

Executive Summary

of

Environmental and Social Impact Assessment Urumqi Urban Transport Improvement Project II

**Environmental Protection Center
Xinjiang Uygur Autonomous Region**

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1. Introduction

1.1 Background

Given its geographical advantage as the capital of Xinjiang Uygur Autonomous Region, the city of Urumqi has become the international trade center for the middle and west Asia. During the recent years, the city of Urumqi is experiencing the rapid economic growth and urbanization. However, the sustainable development of the city is facing the great pressures on the urban infrastructure service, particularly on the poor service status of public transport which has led to severe traffic congestion and a series of environmental problems. To facilitate to address the problems in public transport, the city of Urumqi has prepared an Integrated Public Transport Service Development Planning under the assistance from Global Environmental Facility(GEF) in 2011 which places an emphasis on an integrated approach to improving and managing the public transport service in the city. This proposed project is an integral part of the planning.

An Environment Impact Assessment (EIA) has been prepared by the Environmental Protection Center of Xinjiang Uygur Autonomous Region following relevant provisions specified in Chinese EA laws/regulations and technical guidelines, as well as world Bank (WB) safeguard policies. In addition, a Social Impact Assessment (SA) report has been prepared by the Urumqi PMO. An Environmental and Social Management Plan (ESMP) was prepared to synthesize recommendations of the EA report and the SA Report. A Resettlement Action Plan has been prepared by the Traffic Control Center of Urumqi in compliance with the China's laws and regulations as well as the WB's Safeguard Policy 4.12. As a category A project, an executive summary of all environmental and social documents was prepared.

1.2 Environmental Laws, Regulations and Guidelines

1.2.1 Laws and Regulations applicable

- Environmental Protection law of the People's Republic of China, 1989
- The Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution, 2000
- The Law of the People's Republic of China on Prevention and Control of Water Pollution, 2008
- The Law of the People's Republic of China on Prevention and Control of Pollution From Environmental Noise, 1996
- The Law of the People's Republic of China on Environmental Impact Assessment, 2003
- The solid waste Pollution Control Law of the People's Republic of China, 2005;

In summary, the laws and regulation require that:

- During the project development, environmental impacts be considered to prevent the adverse impacts;
- The impacts to be assessed include, but not limited to, the noise, water, air and solid waste;
- The potential impacts of projects be analyzed, predicted and assessed using scientific methods;
- Specific measures be developed to mitigate the environmental impacts;
- The implementation of the project be monitored and assessed;
- Public participation and information disclosure be conducted during the preparation of the EA.

1.2.2 Relevant National Technical Guidelines for EA

| | | | | | | | |
|---------------------|----------------------------------|--------------------------------------|--|---|----------------------------------|--------------------------------------|--|
| Technical Guideline | EIA Technical Guideline, General | EIA Technical Guideline, Ambient Air | EIA Technical Guideline, Surface Water | EIA Technical Guideline, Acoustic Environment | EIA Technical Guideline, Ecology | EIA Technical Guideline, Groundwater | Environmental Risk Assessment Technical Guideline for Construction works |
| Series No. | HJ2.1-2011 | HJ2.2-2008 | HJ/T2.3-93 | HJ2.4-2009 | HJ19-2011 | HJ610-2011 | HJ/T169-2004 |
| Effective Date | 2011-9-1 | 2009-4-1 | 1994-4-1 | 2010-4-1 | 2011-9-1 | 2011-6-1 | 2004-12-11 |

1.2.3 Applicable world Bank Safeguard Policies

- OP 4.01 Environmental Assessment;
- OP 4.12 Involuntary Resettlement ;
- General Environmental, Health and Safety (EHS) Guideline;
- EHS Guidelines for Retail Petroleum Networks

1.3 Applicable Environmental Standards

1.3.1 National Environment Quality Standards

Table 1.3-1 Acoustic Environment (GB 3096-2008) Unit: dB(A)

| Class | Day | Night | Applicable area |
|-------|-----|-------|--|
| 2 | 60 | 50 | The areas zoned for development of financial and commercial business, and market, or the areas for residential, business and industrial development which require quiet environment. |
| 4a | 70 | 55 | The areas in close proximity of the two sides of the highway, class 1 and 2 roads, urban transit roads, urban trunk and secondary roads, urban railways (on ground surface), and inland waterways. |

Table 1.3-2 Class II of Ambient Air Quality (GB3095-2012) Unit: mg /m³

| Pollutants | Hourly average | Daily average | Annual average |
|-------------------|----------------|--|----------------|
| SO ₂ | 0.50 | 0.15 | 0.06 |
| NO ₂ | 0.20 | 0.08 | 0.04 |
| CO | 10.00 | 4.00 | - |
| O ₃ | 0.2 | 0.16 (average of max. 8 hours one day) | - |
| PM ₁₀ | - | 0.15 | 0.07 |
| PM _{2.5} | - | 0.075 | 0.035 |

Table 1.3-3 Surface Water Quality (GB 3838-2002) Unit: mg/l

| Item | PH | COD | BOD | Oil | NH ₃ -N | Permanganate index≤ | SS |
|---------|-----|-----|-----|-----|--------------------|---------------------|-----|
| Class V | 6-9 | 40 | 10 | 1.0 | 2.0 | 15 | 100 |

1.3.2 Relevant National Emission Standards

Noise: Noise Limits on Boundaries of Construction Sites (GB12523-2011):
Night<55dB (A) , Daytime<70 dB(A).

Table 1.3-4 Vertical Vibration in Urban Areas (GB10070-88) Unit: dB

| No. | Applicable Area | Day | Night |
|-----|---|-----|-------|
| 1 | Special Residential Area | 65 | 65 |
| 2 | Residential and Education Area | 70 | 67 |
| 3 | Mixed areas and Commercial Centers | 75 | 72 |
| 4 | Industrial Concentrated Areas | 75 | 72 |
| 5 | Areas along the two sides of trunk roads | 75 | 72 |
| 6 | Areas along the two aides of the trunk railways | 80 | 80 |

Table 1.3-5 Fugitive Air Pollutants on Site Boundaries (GB16297-1996)

| Pollutants | Control points | limits (mg/m ³) |
|-----------------|--|-----------------------------|
| NO _x | The point with the highest concentration | 0.40 |
| PM | The point with the highest concentration | 1.0 |
| NMHC | The point with the highest concentration | 4.0 |

Table1.3-6 Wastewater Discharge Standard (GB8978-1996) Unit: mg/L

| Item | PH | COD | BOD ₅ | SS | NH ₃ -N | Oil | Petroleum |
|----------|-----|-----|------------------|-----|--------------------|-----|-----------|
| Class II | 6-9 | 150 | 30 | 150 | 25 | 15 | 10 |

1.4 EA Scope

The scope of environmental assessment is shown in Table 1.4-1.

