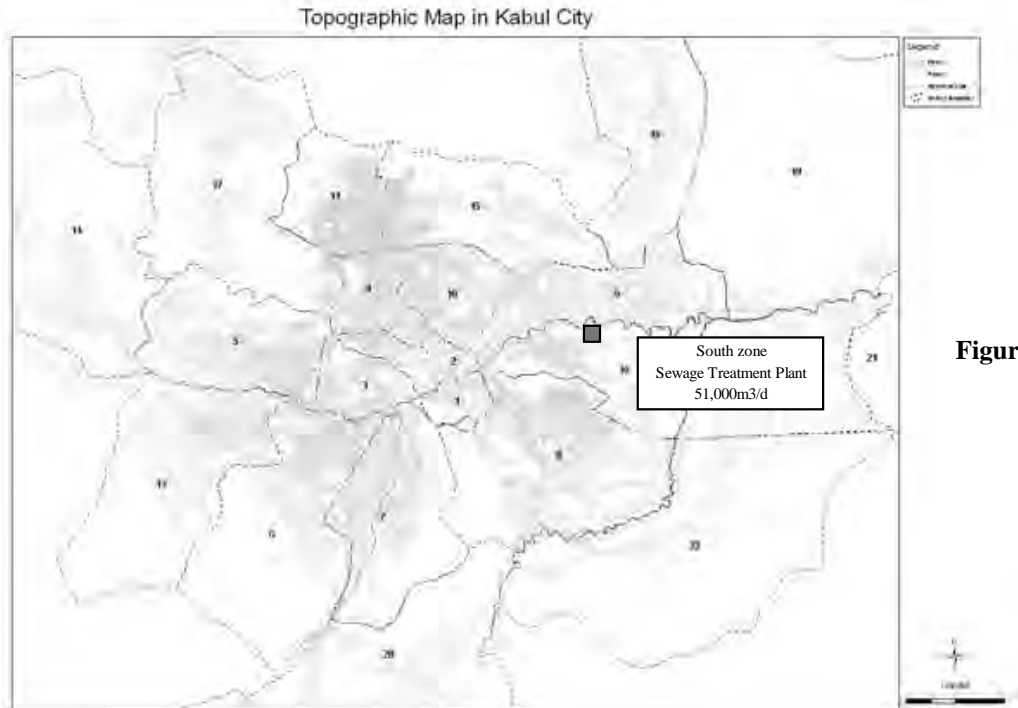


Figure A

SAMPLE PLAN of STP
(Capacity:51,000m³/day)

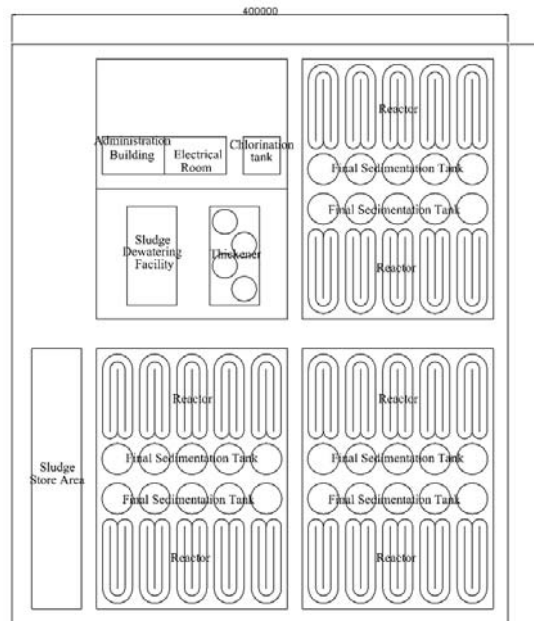


Figure B

Project SK-3: Zone District 12 Sewage Treatment Plant Construction

Location	Kabul city
Implementing body	CAWSS
Objectives	To treat sewage generated in sewerage zone D12
Expected effects	Improved sanitary conditions in sewerage zone D12
Phasing	Phase 1-2
Investment cost	US\$31.7 million

Descriptions

There is no centralized sewerage in Kabul city. Wastewater is presently managed by on-site sanitation. In addition to improper installation of on-site sanitation facility, high population density may cause pollution of shallow wells. Areas, where piped water supply is or will be extended, should be covered by sewerage. Three sewerage zones are extended in Kabul city: North Zone, South Zone and Zone District 12.

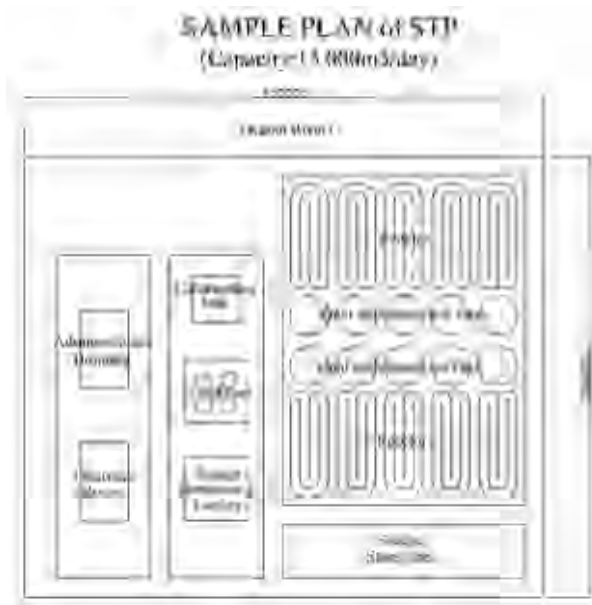


Figure A

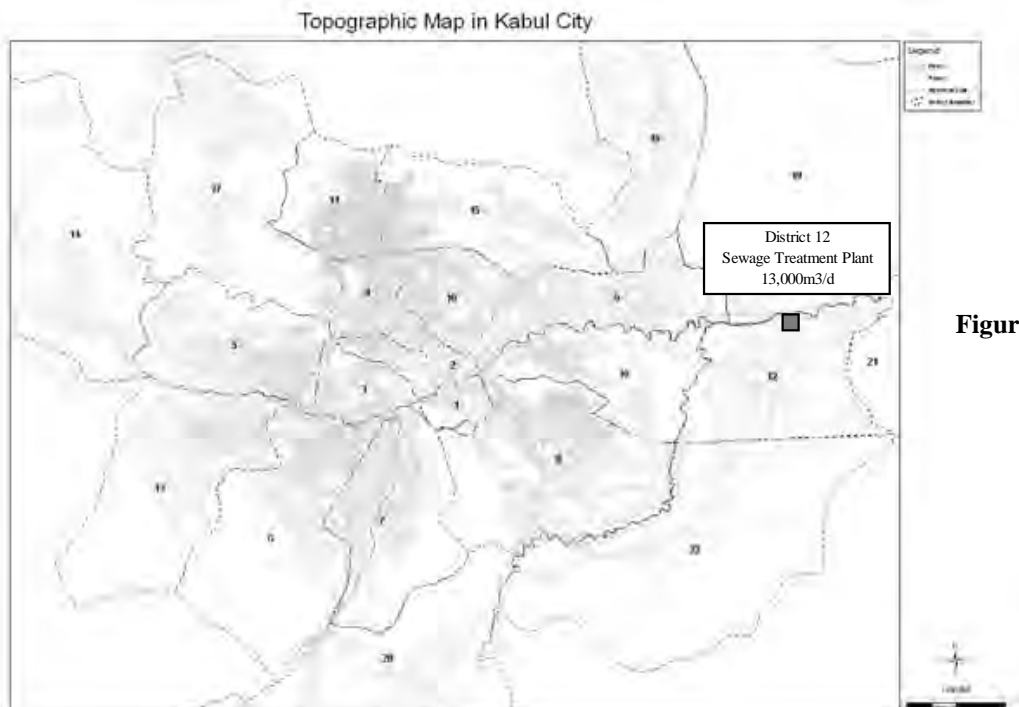


Figure B

The project is to treat the sewage generated in sewerage zone D12. Its direct beneficiary is the area population of 182,000 (est.). The average wastewater flow is estimated at 9,800m³/d. To treat 9,800m³/d of sewage, an STP with capacity of 13,000m³/d is constructed by the project (Figure A). The site for the STP is in the north of District 12 and along Kabul river (Figure B). For treatment, an oxidation ditch is recommended. The project should be mainly implemented in Phase 1 and finished in Phase 2 at the same time as water supply improvement through Shatoot dam and Allaudin water treatment plant.

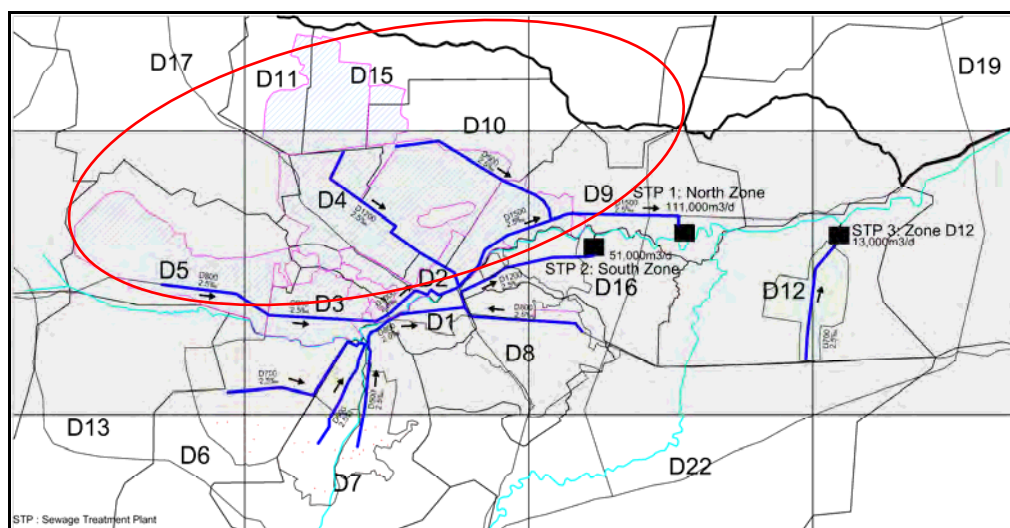
Project SK-4: Sewer Network for North Sewerage Zone

Location	Kabul city
Implementing body	CAWSS
Objectives	(1) To collect sewage generated in north sewerage zone (2) To transport sewage to treatment plant
Expected effects	Improved sanitary conditions in north sewerage zone
Phasing	Phase 1-2
Investment cost	US\$42.7 million

Description

There is no centralized sewerage in Kabul city. Wastewater is presently managed by on-site sanitation. In addition to improper installation of on-site sanitation facility, high population density may cause pollution of shallow wells. Those areas where piped water supply is or will be extended should be covered by sewerage. Three sewerage zones are extended in Kabul city: North Zone, South Zone and Zone District 12.

The project is to collect and transport the sewage generated in North Zone. Its direct beneficiary is the area population of 1,588,000 (est.). The average wastewater flow is estimated at 85,000m³/d. To transport 85,000m³/d of sewage to the STP for North Zone, sewer trunk lines (see the figure below) and networks are constructed by the project. The project starts from down-flow and it is implemented in 2 steps: the first step with the STP and the second step for service area/network extension. The first step includes the trunk line (900×3.8km, 1,000mm×3.6km, 1,200mm×7.3km, 1,500mm×9.1km) and network (4,100ha). The second step includes the trunk line (500mm×6.5km, 800mm×4.1km) and network (6,100ha).

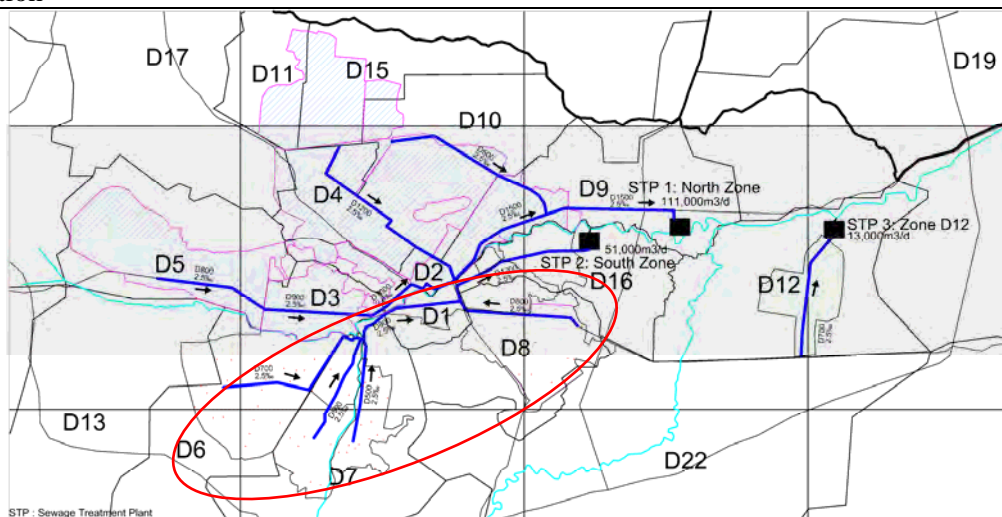


Project SK-5: Sewer Network for South Sewerage Zone

Location	Existing Kabul city
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Implementing body	CAWSS
Objectives	(1) To collect sewage generated in south sewerage zone (2) To transport sewage to treatment plant
Expected effects	Improved sanitary conditions in south sewerage zone
Phasing	Phase 1-2
Investment cost	US\$45.3 million

Description

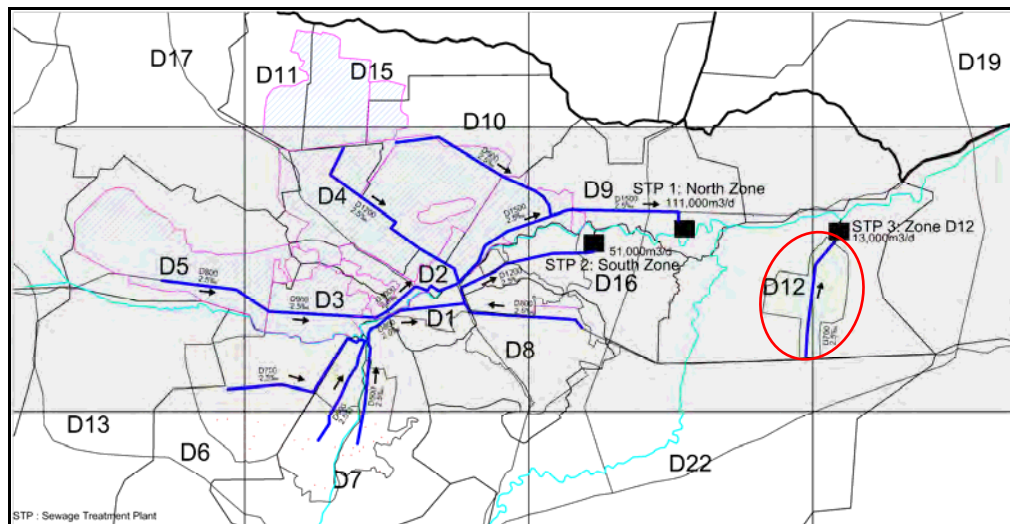


There is no centralized sewerage in Kabul city. Wastewater is presently managed by on-site sanitation. In addition to improper installation of on-site sanitation facility, high population density may cause pollution of shallow wells. Areas, where piped water supply is or will be extended, should be covered by sewerage. Three sewerage zones are extended in Kabul city: North Zone, South Zone and Zone District 12.

The project is to collect and transport the sewage generated in South Zone. Its direct beneficiary is the area population of 728,000 (est.). The average wastewater flow is estimated at 39,000m³/d. To transport 39,000m³/d of sewage to the STP for South Zone, sewer trunk lines (see the figure above) and networks are constructed by the project. The project starts from down-flow and it is implemented in 2 steps: the first step with the STP and the second step for service area/network extension. The first step includes trunk lines (800mm×8.5km and 1,200mm×5.3km) and network (3,100ha). The second step includes trunk lines (500mm×7.7km and 700mm×6.2km) and network (3,800ha).

Project SK-6: Sewer Network for Sewerage Zone District 12	
Location	Kabul city
Implementing body	CAWSS
Objectives	(1) To collect sewage generated in sewerage zone District 12 (2) To transport sewage to treatment plant
Expected effects	Improved sanitary conditions in sewerage zone District 12
Phasing	Phase 1-2
Investment cost	US\$31.0 million
Description	
<p>There is no centralized sewerage in Kabul city. Wastewater is presently managed by on-site sanitation. In addition to improper installation of on-site sanitation facility, high population density may cause pollution of shallow wells. Those areas where piped water supply is or will be extended should be covered by sewerage. Three sewerage zones are extended in Kabul city: North Zone, South Zone and Zone District 12.</p>	

The project is to collect and transport the sewage generated in Zone District 12. Its direct beneficiary is the area population of 182,000 (est.). The average wastewater flow is estimated at 9,800m³/d. To transport 9,800m³/d of sewage to the STP for Zone District 12, sewer trunk lines and networks are constructed by the project (see the figure below). The project starts from down-flow and it is implemented in 2 steps: the first step with the STP and the second step for service area/network extension. Through these steps, a trunk line (700mm×2.3km) and network (1,100ha) are provided.

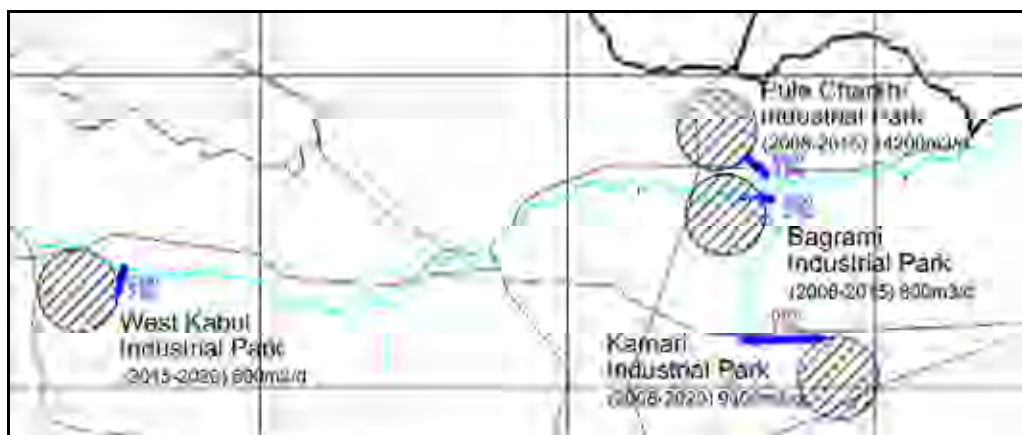


Project SK-7: Sewer Network for Industrial Parks in Kabul City

Location	Industrial parks, existing Kabul city
Implementing body	CAWSS
Objectives	(1) To collect treated sewage generated in industrial parks (2) To transport treated sewage to rivers
Expected effects	Treated sewage from industrial parks properly disposed
Phasing	Phase 1-2
Investment cost	US\$0.3 million

Description

Industrial wastewater should be treated by enterprises at each factory. However, factories have no destination for treated wastewater discharge.



The project is to provide trunk sewers for industrial parks in 2 steps. The first step is to provide trunk sewers of 800mm×1.5km from Pule Charkhi to Kabul river, 350mm×1.5km from Bagrami to Logar river and 700mm×2.5km from Kamari to Logar river (see the figure above). It should be mainly implemented in Phase 1 and completed at the time as the commencement of industrial water supply.

The second step is for West Kabul at 350mm×1.5km to transport the treated wastewater to Paghman river (see the figure below), which is implemented in Phase 2. Sewer networks in the industrial parks should be constructed by enterprises' finance and responsibility.

Project SN-1: 26 Dalwa Sewage Treatment Plant

Location	26 Dalwa and Dehsabz North E zone, new city
Implementing body	CAWSS
Objectives	To treat sewage generated in sewerage zone Dehsabz North E including 26 Dalwa
Expected effects	Secured sanitary conditions in sewerage zone Dehsabz North E including 26 Dalwa
Phasing	Phase 1-2
Investment cost	US\$109.5 million

Description

Since the new city will be fully covered by piped water supply, proper sewerage is necessary for the urban areas. The new city is divided into 4 sewerage zones according to the topography and wastewater flows: Barikab Zone, Dehsabz North E Zone including 26 Dalwa, West Dehsabz Zone, and Southeast Dehsabz Zone.

