

Uurmqi Urban Transport Project (II)

EA Report

Table of contents

1.OVERVIEW.....	6
1.1THE BACKGROUND OF PROJECT	6
1.2 PROJECT CONSTITUTION.....	7
1.3 EIA PURPOSE	8
1.4 BASIS OF MAKING EIA.....	8
1.5 EIA CATEGORY AND SCOPE	11
1.6 ENVIRONMENTAL PROTECTION TARGETS	14
1.7 ENVIRONMENTAL FUNCTION ZONING AND STANDARDS	23
1.8 TIME SCOPE OF ASSESSMENT	27
1.9 PRINCIPLES AND METHOD.....	27
2. PROJECT DESCRIPTION	28
2.1 PROJECT BASIC INFORMATION	28
2.2 ENVIRONMENTAL IMPACT FACTORS' IDENTIFICATION AND ASSESSMENT FACTORS' SELECTION	32
2.3 RELATED PROJECT	34
3. PROJECT PLANS COMPARISON AND SELECTION	35
3.1 THE COMPARISON ON WITH AND WITHOUT PROJECT	35
3.2 COMPARISON OF BRT LINES ALIGNMENT.....	35
3.3 CONFIGURATION COMPARISON OF BRT	39
3.4 SITE SELECTION OF BUS DEPOTS AND TERMINALS	42
3.5 DESIGN OF BUS FACILITIES AND SUGGESTIONS	43
4. ENVIRONMENTAL AND SOCIAL CONDITION.....	44
4.1 NATURAL ENVIRONMENT	44
4.2 SOCIAL AND ECONOMIC STATUS AND ASSESSMENT	46
4.3 CULTURAL RELIC AND RELIGIOUS VENUE	54
4.4 COMPLIANCE WITH RELEVANT POLICY AND PLANS.....	55
5. CURRENT ENVIRONMENTAL QUALITY.....	60
5.1 PRESENT SITUATION OF AIR ENVIRONMENTAL QUALITY	60
5.2 THE SURFACE WATER ENVIRONMENT QUALITY STATUS AND ASSESSMENT	62

5.3 ACOUSTIC ENVIRONMENTAL QUALITY'S PRESENT SITUATION INVESTIGATION AND ASSESSMENT.....	62
5.4 ECOLOGICAL ENVIRONMENT SITUATION	69
6. ENVIRONMENTAL IMPACT PREDICTION DURING CONSTRUCTION PERIOD.....	72
6.1 SOCIAL IMPACT ASSESSMENT	72
6.2 IMPACTS ASSESSMENT ON URBAN ECOLOGICAL ENVIRONMENT.....	73
6.3 AIR IMPACT ANALYSIS	76
6.4 NOISE IMPACTS ANALYSIS.....	77
6.5 IMPACTS ON WATER ENVIRONMENT	78
6.6 SOLID WASTE IMPACTS ANALYSIS	79
6.7 VIBRATION IMPACT ANALYSIS	79
7. ENVIRONMENTAL IMPACT ANALYSIS DURING OPERATION PERIOD	81
7.1 SOCIAL IMPACT ASSESSMENT	81
7.2 URBAN LANDSCAPE IMPACTS ANALYSIS	81
7.3 AMBIENT AIR IMPACTS	82
7.4 NOISE IMPACTS ANALYSIS.....	86
7.5 WATER ENVIRONMENTAL IMPACTS ANALYSIS.....	89
7.6 SOLID WASTE IMPACTS ANALYSIS	90
7.7 VIBRATION IMPACTS ANALYSIS DURING OPERATION PERIOD.....	90
8. PUBLIC PARTICIPATION	92
8.1 INFORMATION DISCLOSURE	92
8.2 PUBLIC FEEDBACK SCOPE, TIMES AND FORMS.....	97
8.3 ORGANISATION OF PUBLIC PARTICIPATION	98
8.4. PUBLIC FEEDBACK COLLETION, ANALYSIS AND ADOPTION.....	100
8.5 VALIDITY, TYPICALITY AND AUTHENTICITY OF PUBLIC PARTICIPATION	102
8.6 SUMMERY	103
9. ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN	103
9.1 RESPONSIBILITY ARRANGEMENT OF ENVIRONMENTAL MANAGEMENT	103
9.2 ENVIRONMENTAL IMPACTS MITIGATION MEASURES.....	106
9.3 ENVIRONMENTAL MONITORING PLAN.....	119
9.4 COMPLETION ACCEPTANCE FOR ENVIRONMENTAL ENGINEERING	124
9.5 TRAINING PLAN AND BUDGET	125

9.6 ENVIRONMENTAL INVESTMENT ESTIMATION	125
9.7 REPORTING SYSTEM AND REQUIREMENTS	126
9.8 SOCIAL IMPACTS MANAGEMENT PLAN.....	127
10.EIA CONCLUSION.....	131
SUGGESTION AND REQUESTS:	131

1. Overview

1.1 The background of project

The Urumqi is the capital of the Xinjiang Uygur Autonomous Region, and the international trading center for China with Central Asia and West Asia, as well as the important central city and hub city. Urumqi is the political, economic, scientific and cultural center for Xinjiang.

In recent years , following rapid economic development, the urbanization and mechanization keep quickening the step in Urumqi, which lengthening the trip distance in Urumqi city. The traffic infrastructure's development plan and construction can not match with the urban development, like the public traffic capacity is not enough, and facilities is not complete, and the related service is low. So there is the obvious and serious conflict between the supply and demand in public transportation, the current public transportation can not fulfill the increasing requirements on daily travel of citizens. At the same time, following the increase of residents' income, the number of motor vehicle on the road is increasing rapidly, the portion of public transportation is reduced in the daily travel, which result in issues like the traffic jam, noise, more energy consumption, more serious air pollution and series of related issues. All these extremely limits on the continuous development of Urumqi.

The Urumqi government pay high attention on above issues, and bring forward the development target as “build safe, happy, livable, pleasant and ecological Tianshan oasis garden city”, and use the public transportation priority development as the solution. For developing the public transportation, the government issue the related laws, regulation, and make development plan and outline.

In 2005, the NDRC and national financial Ministry award Urumqi the GEF(Global Environmental Facility)--demonstrate project among several Chinese Urban Traffic Partnership Projects with IBRD support. In April of 2011, Urumqi make use of one million US dollars from GEF on developing Urumqi Municipal integrated public transportation service plan. In 2012, Urumqi is listed in the first 15 pilot cities in China for developing public transportation that is approved by the National ministry of transport.

Word Bank keep focusing on the urban traffic construction in Urumqi. For further promoting the Urumqi ecological development and developing the green traffic, Urumqi actively apply the “Urumqi urban traffic improvement project II ” for IBRD financial support during Year 2014 to 2016 plan. The project plan to use 1.4 hundred million US dollars from IBRD loan to develop the low carbon and green traffic system in Urumqi for urban sustainable development.

The total loan applied by the Project from Word Bank is 1.4 hundred million US dollars(about 8.68 hundred million RMB), the project construction include four components, which individually are the Municipal integrated public transportation system's development, Municipal integrated public transportation information platform's development, Public transportation Supporting infrastructure's construction and Institutional Capacity Building and project management. The Project

construction is planned to start in 2015.

In February of 2014, Urumqi Municipal integrated urban traffic research center make the public tender for the Project's EIA task, Xinjiang Environmental Technology Consulting Center wind the bidding and undertake the EIA of Urumqi urban traffic improvement project II (hereinafter refer to the "project"). The EIA agency should finish the project's EIA report based on the sufficient survey and monitoring work of proposed project, and then send the EIA report for relatively authorized approval.

In March 2015, Urumqi NDRC change the former Project Owner to be "Urumqi Urban Transportation Investment Ltd.Co.". The former Project Owner named Urumqi Municipal integrated urban traffic research center will still take charge the particular project organizing work and application of IBRD loan.

1.2 Project Constitution

The project is undertaken by the Urumqi Municipal integrated urban traffic research center. In March 2015, the Project Owner is changed to be "Urumqi Urban Transportation Investment Ltd.Co. The project that applies the IBRD loan concerns the total investment of 3.274 billion RMB. The Project is constituted by four components like the following Table 1.2-1.

Table 1.2-1 Project components construction

No.	Components	Sub item	Construction works
1	Municipal integrated public transportation system's development	Bus Rapid Transit	Build 3 BRT line with length of 51.7km, among which BRT 4 th line is 20.1km, BRT 6 th line is 18.1km, BRT 6 th line's branch is 13.5km;
2	Municipal integrated public transportation information platform's development		Build the Urumqi Municipal integrated urban traffic research center, for which the system access has been set up in related departments and the front system, will be completed furthermore.
3	Public transportation Supporting infrastructure's construction	public transit hub	2 public transit hubs, which individually are hub in south square of high-speed railway station, and south suburb passenger terminal
		Bus parking and maintenance place	2 Bus parking and maintenance places which are Sangong parking place, and Midong parking place
		Bus terminal	2 bus terminals which are Midong bus terminal and high-speed railway station North Square terminal
4	Institutional Capacity Building and project management		The research on the subjects related with the urban traffic, project management and technical support, as well as the enhancement of professional technical capability, training, publication and public participation.

1.3 EIA purpose

(1) Make a survey, monitoring and assessment on the social environment, urban ecology, air, acoustic condition. Have an overall understanding of environmental quality of project area.

(2) Make the quantitative analysis and qualitative analysis on all kinds of environmental impacts aroused during the project construction and operation period. And then make the related description, prediction and assessment for future environmental impacts' scope and intensity.

(3) To confirm whether or not the project is feasible on aspect of environmental protection, to make the environmental protection management plan and environmental monitoring plan, to bring forward a workable environmental protection measures and suggestions and feedback this to the designing agency to reduce those environmental negative impacts to the lowest level, and finally successfully achieving the goal of project development and environmental protection's coordinating development.

(4) Make the public participate in the assessment to redeem the possible neglect and omit in the EIA process. Then the project planning, design and environmental management can become more complete and reasonable. The EIA work should try to realize the common optimization on environmental benefit, social benefit and economic benefit during project's construction and operation period

1.4 Basis of making EIA

1.4.1 China's environmental protection laws and regulations

The domestic and local laws and regulations that are based for this EIA are shown in Table 1.4-1

Table 1.4-1 The domestic and local related laws and regulations

No.	Title	Document No.	Time of come into force(Y-M-D)
1	Environmental Protection law of the People's Republic of China	12th NPC 8th Meeting	2015-01-01
2	The Law of the People's Republic of China on Environmental Impact Assessment	9th NPC 30th Meeting	2003-09-01
3	The Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution	9th NPC 15th Meeting	2000-09-01
4	The Law of the People's Republic of China on the Prevention and Control of Water Pollution	10th NPC 32nd Meeting	2008-06-01
5	The Law of the People's Republic of China on the Prevention and Control of Acoustic Pollution	8th NPC 22nd Meeting	1997-03-01
6	The Law of the People's Republic of China on the Prevention and Control of solid waste Pollution	10th NPC 13th Meeting	2005-04-01
7	Water Law of the Peoples Republic of China	9th NPC 29th Meeting	2002-10-01
8	The Law of the People's Republic of China on Water and Soil Conservation	11th NPC18th Meeting	2011-03-01

No.	Title	Document No.	Time of come into force(Y-M-D)
9	The People's Republic of China on road traffic safety	10th NPC 31st Meeting	2004-5-1
10	Classified Management Lists for Environmental Protection of Construction Projects	No.2 Decree of the Ministry of Environmental Protection	2008-10-01
11	Traffic management measures of environmental protection of construction projects	Traffic department[2003] No.5	
12	Interim Procedure on the Public Participation In Environmental Impact Assessment	HuanFa[2006]No. 28	2006-03-18
13	Abrupt environment affairs emergency plan the provisional measures	HuanFa[2015]No. 4	2015-01-08
14	Notice of EIA on environmental noise of highway, rail (including light rail), and other construction projects	HuanFa[2003]No. 94	2003-05
15	Environmental Protection Regulations of Xinjiang	xinjiang government	2012-02-01
16	Xinjiang Government's notice of Key Prevention Zones, Monitoring Zones and Remediation Zones of Soil Erosion	xinjiang government	2000-10-31
17	Water Environmental Function Zoning of Xinjiang	xinjiang government	2002-12
18	Ecological Zoning of Xinjiang	xinjiang government	2004-04-21
19	Urumqi dust pollution prevention and control plan	Urumqi Municipal government	2011-03-07

1.4.2 Policies of the World Bank

After the compliance comparison with Safeguard Policies of the World Bank, the related rules for the project are as follows:

- (1) OP 4.01 (Environmental Assessment);
- (2) BP17.50 (Information Disclosure);
- (3) Environmental health and safety general guidelines;
- (4) Oil retail operations health and safety and environmental guidelines OP

1.4.3 The EIA report drafting relevant technical regulations

See Table 1.4-2.

Table1.4-2 EIA Technical Guidelines and Standards

No.	Title	Document No.	Date of coming into force
1	Technical guidelines for environmental impact assessment-General principles	HJ2.1-2011	2011-9-1
2	Technical guidelines for environmental impact assessment- Atmospheric environment	HJ2.2-2008	2009-4-1
3	Technical guidelines for environmental impact assessment- Surface water environment	HJ/T2.3-93	1994-4-1
4	Technical guidelines for noise impact assessment	HJ2.4-2009	2010-4-1
5	Technical guidelines for environmental impact assessment- Ecological environment	HJ19-2011	2011-9-1
6	Technical guidelines for environmental impact assessment- Underground water	HJ610-2011	2011-6-1
7	Technical Guidelines for Environmental Risk Assessment on Projects	HJ/T169-2004	2004-12-11
8	Technical Code on Comprehensive Control of Soil Erosion	GB/T16453.1~6-2008	2009-2-1
9	Standards for Classification and Gradation of Soil Erosion	GB50433-2008	2008-7-1
10	Highway construction projects environmental impact assessment standard	JTG B03-2006	2006-5-1
11	Highway environmental protection design standard	JTG B04-2010	2010-7-1
12	City road design standard	CJJ37-90	1991-8-1
13	Standards for Classification and Gradation of Soil Erosion	SL190-2007	2008-4-4
14	Designing and construction code for gasoline and CNG station	GB/T50156-2002	2002-7-1

15	Soil and water loss prevention standards for project development and construction	GB50434-2008	2008-7-1
16	Environmental Quality Standard for Surface Water	GB3838-2002	2002-6-1
17	Environmental Quality Standard for underground Water	GB/T14848-93	1994-10-1
18	Ambient Air Quality Standard	GB3095-2012	2013-1-1
19	Environmental quality standards for noise	GB3096-2008	2008-10-1
20	Integrated Wastewater Discharge Standard	GB8978-1996	1998-1-1
21	Noise Limits for Construction Site	GB12523-2011	2011-3-1
22	Integrated Emission Standard of Air Pollutants	GB16297-1996	1997-1-1
23	Standard of environmental vibration in urban area	GB10070-88	1989-7-1
24	Standard for Pollution Control on the Storage and Disposal Site for General Industrial Solid Waste	GB18599-2001	2002-1-1

1.4.4 Planning document

- (1) Outline of 12th five-year plan on national economy and social development in Urumqi
- (2) Outline of Urban Master Plan of Urumqi (2012-2020);
- (3) Outline of Urumqi Municipal traffic road construction according to 12th five-year plan
- (4) Urumqi Municipal traffic system development plan(2010-2020)
- (5) Urumqi Municipal BRT system development plan(2012-2017)

1.4.5 Technical document

- (1) bid-winning notice document, February 2014;
- (2) 《Proposal of Urumqi urban traffic improvement project II》, proposed by Urumqi Municipal integrated urban traffic research center, Dec., 2013.

1.5 EIA category and scope

1.5.1 EIA category according to OP4.01 of World Bank

In light of the “Circular about Strengthening the Management of Environmental Impact Assessment for Construction Projects Funded by the International Financial Organizations” (HuanJian[1993]No. 324) and requirements on EIA in OP4.01 of the World Bank Safeguard Policies, combining the consideration that pollutant and

pollution resources' intensity, as well as the regional environmental condition, in general speaking, the period of such project is short. Mature and reliable techniques are often applied to such project. The pollutant emissions are easy to control and the affected area is limited. Category B of EIA is suitable for this project. In consideration that the delegation group of IBRD focuses more on the domestic Social stability risk assessment, resettlement of inhabitants and minority development, etc., therefore, Category A of EIA is adopted for this project according to the World Bank Safeguard Policies.

1.5.2 The domestic EIA category and scope

The domestic EIA category is different from the World Bank's EIA category procedure. In china, there are three Grades for EIA according to characteristics of project and regional environment. According to the Technical guideline for environmental impact assessment, the EIA items and grades for different components of the project are as Table 1.5-1.

Table 1.5-1 EIA category for project components

No.	Components	EIA items	Grade	The phenomenon EIA category depends on
1	Component1: Municipal integrated public transportation system's development	Ambient air	III	The dust raised during the construction will make the temporary negative impact, as well as the emission of vehicle tail gas.
		Ecological environment	III	Impact scope < 20km ² , ordinary region
		Surface water	III	The sewage discharge amount is small, mainly is domestic waste water with less intensity, which finally discharge into municipal pipe.
		Acoustic environment	III	Most of project site locate in the urban area with the acoustic standard's requirement of 55-70dB (A)
2	Component2: Municipal integrated public transportation information platform's development	Ambient air	III	The dust raised during the construction will make the temporary negative impact..
		Ecological environment	III	Impact scope < 20km ² , ordinary region
		Surface water	III	The sewage discharge amount is small, mainly is domestic waste water with less intensity, which finally discharge into municipal pipe.
		Acoustic environment	III	Most of project site locate in the urban area with the acoustic standard's requirement of 55-70dB (A)
3	Component3: Public transportation Supporting infrastructure's construction	Ambient air	III	The dust raised during the construction will make the temporary negative impact, as well as the emission of vehicle tail gas.
		Ecological environment	III	Impact scope < 20km ² , ordinary region
		Surface water	III	The discharge amount < 200m ³ /d, the content of waste water is simple, after discharging into the municipal pipeline, the sewage will be treated in waste water

				plant
		Acoustic environment	III	The project component locates in the suburb. The noise is mainly due to the construction and operation.

In light of no negative impacts from **Institutional Capacity Building and project management**, EIA scope covers only other three project components as above.

According the related guidance, the project EIA scope can be determined in Table 1.5-2

Table 1.5-2 Project components' EIA scope

No.	Components	EIA ITEM	scope	Remark
1	Component1 : Municipal integrated public transportation system's development	Ambient air	Within 200m from both sides of central line of road.	
		Ecological environment	Within 300m from both sides of central line of road.	
		Surface water	Merely analysis of qualified discharge, without indicate the scope	
		Acoustic environment	Within 200m from both sides of central line of road.	
		Vibration	Within 50m from both sides of central line of road.	
		landscape	Within 200m from both sides of central line of road.	
2	Component2 : Municipal integrated public transportation information platform's development	Ambient air	200m scope outside project construction site	
		Ecological environment	300m scope outside project construction site	
		Surface water	Merely analysis of qualified discharge, without indicate the scope	
		Acoustic environment	200m scope outside project construction site	
3	Component3 : Public transportation Supporting infrastructure's construction	Ambient air	100m outside of bus service facility stations,	
		Ecological environment	10m outside of bus service facility stations	
		Surface water	no scope defined, Merely analysis of qualified discharge	
		Acoustic environment	10m outside of bus service facility stations	

1.6 Environmental Protection Targets

1.6.1 The targets of pollution control

The project aims to build and improve the urban transport facility. The pollutant emission during the period of construction and operation must be controlled and prevented.

(1) During the construction period, the noise of machinery, dust raised by transportation vehicle, construction waste, vibration, resettlement and traffic safety should be controlled especially.

(2) During the operation period, the object of pollution control should be focused on the tail gas, traffic noise and traffic safety.

In consideration of project's characteristic, and the feature of natural environment and social environment where the project locate, the main focuses of EIA for this project are: ecological environment assessment and social assessment during construction, acoustic and ambient air environment assessment during operation period. At the same time, the feasible environment protection measures and environment management plan must be put forward.

1.6.2 The environment protection targets

The targets' selection principles are as follows:

- ① Both sides of road concerning with the project
- ② The first row of building along the road is the main object
- ③ The functional buildings mainly are concern with school, hospital, hotel, dwelling houses, company and governmental public serving branch.

The detailed contents of environmental protection are as follows:

- Avoid the decrease of acoustic environmental quality and ambient air quality impacted by the project's construction and operation.
- Mitigate the negative impact of resettlement arose by the project to the lowest level. Practically protect the public's rights and benefits.
- Protect the vegetation, soil and other ecological environment along the road. Adopt the relevant environmental recover and mitigating measure to lessen the damage level on ecological environment.
- Control the pollution aroused by rain runoff. Protect the surface water from the pollution.
- Pollution control for vehicle vibration. Protect the building along the project from the vibration.

The environmental protection target can be referred to Figure 1.6-1.

1.6.2.1 The target of ambient air environment protection and acoustic environment protection

The project locates in the main urban area of Urumqi, the environmental sensitive points for ambient air pollution and noise pollution is relatively more than other area.

the related environmental sensitive points can refer to Table 1.6-1 for BRT 4th line, Table 1.6-2 for BRT 6th line, and Table 1.6-1 for BRT 6th line's branch. The sensitive points along the Component 3 Public transportation Supporting infrastructure's construction can refer to Table 1.6-4.

Table1.6-1 Environmental sensitive points on ambient air and noise pollution along BRT4

No.	Road or street	Name	The distance away from the central line (m)	distance away from road boundary (m)	No. of house along the road	floor	house holds	Details	remark
1	Xinhua south road	Guohuiyuan apartment	30	20	4	6	108	6 floors building with 1st floor as shop, face directly to Project	
2	Xinhua south road	Guoqingyuan apartment	30	20	4	6	60	6 floors building with 1st floor as shop, face directly to Project	
3	Xinhua south road	Food company apartment	30	20	6	4	60	4 floors building with 1st floor as shop, face directly to Project	
4	Xinhua south road	Yangguang garden apartment	30	20	5	6	90	6 floors building with 1st floor as shop, face directly to Project	
5	Xinhua south road	Taixi garden apartment	30	20	8	6	180	6 floors building with 1st floor as shop, face directly to Project	
6	Xinhua south road	Municipal No.32 elementary school	50	40				18 classes, 700 students, more than 60 school staff, along the road in vertical direction	
7	Xinhua south road	District husbandry export and import company's apartment	20	10	2	6	58	along the road 2 buildings, one has 4 floors, 1st floor is shop, 18 households in 2-4 floor, the other building has 6 floors, 1st floor is shop, 40 households in 2-6 floor	
8	Xinhua north road	Xinhua south road community service center	20	10	1	4		30 medical staff, 23 ward beds.	
9	Xinhua north road	Municipal No.38 Junior high school	50	40				18 classes, 700 students, 100 school staff along the road with L shape, the other building is in parallel with road separated by the playground	

10	Xinhua north road	Qusanjian apartment	20	10	4	5	74	6 floors building with 1st floor as shop, face directly to Project	
11	Xinhua north road	Xinjiang People's hospital apartment	30	20	2	6	58	6 floors building with 1st floor as shop, face directly to Project	
12	Xinhua north road	Urumqi Aixin hospital	20	10				20 medical staff, 6 ward beds	southeast of renmin road intersection
13	Xinhua north road	Urumqi No.5 elementary school	70	60				School gate is 70m away from the road, teaching building is 130m away from the road with 30 degree angle, 1700 students, 150 school staff.	
14	Xinhua north road	Zhongshan hospital	20	10				along the road 3-10 floor, 1st floor is shop; 100 medical staff, 100 ward beds with	
15	Xinhua north road	Municipal No.11 Junior High school	20	10				along the road 1teaching building in parallel with road. 36 classes, 1900 students, 150 school staff	
16	Youhao nan road	Municipal No.3 elementary school	120	110				24 classes, 1000 students	
17	Youhao nan road	Post Office's staff apartment	20	10	5	6	120	1st floor is shop, 2-6 floor is dwelling house	
18	Youhao nan road	Xinjiang vocational college	60	50				Between Northwest road and youhao road, a dwelling house locate, a teaching building beside road	
19	Northwest road	Municipal No.16elementary school	60	50				Between Northwest road and youhao road, a dwelling house locate,	
20	Northwest road	Municipal No.46Junior High school	60	50				Between Northwest road and youhao road, a dwelling house locate,	
21	Northwest road	Xicheng garden apartment	30	20	2	6	60	6 floors building with 1st floor as shop, face directly to Project	
22	Northwest road	Xinjiang oil college's staff apartment	30	20				China Petro training office	
23	Northwest road	museum staff apartment	40	30	1	24	168	1 building 6 floors, 1high building	
24	Northwest road	Xinjiang university north campus	40	30				along the road the first building with 6 floors as dormitory	

25	Altay Road	geology and mineral's staff apartment	60	45	4	6	144	6 floor building ,face directly with the interval of greenbelt	
26	Altay Road	Xibei road apartment's north area	40	25	3	6	132	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
27	Altay Road	Jinkanglijing apartment	40	25	2	6	132	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
28	Altay Road	Aoxiangjinhang apartment	40	25	2	1 5	180	15 floor small high-rise floor, with the interval of greenbelt	
29	Altay Road	Jiaheyuan apartment	40	25	2	6	60	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
30	Altay Road	Huifuyuan apartment	40	25	4	6	144	6 floor building facing directly to Project, with the interval of greenbelt	
31	Altay Road	Lvsejiayuan apartment	40	25	2	6	60	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
32	Altay Road	Dehai apartment	50	35	1	3 3	264	4floor building with 1st floor as shop, with the interval of greenbelt	
33	Zhongya north road	Jiinyin apartment	50	35	2	6	60	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
34	zhongya north road	Juxin apartment	50	35	2	6	60	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
35	Zhongya south road	Anzhi apartment	50	35	3	6	120	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
36	Zhongya south road	Boda apartment	50	35	2	6	60	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
37	Yingbin road	Yingbinlishe apartment	60	45	4	6	120	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
38	Yingbin road	Longtinglinqing apartment	60	45	3	6	90	6 floors building with 1st floor as shop, face directly to Project, with the interval of greenbelt	
39	Yingbin road	Bus company's staff apartment	50	35	5	6	180	6 floor building facing directly to road, with the interval of green belt	

Table 1.6-2 Environmental sensitive points on ambient air and noise pollution along BRT6

N o.	Road or street	Name	The distance away from the central line (m)	distance away from road boundary (m)	No. of house along the road	floors	households	quantity of windows along the road	remark
1	Nanhubei road	Youhaohuayuan III apartment	65	50	1	18	216	18 floor building, 1st floor is shop, face directly	
2	nanhubei road	Xinjiang Islam Jingwen school	100	85	1	6		6floorbuilding, face directly	
3	nanhubei road	Jingwen school apartment	80	65	1	6	60	6 floor building, side towards (project site)	
4	nanhubei road	Yaou chengshi yinxiang apartment	40	25	3	16	384	Under construction, 16 floor building, face directly	
5	nanhubei road	Lvchengbaihe apartment	180	165	12	6	144	6 floor building, side towards	
6	nanhubei road	self-establish Building	30	15	25	6	25	4-6 floor self-establish Building	
7	midongnan road	Wujian apartment	50	35	12	6	576	6 floor, side towards	
8	midongnan road	Yundingdaguang apartment	40	25	3			High building under construction, face directly	
9	midongnan road	Hongguangshan apartment	40	25	2	6	96	6 floor, face directly	
10	midongnan road	Longtinghuaifu apartment	40	25	5	23		High building under construction, face directly	
11	midongnan road	Qingsong Cement company's staff apartment	40	25	6	6	288	6floor, face directly	
12	midongnan road	Yingkewutongshan pan apartment	40	25	3			High building under construction	

13	midongnan road	Hongqing apartment	40	25	2	6	96	6 floor, face directly	
14	midongnan road	Xuianghewan apartment	40	25	4	6	144	6 floor, face directly	
15	midongnan road	Bingtuanjiangong No.4 high school	60	45				2600 students, 170 teachers	
16	midongnan road	Xinjiang chemical engineering school	60	45				3800 students, 180 teachers	
17	midongnan road	Xinjiang foreign trade school	80	65				1300 students, 60 teachers	
18	midongnan road	Boxinyuan apartment	50	35	2	6	96	6 floor, face directly	
19	midongnan road	Road construction machinery plant's apartment	50	35	3	6	132	6 floor, face directly	
20	midongnan road	Jinkunxinchenghua yuan apartment	50	35	5	6	240	6 floor, face directly	
21	midongnan road	Fujingjiayuan apartment	50	35	3	6	132	6 floor, face directly	
22	midongnan road	Milanxiaozhen apartment	50	35	2	6	96	6 floor, face directly	
23	midongnan road	Linqing No.1 apartment	50	35	1	12	88	1 floor as shop	
24	daoxiangnan road	Mingzhuhuayuan apartment	40	25	3	6	132	6 floor, face directly	
25	daoxiangnan road	Huijin apartment	40	25	2	6	96	6 floor, face directly	
26	daoxiangnan road	Urumqi No.108 Junior High school	40	25				side towards, 1 building as 6 floor teaching building, 1800 students	
27	daoxiangnan road	Xiangduhuacheng apartment	40	25	2	6	96	6 floor, face directly	
28	daoxiangnan road	Midonganju apartment	40	25	2	6	96	6 floor, face directly	
29	daoxiangnan road	Milanchuntian apartment	40	25	2	6	96	6 floor, face directly	
30	daoxiangnan road	Urumqi Municipal No.97 elementary school	40	25				2 buildings with 4 floor teaching building, 2300 students	