Table 1.4-1 Assessment Scope

| No. | Environmental Factor | Assessment scope |
|-----|----------------------|---|
| 1 | Ambient Air | within 200 m from the central line of the road, or within |

| | | |
|---|-----------|---|
| | | 200 m from the boundary of the construction site; or within 100 m from the associated facilities |
| 2 | Noise | within 200 m from the central line of the road, or within 200 m from the boundary of the construction site; or within 10 m from the associated facilities |
| 3 | Vibration | within 50 m from the central line of the road |
| 4 | Ecology | within 300 m from the central line of the road; or within 300 m from the boundary of the construction site; or within 10 m from the associated facilities |

2. Project Description

2.1 Composition of Project

The constituents of the Project are described in Table 2.1-1 below:

Table 2.1-1 Description of the Project

| Component | Description |
|--|--|
| 1. Integrated Bus corridor | <ul style="list-style-type: none"> • Construction of 3 BRT lanes with a combined length 51.7 km; • Construction of 3 overbridges and upgrading of 6 overbridges, and construction of 6 underground passages; • Construction of 67 bus stops. |
| 2. Integrated Traffic Management Information | <ul style="list-style-type: none"> • Establishment of an integrated traffic information management system, including software and an information command center hall. |
| 3. Associated Infrastructures | <ul style="list-style-type: none"> • Construction of 2 public transport hub stations with a footprint being 39256 m² and 6000 m² respectively; • Construction of 2 bus maintenance and parking yards, with an area being 52500 m² and 100075 m² respectively; • Construction of 2 bus terminals, with an area being 6727 m² and 6500 m² respectively. |
| 4. Capacity building and project management | <ul style="list-style-type: none"> • Studies on urban transport management; • Project management and technical assistance; • Capacity building and training; and • Public outreach. |

The location of the project is illustrated in Figure 1.

2.2 Related Projects

The city of Urumqi prepares to upgrade the Aletai Road which will preserve an BRT lane to connect with the BRT lanes proposed by this project, thus has been identified as the related project. This road will be built with the exclusive bus lanes in the short term, and the BRT will be provided in the long term. This road is 5.6 km long and the upgrading works is still in the stage of feasibility study. The EA for this related project has not been launched yet. The client is committed to ensure its EA be prepared according to domestic and the WB requirements.

The Resettlement Action Plan (RAP) for this road has been prepared in accordance with domestic and the Bank's requirements.

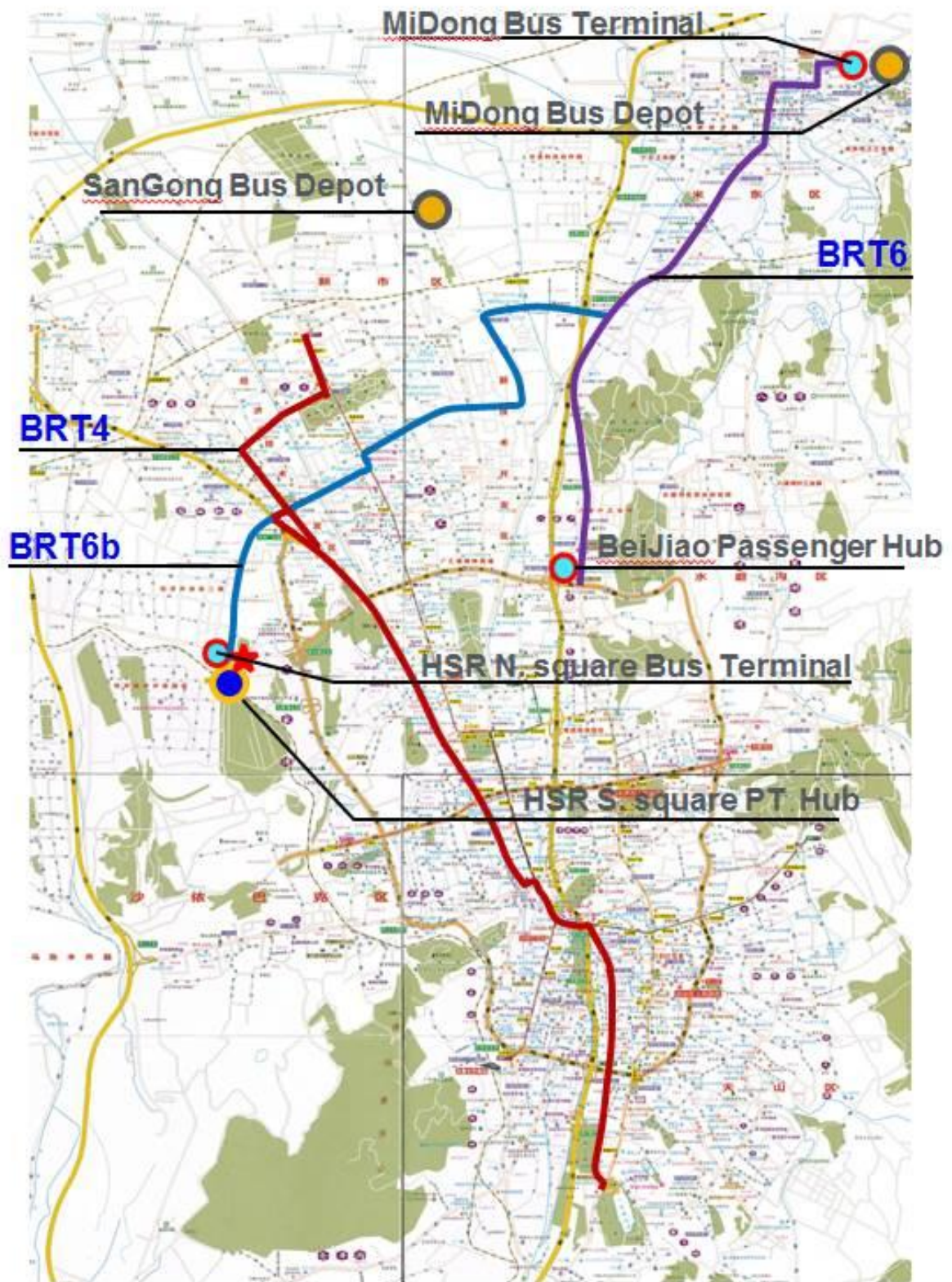


Figure 1. Location of the Project

3. Environmental and Social Baseline

3.1 Topography and Meteorology

Urumqi is the capital city of Xinjiang Uygur Autonomous Region. It covers an area of 1,400 km² with seven districts and one county. The Project covers six districts, they are Tianshan, Shayibake, Gaoxin, Shuimogou, and Midong districts, and the Economic Development Zone. It is surrounded by mountains on all sides except for an open alluvial plain on the north. Its topography slopes from southeast to the northwest with an average ground elevation being 800m.

Urumqi is located in the central part of Eurasia and far from the sea, where the arid continental climate dominates. The climate is characterized with distinct seasons, spring is dry and windy, summer is hot with less rainfall, autumn is mild and cool, and winter is cold with less snow. Days with calm wind and temperature inversion is prevailing in winter, leading to a very poor condition for the dispersion of the atmospheric pollutants. The annual average temperature is 6.1°C. Annual average precipitation is 277.6 mm and evaporation is 2266.0 mm.

3.2 Socio-economic Status

Urumqi City has the most complex composition of ethnic groups in China. There are 49 ethnic groups such as Uygur, Han, Hui, Kazak and Mongolian. The total population is 3 million and the ethnic minorities represents 27.4% of the total population, among which the Uygur and Hui accounts for 47.11% and 36.71% of the population of the ethnic minorities respectively.

Up to the end of 2012, the total length of roads in urban area is 1739.62 km with an area of 22 million m², equivalent to 7.45 m² per capita. The coverage rate of the bus stations within 300 m radius is 49.0% and within 500 m radius is 77.4%, which are much lower than the international standard.

There are no cultural relics protected at any levels within the assessment area, but 4 small mosques built in 1980's for local people. However these 4 mosques will not be relocated or physically damaged as a result of the project.

3.3 Ecology

The Urumqi River is a seasonal river, flowing through the urban area of Urumqi before discharging into the Mengjin Reservoir. The Urumqi River has been artificially modified into a ditch with embankment in the urban section of Urumqi.