The project is to treat the sewage generated in Dehsabz North E Zone including 26 Dalwa. Its direct beneficiary is the area population of 353,000 (est.). The average wastewater flow is estimated at 42,000m³/d. To treat 42,000m³/d of sewage, an STP with capacity of 56,000m³/d is constructed by the project. The site for the STP is in the west of the zone and along Bagram road (Figure A). For treatment, an oxidation ditch is planned.

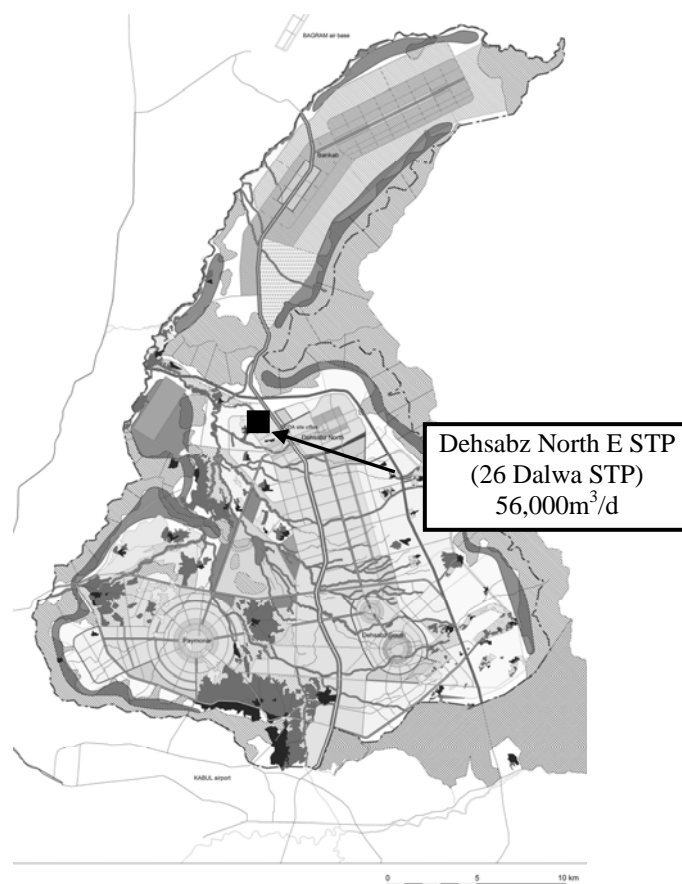


Figure A

The project should be implemented in accordance with water supply development, and its

implementation divided into 3 steps. The first step is the construction of an STP with capacity of 22,000m³/d (Figure B) in Phase 1 in parallel with urban development of 26 Dalwa. The second step is its capacity extension of 11,000m³/d also in Phase 1. The third step is a further extension of 23,000m³/d to be implemented in Phase 2.

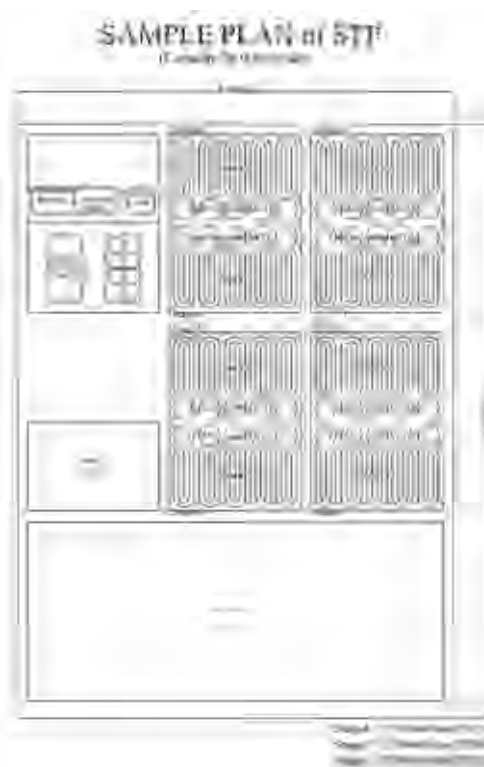


Figure B

Project SN-2: Barikab Sewage Treatment Plant	
Location	Barikab zone, new city
Implementing body	CAWSS
Objectives	To treat sewage generated in sewerage zone Barikab
Expected effects	Secured sanitary conditions in sewerage zone Barikab
Phasing	Phase 1-2
Investment cost	US\$66.0 million
Description	
<p>Since the new city will be fully covered by piped water supply, proper sewerage is necessary for the urban areas. The new city is divided into 4 sewerage zones according to the topography and wastewater flows: Barikab Zone, Dehsabz North E Zone including 26 Dalwa, West Dehsabz Zone, and Southeast Dehsabz Zone.</p> <p>The project is to treat the sewage generated in Barikab Zone. Its direct beneficiary is the area population of 185,000 (est.). The average wastewater flow is estimated at 22,000m³/d. To treat 22,000m³/d of sewage, an STP with capacity of 29,000m³/d is constructed by the project. The site for the STP is at the north edge of the zone (Figure A). For treatment, an oxidation ditch is planned.</p> <p>The project should be implemented in accordance with water supply development, and its implementation is divided into 2 steps. The first step is to construct an STP with capacity of 14,500m³/d in Phase 1. The second step is its capacity extension of another 14,500m³/d in Phase 2. (A sample plan of the STP is shown in Figure B.)</p>	

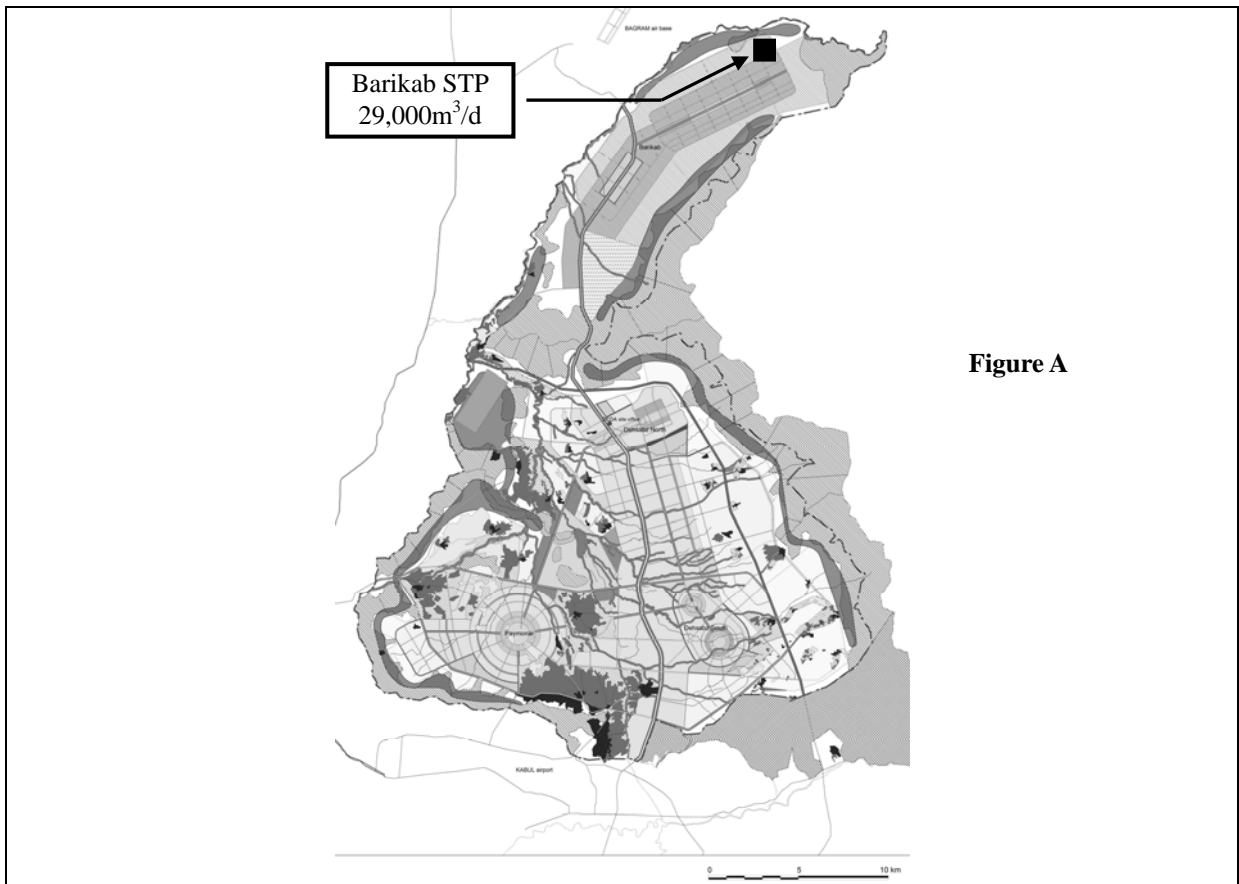


Figure A

SAMPLE PLAN of STP
(Capacity:29,000m3/day)

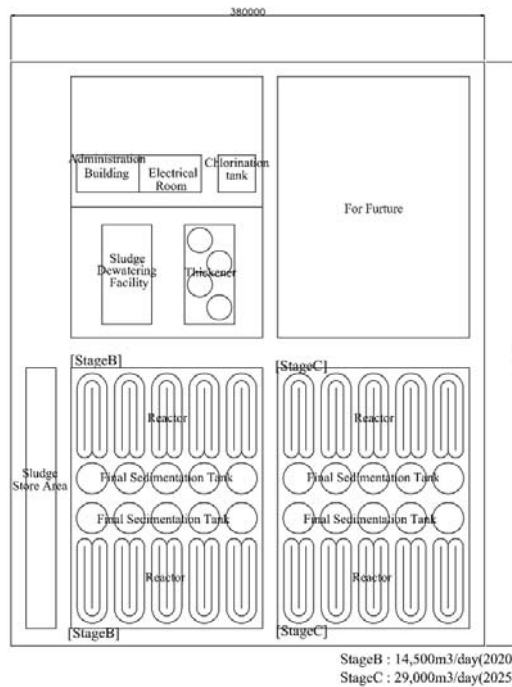


Figure B

Project SN-3: Southeast Dehsabz Sewage Treatment Plant

Location	Southeast Dehsabz zone, new city
Implementing body	CAWSS
Objectives	To treat sewage generated in sewerage zone Southeast Dehsabz

Expected effects	Secured sanitary conditions in sewerage zone Southeast Dehsabz
Phasing	Phase 1-2
Investment cost	US\$84.4 million

Description

Since the new city will be fully covered by piped water supply, proper sewerage is necessary for the urban areas. The new city is divided into 4 sewerage zones according to the topography and wastewater flows: Barikab Zone, Dehsabz North E Zone including 26 Dalwa, West Dehsabz Zone, and Southeast Dehsabz Zone.



Figure A

SAMPLE PLAN of STP
(Capacity: 51,000m³/day)

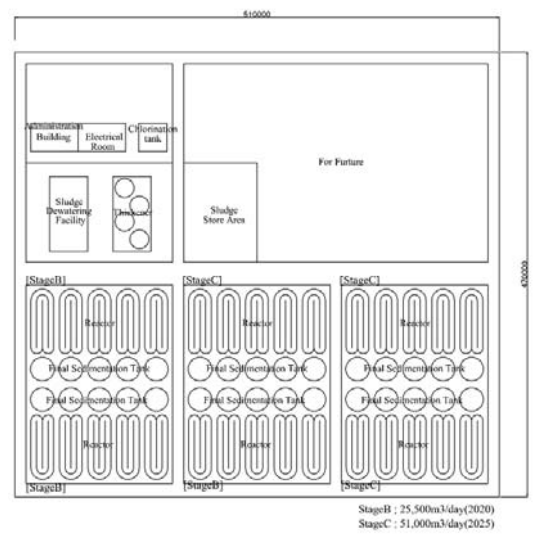


Figure B

The project is to treat the sewage generated in Southeast Dehsabz Zone. Its direct beneficiary is the area population of 327,000 (est.). The average wastewater flow is estimated at 39,000m³/d. To treat

39,000m³/d of sewage, an STP with capacity of 51,000m³/d is constructed by the project. The site for the STP is at the northwest edge of the zone (Figure A). For treatment, an oxidation ditch is planned.

The project should be implemented in accordance with water supply development, and its implementation is divided into 2 steps. The first step is to construct an STP with capacity of 25,500m³/d in Phase 1. The second step is its extension of another 25,500m³/d in Phase 2. (A sample plan of the STP is shown in Figure B.)

Project SN-4: West Dehsabz Sewage Treatment Plant	
Location	West Dehsabz zone, new city
Implementing body	CAWSS
Objectives	To treat sewage generated in sewerage zone West Dehsabz
Expected effects	Secured sanitary conditions in sewerage zone West Dehsabz
Phasing	Phase 1-2
Investment cost	US\$107.0 million
Description	
<p>Since the new city will be fully covered by piped water supply, proper sewerage is necessary for the urban areas. The new city is divided into 4 sewerage zones according to the topography and wastewater flows: Barikab Zone, Dehsabz North E Zone including 26 Dalwa, West Dehsabz Zone, and Southeast Dehsabz Zone.</p> <p>The project is to treat the sewage generated in West Dehsabz Zone. Its direct beneficiary is the area population of 495,000 (est.). The average wastewater flow is estimated at 59,000m³/d. To treat 59,000m³/d of sewage, an STP with capacity of 78,000m³/d is constructed by the project. The site for the STP is at the northwest edge of the zone (see the figure below). For treatment, an oxidation ditch is planned.</p>	

The project should be conducted in accordance with water supply development and it is divided into 2 steps. The first step is to construct an STP with capacity of 39,000m³/d in Phase 1. The second step is its extension of another 39,000m³/d in Phase 2.

Project SN-5: 26 Dalwa Sewer Network

Location	26 Dalwa, Dehsabz North E, new city
Implementing body	CAWSS
Objectives	To collect and transport sewage generated in sewerage zone 26 Dalwa, Dehsabz North E to sewage treatment plant
Expected effects	Secured sanitary conditions in sewerage zone 26 Dalwa, Dehsabz North E
Phasing	Phase 1
Investment cost	US\$11.5 million

Description

Since the new city will be fully covered by piped water supply, proper sewerage is necessary for the urban areas. The new city is divided into 4 sewerage zones according to the topography and wastewater flows: Barikab Zone, Dehsabz North E Zone including 26 Dalwa, West Dehsabz Zone, and Southeast Dehsabz Zone.

The project is to collect and transport the sewage generated in 26 Dalwa in Dehsabz North E Zone to the designated STP. The treatment plant is constructed in parallel with urban development of 26 Dalwa. Its direct beneficiary is the population of 150,000 (est.) in 26 Dalwa. The average wastewater flow is estimated at 18,000m³/d in 2025. To collect and transport the sewage, a sewer trunk line (700mm×1km) and sewer network (820ha) are required. The project should be implemented in Phase 1 together with urban development of 26 Dalwa.

Project SN-6: Barikab Zone Sewer Network

Location	Barikab, new city
Implementing body	CAWSS
Objectives	To collect and transport sewage generated in sewerage zone Barikab to sewage treatment plant
Expected effects	Secured sanitary conditions in sewerage zone Barikab
Phasing	Phase 1-2
Investment cost	US\$65.0 million

Description

Since the new city will be fully covered by piped water supply, proper sewerage is necessary for the urban areas. The new city is divided into 4 sewerage zones according to the topography and wastewater flows: Barikab Zone, Dehsabz North E Zone including 26 Dalwa, West Dehsabz Zone, and Southeast Dehsabz Zone.

The project is to collect and transport the sewage generated in Barikab Zone to the designated STP. Its direct beneficiary is the area population of 185,000 (est.). The average wastewater flow is estimated at 22,000m³/d in 2025.

The project is implemented in 2 steps according to water supply development. The first step is to provide a sewer trunk line and sewer network for the area developed first. The second step is an extension of the sewer network. The first step should be implemented in Phase 1 and the second step in Phase 2. To collect and transport sewage, in the first step a sewer trunk line (900mm×8km, 700mm×8km and 500mm×4.5km) and sewer network (2,275ha) are provided. In the second step, another sewer network (2,275ha) is added. (These sewer trunk lines are indicated in the figure below.)



Project SN-7: Dehsabz North E Zone Sewer Network

Location	Eastern area of Dehsabz North, new city
Implementing body	CAWSS
Objectives	To collect and transport sewage generated in sewerage zone Dehsabz North E to sewage treatment plant
Expected effects	Secured sanitary conditions in sewerage zone Dehsabz North E
Phasing	Phase 1-2
Investment cost	US\$29.8 million

Description

Since the new city will be fully covered by piped water supply, proper sewerage is necessary for the urban areas. The new city is divided into 4 sewerage zones according to the topography and wastewater flows: Barikab Zone, Dehsabz North E Zone including 26 Dalwa, West Dehsabz Zone, and Southeast Dehsabz Zone.

The project is to collect and transport the sewage generated in Dehsabz North E Zone to the designated STP. The facilities for 26 Dalwa, which are listed separately, are not included in the project. Its direct beneficiary is the area population of 203,000 (est.) excluding the population in 26 Dalwa. The average wastewater flow is estimated at 24,000m³/d in 2025.

The project is implemented in 2 steps according to water supply development. The first step is to provide a sewer trunk line and sewer network for the area developed first. The second step is an extension of the sewer network. The first step should be conducted in Phase 1 and the second step in Phase 2. To collect and transport sewage, in the first step a sewer trunk line (1000mm×2km, 800mm×3.5km and 700mm×3km) and sewer network (1,043ha) are provided. In the second step, another sewer network (1,042ha) is added. (These sewer trunk lines are indicated in the figure below.)



Project SN-8: Dehsabz Southeast Zone Sewer Network

Location	Southeastern area of Dehsabz, new city
Implementing body	CAWSS
Objectives	To collect and transport sewage generated in sewerage zone Dehsabz Southeast to sewage treatment plant
Expected effects	Secured sanitary conditions in sewerage zone Dehsabz Southeast
Phasing	Phase 1-2
Investment cost	US\$44.4 million

Description

Since the new city will be fully covered by piped water supply, proper sewerage is necessary for the urban areas. The new city is divided into 4 sewerage zones according to the topography and wastewater flows: Barikab Zone, Dehsabz North E Zone including 26 Dalwa, West Dehsabz Zone, and Southeast Dehsabz Zone.

The project is to collect and transport the sewage generated in Dehsabz Southeast Zone to the designated STP. Its direct beneficiary is estimated at 327,000. The average wastewater flow is estimated at 39,000m³/d in 2025.

The project is implemented in 2 steps according to water supply development. The first step is to provide a sewer trunk line and sewer network for the area developed first. The second step is an extension of the sewer network as well as the additional trunk line. The first step should be implemented in Phase 1 and the second step in Phase 2. To collect and transport sewage, in the first step a sewer trunk line (1200mm×3km, 800mm×1.7km, 700mm×6.2km, and 600mm×2km) and sewer network (926ha) are provided. In the second step, another sewer trunk line (700mm×6km) and sewer network (2,160ha) are added. (These sewer trunk lines are indicated in the figure below.)