31	daoxiangzhong road	Midong district People's hospital	40	25				side towards 12 floor, 200 medical staff, 250 ward beds on both sides	
32	daoxiangzhong road	Baihemingyuan apartment	40	25	2	6	96	6 floor, face directly	
33	daoxiangzhong road	jinxujiayuan apartment	40	25	2	6	96	6 floor, face directly	
34	daoxiangzhong road	Ryuexingcheng apartment	40	25	2	12	192	12 floor, face directly	
35	fuqianzhong road	Midong district Chinese medicine hospital	80	65				12 floor, face directly,	
36	fuqianzhong road	Boruxincun apartment	100	85	4	12	192	12 floor, face directly	
37	fuqianzhong road	Yangguangguoji apartment	80	65	2	12	96	12 floor, face directly	
38	Erhuang road	Government's staff apartment	120	105	4	12	288	12 floor, face directly	

Table1.6-3 Environmental sensitive points on ambient air and noise pollution along BRT6 branch

No.	Road or street	Name	The distance away from the central line (m)	distance away from road boundary (m)	No. of house along the road	floors	house holds	Quantity of windows along the road	remark
1	kashidong road	Wujian apartment	40		1	6	36	6 floor, face directly	
2	kashidong road	Fuyuxinchen apartment	40		2	6、11	92	6 floor 1 building, 11 floor 1 building, face directly	
3	kashidong road	Dongfangyujing apartment	60		3	6	108	6 floor, face directly	
4	kashidong road	Hexingjiayuan apartment	50		4	6	192	6 floor, face directly	
5	kashidong road	Xinjiang information school	50					900 students	
6	kashidong road	Zhonghe company apartment	30		3	6	108	6 floor, face directly	

7	kashidong road	Xinjiang teacher college north campus	70		2	6		6000 students	
8	kashidong road	Ruixianghu ayuan apartment	30		1	6	48	6 floor, face directly	
9	kashidong road	Boyaxinyuan apartment	80		1	25	150	25 floor, face directly	
10	kashidong road	Urumqi No.37 high school	160					Students 600 人	
11	siping road	Boyaxinyuan apartment	40		11	6	528	6 floor, side towards	
12	siping road	Jinxiuyuan apartment	40		8	6	192	6 floor, side towards	
13	siping road	Jinxiuyuan kindergarten apartment	40		4			4 floor, side towards	
14	siping road	Boyunyuan apartment	40		1	4	24	4 floor, face directly	
15	siping road	Wenguangsangdu apartment	30		1	13	78	13 floor, face directly	
16	siping road	Langyueshengjing 3 rd apartment	60		3	25	450	25floor, face directly	
17	siping road	Beipingxiangyuan apartment	90		2	18	288	18floor, side towards	
18	hebeidong road	Guoxiujia Yuan apartment	50		2	15	300	15floor, face directly	
19	hebeidong road	Langyueshengjing 1 st apartment	120		1	6	36	6floor, side towards	
20	hebeidong road	Yingaobeian apartment	50		1	13	78	13floor, face directly	
21	hebeidong road	Lanxianghuayuan apartment	50		2	23	184	23floor, face directly	
22	hebeidong road	Kanchengguoling apartment	50		6	17	408	17floor, face directly	
23	hebeidong road	Baixinkangcheng apartment	50		3	6	108	6floor, face directly	
24	hebeidong road	Xinjiang gongxiao school's apartment	70		1			1500 students	
25	hebeidong road	Xinhuilifang apartment	50		2	18	144	18 floor, face directly	

26	hebeidong road	Duzhou Chinese medicine hospital	30		1	5		110 ward beds	
27	hebeixi road	Jiuzhou apartment	30		4	5	160	5floor, face directly	
28	hebeixi road	Urumqi Municipal No.68Junior High school	30		1	3		2300 students, 171 school staff	Dormitory
29	hebeixi road	Sijian apartment	30		3	6	108	6 floor, face directly	
30	hebeixi road	Urumqi Municipal No.83Junior High school	30					1700 students, 130 school staff	
31	hebeixi road	Hexingrunyuan apartment	40		4	11	352	11floor, side towards	
32	Taiyuannan road	Herunhui apartment	40		1	11	88	11floor, side towards	
33	weixing road	Shijimingyuan apartment	40		3	6	144	6floor, face directly	
34	weixing road	Weixing square north apartment	40		4	6	168	6floor, face directly	
35	weixing road	Jinyang weixing apartment	40		7	6	336	6floor, face directly	
36	weixing road	Xiangbinshuan apartment	40		3	6	108	6floor, face directly	
37	weixing road	Meihaosangdu apartment	40		4	6	168	6floor, face directly	
38	weixing road	Qinjun apartment	40		5	25	500	25floor, face directly	

Table1.6-4 Environmental sensitive points on ambient air and noise pollution along Public transportation Supporting infrastructure's construction

Hub	No.	name	Distance away from	Details	remark
North suburb bus hub	1	Youhaohuayuan 3 rd apartment	100m in the east	12 high buildings, with interval of nanhubei road to hub	
	2	Xinjiang Islam Jingwen school	150m in the northeast	The school is to training the Islam talents, with interval of nanhubei road to hub	

1.6.2.2 The target of social environment protection

The social economic environmental sensitivity points include the community, culture, education and medical care. The points can be seen in Table 1.6-1~1.6-4. The cultural heritage as the main target of social environment protection is shown in Table 1.6-5.

Table1.6-5 Ethical Culture and Cultural Heritages related with the project

No.	Name	Road	Distance from the central line of the road (unit: m)	Classification of protection	Type of agency
1	Xidaqiaobei mosque	BRT4 Line Northwest road section	East 30	General protection	National cultural institutions
2	Heishantou mosque	BRT4 Line Altay Road section	East 30	General protection	National cultural institutions
3	Kalian mosque	BRT6 Line midongnan road section	East 50	General protection	National cultural institutions
4	Islam Jingwen School's mosque	BRT6 Line nanhubei road section	East 50	General protection General protection	National cultural institutions

Along the project site, there are 4 mosques. There are no removals or displacement and disturbance for mosques during the project construction.

1.6.2.3 The target of surface water environmental protection

The project will not go through any river or stream, which belongs to environmentally sensitive points with high level. The nearby rivers' details can be referred to Table 1.6-6.

Table1.6-6 The target of water environmental protection

No.	Type	Water body	Functional zoning	Actual function of water body	Classification of water	The relationship with and the distance away from project site
1	Main channel	Heping channel	nit	agricultural water	V	BRT4 Line cross the channel

1.6.2.4 The target of ecological environment protection

The main targets for environmental protection are street trees along the project site. The main targets of ecological environment protection are shown in Table 1.6-7

Table 1.6-7 The main targets of ecological environment protection

Protection object	Protection items	Related roads
vegetation	Greenbelt, street trees	BRT4 Line, BRT6 Line, BRT6 Line's branch

1.7 Environmental function zoning and standards

1.7.1 Environmental function zoning

According to Urumqi municipal function zoning report and China's Xinjiang water environment function zoning, as well as the Xinjiang ecological function zoning. The environmental function zoning is made like follows:

(1) Ambient air function zoning

According to the Urumqi Municipal Master plan , the city is divided into 9 districts,

including Tianshan District, Shayibake District, Xinshi District, dongshan keziwan District, Airport District, North Station District, West station District and Toutunhe District, etc. Ambient air function zoning is mainly made in the Built-up areas, and categorized into Category 2 and Category 3. The production area and Xiyu Cement company of Xinjiang Bayi steel group belong to the Category 3 air quality functional area, other areas of the Group belong to Category 2. The project site locate in the Category 2 air quality functional area.

(2) Water environment function zoning

According to Urumqi municipal function zoning report and Water environmental function zoning of Xinjiang, the water body of Urumqi mainly include Urumqi River, shuimo river, wulabo reservoir, chawobao Lake, Hongyanchi reservoir and Nanshan water system, etc. The Project construction will not concern above water body.

(3) Acoustic environmental function zoning

According to Urumqi municipal function zoning report, the Acoustic environmental function zoning for this project are focused on the Type 2 area and Type 4 area that regulated in the Environmental quality standards for noise (GB3096-2008) .

(4) Ecological environmental function zoning

According to National Ecological environmental function zoning, the project site belong to “Urumqi town cluster living environment protection level 3 functional area” According to Ecological environmental function zoning of Xinjiang, Urumqi belong to Urban and suburban agriculture ecological function zone, in which the ecological function are mainly concern the human settlement, industrial and agricultural production, and the tourism.

According to the notification of key prevention control zone, key supervision zone, key treatment zone for soil erosion issued in the Xinjiang Uygur Autonomous Region, Urumqi belong to the key supervision zone for soil erosion.

1.7.2 Environmental quality standard

(1) Acoustic environment

For the objective of environmental protection within 35m on both sides of arterial line, the Type 4a standard will be adopted. For others, Type 2 will be adopted. The details can refer to Table 1.7-1.

Table 1.7-1 Acoustic environment standard (GB 3096-2008) (extract) unit: dB(A)

Type	Day	Night	Application scope
2 类	60	50	For the region's function zoning that need to maintain residential quiet, such region include: commerce, finance or trade, or the combination of residence, commerce and industry.
4a 类	70	55	Freeway, first-class highway, second-class highway, city express way, arterial road, secondary trunk road, urban rail transit(on the ground), the region on both sides of inland river channel.

(2) Ambient air environment quality standard

For the region that project located, the GB3095-2012 and the secondary standard of its modification should be carried out. The index is as Table 1.7-2.

Table 1.7-2 Ambient Air Environmental Quality Standard (Extract) Unit: mg /m³

Contaminant	hourly average	Daily average	Yearly 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(daily maximum 8-hour average)	-
PM ₁₀	-	0.15	0.07
PM _{2.5}	-	0.075	0.035

(3) water environment

There distribute the Heping Channel as the water body along the Project. In consideration of the use function in water system, the water quality for the Channel should be evaluated according to the V water quality standard in Surface Water Environment Quality Standard (GB3838-2002). And the SS index should follow dry farming section in Standards (GB5084-2005) for irrigation water quality. The details can be seen in Table 1.7-3.

Table 1.7-3 Surface Water Environment Quality Standard Unit: mg/L

Index	Limit value for Type V	Standard
pH (dimensionless)	6-9	Surface Water Environment Quality Standard (GB3838-2002)
COD _≤	40	
BOD ₅ ≤	10	
Petro type≤	1.0	
ammonia nitrogen≤	2.0	
permanganate≤	15	
SS≤	100	Dry farming section in Standards for irrigation water quality (GB5084-2005)

1.7.3 Pollution emission standard**(1) Noise**

During the construction period, the Limit Value Standard For The Boundary Of Building Construction (GB 12523-2011), refer to Table 1.7-4.

Table 1.7-4 Limit Value Standard For The Boundary Of Building Construction (extract) unit: dB (A)

Day	Night
70	55

The maximum noise level at night is not allowed to be more than 15 dB (A). If the noise source of the project site is close to the noise sensitive building and the outdoor condition can not be suit for measuring, the indoor measuring can be adopted with the noise assessing standard less 10 dB (A) as the benchmark.

The public transportation hub, parking lots and bus terminals during operation period will adopt the Type III limit standard in Emission limit standard of environmental noise within the boundary of industrial enterprise and factory (GB12349-2008).

(2) vibration standard

The vibration impact will be produced during construction, the regions impacted by vibration mainly locate within the urban area. So the Standard of environmental vibration in urban area (GB10070-88) should be adopted. See Table 1.7-5.

Table 1.7-5 Vertical vibration regional lead Z standard values in city unit: dB

No.	Application area	Day	Night
1	Special residence	65	65
2	Residence, District of culture and education	70	67
3	Mixed zone, Shopping center	75	72
4	Industrial clusters	75	72
5	Both sides of arterial road	75	72
6	Both sides of railway	80	80

(3) waste gas

The Asphalt gas's emission will follow the Grade 2 standard in Integrated Emission Standard of Air Pollutants. See Table 1.7-6.

Table 1.7-6 Asphalt gas emission standard (extract)

The highest value of Emission concentration permitted Unit: mg/m ³	The highest emission speed ratio permitted, unit: kg/h		Limit the no organized emissions
	stack height Unit: m	Grade 2	
40 (smelting, dip-coating)	15	0.18	The obvious of no organized emissions is forbidden.
	20	0.30	
	30	1.3	
	40	2.3	
75 (mixing during contraction)	50	3.6	
	60	5.6	
	70	7.4	

During the operation period, all the project sites will follow Grade 2 standard in Integrated Emission Standard of Air Pollutants (GB16297-1996), the details can refer to Table 1.7-7

Table 1.7-7 Unorganized emissions standard nearby the project boundary (extract)

Pollutants	Monitoring points to unorganized emissions	Limit the unorganized emissions (mg/m ³)
NO _x	highest concentration outside the boundary	0.40
PM (particulate matter)	highest concentration outside the boundary	1.0
NMHC	highest concentration outside the boundary	4.0

(3) waste water

The waste water is forbidden to discharge into the main channel and river along the project site. The Grade 2 standard in Integrated Wastewater Discharge Standard (GB8978-1996) (modified in some parts in 1999) will be adopted. See Table 1.7-7.

Table 1.7-7 Wastewater Discharge Standard unit: mg/L

Pollutant	Limit value of Grade 2 standard	Remark
pH	6-9	Integrated Wastewater Discharge Standard (GB8978-1996) (modified in some parts in 1999)
COD	150	
BOD ₅	30	
SS	150	
ammonia nitrogen	25	
Animal and vegetable oils	15	
petroleum	10	

1.8 Time scope of assessment

In consideration of construction and operation period of the project, the construction period that EIA covered is from 2015 to 2019, the operation period that EIA covered is individually Year 2020 as the EA recently, EA Year 2026 middle-term and Year 2034 EA long-term.

1.9 Principles and method

(1) Comply with the “Law of the People's Republic of China on Environmental Impact Assessment”, the “Ordinance on Administration for Environmental Protection of Construction Projects”, “Circular about Strengthening the Management of Environmental Impact Assessment for Construction Projects Funded by the International Financial Organizations” and the World Bank Safeguard Policies as well as the procedures of domestic EIA and the World Bank’s EIA

(2) The project aims to improve the urban transport with the aid of IBRD loan. There are four components of the project that is Municipal integrated public transportation system’s development, Municipal integrated public transportation information platform’s development, Public transportation Supporting infrastructure’s construction and Institutional Capacity Building and project management. Base on those, the project has such features as covering wide scope, the long extension of construction route and integrated benefit on many aspects. So the emphasis for this EIA is on the regional impacts during the traffic infrastructure’s construction period, and highlight the positive environmental impacts aroused by the project.

(3) The EIA approach should combine the analogy survey, data collection, analysis and handing out the public opinion questionnaire together, and make enough use of existed data material.

(4) Putting the environmental protection first, make the conclusion in the practicable and scientific way for the feasibility of the project. The EIA will be the basis for decision-making of the government and the environmental management agency, and also be the environmental protection guide during the project design, construction and operation period.

2. Project description

2.1 Project Basic Information

2.1.1 Project Name, Type and Location

Project name: Urumqi urban traffic improvement project II

Project type: Traffic transportation

Construction unit: Urumqi Urban Transportation Investment Ltd. Co

Project location: The project locates in Urumqi of Xinjiang Uygur Autonomous Region 56

The project's geographical coordinates is North latitude 43°45'~43°56', East longitude 87°28'~87°36'. The details can refer to Figure2.1-1.

2.1.2 Construction scale and layout

The total loan applied by the Project from Word Bank is 1.4 hundred million US dollars(about 8.68 hundred million RMB), the project construction include four components as following:

- (1) component 1: Municipal integrated public transportation system's development;
- (2) component 2: Municipal integrated public transportation information platform's development;
- (3) component 3: Public transportation Supporting infrastructure's construction;
- (4) component 4: Institutional Capacity Building and project management.

Municipal integrated public transportation system's developments is the key and core unit among four components, Public transportation Supporting infrastructure's construction is the supporting facility, Municipal integrated public transportation information platform's development is the technical approach, Institutional Capacity Building and project management is the technical and intelligent support.

The project construction mainly covers Tianshan Area, shayibake district, high-tech development zone(new urban area), economic and technical development zone(toutunhe zone), shuimogou district and Midong district. For different district or zone, the construction standard and the focusing content are different. For the Central urban area, the focus of construction is mainly on the update and reconstruction of the existing traffic system complying with the concept of developing the green and sustainable public transportation system. The new urban district is the key area in future development plan, which is designed and built according to the concept of developing the green and sustainable public transportation system. The layout of project can refer to Figure 2.1-2.

2.1.2.1 Component 1: Municipal integrated public transportation system's development's construction content

The Bus Rapid Transit system concerns the construction of three BRT Lines with total length of 51.7km, the details can refer to Table 2.1-1.

Table 2.1-1

New BRT line's construction

BRT4 Line	Construction content	Start from Machinery Plant Station to Suntunpai Station with total length of 20.1km, including the road, bridge, drainage, lighting, greening and renovation of traffic facilities, station building, intelligent public transportation system and BRT buses' purchasement.
	Exclusive lane's design	<p>For BRT 4 Line, the exclusive way in the central of road will be arranged.</p> <p>The current road width of Kashi road will be kept and the number of vehicle lanes will be reduced. The BRT exclusive way will be set in the middle of road.</p> <p>In Zhongyabei Road, no renovation is made on its configuration. The BRT route will be set in the middle of road. The existing 6m width bicycle lane will be changed to be relief road.</p> <p>In Altay Road(henan road to suzhou road), the BRT route will be set in the middle of road. There still need 3 motor vehicle lanes, so the existing isolation belt will be removed and expanded to be vehicle lane. And the sidewalk and bicycle lane will keep the existing condition.</p> <p>In Zhongyanan Road, no renovation is made on its configuration. The BRT will be mixed with other vehicles.</p> <p>No renovation is made on its configuration. The BRT route will be set in the middle of road.</p> <p>In youhaonan road, the BRT route will be set in the middle of road for BRT1 and BRT2, the existing road condition will not be changed. .</p>
	Bus station	; 23 bus stations with the form of Island medial, one side medial and one side medial for Mixed Vehicle-bicycle Traffic.
	pedestrian crossing facilities	6 over bridges (2 new built and 4 reconstruction), 5 underground passages (2 new, 1 reconstructed, 2 existing one for use)
BRT6 Line	Construction content	Start from Midong terminal Station to Beijiao Station with total length of 18.1km, including the road, bridge, drainage, lighting, greening and renovation of traffic facilities, station building, intelligent public transportation system and BRT buses' purchasement.
	Exclusive lane's design	<p>Except the Erhuan Road along the BRT No. 6 Line is mixed with other lanes, other section will be set with BRT exclusive route. The former scale of Erhuan Road is kept and the BRT station on Erhuan road is one side medial form. The road width in the following road will be kept to be 24m, and reduce the lanes for set the BRT exclusive route, which concern the Jianguo road, yihuan road, daoxiangnan road, midongnan road, nanhubei road (hongguangshan road to dongbajiahu road)</p> <p>Nanhubei road (dongjiabahu road to longsheng road) concerning with BRT No.7 Line has 580m. The related road expansion work will be done for BRT 7 line, together with the exclusive route in the middle of road for BRT.</p>
	Bus station	23 bus stations with the form of Island medial, one side medial and one side medial for Mixed Vehicle-bicycle Traffic.
	pedestrian crossing facilities	3 overbridges (1new built and 2 reconstruction),
BRT6 Line's branch	Construction content	Start from the intersection of Midong road and Kashi road, to Ergong High speed railway station with total length of 13.5km, including the road, bridge, drainage, lighting, greening and renovation of traffic facilities, station building, intelligent public transportation system and BRT buses' purchasement.

	Exclusive lane's design	For the BRT6 Line, all the section will be set with exclusive route in the middle of road. For the road of kashi, siping, hebei weixing and beiweisan, these roads will keep the former pavement and width, and reduce the existing lane's number. The exclusive route of BRT will be set in the middle of road Beijing road has the section concerning the BRT 1 Line's construction, the related configuration will not be changed and leave the exclusive route in the middle of road for BRT 1 line.
	Bus station	23 bus stations with the form of Island medial, and one side medial
	pedestrian crossing facilities	1 underground passage (building the connection between Ergong Station and new build sport center station of BRT No. 1 Line)

2.1.2.2 Component 2: Municipal integrated public transportation information platform construction content

Component 2 concerns the integrated intelligent traffic platform, together with 3 structures of Urumqi traffic to form the Urumqi intelligent traffic system. The 1st level of platform include the development of Urumqi integrated traffic information platform, computer system, computer room environment, and the construction of commanding hall of traffic information platform. The project items developing jointly and use in common are the Urumqi main communication network, Urumqi road traffic information collecting system and traffic basic geographic information system. The 2nd level of platform includes the intelligent traffic renovation on parking lots, buses and taxis.

Component 2 of the project focuses on building the integrated traffic information platform for bus hub dispatching center. The main contents the platform development are facilities installation and software platform.

2.1.2.3 Component 3 : Public transportation Supporting infrastructure's construction

The component 3 include 6 public transportation hubs, which individually are:

(1) two integrated hubs, which include the south square public transit hub in high speed railway station and Beijiao passenger transport hub

(2) two parking and maintenance places(PM), which include sangong PM and Midong PM.

(3) two terminals, which include Midong bus terminals and south square bus terminals in high speed railway station

The land occupation of above hubs is about 20.9648hm², which belong to the urban construction planning land. The detailed scale and construction content is as following Table 2.1-2.

Table 2.1-2 Public transportation Supporting infrastructure's construction

No.	Project name	Project location	Land occupation (m ²)	Construction content
1	public transit hub of South square in high speed railway station	South square in high speed railway station	37846	Normal bus terminal and parking lot, management office, departing place, dispatching office, duty room and switching room, etc.

				For BRT terminal, the construction include parking lot, bus departing place, dispatching and managing facilities and intelligent system.
				Public transit hub's dispatching center has 66700 m ² floor area, 1.2 plot ratio, 12.42% building density, 21% of greening rate and 33 parking spaces.
2	Beijiao passenger transport hub	Suzhou road/beijiao passenger transit station near the nanhubei road	6000	The construction include parking lot, departing place, dispatching and managing facilities and intelligent system.
3	Sangong bus parking and maintenance places	Huzhou road of sangong town/southeast of weisi road	52500	the construction include parking lot, Automatic bus washing room, repairing and maintenance room, fire controlling room, Power distribution room, water cellar, heat supply room, water pumping room, managing facilities and intelligent system.
4	Midong bus parking and maintenance places	Midong erhuan road/northeast of huanqu road	100075	the construction include parking lot, Automatic bus washing room, repairing and maintenance room, fire controlling room, Power distribution room, water cellar, heat supply room, water pumping room, managing facilities and intelligent system.
5	Midong bus terminal	Midong erhuan road/northwest of huanqu road	6727	The construction include parking lot, departing place, dispatching and managing facilities and intelligent system.
6	Bus terminal in north square of high speed railway station	Ergong north square of high speed railway station	6500	The construction include parking lot, departing place, dispatching and managing facilities and intelligent system.
		Total	209648	

All above project sites are covered by the municipal pipeline, which the existing supply of electricity, water and drainage system. For public transit hub, parking and maintenance places and terminals, the new flush toilet will be equipped during the construction. The produced sanitary wastewater will be discharged into the municipal sewage pipeline.

2.1.2.4 Component4: Institutional Capacity Building and project management

Through the Institutional Capacity Building and project management, the scientific level on the decision-making of traffic projects will be enhanced, the project management will be more detailed, and the coordination between departments will be strengthened, and the more efficient policy-making system will be set up. All these promote the sustainable development of the urban traffic. The component include the research on the subjects related with the urban traffic, project management and technical support, as well as the enhancement of professional technical capability, training, publication and public participation.

2.1.3 Project Cycle

The project construction period is from 2015 to 2019.

2.1.4 Project total investment

The project total investment is about 3.274 billion RMB. The capital applying from the IBRD flexible loan is about 1.4 hundred million US Dollars and the rest will be supported by the Urumqi governmental supporting fund.

The project is related with the following local units, like DRC, finance bureau, construction committee, planning bureau, land and resources bureau, EPB, roads and traffic Bureau, public transportation company and other related bureaus in Urumqi.

The IBRD loan is planned to be used on the project's construction, facility purchasement, technical aid and Institutional Capacity Building and training, which are all related with urban public transportation development project. The Urumqi governmental supporting fund is planned to be used on the land occupation fee, survey and designing service fee, as well as the project reserve funds.

2.2 Environmental impact factors' identification and assessment factors' selection

For some project components, the related solid waste, waste water, waste gas and noise can be produced during the construction and operation period. The related EIA should be made for that.

2.2.1 Identification of impacts factors

According to the project type and characteristics of pollutant emission, the environmental elements impacted by project will be identified and be assessed on the impact's intensity and features. The related identification table is as following Table2.2-1 and Table2.2-2.

Table 2.2-1 Identification for the environmental elements under the impact of project

Environment		Natural environment			Ecological resource	Social environment					Quality of life				
Project development period		Surface water quality	Air quality	Acoustic environment	Urban ecology	Land use	Industry development	Agriculture development	Water supply	Traffic	tourism	Health and safety	Social economy	Culture heritage	Living standard
Construction period	Site clearing		-1	-1	-1					-1	-1				
	Excavation		-2	-2	-1					-1	-1				
	Transport		-1	-1						-1	-1				
	Installation			-1						-1					
	Material storage		-1								-1				
operation	Waste water emission	-1			-1					+2	+1				
	Waste gas emission		+2							+2	+2	+2	+2		+2

Noise		+2	+1						+2	+2	+2	+2		+2
Solid waste discharge				-1										
product				+2	+2	+1	-1	+1	+3					

Note: ① 3— heavy impact; 2—medium impact; 1—slight impact; “+”means positive impact; “—” negative impact.

②The positive impacts are much more than the negative impacts during operation period. So in this table only the main impacts during operation are listed.

Table 2.2-2 The property analysis for impacts during operation

Property of impacts		Negative						Positive			
		Long term	Short term	Reversible	Irreversible	Part range	Wide range	Long term	Short term	Part range	Wide range
Natural environment	Surface water quality										
	Air quality	√		√		√			√		√
	Acoustic environment	√		√		√			√	√	√
Ecological resource	Urban ecology	√		√		√			√		√
Social environment	Land use								√		√
	Industry development								√		√
	Agriculture development										
	Water supply										
	Traffic	√		√		√			√		√
	Tourism								√		√
	Health and safety	√		√		√			√		√
	Social economy								√		√
	entertainment								√		√
	Living standard								√		√

Note : The long term means the operation period. And the short term means the construction period.

It can be concluded from above table that main negative impacts is produced during construction period. The impacts are mainly on the traffic, acoustic environment, ambient air, cultural heritage and ecological environment near the project site. The impacts property is part region limit, short-term and reversible. During the operation period, there are mainly the positive impacts, which will benefit the natural environment, social environment and quality of life long-term in a wide scope.

2.2.2 Environmental impact assessment factors screening

According to project analysis result and current environmental condition in project site, the Environmental impact assessment factors are screened and listed as following Table 2.2-3.

Table 2.2-3 Environmental impact assessment factors for the project

Items	EIA factors	Factors for analysis and prediction
Ambient air	CO、NO ₂ 、PM ₁₀ 、SO ₂ 、	CO、NO ₂ 、PM ₁₀ 、SO ₂ 、Dust
Acoustic environment	equivalent A sound level Leq	equivalent A sound level, vibration
Ecological environment	soil, vegetation and soil erosion	soil, vegetation and soil erosion
Social environment	Transportation, landscape and quality of life	

2.3 Related project

In 2015, the reconstruction of Altay Road in Urumqi will be started according to the plan. The BRT exclusive route will be reserved among the motor vehicle lane. According the definition of World Bank, the reconstruction of Altay Road is the project's relevant project.

The existing condition of Altay Road is that has three pieces plate structure with 42m width of profile, 6 carriage ways, non-motor lane, sidewalk, and isolation belt between motor lane and non-motor lane. Altay Road was built in 1993 that is the earliest section of national road No.312 passing through Urumqi city, and the only cement pavement in Urumqi at that time. The design working life of the Altay Road is 15 years and until now it can extend its service for 6 years over the 15 years life.

The reconstruction of Altay Road starts from xihong road section to suzhou road section with total length of 5.6km. The configuration of vehicle lane is one plate structure, which has dual direction 8 lanes. The BRT lane will be arranged on both sides of vehicle lane. The profile is like: 30m width of central vehicle lane. On both sides of the central vehicle lane, in sequence there are 4m width of green belt, 6m width of sidewalk and bicycle lane mixed together. the Road red line is 50m width.

The total investment of the reconstruction of Altay Road will be 8.6335 hundred million RMB. This reconstruction project is still in feasibility researching period and not starts the EIA work.

3. Project plans comparison and selection

The project is the traffic improvement project, the integrated traffic information management and Institutional Capacity Building and project management both have positive impacts on the environment. Those components have no negative impacts on the environment. So in this chapter of EIA report, no project plans comparison is necessary to be made on above components. And the comparison and selection will only made on the following components as public transportation Supporting infrastructure's construction and Municipal integrated public transportation system's development.

3.1 The comparison on with and without project

Assuming that no project is planned to be built, the related comparison on the individual environmental impacts of building or not building the project will be made.

The project has the obvious meaning for urban traffic. Without the construction of the project, the public transportation's efficiency will be reduced sharply. The residents will choose driving own cars but not the public transport, which can result in the increase of pollutant emissions and fuel consumption. At the same time, the travel time for urban residents will be increased; the working efficiency outside the office will be also reduced. Not only increasing the fuel consumption, but also polluted the environment, the environmental impacts without the project can be obvious recognized.

On the other hand, if the project is completed, the citizen's number choosing the public traffic will be increased, which can slow down the increasing speed of private car retaining quantity in Urumqi and reduce the pollutants emission. The citizen's trip become more convenient and at the same time the project realize the energy saving and emission reduction.

In general, the project's positive environmental impacts are far bigger than its negative impacts. The negative environmental impacts after the project completion are obviously less than the situation that without the project.