The original soil type in Urumqi is the grey desert soil formed during the creation of the alluvial plain featured with deep soil horizon and light salt content. The

natural vegetation are mainly the low plants tolerant to drought and the vegetation coverage rate is about 10%. There are no natural vegetation within the assessment area. The information retrieved and the site survey confirmed that there are no rare or endangered species of natural vegetation/animals or important natural habitats within the project area

3.4 Ambient Air Quality

The ambient air quality data released by the Urumqi Environmental Protection Bureau (EPB) for the period May 3 to May 9 2014 was used to help understand the current status of air quality in the project area. The data indicates that the air pollutant of primary concern is PM₁₀ caused by the local dry and windy climate in spring; totally 42 group of data of air quality were obtained during the EA preparation, and the range of data in terms of daily average for PM₁₀ in the urban area of Urumqi is from 0.107 mg/m³ to 0.636 mg/m³. The analysis of the data shows that only 6 groups of the data meet the class II of national standard for ambient air quality on PM₁₀ with the extreme exceedance of the standard by 3.24 times. The data of NO₂, SO₂ and CO meet the Ambient Air Quality Standard for Class II.

3.5 Acoustic Environment Quality

According to the relevant requirements, the Jingcheng Testing Technology Co. of Urumqi has been engaged to conduct the acoustic environment monitoring plan for the sensitive receptors during March 2013. The monitoring results show that the noise level is good in daytime but bad in night time, and specifically the noise level 1) at the first row buildings along the roads where Class 4 standard is applied meet the standard for day time, but at the buildings where the Class 4a standard is applied fail to meet the standard for nighttime; 2) at the buildings after the first row buildings with at least 3 floors generally meet the Class II standard, but at the schools and hospitals within the Class 4 area fail to meet the applicable Class 2 standard; 3) at the sites for the proposed parking yards and bus hubs meet the respective applicable standards, but at the platform of BRT line 1 near the south railway station exceeds the standard for nighttime due to current traffic noise.

3.6 Air pollution prevention and control

So far the city of Urumqi has not developed the relevant air pollution control plan, but has practiced the air pollution control management methods stipulated in the government document-Comments on Enhancing the Management of Regional Air Pollution Control in Urumqi. It calls for construction of green transport system with the priority on BRT and buses powered by gas and electricity, supplemented by other public transport modes such as taxi. This project fit well into with the priority and is expected to be helpful in promoting the development of the green transport system and reducing the air pollution.

4. Comparison of Alternatives

During project development, various alternatives have been screened and compared with technical, economic and environmental criteria. In terms of the environmental assessment of alternatives, the primary objective was to identify and adopt options with the least adverse environmental impacts and maximum positive impacts at reasonable cost.

4.1 Comparison of Alternatives

| Alternatives | Options | Pros and cons |
|--------------------------|---------------------------------|--|
| With Project | with project (preferred option) | Improve the public transport service; Reduce the air pollution; Promote the socio-economic development |
| | without project | Transport efficiency will be deteriorated due to increasing demand for transport; Air pollution will become more severe due to more ownership of small cars and traffic congestions; Noise level will be exacerbated due to worsened traffic condition; Socio-economic development will be delayed. |
| BRT line 4 alignment | Option1 | Less density of residential communities and industries, thus less demand for BRT; will cause more land occupation and resettlement; will occupy large area of public green area |
| | Option2 | Less density of residential communities and industries, thus less demand for BRT; will cause more land occupation and resettlement; will occupy large area of public green area |
| | Option3 (preferred option) | will cause the least land occupation and people resettlement; will cause the maximum improvement in acoustic environment. |
| Alignment for Kashi Road | Option1 (preferred option) | Larger cross section, sufficient space for establishment of BRT; Only need to re-layout of the road space; |
| | Option2 | Smaller cross section, insufficient space for BRT, thus expansion of the road is required; Land acquisition is needed. |
| BRT line 6 | Option1 | Less density of residential communities and industries, thus less demand for BRT; Need to expand the existing road and more land occupation; |

| | | |
|---------------------------|-------------------------------|---|
| | | Existing quiet acoustic environment will be affected by the project; |
| | Option2 (preferred option) | Developed area with high demand for BRT; Most part of the roads have been constructed with sufficient space for BRT; The noisy environment along the road will be improved during the operation of the project. |
| Cross section type of BRT | Option1 | Side BRT lanes will cause significant need for expansion of the existing roads, thus more land occupation |
| | Option2 (Preferred option) | Central BRT lanes will not cause significant need for expansion of the roads |

4.3 Options for Site Selection for Bus Facilities

The proposed sites for the bus depots and parking yards, bus hubs and terminals have been carefully selected in line with the public transport development planning. Most of the sites are located in the area already reserved by local government. Thus the options for the sites have been preferred for the least resettlement and least cost.

5. Environmental Impacts Prediction

5.1 Environmental Impacts during Construction Phase

5.1.1 Air pollution

The air pollution during the construction stage will be caused by the air-borne dust generated from site cleaning, excavation and refilling, and material transportation and the asphalt mixing. As there are many receptors sensitive to air-borne dust, such as schools, stores and residences, the air-borne dust would cause great adverse impact on the people. However such impact of air-borne dust could be readily mitigated by timely water spray and barrier walls and will disappear immediately after the construction is completed.

During the melting and mixing of asphalt, asphalt smoke will be emitted which is often considered one of the major air pollutants in urban transport projects. However this impact could be effectively mitigated to an acceptable level by using the enclosed mixing facility with dust removal devices and tankers.

5.1.2 Noise

The primary noise source in construction phase is the operation of equipment and vehicles. It is estimated that the noise level generated by the construction of roads at 40 m from the construction site will meet the standard (Noise Limits for Construction Site Boundary) for daytime, but at least at 200 m will meet the standard for nighttime. As there are some sensitive receptors, such as schools, hospitals and residential buildings within 200 m from the roads, the noise may cause adverse impact on these sensitive receptors. However, with adoption of mitigation measures, such as noise barriers and prohibition of construction in nighttime, the noise impact in construction stage will be mitigated to an acceptable level.

5.1.3 Social Impact

Although the project is intended to improve the public transport service quality, it will cause some adverse social impacts in construction stage, including interruption of public traffic, safety issue and noisy environment for schools and kindergartens, reduced income for bus companies and increased waiting time for passengers. There are a number of small businesses along the roads under the project, these businesses would be adversely affected during the construction although in general these businesses will be beneficiary in operation stage of the project which will cause economic growth and increased demand for business. The impacts on the business include the traffic blocking which may cut off the accessibility to the business by fencing the road sections, excavation of the roads, stockpiling of materials; the air pollution that would decrease the attractiveness of the business and force people dodge away; the noise that would affect the demand for quiet and

beautiful acoustic environment for business. However these impacts are temporary and can be mitigated through careful scheduling of construction to avoid the sensitive time for schools and kindergarten, and hospitals; provision of access roads to the schools, kindergartens, hospitals and businesses, prohibition of noisy equipment operation and water spray near such sensitive sections, and cooperation with local departments on traffic control and infrastructure service. The construction management will be enhanced for these sensitive receptors and the environmental supervisors need to note the special requirements for mitigation measures for intensive supervision and assign staff to guide the people cross these sections and safeguard the students and children.

5.1.4 Impacts on Religious Venues and Activities

There are four mosques within the assessment area but the impacts will be only limited to traffic blocking and noise impact in construction phase that would affect the religious activities in the mosques, without causing the need for relocation of the mosques. The construction of the roads near the mosques would block the accessibility to the mosques, particularly in the case that the road section under construction is totally fenced. The mitigation measures have been developed to address this issue by placing the access road to the mosques and staff designated to help the prayers cross the road sections; the noise during the construction would interrupt the religious activities which require a quiet environment, the timing for the religious activities has been identified through the consultation, and the construction will be suspended during the religious activities; In addition, the respect on the religious custom is identified as a key issue for the construction management, the workers will be provided with trainings on the good behavior near the religious venues and supervision of their behavior will be the duty of the supervisors.