Project SN-9: West Dehsabz zone sewer network project

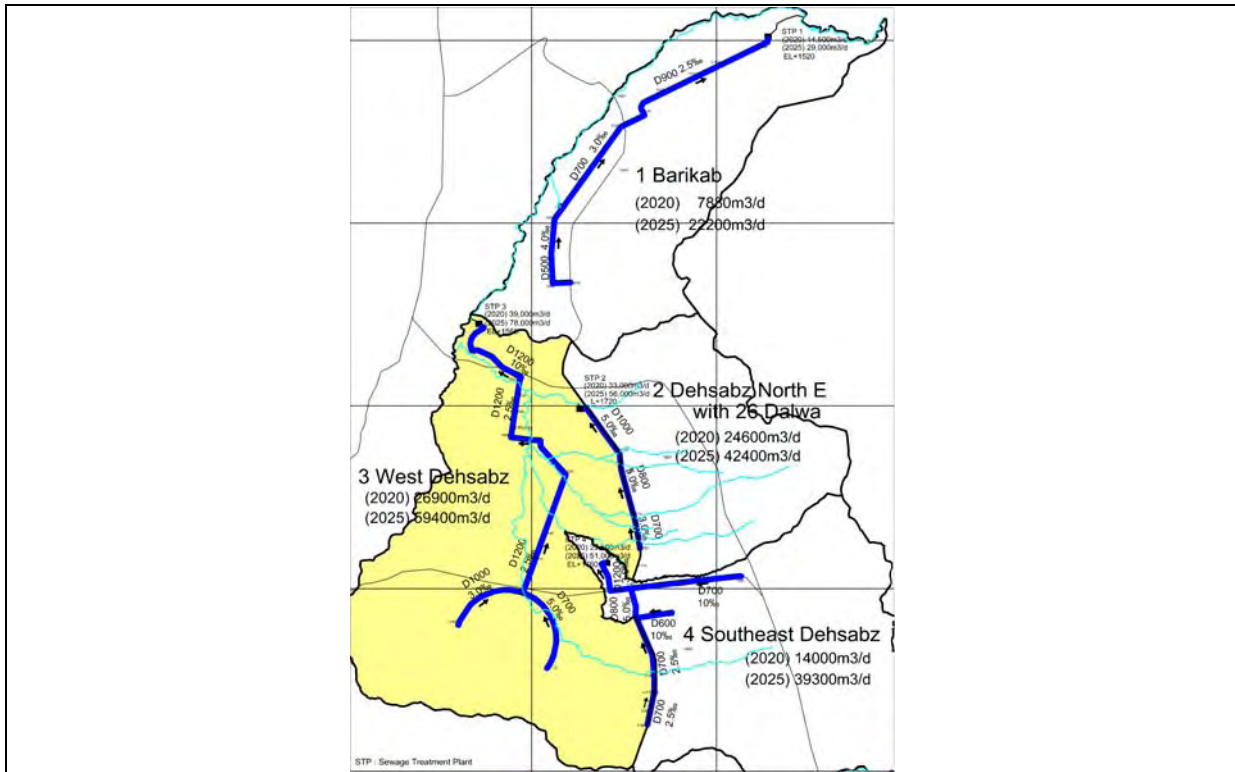
Location	Western area of Dehsabz, new city
Implementing body	CAWSS
Objectives	To collect and transport sewage generated in sewerage zone West Dehsabz to sewage treatment plant
Expected effects	Secured sanitary conditions in sewerage zone West Dehsabz
Phasing	Phase 1-2
Investment cost	US\$84.3 million

Description

Since the new city will be fully covered by piped water supply, proper sewerage is necessary for the urban areas. The new city is divided into 4 sewerage zones according to the topography and wastewater flows: Barikab Zone, Dehsabz North E Zone including 26 Dalwa, West Dehsabz Zone, and Southeast Dehsabz Zone.

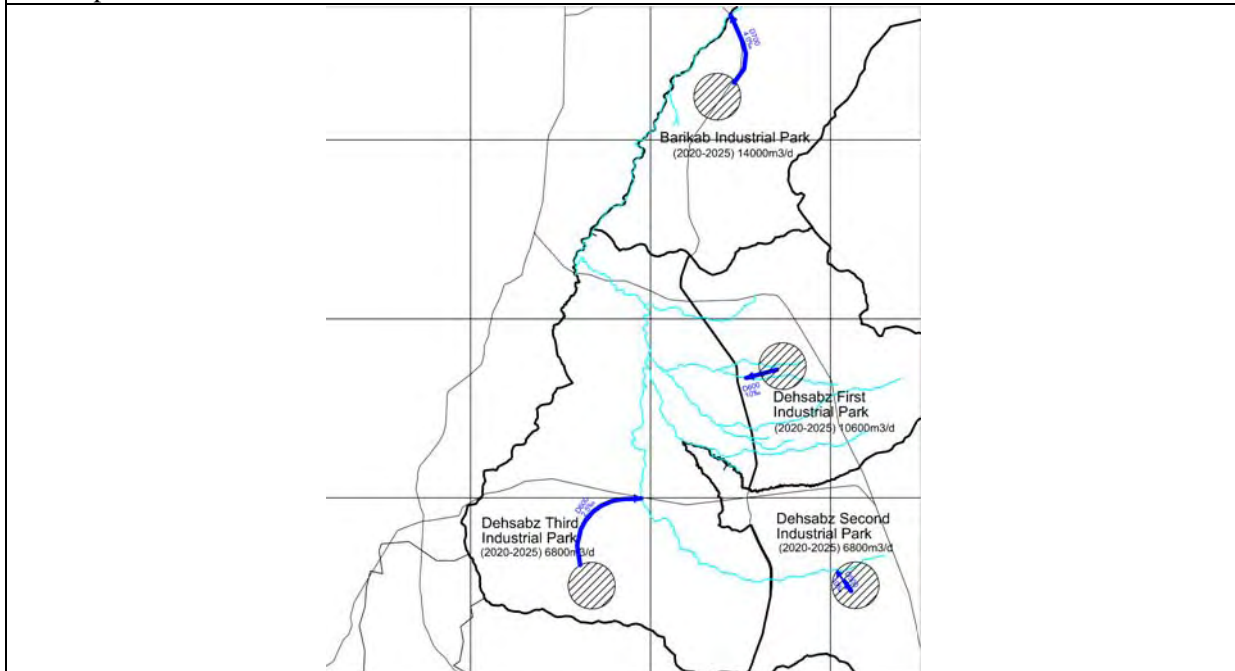
The project is to collect and transport the sewage generated in West Dehsabz Zone to the designated STP. Its direct beneficiary is estimated at 495,000. The average wastewater flow is estimated at 59,000m³/d in 2025.

The project is implemented in 2 steps according to water supply development. The first step is to provide a sewer trunk line and sewer network for the area developed first. The second step is an extension of the sewer network as well as the additional trunk line. The first step should be implemented in Phase 1 and the second step in Phase 2. To collect and transport sewage, in the first step a sewer trunk line (1200mm×15km and 700mm×5km) and sewer network (515ha) are provided. In the second step, another sewer trunk line (1000mm×4.5km) and sewer network (5,296ha) are added. (These sewer trunk lines are indicated in the figure below.)



Project SN-10: Sewer network construction project for industrial parks in new city

Location	Industrial parks, new city
Implementing body	CAWSS
Objectives	(1) To collect treated sewage generated in industrial parks (2) To transport the above treated sewage to rivers
Expected effects	Treated sewage in industrial parks properly disposed
Phasing	Phase 1
Investment cost	US\$0.5 million
Description	



Industrial wastewater should be treated by enterprises at each factory. However, factories have no destination for treated wastewater discharge.

The project is to provide trunk sewers for industrial parks. Since all the industrial parks are scheduled to commence their operation upon Panjshir fan aquifer development in Phase 1, the sewer trunk lines are developed in Phase 1 by 2016: 700mm×4.2km for Barikab, 600mm×1.8km for Dehsabz 1, 500mm×2km for Dehsabz 2, and 600mm×6.1km for Dehsabz 3 (see the figure above). Sewer networks in the industrial parks should be constructed by enterprises' finance and responsibility.

Project WK-1: Central Kabul Water Distribution Network Extension (Amendment to Project 09)

Location	Kabul city
Implementing body	CAWSS
Objectives	(1) To increase local groundwater extraction capacity to 44 million m ³ /y (2) To extend piped water service area to current urban planning area and District 12
Expected effects	Population of 2 million covered by piped water
Phasing	Phase 1-2
Investment cost	US\$139.0 million

Description



The project was planned by the KfW study for “The Extension of the Kabul Water Supply System” as a short-term project to be finished by 2009. The project is phased in 4 stages: STP, MTP-1, MTP-2 and MTP-3.

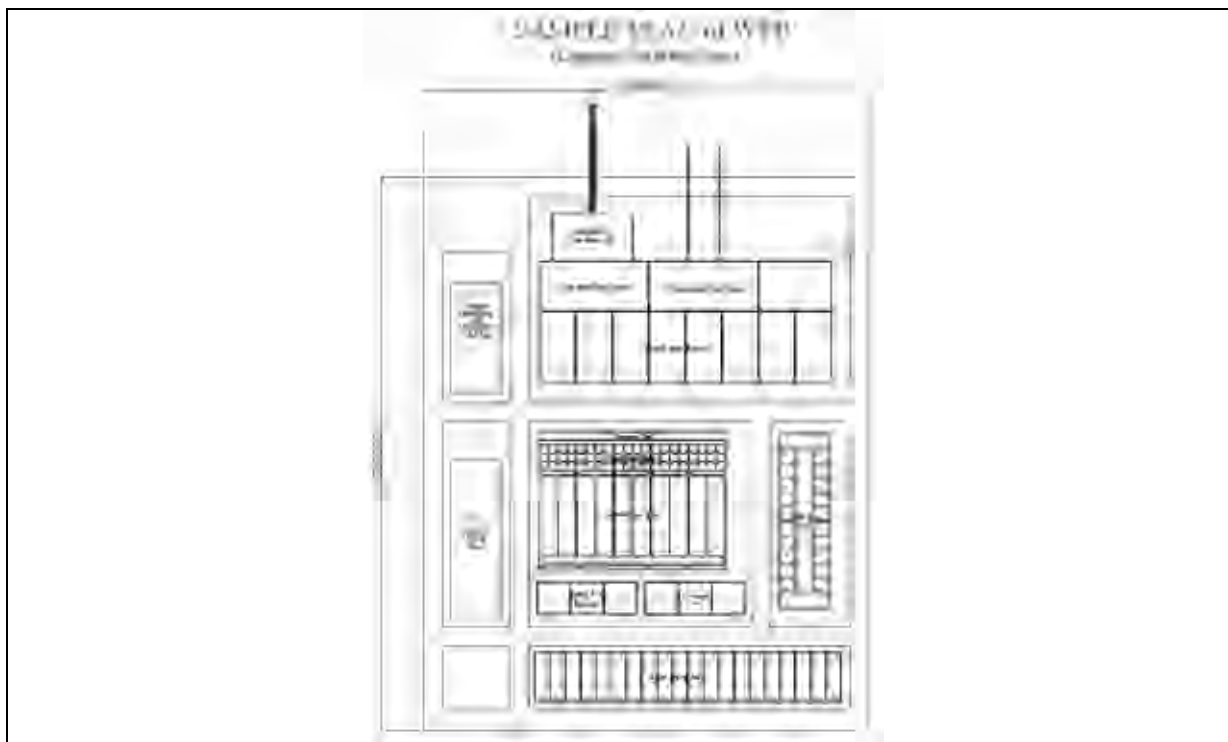
The project aims at extracting all the local groundwater (44 million m³/y) for piped water supply and distributing it to the existing Kabul city by pipeline as well as extending the piped water service area. By the project, most of current urban planning area and District 12 will be covered by piped water and

beneficiary will reach the population of 2 million. The areas to be covered are indicated in the figure above.

The project has not been implemented as scheduled. Although it was planned for the project to be finished by 2009, only STP has been completed and most of MTP-1 and the remaining stages unexecuted due to financial difficulty. CAWSS sets 2015 as the practical target year.

The present master plan recommends binding MTP-1, 2 and major parts of MTP-3 as Phase 1 to be completed by 2015. The execution of MTP-3 should be controlled to keep the service population within 2 million. Otherwise, groundwater extraction would exceed the capacity of water resources. The remaining parts of MTP-3 should be executed after development of Shatoot dam in Phase-2. Major facilities to be constructed are groundwater wells, water reservoirs, transmission mains and distribution networks.

Project WK-2: Allaudin Water Treatment Plant	
Location	Allaudin, Kabul city
Implementing body	CAWSS
Objectives	(1) To treat conveyed surface water from Shatoot dam at 49.3 million m ³ /y on average (2) To transmit the treated water to the existing Kabul city
Expected effects	- Population of 2.5 million covered by piped water - Piped water service supplied to population at 67LCD on average
Phasing	Phase 1-2
Investment cost	US\$171.0 million
Description	
<p>Local groundwater is limited and insufficient to accommodate the population of 5 million in the existing Kabul city. The local groundwater capacity is calculated at only 24LCD on average. To improve the condition, surface water will be developed through Shatoot dam construction. By this surface water development, the total water availability is expected to increase to 47LCD.</p>	
<p>Topographic Map in Kabul City</p>	



This project aims at treating the surface water of Shatoot dam and feed the treated water to piped water distribution network. The project is expected to achieve supply of 67LCD on average to 2.5 million. Moreover, it will contribute to reducing CAWSS’s groundwater extraction so that water availability of shallow well users will increase to 25LCD on average for another 2.5 million.

The project is to construct a water treatment plant (WTP) with capacity of 180,000m³/d at Allaudin (see the figures above). A feasibility and detail design study is finished and construction work commenced in Phase 1. The construction is finished in Phase 2. The completion of the project is expected by 2017 at the same time as the completion of Shatoot dam construction. The project facilities include a treated water reservoir of 30,000m³ and pumping facility to transmit to distribution networks as well as treatment facilities.

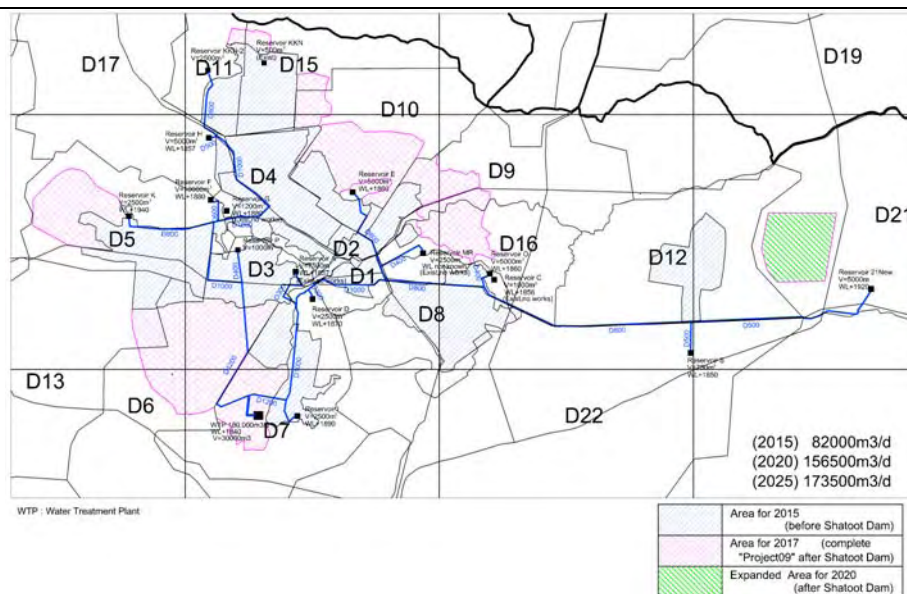
Project WK-3: Water Supply for District 21	
Location	District 21, Kabul city
Implementing body	CAWSS
Objectives	(1) To receive treated water in District 21 (2) To distribute treated water by pipe line to District 21
Expected effects	- Piped water service commenced in District 21 - Piped water supplied to new service population of 88,000 at 67LCD on average
Phasing	Phase 1-2
Investment cost	US\$49.3 million
Description	
Although available local groundwater is limited, District 21 has been developed for a new residential area. To reinforce drinking water availability, piped water should be extended after development of Shatoot dam and Allaudin WTP.	
The project is to cover 50% of the population at 67LCD with piped water in District 21. The piped water service population in the area will reach 88,000 in 2025. By the project, a water reservoir (5,000m ³) and distribution network (800ha) are established. A feasibility and detail design study is	

finished and construction work commenced in Phase 1. The construction is finished in Phase 2.

Project WK-4: Kabul City Water Supply Improvement (Transmission from Allaudin WTP)

Location	Exiting Kabul city
Implementing body	CAWSS
Objectives	(1) To transmit treated water to various zones in Kabul city (2) To improve water supply conditions in Kabul city
Expected effects	Treated water transmitted to 2.5 million people from Allaudin WTP
Phasing	Phase 1-2
Investment cost	US\$62.7 million

Description



This project is to construct water transmission mains from Allaudin WTP. The project should be executed together with the construction of Allaudin WTP. It is necessary to cover a population of 2.5 million with piped water supply. New transmission mains will connect the treatment plant to the existing water reservoirs and new reservoirs to be constructed by Project09 and District 21.

Water transmission mains to be constructed by the project are 1200mm×7.7km, 1000mm×10km, 800mm×6.7km, 600mm×1km, 500mm×0.2km and 400mm×1.2km for the western area and 1200mm×2.1km, 1000mm×8.1km, 800mm×12.4km, 600mm×4km, 500mm×9.1km, 400mm×3.3km and 300mm×3.3km for the eastern area (see the figure above). A feasibility and detail design study is finished and construction work commenced in Phase 1. The construction is finished in Phase 2. The project will be completed by 2017 at the same time as the completion of Allaudin WTP.

Project WK-5: Kabul City Industrial Water Treatment Plant

Location	Industrial parks, Kabul city
Implementing body	CAWSS
Objectives	(1) To treat surface water of Kabul river at 9.1 million m ³ /y on average (2) To transmit treated water to industrial parks of Kabul city
Expected effects	Industrial water of 9.1 million m ³ /y on average secured
Phasing	Phase 1-2
Investment cost	US\$48.4 million

Description

Currently, factories in the existing Kabul city extract the local groundwater for industrial purposes. As many industries are developed in the existing Kabul city, there will be serious shortage of local groundwater rendering it difficult to maintain water volume for both household (drinking) and industrial use. Upon completion of Shatoot dam, the flow of Kabul river will be steady, and stable utilization of water will be possible in quantity. Although the water is not potable, the river has a potential for industrial use at 10 million m³/y at the maximum. To supply 9.1 million m³/y of water, the prospective industrial water demand for 2025, the project should provide a treatment plant with capacity of 33,000m³/d.

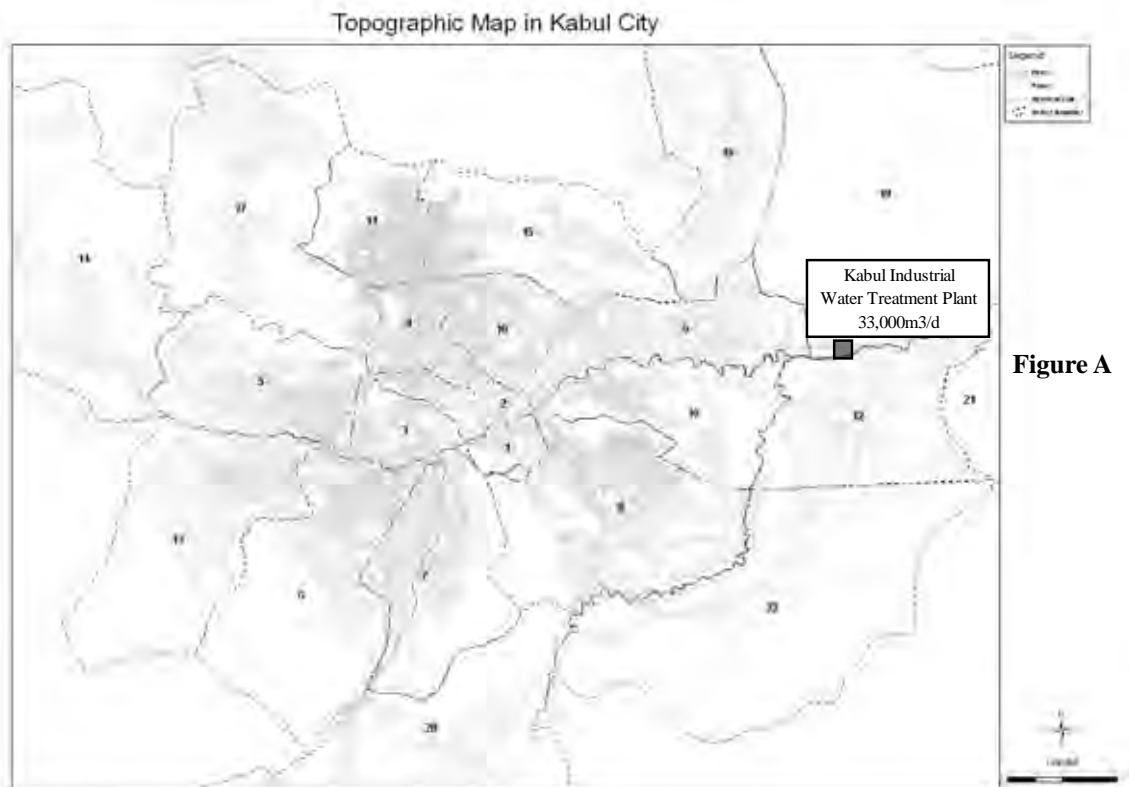


Figure A

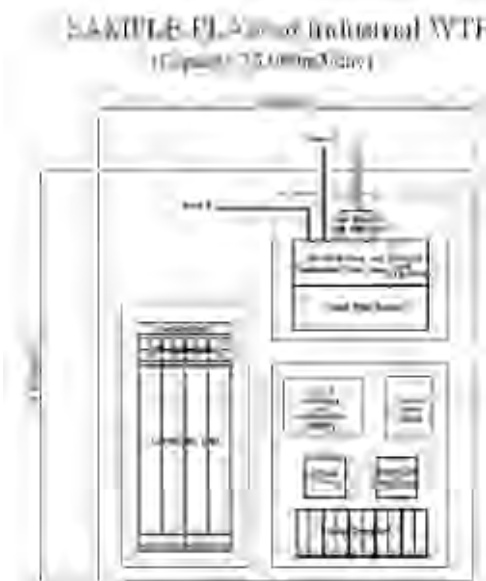


Figure B

The quality of industrial water should be monitored by turbidity. 15NTU is generally considered to be adequate for industrial purposes. Those factories that require purer water should have private

treatment plants. Ordinarily, a WTP with standard 8-hour sedimentation process is sufficient to attain water quality of 15NTU. However, 8-hour sedimentation is insufficient if soil/sand is contaminated during rainy days. Considering high turbidity of raw water, an industrial WTP equipped with a chemical sedimentation facility is recommended. The construction site for the WTP is Pule Charkhi along Kabul river (Figure A). It is noted that sand-filtering process is not required of the industrial WTP.