3.2 Comparison of BRT Lines alignment

3.2.1 BRT No.4 Line alignment plan's comparison and selection

3.2.1.1 BRT line extension alternatives

(1) BRT route northward extension plan

The plan is to extend the BRT route northwards, where passing through Beijingbei road to Changzhou street. Beijingbei road has 6 dual direction carriage ways with good road condition. Along the extension of BRT route northwards, there are resident house, plants and farmland currently . For such area, the urban development and construction is relatively scattered with low intensity. According the land use plan, the land along the project will be used for resident house and green land, so it will has low urban development intensity .

At present, the BRT route's end is BRT No.1 Line's terminal. In the future, the BRT No.1 Line will change the original route and the current station of BRT 1 will be left for BRT No. 4 Line's continuous use.



Figure 3.2-1 BRT No. 4 line's route northward extension and southward extension plan

(2) BRT No. 4 line's route southward extension plan

The plan is to extend the BRT route southwards, where passing through Santunbei road to Shiqihu street. Santunbei road has 6 dual direction carriage ways with good road condition. Shiqihu road has 2 dual direction carriage ways with bad road condition. Along the extension of BRT route northwards, there locate mostly the green land currently and in the east it is the residential land. The urban development belongs to medium intensity. The end of original route is Santunbei Hub.

(3) plan comparison

BRT No. 4 line is relative long. On both sides of the line, the urban development is not enough. Then after the extension, the BRT project's operation benefit will be reduced. The north end of BRT No. 4 line can conveniently use the BRT No. 1 terminal. The south end of BRT No. 4 line can make use of Santunbei Hub, which is convenient for transfer. The both sides of BRT route should be equipped with normal bus transit for transferring conveniently.

(4) environmental comparison

Ecological environment: both northward and southward extension is planned to locate in outer space of city. All the road section need to be expanded, which will occupy the urban green land.

Acoustic environment: both northward and southward extension plan can improve the public traffic capacity and reduce the traffic pressure, as well as mitigate the noise environmental impacts on sensitive points on both sides of extension.

(5) the conclusion of comparison

Both northward extension plan and southward extension plan locate in the outer place of city, where belong to the medium urban development intensity. The extension work will reduce the BRT operation revenue. In consideration of the extension work's slight environmental impacts, the development plan recommended in this EIA is same with the FSR of the project.

3.2.1.2 Kashi road(Yingbin road) comparison

(1) Alignment comparison

Yingbin road: BRT No.4 line start from the mechanical plant to Aletai road with total length of 20.2km, passing by Beijing road and Kashi road.

Kashi road: BRT No.4 line starts from the mechanical plant , extend westward along the Yingbin road, and finally reach Aletai road with the total length of 20.2km.

(2) construction comparison

Kashi road has 6 dual vehicle lanes currently, and sidewalk and bicycle lane in the west of road. The road section is relatively wider than Yingbin road section. Some parts of the road have been covered by the BRT No.1 Line.

Yingbin road has 4 dual vehicle lanes currently, and the road section is relatively narrower than Kashi road section. So from the aspect of construction, it suggests to adopt the Kashi road for developing BRT No.4 Line.

(3) environmental comparison

Ecological environment: all sections in Yingbin road should be expanded, which will occupy the urban greening land. For BRT No.4 Line developing plan in Kashi road, the only work is to divide the road section.

Acoustic environment: the acoustic environmental sensitive points are basically similar along both roads. After the development of public transportation, the negative impacts on those sensitive points can be mitigated effectively.

(5) the conclusion of comparison

Developing BRT in Kashi road can make full use of current road section and reduce the demolition of existing greening land. So it is suggested to develop BRT in Kashi road, which is same conclusion with FSR.

3.2.2 BRT No. 6 Line alignment's selection and comparison

The northward terminal is confirmed and the BRT line will be extended northward from the terminal.



Figure 3.2-2 The section's selection and comparison that is from daoxiangnan road to terminal among BRT No. 6 Line

(1) Alternative 1: daoxiangnan road- ---daoxiangbei road ----- erhuan road--- terminal station

Current road condition: daoxiangbei road belong to County road and its reconstruction starting date is waiting for determined. Erhuan road's construction is basically completed.

Current Land use condition: there are relatively large scale of resident's house near the crossing of daoxiang road and Erhuan road. The urban development is scattered with low intensity. Others land belong to the farmland.

Land utilization plan: mainly for the resident's house and less land along the street for commercial use.

(2) Alternative 2: daoxiangnan road - fuqianzhong road- Jianguo road – terminal station

Current road condition: fuqianzhong road's construction has been completed; Jianguo road's construction is put into plan, which is combined into the BRT development plan.

Current land use: along the fuqianzhong road, there located the Midong district government and new-built residential apartment. In the west of Jianguo road, there is big area of dwelling houses. In the east of Jianguo road, there is the farmland.

Land utilization plan: along the fuqianzhong road, the land is planned for administrative office and citizen's square, etc. The land along Jianguo road will be mainly for dwelling.

(3) Alternative's comparison

The Alternative 2 use the land comprehensively, which combined with the BRT development.

The Alternative 1 uses the land in the single way, which should develop other traffic approach along the project to transfer the BRT.

The road condition choosing in Alternative 2 is relatively good and save the construction cost, as well as fasten the BRT construction process. So after comparison, Alternative 2 is recommended in this EIA report.

(4) environmental comparison

Ecological environment: Both alternatives will locate in the outer space of city. All the road section in Alternative 1 need to be expanded and the urban green land will be occupied. For Alternative 2, the fuqianzhong road has been build up with relatively small ecological impacts.

Acoustic environment: In Alternative 1, the dwelling houses built by the inhabitants are mainly located on both sides of project and closed with the project site. The urban development intensity of fuqianzhong road in Alternative 2 is higher than the intensity of Daoxiangbei road. After the BRT is completed, the public transportation condition will be enhanced and the related acoustic environmental impacts can be mitigated.

(5) comparison conclusion

The Alternative 2 is benefit for quickening the BRT construction and improving the utilization efficiency. After the completion of construction, the public traffic and

acoustic environment can both be improved. So in the EIA, it is recommended the Alternative 2 that is same with FSR conclusion.

3.3 Configuration comparison of BRT

There is not selection and comparison for the road configuration in FSR and project proposal. According analysis of environmental positive or negative impacts for the individual configuration design in FSR figures, the suggestion on optimization of those configuration is provided in this EIA.

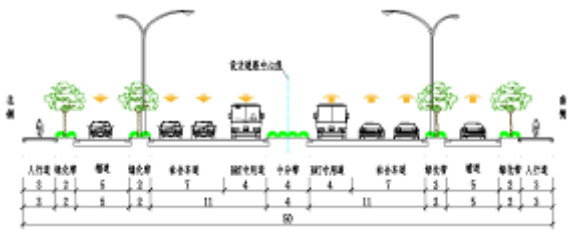
There is no reconstruction on the road section. The road mixing BRT and social vehicles will not be analyzed in this chapter.

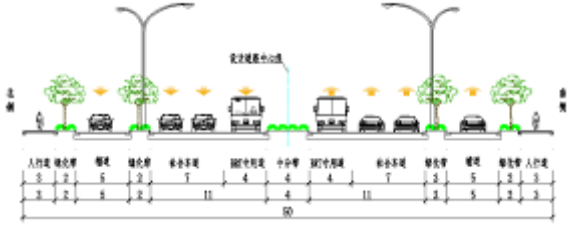
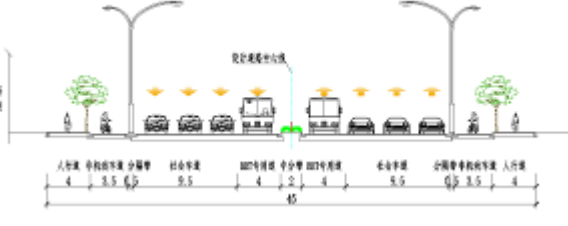
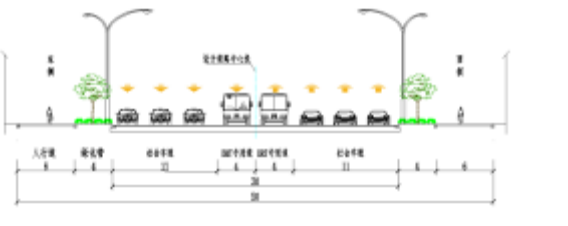
The exclusive way for BRT can be divided into central exclusive way and side exclusive way according different location of road section. The general design is the central exclusive way for fulfilling the traffic need and taking the current road section into consideration.

3.3.1 BRT exclusive way's instruction

For the BRT 4 Line's road section of which the function should be adjusted and the carriage ways need to be expanded, it can be seen in the following Table 3.3-1.

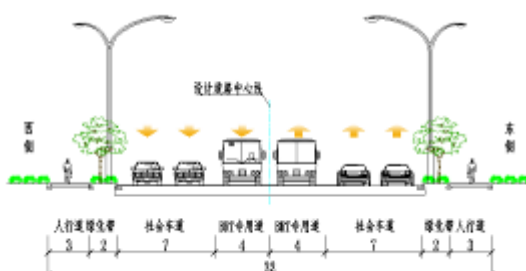
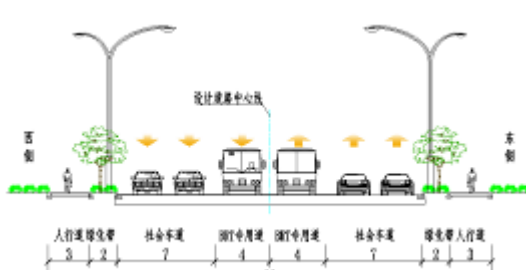
Table 3.3-1 BRT4 line's section analysis

Road	Current section	FSR plan	Comparison analysis
Kaishi road	three plate structure for current road		No renovation on road section, set exclusive way fro the BRT in the middle of the road, the bicycle lane will be adjusted to be relief road. Reduce the width of bicycle lane.
Zhongyabei road	three plate structure for current road		No renovation on road section, set exclusive way fro the BR T in the middle of the road, the bicycle lane will be adjusted to be

			relief road. Reduce the width of bicycle lane.
weixing road	three plate structure for current road		No renovation on road section, set exclusive way fro the BR T in the middle of the road, the bicycle lane will be adjusted to be relief road. Reduce the width of bicycle lane.
Altay Road (henan road to Suzhou road)	Four plate structure for current road. 3 carriage ways in the middle of road with 12m width.		Expand the isolation belt on both sides of the road to be carriage ways. The sidewalk and bicycle lane keep the existing condition. The isolation belt's width between carriage ways and bicycle lane is reduced.
Altay Road-Northwest road (suzhou road to xihong road)	Three plate structures for current road, the section's width is 42m.		Expand the section's width to 50m. the green belt will be removed and the street trees should be transplanted.

For the BRT 6 Line's road section of which the function should be adjusted and the carriage ways need to be expanded, it can be seen in the following Table 3.3-2.

Table 3.3-2 BRT6 line's section analysis

Road	Current section	FSR plan	Comparison analysis
midongnan road (kashi road to wujian apartment)	Current carriage way is 14m wide.		BRT development needs to expand the road, which will reduce the width of green belt for 4m individually on both sides of the road and increase the road width to 22m. The street trees need to be transplanted.
Current	carriage		BRT development needs to expand the road, which will reduce the width of green belt for 4m individually on both sides of the road and increase the road width to 22m. The street trees need to be transplanted.

The current road conditions along BRT 6 line's branch are all 6 carriage ways and 8 carriage ways, which will be kept the existing width and reduced the number of carriage ways for setting the BRT exclusive way in the middle of road.

3.3.2 Environmental comparison

The FSR design is plan to expand the carriage ways in some road, which can ensure the traffic speed on road, as well as reduce the noise and tail gas emission.

Ecological environment: The carriage ways will be planned and divided. The 5304 street trees on both sides of above-mentioned road section need to be transplanted, which concerns the elm, poplar, willow and Chinese ash with average tree's life of 5 to 20 years. For the safe traffic consideration of BRT and social vehicles, the amount of green land and transplanting trees will be reduced according to For's plan for road section. Before the transplanting, the survey on the soil and water sources in related area concerning the transplant will be made firstly, and at the same time the principle of transplanting to nearby area should be followed, like the bush will be mainly transplanted to the green land nearby, the trees with 5cm-15cm DBH(Diameter at Breast Height) will be directly transplanted in arterial road and secondary trunk road as the street trees. For the trees over the 15cm diameter will be transplanted to the tending base (like plants garden, seed nursery, water paradise, wulabo transplanting base, trees transplanting base in high-tech new developing zone), in which the trees is

under the special care and protection. For guarantee the trees' surviving rate, the excavation during the transplanting will strictly follow the related standard that regulated the earth ball-plant should be 3 to 4 times more than tree trunk's diameter. According to statistic data from Urumqi gardening bureau, the 85.5 hundred thousand arbors and bushes has been transplanted with over 95% surviving rate in 2014. So the project's impacts on the ecological environment are within the acceptable range.

Conclusion: Based on the safe traffic of BRT and social vehicles, the expansion work of carriage ways has been reduced as far as possible in FSR for reducing the project's negative impacts on urban ecological environment. So it is suggested in this EIA report that the FSR's plan should be adopted. The trees removed from the project site should be used on the greening of fell or transplanted in nearby area, which can reduce the loss of trees and economic cost.

3.4 Site selection of bus depots and terminals

According the analysis on demand for project's service and environmental characteristics in project site, Component 3 named public transportation supporting infrastructure's construction concerns 6 stations. The rationality analysis for its site selecting can be referred to following Table3.3-1.

Table3.3-1

Project site selection analysis

No.	Station	Site selection	Rationality analysis	Remark
1	south square of high speed railway station public transit hub	Ergong south square of high speed railway station	Locate in the west of south square of high speed railway station, closing to the governmental reserved land along weixing road, which can fulfill the requirement of constructing bus terminal, BRT terminal and connection of railway and BRT, and bus transit. The current condition of site is governmental reserved land, so the site selection is rational.	
2	Beijiao passenger transport hub	Suzhou road/nanhubei road nearby beijiao passenger transit station	Locate in the Beijiao passenger transit station, which has the constructing condition for bus terminal, BRT terminal connection of railway and BRT, and bus transit. . The current site has Dongbajiahu terminal, freight transport parking lots, and Beijiao passenger transit station. The site selection is rational.	
3	Sangong bus depot	Sangong town huzhou road/southeast of Weizhou road	The site is selected in Sangong bus depot, which locate in the reserved land between weisi road and huzhou road. The selected site is the governmental reserved land currently, which can fulfill the requirements of bus parking and maintenance. The site selection is not concern the house displacement and is rational.	
4	Midong bus depot	Midong erhuan road/northeast of Huangqu road	The site locates in parking lots on the crossing of huangqu road and erhuan road, which can fulfill the requirements of bus parking and maintenance. The selected site is the big parking lots currently. The site selection is not concern the house	

			displacement and is rational.	
5	Midong bus terminal	Midong erhuan road/northwest of Huangqu road	The site locates in the intersection of huangqu road and erhuan road, which is the governmental land near the Midong bus depot with the condition for building the BRT 6 line's terminal. The site selection is not concern the house displacement and is rational.	
6	bus terminal in north square of high speed railway station	Ergong north square of high speed railway station	Locate in the east of north square of high speed railway station, and the site own the condition for building the parking lots, bus departing place, dispatching and management facility, and intelligent system,	

3.5 Design of bus facilities and suggestions

Bus is part of urban public infrastructure, and the important traffic approach for urban residents. During its design and construction, the humanization should be taken into the consideration.

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. The proportion of men squatting pans and women squatting pan is 4:6. The seats in the waiting hall will be increased to ensure the comfort of passengers. 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.

4. Environmental and social condition

4.1 Natural environment

4.1.1. Geographic location

Urumqi urban traffic improvement project II locates in the Urumqi city of the Xinjiang Uygur Autonomous Region. The project is constituted by four components. The component 1 is Municipal integrated public transportation system's development, including construction of BRT4, BRT6 and BRT6 branch with total length of 51.7km. The component 2 is the Municipal integrated public transportation information platform's development. The component 3 is to build 6 public transit hubs and station. The component 4 is the Institutional Capacity Building and project management.

The project covers Tianshan Area, shayibake district, high-tech development zone (new urban area), economic and technical development zone(toutunhe zone) , shuimogou district and Midong district. The BRT 4 line is from the Machinery Factory in the north to Nanjiao passenger transit station in the south with the total length of 20.8km. The BRT 6 line is from the terminal station to the Beijiao passenger transit station with the total length of 14.1km. The connection between Midong east district and urban area make the BRT traffic network cover the area along the Midong road, which currently is not covered by the BRT yet. The BRT 6 line's branch starts from the intersection of Midong road and kasi road, reach the ergong high-speed railway station with the total length of 12.6km. The branch connect the Midong road and Ergong station, which make the future BRT traffic network cover the existing blank area in the north.

4.1.2 Landform and terrain

The main landform in Urumqi city is the mountain and plain. Urumqi is embraced on three sides by hills and has the wide alluvial fan plain in the north. The southeast part of Urumqi city is higher than the northwest part. The elevation is from 680m to 920m, and the average elevation is 800m.

Tianshan district's terrain is higher in north, south and east, and the west is relatively lower. The landform for north area is low hill with ridge net shape and swales between low hills. The flood gully distribute alternately. The landform for south area is terrace along the right bank of Urumqi River and flood plain.

Shabake district locate in the southwest of Urumqi city. The north of the district locates in city center with flat terrain. The south of the district locate in the suburb, which has the terrain up and down, leaning from the south to north in general. The terrain elevation difference is about 100m. The terrain with relatively bigger elevation differences is the area along the Sha district heat supply network. The heat supply source locates in the higher place with absolute elevation of 1004.1m. And the farthest heat user locates in the place with absolute elevation of 855m. The elevation between each other is 155m.

The high-tech development zone(new urban area) locate in the northwest of Urumqi, which is 14km long from east to west and 9km long from the south to north. The total

area is 143 km². The south is narrower than the north for landform. The south is higher than the north for terrain. The zone belong to the mid-temperate zone arid continental climate zone.

The toutunhe district locates in the northwest of Urumqi, which is the sub-center of Urumqi. The administrative division area for the district is 400 km². The jiancheng district has 40 km² area. which faces the new urban area is on the east, Changji city on the west, northern piedmont Tianshan Mountain on the south and neighboring with Urumqi county.

Shuimogou district locate in the northeast of Urumqi, which is neighboring with Urumqi county on the east, and with shabake district and new urban area on the west, among which there is the Hetanbei road as the border. The Xiaohongqiao of the district adjoin the Tianshan district on the south. The shuimogou district is neighbored with the Jiangou area and Kaziwan area on the north

Midong district's terrain is like that southeast is higher than northwest. The landform is formed by three parts in Midong district, which are hills in southeast with elevation of 650m to 4233m, the alluvial plain with elevation of 418m to 650m in the middle area, the plain in the south. The water sources in Midong district are abundant, so it is the crop plant area. The north of the district is a part of Gurbantunggut desert with elevation of 426m to 630m, which is the main winter meadow in the city.

4.1.3 Climate

Urumqi falls within the mid-temperate zone arid continental climate zone and locate in the deep of hinder land, which is far away from the ocean. The climate features are like these. It is hot in summer and cold in winter with great temperature difference on the day and at night. There is less rain fall with uneven distribution in seasons and big evaporation capacity. The inversion layer happens in winter. The predominant wind direction is the northwest wind in the city. There is the obvious valley wind aroused by the Tianshan Mountain. In winter, it is more the calm wind weather. And at night there is the south wind, and on the day it is the north wind. The gale happens mostly in spring and autumn. The Urumqi's frequency of temperature inversion is relatively high for the whole year, especially in winter its evident character is strong, thick, long duration and low elevation of mixing layer. Altogether, the atmospheric diffusion condition in Urumqi is not ideal, plus the dry weather and less rainfall, which result in the poor Air self-purification capacity. So it is vulnerable for air pollution, especially in long duration of winter.

The details of climate index in Urumqi can refer to Table4.3-1.

Table 4.3-1 Main Meteorological Parameters in Urumqi

Items	Index	Items	Index
Annual average temperature	6.1°C	Spring rainfall proportion in whole year	40%
Historical extreme maximum temperature	40.5°C	mean annual rainfall	277.6mm
Historical extreme minimum temperature	-41.5°C	Daily maximum rainfall	57.7mm

Monthly average temperature in summer	23.0°C	Hourly maximum rainfall	13.4mm
predominant wind direction	northwest wind	Annual mean evaporation capacity	2266.0mm
Annual maximum wind speed	30m/s	maximum depth of frozen ground	1.33m
Annual mean wind speed	2.3m/s	maximum snow depth	39cm

4.1.4 water system

There are five water systems in Urumqi, which are individually the Urumqi River, Toutun River, chawobao water system, debauching water system and dongshan water system. The Urumqi River is seasonal stream, which is originated from the Tianshan No. 1 Glacier, flow out of mountain pass, then meet the Nanshan nine streams, flow through the Pluvial-flood plains, urban area and north plain ,finally reach the Mengjin Reservoir in Miquan area. The total flow path is 160km with annual runoff of 1.820-2.906 hundred million cubic meters. The catchment area is 924km². after it flow into the urban area, it become the Heping Channel.

4.1.5 soil and vegetation

The main originated soil type in Urumqi is the desert grey soil, which is formed during the formation of alleviation plain flooded by the Urumqi River. The character of the soil is the deep, thick and slight salination. Due to the urban construction and development, there mainly are the hard road pavement and artificial green land for most road surface of urban area. The soil type of nearby suburb is mainly the desert grey soil, where growing the short, small and sparse drought-enduring plants as the distributed vegetation. The vegetations are mainly the Seriphidium borotalense and anophyton erinaceum, which include the salsola collina, Ceratocarpus arenarius Linn and other ephemeral plants. The vegetation covering rate is about 10%.

4.2 Social and Economic Status and Assessment

4.2.1 Urumqi social economic condition

The Urumqi is the capital city of the Xinjiang Uygur Autonomous Region, and the international trading center in the west of China, as well as the important hub city. Urumqi is the political, economic, scientific and cultural center for Xinjiang. There are seven districts and one county in Urumqi city, including Tianshan district, shanyibake district, new urban district, toutunhe district, shuimogou district, dabancheng district, Midong district and Urumqi county. The total area of Urumqi is 1.38*10⁴ km² and population of 780905 inhabitants, among which include 2331654 Han people occupying 74.91% of total population, and other minority occupy 25.09%. The Urumqi total economic aggregate is huge as the capital city and central city. The index of GDP, Industrial added value, total retail sales of consumer goods and the fiscal revenue list the No.1 in Xinjiang. The important economic role in Xinjiang become more and more prominent.

4.2.2 Social economy in the related districts with the project development

4.2.2.1 Overview

There are seven districts and one county in Urumqi city, including Tianshan district, shanyibake district, new urban district, toutunhe district, shuimogou district, dabancheng district, Midong district and Urumqi county. The total area of Urumqi is $1.38 \times 10^4 \text{ km}^2$ including urban built-up area of 368.4 km^2 . The east of Urumqi is neighbored with Turpan city on the part of Qiakemaketage to Daheyan. The Toutun river is the border between Urumqi and Changji city on the west. The Gelatage—kezileyi in the south of Urumqi adjoin the Nanshan Mining area. The sticking part of the area towards the Southeast adjoins the Tuokexun county along the line of Weirluoke---east of Alagou. The south of Xiazhege No.3 ridge line adjoins the Suo County. The southwest adjoin the Jing County. The Bogeda ridge as the border in the north divides the Urumqi with Jimusaer Conty and fukang county.

Urumqi is the multi-ethnic city including 49 nationalities like Uyghur, Han, Kazak, Hui, Mongolia, Xibe, Uzbeks and Russians, etc. The ethnic minorities occupy 27.4% of total population. The Uygur and Hui's population are more than others, among which Uygur occupy 47.11% of total ethnic minorities and Hui minorities occupy 36.75%. The Uygur distribute mainly in Tianshan district, Shayibake district and toutunhe district. The new urban district and shuimogou district owns mainly the Han inhabitants. The Hui minorities mainly lived in the Midong district.

The related population of ethnic minorities in districts of Urumqi can refer to the Table 4.2-1 and 4.2-2.

Table 4.2-1 Population statistics for districts and county of Urumqi in Year 2012
unit: persons

District	Household	Population	Gender	
			Man	Woman
Tianshan district	185369	576246	289959	286287
Shanyibake district	176600	537548	273209	264339
New urban district	183311	556204	294903	261301
shuimogou district	98287	301441	161095	140346
Toutunhe district	81644	230230	122815	107415
Dabancheng district	14630	42170	22553	19617
Midong district	96792	274332	141844	132488
Urumqi County	20875	59862	29732	30130
Total	857508	2578033	1336110	1241923

Sources from: 《Year 2013 Urumqi Municipal Statistics》

The Urumqi is multi-ethnic city with 13 Indigenous minorities, which is Uygur, Hui, Kazak, Manchu, Xibe, Mongolia, Kyrgyz, Tajik, Tartar, Uzbek, Russian, Daur and Han. The total population reached 257.8 hundred thousand persons in 2012, among which the nonagricultural population occupy 72.2%. Urumqi has 49 nationalities like Uyghur, Han, Kazak, Hui, Mongolia, Xibe, Uzbeks and Russians, etc., which include

Han people of 87.2 hundred thousand people, Uyghur of 33.26 hundred thousand people, Kazak of 6.92 hundred thousand people, Hui of 25.95 hundred thousand people, and other minorities of 4.48 hundred thousand people.

Table 4.2-2 Minorities Population statistics for districts and county of Urumqi in Year2012 unit: persons

District	Total	Han	Uyghur	Hui	Kazak	others
Tianshan district	576246	357646	148268	43609	13954	12769
Shanyibake district	537548	417471	63704	37061	8478	10834
New urban district	556204	440905	52084	45485	7354	10376
shuimogou district	301441	254949	29043	10571	2969	3909
Toutunhe district	230230	178437	24689	22004	1847	3253
Dabancheng district	42170	18956	2614	13798	6575	227
Midong district	274332	182673	11358	72862	4458	2981
Urumqi County	59862	20945	860	14119	23518	420
Total	2578033	1871982	332620	259509	69153	44769

Sources from: 《Year 2013 Urumqi Municipal Statistics》

4.2.2.2 Social and economic development in districts concerning the project

(1) Tianshan district

Tianshan district locate in the southeast of the Urumqi. In the east that is the dongshan gongmu ridge neighboring with Shuimogou district and dabancheng. In the east that is the Hetan road and Heping channel as the border with Shayibake district. Tianshan district is the center of politic, economy, culture and finance in Urumqi, as well as the location of Xinjiang Production and Construction Corps(XPCC), the Communist Party in Xinjiang, the Army and the Xinjiang Government office. The total area of Tianshan district is 200km² including the build-up urban area of 50 km². Until 2012, there are total 12 sub-district offices in Tianshan district, where lived 44 minorities as Han, Uygur, Hui, Kazak, Mongolia, Kyrgyz, etc., The total population is 57.62 hundred thousand people, among which the 21.86 hundred thousand people is ethnic minorities occupy the 37.94% of the total population. There are 60 religious sites that include the 57 mosques and 3 churches. There are 55 arterial roads, 130 secondary trunk roads, and 879 laneways, which individually occupy one third of traffic roads in the district. The green coverage rate is 28%. There are 133 schools. The 90% are covered by Community Public Health Service. There are 2449 households with 5457 persons receiving subsistence allowances. In 2012, the regional GDP has reached the 29.3 billion RMB, with the year-on-year growth of 17.87%. The fiscal revenue reached the 2.263 billion RMB with year-on-year growth of 33.9%. The total retail sale of consumer goods is 19.8 billion RMB with year-on-year growth of 19.2%. The average annual net income of Farmers and herdsmen in 2012 is 9354RMB.

(2) Shayibake district

Shayibake district is one of the central districts in Urumqi, which locate in the west of Urumqi. In the east it is neighboring with Tianshan district and shuimogou district with the interval of Hetan road. In the west it adjoins the Xinyi road and New urban

district. The total area of the district is 427km² including the build-up urban area of 25 km². Until 2012, there are total 12 sub-district offices and 150 community residents committees in Shayibake district, where lived 38 minorities as Han, Uygur, Hui, Kazak, Mongolia, Kyrgyz, etc., The total population is 53.75 hundred thousand people, among which the 12.01 hundred thousand people is ethnic minorities occupy the 22.34% of the total population. The households receiving subsistence allowances have 4964 persons. There are 42 religious sites that include the 38 mosques and 3 Christians meeting places and 1 Taoism temples.

The Shayibake district has the convenient traffic condition and advanced communication. The advantaged geographical environment forms the good economic development base for the district. Lanzhou-Xinjiang railway and North-South Xinjiang railway as a part of Siberian Landbridge cover the whole district. The No. 321 national road, No. 216 national road, Turpan-Urumqi highway, Urumqi-Kuitun highway and other provincial roads, together with railways formed the traffic networks that can extend in all directions. The Shayibake district gathers the long distance bus passenger hubs, and most autonomous prefectures governments in Xinjiang together, which is the important district to show the whole Urumqi development and construction's achievement outside.

In recent year, the district strengthen the development of tertiary industry, explore the development of the secondary industry and adjust the development of primary industry. The regional integrated economy and non-public economies is strengthened, which make the economy of the district be developed in a big step and become the prosperous trading area in Urumqi. Currently there are 5 business areas, which individually regard the South railway station, Honghsan, Youhao, Beiyuancun and Xishan as the commercial center. The large markets with different focuses has Xinjiang commercial trade plaza, dehuizhiye, huochetou, Xinbeiguo chun market. For the 5 business areas, Youhao commercial road is the delegation, which together with the 2 entrepots named petty commodities center and Beiyuancun agricultural products selling center form the big commercial structure. The scale of above commercial structure has been deeply developed. Now there are 94 markets, among which 14 markets' sale revenue has surpassed 1 hundred billion RMB. The 14 markets occupy one third of Xinjiang markets that own sales revenue of more than 1 hundred billion RMB. It becomes the important economic support for Urumqi markets and regional economy development. In 2012, it realized the regional GDP of 25.168 billion RMB and 1.578 billion RMB of fiscal revenue. The total retail sale of consumer goods is 2.361 billion RMB. The average annual net income of Farmers and herdsmen in 2012 is 9798 RMB.