The imams of the mosques have been consulted during the process of public consultation and their concerns and advices have been considered in the development of the EA. In addition, the Chance Find procedure has been applied in the mitigation measures.

5.1.5 Wastewater

Construction wastewater is mainly generated from grouting and washing of equipment and domestic wastewater of workers. Surface run-off formed by rainfall through the construction site would be another source for wastewater. The good construction management will be adopted to reduce the generation of construction wastewater and remove the solids in the construction wastewater by settling and the domestic wastewater will be discharged together with the construction wastewater before the oil in the domestic waster is separated by devices.

5.1.6 Solid wastes

Solid wastes include the construction and domestic solid waste. The former is mainly the spoil and waste construction materials, which could cause water pollution, traffic blocking and clogging of sewers in the urban area, and water and soil erosion

in disposal site. In addition, the vehicles transporting the spoil may interrupt the traffic in the city. Spoil will be refill on-site as much as possible. The reminder be disposed at Urumqi's site for construction waste. Currently there is an operating landfill 15km from the urban center with a capacity of 2 million m³, which is designated for construction wastes like spoil from this project,

Additionally, workers' camps will generate 9.6 t domestic solid wastes, which will be collected and transported to Urumqi's sanitary landfill.

5.1.7 Vibration impacts

The vibration is mainly caused by piling, compaction and movement of heavy trucks. It is estimated that the vibration level will be attenuated to the standard at 10 m from the vibration source, thus causing little impact.

5.1.8 Ecological and landscape impacts

The project is located in an urban setting, and the site survey has confirmed that there are no sensitive ecological receptors in the project area. However, totally 5304 road-side trees will be relocated, and the dust caused by the construction of the project will affect the photosynthesis of the vegetation and damage the vegetation near the road sections. It is expected that the green area in the city would be reduced to some extent. However such impact is temporary and the replantation of the trees and vegetation after the works is completed will compensate for the loss of the green area. The construction management will be enhanced to control the scope of the works and the workers will be trained on the protection of the vegetation area. The urban landscape may be affected by spoils and the green belts along the roads will be damaged or destroyed. However the greening plan will be developed in the detailed design which include the establishment of larger green belt and plots of flower beds that would improve the landscape and aesthetics of the city.

5.2 Environmental Impacts during Operation Phase

5.2.1 Social Impact

The proposed project will produce major social benefits as intended for improving the public transport service and promoting the economic development of the city of Urumqi. Through the project the city of Urumqi will be benefited from:

- improved environment for investment;
- saving of traffic time for the public;
- increased traffic safety and improved living quality.

In addition to the above impacts, the Social Assessment Team has conducted the public consultation along the project BRT lanes to screen the primary social concerns during the project development process, with the mitigation measures incorporated into the ESMP. The negative social impact of primary concern have been screened and scoped, including:

- impact on the people to be relocated, in terms of change of livelihood and

relocation into high buildings from current flat houses;

- impact on traffic congestion in construction phase; and
- impact on small commercial businesses along the roads.

However, these negative impacts can be mitigated by sufficient information disclosure on the compensation standard and the construction schedule, and the social security for the people lost farmland.

5.2.2 Noise Impact

The noise impact during operation stage of the project is mainly caused by the traffic noise from the BRT lanes. Given the high complexity of the physical setting and the wide fluctuation of traffic flow in the city of Urumqi, the analogy method is adopted rather than the model recommended by the technical guideline for EA which may produce results with large errors under such situation. Thus the data are retrieved from the operating BRT lanes in Urumqi for estimating the noise levels along the proposed BRT roads. The data available indicate that the buses only make up 5% of the total vehicular flow in day time, the primary source for traffic noise is thus the small vehicles rather than big buses.

Based on the traffic flow projection, it is estimated that the noise level at the sensitive receptors still can not meet the respective standards during the operation stage. The noise level in the areas applied with Class IV of Ambient Air Quality Standard will exceed the standard for night time by the range of 10-15 dB(A); in the areas applied with Class II of the standard will meet the standard for day time, but would exceed the standard for night time by 5 dB(A).

Given the fact that the windows in the city adopt double-layer glass which would reduce the noise level by about 25 dB(A), the noise level at the receptors would meet the respective standards without the need to adopt additional noise reduction measures. However, an precautionary approach has been adopted in the EA that the noise level at the sensitive receptors will be monitored in the operation phase under the environmental monitoring plan to help determine whether to develop and conduct appropriate mitigation measures or not so as to ensure the noise level at the receptors meet the respective standards.

5.2.3 Ambient Air Impact

As the buses only represents 5% of the traffic flow in the city, the in-use small vehicles are considered the major source for vehicular emission. Analogy method is used based on the data monitored in 2014 by Urumqi Monitoring Center for estimating the air quality along the proposed BRT lanes. It is expected that under the typical meteorological condition, the hourly concentration of NO₂ and CO within the distance of 200 m from the roads can meet the Class II of Ambient Air Quality Standard in both the short and medium terms in operation stage because of the improved traffic condition due to the project. In the long term, as the traffic flow would largely increase, the concentration of NO₂ near the roads would exceed the standard under

the worst meteorological condition.

Urumqi has already established the in-use vehicle inspection and maintenance (I/M) system in 2007, the vehicular emission would be further reduced through the implementation of the I/M system. In addition, with the adoption of cleaner fuel and advanced technology, the potential impact of vehicular emission due to the project is expected to be insignificant in the long term.

The buses in the parking yards and terminals will also cause vehicular emission, particularly in idling condition. The organic solvents used in the repair and painting of the buses may cause air pollution and damage to the health of the workers. Such impact can be mitigated by enhanced management of buses routing so as to reduce the idling times and duration, and installation of venting equipment; provision of protective gears for workers and careful scheduling of shifts of workers.

5.2.4 Wastewater

Wastewater will be generated from the repair and maintenance of the buses in the parking yards, hubs and the terminals, as well as the domestic wastewater from these facilities. The wastewater will be collected and discharged into the municipal sewers so that such impact will be mitigated to an acceptable level.

5.2.5 Solid wastes

The solid waste includes the waste asphalt generated during the repair of the road surface, the waste during the bus repair and maintenance and the domestic waste. The waste will be collected and reused wherever possible with the remaining to be disposed in designated facility.

5.2.6 Vibration Impacts

Through analogy analysis based on the data obtained from the inner ring road of Guangzhou where the traffic flow is about 1,000 per hour but the vibration level is less than 70 dB, Given that the traffic flow in this project roads are far less than that in Guangzhou, thus it is estimated that the vehicles on the project roads will not cause severe vibration impact.

5.2.7 Indirect and Induced Impacts

The project will improve the public transport, not build new roads but new bus facilities. It would have some indirect or induced impacts as follows:

- People will be attracted to the improved public transport to replace the private cars, which will reduce the emission of air pollutants and GHG;
- Transport efficiency will be improved thus stimulating the economic growth and increasing the business and employment especially around new bus stations;
- Urban development in the city of Urumqi will be more energy-saving, efficient and sustainable.

6. Land Acquisition and Resettlement

The beneficiary area of the project is defined to be the whole Urumqi city, which mainly covers Tianshan district, Shayibake district, high technology industry development zone (new district), economic and technological development zone (Toutunhe district) and ShuiMoGou district.