The industrial WTP should have a transmission pump facility (Figure B) to transmit the treated water to industrial parks, namely, Pule Charkhi, Bagرامي, Kamari and West Kabul as well as a treated water reservoir (5,500m³). A feasibility and detail design study is finished and construction work commenced in Phase 1. The construction is finished in Phase 2. The completion of the project is expected by 2017 at the same time as the completion of Shatoot dam construction.

Project WK-6: Kabul City Industrial Water Transmission	
Location	Industrial parks, Kabul city
Implementing body	CAWSS
Objectives	(1) To transmit the treated water to industrial parks of Kabul city (2) To secure enough water in industrial parks
Expected effects	Treated water of 9.1 million m ³ /y on average transmitted to industrial parks from industrial WTP
Phasing	Phase 1-2
Investment cost	US\$8.1 million
Description	
<p>This project is to construct water transmission mains from Kabul city industrial WTP. It is recommended that the project be executed together with the construction of the industrial WTP. It is necessary to supply water to the industrial parks of Pule Charkhi, Bagرامي, Kamari and West Kabul. New transmission mains will connect the WTP to the industrial parks. However, water reservoirs in the industrial parks need to be designed and developed by factories, according to their water demand and demand curve.</p> <p>Water transmission mains to be constructed by the project are 300mm×23.5km and 500mm×12.8km in total length (see the figure below). A feasibility and detail design study is finished and construction work commenced in Phase 1. The construction is finished in Phase 2.</p>	

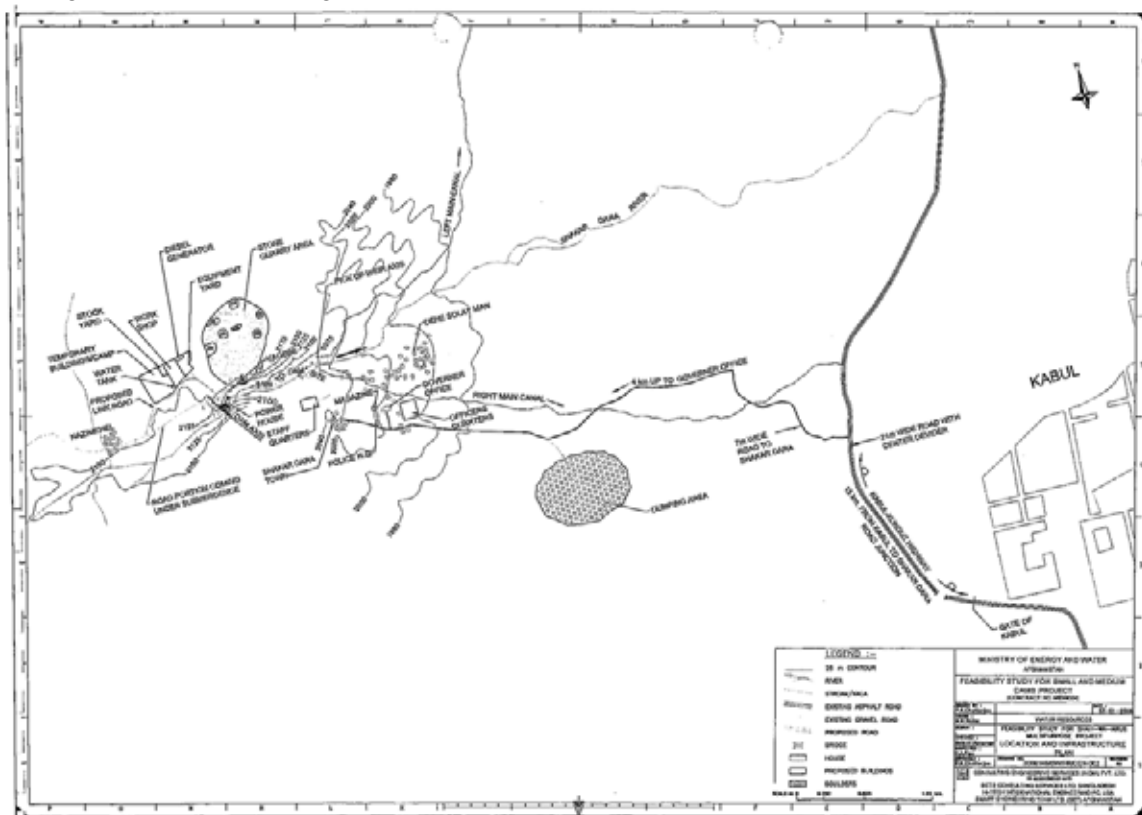
Project WK-7: Shah-wa-Arus Dam	
Location	District 17, Kabul city
Implementing body	MoEW
Objectives	To secure water resources for District 17

Expected effects	- Potable water resources of 2.63 million m ³ /y added for District 17 - Public taps water supplied to population of 144,000 at 50LCD on average
Phasing	Phase 1
Investment cost	US\$5.0 million for potable water, total US\$29 million

Description

The project design was finished in July 2008. The project is to construct a dam to secure irrigation water and develop hydropower. The dam has a capacity to supply 7,200m³/d of potable water on average. The construction is finished in Phase 1. The outline of the dam is as follows (see the figure below).

- (1) Type: Multipurpose hydropower
- (2) Location: Near Nazim Khel village on Shakardara river (34.68N: 69.02E)
- (3) Structure: Concrete
- (4) Size: 52.1m high; 60m wide
- (5) Output: 600kW ×2
- (6) Irrigation area: 3,584ha gross; 1500ha net



Source: MoEW

Project WK-8: District 17 Water Treatment Plant

Location	District 17, Kabul city
Implementing body	CAWSS
Objectives	(1) To treat conveyed surface water from Shah-wa-Arus dam at 2.63 million m ³ /y on average (2) To transmit treated water to District 17 of Kabul city
Expected effects	Public taps water supplied to population of 144,000 at 50LCD on average
Phasing	Phase 1
Investment cost	US\$34.3 million

Description

The residents of District 17 have obtained drinking water from local shallow wells. However, by the KMA master plan, urban development will proceed in District 17 and its population is expected to increase dramatically from 71,000 at present (2008) to 214,000 in 2025. It will be impossible for the local groundwater to accommodate such increase in the population. Thus, it is recommended that the surface water of Shah-wa-Arus dam be utilized as a measure to prevent future water shortage.

To treat the surface water of 2.63 million m³/y on average, the project provides a WTP with capacity of 10,000m³/d (Figures A and B). The plant's treatment process is by chemical sedimentation and rapid sand filtering. The project includes construction of a water conveyance pipeline from the dam to District 17 (500mm×14.5km; Figure C), treated water reservoir (2,500m³) and water transmission facility. The construction of the WTP and Shah-wa-Arus dam is completed in Phase 1.

By the project, it is expected to achieve average supply of 50LCD to the population of 144,000 by public taps. Furthermore, the project contributes to securing local groundwater for shallow well users (70,000 residents) at 40LCD.

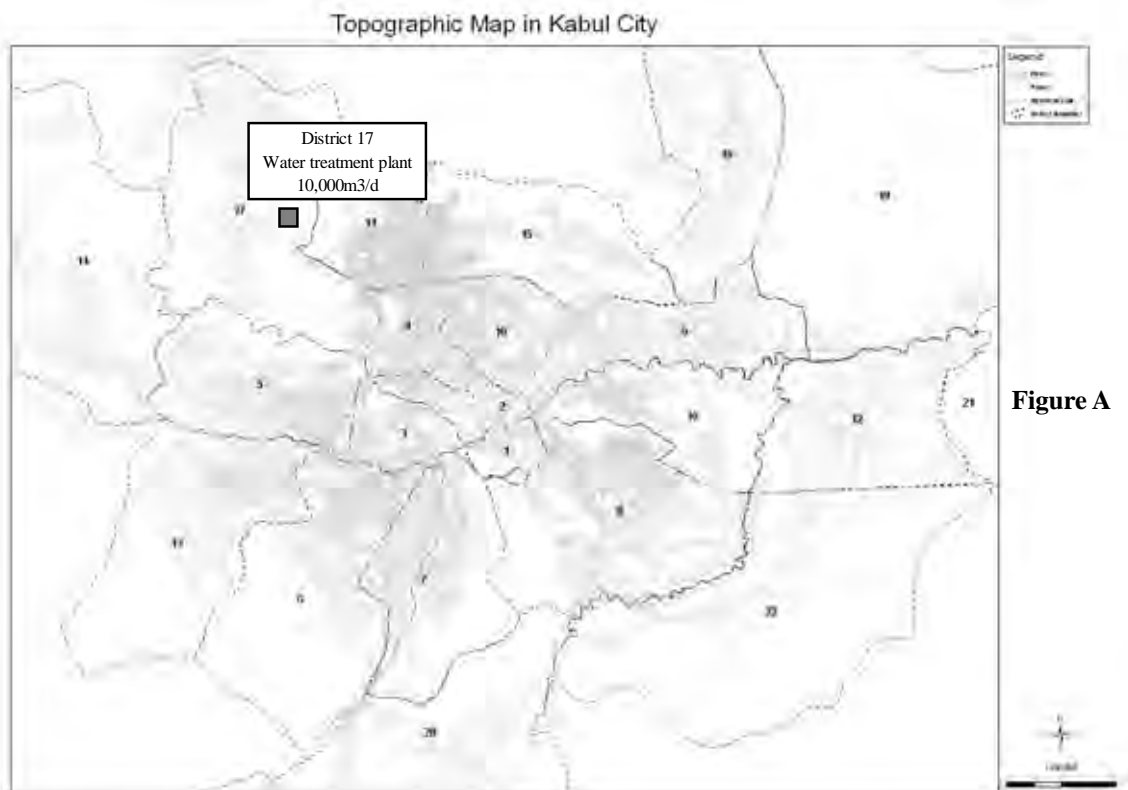
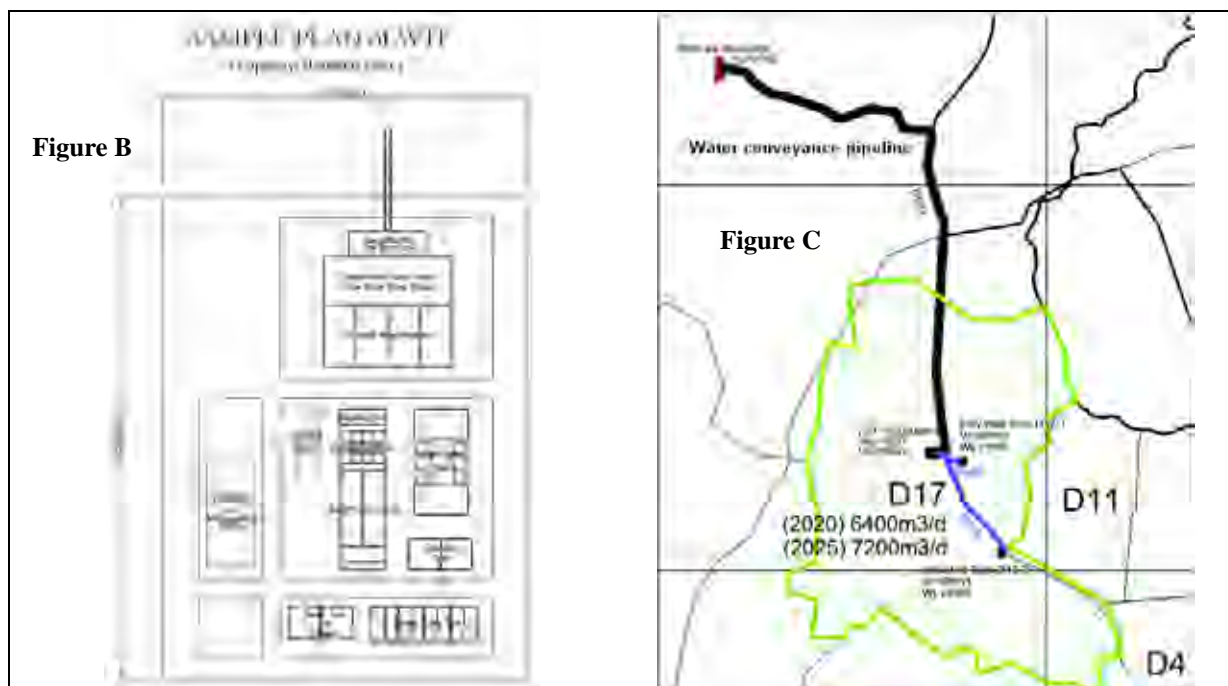


Figure A



Project WK-9: District 17 Water Supply

Location	District 17, Kabul city
Implementing body	CAWSS
Objectives	(1) To receive treated water in District 17 (2) To transmit/distribute treated water to District 17 by pipeline and public tap
Expected effects	- Public tap water supply service commenced in District 17 - Piped water supplied to 144,000 public tap service population at 50LCD on average
Phasing	Phase 1-2
Investment cost	US\$108.4 million
Description	
<p>To distribute treated water to District 17 residents through public taps, water transmission mains, key service reservoirs, distribution networks, and public taps are constructed. To prevent water supply capacity from excess consumption, no house connection is extended in the project. The project is to distribute all the water treated by the District 17 WTP (10,000m³/d) and supply the water at 50LCD (40LCD on a consumption basis) to the resident population of 144,000.</p> <p>As the first step, 2 key service reservoirs (one in the north and another in the south, 500m³ each), a transmission main (300mm×3.3km) and distribution network including public taps (1,000ha) are provided (see the figure below for the transmission main). The construction of these is completed at the same time as the construction of the District 17 WTP to commence the supply service immediately. The first step is therefore undertaken in Phase 1. As the second step, the service area is expanded monitoring the urban development and population increase as well as water resources conditions. The service area expansion is through construction of distribution network including public taps (760ha) in Phase 2.</p>	



Project WN-1: 26 Dalwa Water Supply	
Location	26 Dalwa, Dehsabz North, new city
Implementing body	MoUD
Objectives	(1) To provide drinking water to residents of 26 Dalwa (2) To support the 26 Dalwa project (new urban district development project) in water supply
Expected effects	- House connection water supply service provided in 26 Dalwa - Water supplied to population of 150,000 at 125LCD on average
Phasing	Phase 1
Investment cost	US\$57.7 million
Description	
<p>A development project of new urban district, 26 Dalwa, which includes water supply facilities, has been implemented by MoUD. By the project, wells outside the new city, water transmission facilities, a water reservoir in 26 Dalwa, and distribution networks are provided.</p> <p>The master plan recommends regulating water supply at a level of 7-8 million m³/y on average to conserve the groundwater in Northern Kabul Province. The master plan also recommends providing facilities of 6.8m³/y on average capable of supplying water to 150,000 residents at 125LCD. As the facilities are constructed in parallel with the urban development, the project is implemented in Phase 1. The recommended project is considered to be the first step of water supply development for 26 Dalwa. It is recommended that the main water supply system to be constructed in the new city supply additional water to 26 Dalwa in 2025 to achieve the ideal water supply at 150LCD.</p>	

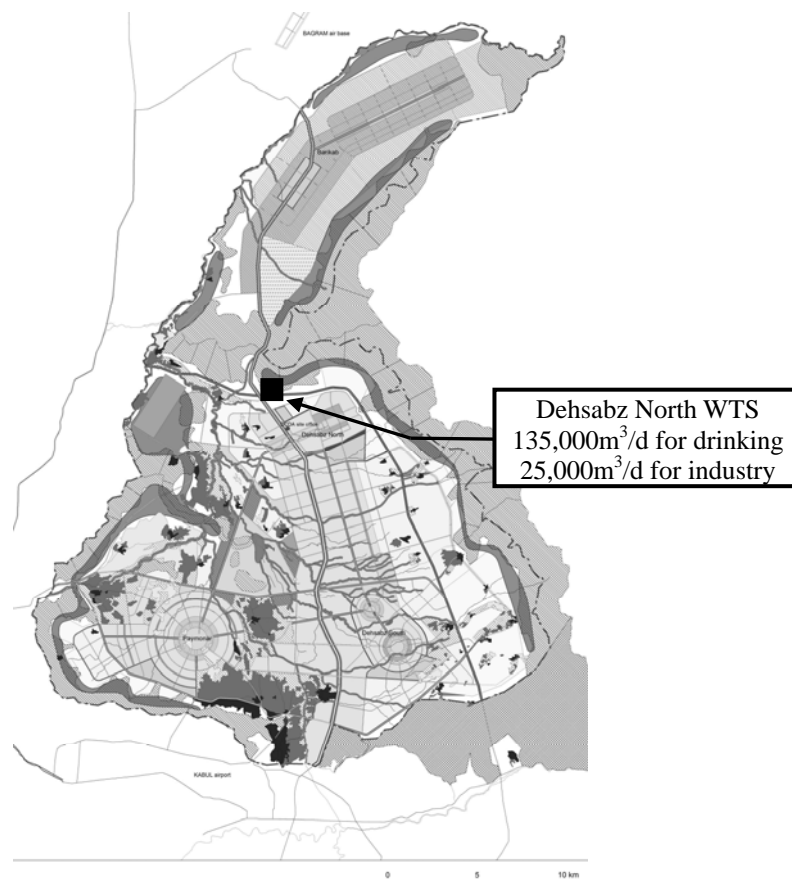
Project WN-2: Dehsabz North Water Transmission Station	
Location	Dehsabz North, new city
Implementing body	CAWSS
Objectives	(1) To receive water from Panjshir fan aquifer (2) To supply water to new city until 2018 and to Barikab and east side Dehsabz after 2018 (3) To supply a half required volume of water at final stage in 2025

Expected effects	- 44.6 million m ³ /y water received and supplied to new city - Piped water supply activity secured in new city
Phasing	Phase 1-2
Investment cost	US\$7.9 million

Description

Local groundwater resources of the new city are limited. To accommodate a new urban population, outside water resources are required. As a water source for drinking water, the master plan recommends the Panjshir river and Gulbahar dam to solve water problems for the new city. However, since the construction of Gulbahar dam is expected to take about 15 years, the dam would not be able to supply water at the initial development stages of the new city. Accordingly, the master plan recommends bringing sub-surface water of the Panjshir fan aquifer at 44.6 million m³/y that is a half of the required water volume in the new city.