(3) New urban district

New urban district is one of the central districts in Urumqi, which locate in the northwest of Urumqi. The total area of the district is more than 300km². Until 2012, there are total 4 towns, 1 county, 13 sub-district offices, 23 villages, and 127 community residents committees in the district, where lived 38 minorities as Han, Uygur, Hui, Kazak, Mongolia, Kyrgyz, etc., The total population is 55.62 hundred thousand people, among which the 11.53 hundred thousand people is ethnic minorities occupy the 20.73% of the total population. The households receiving subsistence allowances have 2852 persons.

New urban district is newly developed in recent years. There locate 2 industrial parks, 500 governmental branches(National government, Xinjiang government, Army, Armed forces, production and construction corps,etc.) , 20 scientific research institution(CAS Xinjiang branch, Xinjiang academy of Social Sciences, Xinjiang finance University), 33 colleges, 43 companies listed on the top 500 companies and 8000 companies with independent legal representative. The district is also the intensive high-tech area. The Urumqi Airport in the district is the biggest goods distributing center in Xinjiang. The Urumqi north station goods yard locates here. The district is the import traffic hub in Xinjiang to connect the Asia, Europe and Middle East. There are 67 religious sites that include the 67 mosques and 4 Christians meeting places. In 2012, it realized the regional GDP of 68.652 billion RMB with year-on-year growth of 20%, and 5.122 billion RMB of fiscal revenue with year-on-year growth of 53.1%. The total retail sale of consumer goods is 17.07 billion RMB. The average annual net income of Farmers and herdsmen in 2012 is 11368 RMB.

(4) shuimogou district

Shuimogou district is one of the 4 central districts in Urumqi, which locate in the northwest of Urumqi. The total area of the district is about 277.56 km². In the south it is neighboring with Tianshan district with the border of Hongshan road. In the west it adjoins the Shayibake district and New urban district with the border of hetan road. In the east and north it adjoin the Midong district. Until 2012, there are total 1 Rural affairs management office, 89 communities, and 6 villages in the district, where lived 29 minorities as Han, Uygur, Hui, Kazak, etc., The total population is 30.14 hundred thousand people, among which the 4.65 hundred thousand people is ethnic minorities occupy the 15.42% of the total population. The households receiving subsistence allowances have 2751 persons. There locate 900 public institutions, including Urumqi government, gym, museum, library, Nanhu people square and the hongshan hill as the symbol of Urumqi. The district combines the natural scenery and cultural landscape together. It is also the center of politic, culture and information in Urumqi. There are 29 religious sites that include the 26 mosques, 2 Christians meeting places and 1 Buddhism temples. In 2012, it realized the regional GDP of 13.277 billion RMB and 1.74 billion RMB of fiscal revenue. The total retail sale of consumer goods is 15.925 billion RMB. The average annual net income of Farmers and herdsmen in 2012 is 10131 RMB.

(4) Toutunhe district: In January of Year 2011, Xinjiang government decided to combine the Urumqi economic and technological development zone set up in 1994 with Toutunhe district set up in 1961. After combination, the district is named Toutunhe district.

Toutunhe district locate in the northwest of Urumqi. The total area of the district is about 480 km² with the build-up area of 133 km². In the east it adjoin Urumqi high speed railway hubs, in the north it is neighboring with Urumqi Airport. There locate the biggest Goods storage and transportation station in Xinjiang, and the container distribution hubs that is under construction. The highway of Urumqi-Changji and Urumqi-Kuitun go through the district. that bring the traffic convenience.. Until 2012, there are totally 9 sub-district offices, 1 village and 69 community residents committees in the district, where lived 29 minorities as Han, Uygur, Hui, Kazak, etc., The total population is 23.02 hundred thousand people, among which the 5.18

hundred thousand people is ethnic minorities occupy the 22.5% of the total population. The 1074 persons received subsistence allowances.

There locate 3800 registered companies, including 588 key enterprises and 126 big companies with certain scale, 40 foreign companies, and 17 companies listed among world top 500, and 30 companies listed in the domestic top 500. There are 3 supporting industries like metallurgy, wind farm, food and beverage, and 4 leading industries like motor vehicle production, machineries production, New building materials and the Logistics. There are also the four new industries like coal chemical industry, IT, biological medicine and Logistics. The development target is to build the seven bases as domestic biggest wind power facilities production base, the biggest metallurgical industrial base in northwest of China, the new automobile and machinery production base in northwest of China, the biggest food and beverage production base, the Xinjiang intelligent commercial base, the Asia and Europe export-import logistics base, the Asia and Europe IT base. In 2012, it realized the regional GDP of 34.004 billion RMB with year-on-year growth of 32.3%, and 4.717 billion RMB of fiscal revenue with year-on-year growth of 27.5%. The total retail sale of consumer goods is 2.74 billion RMB. The average annual net income of Farmers and herdsmen in 2012 is 10380 RMB.

(6) Midong district

In 2007, Xinjiang government decided to combine Hui Autonomous Prefecture of Changji into the Urumqi. After combination, the former Changji Autonomous Prefecture is officially named Midong district in 1st Aug., 2007, which mean the start of integrated economy development for both area after combination. Midong district is approved to be the sub-center of Urumqi, the biggest manufacturing base's core area in Xinjiang, the important chemical industry city, the important export processing base in Xinjiang, green food base and the important ecological district of Urumqi. Midong district locate in the northeast suburb of Urumqi, which is 15km away from the center of Urumqi. In the east it adjoins Fukang city. In the west it adjoin the Changji city, wujiaqu city and Urumqi County. In the north it is neighboring with Fuhai county. The total area is 3407.42 km² with the built-up area of 40 km². Until 2012, there are totally 2 country, 5 towns, 6 sub-district offices, 81 villages and 53 community residents committees in the district, where lived 42 minorities as Han, Uygur, Hui, Kazak, etc., The total population is 27.43 hundred thousand people, among which the 9.17 hundred thousand people is ethnic minorities occupy the 33.43% of the total population. The 1873 persons received subsistence allowances in 2012.

The natural resources is abundant with 20 types in Midong district, including the coal, siderite, limestone, fossil oil, argil, quartz sand and mirabilite, etc. Midong district is listed in the top 100 mining area in China. The district is close to Urumqi airport, and all the railway stations lies within 20km away from the district. So the district has its regional advantages. No. 216 national road, dahuangshan railway and Shihua railway go through the district. The district is also the intersection of Turpan-Urumqi high speed railway and Urumqi-Kuitun high speed railway. The roads in the district tend in all directions. The district is the important hub to connect other prefectures in north of Xinjiang.

The integrated economic development brings the opportunities to Midong district. In 2007, the rapid growth of economy makes Midong step into the new developing period. In 2007, it realized the regional GDP of 9.824 billion RMB and 0.592 billion RMB of fiscal revenue. In 2012, it realized the regional GDP of 24.002 billion RMB with year-on-year growth of 33.3%, and 2.496 billion RMB of fiscal revenue with year-on-year growth of 78.3%. The proportion among the tertiary industry, the secondary industry and primary industry is 3:74:23. The total retail sale of consumer goods is 3.497 billion RMB. The average annual net income of Farmers and herdsmen in 2012 is more than 10000 RMB that is almost the same level with Urumqi central urban area.

The industrial economy in Midong district is mainly depending on the industrial park's development. Currently there are chemical industrial park and Ganquanbao industrial park. Based on the development of industrial park, the chemical industry, building material, machinery production, coal industry, agricultural byproducts processing and paper manufacturing and packaging industry keep a continuous development. For agricultural industry in Midong district, there already has the biggest furs and wools distributing centre in Xinjiang, waste and old materials distributing centre, second-hand car trading centre and new car purchasing base. Its tertiary industry gains the rapid development. The initial scale of cotton logistics area, Hualin slabstone and stone trading area has been formed. The tourism has the support of tianshan forest park, Ximenzi touring area, dongdaohaizi desert tourist area and country yards tourism.

The urban infrastructure and supporting facilities has been developed continuously in Midong district. The northwards expansion work has been executed, and new-built or reconstructed the Midong road, wenhua road, jinhexi road the oil chemical plant's front road. The reinforcing works also has been done among yongfeng alley, mingyuan alley, hongguangshan alley and other alleys. Newly build the drainage pipeline, heat supply pipeline, and urban sewage treatment plant, and strengthen the urban ecological landscape development. The urban function in Midong district is improved continuously which give the district a brand new image.

The people's livelihood protecting system is gradually development in Midong district. People's living standard has been improved. The employing policy has been carried out completely. The employing service system has been developed in labor market as the core unit. The registered unemployment rate is controlled within 3.8%. Steadily promote the coverage of pension insurance, medical insurance, unemployment insurance, employment injury insurance and maternity insurance. The covering range of social insurance keeps enlarging.

Carry out the system of subsistence allowances for the urban poor completely following the principle of "give all the people who deserve". Carry out the policy of veteran benefit and placement and give the subsidy to ex-servicemen for finding job. Promote the residential condition and build the earthquake proof dwelling house. Build and repair the house for the poor in rural area. Help and support the poor, the governmental institutions and enterprises should help the indicated the poor people's living and working. Make the urban and rural digital television realize the 99% coverage rate. Execute the compulsory education in rural areas with the county management-oriented and educational appropriations guarantee system, and carry out

the policy of “two free and one subsidy”, for the students in rural and husbandry area, the free education will be made. The Medical and health infrastructure and Tertiary disease prevention and health care network will be improved furthermore, push the development of the new cooperative medical service in agricultural and pastoral areas with participation of 90%. The emergency control for public health event as SARS and HPAI will be made. Carry out the policy regarding the population growth and family planning. guarantee the policy coincidence rate of more than 99.8% for new birth.

Table 4.2-3 Main social and economic index of project districts in 2012

Index	Tianshan district	Shayibake district	New urban district	shuimogou district	Toutunhe district	Midong district
Total area(km ²)	171	422.5	262.52	277.56	275.59	3407.42
Household number	185369	176600	183311	98287	816444	96792
Population (hundred thousand people)	57.62	53.75	55.62	30.14	23.02	27.43
Nonagricultural population percentage (%)	81.1	84.76	69.2	64.63	77.8	54.3
Ethnic minorities proportion (%)	37.94	22.34	20.73	15.43	22.5	33.43
Regional GDP (10 ⁶ RMB)	293	251.68	686.52	132.77	340.04	240.02
Companies with certain scale	15	22	78	18	111	89
Sowing area(hectare)	1902	1103	8920	820	8617	18974
amount of livestock on hand (10 ⁴)	1.68	0.31	3.69	2.27	10.60	19.81
per capita net income of farmers and herdsmen (RMB/Year)	9354	9798	11368	10131	10380	10602
persons received subsistence allowances	5457	4964	2852	2751	1074	1873
floating population	106866	74543	124072	97062	46221	16928

Sources from: 《Year 2013 Urumqi Municipal Statistics》

4.2.3 Infrastructure construction

4.2.3.1 urban traffic road infrastructure

Until the end of 2012, the total length of urban road is 1739.62km with 2225.18*10⁴ of road area. The road area per capita is 7.45km². The individual proportion of high way, arterial road, secondary trunk road and branch is 1: 1.9: 1.5: 5.5 in Urumqi, which still different from the benchmark standard of 1: 2: 4: 7~8. At the same time, the secondary trunk road and branch's traffic capacity is not enough due to its poor road condition and low service level, etc.

4.2.3.2 Public transportation's development in Urumqi

(1) Public bus

There are 3914 buses in Urumqi, which equal to 4228 PCU(Passenger Car Unit). The per capita PCU for per hundred thousand people is 16, which comply with the national standard of 11 PCU for 10⁴ people in megacity. But it can not fulfill the local standard's requirement as 18PCU/10⁴ people.

(2) Bus station and coverage rate

There are 1884 bus stations in Urumqi, including the 288 opening Harbor-style bus stations, 227 isolating Harbor-style bus stations and 1369 non Harbor-style bus station. Among all stations, 116 BRT stations and 165 NBT (Normal Bus Transit) stations are equipped the bus shelter, the minimum spacing between stations is 292m, and maximum spacing between stations 1980m, the average station spacing is 587m that is superior to the normal standard value.

Within the 300m area, the bus station coverage rate in Urumqi can reach 49.0%. Within the 500m area, the bus station coverage rate in Urumqi can reach 77.4%. Those values do not reach the international standard regulated individually for more than 50% and 90%.

4.2.3.3 Intelligent system's development in Urumqi

In Urumqi, the traffic guidance center in the city traffic police detachment, the bus dispatching and command center, hongshan IC card data management system and Taxi dispatching and command platform has been built up.

(1) The traffic guidance center in the city traffic police detachment has the function of traffic video monitoring, traffic violation management, and initial traffic guidance, etc.

(2) The bus dispatching and command center has been equipped with GPS intelligent traffic dispatching system, 3G video monitoring system on bus, which basically have the initial capacity for safeguarding the buses' normal operation of service.

(3) All public buses has been installed the POS equipment. Hongshan IC data center can collect and analyze the related information. Next step, such function will be applied among the taxis, subway and parking lots.

(4) The Taxi dispatching and command platform has been built by the Urumqi Passenger Transport Unified Management Office and Urumqi urban traffic investment company. The main functions of the center are vehicle-mounted GPS information's collection and taxi management.

(5) The traffic model and data base, parking lots management system and the traffic transportation management system has been built up jointly by municipal construction committee, urban management committee and traffic transportation management committee.

4.3 cultural relic and religious venue

There is no cultural relic under the projed along the project site. but there are 4 mosques within 200m near the project site, which individually are Xidaqiaobei mosque, heishantou mosque, Kaziwan mosque in Midong district and Islam jingwen school Mosque. During the construction, there is no any displacement or interruption on above 4 mosques. During the EIA team's site visit, the communication has been made and the related suggest from the stakeholders of Mosques has been adopted in this EMP.

(1) Xidaqiaobei mosque

The mosque locates in the No.165 of Northwest road, which is moved from the

Xinhua printing plant of Xidaqiao area in 1998. The mosque has 3 floors with more than 1000 m². Most inhabitants who go to mosque to do the religious activities are the Hui minorities and Uyghur who do business nearby. Most of them is the floating population that is 60 to 70 people in normal day and 500 people in Jumah Day.

(2) Heishantou mosque

The mosque locates in the Jinfengyuan community, which is under the administrative management of shiyouxincun Sub-District Office in new urban district.. The mosque belongs to Hui minorities. Every day there are 20 people coming to the mosque. in Jumah Day there are almost 300 hundred people, among which 80% is Hui minorities , the 19% is Uyghur and Kazak minorities. Some people coming to the mosque (ten or more) are the foreign people who do business in the nearby machine and electricity market. During the two important religious festival, there are almost 600 people.

(3) Midong district kaziwan mosque

Kaziwan mosque is set up in 1989, mainly for the Muslim near the Kaziwan area. According to the introduction of Mafucheng imam in mosque, there are more than ten people here and 300 to 400 people in Jumah, among which the age's difference is relatively big. The young occupy one fifth and the senior occupy two third.

(4) Islam Jingwen mosque

The school is for training the Islam talents. According the school leader's introduction, the trainees is not fixed. Every 20 days, the school will organize the training class targeting for the imam in Xinjiang. Every training there will be about 200 trainees. The training will be made for 10 times during a year with 2500 trainees. The train will be intensive hold in the middle of March and December. It is the holiday from the last ten-day of December to the first ten-day period of March. Most of the trainee is Uyghur living in south of Xinjiang.

4.4 Compliance with relevant policy and plans

4.4.1 Urumqi urban development plan

4.4.1.1 Master plan

According to the Urumqi urban development maser plan(Year2012—2020), the great change on the urban space and function will be made. The construction of traffic infrastructure as road and railway will be quickened for improving the traffic condition in city and nearby area. The target is to develop the public traffic system as the main body, combining other traffic approaches, and actively push the construction of sidewalk and bicycle lane, finally to realize the integrated urban traffic system. This project belong to the construction of Urumqi urban development maser plan, which is the BRT development of 1st ring of urban road traffic system for the planning new city center's external traffic development.

4.4.1.2 Air pollution prevention and control in Urumqi

Currently there is no Air Pollution Control Plan in Urumqi, but the government has put forward the opinions on strengthening Air pollution prevention and control in Urumqi, including the target of developing the public traffic system as the main traffic transportation body, combining other traffic approaches, and actively push the construction of sidewalk and bicycle lane, finally to realize the integrated urban traffic

system. And preferentially develop the BRT with large traffic capacity on order to develop the green traffic system, optimize the urban functional layout and improve the urban traffic road plan.

The BRT No. 4, No. 6 and No. 6 branch in this project all comply with above policies with large traffic capacity, which can promote the green traffic development and reduce the air pollutant emission in Urumqi.

4.4.2 Urumqi public traffic development plan

The Urumqi public traffic development plan (Year 2012—2020) has the detailed developing plan for the Urumqi BRT, NBT station, public traffic hub, public transit exclusive way, taxi and public traffic information, ect.

4.4.2.1 BRT network's plan

Before 2020, it is planned to build 7 BRT lines with total length of 128.9km in Urumqi. The individual BRT line's function and routine can be seen in the following.

(1) The BRT No. 1 line pass by the Beijing road, xinyi road, youhao road, yangzijiang road, changjiang road, and finally reach the south railway station. The BRT No. 1 line mainly serves the traffic of Beijing road, youhao road the key passenger concentration area, strengthen the traffic efficiency among the new urban district, youhao road shopping street and south railway station.

(2) The BRT No. 2 line starts from Nanhu road and extends northward to Beijiao passenger public transit station, passing by Suzhou road, Yinchuan road, xibajiahu road, xinyi road, youhao road, guangming road, qingnian road and finally reaches the hongqiao hub. The BRT No. 2 line is the supplement of the rail transit and BRT No. 1 line, which strengthen the connection among the Beijiao passenger transit, youhao road commercial center and hongqiao area. At the same time, it covers the blank area that is not covered by the rail transit network in the future.

(3) The BRT No. 3 line starts from ergong high speed railway station and end at Santunbei station, passing by xinyi road, nanhu road, Xinhua road. Its branch passes by xinming road, jiefang road, shengli road and finally reaches the Santunbei station. The BRT No. 3 line is built mainly for the connection of Nanjiao passenger transit, old ruban core area, nanhu road administration center and ergong high speed railway station. The line covers the passenger flow's concentration area in Xinyi road.

(4) The BRT No. 4 line starts from beizhan road of west railway station, passing by Altay Road, Northwest road, lanxiuyuan xi street, youhaonan road, Xinhua road, santunbei road and finally reaches the Nanjiao passenger transit hub. The line covers the north-south passenger flow's concentration area in old urban area and strengthens the connection among the old urban area, north new urban area and Northwest area. At the same time, it covers the blank area that is not covered by the rail transit network in the future.

(5) The BRT No. 5 line starts from jingkai district and extends westward along

Xinyi road to hongqiao hub, passing by weixing road, kelamayi road, nanhu west road, nanhu east road. The line covers the north-south passenger flow's concentration area in old urban area and strengthens the connection among nanhu road administrative center and Jingkai district. At the same time, it covers the blank area that is not covered by the rail transit network on kelamayi road.

(6) The BRT No. 6 line starts from Midong passenger transit hub and extends southward to Beijiao passenger transit hub, passing by wuqi road, nanhu bei road. The branch is along wuqi road, passing by hebei road, weixing road, and finally reach Ergong high speed railway station. The line strengthens the connection among midong district, Urumqi related center and group, Ergong high speed railway station and Beijiao passenger transit hub. At the same time, it covers the blank area that is not covered by the wuqi road.

(7) The BRT No. 7 line starts from Xishan terminal and end at Beijiao passenger transit hub, passing by Xishan road, xihong road and nanhu road. The line covers the passenger flow's concentration area from xihong road to nanhu road and strengthens the connection among Xishan community, Urumqi related center and group, and Nanhu administrative center. At the same time, it brings the passenger flow for BRT No.7 line.

The BRT No. 4, No. 6 and No. 6 branch, Midong bus terminal, bus terminal in north square of high speed railway station in this project all belong to the BRT works of Urumqi public traffic development plan (Year 2012-2020). So the project comply with the governmental traffic development plan.

4.4.2. 2 Integrated public traffic hub development plan

There will be 9 hubs that can refer to following Table 4.4-1.

Table 4.4-1 Integrated public traffic hub development plan

Name	Location	Floor area(m ²)	Construction type	Service function
south railway station integrated hub	within south railway station	60,000	Existing land for the reconstruction of station	railway passenger transport, highway passenger transport (only for military), No.3 subway, BRT No.1 line, NBT, taxi, car
international airport integrated hub	Within Urumqi Diwobao International Airport	50,000	Existing land for building airport passenger depot	airport passenger depot, highway passenger transport, subway No.1 line, NBT, taxi, car
Gumudi Intercity integrated hub	Midong district Gumudi Intercity railway station	30,000	newly-built Intercity railway	Intercity railway, urban railway No.7 line, NBT, taxi, car
midong	southeast of	50,000	newly-built	highway passenger

passenger transit integrated hub	shangshahe overpass			transport,BRT No.6 line,NBT,taxi,car
ergong high speed railway station integrated hub	Within ergong high speed railway station	50,000	Newly-built the high speed railway station and passenger depot	railway passenger transport,highway passenger transport (ergong bus depot),Subway No.2 line,BRT No.3 and No. 6 line,NBT,taxi,car
Nanjiao passenger transit integrated hub	No.1 of Yanerwo road	70,000	Reconstruction and expansion	highway passenger transport, Subway No.1 line,BRT No. 3 and No.4 line,NBT,taxi,car
Beijiao passenger transit integrated hub	No.969 of nanhubei road	40,000	Reconstruction and expansion	highway passenger transport,BRT2/6/7 line,NBT,taxi,car
Nianzigou passenger transit integrated hub	No.49 of Heilongjiang road	50,000	Reconstruction and expansion	highway passenger transport,NBT,taxi,car
toutunhe passenger transit integrated hub	court of toutunhe district	50,000	Newly-built	highway passenger transport,NBT,taxi,car

Both south square of high speed railway station public transit hub and Beijiao passenger transport hub in this project belong to the BRT works of Urumqi public traffic development plan (Year2012-2020) . So the project comply with the governmental traffic development plan.

4.4.2.3 NBT station plan

It is planned to build 22 depot in Urumqi, including Toutunhe depot, kaiku depot, xishan depot, nanjiao depot, shangshahe depot, Midong depot, shuimogou depot, six markets depot, qidaowan depot, henanzhuang & sigong depot (PMP), liyuan parking lots, Sangongxiang PMP, fruit market PMP, wuyi farm PMP, sanping farm PMP, tougongxiang PMP, Xinhua south road PMP, yingbin road PMP, liudao wan PMP, wangjialiang PMP, ergong high speed railway PMP.

Both Sangong bus parking and maintenance places and Midong bus parking and maintenance places in this project belong to the BRT works of Urumqi public traffic development plan (Year2012-2020) . So the project complies with the governmental traffic development plan.

4.4.2.4 public traffic information platform's development

The development of traffic system intelligent dispatching platform has been put forward in Urumqi public traffic development plan (Year2012-2020) . The Component2-Municipal integrated public transportation information platform's development belong the above plan, which comply with the Urumqi traffic development plan.

4.4.3 Urumqi BRT system's development plan

According to Urumqi BRT system's development plan, 7 BRT lines and 2 branches with the total length of 150.8km will be developed to be the BRT traffic network with the total length of 118km.

The basic information of BRT No. 4 and No.6 line is like following:

BRT No. 4 traffic corridor: the route is like this, Xizhan terminal—beizhan road - Altay Road - Northwest road - lanxiuyuanxi street - xinhua road —santunbei road—nanjiao passenger transit hub. The total length is 25.5km. The line covers the north-south passenger flow's concentration area in old urban area and strengthens the connection among the old urban area, north new urban area and Northwest area. At the same time, it covers the blank area that is not covered by the rail transit network in the future.

BRT No. 6 traffic corridor: the route is like this, Midong passenger transit hub—wuqi Road - wenguang road - Beijiao passenger transit hub (branch route: hebei road —weixing road—ergong passenger transit hub). The total length is 11.4km, which include the 11.4km from hebei road to weixing road). The line strengthens the connection among midong district, Urumqi related center and group, Ergong high speed railway station and beijiao passenger transit hub. At the same time, it covers the blank area that is not covered by the wuqi road.

The BRT No.4, No.6 and No.6's branch in this project belong to the BRT corridor works of Urumqi BRT development plan (Year2012-2020) . So the project complies with the BRT traffic development plan.

5. Current Environmental Quality

5.1 Present situation of air environmental quality

5.1.1 Monitoring points

In order to make a full understanding of the air environmental quality in project site, the routine monitoring data publicized Urumqi municipal environmental protection bureau (EPB) from the 3rd to 9th May, 2014 has been introduced for this project's EIA. The 6 monitoring points individually are located in Midong district, No.74 Junior High school, No.31 junior high school, toll station, monitoring station and railway bureau, which basically covers the whole built-up area in Urumqi. See Figure 5.1-1

5.1.2 Monitoring results

The monitoring result for the ambient air quality along the project site is shown in Table 5.1-1.

Table 5.1-1 Urumqi routine air quality monitoring data statistics and assessment
unit: mg/m^3

Monitoring points	Monitoring date	Monitoring items				
		SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO
Midong district	3 rd May	0.03	0.044	0.191	0.051	0.853
	4 th May	0.026	0.038	0.201	0.059	1.237
	5 th May	0.023	0.04	0.17	0.034	0.855
	6 th May	0.022	0.028	0.123	0.036	0.839
	7 th May	0.009	0.022	0.107	0.017	0.562
	8 th May	0.008	0.019	0.403	0.036	0.527
	9 th May	0.017	0.016	0.205	0.024	0.548
No. 74 Junior High school	3 rd May	0.027	0.07	0.27	0.074	0.926
	4 th May	0.023	0.069	0.361	0.081	1.02
	5 th May	0.015	0.067	0.214	0.053	0.584
	6 th May	0.014	0.062	0.199	0.051	0.521
	7 th May	0.017	0.071	0.176	0.049	0.686
	8 th May	0.007	0.036	0.414	0.051	0.363
	9 th May	0.007	0.027	0.19	0.035	0.394
No.31 Junior High school	3 rd May	0.011	0.059	0.263	0.066	0.683
	4 th May	0.006	0.049	0.294	0.057	0.466
	5 th May	0.005	0.048	0.206	0.045	0.673
	6 th May	0.006	0.046	0.17	0.04	0.638
	7 th May	0.008	0.049	0.17	0.042	0.79
	8 th May	0.005	0.024	0.636	0.06	0.501
	9 th May	0.004	0.026	0.231	0.035	0.561
Toll booth	3 rd May	0.022	0.066	0.283	0.034	0.937
	4 th May	0.018	0.079	0.303	0.031	0.98

	5 th May	0.012	0.077	0.211	0.045	0.693
	6 th May	0.013	0.079	0.189	0.025	0.689
	7 th May	0.015	0.077	0.163	0.023	0.767
	8 th May	0.008	0.046	0.346	0.02	0.484
	9 th May	0.006	0.037	0.147	0.014	0.513
Monitoring station	3 rd May	0.03	0.077	0.207	0.061	1.123
	4 th May	0.02	0.078	0.28	0.068	1.386
	5 th May	0.014	0.058	0.231	0.036	0.812
	6 th May	0.014	0.052	0.111	0.033	0.682
	7 th May	0.017	0.062	0.125	0.038	0.867
	8 th May	0.006	0.037	0.295	0.042	0.599
	9 th May	0.007	0.031	0.138	0.026	0.554
Railway bureau	3 rd May	0.034	0.077	0.203	0.066	1.241
	4 th May	0.02	0.071	0.283	0.066	1.126
	5 th May	0.018	0.068	0.201	0.055	1.317
	6 th May	0.018	0.057	0.161	0.046	0.822
	7 th May	0.025	0.071	0.194	0.055	1.176
	8 th May	0.007	0.037	0.368	0.048	0.555
	9 th May	0.009	0.029	0.162	0.029	0.579

5.1.3 EIA of current air environment

The monitoring results on air environmental quality of Urumqi can be seen in Table5.1

Table 5.1-2 Urumqi ambient air monitoring results for regular monitoring factors
unit: mg/m³

Monitoring points	Items	SO ₂	NO ₂	PM ₁₀	PM _{2.5}	CO
Midong district	daily mean value	0.009~0.030	0.016~0.044	0.107~0.403	0.017~0.059	0.527~1.237
	Pi %	20	55	268	79	31
	Out of limits %	0	0	71.4	0	0
No. 74 Junior High school	daily mean value	0.007~0.027	0.027~0.070	0.176~0.414	0.035~0.081	0.363~1.02
	Pi%	18	88	277	101	26
	exceeding rate%	0	0	100	14	0
No.31Junior High school	daily mean value	0.004~0.011	0.024~0.059	0.17~0.636	0.035~0.066	0.466~0.790
	Pi%	7.3	73.8	424	88	20
	exceeding rate	0	0	100	0	0
Toll booth	daily mean value	0.006~0.022	0.037~0.079	0.147~0.346	0.014~0.045	0.484~0.98
	Pi%	15	99	231	60	25
	exceeding rate%	0	0	86	0	0
Monitoring station	daily mean value	0.006~0.030	0.031~0.078	0.111~0.295	0.026~0.068	0.554~1.386
	Pi%	20	98	197	91	35
	exceeding rate%	0	0	57	0	0
Railway bureau	daily mean value	0.007~0.034	0.029~0.077	0.161~0.368	0.029~0.066	0.555~1.317
	Pi%	23	96	245	88	33
	exceeding rate	0	0	100	0	0
EIA standard value		0.15	0.08	0.15	0.075	4.00

(note: P_i mean the maximum value with the rate of reaching the standard)

From above table, it can be seen that:

(1) The main pollutant in Urumqi is PM_{10} . According to the Grade 2 of Ambient Air Quality Standard (GB3095-2012), only 6 group of data among the total 42 groups of monitoring data in 6 monitoring points is not comply with the standard. The maximum P_i is 424%, the maximum exceeding rate is 3.24 times.