The projects have been constructed, this proposed project and linked project will totally affect 652 people in 117 households, which include: 216 people in 50 households will be affected by the permanent acquisition of rural collective land; Beijiao Passenger Terminal component will involve relocation of 45 households on state-owned land affecting 147 people; the Altay road widening component will relocate 69 households on state-owned land affecting 242 people. So the proposed project will obtain 4.59ha (68.93 mu) state-owned land. The proposed project will involve the demolition of houses 18776.98 m², totally affecting 89 people in 114 households. The proposed project will acquire collectively-owned land in rural area at 15.93ha (238.95 mu) affecting 216 people in 50 households. In terms of the enterprises, entities and stores, the constructed Beijiao Terminal Component will affect 1 enterprise and 40 stores with 134 people; the Altay road widening component will involve 13 enterprises and institutions, affecting 47 people.

Resettlement impacts of the constructed components: state-owned land of 4.59ha (68.93 mu) have been obtained, including state-owned land 3.78ha (56.77 mu) by the South Square of High Speed Rail Station's transit hub recycle, 0.81ha (12.16 mu) state-owned land by the North Square of High Speed Rail station's bus terminal. Demolition of housing area is 3300.29 m², involving 13 people in 4 residential households, 134 people in 40 stores, 1 institution affecting 147 people in 45 households.

Resettlement impacts of the proposed project: the proposed project will acquire permanently collectively-owned land of 15.93ha (238.95 mu) in rural area, of which Midong terminal station will acquire 0.67ha (10.09 mu); Midong Parking Yard will acquire 10.01ha (150.11 mu); Sangong Parking Yard will acquire 5.25ha (78.75 mu). The acquisition of the collectively-owned land in rural area will affect 50 households with 216 people. The proposed project will involve the permanent acquisition of arable land which accounts for only 1.64% in Sangong village, and the permanent acquisition of the arable land in the Donggong Village accounts for only 3.39 % of the total amount of cultivated land in the village. Totally, the acquisition of arable land totally accounts for 2.51% of that in the two villages. It is therefore estimated that cultivated land to be acquired by the proposed project is only a small percentage of that in the affected villages, so the impact on the Donggong Village and the Sangong village is very small.

Resettlement impacts of linked project: The linked project will involve house demolition totally at 15476.98 m², including 5726.61 m² houses, 9750.37 m² floor area in enterprises. The construction of the linked project will affect 69 households with 242 people and 13 enterprises with 47 people.

In addition, there are only two vulnerable people in one household in Donggong Village to be affected by the project in land acquisition. The livelihood and vulnerable people recovery measures have been developed for the two vulnerable people. Besides, it is found that there are no families supported by single woman that to be affected by land acquisition under the project.

A Resettlement Action Plan(RAP) has been prepared by the Traffic Control Center of Urumqi in line with China's laws and regulations, as well as the WB's OP 4.12. The RAP include the identification of the impact of land acquisition and resettlement as well as the respective compensation standards, the inventory of the ground attachment, measures for livelihood recovery, the monitoring plan and the grievance redress mechanism. Through the implementation of the RAP, it is expected that the living quality of affected people will at least the same with that before the project or even the affected people can be better off due to the implementation of the project by participating in construction and benefit from the economic growth after the project.

7. Public Consultation and Information Disclosure

7.1 Information Disclosure

Information on the project EA has been disclosed to the public throughout the public consultation. For the first round, the project information was disclosed via bulletins and public media in line with the requirements stipulated in the Temporary Method for Public Participation for EA. The advertisement on the first-round information disclosure has been placed on the Xinjiang Economics News and the local website at <http://www.xjepb.gov.cn> on March 4 2014. The EA team has also pasted notices on the bulletin boards in the communities, schools and hospitals along the project BRT roads during March 13 to March 15 2014.

For the second round, an advertisement has been placed on the Urumqi Night News on May 28, 2014, the most popular local newspaper during the second round consultation to invite the public to express their concerns about the project, and to inform the public the place to assess to the draft EIA report which has been placed in the Urumqi EPB and the Xinjiang Environmental Protection Technology Consulting Center. The full text of the EA documents have been disclosed on local website since May 28, 2014 at an address: <http://www.xjepb.gov.cn>

7.2 Public Consultation

In accordance with the requirements of the China’s EA Law and the world Bank, two rounds of public consultation were conducted by the EIA team. The first round focused on environmental screening to define public concerns, to assist identification of key environmental issues and to draw public response and comments on the initially developed mitigation measures for the potential adverse impacts identified before EA TOR finalization. The second round was designed to ensure public awareness of the EA effort and final project definition and mitigation by presenting a draft EA report to the public through information disclosure procedures. Details of the two rounds of public consultation undertaken are presented in Table 7.2-1.

Table 7.2-1 Implementation of the Public Consultation

| Round | Timing | Participants | Method | Organizer |
|-------|--------------------|--|---|-----------|
| 1 | March 2014 | Representatives of communities, schools and hospitals in the project affected area; experts and relevant departments | Interviews, phone calls | EA team |
| 2 | June to July, 2014 | Representatives of communities and villages in the project affected area; experts and relevant departments | Questionnaires, interviews, meetings with experts | |

During the consultation, the public expressed several concerns on the land occupation and the livelihood recovery, and environmental impacts including noise and traffic blocking during the construction. The representatives of the schools expressed concern on safety of students during construction and advised to adopt street crossing facilities and careful routing of material transport so as to ensure the fleet be as far from the school as possible. These concerns have been considered and incorporated in the EA.

The imams of the mosques made suggestions on the construction management and access to the mosques during the construction phase as well as the water supply and gas pipeline connection; and their suggestions have been considered and incorporated in the EA and design document.

The Social Assessment Team has conducted the public consultation which identified the whole people in Urumqi is the stakeholder and the people has been divided into several groups for consultation. During the consultation, the people raised suggestions on a wide variety of social issues on road planning and design, improvement on bus service quality, vulnerable groups, and gender issues. These suggestions have been considered in the project design and incorporated into the EA.

Through the consultation, it is understood that the public strongly support the project as they think it would be a good approach to improving their living conditions.

8. Environmental and Social Management Plan

8.1 Institutional Arrangement

The duties and responsibilities for institutions for environmental and social management have been identified for stages of design, construction and operation respectively. These institutions will be involved in the environmental management, supervision and monitoring. An environmental and social management unit will be established in the PMO with dedicated safeguards staff. Civil work contractors and supervision companies will be required to assign qualified environmental staff to their team to ensure effective implementation of the ESMP.

Table 8.1-1 Institutional Arrangement and Responsibility

| Phase | Parties | Responsibilities | No. of staff |
|--------------|------------------------------------|--|--------------|
| | Urumqi PMO | <ul style="list-style-type: none"> Take the ultimate responsibility for environmental protection and management. Ensure the ESMP be included in the tender documents, the civil contracts and construction supervisors' contracts. Hiring environmental monitoring agency. | 1 |
| | Design Institutes | <ul style="list-style-type: none"> To provide technical support for environmental management | 1 |
| | EA Consultant | <ul style="list-style-type: none"> Prepare the ESMP | 5 |
| Construction | Urumqi PMO | <ul style="list-style-type: none"> Supervise contractors to implement mitigation measures; Participate in the environmental supervision; Contract the environmental consultant to provide technical assistance, guidance to the contractors on ESMP implementation and to provide related training for the staff from PMO, supervisors and contractors. Submit the bi-annual implementation progress report on ESMP to the Bank. | 1 |
| | Contractors | <ul style="list-style-type: none"> Be responsible to implement ESMP mitigation measures; Provide training on ESMP measures to their workers. | 1 |
| | Construction Supervisors | <ul style="list-style-type: none"> Be responsible for day to day supervision to ensure the implementation of the ESMP; Record the progress of the ESMP and the issues found in the monthly report. | 1 |
| | Environmental Monitoring Station | <ul style="list-style-type: none"> Conduct the environmental monitoring according to the ESMP and the PMO's requirements and accidental monitoring | 1 |
| | Urumqi EPB and Construction Bureau | <ul style="list-style-type: none"> Inspect the environmental management during construction | 1 |