This project is to provide a water transmission station (WTS) to receive water of the Panjshir fan aquifer in the new city and supply it. By the project, a potable water reservoir (23,000m³), industrial water reservoir (4,000m³), and potable and industrial water pump stations are constructed for Dehsabz. No pump may be required to transmit the water to Barikab. As the water conveyance is developed in 2 steps, the project facilities are also constructed in 2 steps. Most of the first step is implemented in Phase 1 for the half capacity and the operation is commenced by 2016. The second step for another half capacity is undertaken in Phase 2 and the operation is commenced by 2019. Finally, the project will supply water to the new city at 150LCD for the population of 750,000 and 7 million m³/y of industrial water. The site for the WTS is indicated in the figure below.



Project WN-3: Barikab Drinking Water Supply

Location	Barikab, new city
Implementing body	CAWSS
Objectives	(1) To transmit drinking water to Barikab

	(2) To distribute drinking water to Barikab at 150LCD through piped water supply
Expected effects	Drinking water supplied to 195,000 Barikab residents at 150LCD
Phasing	Phase 1-3
Investment cost	US\$294.1 million

Description

The project provides transmission mains, key water reservoirs and distribution networks (see the figure below). By the project, Barikab residents (195,000 in 2025) will have piped water supply at 150LCD. The project is implemented in 3 steps in accordance with the water resources and urban development.

The first step covers the southern area of Barikab in Phase 1 in parallel with the first step of the Panjshir fan aquifer development. In this step, transmission mains (800mm×4km and 300mm×0.5km), a water reservoir (2,000m³) and distribution network (1,517ha) are constructed.

The second step covers the entire Barikab in Phase 2 in parallel with the second step of the Panjshir fan aquifer development. Constructed in this step are transmission mains (800mm×7km and 600mm×13km), a water reservoir (2,000m³) and distribution network (1,517ha).

The third step is to reinforce the capacity for the entire Barikab. It is implemented in Phase 2-3 in parallel with the development of the Paymonar WTP. Upon completion of the treatment plant, the water allocation for Barikab will be increased. The project will utilize the increased allocation to reinforce the capacity. The constructions in this step consist of a transmission main (400mm×2km), water reservoir (2,500m³) and distribution network (1,516ha).



Project WN-4: Dehsabz Northeast Drinking Water Supply (Zone Dehsabz North E)	
Location	Eastern side of Dehsabz North, new city
Implementing body	CAWSS
Objectives	(1) To transmit drinking water to eastern side of Dehsabz North (2) To distribute drinking water to eastern side of Dehsabz North at 150LCD

	through piped water supply
Expected effects	Drinking water supplied to 361,000 residents of eastern side of Dehsabz North at 150LCD
Phasing	Phase 1-3
Investment cost	US\$157.8 million

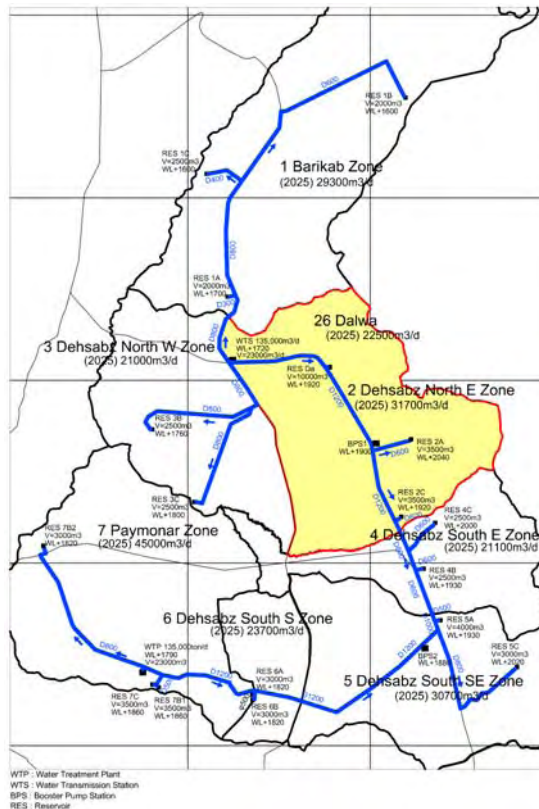
Description

The project provides transmission mains, key water reservoirs and distribution networks (see the figure below). By this project, the residents of the eastern side of Dehsabz North (361,000 in 2025) will have piped water supply at 150LCD. The project is implemented in 3 steps in accordance with the water resources and urban development. (Water distribution networks for 26 Dalwa are not included in the project.)

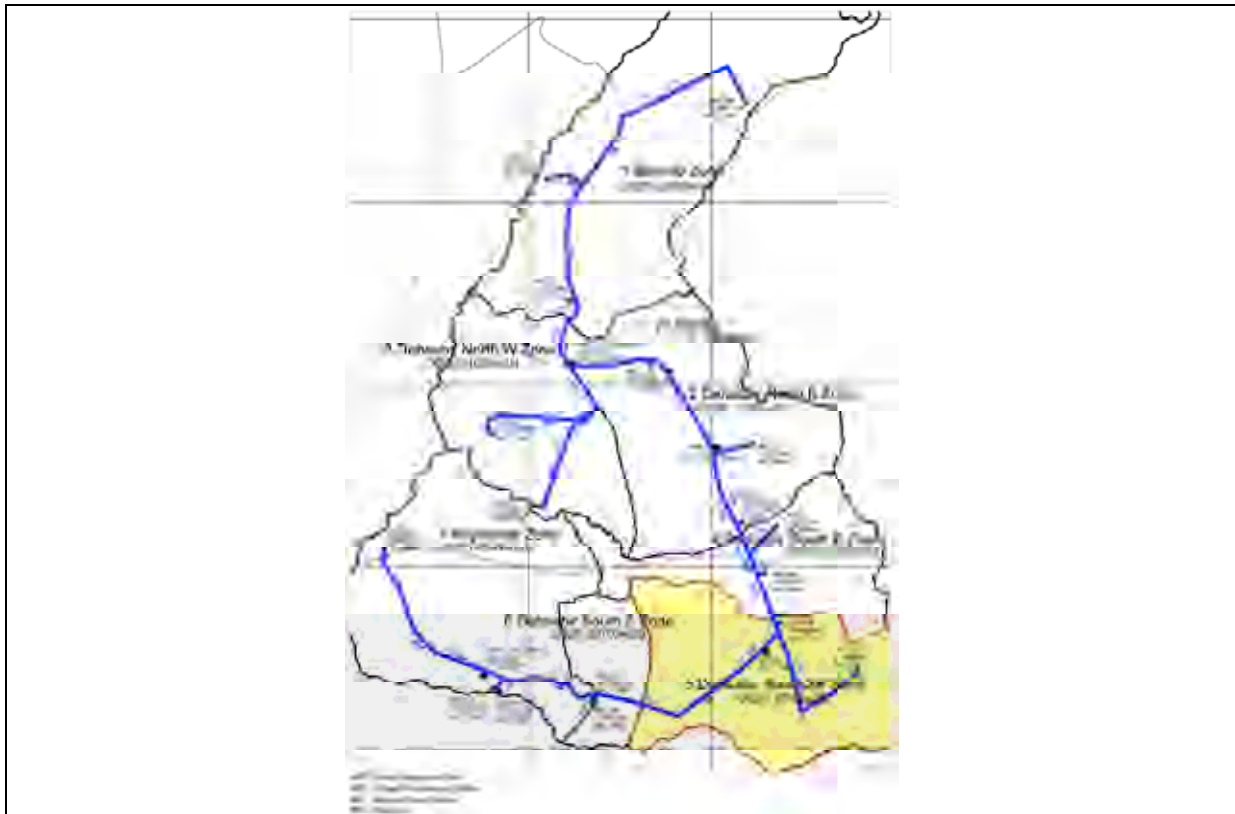
The first step provides key water transmission mains connecting to Dehsabz South in Phase 1 in parallel with the first step of the Panjshir fan aquifer development. In this step, transmission mains (1200mm×16km, 600mm×2km and a booster pump to Dehsabz South), a water reservoir (3,500m³) and distribution network (695ha) are constructed. The planned distribution network is for the central area of Dehsabz North E Zone. Details need to be further examined in the next study stage of the urban development.

The second step is an extension of distribution networks in Phase 2, using additional water from the second step of the Panjshir fan aquifer development. Another distribution network (695ha) is added in this step.

The third step is to reinforce the capacity for the entire Dehsabz North E Zone in Phase 2-3 in parallel with the development of the Paymonar WTP. Upon completion of the treatment plant, the water allocation for Dehsabz North E Zone will be increased. The project will utilize the increased allocation to reinforce the capacity. The constructions in this step consist of a transmission main (600mm×0.5km), water reservoir (3,500m³) and distribution network (695ha).



Project WN-5: Dehsabz South-southeast Drinking Water Supply (Zone Dehsabz South SE)	
Location	Southeastern side of Dehsabz South, new city
Implementing body	CAWSS
Objectives	(1) To transmit drinking water to southeastern side of Dehsabz South (2) To distribute drinking water to southeastern side of Dehsabz South at 150LCD through piped water supply
Expected effects	Drinking water supplied to 205,000 residents of southeastern side of Dehsabz South at 150LCD
Phasing	Phase 1-3
Investment cost	US\$125.0 million
Description	
<p>The project provides transmission mains, key water reservoirs and distribution networks (see the figure below). By this project, the residents of the southeastern side of Dehsabz South (205,000 in 2025) will have piped water supply at 150LCD. The project is implemented in 3 steps in accordance with the water resources and urban development.</p> <p>The first step provides key water transmission mains connecting to Dehsabz South SE Zone in Phase 1 in parallel with the first step of the Panjshir fan aquifer development. In this step, transmission mains (800mm×2km, 600mm×5km and 500mm×0.5km), a water reservoir (4,000m³) and distribution network (618ha) are constructed. The planned distribution network is for the northern area of Dehsabz South SE Zone. Details need to be further examined in the next study stage of the urban development.</p> <p>The second step is an extension of distribution networks in Phase 2, using additional water from the second step of the Panjshir fan aquifer development. Another distribution network (617ha) is added in this step.</p> <p>The third step is to reinforce the capacity for the entire Dehsabz South SE Zone in Phase 2-3 in parallel with the development of the Paymonar WTP. Upon completion of the treatment plant, some of the water will be transmitted from the plant and the water allocation for Dehsabz South SE Zone will be increased. The constructions in this step consist of a transmission main (800mm×8.5km and a booster pump station to bring water from the treatment plant), water reservoir (3,000m³) and distribution network (617ha).</p>	



Project WN-6: Dehsabz South-south Drinking Water Supply (Zone Dehsabz South S)

Location	Southern side of Dehsabz South, new city
Implementing body	CAWSS
Objectives	(1) To transmit drinking water to southern side of Dehsabz South (2) To distribute drinking water to southern side of Dehsabz South at 150LCD through piped water supply
Expected effects	Drinking water supplied to 158,000 residents of southern side of Dehsabz South at 150LCD
Phasing	Phase 1-3
Investment cost	US\$85.3 million

Description

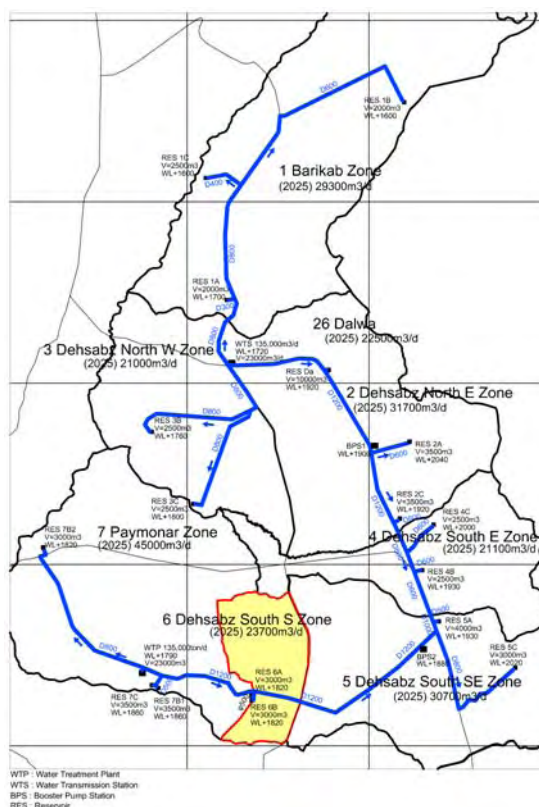
The project provides transmission mains, key water reservoirs and distribution networks (see the figure below). By this project, the residents of the southern side of Dehsabz South (158,000 in 2025) will have piped water supply at 150LCD. The project is implemented in 3 steps in accordance with the water resources and urban development.

The first step provides key water transmission mains connecting to Dehsabz South S Zone in Phase 1 in parallel with the first step of the Panjshir fan aquifer development. In this step, transmission mains (1,200mm×11km, 1,000mm×1.5km and 600mm×0.5km), a water reservoir (3,000m³) and distribution network (343ha) are constructed. The planned distribution network is for the first urban development area of Dehsabz South S Zone. Details need to be further examined in the next study stage of the urban development.

The second step is an extension of distribution networks in Phase 2, using additional water from the second step of the Panjshir fan aquifer development. Another transmission main (500mm×0.5km), water reservoir (3,000m³) and distribution network (343ha) are added in this step.

The third step is to reinforce the capacity for the entire Dehsabz South S Zone in Phase 2-3 in parallel with the development of the Paymonar WTP. Upon completion of the treatment plant, water will be

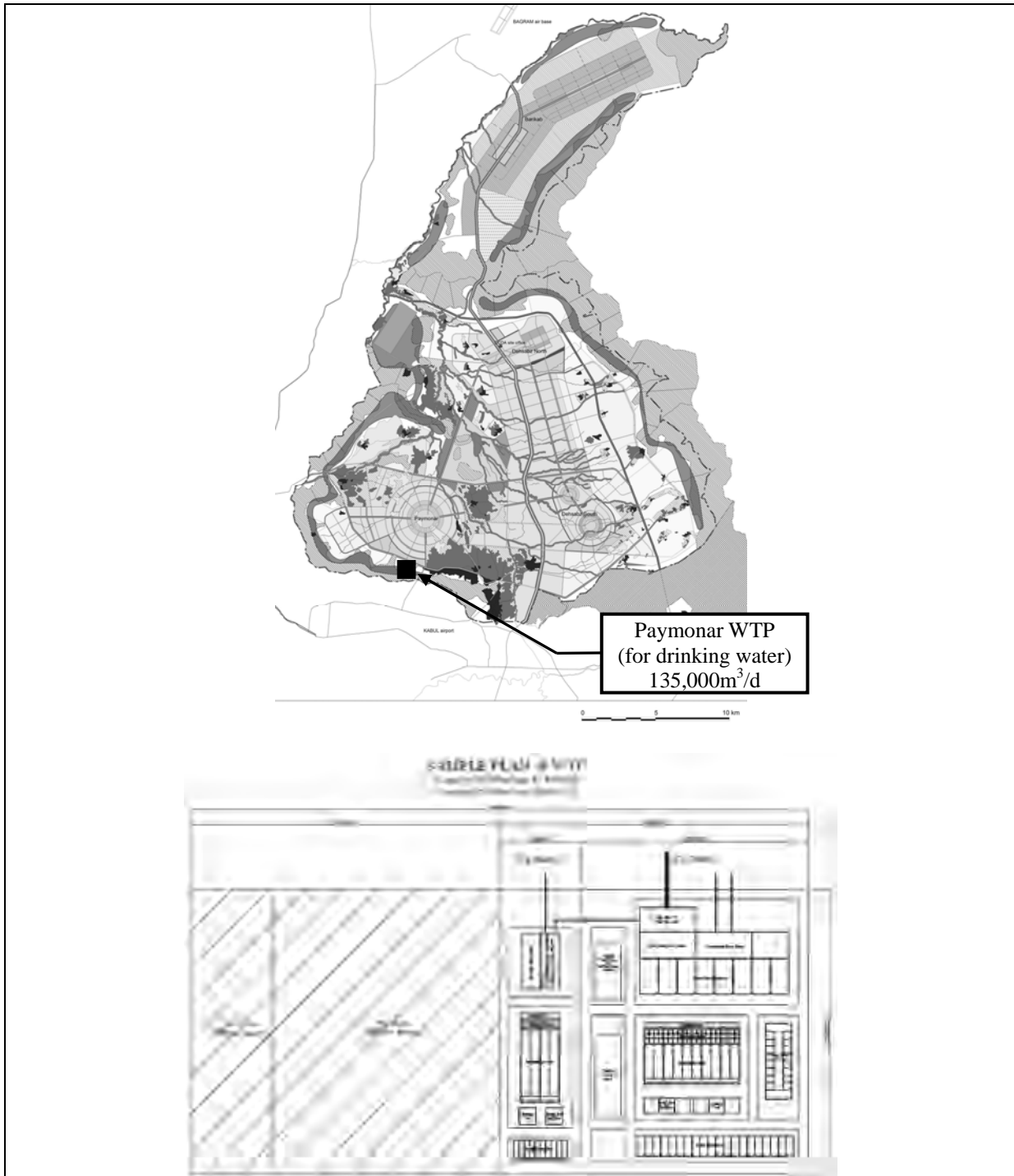
transmitted from the plant and the water allocation for Dehsabz South S Zone will be increased. In this step, an additional distribution network (343ha) is constructed.



Project WN-7: Paymonar Water Treatment Plant

Location	New city
Implementing body	CAWSS
Objectives	(1) To treat conveyed surface water from Gulbahar dam at 37.7 million m ³ /y on average out of 44.7 million m ³ /y (2) To transmit treated water to new city (3) To supply a half required volume of drinking water at final stage 2025
Expected effects	Treated water supplied to new city at 150LCD on average at final stage in 2025
Phasing	Phase 2-3
Investment cost	US\$134.0 million
Description	

Local groundwater resources in the new city are limited. To accommodate the new urban population, outside water resources are required. For a possible drinking water source, the Panjshir river is recommended. Since the new dam construction is expected to take 15 years, the Panjshir fan aquifer will be developed first. Accordingly, it is recommended that water conveyance from Gulbahar dam be realized next to cover a half of the required water volume for the new city. The conveyed water should be received at Paymonar and separated for drinking and industrial purposes.



This project is to receive and treat the conveyed water for drinking. To treat and supply 37.7 million m^3/y on average, a WTP with $135,000m^3/d$ capacity with chemical sedimentation and rapid sand filter (see the figures above), treated water reservoir ($23,000m^3$) and a water transmission pump station are constructed. Its construction is in parallel with Gulbahar development and completed by 2021. Thus, a feasibility/detail designs study should be conducted and construction work commenced in Phase 2. The construction is finished at the beginning of Phase 3.

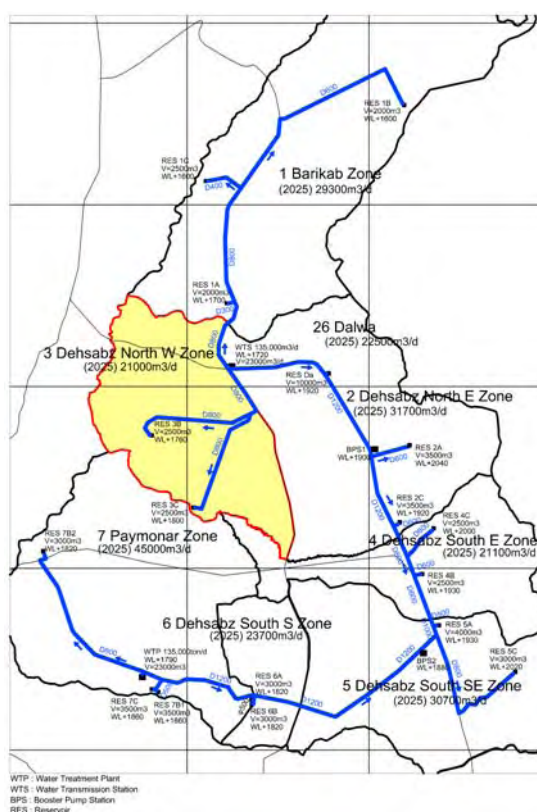
Project WN-8: Dehsabz North-west Drinking Water Supply (Zone Dehsabz North W)

Location	Western side of Dehsabz North, new city
Implementing body	CAWSS

Objectives	(1) To transmit drinking water to western side of Dehsabz North (2) To distribute drinking water to western side of Dehsabz North at 150LCD through piped water supply
Expected effects	Drinking water supplied to 140,000 residents of western side of Dehsabz North at 150LCD
Phasing	Phase 1-3
Investment cost	US\$99.2 million

Description

The project provides transmission mains, key water reservoirs and distribution networks (see the figure below). By this project, the residents of the western side of Dehsabz North (140,000 in 2025) will have piped water supply at 150LCD. The project is implemented in 2 steps in accordance with the water resources and urban development.