(2) The $PM_{2.5}$ in one day near the No. 74 Junior High school of Toutunhe district surpass the standard value for 0.01 times. For other monitoring points' data, they all comply with Grade 2 of Ambient Air Quality Standard (GB3095-2012).

(3) The NO_2 values in all monitoring points are all close to standard value, the maximum P_i is from 55%-99%, which comply with Grade 2 of Ambient Air Quality Standard (GB3095-2012).

(4) The P_i of SO_2 and CO is low, which comply with Ambient Air Quality Standard (GB3095-2012).

It can be judged from the 6 monitoring points' data, the mainly pollutant in EIA area is PM_{10} , $PM_{2.5}$ and NO_2 . The monitoring results show that PM_{10} commonly exceed the standard value due to the windy and dry weather in spring of Urumqi, which can result in the natural raised dust and floating dust. So the PM_{10} commonly exceed the standard value on site.

5.2 The surface water environment quality status and assessment

The main surface water body on site is Heping Channel, which often keeps a zero flow in recent years.

5.3 Acoustic environmental quality's present situation investigation and assessment

5.3.1 Current monitoring points

There are 12 acoustic environment sensitive points along the BRT4, 13 acoustic environment sensitive points along the BRT6, 10 acoustic environment sensitive points along the BRT6 branch, and 6 planned stations has been monitored in this EIA. See Figure 5.1-1.

5.3.2 Monitoring approach and date

Complying with the Environmental quality standards for noise (GB3096-2008), the monitoring at the acoustic environmental sensitive points has been made in Mar. 2013 by Urumqi jingcheng inspection technical company.

The monitoring requirements include: ① equivalent continuous A sound level L_{Aeq} ; ② Monitoring last two days, once in day and once at night, the monitoring should be not less than 20min every time; ③ The outdoors monitoring points in village residence

should be set 1m away the window of bedroom with the height about 1.2m.

Monitoring period: 28th March 2014 to 2nd April 2014

5.3.3 Monitoring result

The acoustic environment monitoring results can refer to Table5.3-1 to Table5.3-4.

Table 5.3-1 BRT4 acoustic environment quality monitoring results unit: dB(A)

No.	Acoustic sensitive points		Sampling time		Total traffic flow	Monitoring result dB（A）	Monitoring result's analysis
1	Taixi Huanyuan apartment		3.28	Day	1932	70.4	Over Type 4a limit value for 0.4db
				Night	217	57.6	Over Type 4a limit value for 3db
				Day	1932	57.2	Meet Type 2 standard
				Night	217	45.5	Meet Type 2 standard
			3.29	Day	1653	69.7	Meet Type 4a standard
				Night	229	56.9	Over Type 4a limit value1db
				Day	1653	56.8	Meet Type 2 standard
				Night	229	42.9	Meet Type 2 standard
2	Municipal No.32elementary school		3.28	Day	1758	53.5	Meet Type 2 standard
				Night	554	46.5	Meet Type 2 standard
			3.29	Day	1594	53.1	Meet Type 2 standard
				Night	554	46.4	Meet Type 2 standard
3	Municipal No.38Junior High school		3.28	Day	1382	58.1	Meet Type 2 standard
				Night	357	48.7	Meet Type 2 standard
			3.29	Day	1219	56.9	Meet Type 2 standard
				Night	357	47.8	Meet Type 2 standard
4	Xinhua south road community service center		3.28	Day	1369	71.2	Over Type 2 limit value for 11db
				Night	376	56.7	Over Type 2 limit value for 1db
			3.29	Day	1235	70.8	Over Type 2 limit value for 10db
				Night	376	56.4	Over Type 2 limit value for 6db
5	Urumqi Municipal No.5elementary school	School gate	3.28	Day	108	57.7	Meet Type 2 standard
				Night	——	49.7	Meet Type 2 standard
			3.29	Day	127	——	-
				Night	——	——	-
		Xinhua road	3.28	Day	1251	——	-
				Night	433	——	-
			3.29	Day	1324	58.9	Meet Type 2 standard
				Night	411	49.3	Meet Type 2 standard
6	Xinjiang oil institution apartment		3.28	Day	2982	69.0	Meet Type 4a standard
				Night	683	67.0	Over Type 4a limit value for 12dB
				Day	3389	52.5	Meet Type 2 standard
				Night	683	49.4	Meet Type 2 standard
			3.29	Day	2982	69.0	Meet Type 4a standard
				Night	683	67.9	Over Type 4a limit value for 12dB
				Day	2982	52.5	Meet Type 2 standard
				Night	683	49.4	Meet Type 2 standard
7	Aoxiang jinshan apartment		3.28	Day	3389	70.0	Meet Type 4a standard
				Night	1294	69.9	Over Type 4a limit value for 14db
				Day	3389	53.6	Meet Type 2 standard
				Night	1294	45.0	Meet Type 2 standard
			3.29	Day	2243	71.1	Over Type 4a limit value for 1db

			Night	534	65.7	Over Type 4a limit value for 12db
			Day	1770	57.9	Meet Type 2 standard
			Night	769	53.7	Over Type 2 limit value for 2db
8	Huifuyuan apartment	3.28	Day	3389	71.5	Over Type 4a limit value for 1.5db
			Night	1237	69.5	Over Type 4a limit value 14.5db
			Day	3137	45.5	Meet Type 2 standard
			Night	1237	45.2	Meet Type 2 standard
		3.29	Day	3074	71.1	Over Type 4a limit value for 11db
			Night	989	68.9	Over Type 4a limit value for 14db
			Day	3074	45.5	Meet Type 2 standard
9	Zhongshan hospital	3.28	Night	989	44.8	Meet Type 2 standard
			Day	2243	71.1	Over Type 2 limit value for 11db
		3.29	Night	534	54.7	Over Type 2 limit value for 4db
			Day	2173	71.1	Over Type 2 limit value for 11db
10	Municipal No.11 Junior High school	3.28	Night	610	65.7	Over Type 2 limit value for 15db
			Day	1770	57.9	Meet Type 2 standard
		3.29	Night	769	53.7	Over Type 2 limit value for 3db
			Day	2173	58.6	Meet Type 2 standard
11	Northwest road apartment	3.28	Night	833	54.6	Over Type 2 limit value for 4db
			Day	2273	55.4	Meet Type 4a standard
			Night	378	53.8	Meet Type 4a standard
			Day	2273	53.8	Meet Type 2 standard
		3.29	Night	476	48.3	Meet Type 2 standard
			Day	2273	71.5	Over Type 4a limit value 1db
			Night	378	55.4	Over Type 4a limit value 0.5db
			Day	2273	53.8	Meet Type 2 standard
12	Municipal No.46 Junior High school	3.28	Night	378	48.3	Meet Type 2 standard
			Day	3144	68.3	Meet Type 4a standard
		3.29	Night	476	52.2	Meet Type 4a standard
			Day	3144	54.2	Meet Type 4a standard
			Night	476	49.1	Meet Type 4a standard

Table 5.3-2 BRT6 acoustic environment quality monitoring results unit: dB(A)

No.	Acoustic sensitive points	Sampling time		Total traffic flow	Monitoring result dB (A)	Monitoring result's analysis
1	Xinjiang Islam jingwen school	4.1	Day	1669	53、8	Meet Type 4a standard
			Night	336	45.6	Meet Type 4a standard
		4.2	Day	1538	54.2	Meet Type 4a standard
			Night	312	44.9	Meet Type 4a standard
		4.1	Day	1428	51.0	Meet Type 4a standard

2	Jingwen school's apartment		Night	339	47.2	Meet Type 4a standard
			Day	1428	46.9	Meet Type 2 standard
			Night	339	43.4	Meet Type 2 standard
		4.2	Day	1379	51.4	Meet Type 4a standard
			Night	309	46.8	Meet Type 4a standard
			Day	1379	47.6	Meet Type 2 standard
			Night	309	44.1	Meet Type 2 standard
3	Hongguangshan apartment	4.1	Day	1458	59.8	Meet Type 4a standard
			Night	384	62.0	Meet Type 4a standard
			Day	1458	53.9	Meet Type 2 standard
			Night	384	49.2	Meet Type 2 standard
		4.2	Day	1388	67.5	Meet Type 4a standard
			Night	343	58.8	Over Type 4a limit value3db
			Day	1388	54.7	Meet Type 2 standard
4	Xianghewan apartment	4.1	Day	4506	56.2	Meet Type 4a standard
			Night	1546	43.3	Meet Type 4a standard
		4.2	Day	4365	56.9	Meet Type 4a standard
			Night	1363	43.4	Meet Type 4a standard
5	Corp jiangongshi No.4 high school	4.1	Day	4220	57.3	Meet Type 4a standard
			Night	1302	48.9	Meet Type 4a standard
		4.2	Day	4087	58.2	Meet Type 4a standard
			Night	1165	46.8	Meet Type 4a standard
6	Xinjiang chemistry school	4.1	Day	3830	58.2	Meet Type 4a standard
			Night	403	50.2	Meet Type 4a standard
		4.2	Day	3784	57.6	Meet Type 4a standard
			Night	332	49.6	Meet Type 4a standard
7	Xinjiang foreign trade school	4.1	Day	3642	56.6	Meet Type 4a standard
			Night	994	48.9	Meet Type 4a standard
		4.2	Day	3532	57.3	Meet Type 4a standard
			Night	903	49.7	Meet Type 4a standard
8	Milan xiaozhen apartment	4.1	Day	2087	69.9	Meet Type 4a standard
			Night	1220	63.5	Meet Type 4a standard
			Day	2087	52.5	Meet Type 2 standard
			Night	1220	52.4	Over Type 2 limit value for 2.5db
		4.2	Day	1996	59.8	Meet Type 4a standard
			Night	1111	63.8	Meet Type 4a standard
			Day	1996	53.7	Meet Type 2 standard
			Night	1111	52.5	Meet Type 2 standard
9	Municipal No.108Junior High school	4.1	Day	2224	55.4	Meet Type 4a standard
			Night	886	48.0	Meet Type 4a standard
		4.2	Day	2233	54.3	Meet Type 4a standard
			Night	823	84.1	超标 4a 类 14db
10	Huijin apartment	4.1	Day	2058	60.6	Meet Type 4a standard
			Night	780	60.3	Over Type 4a limit value5.3db
			Day	2058	50.7	Meet Type 2 standard
			Night	780	46.7	Meet Type 2 standard
		4.2	Day	2159	60.8	Meet Type 4a standard
			Night	818	60.8	Over Type 4a limit value5.8db
			Day	2159	51.5	Meet Type 2 standard
			Night	818	46.1	Meet Type 2 standard
	Urumqi No.97	4.1	Day	2280	57.8	Meet Type 4a standard

11	elementary school		Night	678	46.5	Meet Type 4a standard
		4.2	Day	2137	57.3	Meet Type 4a standard
			Night	609	46.9	Meet Type 4a standard
12	Midong district People hospital	4.1	Day	2400	52.8	Meet Type 4a standard
			Night	948	47.4	Meet Type 4a standard
		4.2	Day	2137	57.3	Meet Type 4a standard
			Night	609	46.9	Meet Type 4a standard
13	Baihemingyuan apartment	4.1	Day	1806	65.1	Meet Type 4a standard
			Night	834	61.3	Over Type 4a limit value6.3db
			Day	1806	56.0	Meet Type 2 standard
			Night	834	45.5	Meet Type 2 standard
		4.2	Day	1822	65.2	Meet Type 4a standard
			Night	903	61.6	Over Type 4a limit value6.6db
			Day	1822	52.1	Meet Type 2 standard
			Night	903	45.3	Meet Type 2 standard

Table 5.3-3 BRT6 acoustic environment quality monitoring results unit: dB(A)

No.	Acoustic sensitive points	Sampling time		Total traffic flow	Monitoring result dB (A)	Monitoring result's analysis
1	Xinjiang information engineering school	3.28	Day	4386	52.5	Meet Type 2 standard
			Night	498	49.6	Meet Type 2 standard
		3.29	Day	3926	51.7	Meet Type 2 standard
			Night	482	50.1	Over Type 2 limit value for 0.1dB
2	Hexingjiayuan apartment	3.28	Day	4434	62.6	Meet Type 4a standard
			Night	678	58.4	Over Type 4a limit value3.4db
			Day	4434	57.6	Meet Type 2 standard
			Night	678	47.5	Meet Type 2 standard
		3.29	Day	4334	62.1	Meet Type 4a standard
			Night	594	57.7	Over Type 4a limit value2.7dB
			Day	4334	56.7	Meet Type 2 standard
			Night	594	47.3	Meet Type 2 standard
3	North campus Xinjiang teacher university	3.28	Day	3198	54.1	Meet Type 2 standard
			Night	462	53.0	Meet Type 2 standard
		3.29	Day	3075	53.7	Meet Type 2 standard
			Night	428	53.7	Meet Type 2 standard
4	Boyuan yuan apartment	3.28	Day	2088	63.2	Meet Type 4a standard
			Night	300	56.6	Over Type 4a limit value1.6db
			Day	2088	50.8	Meet Type 2 standard
			Night	300	42.7	Meet Type 2 standard
		3.29	Day	2017	62.4	Meet Type 4a standard
			Night	276	56.2	Over Type 4a limit value1.2db
			Day	2017	51.4	Meet Type 2 standard
			Night	276	42.1	Meet Type 2 standard
5	Kangcheng guoling apartment	3.28	Day	2496	68.8	Meet Type 4a standard
			Night	408	63.6	Over Type 4a limit value8.6db
			Day	2496	56.8	Meet Type 2 standard
			Night	408	41.7	Meet Type 2 standard
		3.29	Day	2644	68.2	Meet Type 4a standard
			Night	376	63.8	Over Type 4a limit value8.8db
			Day	2644	56.1	Meet Type 2 standard
			Night	376	41.9	Meet Type 2 standard
6	Xinjiang supply	3.28	Day	2004	59.8	Meet Type 2 standard

	and marketing school	3.29	Night	648	56.2	Over Type 2 limit value for 6.2dB
			Day	2056	59.3	Meet Type 2 standard
			Night	615	55.3	Over Type 2 limit value for 5.3dB
7	Duzhou Chinese medicine hospital	3.28	Day	2514	62.4	Over Type 2 limit value for 2.4dB
			Night	1152	62.0	Over Type 2 limit value for 12.0dB
		3.29	Day	2518	62.9	Over Type 2 limit value for 2.9dB
			Night	1132	62.4	Over Type 2 limit value for 12.4dB
8	No.83Junior High school	3.28	Day	1434	64.7	Over Type 2 limit value for 4.7dB
			Night	588	61.4	Over Type 2 limit value for 11.4dB
		3.29	Day	1452	64.2	Over Type 2 limit value for 4.2dB
			Night	1370	61.9	Over Type 2 limit value for 11.9dB
9	Shijimingyuan apartment	3.28	Day	1884	64.0	Meet Type 4a standard
			Night	756	60.9	Over Type 4a limit value5.9db
			Day	1884	55.3	Meet Type 2 standard
			Night	756	45.3	Meet Type 2 standard
		3.29	Day	1803	62.7	Meet Type 4a standard
			Night	1620	60.3	Over Type 4a limit value5.3db
			Day	1803	55.7	Meet Type 2 standard
			Night	1620	45.7	Meet Type 2 standard
10	Jinyang weixing apartment	3.28	Day	1452	63.1	Meet Type 4a standard
			Night	576	61.4	Over Type 4a limit value6.4db
			Day	1452	57.3	Meet Type 2 standard
			Night	576	45.8	Meet Type 2 standard
		3.29	Day	1475	63.7	Meet Type 4a standard
			Night	1553	60.8	Over Type 4a limit value3.1db
			Day	1475	57.1	Meet Type 2 standard
			Night	1553	45.9	Meet Type 2 standard

Table5.3-4 Acoustic environment quality monitoring results in stations unit: dB(A)

No.	Stations	Day	Night	Monitoring results	Noise sources
1	High speed railway hub	62.6	52.1	Day: 2.6 dB above type2 standard Night: 2.1dB above type2 standard	Construction noise of Ergong high speed railway station
2	Beijiao hub	68.1	53.9	meet Type4a standard day and night	traffic noise
3	Sangong bus depot	45.0	41.2	Meet type 2 standard	noise of social activities
4	Midong bus depot	51.4	43.0	meet Type2 standard	noise of social activities
5	Midong bus terminal	41.9	40.3	meet Type2 standard	noise of social activities
6	Bus terminal in high speed railway station	61.4	57.5	Day: 1.4dB above type2 standard Night: 2.5dB above type2 standard	Construction noise of Ergong high speed railway station

7	BRT 1 station of south railway	70.0	62.9	Day:meet Type4a standard Night: 7.9dB above type4a standard	traffic noise
8	BRT2 station of Yinchuang road	69.7	48.9	meet Type4a standard day and night	traffic noise

5.3.4 EIA for current Acoustic environmental quality

According to Table 5.3-1 to 5.3-3, the EIA conclusion for Acoustic environmental quality on site is like the following:

(1) For the 3rd floor or above of the building along the project construction site applied the type 4 Acoustic environmental standard, the noise level can meet the standard in daytime. But at night several monitoring points' noise level exceed the standard, the excess noise above the standard can maximally reach 15.0dB,

(2) For the 3rd floor or above of the building beside the project construction site applied the type 2 Acoustic environmental standard, the noise level can meet the standard in daytime. At night most monitoring points' noise level meet the standard; only few exceed the standard with the maximum level of 6.0dB over the standard value. The school and hospital applied the type 4 Acoustic environmental standard, the noise level exceed the standard with the maximum level of 11.9dB over the standard value.

It can be seen from the monitoring results in Table5.3-4 that the noise level in planed high speed railway station and terminal will occasionally exceed the standard value with the maximum level of 2.6dB over the standard value due to the construction noise's impacts. Due to the traffic noise impacts, the BRT1 station in the south railway station exceed the standard value with the maximum level of 7.9dB over the standard value at night. For other stations, the noise level can all meet the related Type 4a and Type 2 standard.

5.4 Ecological environment situation

5.4.1 Ecological functional zoning

For the Ecological functional zoning for project site, it belong to Urumqi city and Suburban agricultural function zone. The main ecological service function are human settlement, commercial trading and tourism.

The administrative division for the project site is belonging to Urumqi city. It is less rainfall and dry. The water resource is in shortage. The water for agricultural irrigation is mainly from Urumqi River and urban sewage with high utilization rate of water resources. The main ecological issues on site are the serous air pollution, water pollution, less urban greening area, water shortage and soil degradation.

The ecological system on site is the urban ecological system.

The urban ecological system is formed to be a functional net structure, under the interaction of surrounding creatures and a biotic environment. It is also an artificial system, due to the human beings keep changing and adapting the natural environment. So the ecological system is made up by natural system, economic system and social system. In the region that project locate, there are less wild animals due to the activities of human beings. And the ecological system is mainly formed by the urban

fringe, urban and rural residential areas, commercial trading area and urban gardening.

The pollution is easy to be produced on site due to the weakness of automatically adjusting capacity in natural system. In the past winter, the large amount of air pollutants worsens the regional air quality due to the coal heating supply. In recent years, the air quality is improved after execution of air pollution prevention and control measures in winter.

5.4.2 Soil environmental survey and assessment

The main originated soil type in Urumqi is the desert grey soil, which is formed during the formation of alleviation plain flooded by the Urumqi River. The character of the soil is the deep, thick and slight salination. Due to the urban construction and development, there mainly are the hard road pavement and artificial green land for most road surface of urban area. The distribution of soil types can refer to Figure5.4-1.

5.4.3 The current land utilization

According to the design and site survey, the project will be built along the existing road and will not concern the new land occupation. The current land utilization type along the project belong to the urban land.

5.4.4 The vegetation environment survey and assessment

Along the road related with the project, there is the city block and no distribution of natural vegetation. And the vegetation is mainly the artificial vegetation like the street trees.

5.4.4.1 Street trees

According to the site survey, the roads related with the project area all the arterial roads with intensive buildings along the road. The street trees are distributed continuously along the single side of the road. The main species of street trees are Chinese ash, *Acer negundo*, lombardy poplar and elm with the average DBH(Diameter at Breast Height) of 15~30cm. In some roads, there distribute the green belt with the plantation of Xinjiang honeysuckle, *Ulmus pumila* and lawn.

5.4.4.2 Public green land

The distribution of public green land and forest land can refer to Table5.4-1.

Table 5.4-1 Distribution of vegetaton and green land along the road concerning the project

Type	Items	Road section	Main vegetation	Remark
Street trees	BRT4 line, BRT6 line, BRT6 line's branch	Xinhua road, Youhao road, Altay Road Nanhu road, midong road, daoxiang road, Kashi road, siping road, hebei road, weixing road	<i>Ulmus densa</i> , Chinese ash	
Water park	BRT4 line	Xinhua road	poplar, willow and elm	Start of line
Urumqi zoo	BRT4 line	Xinhua road	poplar, willow and elm	West of line
People park	BRT4 line	Youhao road	maple, willow	South of

			and pipe	line
Hongshan park	BRT4 line	Youhao road	maple, willow and pipe	North of line
Zhizhushan park	BRT4 line	Altay Road	poplar, willow 和 elm	West of line
Hongguangshan Park	BRT6 line	midongnan road	poplar, willow 和 elm	East of line

5.4.5 Wild animals in project area

The roads along the project has been developed to be urban road with less specie and quantity of wild animals. The main animals are *Passer montanus*, *Montacilla cinerse*, *Ermophila alpestris*, and *Alauda arvensis*. The mus musculus is very common along the project and there are no endangered wild animal or rare species on site.

5.4.6 The urban ecological environment and landscape

The city is the human settlement place with the high intensity of population and advanced economic development, which is the complicated artificial ecological system combining society, economy and nature together. The landscape is the integrated feeling and description on the shape, color and structure of building and natural landscape through the human's vision.

The urban ecological system is formed to be a functional net structure, under the interaction of surrounding creatures and a biotic environment. It is also an artificial system, due to the human beings keep changing and adapting the natural environment. So the ecological system is made up by natural system, economic system and social system. In the region that project locate, there are less wild animals due to the activities of human beings. So the pollution is easy to be produced due to the weakness of automatically adjusting capacity in natural system.

Most urban roads along the BRT 4 and BRT 6 line's branch has been reconstructed with the new look, but due to the large traffic flow in the city, it still will be looked crowded. In addition, the green land is less and the tree species is single. So it will be looked like a relatively poor landscape. BRT 6 line manly pass by the rural-urban continuum, in which some commercial apartments has been developed, and the commercial trading activities is less relatively. So the renovating focuses on the landscape along the project site are strengthening the transition of landscapes and the succession of ecological landscape.

6. Environmental impact prediction during construction period

6.1 Social impact assessment

6.1.1 Impacts on public traffic

The project construction will adopt the fully enclosed traffic or side open traffic side enclosed for construction. Altogether the project construction is inconvenient for public traffic.

(1) Residences along project site

The intensive residences will be impacted by the traffic jam or crowded situation aroused by the construction. So the traffic diverging, detour or other temporary measure will be adopted. The bus route will be reallocated. All these bring inconvenience to inhabitants on aspects of public traffic, daily work and life. The inhabitants along the road have to make a detour to the reserved road or other crossings to destination.

2) The kindergarten and school along the project site

The construction will bring the inconvenience for the students during the process of going school and afterschool, especially for the students who live in kindergarten or the opposite houses towards school. The PMO think the most important thing during the construction is to guarantee the traffic safety for the teachers and students and keep the quiet study environment.

6.1.2 Impacts on traffic block

The impacts on bus firstly will result in the passengers loss, then directly reduce the bus operation revenue and bus staff's income, secondly, the passenger's inconvenient and delay aroused by the change of route and bus stops.

6.1.3 Impacts on cultural resources and religious activities

There are mosques along the project. The mosque and minority graveyard is the general religious places, which belong to cultural resources. During the construction, the related culture should be respected in avoidance of any impacts on local culture and guarantee the normal use of 4 mosques along the project.

Although there are no findings of any cultural relics, it is still hard to predict if there is any finding during the excavation works due to some road section located in the old urban area. . So once finding the relics during construction, all the construction activities should be stopped at once and report to the environmental staff on site. The staff should organize the protection for the relics on site and notice the related relic's management departments for further action.

6.1.4 Impact on commercial businesses

For mitigating the impacts on the commercial businesses along the project site, the construction will be made outside of the red line of the road, and the construction fence, the temporary access should also be equipped to guarantee the normal access of those commercial buildings. After above measures, the quantity of the customers

along the project site can not be reduced due to the construction to ensure the normal running of commercial activities along the site. In addition, the impacts of construction on commercial businesses is temporary, and lasted for a short period of time. Following the completion of the project construction, the related commercial businesses can be recovered as before. The temporary impacts can be accepted by the commercial tenants along the site.

6.2 Impacts assessment on urban ecological environment

6.2.1 Ecological environment impacts analysis during construction

Some construction works for this project have ecological environment impacts on the surroundings. Those construction works are Municipal integrated public transportation system's development and Public transportation supporting infrastructure's construction. The constitution for above project components are as the following table.

No.	Components	Sub item	Construction works
1	Municipal integrated public transportation system's development	Bus Rapid Transit	Build 3 BRT line with length of 51.7km, among which BRT 4 th line is 20.1km, BRT 6 th line is 18.1km, BRT 6 th line's branch is 13.5km;
2	Public transportation Supporting infrastructure's construction	public transit hub	2 public transit hubs, which individually are hub in south square of high-speed railway station, and south suburb passenger terminal
		Bus parking and maintenance place	2 Bus depot which are Sangong parking place, and Midong parking place
		Bus terminal	2 bus terminals which are Midong bus terminal and high-speed railway station North Square terminal

The road construction work has less ecological impacts on the surrounding. For the six station's construction within Public transportation supporting infrastructure's construction is the new construction work, which mainly generate the ecological environmental impacts from land occupation.

(1) Construction impacts analysis for greening works and vegetation

The 3 roads and the related carriage ways in Municipal integrated public transportation system's development will be replanned and divided. The greenbelt on both sides of the related road will be impacted during construction. There will be 49278 m² of greening area concerning the transplantation, which include the arbors, bushes and flowers. The trees removed and transplanted for the project mainly include the 5304 trees on both sides of road, which are mainly elm, poplar, willow, ash, or other species with the age scope of 5 to 20 years. There are no ancient or endangered trees within boundary of project site. Those arbors, bushes and flowers will be transplanted to Kangzhuang road, Minglian road and Zhongyi road. The transplanting work should be completed by the People's Park Unit to ensure the survival rate of above 95% for the transplantation, whom is assigned by the Urumqi Municipal

Afforestation Committee.

Due to drought and less rainfall in project area, the relative humidity is small, the dust pollution is serious. The dust raised in the construction will influence the grow up of the nearby natural vegetation. The dust blocks the pore on the surface of the leaves that influence the breath, photosynthesis and transpiration of plants. So the vegetation area will be reduced due to the construction, and the cover rate of plant will be lowed down, as well as the ecological system adjusting capacity. But all those impacts on vegetation is temporary, and will disappear after implementation of construction. During the construction, the frequent watering on site should be done to improve the humidity and reduce the dust pollution. For the temporary land occupation, the recovery and rebuild of ecological environment for that must be realized in time after implementation of construction.

After the implementation of project, the new green belts will be built. So only the temporary impacts on vegetations during construction, those impacts can disappear after the implementation of project. But the damage on current trees, sanitation and landscape will be impacted and damaged to a certain extent by waste water discharge, construction waste, the wheel crushes and tread on foot,

(2) Analysis of impacts on ambient environment from construction waste and abandoned earth

The abandoned earth of this project mainly comes from the cleaning of road surface. The inappropriate disposal for those wastes will influence the landscape on both sides of road. The abandoned earth and construction waste of the project will be delivered to the Urumqi construction waste landfill. There will be not negative impacts of abandoned earth in project area. On opposite, the positive impacts on local ecological environment will be produced by the project.

(3) Analysis of impacts on ambient environment from soil erosion and raised dust

The project is planned to be built in urban area with flat landform. Due to the higher fill of earth and less deep excavation, there is basically no soil erosion. But during the construction, the construction material such as earth, gravel, cement and clay, and the abandoned earth and material are stacked. In this process, there will be potential impacts on urban ecological environment due to the improper stacks under the flushing of rainfall. That will result in the drainage pipeline block that influences the traffic and city appearances.

If no prevention measures in the transportation of earth, gravel and cement, etc, the raised dust can be produced. The dust and dreg left by the transport vehicles will raise the dust pollution on road, greenbelt and residences along the project, as well as negative impacts on the urban sanitation.

In suburb, lots of dust will fall on the leaves of plants and the dust will influence the normal grow up of vegetation along the highway. Especially in the flowering phase, the fruit production will be reduced upon the dust impacts on bearing fruit. More close with the project site, more influences has on vegetation.

(4) Analysis of impacts on wild animals during construction

The project site locate in the urban built-up area, where have no wild animal except some common birds as tree sparrow, barn swallow and lark. The project construction may have impacts on their habitat. But due to the large number of the three kinds of birds and the high adaptability to the environmental change for them, the project

impact for them is limit.

(5) Analysis of impacts on urban landscape during construction

①There are certain demolish on few stores and houses along the road. So the related landscape will be damaged to some extent.

②The removal and replacement of public facilities is needed in this project, such as the part of pipeline for water supply, gas supply, heating supply and communication, etc. The old road pavement in the reconstruction works is also replaced. All these will have negative impacts on urban landscape.