| | | | |
|-----------|----------------------------------|---|---|
| Operation | Urumqi PMO | <ul style="list-style-type: none"> Supervise the operation entities to implement the ESMP mitigation measures. Submit the bi-annual implementation progress report on ESMP to the Bank. | 1 |
| | Urumqi Bus Company | <ul style="list-style-type: none"> Be responsible for the implementation of ESMP measures. Ensure the normal operation of the environmental treatment facilities. | 2 |
| | Urumqi EPB, Construction Bureau | <ul style="list-style-type: none"> Mobilize the inspection and acceptance of the environmental treatment facilities. Inspect the environmental management during operation. | 1 |
| | Environmental Monitoring Station | <ul style="list-style-type: none"> Conduct the environmental monitoring according to the ESMP and the PMO's requirements and accidental monitoring | 1 |
| | Urumqi Planning Bureau | Control the development of the sensitive buildings along the newly rehabilitated roads and new bus hub/depot. | 1 |

8.2 Mitigation measures

Based on the EIA report, domestic related laws and regulations, and the applicable EHS guidelines of the World Bank as well as experiences from other similar domestic projects and WB projects, the related environmental impact mitigation measures have been developed for project design, construction and operation period (see Table 8.2-1 and Table 8.2-2.).

8.3 Environmental Monitoring Plan

An environmental monitoring plan has been developed for both the construction and operation phases and incorporated into the ESMP as shown in Table 8.3-1 so as to further ensure the proper implementation of mitigation measures.

Table...8.3-1 Environmental Monitoring Plan

| Period | Indicator | Monitoring Point | Frequency |
|--------------|--|--|--|
| Construction | Noise and TSP | Guojingyuan Community, No. 32 Primary School, Dikuangju Community, Haoxiang Jinshan Community, Huifuyuan Community, Yingbinlishhe Community, Youhaohuayuan Community, Wujian Community, XIanghewan Community, Milan Community, NO. 108 High School, Xidong District Hospital, Borui Community, Hexing Jiayuan Community, No. 37 High School, Guoxiu jiayuan Community, Jinyang Weixing Community | One time/quarter or receive the complaints |
| Operation | NO ₂ , CO, PM _{2.5} , PM ₁₀ | Two ambient air quality monitoring stations in Midong District | Auto monitoring |
| | pH, BOD ₅ , COD, NH ₃ -N, SS, Oil | Outfalls of the bus hubs and bus parking and maintenance yards | One time/year |
| | Noise (L _{Aeq}) | 1 m from the boundary of the bus hubs and the bus parking and maintenance yards | One time/half yr |

| Period | Indicator | Monitoring Point | Frequency |
|--------|---------------------------|---|--------------------|
| | Noise (L _{Aeq}) | Guojingyuan Community, Haoxiang Jinshan Community, Youhao Huayuan Community, Milan Community, Guoxiu Jiayuan Community, Jinyang Weixing Community | One time/half year |

8.4 Environmental Training Plan

A training program has been developed for the PMO staff, environmental supervisors, contractors and environmental monitoring units with the contents focusing on the responsibilities of the relevant organizations, environmental regulations, mitigation measures, supervision and reporting mechanism.

8.5 Supervision and Reporting mechanism

The supervising and reporting mechanism is as follows:

- (1) The construction supervising engineer should record the detailed execution of EMP, and submit the weekly report and monthly report to PMO. The weekly and monthly report should include environmental measures' implementation.
- (2) The contractor should record the implementation of EMP in detail. And make the quarterly report as the submission to PMO.
- (3) After completing the monitoring duties, Urumqi environmental monitoring station should submit the monitoring report to PMO.
- (4) Once the complaint on environment occurs, the environmental supervising engineer and PMO should report it to local EPB, or report to the authorities.
- (5) The EMP implementation report for this year should be completed and submitted to World Bank before 31st March of next year

The main contents of EMP implementation periodic report include:

The EMP implementing report should contain the following main contents:

- The brief introduction of project developing phase, the overall implementation of EMP, such as the related training's implementing situation;
- The implementation of environmental protection measures, the existing problems and the cause of the problems. The measures of making corrections during last time and the related implementing situation, as well as the effectiveness;
- The implementation of environmental monitoring and the main monitoring results, whether or not the monitoring results reach the standard, if not, why?
- Whether or not have the public complaints, if have, what is the main issues? Find the related problems and make the solution, as well as collect the feedback afterwards;
- The next phase EMP implementation plan, including providing the correction measures for the existing problems.

8.6 SA Measures and Public Grievance Mechanism

The public grievance mechanism will be established and maintained throughout the project to deal with any public concerns in environmental management. During the consultation, the SA team has developed measures to the public concerns and suggestions which have been incorporated in the EA.

Measures recommended by the SA are mainly the following:

- The disadvantaged families should be guaranteed with the basic living level after resettlement.
- Improve the social security measures, especially the pension, for the farmers who lost the land during land acquisition.
- The people affected by the project have the right to know, to participate and to supervise the project implementation.
- Take into careful account of the stakeholders' benefits during the project preparation and implementation.
- Through the TV, newspaper, broadcast and other media, to ensure the information disclosure to the group affected by the project.
- The compensation standard for the land acquisition and demolition should be disclosed to the public. The demolition schedule should be disclosed in advance, and the PMO should take charge of the coordination on the resettlement, compensation, temporary resettlement and employment for the resettled people.
- The information disclosure should be made to the people and entities affected by the projects in advance, especially for the schools, hospitals and religious places so as to allow for enough time to make the related preparation as soon as possible.
- The bus route's adjustment during construction should be disclosed in detail and in advance to the public for reducing the negative impacts from the project construction on public traffic. The Project Developer should organize the SIA activities and the public meetings for the consultation with the affected people, and designate the contact person in village and communities.

Table 8.2-1 Measures for Preparation and Construction Stages

| Activity | Impacts | Mitigation Measures |
|--------------------------------------|--|---|
| Bidding | / | <ul style="list-style-type: none"> • EMP should be included in the bidding document for civil works, as well as in the construction contracts. |
| Roads' configuration, and alignment | on vegetation in urban area | <ul style="list-style-type: none"> • Consider the use of the existing roads in the further design of road, and keep the existing green belt. • The carriage ways need to be re-planned and divided, and 5304 road-side trees need to be relocated. The project total budget should include the replanting fee for the trees. |
| Land acquisition and housing removal | social environmental impacts due to resettlement | <ul style="list-style-type: none"> • Before the construction, the existing public facilities, such as road, power supply, communication device should be investigated and got to know by the construction party. The party should confirm the displacement, resettlement, and emergency plans to ensure the regular running of society. • Get the support from local government on land acquisition. For the land occupation, housing removal and resettlement, the related opinions should be collected from the local government and vulnerable group in this project. The approach, standard or execution of compensation should be determined through sufficient consultation with the impacted people and based on the consensus agreed. Make the land replacement in the same village, and give the employment opportunities or arrangement for reducing potential impacts maximally. The resettlement action plan should be made based on the consensus agreed. • The resettlement is arranged by the contractors of this project. The compensation should be made for displaced inhabitants for this project according to national or local regulations. |
| Alternative comparisons | site and route selection, layout issue | <ul style="list-style-type: none"> • reduce the expansion work of carriage ways as much as possible for reducing the impacts on urban ecological environment • The intensive passenger movement are in the public transit hub and terminal. The public toilet has been designed in the FSR. It is suggested to increase the number of women toilet's squatting pan in this EIA. It is suggested that granite slab should adopt the fired slab paved outside of terminal station, which can prevent the skid of passengers. • The ceiling of BRT station adopt the transparent material to maintain the sun light in the corridor and reduce the passenger's oppressing sensation. The BRT station has air-conditioned room that is convenient for the passenger to warm themselves |