The first step starts in Phase 1 in parallel with the second stage of the Panjshir fan aquifer development. In this step, a transmission main (800mm×10km), water reservoir (2,500m³) and distribution network (695ha) are constructed. The planned distribution network is for the north area of Dehsabz North W Zone. Details need to be further examined in the next study stage of the urban development.

The second step is an extension of distribution networks in Phase 2-3, using additional water from the Panjshir fan aquifer. The additional water will be allocated after the development of the Paymonar WTP. Another transmission main (800mm×7km), water reservoir (2,500m³) and distribution network (694ha) are constructed in this step.

Project WN-9: Dehsabz South-east Drinking Water Supply (Zone Dehsabz South E)

Location	Eastern side of Dehsabz South, new city
Implementing body	CAWSS
Objectives	(1) To transmit drinking water to eastern side of Dehsabz South (2) To distribute drinking water to eastern side of Dehsabz South at 150LCD

	through piped water supply
Expected effects	Drinking water supplied to 140,000 residents of eastern side of Dehsabz South at 150LCD
Phasing	Phase 1-3
Investment cost	US\$76.8 million

Description

The project provides transmission mains, key water reservoirs and distribution networks (see the figure below). By this project, the residents of the eastern side of Dehsabz South (140,000 in 2025) will have piped water supply at 150LCD. The project is implemented in 2 steps in accordance with the water resources and urban development.



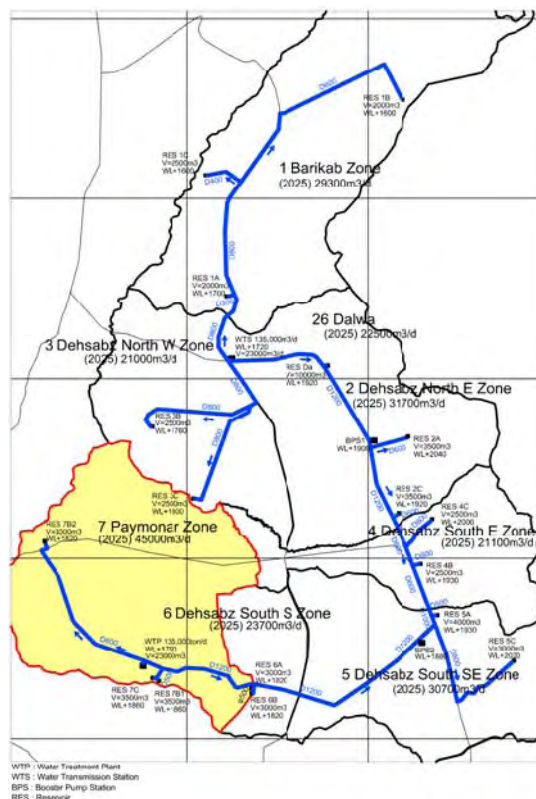
The first step starts in Phase 1 in parallel with the second stage of the Panjshir fan aquifer development. In this step, a transmission main (600mm×0.2km), water reservoir (2,500m³) and distribution network (617ha) are constructed. The planned distribution network is for the center of Dehsabz South E Zone. Details need to be further examined in the next study stage of the urban development.

The second step is an extension of distribution networks in Phase 2 to 3, using additional water from the Panjshir fan aquifer. The additional water will be allocated after the development of the Paymonar WTP. An additional transmission main (600mm×2km), water reservoir (2,500m³) and distribution network (617ha) are constructed in this step.

Project WN-10: Paymonar Drinking Water Supply (Zone Paymonar)	
Location	Paymonar, new city
Implementing body	CAWSS
Objectives	(1) To transmit drinking water to Paymonar (2) To distribute drinking water to Paymonar at 150LCD through piped water supply

Expected effects	Drinking water supplied to 300,000 Paymonar residents at 150LCD
Phasing	Phase 1-3
Investment cost	US\$231.3 million
Description	

The project provides transmission mains, key water reservoirs and distribution networks (see the figure below). By this project, the residents of Paymonar (300,000 in 2025) will have piped water supply at 150LCD. The project is implemented in 2 steps in accordance with the water resources and urban development.



The first step starts in Phase 1 in parallel with the second stage of the Panjshir fan aquifer development. In this step, transmission mains (1200mm×8km, 800×10km and 500mm×1km), a water reservoir (1 unit of 3,000m³, 1 unit of 3,500m³) and distribution network (1,697ha) are constructed. The planned distribution network is for the first urban development area of Paymonar. Details need to be further examined in the next study stage of urban development.

The second step is an extension of distribution networks in Phase 2-3, using additional water from the Paymonar WTP. An additional transmission main (500mm×1km), water reservoir (3,500m³) and distribution network (1,696ha) are constructed in this step.

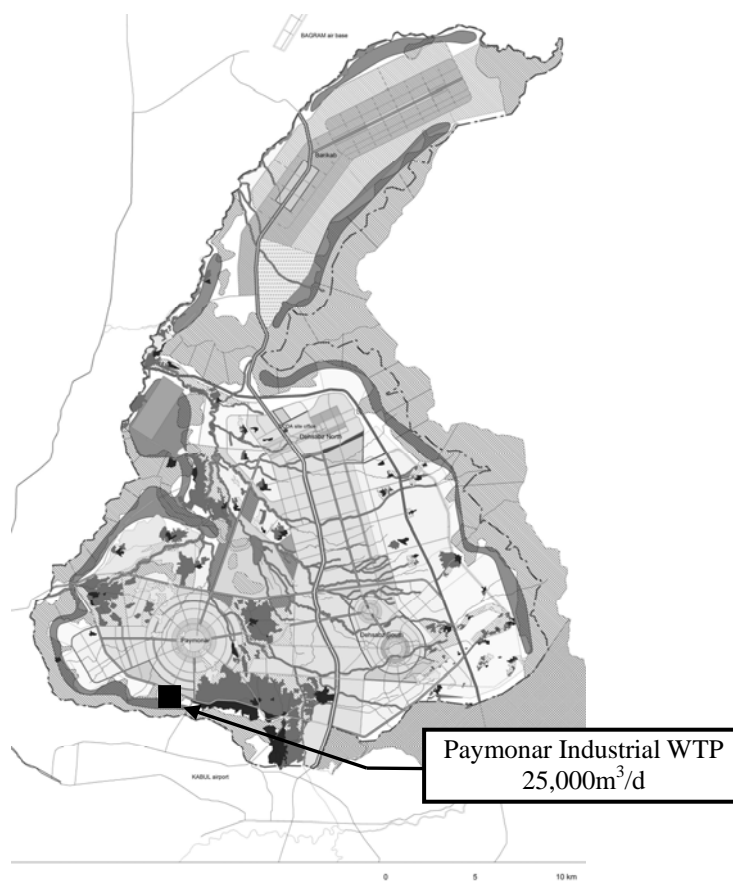
Project WN-11: Paymonar Industrial Water Treatment Plant	
Location	New city
Implementing body	CAWSS
Objectives	(1) To treat conveyed surface water from Gulbahar dam at 7 million m ³ /y on average out of 44.7 million m ³ /y for industry (2) To transmit the treated water to new city (3) To supply a half required volume of industrial water at final stage 2025
Expected effects	7 million m ³ /y industrial water secured (a half of demand at final stage in 2025)
Phasing	Phase 2-3
Investment cost	US\$41.8 million

Description

Local groundwater resources of the new city are limited. To accommodate the new urban population, outside water resources are required. For a potable water source, the Panjshir river is recommended by the master plan. Since the new dam construction is expected to take about 15 years, it is recommended that the Panjshir fan aquifer be first developed. Accordingly, the master plan recommends that water conveyance from Gulbahar dam be realized next to cover a half of the required water volume for the new city. The conveyed water is received at Paymonar and separated for drinking and industrial use.


This project is to receive and treat conveyed water for industrial purposes. To treat and supply 7 million m³/y on average, a WTP with 25,000m³/d capacity is required. Its construction is undertaken in parallel with Gulbahar dam development and completed by 2021. Thus, a feasibility/detail designs study is conducted and construction work commenced in Phase 2. The construction is finished at the beginning of Phase 3.

The FRP should be placed adjacent to the drinking water treatment plant in Paymonar (see the figure below). In the project, a treatment facility (25,000m³/d) equipped with chemical sedimentation, treated water reservoir (4,000m³) and water transmission pump station are constructed.



Project WN-12: Industrial Water Transmission for New city

Location	Industrial parks, new city
Implementing body	CAWSS
Objectives	(1) To transmit treated water to industrial parks in new city (2) To secure sufficient water for industrial parks
Expected effects	- Treated water transmitted to industrial parks from water transmission station in Dehsabz North (7 million m ³ /y on average) - Treated water transmitted to industrial parks from Paymonar industrial water

	treatment plant (7 million m ³ /y on average)
Phasing	Phase 1
Investment cost	US\$16.3 million
Description	
<p>This project is to construct water transmission mains from both the WTS in Dehsabz North and the Paymonar industrial WTP. In the initial stage, water will be transmitted from the WTS. Upon completion of the Paymonar industrial WTP, additional water will be fed by the plant. It is recommended, therefore, that the project be executed together with the construction of the WTS.</p> <p>New transmission mains will connect the transmission station/ treatment plant to the industrial parks. However, water reservoirs in the industrial parks should be designed and developed by factories in the industrial parks, according to their water demand and demand curve.</p> <p>In the project, water transmission mains (500mm×12km, 600mm×13km and 800mm×25km) are constructed (see the figure below). A feasibility and detail design study is conducted and construction work commenced in Phase 1. The construction is finished in Phase 2.</p>	
	

6. POWER AND ENERGY SUPPLY PROJECTS

Project PE-1: New City Power Supply – Phase 1	
Location	Kabul province
Implementing body	MoEW
Objectives	To supply electric power to new city covering Bagram, Dehsabz North and South, and Paymonar areas
Expected effects	<ul style="list-style-type: none"> - Stable and reliable power supply to support new city development - Promotion of rural electrification in villages surrounding new city - Reduced energy losses
Phasing	Phase 1
Investment cost	US\$224 million
Description	
<p>As part of the KMA master planning, four major areas in Dehsabz and Barikab have been planned for the new city development. According to the plan, these areas are selected for detailed power supply planning. The electric power supply to the areas would contribute to the improvement of social infrastructure, economical and industrial development as well as the improvement of living conditions</p>	

for residents, both existing and incoming.

The ministry concerned and donors should be involved in the project from the beginning as attempted through the master planning. The conceptual plan prepared as part of the master plan shall be studied in the subsequent stage for feasibility study and related works.

Basic plans and designs are prepared for other parts of the area in steps for continued implementation. The basic planning follows the same procedure, more or less, as taken for the area. It may consist of the following:

- Study power flow and system analysis including load density
- Study and provision of adequate protection system
- Consider ambient conditions
- Conduct environmental assessment
- Prepare existing land use map and route map
- Prepare detailed design

The main components of the project are as follows:

- Construction of 220kV substations and transmission lines in Bagram and Dehsabz south area, and
- Construction of 20/0.4 kV distribution networks in the four areas

Project PE-2: New City Power Supply – Phase 2	
Location	Kabul province
Implementing body	MoEW
Objectives	To improve electric power supply new city covering Bagram, Dehsabz north and south, and Paymonar areas
Expected effects	<ul style="list-style-type: none"> - More reliable and stable power supply - Further promotion of rural electrification - Reduced energy losses
Phasing	Phase 2
Investment cost	US\$235 million
Description	
<p>The main components of the project are as follows:</p> <ul style="list-style-type: none"> - Construction of 220kV Paymonar substation and transmission lines in Paymonar area - Construction of 20/0.4kV distribution networks in the four areas 	

Project PE-3: New City Power Supply – Phase 3	
Location	Kabul province
Implementing body	MoEW
Objectives	To ensure electric power to new city covering Bagram, Dehsabz north and south, and Paymonar areas
Expected effects	<ul style="list-style-type: none"> - More reliable and stable power supply - Further promotion of rural electrification - Reduced energy losses
Phasing	Phase 3
Investment cost	US\$259 million
Description	
<p>The main components of the project are as follows:</p> <ul style="list-style-type: none"> - Construction of 220kV transmission line with extensions of substation in Bagram area 	

- Construction of 20/0.4kV distribution networks in four areas

Project PE-4: Waste-to-Energy Project

Location	High density area in Kabul city for solid waste collection and area in Kabul city suburbs for power generation
Implementing body	MoEW, private sector
Objectives	(1) To establish the first plant to generate power from solid wastes in Kabul city (2) To clarify conditions for wider application of waste-to-energy in other areas and regions
Expected effects	- Effective disposal and use of solid wastes - Cost-effective provision of electric power and hot water/steam for heating
Phasing	Phase 1 for pilot implementation
Investment cost	US\$3.0 million for pilot implementation

Description

The project is to establish the first unit of power and energy generation from solid wastes. It should be implemented first on a pilot scale by selecting an area where a large quantity of solid wastes of suitable quality is generated. Waste separation at the source is an essential condition for successful operation of this system, and thus cooperation of residents needs to be ensured. The cooperation of residents is required also in the area where the plant is established.

The waste-to-energy system mainly consists of the following components:

- 1) Waste receiving facilities
- 2) Incineration facilities
- 3) Flue gas cooling facilities including waste heat boiler and ancillary equipment
- 4) Flue gas cleaning facilities
- 5) Draft facilities
- 6) Heat utilization facilities such as steam turbine and generator
- 7) Ash treatment facilities
- 8) Waste treatment facilities
- 9) Mechanical and electrical auxiliary systems

7. SOLID WASTE MANAGEMENT PROJECTS

Project SW-1: Kabul City Solid Waste Management – Phase 1

Location	Urbanized areas of Kabul city
Implementing body	Kabul municipality
Objectives	(1) To establish improved solid waste management system for Kabul city (2) To improve sanitation and health of Kabul city residents (3) To improve aesthetics of the city for tourism
Expected effects	- Sanitary and complete disposal of solid wastes - Improved sanitation and hygiene of city residents - Beautiful Kabul city without litters and dumped wastes
Phasing	Phase 1
Investment cost	US\$165.8 million

Description

The solid waste management system for Kabul city is to be improved in steps, encompassing storage and discharge, collection and transport, transfer and treatment, and final disposal. Household wastes are tentatively stored at home and discharged into containers according to the collection schedule. The wastes collected are transferred to larger vehicles for more efficient transportation. Some

intermediate treatment may be provided such as waste-to-energy application and composting. These options should be tested first by pilot implementation. Final disposal of solid wastes is at a sanitary landfill applying state-of-the-art technologies.

In Phase 1, 5,400 containers and 270 collection trucks are procured. Two transfer stations are established in the east and the northeast of the city. The Caparo Ghar site is opened for sanitary landfill, and the Chamtala 2 site is constructed.

Project SW-2: Kabul City Solid Waste Management – Phase 2

Location	Urbanized areas of Kabul city
Implementing body	Kabul municipality
Objectives	(1) To establish improved solid waste management system for Kabul city (2) To improve sanitation and health of Kabul city residents (3) To improve aesthetics of the city for tourism
Expected effects	- Sanitary and complete disposal of solid wastes - Improved sanitation and hygiene of city residents - Beautiful Kabul city without litters and dumped wastes
Phasing	Phase 2
Investment cost	US\$3.6 million
Description	
In Phase 2, additional 1,000 containers and 180 collection trucks are procured. The third transfer station would be established in the southwestern area of the city, from which wastes are transported to the Childoktharam site for disposal by sanitary landfill.	

Project SW-3: Kabul City Solid Waste Management – Phase 3

Location	Urbanized areas of Kabul city
Implementing body	Kabul municipality
Objectives	(1) To establish improved solid waste management system for Kabul city (2) To improve sanitation and health of Kabul city residents (3) To improve aesthetics of the city for tourism
Expected effects	- Sanitary and complete disposal of solid wastes - Improved sanitation and hygiene of city residents - Beautiful Kabul city without litters and dumped wastes
Phasing	Phase 3
Investment cost	US\$40.0 million
Description	
In Phase 3, additional 1,000 containers and 150 collection trucks are procured. The fourth transfer station is established to handle increased quantities of wastes from the central part of the city. Wastes are transported from there to the disposal sites to be opened at Pulecharki. Another disposal site is opened at Morghgiran for wastes to be generated in the southwestern part of the city.	

Project SW-4: New City Solid Waste Management

Location	Dehsabz and Barikab
Implementing body	DCDA and/or new municipality to be established
Objectives	(1) To establish advanced solid waste management system for new city (2) To ensure sanitation and health of new city residents including residents in surrounding villages (3) To contribute to creation of recycle-oriented eco-city

Expected effects	- Sanitary and complete disposal of solid wastes - Sanitary and healthy living environment for new city residents - New city as recycle-oriented eco-city																				
Phasing	Phase 1-3																				
Investment cost	US\$63.7 million																				
Descriptions																					
<p>The most advanced solid waste management system should be established from the beginning for the new city. It consists of temporary waste storage at home and regular discharge of stored wastes into containers, regular collection and transport, transfer of the collected wastes for efficiency, and final disposal at a sanitary landfill by applying state-of-the-art technologies.</p> <p>The main components of the project are summarized as follows.</p>																					
	<table border="1"> <thead> <tr> <th></th> <th>Sort term (2015)</th> <th>Middle term (2020)</th> <th>Long term (2025)</th> </tr> </thead> <tbody> <tr> <td>Container</td> <td>2,000</td> <td>500</td> <td>500</td> </tr> <tr> <td>Truck</td> <td>29</td> <td>60</td> <td>70</td> </tr> <tr> <td>Transfer station</td> <td>3</td> <td>0</td> <td>0</td> </tr> <tr> <td>Sanitary landfill</td> <td>2</td> <td>1</td> <td>0</td> </tr> </tbody> </table>		Sort term (2015)	Middle term (2020)	Long term (2025)	Container	2,000	500	500	Truck	29	60	70	Transfer station	3	0	0	Sanitary landfill	2	1	0
	Sort term (2015)	Middle term (2020)	Long term (2025)																		
Container	2,000	500	500																		
Truck	29	60	70																		
Transfer station	3	0	0																		
Sanitary landfill	2	1	0																		

8. TRANSPORTATION PROJECTS

Project TR-1: Bagram Road Upgrading	
Location	New city
Implementing body	MoPW and MoUD
Objectives	(1) To strengthen north-south transportation axis for KMA (2) To improve access from Kabul city to new city (3) To serve as main artery road of new city
Expected effects	- Smoother traffic movements with heavy vehicles between east and north - Stronger link between Kabul city and new city - Acceleration in new city development
Phasing	Phase 2-3
Investment cost	US\$115.0 million (US\$56.4 million in Phase 1; US\$58.6 million in Phase 2)
Description (Project link no. 102)	
<p>Bagram Road (currently being widened) is upgraded to serve as part of the main north-south artery. Additional lanes are provided to accommodate the introduction of BRT in bus exclusive lanes. The assumptions and upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 110,000PCU/day - Geometric design standard Class I (8 lanes + frontage road) - Road length: 48.5km - Phase 2: Widening from 4 to 8 lanes by MoPW - Phase 3: Frontage road by MoUD 	

Project TR-2: Bagram Road Extension	
Location	East of Kabul city center
Implementing body	MoPW and Kabul municipality
Objectives	(1) To strengthen north-south transportation axis for KMA (2) To provide alternative artery link between north and south of capital region (3) To accommodate mass transit system
Expected effects	- Augmented north-south transportation capacity