③The excavation, stacking of earth and construction material, especially the stacking of abandoned earth, construction waste will influence the urban sanitation and landscape.

④The temporary building or the irregular parking of machinery for construction will have negative impacts on the ambient landscape.

⑤The protective guard and surround cloth for construction of BRT exclusive way will have negative impacts on the ambient landscape.

⑥The noise, dust, waste gas, construction waste or sewage discharge will pollute the ambient environment. The daily routine work in the companies, governments, and stores will be influenced by the construction activity. The related landscape will be impacted negatively.

6.3 Air impact analysis

The air pollution during construction period mainly includes the raised dust, suspended matters caused by load and unload and the gas produced in the process of bitumen mixing and heating. These pollutants possibly have negative impacts on the ambient air environment near the project construction site.

6.3.1 Raised dust analysis

During the construction, the dust was raised during the process of land leveling, subgrade excavation, pavement works, construction material transportation, load and unload, mixing, etc. Especially during the transportation of construction material and the process of construction works, such as concrete mixing, cement load, unload and feeding procedure, there are more dust pollution aroused.

① During the process of the subgrade excavation, land leveling and subgrade filling, large amount of earth and gravel are concerned. The big excavation area result in the demolishment of vegetation and loose soil. Once there is a windy day, the dust pollution will be aroused.

② The dust pollution can also be aroused by the leakage. Due to the improper way on transport, load and unload, storage of earth, gravel and cement, as well as the construction waste, such as abandoned earth, etc, the leak of those material can happen and make the dust pollution.

③ The dust leakage can be aroused during the processing of construction, such as the concrete mixing process. Especially during the process of lime soil mix, there is severe dust pollution. For this project, the related mix process will be taken charge by commercial mixing station.

④ The dust left during the process of transportation will produce the secondary pollution under the effect of wind or pass by of other vehicles. Those left dust exist on the construction site or nearby. The dust caused by the transportation occupies 50% of the total dust amount. Especially the lime transport lorry can arouse obvious dust pollution for the ambient environment on both sides of road.

Along the road concerning the project construction, there distribute many environmental sensitive points, such as stores, restaurants, schools and residences. The dust caused by the construction in this section can interrupt the daily life of local inhabitants. So the necessary environmental protection measures should be adopted, such as the dust guard board or periodically watering for reducing the dust pollution in local area.

6.3.2 Gas impact prediction and analysis for bitumen mixing place

During the bitumen processing, mixing and paving on the road, bitumen gas and other pollutant come out that has the negative impacts on ambient air quality. The maximum emission is produced in the refining process of bitumen. The toxic and harmful substances in the gas include THC, phenol and benzopyrene. At present recommended solutions for this gas pollution has been provided, which is equipped

the dust removal device in enclosed mixing process and transport the bitumen with high temperature resistant or Pyrogen free containers to project site. Then the emission density of bitumen gas will be lowered and meet the relevant limit in Integrated Emission Standard of Air Pollutants (GB16297-1996). The gas in the heating procedure of bitumen has the certain impacts on the environment, but the impact scope is limited.

6.4 Noise impacts analysis

According the FSR of the project, the project has 4 components, in which 3 component will have noise impacts. Those components are individually Municipal integrated public transportation system's development, Municipal integrated public transportation information platform's development, and Public transportation Supporting infrastructure's construction. During this EIA, the assessment will mainly be made on the Municipal integrated public transportation system's development.

6.4.1 Analysis of noise impacts during construction

The noise sources during construction mainly from the construction machinery and transport vehicles. Take the similar project as reference, the main construction machinery that the project concerned include Bulldozer, excavator, loading machine, land leveler, Concrete-mixer, roller, paver, etc. For the testing value of noise intensity of common construction machinery during construction, see Table 6.4-1.

Table 6.4-1 Testing value of noise intensity of main construction machineries unit: dB (A)

No.	machinery	model	Monitoring distance from noise source (m)	Maximum dB(A)
1	wheel loader	ZL40type	5	90
2	land leveller	PY160Atype	5	90
3	vibrating roller	YZJ10Btype	5	86
4	The double vibration roller	CC21type	5	81
5	three wheeled roller		5	81
6	rubber-tyred roller	ZL16type	5	76
7	Bulldozer	T140type	5	86
8	hydraulic wheel excavator	W4-60Ctype	5	84
9	paver (made in Britain)	Fifond311 ABG CO	5	82
10	paver (made in Germany)	VOGELE	5	87
11	Power engine (2 sets)	FKV-75	1	98
12	Impact drilling	22type	1	87
13	conical drum reversing Concrete-mixer,	JZC350type	1	79

Note: The monitoring data is collected on site during the construction machinery running with full load. Data from the Highway construction environment impact assessment standard

6.4.2 Analysis and prediction of noise impacts during construction

According the analogy comparison, the noise intensity of domestic usual machineries for road construction, which is tested from different distance during the machineries running with full capacity, is as following Table 6.4-2.

Table 6.4-2 Noise intensity of main construction machineries tested in different distance
unit: dB(A)

Machinery	measured value	10m	20m	30m	40m	50m
wheel loader	90	84	78	72	70	64
land leveller	90	84	78	72	70	64
vibrating roller	86	80	74	68	66	60
The double vibration roller	81	75	69	63	61	55
three wheeled roller	81	75	69	63	61	55
rubber-tyred roller	76	70	64	58	56	50
Bulldozer	86	80	74	68	66	60
hydraulic wheel excavator	84	78	72	66	64	58
paver (made in Britain)	87	81	75	69	67	61
Power engine	98	92	86	80	78	72
Impact drilling	87	81	75	69	67	61
truck	92	86	80	74	72	66
Concrete-mixer	91	85	79	73	71	65
concrete pump	85	76	70	64	62	56
vibrator	84	78	72	66	64	58

The noise intensity will be different among different machineries and different construction work. In the actual construction, the possible situation of many types of machinery working the same location can happen. The noise impact scope will be bigger than normal in such situation. There are acoustic environmental sensitive points within the 200m scope on both sides of road, such as schools, hospitals and residences, etc. Altogether the construction noise has negative impacts on the ambient environment.

6.5 Impacts on water environment

In the project construction site, there is only the Heping channel as the surface water body. The main impacts for the channel are from the flushing water for machineries and construction materials, and domestic sewage within construction site.

(1) The oil that runs, spilled, dropped or leaked from the construction machinery or the outdoor machines are flushed by rain water, all those can make the oil water pollution.

(2) The rainwater is mixed with grout, domestic sewage under the effect of surface runoff.

(3) The construction waste, abandoned earth and dreg contain large amount of pollutant and suspended particles, which will flow into the nearby water body under the effect of storm flushing or normal drainage of waste water during construction,

Above-mentioned waste water will flow into the Heping Channel, and impacts on the water body. So during the construction period, the environmental management must be strengthened, and reduce the emission of oil or other material, as well as the pollution for river. Once the pollution control and prevention measures in this EIA are adopted during project construction, the impacts from waste water on surface water

environment will be mitigated and reduced efficiently.

6.6 Solid waste impacts analysis

The solid waste mainly comes from the construction waste and working staff's domestic waste during construction. The construction waste are mainly from the waste during cleaning of road surface.

During Construction, large amount of slag earth and construction waste will be produced, including the solid waste like gravel and lime. The improper dispose for these solid wastes will result in the traffic jam and environmental pollution. During the transportation, the vehicles left the earth or slag along the road that will pollute the environment and influent the urban appearance and traffic. If the transport vehicles move in the urban road, that can result the big increase of traffic volume and traffic jam. The earth left on roads by the trucks will have negative impacts on urban environment and sanitation. The abandoned slag stacking without order and cover will result in the soil erosion once raining, as well as the block to municipal drainage pipeline. In addition the muddy water may contain some oil or construction material, which can pollute the water body.

Currently Urumqi construction waste landfill located in the north of urban area with 15km distance away from the city center. The landfill originally is abandoned gravel farm, with the length of 600 from north to north and 150m width from east to west. The capacity for the landfill is 2000000 m³, now 400000m³ has been filled. Now the landfill is taken charge by Urumqi municipal sanitation management department. There is a guard's room for enroll the accessed transport vehicles.

The domestic waste produced in each construction camp is estimated to be 9.6t based on the statistics of 1kg/person, 80 total staffs and 4month construction period. It can be judged from that the domestic waste amount is small. But without care and related management, this small amount of domestic waste also can attract the flies, etc. and result in the environmental pollution. So garbage bin should be temporarily placed on construction site for periodically waste transport.

Urumqi domestic waste sanitary landfill has been built in Xishan Dafugou area. The landfill capacity is 30,000,000 m³ with 20 years of service life., which can fulfill the disposal requirements of the domestic waste from the project.

6.7 Vibration impact analysis

The vibration mainly comes from piling works, subgrade engineering, compacting backfill works or truck moving.

The constructions for this project include the BRT and stations' construction. The subgrade improving works mainly include the compacting of sand and earth. The machinery for that is Vibratory Hammer. The vibration from truck moving mainly comes from the roller or diesel fuel vehicles. According statistic data from Japan's environment impact assessment manual, the vibration index for construction machineries are as following Table 6.8-1.

Table 6.8-1 vibration index for construction machineries unit: dB

Machinery	5m distance	10m distance	20m distance	30m distance
Vibratory Hammer	75	67	48	44
Roller	58	53	50	48

Diesel fuel vehicle	62	58	54	51
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For the Component named Public transportation Supporting infrastructure's construction, the related construction works is small with less number of machineries. So there will no intense vibration for nearby inhabitants. For this Component, the intensity of vibration from above machineries can meet the limit value for education and culture zone's requirements in 10m away from the vibration sources, which regulated in Standard of environmental vibration in urban area. They can also meet the standard for ambient environment on both sides of road.

7. Environmental impact analysis during operation period

7.1 Social impact assessment

7.1.1 Social benefits enhanced

(1) promote the Urumqi economic development

Following the development of economy in Urumqi, the urban area is enlarged continuously. So the infrastructure should be developed as the base for other career's development in Urumqi. The project is to promote the further economic development of Urumqi with the support of World Bank's IBRD loan. The project can enhance Urumqi urban competitive ability, and environment for attracting more foreign investment.

(2) Saving the travel time and promote the urban economic development

After the implementation of the project, the traffic efficiency can be largely enhanced in Urumqi and save the travel time for people. The more social output can be created during the time saved by the project.

(3) Following the development of public transport, more and more people will choose the bus at their traffic approach. Due to less ratio of bicycle and walking as traffic approach, more spaces can be saved on road for further plan or development. The whole efficiency of urban logistics can be enhanced for the promotion of urban economic development of Urumqi.

7.1.2 Improvement on life of quality

For the inhabitants who live along the project in the future, their traffic efficiency, safety, sanitation, shopping or others can all benefit from the project. The students go to school in a wider road with more safety than before. And the extension of bus route can give more convenience for students. The drivers or working staffs in the bus has a better working environment and safetyguard benefit from the project. The life of quality of inhabitants will be enhanced.

7.2 Urban landscape impacts analysis

The urban landscape is the combination of natural landscape, building landscape and cultural landscape. The coordination among the natural landscape, building, resources exploitation, economic development and ecological environment protection should be made for the orderly urban development. Then ecological system can be recycled in good manner. The soil erosion, traffic dust and noise can be reduced. After the implementation of the project, the related greening ratio along the bus depots and roads will be increased, and properly arranged. The greening work can improve the landscape along the project, and create a beautiful road appearance for public.

(1) People always judge a city's appearance from the first sight of the view along the road. Due to this project mainly concern the construction of arterial road and secondary trunk road, and all those roads mainly locate in the urban area. On both sides of road, there are cold high buildings and the street looked like narrowly under such background. People will feel depressed when walking on the seemed like narrow

street surrounded by so many high buildings. The green belt or vegetation can reduce such potential depression for the people. The green color with the blue sky as the background can make people have a good mood. So it is important for the greening works to improve views and the feelings of local inhabitants.

(2) The vegetation is the key factor for good appearance of the city. A good landscape can be made by different color, shape and species of trees matching with the road lights, flower beds and garbage bins.

(3) The green land in the city is a perfect decoration for the building along the road and the whole cities as well. At the same time, it fulfill the eager of the inhabitants on the demanding of green land.

In generalized, the proper allocation of green works after the implementation of the project will improve the appearance and beauty of city, as well as the good feelings for citizens.

7.3 Ambient air impacts

7.3.1 Ambient air impacts analysis in station

(1) Exhaust emission

After the project's completion, the exhaust emission from the public transit hub, depot and terminals have the negative impacts on the ambient air. The main pollutants are CO, THC and NO₂, which come from the exhaust emission, fuel evaporation in fuel tank and carburetor and the gas leakage in crankcase. The three pollution sources pollutants' proportion in total amount of pollutants can refer to the Table7.3-1.

Table7.3-1 Pollutants' proportion in total amount of pollutants produced in different vehicle parts

Pollution source	CO	NMHC	NO ₂
exhaust pipe	98-99	55-56	98-99
crankcase	1-2	25	1-2
fuel system	0	10-20	0

The pollutants are mainly generated from the process of vehicle's switching on and off, coming into and out of garage, as well as the driving in idle speed. If It is calculated as the 70% of Rate parking turnover, 2 times idle for per vehicle on average, 3 minutes for each idle, the related calculating results for the pollutants can refer to the Table 7.3-2.

Table 7.3-2 Pollutants from the exhaust emission from the stations

Item			CO	THC	NO ₂
Per vehicle (g/once)			8.25	2.34	0.02
Hubs	2000	g/d	16500	4680	40
		t/a	6.0225	1.7082	0.0146
depot	1500	g/d	12375	3510	30
		t/a	4.5169	1.281	0.01095
Terminals	900	g/d	7425	2106	18
		t/a	2.7101	0.7687	0.00657

In order to reduce the concentration of exhaust emission in the parking lots to protect the environmental quality, firstly the management should be strengthened, and dispatching the vehicle properly for reducing the excess exhaust emission due to the idle speed. Secondly the air blower system will be installed for strengthening the air exchanging in garage. In addition, the warning device will be installed. After those measures have been taken, the exhaust pollutants emission in parking lots and garage can meet the air pollutant emission standard (GB16297-1996) .

(2) Environmental impacts from the Organic solvent steam

The repairing and painting works in depot will have some certain negative impacts on the air and worker's health. The main occupational hazard for painting work is the organic solvent steam. All the paint is made by the resin, solvent, pigment, desiccant and additive. The normal paint use the gasoline as the solvent. The epoxy iron red shop primer contains few xylene, and the dipping paint contains mainly the methylbenzene. The nitrolacquer and its diluent contains a few benzene or methylbenzene. If the paint spraying work is made without any protection, the benzene concentration is high enough to damage the hemopoietic organ of the painting workers.

The painting fog formed during the painting works also damage the human health, in which the flexibilizer among the cellulose lacquer and alkyd paint have relative big toxicity. The acid fog produced from the rust removal work also strongly stimulate the eyes and Respiratory Mucosa.

The mitigation measures include the use of 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. It can apply the Jelly for medical purposes on the naked skin and hands, which can be washed after the painting work.

Realize the strong natural air exchange and partial mechanical ventilation. If the condition is mature, the isolated painting room and mechanical ventilation facilities should be equipped. The oil screen for removing the painting fog should be adopted at the same time. All these can avoid the hazards of toxic pollutants and painting fog for human health.

In the space that air ventilation is not good, the construction workers should wear the air supply mask and adopt the Intermittent Working Method. The labor protection should be strengthened. The workers should not wash hands with the benzene solvent, which can reduce the harmful gas's damage on human body.

The air impacts from painting works are mainly in the range of depot, which will have no serious negative impacts on regional ambient air. After the adoption of above mitigation measures, the impacts of organic solvent steam from repairing and painting works on the ambient air can be acceptable.

7.3.2 Ambient air impacts from vehicle exhaust

The BRT exclusive way's construction is based on the redivision of current road section. According to the traffic flow data, the traffic flow of the BRT and bus only

occupy 5% in total traffic flow. The exhaust pollution is mainly from the social small vehicles. The analogy analysis will be made on the monitoring data of ambient air quality along the current roads of Urumqi. The purpose for that is to predict the ambient air quality after the operation of BRT No. 4 and No.6 line.

The monitoring data collected for the analogy analysis are from the monitoring points of Jiujiawan point that is 10m away from the Xiwaihuan road, and railway bureau point that is 20m away from Beijing road. The two monitoring points locate on both sides of urban arterial road, which is set by the Urumqi monitoring station for emphasizing the analysis work on the traffic pollutant of NO_2 and CO with the reason that NO_2 and CO are the main pollutants of tail gas. Through the analogy analysis on the monitoring data of 7 monitoring points, the ambient air impacts from vehicle exhaust had been assessed as Table 7.3-1, Figure 7.3-1 and Figure 7.3-2

Table 7.3-3 6 monitoring points with analogy analysis of Jiujiawan NO_2 and CO

Monitoring data	NO_2 ($\mu\text{g}/\text{m}^3$)							CO ($\mu\text{g}/\text{m}^3$)						
	Midong district	No. 74 junior high school	No. 31 junior high school	Toll station	Monitoring station	Railway bureau	Jiujiawan	Midong district	No. 74 junior high school	No. 31 junior high school	Toll station	Monitoring station	Railway bureau	Jiujiawan
3 rd May	44	70	59	59	77	77	69	853	926	683	937	1123	1241	937
4 th May	38	69	49	49	78	78	75	1237	1020	466	980	1386	1126	967
5 th May	40	67	48	48	58	58	77	855	584	673	693	812	1317	693
6 th May	28	62	46	46	52	52	79	839	521	638	689	682	822	689
7 th May	22	71	49	49	62	62	77	562	686	790	767	867	1176	767
8 th May	19	36	24	24	37	37	44	527	363	501	484	599	555	470
9 th May	16	27	26	26	31	31	37	548	394	561	513	554	579	513

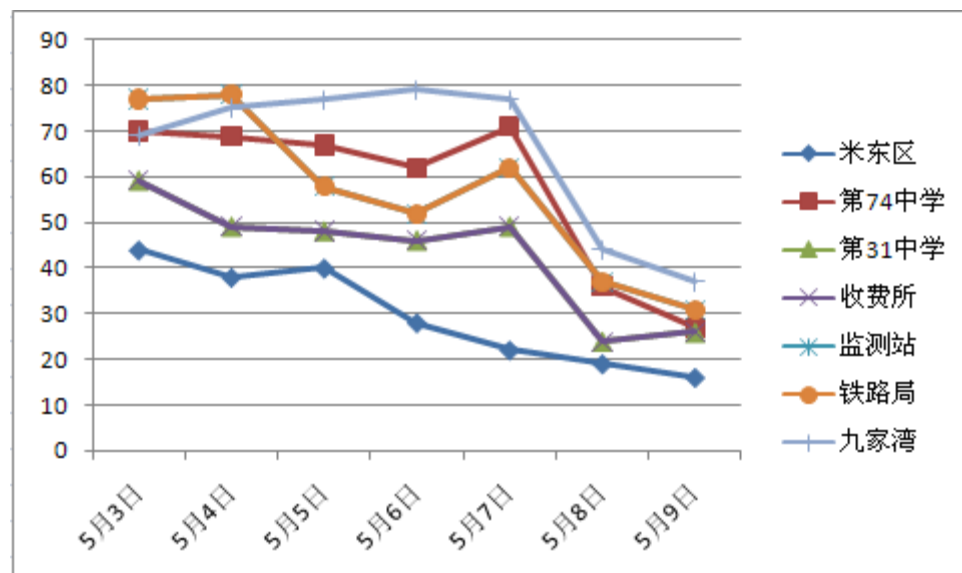


Figure 7.3-1 7 monitoring points NO_2 analogy

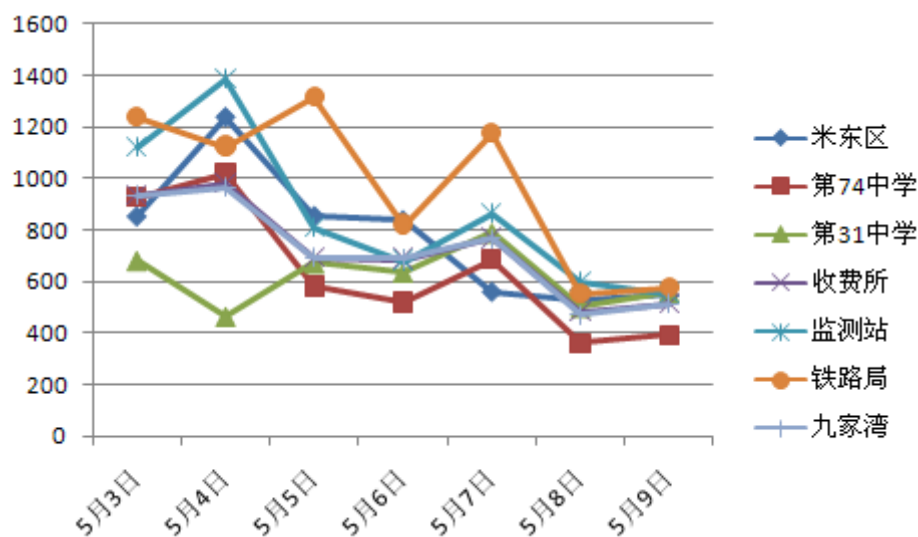


Figure 7.3-2 7 monitoring points CO analogy

According to above figures and table, it can be seen that the NO_2 and CO concentration in railway bureau and Jiujiawan is higher than other monitoring points. The whole Urumqi's ambient air is impacted by the exhaust emission. The data along the arterial road is not much higher than other area's.

According to experiences and monitoring data, under the normal meteorological condition (Type D stability), the average concentration of NO_2 and CO within 200m away from the site can meet the Grade 2 of Ambient air quality standard (GB3095-2012) during the project operation. Under the condition of increasing traffic flow in the future, calm wind and Type E stability of meteorological condition, the NO_2 along the road can possibly exceed the standard value. But for the area with the distance that far from the road, the ambient air quality can still meet the Grade 2 value of the standard.

The Urumqi EPB establish the Urumqi motor vehicle emission monitoring center in May 2007. The center will inspect all the motor vehicle's exhaust emission in Urumqi and issue the green label for the qualified motor. For the unqualified motors, the correction should be made in certain period. After the motors reach the exhaust emission standard, the motors can be driven on the road with the issuance of green label. It is suggested the inspection should also be made on the motor vehicles of other cities once coming into the border of Urumqi.

After the establishment of above center and related inspecting system, the exhaust emission item is also involved in the motor's yearly safety check. Only the motor vehicle is qualified in exhaust emission item, its yearly safety check can be passed, or it can not pass. So the exhaust emission is controlled by the administrative management.

Although the traffic flow will be increased continuously in the future, the exhaust emission from the motor vehicles can still be mitigated by promoting the technique and application of clean energy during the process of design and manufacturing of automobiles. In conclusion, the exhaust emission has less impact on the regional ambient air during the project operation period.

7.3.3 emission reduction of greenhouse gas

The increasing proportion of public transportation can control the increasing rate of private automobiles on roads., which can mitigate the urban air pollution.

According to statistics of the per capita energy consumption and carbon emission during 100km traffic trip, the bus's emission is 8.4% of car's emission, and the trolley bus is 3.4% to 4% of car's emission, and the railway's is the 5% of car's emission.

The project is tend to build the public traffic system, like the BRT, public transit hub and other public traffic infrastructures, which can enhance the urban traffic efficiency, push the application of intelligent tech, mitigate the traffic jam, improve the public traffic operating condition, reduce the fuel consumption and greenhouse gas emission. The urban traffic environmental quality can also be enhanced. At the same time, it is planned to purchase the clean-energy buses in this project, which can actively promote the energy saving in public transportation.

7.4 Noise impacts analysis

During the project operation, the main noise impacts come from the traffic noises of Municipal integrated public transportation system's development.

7.4.1 Noise impacts predicting method

During the EIA period, there already have the BRT No.1, No.2 and No.5 lines operating in Urumqi. According to the traffic flow data, the traffic flow of the BRT and bus only occupy 5% in total traffic flow. The main traffic noise mainly sources from the social small vehicles. The traffic flow has the significant difference at peak and normal time. In addition, the road and the surroundings are all complicated, plus the absorbing and reflecting effect of noise among the buildings and trees, the EIA guidance's noise predicting model is not suitable used here due to the big deviation. On the contrary, the predicting results through the analogy are more accurate than the model's prediction. The targets of analogy analysis are road condition, grade, motor vehicle speed, traffic flow, roads with similar monitoring points, BRT No.1 line, BRT No.2 line, BRT No.5 line that is similar with BRT No.4 line, No.6 line and No.6 line's branch on traffic flow and type. So the existing BRT lines in Urumqi can be used for the analogy during the process of noise impacts prediction.

7.4.2 Noise impacts analysis during operation

The BRT exclusive way is built on the current road section that need to be divided once more for the BRT. The Jiadeyuan section of Beijingzhong road along BRT No.1 line is the target for analogy of noise impacts in this project, as well as the Xinjiang building design institution of Qingnian road along BRT No.2 line, and the Geology&Mineral bureau section of Kelamayi road along BRT No.5 line. The existing noise monitoring data in above sections will all be used for the noise impacts prediction of this project.

The hourly traffic flow is about 1500 vehicles in daytime for Jiadeyuan section of Beijingzhong road along BRT No.1 line, which is similar with the Xinhua road along BRT No.4 line and nanhubei road along BRT No.6 line.

The hourly traffic flow is about 1700 vehicles in daytime for the Xinjiang building design institution of Qingnian road along BRT No.2 line, which is similar with the

yingbin road along BRT No.4 line, siping road along BRT No.6 line, and daoxiangbei road along BRT No.6 line's branch.

The hourly traffic flow is about 3800 vehicles in daytime for the Geology&Mineral bureau section of Kelamayi road along BRT No.5 line, which is similar with Northwest road and Altay Road along BRT No.4 line, kashi road and hebei road along BRT No.6 line and the Midong road along BRT No.6 line's branch.

So the monitoring data along above existing BRT lines can be the prediction results of noise impacts during the new BRT operation of this project. The monitoring period is from 2nd to 4th in April, 2014. The monitoring results for analogy can refer to Table 7.4-1.

Table 7.4-1 noise monitoring results of roads along the existing BRT line

	BRT line	Monitoring points		Monitoring time	Monitoring results (dB)	BRT and bus (vehicles/hour)	Total traffic flow (vehicles/hour)	EIA results
1	BRT 1	Jiadeyuan of Beijingzhong road	Before the first row of buildings, 20m away from the road edge	2 nd April 16: :00	66.2	72	1584	Day: meet Type4a standard
				3 rd April 1:00	57.5	0	367	Night: exceed 4a standard 2.5dB
				3 rd April 12: :00	67.1	60	1673	Day: meet Type4a standard
				4 th April 1:00	56.3	0	326	Night: exceed 4a standard1.3dB
			Behind the first row of buildings, 40m away from the road edge	2 nd April 16: :00	58.7	72	1584	Day: meet Type2 standard
				3 rd April 1:00	49.2	0	367	Night: meet Type2 standard
				3 rd April 12: :00	56.2	60	1673	Day: meet Type2 standard
				4 th April 1:00	48.6	0	326	Night: meet Type2 standard
2	BRT 2	Xinjiang building design institution of Qingnian road	Before the first row of buildings, 12m away from the road edge	2 nd April 18: :00	69.6	132	1686	Day: meet Type4a standard
				3 rd April 2:00	61.1	0	348	Night: exceed 4a standard5.1dB
				3 rd April 13: :00	70.3	116	1673	Day: exceed 4a standard0.3dB
				4 th April 1:00	62.3	0	367	Night: exceed 4a standard7.3dB
			Behind the first row of	2 nd April 18: :00	59.4	132	1686	Day: meet Type2 standard

			buildings, 40m away from the road edge	3 rd April 2:00	50.2	0	348	Night: exceed 2 standard0.2dB
				3 rd April 13: :00	58.6	116	1673	Day: meet Type2 standard
				4 th April 1:00	51.4	0	367	Night: exceed 2 standard1.4dB
3	BRT 5	South yard in Geology&Mineral bureau of Kelamayi road	Before the first row of buildings, 30m away from the road edge	2 nd April 17: :00	74.0	192	3878	Day: exceed 4a standard4.0dB
				3 rd April 1:00	67.3	0	445	Night: exceed 4a standard12.3dB
				3 rd April 13: :00	73.5	156	1673	Day: exceed 4a standard3.5dB
				4 th April 1:00	67.6	0	439	Night: exceed 4a standard12.6dB
			Behind the first row of buildings, 50m away from the road edge	2 nd April 17: :00	52.7	192	3878	Day: meet Type2 standard
				3 rd April 1:00	46.5	0	445	Night: meet Type2 standard
				3 rd April 13: :00	53.3	156	1673	Day: meet Type2 standard
				4 th April 1:00	47.3	0	439	Night: meet Type2 standard

The type 4 standard for EIA of noise impacts is applied on both sides of arterial road. For the buildings with three or more floors along the road, the area in front of the first row of building along the road will be categorized into the EIA area applied the type 4 standard. The acoustic environmental function zones regulated by type 4 in Acoustic environmental quality standard are highway, first-class highway, arterial road, and secondary trunk road, etc. The BRT No.4 line and No.5 line are both arterial road, along which belong to the Type 4a acoustic environmental function zone. And others belong to the Type 2 acoustic environmental function zone.

According to the mentoring results, the noise on both sides of arterial road in Urumqi exceeds the related standard. In the arterial road like Xinhua road, altay road, kashi road, Midong road, Suzhou road, daoxiang road, the daily traffic flow can reach 1000-4000 vehicles / hour; It even can reach 5000 vehicles / hour in Altay road. At night, the traffic flow keeps 500-1500 vehicles / hour in arterial road. The traffic noise pollution is serious along the arterial road. The noise monitoring data in first row of building along the road commonly exceed the standard.