| Activity | Impacts | Mitigation Measures |
|------------------------------|--|---|
| Public consultation | Environmental issues the public care about | <ul style="list-style-type: none"> The safe street crossing facilities should be equipped in the station near the school. Both overbridge and underground passage should be equipped with lighting system, and be adopted the anti-skidding and rainfall flow backward prevention measures for safety. The road construction near the school should be intensive arranged in the weekend. The construction material's transport route should be arranged with the distance that is far away from the school. The feedback opinions from the mosques along project site are mainly like the following: firstly the construction should take good conduct. Secondly the natural gas and water supply and heat supply pipelines should be coordinated accordingly during the road construction. The water cleaning ceremony in mosque should be guaranteed from the aspect of water supply. Thirdly the sidewalk should be reserved for the traffic convenience for believers going to mosque periodically . |
| Preparation for construction | Social disturbance | <ul style="list-style-type: none"> Make the notification in the Bulletin board in the region along project route. And strengthen the publicizing among the inhabitants and set the bulletin board in construction site, let them know the meaning of project construction. Deliver the information of land acquisition and resettlement policies to gain more support from the public and their understanding for the temporary intervene of project construction. All the words will be written in both Chinese and Uyghur language. Limit the construction scope strictly, forbid the enlarging of land use for project construction. The separation wall should be built around the construction site. Strengthen the cooperation with local traffic management departments. Make the proper plan for construction materials transportation on existing road; coordinate with the local government to prevent the traffic jam. Guarantee the smooth and normal running traffic with the support of Public security traffic management department if necessary. Notice the public in advance though broadcast, TV or newspaper. Make the proper transportation route and try to avoid the school and dense residential area, for the purpose of mitigate the impacts and potential pollution on local residents. Strengthen the training, supervision and management of construction workers. Actively promote the civilized construction. |
| | traffic blocking | <ul style="list-style-type: none"> Make the traffic management plan for construction period, give the public notice by media on the information of enclosed road, detour routine, road closed duration and place. The construction company should communicate with Public security traffic management department to control the traffic volume, and direction properly, as well as the actual fulfillment of the traffic dispersion duties. |

| Activity | Impacts | Mitigation Measures |
|-------------------|----------------------------------|---|
| Road construction | Traffic Safety and Accessibility | <ul style="list-style-type: none"> • Keep a safety way for schools impacted during the construction, and guarantee the normal pass in and out of school bus. Or arrange the construction period on the summer holiday of school to reduce the threaten on the traffic safety on children in school as far as possible. • If the construction occurs near the schools, kindergarten, villages, residences and commercial buildings, the temporary bridge should be placed at the access for the school students and inhabitants. The scaffold should be surrounded with dense mesh enclosure to ensure the safety of the pedestrians. • Leave the access road in crossings, gate of hospitals and schools to ensure the regular work of inhabitants in those working places. The road block facility and warning sign should be equipped. The light for construction at night should be placed in proper height and direction to avoid the interruption on inhabitant's rest at night. • Make the notification in the Bulletin board in the region along project route. And strengthen the publicizing among the inhabitants and set the bulletin board in construction site, let them know the meaning of project construction. Deliver the information of land acquisition and resettlement policies to gain more support from the public and their understanding for the temporary intervene of project construction. |
| | On existing infrastructure | <ul style="list-style-type: none"> • Mitigating the negative impacts on the irrigation works • Based on the principle of remaining the current irrigation works for farmland, the project will placed the bridge for the river section or wide dry channels, and the culvert for the ditches, etc. • Mitigation measure for the current public facilities • The sufficient communication should be made on extra traffic dispersion and directing during construction period. The damaged road due to the construction should be repaired immediately or give the compensation money to local road management departments to repair. • Before the construction, the existing public facilities, such as road, power supply, communication device should be investigated and got to know by the construction party. The party should confirm the displacement, resettlement, and emergency plans to ensure the regular running of society. |
| | Chance Find | <ul style="list-style-type: none"> • once finding the relics during construction, the protection on the relics should be made according to Cultural relic's protection law of the People's Republic of China, and report the related relic's management departments for further identification and action. After those and get the related confirmation the further construction on this place can be continued |

| Activity | Impacts | Mitigation Measures |
|---------------------------|--|--|
| | on normal religious routine and activity | <ul style="list-style-type: none"> • The construction staffs should respect the related customs of minority. The related introduction on minority's custom and manners should be made among staffs. The staffs should pay attention to the sanitation of site, and the dispose of domestic waste. Forbid the upper body naked of construction working staffs due to the hot weather in the minority residential area to avoid the dissatisfaction of local minority. • Pay attention to the traffic safety facilities near the residential area and mosque • Along the some sections of project route, there are several residential areas with mainly minority population and mosques. Some seniors go to mosques on foot for several times everyday. It is relatively dark outside for the night and morning, in addition, more Believers will go to mosque to do the religious activities on Friday. So the related lighting system and protective guard on construction position should be placed. Or quicken the construction schedule to reduce the impacts on local public traffic. • The caution sign should be written in simple words or signal. The notification of project construction should be written in Chinese and Uyгур language. |
| Relocate trees and bushes | Impacts on the greening land | <ul style="list-style-type: none"> • Replant the existing vegetation with the great effort for their continuous survival. The ideal place for replanting is the nearby area. Make the supplement vegetation for the vegetation suffered in the permanent land occupation. • The lawn should be placed on Road isolation belt and the flower bed should be placed near the buildings, as well as the ever-green arbors. That is for the supplement for the demolished green area during construction. |
| spoils and refill | Soil and water erosion, and on landscape | <ul style="list-style-type: none"> • Send the abandoned earth, dreg and tile produced during construction to the landfill for construction waste in Urumqi. • Categorize the construction waste or maintenance waste for recycle, such as paper, timber, metal or glass, etc. For other construction waste that can not be recycled, it can be sent to Urumqi construction waste landfill. • Make the regulations for the management of construction waste and slag earth for the project. • For the dreg earth for backfill, according to the Urumqi Municipal Administrative regulations, that should be delivered to the indicated place for temporarily storing, which will be delivered back to the project site when backfilling. |
| garbage of camp | Impacts on health | <ul style="list-style-type: none"> • The domestic waste should be collected in indicated place according to related signed contract. The local environmental sanitation department takes charge the collection for integrated disposal in Urumqi domestic waste landfill. |