	<ul style="list-style-type: none"> - Stronger links between northern and southern regions - Wider use of public mass transportation
Phasing	Phases 1-3
Investment cost	US\$72.1 million (US\$27.3 million in Phase 1, US\$27.3 million in Phase 2 and US\$17.5 million in Phase 3)
Description (Project link no. 103)	
<p>Bagram Road is extended to the south in the east of Kabul city center up to link with the future KCORR. This establishes a new north-south artery, an alternative to Mazari Sharif Road, and contributes to the development of the northern and the southern regions of the NCRK. Bus exclusive lanes are provided to widen the use of public mass transport. The assumptions and project outline are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 107,000PCU/day - Geometric design standard: Class I (8 lanes) - Road length: 14.5km - Phase 1: New construction with 4 lanes by MoPW - Phase 2: Widening to 8 lanes by MoPW - Phase 3: Frontage road by Kabul municipality 	

Project TR-3: Southern Cross Road – Qala-i-jabbar Section	
Location	Southwestern area of Kabul city
Implementing body	Kabul municipality
Objectives	<ol style="list-style-type: none"> (1) To provide alternative east-west axis not passing through Kabul city center (2) To facilitate development of city's southwestern part (3) To serve as new east-west artery linking east with western and southwestern regions
Expected effects	<ul style="list-style-type: none"> - Reduction of through traffic passing through city center - Induced urban renewal along the route
Phasing	Phase 2
Investment cost	US\$10.5 million
Description (Project link no. 211)	
<p>A new east-west axis is developed in the southern part of Kabul city to handle the inter-regional traffic without passing through the city center. This will facilitate urban renewal in the southwestern part of the city along the route. This road section constitutes the western portion of the new east-west axis, called the southern cross road. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 18,000PCU/day - Geometric design standard: Class II (4 lanes + sidewalks) - Road length: 9.5km - New construction: 4 lanes + sidewalks 	

Project TR-4: Southern Cross Road – Asmay Tunnel Section	
Location	Southern area of Kabul city
Implementing body	Kabul municipality
Objectives	<ol style="list-style-type: none"> (1) To provide alternative east-west axis not passing through Kabul city center (2) To facilitate development of city's southwestern part (3) To serve as new east-west artery linking east with western and southwestern regions
Expected effects	<ul style="list-style-type: none"> - Reduction of through traffic passing through city center - Induced urban renewal along the route

Phasing	Phases 2-3
Investment cost	US\$242.5 million (US\$227.1 million in Phase 2; US\$15.4 million in Phase 3)
Description (Project link nos. 212 and 213)	
<p>The road constructed by this project constitutes the middle section of the new east-west axis, called the southern cross road. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 70,000PCU/day - Geometric design standard: Class I (6 lanes + frontage road) - Road length: 13.53km - Phase 2: New construction with 6 lanes - Phase 3: Frontage road 	

Project TR-5: Southern Cross Road – Bagrami Section	
Location	Southern area of Kabul city
Implementing body	Kabul municipality
Objectives	<ol style="list-style-type: none"> (1) To provide alternative east-west axis not passing through Kabul city center (2) To facilitate development of city's southwestern part (3) To serve as new east-west artery linking east with western and southwestern regions
Expected effects	<ul style="list-style-type: none"> - Reduction of through traffic passing through city center - Induced urban renewal along the route
Phasing	Phases 2-3
Investment cost	US\$30.1 million (US\$15.3 million in Phase 2; US\$14.8 million in Phase 3)
Description (Project link no. 214)	
<p>The road constructed by this project constitutes the eastern section of the new east-west axis, called the southern cross road. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 14,000PCU/day - Geometric design standard: Class II (4 lanes + sidewalks) - Road length: 13.0km - Phase 2: New construction for 3.0km with 4 lanes + sidewalks and widening from 4 to 6 lanes for 10.0km - Phase 3: Frontage road: for 13km 	

Project TR-6: Kabul City Outer Ring Road (KCORR) – Existing City Section	
Location	Peripheries of Kabul city
Implementing body	MoPW
Objectives	<ol style="list-style-type: none"> (1) To improve geometric structure of Kabul artery road system by establishing new ring road in addition to existing radial roads (2) To separate inter-regional and city traffic (3) To improve links between different urban areas in peripheries of existing urban areas
Expected effects	<ul style="list-style-type: none"> - Reduced traffic jams in Kabul city center - Induced complementary development of urban areas around existing urbanized area - Fostering regional development of contiguous areas
Phasing	Phases 1-2
Investment cost	US\$127.1 million (US\$74.6 million in Phase 1; US\$52.5 million in Phase 2)
Description (Project link no. 162)	
This outer ring road for Kabul city, as planned earlier, has been reformulated in the context of the	

KMA development with the new city. Kabul city section remains largely the same as planned earlier and would serve to separate the through traffic from the city traffic. It would also help to improve the links between several urban areas, existing and new, inducing their complementary development. The assumption and the road specifications are as follows.

- Traffic demand in 2025: 48,000PCU/day
- Geometric design standard: Expressway (4 lanes)
- Road length: 76.9km
- Phase 1: New construction with 2 lanes
- Phase 2: Widening from 2 to 4 lanes

Project TR-7: Kabul City Outer Ring Road – New City Section

Location	Dehsabz
Implementing body	MoPW and MoUD
Objectives	(1) To provide main artery road for new city (2) To strengthen links with eastern and southern regions (3) To improve links between different urban areas in peripheries of existing urban areas
Expected effects	- Facilitation of new city development - Induced complementary development of urban areas around existing urbanized area - Fostering regional development of contiguous areas
Phasing	Phases 1 and 3
Investment cost	US\$101.1 million (US\$30.7 million in Phase 1; US\$70.4 million in Phase 3)
Description (Project link no. 161)	
<p>The northern section of KCORR with modified alignment serves as the main artery road for the new city. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic Demand in 2025: 33,000PCU/day - Geometric design standard: Class I (4 lanes + service road) - Road length: 26.3km - Phase 1: New construction with 2 lanes by MoPW - Phase 3: Widening from 2 to 4 lanes + service road by MoPW and MoUD 	

Project TR-8: Kabul City Inner Ring Road (KCIRR) – North Section

Location	North side of Kabul airport
Implementing body	Kabul municipality
Objectives	(1) To improve traffic circulation in Kabul city (2) To strengthen link between city's northeastern and southwestern parts (3) To accommodate improved public transportation by BRT
Expected effects	- Smoother traffic flow around city center - Reduced traffic congestion in city center - Wider use of public bus transportation
Phasing	Phase 2
Investment cost	US\$18.0 million
Description (Project link nos. 272, 271 and 274)	
<p>KCIRR is established circling the city center at distance of 5-7km to disperse traffic coming into the central part of the city. It also helps strengthen the link between the northeastern and the southwestern parts of the city. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025 38,000PCU/day 	

- Geometric design standard: Class II (4 lanes + sidewalks)
- Road length: 16.3km
- New construction for 2.0km with 4 lanes + sidewalks and widening from 2 to 4 lanes + sidewalks for 14.3km

Project TR-9: Kabul City Inner Ring Road –West Section

Location	Western part of Kabul city
Implementing body	Kabul municipality
Objectives	(1) To improve traffic circulation in Kabul city (2) To strengthen north-south link in city’s western part (3) To accommodate improved public transportation by BRT
Expected effects	- Smoother traffic flow around city center - Reduced traffic congestion in city center - Wider use of public bus transportation
Phasing	Phase 1
Investment cost	US\$51.8 million
Descriptions (Project link nos. 221, 191, 192, and 193)	
<p>The western section of KCIRR is established with two additional lanes and resolution of a missing link. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 80,000PCU/day - Geometric design standard: Class I (6 lanes + sidewalks) - Road length: 6.6km - New construction for 1.7 km with 6 lanes + sidewalks and widening from 2 to 6 lanes + sidewalks for 4.9km 	

Project TR-10: Dehsabz Periphery Artery Road

Location	East and north areas of Dehsabz
Implementing body	MoPW
Objectives	(1) To establish artery road for new city to serve eastern and northern parts of Dehsabz (2) To provide improved market access for existing villages in Dehsabz (3) To facilitate traffic of heavy vehicles between eastern and northern regions
Expected effects	- Facilitated new city development - Revitalized socio-economy of villages surrounding new city - Smoother traffic movement between northern and eastern regions
Phasing	Phases 2-3
Investment cost	US\$58.3 million (US\$27.5 million in Phase 2; US\$30.8 million in Phase 3)
Description (Project link no. 171)	
<p>This new artery road is to serve inter-regional traffic between the east and the north and prevent through traffic from entering the city road system of Kabul. At the same time, the road serves the existing villages to improve their market access and facilitates development along the route. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 41,000PCU/day - Geometric design standard: Expressway (4 lanes) - Road length: 27.8km - Phase 2: New construction with 2 lanes - Phase 3: Widening from 2 to 4 lanes 	

Project TR-11: Barikab Road Upgrading	
Location	Barikab sub-center of new city
Implementing body	MoPW
Objectives	(1) To improve access to Barikab from northern region (2) To integrate Barikab sub-center with the rest of new city
Expected effects	- Improved market access and job opportunities by Barikab residents - Integrated socio-economy of new city
Phasing	Phase 3
Investment cost	US\$20.4 million
Description (Project link no. 101)	
<p>Barikab Road is upgraded to serve the residents and vitalizes the local economy. The assumption and the upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 3,000PCU/day - Geometric design standard: Class II (4 lanes + sidewalks) - Road length: 16.3km - Widening from 2 to 4 lanes + sidewalks 	

Project TR-12: Mazar-e Sharif Road Upgrading	
Location	Northwest of Kabul city
Implementing body	MoPW
Objectives	(1) To accommodate rapid increase in traffic on main north-south highway of Afghanistan (2) To improve alternative access to new city from Kabul city
Expected effects	- Smoother flow of much increased traffic on Country's main artery highway - Complementary development of capital region and neighboring regions
Phasing	Phases 1 and 3
Investment cost	US\$111.4 million (US\$49.8 million in Phase 1; US\$61.6 million in Phase 3)
Description (Project link nos. 111, 112 and 113)	
<p>The project is to improve the inter-regional artery highway to accommodate 10 times increase in traffic partly due to the new city development. The assumption and the upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 78,000PCU/day - Geometric design standard: Expressway (4 lanes + 4 lanes) for Link Nos. 111 and 112, and Class II (6 lanes) for Link No. 113 - Road length: 38.4km - Phase 1: Improvement (new construction) from 2 to 4 lanes for 30.9km (Link Nos. 111 and 112) - Phase 3: Expressway with additional 4 lanes for 30.9km (Link Nos. 111 and 112) and widening: from 4 to 6 lanes, for 7.5km (Link No. 113) 	

Project TR-13: Dehsabz Tunnel Road	
Location	North area of Kabul city
Implementing body	MoUD
Objectives	(1) To provide another link between Kabul city and new city (2) To promote complementary development of two main urban areas
Expected effects	- Accelerated new city development - Complementary development benefiting both main urban areas
Phasing	Phases 1 and 2

Investment cost	US\$84.4 million (US\$40.7 million in Phase 1; US\$40.7 million in Phase 2)
Description (Project link no. 281)	
<p>The project is to link the northern part of Kabul city to the Paymonar sub-center of the new city for complementary development of the both urban areas. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 82,000PCU/day - Geometric design standard: Class II (6 lanes + sidewalks) - Road length: 7.1km - Phase1: New construction with 3 lanes + sidewalks - Phase2: Continuation of the new construction 	

Project TR-14: Jalalabad Road Upgrading	
Location	East of Kabul city
Implementing body	MoPW
Objectives	(1) To upgrade radial road with additional lanes to serve increasing traffic (2) To provide improved link to KCORR
Expected effects	- Smoother traffic flow on radial road - Stronger link between KMA and eastern region
Phasing	Phases 2-3
Investment cost	US\$23.5 million (US\$9.8 million in Phase2; US\$13.7 million in Phase3)
Description (Project link nos. 141 and 142)	
<p>Jalalabad Road is one of the three main radial roads to be upgraded to deal with the increasing traffic. The assumption and the upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 73,000PCU/day - Geometric design standard: Class II (6 lanes + sidewalks) - Road length: 18.7km - Phase 2: Widening, from 4 to 6 lanes + sidewalks, for 6.0km (Link No. 141) - Phase 3: Widening from 2 to 4 lanes + sidewalks for 12.7km (Link No. 142) 	

Project TR-15: Paghman Road Widening	
Location	West of Kabul city
Implementing body	MoPW
Objectives	(1) To widen Paghman Road to deal with increasing traffic (2) To improve access to Paghman area in the west
Expected effects	- Smoother traffic flow to west and southwest - Improved access to resort area in Paghman by Kabul city residents
Phasing	Phases1-3
Investment cost	US\$20.1 million (US\$5.5 million in Phase1, US\$4.2 million in Phase2 and US\$10.4 million in Phase3)
Description (Project link nos. 153, 154 and 152)	
<p>The project is to improve the traffic flow on Paghman Road linked to the west and the southwest. The assumption and the upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 32,000PCU/day - Geometric design standard: Class II (6 lanes + sidewalks) - Road length: 17.8km - Phase 1: Widening from 2 to 6 lanes +sidewalks for 3.8km (Link No. 153) - Phase 2: New construction with 4 lanes + sidewalks for 2.2km (Link No. 154) 	

- Phase 3: Widening from 2 to 4 lanes for 11.8km (Link No. 152)

Project TR-16: Kandahar Road Upgrading

Location	Southeast of Kabul city
Implementing body	MoPW
Objectives	(1) To upgrade radial road with additional lanes to serve increasing traffic (2) To provide improved link to KCORR
Expected effects	- Smoother traffic flow on radial road - Stronger link between KMA and southern region
Phasing	Phase2
Investment cost	US\$6.6 million
Description (Project link no. 121)	
<p>Kandahar Road is one of the three main radial roads to be upgraded to serve the increasing inter-regional traffic. The assumption and the upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 15,000PCU/day - Geometric design standard: Class II (4 lanes) - Road length: 8.8km - Widening from 2 to 4 lanes for 8.8 km 	

Project TR-17: Logar Road Upgrading

Location	South of Kabul city
Implementing body	MoPW
Objectives	(1) To upgrade radial road with additional lanes to serve increasing traffic (2) To provide improved link to KCORR
Expected effects	- Smoother traffic flow on radial road - Induced development of southern part of Kabul city - Stronger link between KMA and southern region
Phasing	Phase 2
Investment cost	US\$28.8 million
Description (Project link no. 131)	
<p>Logar Road is one of the three main artery roads to be upgraded to serve the increasing traffic. It establishes an alternative north-south artery to link the KMA with the southern region. The assumption and the upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 37,000PCU/day - Geometric design standard: Class II (4 lanes + sidewalks) - Road length: 18.1km - Widening from 2 to 4 lanes + sidewalks 	

Project TR-18: Darulaman Road Upgrading

Location	Southwestern part of Kabul city
Implementing body	Kabul municipality
Objectives	(1) To upgrade Darulaman Road to deal with increasing traffic (2) To improve access to Darulaman area in the south
Expected effects	- Smoother traffic flow on Darulaman Road - Stronger link between city center and city's southern part - Induced urban development/renewal along the route

Phasing	Phase 2-3
Investment cost	US\$16.5 million (US\$5.9 million in Phase2; US\$10.6 million in Phase3)
Description (Project link nos. 342 and 341)	
<p>Darulaman Road is upgraded to a major road. The assumption and the upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 14,000PCU/day - Geometric design standard: Class III (4 lanes + sidewalks) - Road length: 14.1km - Phase 2: Widening from 2 to 4 lanes + sidewalks for 4.7km (Link No. 342) - Phase 3: New construction with 4 lanes + sidewalks for 9.4km (Link No. 341) 	

Project TR-19: Doghabad Road Upgrading	
Location	Southwestern part of Kabul city
Implementing body	Kabul municipality
Objectives	(1) To upgrade Doghabad Road to serve increasing traffic (2) To strengthen link of Kabul city road system to regional transport network
Expected effects	- Smoother traffic flow on Doghabad Road - Stronger link between southern part of city center and southern region - Induced urban development/renewal along the route
Phasing	Phase 3
Investment cost	US\$6.6 million
Description (Project link no. 181)	
<p>Doghabad Road is upgraded to a major road. The assumption and the upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 18,000PCU/day - Geometric design standard: Class II (4 lanes + sidewalks) - Road length: 6.6km - New construction with 4 lanes + sidewalks for 6.6km 	

Project TR-20: New City Arterial Road Network Development	
Location	Dehsabz and Barikab
Implementing body	MoUD
Objectives	(1) To develop artery roads of new city ahead of urban land development (2) To improve market access and job opportunities by inhabitants in existing villages
Expected effects	- Established artery road network for new city - Improvement of livelihood of villagers around new city - Promotion of urban development
Phasing	Phase 1 and 3
Investment cost	US\$178.3 million (US\$120.5 million in Phase1; US\$57.8 million in Phase3)
Description (Project link nos. 301, 291, 331, 321, 332, 333 and 311)	
<p>The primary and secondary artery roads are constructed in steps to lead the new city development. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 56,000PCU/day - Geometric design standard: Class I and III with sidewalks - Road length: 80.7km - Phase 1: New construction as follows 	

<ul style="list-style-type: none"> Class II with 2 lanes for 40.0km (Link Nos. 291 and 311) Class III with 2 lanes for 25.2km (Link Nos. 333, 332 and 331) Class III with 4 lanes for 15.5 km (Link Nos. 301, 302 and 321) - Phase 3: Widening + sidewalks as follows <ul style="list-style-type: none"> Class II with 4 lanes for 40.0km (Link Nos. 291 and 311) Class III with 4 lanes for 25.2km (Link Nos. 333, 332 and 331) Class III with 6 lanes for 15.5km (Link Nos. 301, 302 and 321)

Project TR-21: New City Circumferential Road	
Location	Dehsabz south and Paymonar
Implementing body	MoUD
Objectives	(1) To link new city's eastern and western parts (2) To improve market access and job opportunities by new city residents and inhabitants in existing villages
Expected effects	- Integrated socio-economic development of existing communities and new city communities - Improved living environments for old and new communities
Phasing	Phases 2-3
Investment cost	US\$33.4 million (US\$17.2 million in Phase2; US\$16.2 million in Phase3)
Description (Project link no. 334)	
<p>The project is to link the existing villages and the new city communities for their integration and complementary development. The road specifications are as follows.</p> <ul style="list-style-type: none"> - Geometric design standard: Class III +sidewalks - Road length: 23.9km - Phase2: Construction with 2 lanes - Phase3: Widening from 2 to 4 lanes + sidewalks 	

Project TR-22: New City Secondary Road Network	
Location	Dehsabz and Barikab
Implementing body	MoUD
Objectives	(1) To develop secondary roads for new city (2) To define large blocks for land development of new city
Expected effects	- Completed structure of the new city road network - Large blocks ready to be developed by individual developers
Phasing	Phases 1-3
Investment cost	US\$199.6 million (US\$62.2 million in Phase 1; US\$62.2 million in Phase 2; US\$62.2 million in Phase 3)
Description	
<p>The project is to construct secondary roads to complete the new city road network in steps and define large blocks of land to be developed by individual developers. The road specifications are as follows.</p> <ul style="list-style-type: none"> - Geometric design standard: Class IV + sidewalks - Road length: 321km - Phase 1: New construction with 2 lanes for 100km - Phase 2: New construction with 2 lanes for 121km - Phase 3: New construction with 2 lanes for 100km 	

Project TR-23: Missing Links Resolution – Bibimaru Road	
Location	Kabul city
Implementing body	Kabul municipality
Objectives	(1) To resolve missing link in Kabul city road system, (2) To serve as bypass for city center traffic (3) To facilitate introduction of improved public bus transport
Expected effects	- Mitigation of city center traffic congestion - Wider use of improved public bus transport with better routes
Phasing	Phase 1
Investment cost	US\$3.2 million
Description (Project link no. 261)	
<p>Bibimaru Road is one of the missing links in Kabul city road system. Once linked, the road will strengthen the east-west links in District 10 providing a detour of the hill. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 16,000PCU/day - Geometric design standard: Class III + sidewalks - Road length: 2.2km - New construction with 4 lanes + sidewalks 	