According to the monitoring data in Table7.4.for both side of roads concerned with exist

(1) For the 3rd floor or above of the building along the project construction site applied the type 4 Acoustic environmental standard, the noise level can meet the

standard in daytime. But at night all monitoring points' noise level exceed the standard, the excess noise above the standard can maximally reach 12.6dB,

(2) For the 3rd floor or above of the building beside the project construction site applied the type 2 Acoustic environmental standard, the noise level can meet the standard in daytime. At night most monitoring points' noise level meet the standard; only few exceed the standard with the maximum level of 1.4dB over the standard value.

(3) The Geology&Mineral bureau as the monitoring point locate under the viaduct in Kelamayi road. the 3rd floor or above of the building has good noise resistance of 20.2-21.3dB, the other two monitoring points has the noise resistance of 7.5-11.7dB.

According to above monitoring data and the current acoustic environmental analysis in chapter 5.3 of the EIA, the noise level can still occasionally exceed the standard after the completion of project component 1 named Municipal integrated public transportation system's development. The noise in type 4 zone exceed the standard seriously at night with the maximum excess over the standard of 10-15dB. The noise in type 2 zone can basically meet the standard in daytime and exceed the standard at night with the maximum excess over the standard of 5 dB.

Due to the Urumqi city locates in the north of China, the window for the building adopts the double glazing with the 25dB acoustic insulation effect more or less. So it is no necessary to add the acoustic insulation window as the mitigation measures for this project.

7.5 Water environmental impacts analysis

The project's water environmental impacts are mainly from the water discharge of station and hubs.

7.5.1 Analysis of impacts aroused by Public Transport component on water environment

According to the project analysis, after the implementation of the project, the main waste water come from the bus terminals, bus hubs, and depot. The waste water are mainly the domestic waste water or produced during the process of bus repairing or maintenance.

7.5.1.1 Waste water produced during the process of bus repairing or maintenance

The waste water produce in such process mainly contain some suspended matter or petroleum, etc. In addition, the waste engine oil or gasoline should be treated properly. The productivity of solid waste is estimated to be 160m³/a, include unit productivity of 10m³/a in bus terminal, 20m³/a in hubs, and 50 m³/a in depot.

7.5.1.2 Domestic sewage

The productivity of domestic sewage mainly come from the working staffs and driver's daily domestic waste water and is estimated to be 0.584×10^4 m³/a, including unit productivity of 2m³/a in bus terminal, 4m³/a in hubs, and 10m³/a in depot. The domestic sewage will be discharged into the municipal drainage pipeline.

7.5.2 Water environment monitoring during operation period

During operation period, the monitoring at the domestic waste water discharging points of bus hubs and bus depot should be performed once annually; the monitoring indexes include PH, BOD₅, COD, suspended matter, NH₃-N and petroleum.

The Grade 3 limit in Integrated Wastewater Discharge Standard (GB8978-1996) will be adopted as the assessment referential standard for above monitoring indexes.

7.6 Solid waste impacts analysis

(1) BRT development and system's improvement

The solid waste during the operation period of this project component is mainly the bitumen slag, which is not needed in front operation period of road and has no relative negative impacts. The bitumen slag is produced in the process of road repair. For the upper bitumen slag on the road, the related recycled utilization can be made. For the useless abandoned slag, they should be transported to the indicated place for further disposal.

(2) Public transportation Supporting infrastructure

The solid wastes for the Public transportation supporting infrastructure's operation are mainly the domestic garbage and solid waste from bus repairing.

① Bus maintenance and repair

After the evaporation and drying, the waste water from bus repair become the solid waste that contains mineral oil. So this solid waste belongs to the hazards 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.

The productivity of solid waste is estimated to be unit productivity of 1t/a in bus terminal, 2t/a in hubs, and 5t/a in depot. The waste water produced from the Bus maintenance and repair is estimated to be 16t/a.

The machine processing waste, waste oil and waste mountings will be sold for recycle once produced.

② Domestic waste

The domestic waste mainly comes from the staff and drivers concerned the bus service. According to the unit productivity estimation of 20kg/d in bus terminal, 40kg/d in hubs, and 100kg/d in depots, the total waste water in this part is 58.4t/a.

7.7 Vibration impacts analysis during operation period

The intensity of vibration aroused by road traffic has relationship with motor vehicle's structure, traffic condition, road pavement condition, road structure and subgrade conditions. According statistic data from Japan's environment impact assessment manual, the vibration impacts on environment has following characteristics:

(1) There are no relevance between vibration intensity and traffic volume, but has certain relevance with moving speed of motor vehicles. According the testing result, every increase of 10km moving speed of motor vehicle, every increase of 2.5dB vibration intensity can be realized.

(2) The vibration intensity of subgrade has relevance with the longitudinal smoothness of road and vertical slab staggering. After the improvement of road pavement, the vibration intensity can be reduced by 5~10dB.

(3) The road structure includes the plane structure, viaduct, backfill, excavation and tunnel, etc. The testing result indicate that vibration intensity reduce gradually in the sequence of backfill, viaduct, plane structure.

The zoo road section of internal ring in Guangzhou city is chosen to be object for analogy in this EIA. It can be judged from the analogy that vibration in all road sections of internal ring of Guangzhou city can meet the standard during the daytime, night or traffic peak time during operation period. And the vibration has no obvious negative impacts on the acoustic environmental sensitive points. After the quarterly motoring during the 1.5 years construction period and 2 years operation period, the vibration monitoring results in Guangzhou zoo road section are as Table 7.6-1.

Table 7.6-1 Vibration monitoring results statistic in Guangzhou zoo road section (analogy)

Period	Before road put into use, from Jan.1999 to 27 th Jan.2000.	After road put into use, from 28 th Jan.2000 to Jun.2002
Vibration intensity	<50dB	51.1—64.4dB
Traffic volume	no road and traffic volume	471—3564 vehicles/hour

It can be seen from above table that the vibration intensity will not surpass 70dB even when the traffic volume reach thousands of vehicles in one hour. This analogy indicates the vibration will have no obvious negative impacts on ambient acoustic environment along the road for this project component during operation period.

7.8 Induced impacts

The project can effectively improve the current condition of Urumqi traffic. It does not build new roads but only new bus facilities. These new bus stations can bring business to these areas and good for employment.

On approaches of improving the traffic infrastructure, applying the intelligent traffic management, strengthening the institutional training and capacity, the big challenges from the quickening urbanization and motorization can be softened. The traffic jam can be mitigated and the urban traffic safety can also be improved.

Following the development of public transportation, the proportion of passengers who choose the public transportation will be increased, and accordingly the proportion of citizens who choose the motor vehicle or bicycle can be reduced. Then the traffic pressure can be reduced and road space can be sufficient, which enhance the urban traffic efficiency totally.

Following the increase of public transportation, and the less of motor vehicles as traffic approach, the gasoline consumption can be reduced. The related emission of pollutants can be reduced as well, which realized both energy saving and emission reduction.

8. public participation

8.1 information disclosure

8.1.1 the first information disclosure

Based on "The Provisional Measures for Public Participation in Environmental Assessment in PRC", the project information disclosure will be made through posting the notification and Media notification.

8.1.1.1 Media notification

On 4th March of 2014, the media notification is made in Xinjiang EPB website (<http://www.xjepb.gov.cn>) and Xinjiang Economy Paper with the title of Public Participation in the EIA of Urumqi urban traffic improvement project II. See Figure10.1-1.





Xinjiang Economy Newspaper
Figure10.1-1 The first media notification

8.1.1.2 Post notification

During the period from 13th March to 14th March of Year 2014, two EIA teams post the notification in residential area, schools and hospitals, etc, which locate along the BRT No.4 line, No.6 line and No.6 line's branch.

Notification of Urumqi urban traffic improvement project II

No.	Road section	Position	BRT line	Time of posting notification in 2014(M-D)
1	Xinhua south road	Guohuiyuan apartment	BRT4	3-13to 3-15
2	Xinhua south road	Daily Chemical Products plant's apartment	BRT4	3-13to 3-15
3	Xinhua south road	Guoqingyuan apartment	BRT4	3-13to 3-15
4	Xinhua south road	Mingzhu apartment	BRT4	3-13to 3-15
5	Xinhua south road	Municipal engineering apartment	BRT4	3-13to 3-15
6	Xinhua south road	Taixi apartment	BRT4	3-13to 3-15
7	Xinhua south road	Huaqiao apartment	BRT4	3-13to 3-15
8	Xinhua south road	Urumqi No.32 elementary school	BRT4	3-13to 3-15
9	Xinhua south road	Xinhua south road community health service center	BRT4	3-13to 3-15
10	Xinhua south road	Urumqi No.38 high school	BRT4	3-13to 3-15

11	Xinhua south road	Sanjian No.56 yard	BRT4	3-13to 3-15
12	Xinhua south road	Zhongshan hospital	BRT4	3-13to 3-15
13	Youhao road	Urumqi No.3 elementary school	BRT4	3-13to 3-15
14	Lanxiuyuanxi street	Post bureau apartment	BRT4	3-13to 3-15
15	Northwest road	Yunxiang apartment	BRT4	3-13to 3-15
16	Northwest road	Northwest road apartment	BRT4	3-13to 3-15
17	Northwest road	Sha district educational bureau apartment	BRT4	3-13to 3-15
18	Northwest road	petroleum institute apartment	BRT4	3-13to 3-15
19	Northwest road	east of Xibeilu apartment	BRT4	3-13to 3-15
20	Altay Road	Jinkanglijingyuan apartment	BRT4	3-13to 3-15
21	Altay Road	Aoxiangjinshan apartment	BRT4	3-13to 3-15
22	Altay Road	Jiaheyuan apartment	BRT4	3-13to 3-15
23	Altay Road	Huifuyuan apartment	BRT4	3-13to 3-15
24	Altay Road	Lvsejiayuan apartment	BRT4	3-13to 3-15
25	Altay Road	Dehai apartment	BRT4	3-13to 3-15
26	Altay Road	Xiangtong apartment	BRT4	3-13to 3-15
27	Altay Road	Jiangyiyuan apartment	BRT4	3-13to 3-15
28	Altay Road	Shijihuayuan apartment	BRT4	3-13to 3-15
29	Altay Road	Jinfengyuan apartment	BRT4	3-13to 3-15
30	nanhubei road	Youhaohuayuan 3 rd apartment	BRT6	3-13to 3-15
31	nanhubei road	Islam jingwen school	BRT6	3-13to 3-15
32	midongnan road	Wujian apartment	BRT6	3-13to 3-15
33	midongnan road	Hongqi apartment	BRT6	3-13to 3-15
34	midongnan road	Corp jiangongshi No.4 high school	BRT6	3-13to 3-15
35	midongnan road	Jinkunxincheng huayuan apartment	BRT6	3-13to 3-15
36	daoxiangnan road	Urumqi No.108 Junior High school	BRT6	3-13to 3-15
37	daoxiangnan road	Urumqi Municipal No.97elementary school	BRT6	3-13to 3-15
38	daoxiangzhong road	Midong district People's hospital	BRT6	3-13to 3-15
39	daoxiangzhong road	Ryuexingcheng apartment	BRT6	3-13to 3-15
40	daoxiangzhong road	Lantian kindergarten	BRT6	3-13to 3-15
41	kashidong road	Fuyuxincheng apartment	BRT6 line's branch	3-13to 3-15
42	kashidong road	Dongfangyujing apartment	BRT6 line's branch	3-13to 3-15
43	kashidong road	Xinjiang information engineering school	BRT6 line's branch	3-13to 3-15
44	kashidong road	North campus of Xinjiang teacher's university	BRT6 line's branch	3-13to 3-15

45	siping road	Boyaxinyuan apartment	BRT6 line's branch	3-13to 3-15
46	hebeidong road	Guoxiujiaoyuan apartment	BRT6 line's branch	3-13to 3-15
47	hebeidong road	Kangchengguoling apartment	BRT6 line's branch	3-13to 3-15
48	hebeidong road	Xinjiang supply and marketing school	BRT6 line's branch	3-13to 3-15
49	hebeixi road	Sijian apartment	BRT6 line's branch	3-13to 3-15
50	hebeixi road	UrumqiMunicipla No.83Junior High school	BRT6 line's branch	3-13to 3-15
51	太原南路	Hexingrunyuan apartment	BRT6 line's branch	3-13to 3-15
52	weixing road	Shijimingyuan apartment	BRT6 line's branch	3-13to 3-15
53	weixing road	Jinyangweixing huayuan apartment	BRT6 line's branch	3-13to 3-15
54	weixing road	Taijun apartment	BRT6 line's branch	3-13to 3-15

8.1.2 Public feedback of the first information disclosure

(1) On 4th March of 2014, Mr. Chen inquiry the information of project construction with e the phone number of 18681636703.

(2) On 7th March of 2014, the email feedback from website is to support the project construction, but hope to have less impacts on the traffic.

(3) On 7th June of 2014, the email feedback from website is to make the suggestion on the route design.



8.1.3 The second media notification

8.1.3.1 Notification on website

On 28th May of 2014, the second notification is made in Xinjiang EPB website (<http://www.xjepb.gov.cn>) with the title of Public Participation in the EIA of Urumqi urban traffic improvement project II in second round. The whole EIA report is also uploaded on the website for downloading and viewing.

8.1.3.2 Notification in newspaper

The media notification is made in Urumqi Evening Paper with the title of Public Participation in the EIA of Urumqi urban traffic improvement project II in second round. The EIA report's link for download has also been publicized in the newspaper,

which can link to the official website of Urumqi EPB or EIA agency. See Figure8.1-2.



Xinjiang EPB website



Urumqi Evening Paper

8.1.4 Second public notification of supplementary information

The original project construction has been changed. The related reconstruction for BRT platform and four bus transit lanes' construction have been canceled in the whole project development. And other construction will be made according to the original plan. according to PRC EIA Law, PRC environmental protection law, and the Provisional Measures for Public Participation in Environmental Impacts Assessment in PRC(Huanfa[2006]No.28 document), as well as the Xinjiang EIA Public Participation Management Interim Regulation (Xinhuanpingjiafa[2013]No.488 document), such change of construction should be notified. In 4th January, the related notification is made in Xinjiang EPB website (<http://www.xjepb.gov.cn>) with the title of Public Participation in the EIA of Urumqi urban traffic improvement project II in second round. The whole EIA report after the content's modification on construction change and EIA conclusion is uploaded on the website for downloading and viewing with related website link.



Figure: second public notification of supplementary information

8.2 Public feedback scope, times and forms

8.2.1 Public feedback scope

In order to gain more public feedback, the targets during the public participation of EIA survey has been confirmed as following:

- (1) The company or person directly impacted by the project construction

- (2) The company or person indirectly impacted by the project construction
- (3) related experts
- (4) The company or person who care the project construction

8.2.2 Public feedback times and forms

According to the Provisional Measures for Public Participation in Environmental Impacts Assessment in PRC(Huanfa[2006]No.28 document), the public feedback collecting work has been done for two times. The legal public participation work can be concluded in the Table 8.2-1.

Table8.2-1 Public feedback times and forms

Public participation	Survey method	Content	Date of Year 2014(Month-Day)
1st time	Media notification	Xinjiang EPB (http://www.xjepb.gov.cn) and Xinjiang Economy Paper	3-4
	Post notification	On the residential area, schools and hospitals along the BRT 4, BRT 6 and BRT 6 branch.	3-13 to 3-15
	Site visit	On the residential area, schools and hospitals along the BRT 4, BRT 6 and BRT 6 branch.	3-13 to 3-15
2 nd time	Media notification	Xinjiang EPB (http://www.xjepb.gov.cn) And Urumqi Evening Paper	5-28 to 6-7
	Personal online questionnaire	51investigating web, http://www.51diaocha.com/w/1070037.htm	6-1to 7-1
	Questionnaire filling during site visit	On the property management offices, communities and hospitals along the BRT 4, BRT 6 and BRT 6 branch.	6-19 to 6-21

8.3 Organisation of public participation

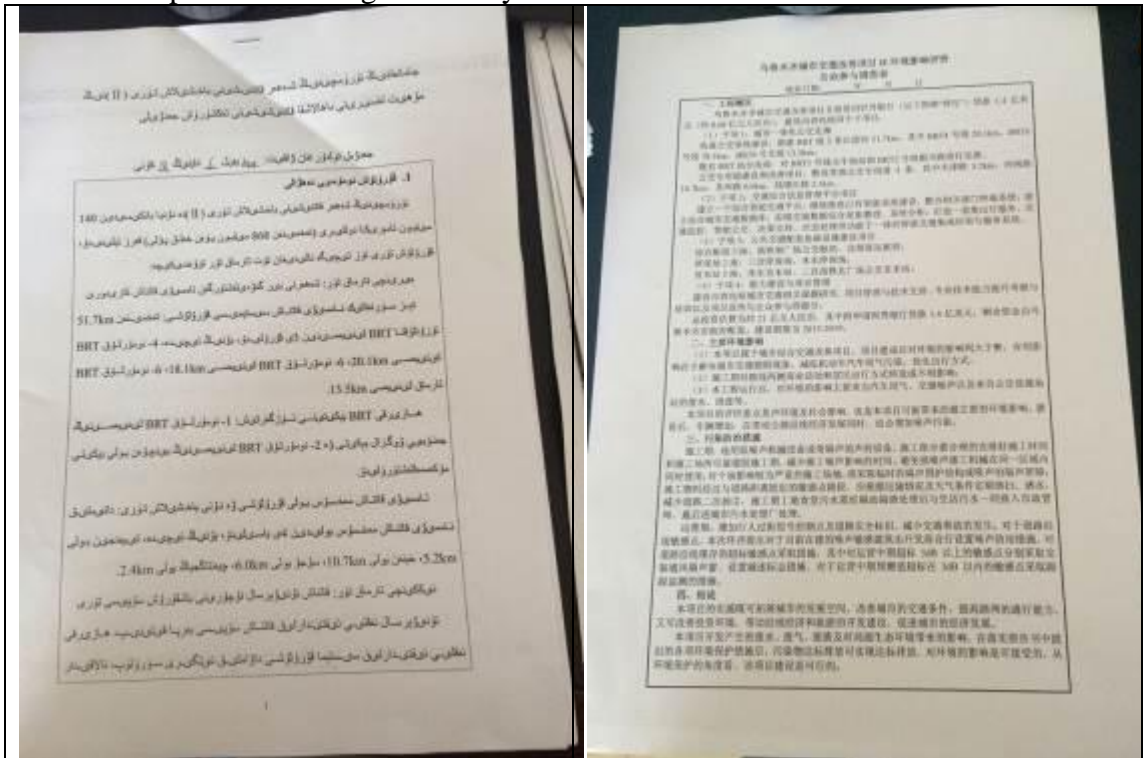
The public participation is made by the way of Questionnaire filling during site visit and investigation through internet.

8.3.1 Questionnaire

The issue of Questionnaire is made after 10 working days of the second notification, which is questionnaire filling during site visit and questionnaire investigation through internet. The 701 copies of questionnaire had been issued, which include the 596 copies collected through internet and 105 paper copies collected through site visit.

The design of questionnaire has taken consideration of ethnic minorities' distribution along the project site, which is made in Chinese and Uighur language. The respondents covered by the questionnaire survey is made up by the 585 Han people, 36 Uyгур, 33Kazak, 36 Hui people and 11other ethnic minorities. The quantity

proportion between the Han people and the ethnic minorities is 585: 116. The related Table of respondents during the survey can refer to the annex of the EIA.



8.3.2 EIA seminar

After the EIA draft report has been finished, the construction company, designing agency

8.4. Public feedback collection, analysis and adoption

8.4.1 public feedback collection and analysis

8.4.1.1 Opinions in questionnaire

(1) Personal questionnaire's opinions conclusion

The issue of Questionnaire is made after 10 working days of the second notification, which is questionnaire filling during site visit and questionnaire investigation through internet. The 701 copies of questionnaire had been issued, which include the 596 copies collected through internet and 105 paper copies collected through site visit. The conclusion of public feedback in questionnaire can refer to Table 8.4-1.

Table 8.4-1 The conclusion of public feedback in questionnaire

Questions	Public feedback
1. Will the project benefit the local economy and social development?	Yes, it will : 635persons, 91%
	Just so so: 64persons, 9%
	No, it will not: 2persons, 1%
2. What do you think the project's impacts on the local people's life?	benefit: 631persons, 90%
	Not benefit: 33persons, 5%
	No impacts: 16persons, 2%
	No idea: 21persons, 3%
3. Do you care about the environmental issues of the project?	Care: 573persons, 82%
	Just so so: 128persons, 18%
	Do not care: 0persons, 0%
4.Are you satisfied the current environmental quality?	Satisfy : 200persons, 29%
	Just so so: 363persons, 52%
	Not satisfy: 138persons, 19%
5. What environmental issues do you care about?	Noise and dust pollution during construction: 445persons, 63%
	Inconvenient traffic during construction: 513persons, 73%
	Traffic jam during construction: 478, 68%
	Tail gas and noise during operation: 268persons, 38%
6 What kind of compensation for land occupation do you want?	Compensation in other cities: 174persons, 25%
	Cash : 505persons, 72%
	New job offer: 22persons, 3%
7. What will the environmental impacts of the project mainly on?	Acoustic environment: 491persons, 70%
	Ambient air: 570persons, 81%
	Water environment: 261persons, 37%
	Solid waste: 370persons, 53%
8.What do you think of the potential environmental negative impacts of the project on ambient air quality?	Seriously big: 32persons, 5%
	Big: 192persons, 27%
	Common : 336persons, 48%
	Small: 107persons, 15%
	No idea: 34persons, 5%
9. What is your attitude for the project development?	Support: 403persons, 57%
	Basically support: 282persons, 41%
	Do not care: 8persons, 1%
	Oppose: 8persons,1%
10. What is your suggestions on the environmental protection work of the project?	control construction scope and reduce house removal and resettlement: 353persons, 57%

	strengthen the traffic organization, mitigate the traffic jam and residents' traffic inconvenience during construction: 572persons, 32%
	Strengthen the construction noise control to ensure the residents normal life and rest nearby: 500persons, 71%
	control sewage discharge, protect water and soil environment: 340persons, 49%
	control waste gas emission and improve the air quality: 329persons, 47%
	prevent and control the solid waste pollution on road, traffic and city appearance: 482persons, 69%

The respondents of public feedback is living along the roads and communities near the project site, whose trip in the city mainly depends on public transportation. They all have certain understanding on the project construction and its related environmental impacts. The respondents all have good cognitive competence and enough ability of expression. So the feedback collected from these respondents is typical.

(1) 57% respondents support the project's development; 41% respondents basically support, 1 person do not care; 91% respondents think the project will benefit the local economy and social development, 9% respondents think no significant benefit, 1% respondents think the project has no benefit for the local;

(2) 90% respondents think the project can enhance the, 5 persons think it can not, others think the project has no significant meaning to local life; For environmental issues, 73% respondents worry about the traffic inconvenience during construction.

(3) 72% respondents hope to gain the proper cash compensation, 25% respondents hope to gain the compensation in other cities, and some want to gain the new job offer as the compensation.

(4) For the environmental protection work of the project, 71% respondents hope to strengthen the construction noise control to guarantee the residents normal life and rest nearby, 57% respondents hope to control construction scope and mitigate the house removal and resettlement.

8.4.1.2 Opinions collected during Site visit

(1) feedback opinions from school along the project site

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.

(2) feedback opinions from the mosques along project site

The feedback opinions from the mosques along project site are mainly like the following: firstly the construction should be civilized. Secondly the natural gas 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 .

8.4.2 Adoption of the feedback opinions

The feedback opinions collected during the two times of public participation will be recorded in the EMP and be reported to the EPB. The construction company will follow those advices from respondents, and make the construction more proper for reducing the negative impacts on environment and residents during construction.

8.5 Validity, typicality and authenticity of Public participation

8.5.1 The legality of public participation

According to the Provisional Measures for Public Participation in Environmental Impacts Assessment in PRC (Huanfa[2006]No.28 document), the project hold two times of public participation. The first notification is made on 4th March, 2014, which is within 7 days after the EIA assigning. The duration of notification for the project is not less than 10 working days.

The second notification is made on 4th May, 2014, which is after the completion of EIA draft report. The duration of notification for the project is not less than 10 working days. All the information disclosure comply with the time schedule, and the process of public participation is legally valid.

8.5.2 validity on the approaches

The information disclosure is made by the way of publicizing on website through internet and posting notification. The survey approach is issuing the questionnaire and consulting experts, etc. All the approaches is effective and valid.

8.5.3 Typicality of the respondents

The respondents of public feedback include the persons with different ages, occupations, and nationalities of Han, Hui, Uyghur, Kazak and Mongolia, etc. The respondents of public feedback is living along the roads and communities near the project site, whose trip in the city mainly depends on public transportation. They all have certain understanding on the project construction and its related environmental impacts. The respondents all have good cognitive competence and enough ability of expression. So the feedback collected from these respondents is typical.

8.5.4 Authenticity of survey's results

The respondents express that project can improve the urban infrastructure and environment, increase the regional employment opportunities, promote the social security. At the same time, the respondents give high attention on the ecological environmental impacts, and hope the execution of related measure for mitigating the negative impacts. The survey result is true.

8.6 Summery

The two notification has been made following the rules of Huanfa[2006]No.28 document. The 701 copies of questionnaire had been issued, which include the 596 copies collected through internet and 105 paper copies collected through site visit. The respondents of public feedback is living along the roads and communities near the project site, whose trip in the city mainly depends on public transportation. For the governmental departments, the survey results show all the governmental departments would like to support the project development. For the public respondents, the survey results show that 57% of support, 41% of basically supporting opinion, and others of careless. The statistics of the public feedback show that most of the public support the project's development and deem the project has active and good impacts on Urumqi urban traffic development.

9. Environmental management and monitoring plan

9.1 Responsibility arrangement of environmental management

According to the Environmental protection law of the People's Republic of China and Ordinance on Administration for Environmental Protection of Construction Projects, the EIA report of this project should be approved by the EPB of Xinjiang Uygur Autonomous Region. So the EPB of Xinjiang Uygur Autonomous Region is the environmental management agency of this project with the obligations of providing the environmental protection requirements based on this EIA, coordinating the environmental management of different branches, and organize the acceptance check for the implementation of pollution prevention and control measures during the project design, construction and operation periods.

The Urumqi Municipal Government has given high priority and strong support to this proposed IBRD project. A **Project Steering Group** has been established, and the Project Management Office (PMO) is already in place under the control of Urumqi municipal construction bureau. The PMO take charge the guidance, supervision and coordination for the project and is directly responsible for the World Bank.

The PMO of this project also take charge the organization of feasibility study, environmental planning, coordinating the relationship between the environmental management agencies and construction contractors and direcing the construction company on the execution of project management. Urumqi Urban Transportation Investment Ltd. Co takes charge making the environmental protection plan and environemtnal management during the project construction.

The Urumqi monitoring station is assigned by PMO to take charge the regional environmental quality during project construction and operation period.

The specialized environmental managers has been indicated in PMO of this project, who take charge the environmental management in every phase of this project, and carrying out the environmental plan, checking the execution of environmental protection measures, promote the advanced environmental protection techniques and experiences, organizing the environmental training to improve the staff's quality. Due to the different contents and duration for environmental management during construction and operation period, the individual agencies for environmental management for project construction and operation. After construction is completed, the environmental management agency for project operation can take over. But the two agencies can be allowed to have a certain period for transferring the related work or duties. The environmental management system can refer to Figure 9.1-1.