| Activity | Impacts | Mitigation Measures |
|--|---|---|
| machineries vibration | on nearby schools, residents, etc. | <ul style="list-style-type: none"> • Forbid running the machineries with high vibration at night. • Encourage the application of the machineries with low vibration level. |
| Air-borne dust and waste gas produced by machineries | on ambient air quality and inhabitants' daily life and work along the project | <ul style="list-style-type: none"> • The surround wall or simple enclosure should be built before construction to avoid the dust spreading, such as the enclosure made by corrugated plate or PP cloth with the height of 2.5-3.0m surrounding the construction site. • The periodically cleaning, spraying on the sensitive road section that transport vehicles pass by should be done to avoid the secondary dust pollution. It is required that each construction road section will be equipped with one watering cart. And the water spraying times will be determined based on weather. The basic principle is once during 9: 00-10: 30 , once during a13: 00-14: 30 and once during 19: 00-20: 30. Those period belong to the traffic peak time • Some construction materials as gravel, etc can result in the raised dust possibly. The stack for those construction material should be categorized and with the height of less than 0.7m. The dense mesh and other enclosures should cover those construction materials. • Choose the enclosed bitumen mixing device with dust and gas removal function to meet the related standards of cleaner production. After the construction the cleaning work for bitumen mixing should be made, the related waste produced during the bitumen mixing process should be recycled and incinerated by the bitumen supplier, or transported to the landfill indicated by local EPB. It is forbidden that reuse the waste as the fill for backfill works on project site. • The machineries and transport vehicles must comply with the National health protection standard to ensure the tail gas emission under the limit value. The transportation for the project should miss the rush hours and proceed at night for large amount of or urgent transportation. • For the earthwork management for backfill, the related measures should be made, such as surface press, periodically spraying and covering, etc. The extra earth or dreg should be cleared from the project site in time to avoid the long term pile. The totally enclosed construction approach should be adopted to prevent and control the dust pollution. The access permission should be issued only for the transport vehicle that loads waste, dreg or gravel. Those vehicles should be flushed for removal of mud and covered to avoid the leakage along the road. • The totally enclosed construction approach should be adopted to prevent and control the dust pollution. |

| Activity | Impacts | Mitigation Measures |
|---|--|---|
| Construction vehicles transportation, piling and tamping pavement | Noise impacts on nearby schools or residents, etc. | <ul style="list-style-type: none"> • Choose the machineries with low noise or sound insulation device. • Arrange the construction time properly and shorten the construction duration as short as possible. Avoid the utilization of noisy machineries at the same time in the same place. For some individual site with severe noise pollution, the temporary sound insulation palisade structure or the noise barrier with the function of noise absorption should be equipped on site. • Civilized construction, the proper maintenance, repair and manual operation should be done for the construction machineries and power engines to reduce the noise emission during construction. • During the period of 24:00-8:00, the running of machinery with intense noise is forbidden. • During the college entrance exam and high school entrance examination, the construction near the schools is stopped. • The working staff in construction site should be equipped with private protection device, such as earplug and helmet. The working duration should be controlled according to the labor and sanitation standard. • Make the proper transport schedule and route for the transportation of construction materials. Avoid the route going through the towns, collective residential area, schools and other sensitive points. Once passing by the school or towns, the speed should be lowered down and no whistle. Reduce the transport noise impact to lower level on the daily life of inhabitants along the project. • The construction supervision should supervise the construction noise impact and monitor the noise impact in the nearby residences with certain number of noise measurement devices. |
| Layout of construction site and domestic water emission | Pollutants from construction site come into water body | <ul style="list-style-type: none"> • The construction wastewater contains large amount of sand and oil material. The direct discharge into municipal drainage pipeline will influence the water quality in whole system. If discharging into soil, the soil pollution will be aroused. So the direct discharge into municipal drainage pipeline for construction wastewater is forbidden. Before discharging into the pipeline, the construction wastewater must go through the relatively simple treatment. In addition, the direct discharge into surface water body for construction wastewater is forbidden. • For the wastewater from the canteen of project site, the separation treatment of oil and residue, the wastewater can be discharge into municipal drainage pipeline with domestic sewage, and finally flow into the municipal wastewater treatment plant. |

Table 8.2-2 Mitigation Measures for Operation Stage

| Activity | Impacts | Mitigation measures |
|---|--|---|
| Repairing and maintenance at bus facilities | Impacts on health and ambient air | <ul style="list-style-type: none"> • strengthen the management and reduce the excess exhaust emission due to the idle speed. • the air blower system will be installed for strengthening the air exchanging in garage • Use labor protection appliance, such as the labor suit, labor shoes, protective glasses and mask, etc, which can prevent solvent steam to be breathed into the lung or contacting with the skin. If the condition is mature, the isolated painting room and mechanical ventilation facilities should be equipped. Adopt oil screen for removing the painting for avoiding the hazards of toxic pollutants and painting fog for human health. |
| Exhaust gas emission from road traffic | Impacts on environmental sensitive points along road | <ul style="list-style-type: none"> • For the different types of vehicles, the traffic diverging and the different routine limit can guarantee the smooth traffic and road's pavement free from damage, as well as for the inhabitants free from related traffic interruption. • Strengthen the roads' maintenance works and keep the good running condition of road for reducing the traffic jam. • Strengthen the vehicle's testing and maintenance. • Carrying out the new national emission standard for vehicles. • Strengthen the execution of vehicle annual inspection, road inspection and sampling testing. The traffic management for vehicles should also be stricter in order to control the exhaust emission and eliminate the obsolete vehicles without certified emission on the road. • Strengthen the sampling test among households for vehicle. • Make the traffic scientific management. Enhance the road capacity and vehicle traffic speed to reduce the exhaust gas in a maximum level. • The actual greening works should be done on both sides of roads. Make the supplement for the occupied forest and vegetation in project construction. The low shrubs and high broad-leaved trees form the main forest belt, which will be the most important road with the landscape background. The related acoustic noise isolation and reduction can be realized at the same time. |
| Noise of road traffic | On sensitive points along road | <ul style="list-style-type: none"> • Limit the driving speed of motor vehicles, especially at night, make a good maintenance for road surface and repair the damaged pavement as soon as possible. • More vegetation should be placed on both sides of road, especially in the acoustic environment sensitive points, such as schools and hospitals. Some schools or residential area is close to the road in this project, so the necessary noise isolation measures should be done to ensure the indoors noise level meeting the standard. |

| Activity | Impacts | Mitigation measures |
|--|--|--|
| Vehicles moving on road | on traffic safety | <ul style="list-style-type: none"> • Increase the traffic signal control points in crosswalk and road safety sign to reduce the potential traffic accidents. • Plant the trees, and grass on both sides of road and isolation belt between motor lane and non-motor lane for mitigate the loss of green land. |
| Waste water from bus facility (depot, hub and station) | Impacts on water body around bus facilities | <ul style="list-style-type: none"> • The waste water in the process of bus repairing or maintenance always contain high content of petroleum substances. This kind of is forbidden to be discharged into the municipal drainage pipeline or spilled in casual manner. In this EIA, it is suggested to increase drying tanks with individual volume of 5m³, 10m³ and 20 m³ in bus terminal, hub and depot. After the evaporation and drying, the waste water from bus repair becomes the solid waste that contains mineral oil. So this solid waste belongs to the hazardous waste. The related collection, storage and dispose of the solid waste should comply with the national regulations, and forbid this solid waste to be mixed with the domestic waste and construction waste. • Due to the small productivity of domestic sewage for this component of project, the related emission can meet the Grade 3 limit of Integrated wastewater Discharge Standard GB8978-1996. The domestic sewage will be discharged into the nearby municipal drainage pipeline and finally for the further treatment in Urumqi east district waste water treatment plant. |
| Solid waste from bus facilities | Impacts on ambient environment around stations | <ul style="list-style-type: none"> • For the solid waste during the operation period of BRT component, they should be transported to Urumqi construction waste landfill according to related regulations. • The traffic management departments should forbid the uncovered transport vehicles moving on road, to avoid the leakage or left of solid waste along the road. • The domestic waste produced during the operation period of Component of Public transportation Supporting infrastructure's construction, are mainly the working staffs and driver's daily domestic waste. The waste can be sent to the Urumqi domestic waste sanitary landfill by Urumqi municipal environment sanitation department. • For the hazardous waste produce in Component of Public transportation Supporting infrastructure's construction due to the bus repair and maintenance, the related collection, storage and dispose of the solid waste should comply with the national regulations. Those solid wastes will be transported to Xizang hazardous waste disposal center for further disposal |