Project TR-24: Missing Links Resolution – Macrorayon Circle Road	
Location	East and northeast of Kabul city center
Implementing body	Kabul municipality
Objectives	(1) To resolve missing link in Kabul city road system (2) To improve traffic flow in eastern and northeastern peripheries of city center (3) To facilitate introduction of improved public bus transport
Expected effects	- Mitigation of city center traffic congestion - Wider use of improved public bus transport with better routes
Phasing	Phase 1
Investment cost	US\$22.2 million
Description (Project link nos. 251 and 252)	
<p>Macrorayon Circle Road constitutes the eastern and northeastern sections of the first inner ring road of Kabul city. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 12,000PCU/day - Geometric design standard: Class III + sidewalks - Road length: 9.7km - 4 lanes + sidewalks 	

Project TR-25: Missing Links Resolution – Airport Circle Road	
Location	East and northeast of Kabul city
Implementing body	Kabul municipality
Objectives	(1) To resolve missing link in Kabul city road system (2) To improve traffic flow in city's eastern and northeastern parts (3) To facilitate introduction of improved public transport by BRT
Expected effects	- Dispersion of traffic flow away from city center - Mitigation of city center traffic congestion - Increased mass transport capacity and improved public transport services
Phasing	Phase 1

Investment cost	US\$29.6 million
Description (Project link nos. 241 and 242)	
<p>Airport Circle Road constitutes the eastern and northeastern sections of the second inner ring road of Kabul city. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 65,000PCU/day - Geometric design standard: Class II + sidewalks - Road length: 9.1km - New construction with 6 lanes + sidewalks 	

Project TR-26: Missing Links Resolution – Qara-i-Zaman Road Extension	
Location	Eastern part of Kabul city
Implementing body	Kabul municipality
Objectives	<ul style="list-style-type: none"> (1) To resolve missing link in Kabul city road system (2) To improve traffic flow in city’s eastern part (3) To facilitate introduction of improved public bus transport
Expected effects	<ul style="list-style-type: none"> - Establishment of artery road network for Kabul city road system - Increased mass transport capacity and improved public transport services
Phasing	Phase 1
Investment cost	US\$9.3 million
Description (Project link nos. 231 and 232)	
<p>Once extended and linked, Qara-i-Zaman Road will connect the city center and the inner ring road. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 32,000PCU/day - Geometric design standard: Class II + sidewalks - Road length: 4.7km - New construction with 6 lanes + sidewalks 	

Project TR-27: Missing Links Resolution – North Industrial Area Access Road	
Location	Northern area of Kabul city
Implementing body	Kabul municipality
Objectives	<ul style="list-style-type: none"> (1) To resolve missing link in Kabul city road system (2) To improve traffic flow in city’s northern part (3) To improve access to industrial area from artery road
Expected effects	<ul style="list-style-type: none"> - Mitigation of traffic congestion in city’s northern part - Promotion of industrial development
Phasing	Phase 1
Investment cost	US\$7.1 million
Description (Project link nos. 272 and 273)	
<p>This road starts from KCIRR and extends to the east to improve access to the newly developing urban area. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 13,000PCU/day - Geometric design standard: Class III + sidewalks - Road length: 7.2km - New construction with 4 lanes + sidewalks 	

Project TR-28: Missing Links Resolution – Chamar Qalaywazir Abad Urban Renewal	
Location	North of Kabul city center
Implementing body	Kabul municipality
Objectives	(1) To resolve missing link in Kabul city road system (2) To improve traffic flow in city's northern part (3) To serve as distribution road for traffic from the second ring road
Expected effects	- Mitigation of traffic congestion in city's northern part - Improved traffic flow from the second ring road
Phasing	Phase 1
Investment cost	US\$2.5 million
Description (Project link no. 253)	
<p>Once constructed, this road is expected to help disperse traffic from the second ring road and improve the traffic flow in the northern part of the city. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 20,000PCU/day - Geometric design standard: Class III + sidewalks - Road length: 2.5km - New construction with 4 lanes + sidewalks 	

Project TR-29: Missing Links Resolution – New Kabul River Bridge Road	
Location	Kabul city
Implementing body	Kabul municipality
Objectives	(1) To resolve missing link in Kabul city road system (2) To improve traffic flow in city's central part (3) To serve as bypass of city center and public transport axis for east-west traffic flow
Expected effects	- Mitigation of traffic congestion in city's central part - Improved traffic flow along east-west axis - Alternative of existing bridge under passage control due to damage to cross Kabul river
Phasing	Phase 1
Investment cost	US\$7.5 million
Description (Project link no. 253)	
<p>This road is to be constructed as an elevated road only for vehicles. The assumption and the road specifications are as follows.</p> <ul style="list-style-type: none"> - Traffic demand in 2025: 30,000PCU/day - Geometric design standard: Class IV - Road length: 1.0km - New construction with 2 lanes 	

Project TR-30: Boundary Road Network Development	
Location	Kabul city
Implementing body	Kabul municipality
Objectives	(1) To develop roads between formal and informal housing areas to facilitate formalization of the latter (2) To develop roads between urbanized areas and greenery to protect the latter (3) To develop roads to serve new residential areas in the east and west

Expected effects	- More orderly land use realized - More pleasant urban living environment - Facilitated formalization of informal housing areas
Phasing	Phase 1-2
Investment cost	US\$84.6 million (US\$10.9 million in Phase 1; US\$73.7 million in Phase 2)
Description	
<p>The project is to develop secondary roads in such areas that may undergo significant changes in land use due to the formalization of informal housing areas, conflicts between urbanization and greenery protection, and new residential development in the suburbs. The road specifications are as follows.</p> <ul style="list-style-type: none"> - Total road length: 91.4km <p><u>Phase1</u></p> <ul style="list-style-type: none"> - Geometric design standard: Class III + sidewalks - Road length 8.1 km - New construction with 2 lanes + sidewalks <p><u>Phase2</u></p> <ul style="list-style-type: none"> - Geometric design standard: Class IV + sidewalks - Road length: 83.3km - New construction with 2 lanes + sidewalks 	

Project TR-31: Secondary Road Network Expansion	
Location	Periphery areas of Kabul city center
Implementing body	Kabul municipality
Objectives	(1) To expand secondary road network for better service coverage in Districts in city's peripheries (2) To allow easier links with community roads for services delivery
Expected effects	- Better services provision in areas outside city center - Development of new urban areas - Improved living environment throughout city territory
Phasing	Phase 3
Investment cost	US\$90.0 million
Description	
<p>The project is to improve the secondary road network so that the entire city territory would be covered by social and other urban services. The road specifications are as follows.</p> <ul style="list-style-type: none"> - Total road length: 111.0km - Geometric design standard: Class IV + sidewalks - New construction with 2 lanes + sidewalks 	

Project TR-32: Community Roads Improvement	
Location	Kabul city
Implementing body	Kabul municipality
Objectives	(1) To increase pavement coverage of community roads (2) To improve roadside drains (3) To help improve living conditions for majority of city residents
Expected effects	- Decreased traffic on artery road - Decreased flooding of community roads - Improved living environment
Phasing	Phases 1-2
Investment cost	US\$105.4 million (US\$67.0 million in Phase 1; US\$63.4 million in Phase 2)

Description	
<p>The project is to improve the surface conditions and drainage of community roads. The upgrading specifications are as follows.</p> <ul style="list-style-type: none"> - Total project road length: 240.0km - Geometric design standard: Class IV (2 lanes) - Asphalt pavement and drainage coverage: 96.0km in Phase1 and 144km in Phase2 	

Project TR-33: Integrated Bus Terminals	
Location	<ol style="list-style-type: none"> 1. West terminal: Vicinity of intersection between KCORR and National Highway No.1 (Kandhar Road) 2. South terminal: Vicinity of intersection between Bagram Road and KCORR southern section 3. East terminal: Vicinity of boundaries between District 12 and District 21 4. North terminal: Vicinity of intersection between Bagram Road and KCORR northern section
Implementing body	MOT, MoUD and Kabul municipality
Objectives	<ol style="list-style-type: none"> (1) To improve public bus transport services by facilitating transfer between inter-city and city bus services (2) To exclude inter-city buses from city's central part (3) To provide public facilities at terminals
Expected effects	<ul style="list-style-type: none"> - Mitigation of traffic jam in city's central part - Wider use of public bus services - Elimination of on-road parking of large size buses
Phasing	Phase 1
Investment cost	US\$9.0 million
Description	
<p>The following facilities are provided at each terminal:</p> <ul style="list-style-type: none"> - Pavement and drainage of bus passage lines - Intercity bus fleets parking - Platforms for passengers - Transfer facilities (city bus stops, taxis stands and pool), - Passengers and bus driver service facilities - Administration building - Garage (for maintenance and repairs) and gas station <p>Each terminal may occupy 10ha of land and have the passenger handling capacity and the operating body as follows.</p> <p>No. 1. West terminal: 8,000 passengers/day; MOT and KM No. 2. South terminal: 7,000 passengers/day; MOT and KM No. 3. East terminal: 8,000 passengers/day; MOT and KM No. 4. North terminal: 15,000 passengers/day; MOT and MoUD</p>	

Project TR-34: Kabul City Bus Terminals	
Location	<ol style="list-style-type: none"> 1. Darulaman terminal: Vicinity of intersection between KCIRR and National Highway No.1 (West terminal) 2. Qawalha terminal: Vicinity of intersection between Logar Road and KCIRR 3. Wuluswali Bagarami terminal: Vicinity of Wuluswali Bagarami zone 4. Khajabughra terminal: Vicinity of west side of airport
Implementing body	MOT and Kabul municipality

Objectives	(1) To improve public bus services (2) To establish links with operation and management of inter-city bus services (3) To reduce traffic congestion in city's central part												
Expected effects	- Mitigation of traffic congestion in city's central part - Wider use of public bus services - Elimination of on-road parking of buses												
Phasing	Phase 1												
Investment cost	US\$7.6 million												
Description													
<p>The following facilities are provided at each terminal:</p> <ul style="list-style-type: none"> - Pavement and drainage of bus passage lines - City bus fleets parking - Platforms for passengers - Passengers and bus drivers service facilities - Administration building - Garage (for maintenance and repair) and gas station <p>Land requirement and capacity of each terminal are summarized below.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">No. 1. Darilaman terminal:</td> <td style="width: 30%;">100 buses/peak hour;</td> <td style="width: 40%;">3.0ha</td> </tr> <tr> <td>No. 2. Qawalha terminal:</td> <td>120 buses/peak hour;</td> <td>3.2ha</td> </tr> <tr> <td>No. 3. Wuluswali Bagarami terminal:</td> <td>210 busses/peak hour;</td> <td>4.1ha</td> </tr> <tr> <td>No. 4. Khajabughra terminal:</td> <td>120 buses/peak hour;</td> <td>3.2ha</td> </tr> </table>		No. 1. Darilaman terminal:	100 buses/peak hour;	3.0ha	No. 2. Qawalha terminal:	120 buses/peak hour;	3.2ha	No. 3. Wuluswali Bagarami terminal:	210 busses/peak hour;	4.1ha	No. 4. Khajabughra terminal:	120 buses/peak hour;	3.2ha
No. 1. Darilaman terminal:	100 buses/peak hour;	3.0ha											
No. 2. Qawalha terminal:	120 buses/peak hour;	3.2ha											
No. 3. Wuluswali Bagarami terminal:	210 busses/peak hour;	4.1ha											
No. 4. Khajabughra terminal:	120 buses/peak hour;	3.2ha											

Project TR-35: New City Bus Terminals	
Location	1. Barikab terminal: Vicinity of intersection between Bagaram Road and Barikab arterial road 2. Dehsabz center terminal: Vicinity of intersection between Bagaram Road and Dehsabz peripheral road 3. Dehsabz west terminal: Vicinity of intersection between KCORR and Dehsabz artery road 4. Dehsabz east terminal: Vicinity of intersection between Dehsabz periphery road and KCORR
Implementing body	MOT and MoUD
Objectives	(1) To establish public bus services (2) To establish effective links with operation and management of inter-city bus services (3) To ensure parking spaces for buses
Expected effects	- Wider use of public bus services - Elimination of on-road parking of buses - Universal access to public bus services for new city residents and village inhabitants
Phasing	Phase 2
Investment cost	US\$8.3 million
Description	
<p>The following facilities are provided at each bus terminal:</p> <ul style="list-style-type: none"> - Pavement and drainage of bus passage lines - City bus fleets parking - Bus platforms for passengers - Passengers and bus driver service facilities - Administration building 	

- Bus maintenance workshop and gas station

The capacity and land requirement of each terminal are presented below.

No. 1. Barikab terminal:	150 buses/peak hour;	3.5ha
No. 2. Dehsabz center terminal:	200 buses/peak hour;	4.0ha
No. 3. Dehsabz West terminal:	200 buses/peak hour;	4.0ha
No. 4. Dehsabz East terminal:	130 buses/peak hour;	3.3ha

Project TR-36: City Bus Centers

Location	1. Qalayinjraha bus terminal 2. Baghizana bus center 3. Jadayi Maiwand bus center 4. Millie bus terminal
Implementing body	MOT and Kabul city
Objectives	(1) To improve existing bus terminals in city center (2) To contribute to improving operation and management of city bus services (3) To improve bus user services
Expected effects	- Wider use of public bus services - Reduced traffic congestion in city center
Phasing	Phase 1
Investment cost	US\$6.7 million
Description	
<p>The following facilities are provided at each bus center:</p> <ul style="list-style-type: none"> - Pavement and drainage of bus passage lines - Bus platforms for passengers - Passengers and bus driver service facilities - Administration building - Planting 	

Project TR-37: Bus Rapid Transit (BRT) – Kabul City

Location	Kabul city
Implementing body	MOT and Kabul municipality
Objectives	(1) To provide upgraded bus services (2) To increase public bus services users (3) To operate and manage new rapid transport system
Expected effects	- Wider use of public bus transport - Reduction of traffic-related environmental pollution
Phasing	Phase 2
Investment cost	US\$71.6 million
Description	
<p>The project is to introduce a bus-based rapid transport system in Kabul city to increase the capacity of public transportation. The outline of the BRT system for Kabul city is as follows.</p> <ul style="list-style-type: none"> - Service length of BRT system: 58.1km - Reinforcement of pavement length: 53.1km - BRT bus fleets: 130 vehicles - BRT interchange bus stops: 100 places - Flyovers: 5 places 	

Project TR-38: Bus Rapid Transit (BRT) – New City	
Location	Dehsabz and Barikab
Implementing body	MOT and MoUD
Objectives	(1) To provide upgraded bus services (2) To increase public bus services users (3) To operate and manage new rapid transport system
Expected effects	- Wider use of public bus transport - Reduction of traffic-related environmental pollution
Phasing	Phase 2
Investment cost	US\$52.4 million
Description	
<p>The project is to introduce a bus-based rapid transport system in the new city to increase the capacity of public transportation significantly. The outline of the BRT system for the new city is as follows.</p> <ul style="list-style-type: none"> - Length of bus exclusive lanes: 55.6km - Widening of bus exclusive lanes: 53.1km - Purchase of large size bus fleets: 70 vehicles - Bus stops: 50 places - Flyovers: 5 places 	

Project TR-39: Light Rail Transit (LRT)	
Location	Kabul city and new city
Implementing body	MOT, MoUD and Kabul municipality
Objectives	(1) To introduce rail-based mass transport system (2) To increase public transport users (3) To contribute to realizing pollution-free urban environment
Expected effects	- Enhanced public transport capacity - Reduction of traffic-related environmental pollution
Phasing	Phase 3
Investment cost	US\$1,287.5 million (US\$421.2 million for Kabul city; US\$873.3 million for new city)
Description	
<p>As the traffic demand increases, the BRT system is converted to LRT by section. The outline of the LRT is as follows.</p> <ul style="list-style-type: none"> - Total system length: 96.8km (31.5km in Kabul city and 65.3km in the new city) - Rail track at grade: 76.8km - Flyovers: 18.0km - Street car fleets and system operation facilities 	

Project TR-40: Public Truck Terminals	
Location	<ol style="list-style-type: none"> 1. Kabul south logistic center: Vicinity of intersection between KCORR and Logar Road 2. Kabul west logistic center: Vicinity of intersection between KCORR and National Highway No.1 (Kandhar Road) 3. Kabul east logistic center: Vicinity of intersection between KCORR and National Highway No.5 (Jalalabad Road) 4. Kabul north logistic center: Vicinity of intersection between Dehsabz periphery road and Bagrami Road

Implementing body	MOT
Objectives	(1) To provide efficient facilities for physical distribution services (2) To eliminate on-road parking of cargo trucks in built-up areas (3) To prevent large size trucks from entering city's central area
Expected effects	- Development of logistic industry - Provision of efficient physical distribution services - Mitigation of traffic congestion in and around city's central part
Phasing	Phases 1 and 3
Investment cost	US\$21.9 million (US\$16.3 million in Phase 1; US\$5.6 million in Phase 3)
Description	
<p>The following facilities are provided at each public truck terminal:</p> <ul style="list-style-type: none"> - Parking lot for large size trucks - Pavement and drainage of truck passage - Platform for disposal of goods - Storages and offices - Administration office - Facilities for users - Garage (for maintenance and repair) and gas station - Planting. <p>Each terminal has 20ha land area and its cargo-handling capacity will be 4500t/day in 2025. Three terminals in Kabul city are completed in Phase 1 and the one in the new city in Phase 2.</p>	

Project TR-41: Public Off-Street Parking	
Location	1. Northeast parking: Vicinity of intersection between Bararam Road and Doghabad Road 2. Southeast parking: Vicinity of intersection between Bagaram Road and Bagrami Road 3. Northwest parking: Vicinity of intersection between Mazar-e Sharif Road and KCIRR 4. Southwest parking: Vicinity of intersection between Kandhar Road and KCIRR
Implementing body	Kabul municipality
Objectives	(1) To provide public off-street parking, (2) To reduce traffic congestion in city's central part (3) To promote modal shift from private to public means of transportation
Expected effects	- Reduced on-street parking and traffic congestion - Wider use of public transportation - Mitigation of environmental pollution
Phasing	Phase 3
Investment cost	US\$1.1 million
Description	
<p>The project would establish public parking at four locations in the immediate peripheries of the city center. The capacity and land area required for each parking lot are as follows.</p> <p>No. 1. Northeast: 150 vehicles; 5,000m² No. 2. Southeast: 170 vehicles; 5,400m² No. 3. Northwest: 120 vehicles; 4,400m² No. 4. Southwest: 220 vehicles; 6,400m²</p>	

Project TR-42: KCIRR Intersections Upgrading	
Location	Kabul city
Implementing body	Kabul municipality
Objectives	(1) To facilitate traffic flow on KCIRR (2) To improve traffic flow on main radial roads (3) To facilitate introduction of BRT on KCIRR
Expected effects	- Mitigation of traffic congestion around intersections between KCIRR and main radial roads - Smooth operation of BRT on KCIRR - Reduced environmental pollution
Phasing	Phase 1-2
Investment cost	US\$51.7 million
Description	
The project is to introduce grade separation for intersections between KCIRR and the main radial roads. There are 16 target intersections, of which 13 are upgraded to flyover, 2 to underpass and 1 to roundabout.	

Project TR-43: Roundabouts Improvement	
Location	Kabul city
Implementing body	Kabul municipality
Objectives	(1) To improve selected roundabouts to increase traffic capacity (2) To ensure safety of all intersections (3) To control traffic by signals at intersections with heavy traffic congestion
Expected effects	- Reduced traffic congestion and accidents - Enforcement of traffic control by signals - Mitigation of environmental pollution
Phasing	Phase 1-2
Investment cost	US\$40.6 million
Description	
The project is to improve existing roundabouts and intersections. There are 5 places to be upgraded to flyovers and 200 traffic signals to be installed, of which 100 are for vehicles and 100 for pedestrians.	

Project TR-44: Road Safety and Pedestrian Crossing Improvement	
Location	Kabul city
Implementing body	Kabul municipality
Objectives	(1) To provide medians on wider roads (2) To provide crosswalks (pedestrian crossings) (3) To install pedestrian bridges
Expected effects	- Reduction of traffic accidents involving pedestrians - Enhanced safety and comfort in urban environment for residents
Phasing	Phase 1-2
Investment cost	US\$4.7 million
Description	
To be installed by the project are medians for 33.5km, 30 pedestrian bridges, 50 signals, and pedestrian crossings throughout Kabul city.	