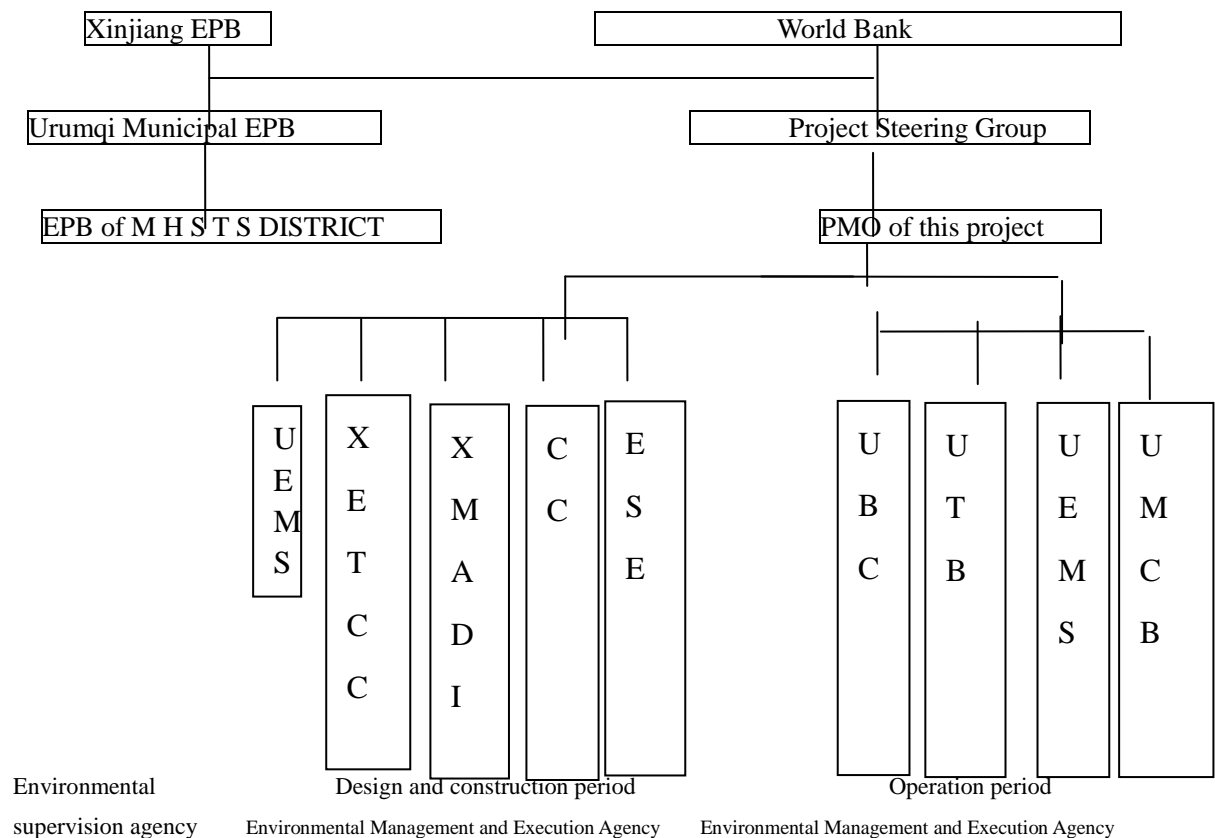


Figure9.1-1 Environment management system

Abbr. in Figure9.1-1:

Urumqi Municipal Construction Bureau: UMCB

Urumqi Traffic Bureau: UTB

Urumqi Bus Company: UBC

Environmental Supervision Engineer: ESE

Construction Contractor: CC

Shanghai WSP Consulting Ltd.: SHWSP

Xinjiang Environmental Technology Consulting Center: XETCC

Urumqi Environmental Monitoring Station: UEMS

The project PMO, contractor, environmental supervision agency and monitoring party, as well as the individual responsibilities can refer to Table9.1-1。

Table 9.1-1 Institutional Arrangement and Environmental Management Responsibilities

Period	Institutions	Environmental management responsibilities	Staff
Design and construction period	Xinjiang EPB	Approving EIA documents	1
	PMO of this project	(1) Take charge the overall environmental management, and make the related regulations (2) Ensure that the environmental management plan is included in the bidding document for construction and construction contract (3) Ensure the environmental management plan is included in project supervision bidding document and project supervisor contract	1
	Shanghai WSP Consulting Ltd (project designing agency)	Providing technical support for environmental management	1
	Xinjiang Environmental Technology Consulting Center (EIA agency)	Proposing the environmental management plan (EMP)	5
Project operation period	PMO of this project	1. Supervise the pollution prevention and control measures taken charge by contractors. 2. Supervise and participate environmental supervision works 3. Employ the environmental consultant to give the technical support for the environmental protection in construction, provide the guidance for the contractors on environmental protection, and train the supervisor, project manager and contractor on environmental protection knowledge. 4. Assign the agency for environmental monitoring during construction. 5. Deliver the EMP execution report to World Bank every half year	1
	Contractor	1. Implementing this EMP and other environmental protection measures 2. Conducting environmental protection training for construction staff	1
	Supervisor for this	1. Conducting regular supervision to	1

	project and environment management	ensure the implementation of environmental protection measures 2. Recording the implementation of environmental protection and problems in monthly supervision reports	
	Urumqi Environmental Monitoring Station	Environmental monitoring during the construction phase and environmental monitoring for accidents	1
	Urumqi municipal EPB	Examining the environmental management during the construction phase	1
Operation period	PMO of this project	The same responsibilities as that in the construction phase	1
	Urumqi Bus Company, Urumqi Municipal Construction Bureau	1、Implementing environmental protection measures and this EMP 2、Ensuring the normal operation of environmental protection equipment	2
	Urumqi municipal EPB	1、Organizing the approval of the completion of environmental protection equipment according to “Three Simultaneousness” requirement 2、Examine the environmental management during operation period	1
	Urumqi Environmental Monitoring Station	Environmental monitoring during the operation phase and environmental monitoring for accidents	1
	Urumqi city planning bureau	Control the further development of environmental sensitive buildings or organizations on both sides of road.	1

9.2 Environmental impacts mitigation measures

Based on the EIA report, domestic related laws and regulations, and the Environmental health and safety general guidelines of World Bank, as well as refer to the similar developing experiences from other domestic projects and IBRD projects, the related environmental impact mitigation measures have been concluded in this EIA for project design, construction and operation period. The details can refer to Table 9.2-1~9.2-3.

Table 9.2-1**Mitigation measures for initial project designing and preparing period**

Activities	Main negative impacts	Mitigation measures	Implementer	Supervisor	Cost estimate (10,000RMB)
Tender	/	EMP should be made in the bidding document for further execution, as well as in the construction contract.	Urumqi Municipal urban traffic research center	PMO	0
Road alignment	reduce the impacts on vegetation in urban area by optimizing the design	<p>(1) Consider the continuous use of the existed road cross-section in the further design of road, and keep the existed green belt.</p> <p>(2) The carriage ways need to be replanned and divided, and 5304 street trees need to be transplanted on both sides of above-mentioned roads. The project total budget should include the replanting fee for trees.</p>	Shanghai WSP Consulting Ltd.	PMO	0
Alternatives comparison	site and route selection, layout issue	<p>(1) reduce the expansion work of carriage ways as much as possible for reducing the impacts on urban ecological environment</p> <p>(2) 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.</p> <p>(3) 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</p>	Shanghai WSP Consulting Ltd	PMO	0

Activities	Main negative impacts	Mitigation measures	Implementer	Supervisor	Cost estimate (10,000RMB)
Public participation	Environmental issues the public care about	<p>(1) 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.</p> <p>(2) The feedback opinions from the mosques along project site are mainly like the following: firstly the construction should be civilized. Secondly the natural gas 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 .</p>	Urumqi Urban Transportation Investment Ltd. Co	PMO	0

Table 9.2-2

Mitigation measures in construction period

Impact factor	Main activity	Main negative impacts	Mitigation measures	Implementer	Supervisor	Estimated fees (unit: 10,000RMB)
Social environment	Preparation prior to construction	Social disturbance	<p>(1) 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.</p> <p>(2) Limit the construction scope strictly, forbid the enlarging of land use for project construction.</p> <p>(3) The separation wall should be built around the construction site.</p> <p>(4) Strengthen the cooperation with local traffic management departments. Make the proper plan for construction materials transportation on existed 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.</p> <p>(5) Strengthen the training, supervision and management of construction workers. Actively promote the civilized construction.</p>	contractor	Project supervisor, PMO	10

Impact factor	Main activity	Main negative impacts	Mitigation measures	Implementer	Supervisor	Estimated fees (unit: 10,000RMB)
Social environment	Road construction	Inhabitants traffic accessibility	<p>(1) 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.</p> <p>(2) 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.</p> <p>(3) 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.</p> <p>(4) 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.</p>	contractor	Project supervisor, PMO	20
		traffic disturbance	<p>(1) 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.</p> <p>(2) 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.</p>			

Impact factor	Main activity	Main negative impacts	Mitigation measures	Implementer	Supervisor	Estimated fees (unit: 10,000RMB)
Social environment	Road construction	Impacts on Infrastructure	<p>(1) Mitigating the negative impacts on the irrigation works Based on the principle of remaining the current irrigation works for farmland, the project will place the bridge for the river section or wide dry channels, and the culvert for the ditches, etc.</p> <p>(2) 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.</p> <p>(3) Before the construction, the existed 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.</p>			
		cultural resources	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			

Impact factor	Main activity	Main negative impacts	Mitigation measures	Implementer	Supervisor	Estimated fees (unit: 10,000RMB)
		influence the normal religious routine and activity	<p>(1) 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.</p> <p>(2) Pay attention to the traffic safety facilities near the residential area and mosque</p> <p>(3) 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.</p> <p>(4) The caution sign should be written in simple words or signal. The notification of project construction should be written in Chinese and Uygur language.</p> <p>(5) During the period of religious activities and ceremony, all the facilities and machines with high level of noise should be stopped running.</p>			
Ecological environment	Road and station construction	Impacts on the greening land	<p>(1) Those impacted vegetations will be transplanted to Kangzhuang road, Minglian road and Zhongyi road. The transplanting work should be completed by the People's Park Unit to ensure the survival rate of above 95% for the transplantation, whom is assigned by the Urumqi Municipal Afforestation Committee.</p> <p>(2) 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.</p>	Contractor, construction company	Project supervisor, PMO	265.2

ambient air	dust and waste gas produced by machineries	Impacts on ambient air quality and inhabitants' daily life and work along the project	<p>(1) 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.</p> <p>(2) 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 13: 00-14: 30 and once during 19: 00-20: 30. Those period belong to the traffic peak time</p> <p>(3) 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.</p> <p>(4) 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.</p> <p>(5) 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.</p> <p>(6) 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.</p> <p>(7) The totally enclosed construction approach should be adopted to prevent and control the dust pollution.</p>	Contractor, construction company	Project supervisor , PMO	10
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Acoustic environment	Construction vehicles transportation, piling and paving pavement	Noise impacts on nearby schools or residents, etc.	<p>(1) Choose the machineries with low noise or sound insulation device.</p> <p>(2) 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.</p> <p>(3) 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.</p> <p>(4) During the period of 24:00-8:00, the running of machinery with intense noise is forbidden.</p> <p>(5) During the college entrance exam and high school entrance examination, the construction near the schools is stopped.</p> <p>(6) 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.</p> <p>(7) 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.</p> <p>(8) 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.</p>	Contractor, construction company	Project supervisor, PMO	0
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Impact factor	Main activity	Main negative impacts	Mitigation measures	Implementer	Supervisor	Estimated fees (unit: 10,000RMB)
Water environment	layout of construction site and waste water	Pollutants from construction site come into water body	<p>(1) The construction waste water 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 waste water is forbidden. Before discharging into the pipeline, the construction waste water must go through the relatively simple treatment. In addition, the direct discharge into surface water body for construction waste water is forbidden.</p> <p>(2) For the waste water from the canteen of project site, the separation treatment of oil and residue, the waste water can be discharge into municipal drainage pipeline with domestic sewage, and finally flow into the municipal waste water treatment plant.</p>	Contractor, construction company	Project supervisor, PMO	5
Solid waste	Abandoned earth	Impacts on landscape	<p>(1) Send the abandoned earth, dreg and tile produced during construction to the landfill for construction waste in Urumqi.</p> <p>(2) 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.</p> <p>(3) Implement the regulations for construction waste and slag earth management.</p> <p>(4) 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.</p>	Contractor, construction company	Project supervisor, PMO	10
	Domestic waste	Impacts on health	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.			
vibration	Construction machineries	on nearby schools or residents	<p>① Forbid running the machineries with high vibration at night.</p> <p>② Encourage the application of the machineries with low vibration level.</p>	construction company or, construction	Project supervisor or, PMO	0

Table 9.2-3

Mitigation measures during operation period

Impact factor	Main activity	Main negative impacts	Mitigation measures	Implementer	Supervisor	Cost (10,000 RMB)
ambient air	Repairing and maintenance place	Impacts on health and ambient air	<p>(1) strengthen the management and reduce the excess exhaust emission due to the idle speed.</p> <p>(2) the air blower system will be installed for strengthening the air exchanging in garage</p> <p>(3) 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.</p>	PMO, Urumqi bus company	Urumqi EPB,	0
	exhaust emission	Impacts on environmental sensitive points along road	<p>(1) 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.</p> <p>(2) Strengthen the roads' maintenance works and keep the good running condition of road for reducing the traffic jam.</p> <p>(3) Strengthen the vehicle's testing and maintenance.</p> <p>(4) Carrying out the new national emission standard for vehicles.</p> <p>(5) 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.</p> <p>(6) Strengthen the sampling test among households for vehicle.</p> <p>(7) Make the traffic scientific management. Enhance the road capacity and vehicle traffic speed to reduce the exhaust gas in a maximum level.</p> <p>(8) 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.</p>	Urumqi traffic bureau, public security bureau	Urumqi DRC	

Impact factor	Main activity	Main negative impacts	Mitigation measures	Implementer	Supervisor	Cost (10,000 RMB)
Acoustic environment	Noise pollution	Impacts on sensitive points along road	(1) 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. (2) 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, so the necessary noise isolation measures should be done to ensure the indoors noise level meeting the standard.	PMO, design institute, contractors,	Urumqi EPB, project supervisor	0
Social environment	Vehicles moving on road	Impacts on traffic safety	(1) Increase the traffic signal control points in crosswalk and road safety sign to reduce the potential traffic accidents. (2) 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.	Urumqi traffic bureau	PMO	0
Water environment	Waste water emission in station	Impacts on water body around station	(1) 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 5m ³ , 10m ³ and 20 m ³ 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. (2) 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.	construction company, Contractor, Urumqi bus company	Urumqi EPB	50

Impact factor	Main activity	Main negative impacts	Mitigation measures	Implementer	Supervisor	Cost (10,000 RMB)
Solid waste	Solid waste discharge in station	Impacts on ambient environment around stations	<p>(1) For the solid waste during the operation period of BRT component, they should be transported to Urumqi construction waste landfill according to related regulations.</p> <p>(2) 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.</p> <p>(3) 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.</p> <p>(4) 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</p>	Urumqi bus company		

9.3 Environmental monitoring plan

9.3.1 Environment monitoring agency

In order to ensure various negative environmental impacts to be controlled and mitigated, the whole project cycle should be strictly and scientifically followed and standardized environmental management and supervision should be contacted.

The environmental monitoring duties for different institutions are as following:

During the construction period, the contractors and Urumqi Environmental Monitoring Station should undertake the monitoring duties. The project supervision company takes charge supervising of monitoring work. The PMO take charge the management and be responsible for the experts from World Bank.

During the operation period, the Urumqi municipal construction bureau and Urumqi Environmental Monitoring Station should undertake the monitoring duties. The PMO take charge the management and be responsible for the experts from World Bank.

Urumqi EPB will supervise the monitoring work during construction and operation period, and be responsible for the reports to Xinjiang EPB.

9.3.2 Monitoring reports and contents

There are monitoring reports individually for the construction period and operation period.

The monitoring place, sampling date, monitoring factors and the comparison with related standard will be included in the report for analysis and assessment.

According the monitoring report, the assessment will be made on the execution results of environmental mitigation measures.

The monitoring institution will discuss with EIA team on the replacement or improvement of less efficient mitigation measure.

9.3.3 Monitoring report submission time and receiver

(1) Monitoring report submission

Monitor for once or twice for every construction period, submit the periodical report. After the implementation of construction, the integrated monitoring report should be submitted.

Submit one monitoring report every half year during operation period.

(2) Receiver of monitoring report

The monitoring reports receiver is Urumqi EPB, PMO, construction bureau and related department in World Bank.

There are monitoring reports individually for the construction period and operation period.

(3) Contents and location for periodically monitoring

The monitoring contents for construction and operation period include: the monitoring objects, monitoring indicator, monitoring method, location, frequency and cost. See Table 9.3-1. The implementing agency for monitoring is Urumqi environmental

monitoring station.

There are monitoring reports individually for the construction period and operation period. The aim for monitoring is to have a complete and timely understanding of the pollution situation, the environmental quality variation, impacts scope and environmental quality trends during operation. The monitoring information should be reported to the related authority as the scientific reference for making the environmental management plan.

Table 9.3-1 Environmental monitoring plan

period	Monitoring object	Monitoring location	frequency	Monitoring method	implementer	Capital source	Monitoring fee (10 ⁴ RMB)
Construction	Noise, dust	Guoqing Yuan apartment, Urumqi No.32 elementary school, Geology&Mineral Bureau, haoxiangjinshan apartment, huifuyuan apartment, yingbinlishe apartment, youhaohuayuan 3 rd apartment, wujian apartment, xianghewan apartment, Milan apartment, Urumqi No.108 high school, Midong People Hospital, boruixincun apartment, hexingjiayuan apartment, Urumqi No.37 high school, guoxiujiaoyuan Urumqi No.108 high school, jinyangweixing Urumqi No.108 high school,. Above monitoring points can be adjusted according to the construction schedule.	1 time quarterly or start after receiving complaint	The noise should be monitored according to Annex C: Noise monitoring method for sensitive buildings in Standards for acoustic environmental quality (GB3096-2008) The dust should be monitored according to Environmental Monitoring Technical Specifications	Urumqi environmental monitoring station	construction capital	9.0
Operation period	NO ₂ 、CO、PM2.5、PM10	Two ambient air quality monitoring sub-station, Midong district air quality monitoring station	auto monitor	Monitor according to Environmental Monitoring Technical Specifications air section	Urumqi environmental monitoring station	Governmental fund support	/

	pH、BOD ₅ 、 COD、 NH ₃ -N、 SS, Oil type	Sewage discharge outlet of public transit hub, depots, etc.	Once a year	Monitor according to Environmental Monitoring Technical Specifications surface water and waste water section	Urumqi environmental monitoring station	Project operation capital	2.0
	L _{Aeq}	1m scope away from boundary of public transit hub and depots,etc.	Once every half year,	Monitor according to the measurement guide in Emission limit standard of environmental noise within the boundary of industrial enterprise and factory (GB12348-2008)	Urumqi environmental monitoring station	Project operation capital	0.5

	L_{Aeq}	Guoqing Yuan apartment, haoxiangjinshan apartment, Milan apartment, youhaohuayuan 3 rd apartment, guoxiu apartment, jinyangweixing apartment. Above monitoring points can be adjusted according to the construction schedule.	Once every half year	The noise should be monitored according to Annex C: Noise monitoring method for sensitive buildings in Standards for acoustic environmental quality (GB3096-2008)	Urumqi environmental monitoring station	Project operation capital	20.0
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9.3.4 Comments feedback to monitoring report

The related departments or companies should give the feedback comments within one month after receiving the monitoring report.

Before they give the feedback comments, the receivers should analyze and assess the monitoring reports and confirm the validity of the environmental mitigation measures for the further arrangement, and finally give the relative comments or requests on the monitoring report.

9.4 Completion acceptance for environmental engineering

The project design should emphasize the prevention and control of “three wastes” as waste gas, waste water and solid waste, in order to realize the certified waste pollutant discharge. According to Technical Guidelines for Environmental Protection Check and Accept of Completed Project, the contractor should apply for the checking and accepting of this project made by EPB and make the monitoring plan at the same time. Once the application has been approved by EPB, the project’s Environmental Protection Check and Accept procedure can be initiated after the following data and documents has been prepared. See Table9.4-1.

Table9.4-1 The document list for Environmental Protection Check and Accept of Completed Project

Components	Pollutant	Environmental protection facility	Pollution prevention and control measures	Items for checking and accepting	Quantity	Acceptance standard
Public transportation Supporting infrastructure’s construction	Waste water produced from the maintenance and repair of bus	Impermeable drying lagoon	Evaporation of waste water	-	Bus hubs and maintenance area	
	Noise	Noise reduction, isolation, insulation facilities	Independent room for power engines	L_{Aeq}	Bus hubs	Industrial enterprise factory emission of environmental noise within the boundary (GB12349-2008) Type II
	Domestic waste	Garbage bin	Sorting in different trash bag	100% collected and transported by environmental sanitation department		
	Green		bush and arbor match in certain percentage near the depots	The green area meet the requirements of design		
Municipal integrated public transportation system’s development	Noise	Sound isolation windows	Noise reduction near residence house and school	L_{Aeq}		Standards for acoustic environmental quality (GB3096-2008) Type 2 and 4a

9.5 Training plan and budget

For the purpose of smooth project development and operation, it is necessary to train all the staffs, especially the construction staffs on the environmental protection knowledge and technical skill. Except the general introduction of the importance and meanings for this project, for staffs in different position the emphasis of training content should be different. The training method will adopt the domestic and international approaches according to different importance on the position of management and environmental protection. The detailed training plan can refer to Table9.5-1.

Table9.5-1 Training plan

Staff	Training content	Persons	Days	Budget (10 ⁴ RMB)
Contractor and environmental engineer on site	①Introduction environmental impact factor and protection measures ②Introduction of environmental sensitive area along the project site and other area near the project ③Waste management in construction camp and site. ④Pollution control measures in construction site. ⑤Cultural heritage issues ⑥The simple noise self-monitoring method and noise pollution control measures in construction ⑦Regulation for breach of law, and the penalty for breaking the law or regulations	2 Persons For every construct ion phase	4	8.0
Project and environmental protection supervisor	①study the environmental policies of World Bank ②EMP requirements and the related measures ③Environmental regulation, construction plan, supervision details concerning the construction activities ④Intensive study, including the environmental protection details indicated for contractor, the monitoring specification edited by technical expert on environmental protection, and the environmental impacts and the items that related monitoring request. ⑤Ambient air monitoring and control technique, acoustic noise monitoring and control technique	1 or 2 Persons For every construct ion phase	5	5.0
Environmental management staff in contractor	Above mentioned contents, and the EMP measures in operation period, as well as the environmental facilities' operation and maintenance.	2-4	5	3.0
Senior environmental management staff, senior environmental engineers	The foreign advanced environmental management experiences on traffic project and noise control approaches	4	5	5
Total				21.0

9.6 Environmental investment estimation

In order to realize the two win between environmental protection and economic construction, a series of environmental protection measures have been adopted in the

development of this project. The investment on environmental protection of this project is 623.7×10^4 RMB, occupying the 0.27% of total investment. The details can refer to Table9.6-1.

Table9.6-1 Environmental protection investment

Items	Measures	Budget (10^4 RMB)	Remark
Ecological environment protection	Transplant the street trees	265.2	listed in project cost
Air pollution prevention and control	dust removal by water spraying and dust prevention	10	Existed urban watering cart
Social environment	Pipeline survey on ground and underground	6	listed in project cost
	notification in media for comfort the inhabitants	4	listed in project cost
	Sign of construction site	5	listed in project cost
	temporary bridge for pedestrians and mesh enclosure	15	listed in project cost
Waste water treatment	construction waste water treatment	5	listed in project cost
	drying tanks in bus terminal, hub and depot.	50	listed in project cost
Solid waste disposal	abandoned earth and construction material disposal	10	listed in project cost
Environmental protection training fee budget	Environmental protection training on related staff of contractor and environmental management agency	21	New increase
Environmental management	environmental monitoring and management during construction	32.5	New increase
	EIA and environmental acceptance	200	New increase
	Total	623.7	

9.7 Reporting system and requirements

The contractors, operator, monitoring agency and environmental supervising engineer should report the project development condition, EMP execution and environmental monitoring result, etc. to the related department. The reporting contents mainly including six parts as follows:

(1) The project environmental supervising engineer should record the detailed execution of EMP monthly. And submit the weekly report and monthly report to PMO. The weekly report and monthly report should include the introduction of environmental protection measures' implementation, implementation of

environmental monitoring and monitoring data.

(2) The contractor and Urumqi municipal construction bureau 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 class by class if necessary.

(5) The EMP implementation report for this year should be completed and submitted to World Bank before 31st March of next year

The EMP implementing report should contain the following main contents:

- a. The brief introduction of project developing phase, the overall implementation of EMP, such as the related training's implementing situation;
- b. 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;
- c. The implementation of environmental monitoring and the main monitoring results, whether or not the monitoring results reach the standard, if not, why?
- d. 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;
- e. The next phase EMP implementation plan, including providing the correction measures for the existing problems.

9.8 Social impacts management plan

The local professional team has been employed for assessing the project's social impacts. The main negative social impacts for the project include the following: the impacts of land occupation on the local residents' living, the temporary inconvenience for the local traffic during construction, the impacts on the shops along the project construction site, etc. Except the normal bargain on land compensation and the inconvenience of short-term resettlement, the more significant impacts will be aroused by the involuntary resettlement. Some local residents' living approaches will be changed, like giving up the farming or breeding and choose the business or to be employed in the company, or giving up the former bungalow and moving into the storied house. After the suitable measures, those negative impacts can be mitigated, such as:

- The poor families should be guaranteed the basic living standard after resettlement.
- Improving the social security measures for guarantee the living standard for the peasants when they get old and lost the land during land acquisition.
- The people affected by the project has the right to know, to participate and to supervise.

- Take consideration of the stakeholders' benefits.
- Through the TV, newspaper, broadcast and other media, as well as the publicizing work of grass-roots cadres, the notification can be strengthened among the group affected by the project for their further coordination.
- The compensation standard for land acquisition and demolition should be opened to the public. The demolition should be notified in advance, and the PMO should take charge the coordination on the resettlement, compensation, temporary resettlement and employment for the resettled inhabitants.
- The notification work should be made in advance to the people and entities affected by the projects, especially for the school, hospital and religious place for giving them enough time to make the related preparation as soon as possible.
- The bus route's adjustment during construction should be notified in detail and in advance to the public for reducing the negative impacts from the project construction on public traffic. The affected people are usually scattered with passive position. They lack the activeness in public participation and the related approaches to participate. So the Project Developer should organize the SIA activities and the meeting for the coordination with the affected people, and indicate the contact person in village and communities, which can provide the opportunities and platform for the affected people to participate.

For the project design, such as the road extension width and direction, the public participation will make those be more comply with the actual needs. For the traffic management and road safety works, the suggestions from affected group can optimize the traffic signal facilities.

Some suggestions from the inhabitants along the BRT No.4 Line:

- suggest the municipal administrative departments reconstruct the Aletai road with “three-in-one” approach .
- Rebuild the overpass or underground passage at the gate of Xinjiang University in Xibei road, and forbid the parking in sidewalk.
- Set the station in Wood plant and demolish the Automobile Repair Plant under the viaduct.
- build the overpass in terminal of BRT No.1 Line
- The current Zhongyanan Road will be changed to be dual carriageway, and the traffic safety of the nearby students in Forestry Bureau School should be paid attention to.

Some suggestions from the inhabitants along the BRT No.6 Line:

- Connect the BRT No.6 line directly with other BRT lines in order to give the citizen in Miqian district the direct access to urban area directly.
- Due to the serious traffic jam in Beijiao station, the inhabitants suggest to expand the current road.
- Set the crossing facilities in the intersection of kashidong road and Midongnan

road.

- Set the underground passage or overpass as soon as possible in the Bajiahu road intersection and Kaziwan road intersection.

- suggest to set the temporary bus stations in Kaizwan for diverse the traffic vehicles.

Main suggestions from the inhabitants along the BRT No.6 Branch:

- The seats number in BRT can be reduced according to the actual needs.
- Build the ring bridge or underground passage at the gate of Railway Bureau
- Reduce the limit of traffic light on BRT on the road section that is not the arterial traffic road.
- Make the road construction plan in advance for the faraway section in the north of city.
- Increase the greening area on the road.
- Pay enough attention to the benefit and traffic issues of the poor and vulnerable group

Some suggestion on the static parking facilities:

- The parking issues' mitigation should be made in three aspects, which are the plan, the construction and the management.

- Build the strict completion acceptance mechanism for Parking lots.

- Mitigate the hard parking issues by strengthening the parking management, adjusting the parking fee and parking time, and improving the utilization rate of current parking lot.

- Strengthen the management on illegal parking, make the plan for forbidding parking in indicated area, and permitting the temporary parking and long time parking in the certain area.

Suggestion on improving the traffic condition and public transportation service in Urumqi

- Increase and promote the BRT lines
- Promote the bus route
- Improve the traffic management, especially for Midong district.
- Quickening the secondary and branch roads' reconstruction
- make the plan for developing the line from east to west in city, put more investment for that.
- Improve the current bus station's equipments and facilities
- Improve the working capacity and cultural quality of staffs in public transportation.
- Optimize the bus route to cover more area.
- communicate with more residents, to listen and to accept the good suggestion.

Suggestions on the land acquisition

- Strengthen the publicizing of the compensation policy for resettlement and land acquisition for realizing the social supervision by public opinion.

- Human oriented, make the scientific approach of land acquisition and demolishing to guarantee the resettled persons' benefits.

- Make the scientific analysis on the road expansion alternatives if on the right or left of road central line, which should take consideration of reducing the demolishing work and resettling cost for the inhabitants.

- Reduce the interruption on inhabitants during the construction period, and strengthen the risk early warning, as well as the safeguard stability on land acquisition site.

- Increase the employment opportunities, and try to develop the skill training system for re-employment of resettling persons.

- Strengthen the supervision on land acquisition special fund to avoid the corruption issues.

Suggestions for minority, poor, and vulnerable group

- Give enough attention to the traffic issues of the poor and vulnerable group, as well as their benefit.

- Respect the choosing right of minority on the way of resettlement, and actively reserve and protect the cultural features.

- The construction staff should respect the local minority's manners and customs.

- Actively promote the minority's employment who is farmer and be impacted during land acquisition.

- Increase the guarantee of rights and interests among the vulnerable group impacted by the land acquisition

Promote the participation of women in project development

- Promote the participation of female

- Improve the training of labor skill among women

- Promote the working safety awareness of women through the training

Other suggestions on improving the project design

- Avoid the waste of resources on bus route design, the bus route should be designed scientifically, properly, orderly and with the aim of long-term use.

- Promote the bus route, extend the bus route to cover the Secondary roads and urban external area

- Promote the traffic signal's allocation, make the distribution and design of traffic light properly and scientifically

- Increase the greenbelt on both sides of the road

- Increase the pedestrian crossing facilities

- Care the seniors' demand

- Improve the exclusive way for the disabled

10.EIA conclusion

The project fulfill the related requirements in the document of Outline of 12th five-year plan on national economy and social development in Urumqi city, Outline of Urban Master Plan of Urumqi city(2012-2020), Outline of Urumqi BRT development plan(2012-2017)and Urumqi integrated traffic system development plan(2010-2020). The project is public transport improvement project that is the encouraged type of project according to Guiding Catalogue of Industrial Structure Adjustment (2011 Version). So the project is consistent with the requirements of national policies. According the analysis on BRT route selection and road configuration, as well as the environmental characteristics on station site, the site selection is reasonable.

The implementation of the project construction can improve the current traffic condition, improve the residents' living environment and promote the tourism development and regional economic development. After the implementation of environmental protection measures for this project, the negative impacts will be efficiently controlled. Therefore, from the environmental protection point of view, the result of environmental impacts assessment for this project is feasible.

Suggestion and requests:

(1) For this project, the earthwork is large and the construction period is relatively long. The construction noise and raised dust on the road will have negative impacts on regional environment. It is suggested in this EIA the approach of intensive construction span by span can be adopted for reducing the construction period. And the construction fence or enclosure should be used to surround the site.

(2)Take the urban master planning into the consideration of the project construction, which mean the coordinative developing the related municipal infrastructures with the project. The purpose for that is to avoid the repetitive excavation of road pavement, which results in unnecessary waste.