

Chapter 20 Environmental Impact Assessment

20.1 Existing Environment

Air pollution: Air quality monitoring was carried out at 2 stations – Old market and New Market. Concentration of CO and SO₂ was lower than the standard, but that of NO₂ and SPM was higher than the standard.

Noise and Vibration: Noise and vibration monitoring was carried out at 10 sites along the proposed roads. The noise levels were comparatively high and in the range 57 to 72dB(A). The vibration levels were in the range 36 to 48 dB.

20.2 Prediction of Impact and Evaluation

20.2.1 Socio-economic Environment

Resettlement: Resettlement will be required for the NW Tolgoit road, Teeverchid road and West Naran-Ayush road. A total of 340 households with around 2,700 people are living within 50 meter corridor of the existing or planned roads. The number of households under resettlement is estimated to be 23. Some gers along NW Tolgoit Rd are located within 2-15 meters from the edge of the existing road. Most of them have low income and most households have no land-possessing certificate. Therefore, they all will require social care and compensation.

Economic activities: 16 shops, 36 kiosks (small shops) and service centers lie along the NW Tolgoit road. A restaurant, a heating/power sub-station, 6 kiosks and 2 petrol stations exist along the widening areas of Teeverchid Road.

Traffic and public facilities: Proposed traffic facilities such as flyovers will cause more effective public transportation network against simultaneous increase of traffic volume and encourage decreasing of traffic accidents. Meanwhile, traffic congestion and noise pollution during construction are expected, so construction planning will need prudent environmental consideration for hospitals, schools, and kindergartens along the road corridor.

Cultural property: The state protected cultural heritage. Geser temple is located at IS4 intersection. Therefore, special care should be given during the construction phase.

Waste: The central dumpsite of Ulaanbaatar located at Morin Davaa is considered as the most suitable one for disposal of solid waste from road construction.

20.2.2 Natural Environment

Groundwater: New market-Stadium Rd is proposed to pass through the protected and sanitary zones of UB City water sources for centralised water supplies. It is necessary to consider the following items:

- to establish the proper drainage along the new road in order to avoid negative impacts of rain water with oil and grease by automobiles
- to establish net fences along the new road in order for service facilities and gers not to encroach on the property
- to execute environmental monitoring of groundwater periodically

Hydrological situation: West Naran-Ard Ayush new road will pass through dry beds of the catchment areas. These areas have rain flood and flood from snow melting in the spring season. It is necessary for road planning in this area to cope with those floods.

Landscape: The function of greenery in road planning is to improve the scenery, conserve the natural environment, enhance traffic safety, provide shade and prevent disasters. Therefore, it is necessary to promote greening activities applied to the road and the region.

20.2.3 Environmental pollution

Air pollution: The prediction of pollutant concentration of NO_x and CO caused by vehicle transportation in the future is calculated. The distribution of pollutant level of Teeverchid Rd is shown in Figure 20.2.1. High concentrations are anticipated in a short term and especially in winter. Therefore, if settlement exists along the proposed road, adequate afforestation planning of road sides will be required to promote air diffusion function.

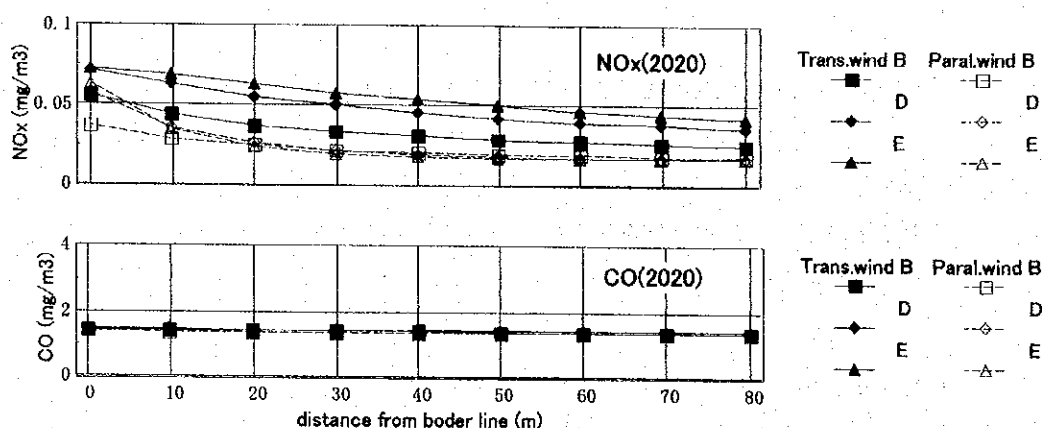


Figure 20.2.1 Distribution of Pollutant Level

The environmental effect of proposed future road network is predicted for 2020. The traffic flow will be improved because of implementation of proposed future road network, as a result volume of air pollutants such as NO_x, CO, CO₂ will decrease by 40 % compared to the case of leaving current network as it is, as shown in Figure 20.2.2. Therefore, the proposed future road network will contribute to improvement of air conditions in UB City.

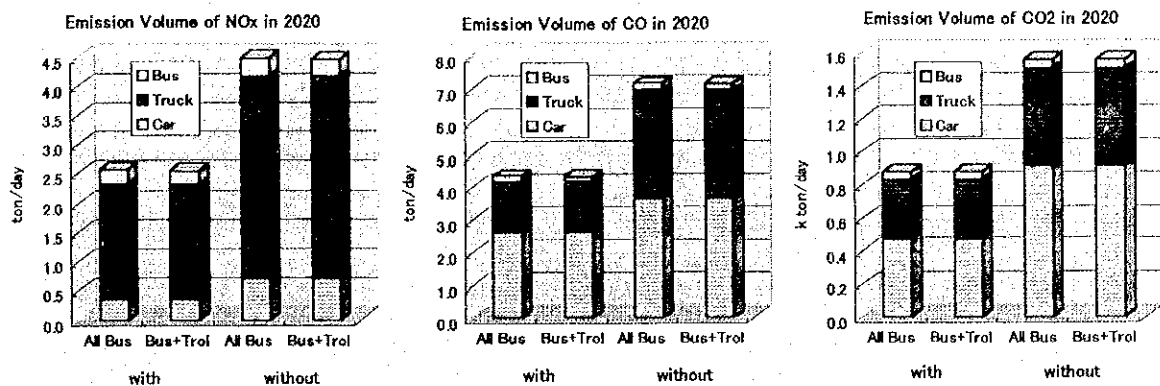


Figure 20.2.2 Comparison between With and Without Future Road Network

Water pollution: As regards plan to rebuild a bridge over the Selbe River, muddy waters will be caused during construction of foundations. Therefore, it is necessary to consider the time of construction should be in no raining months and plan their proper execution.

Noise: Using the measured power level, the distributions of noise level in 2010 and 2020 were calculated. The noise norm in residential areas is 55 dB in daytime, therefore, noise level from proposed roads meets the standard in the area beyond 20-40 m away as shown in Figure 20.2.4. With continued traffic growth after 2010, the noise levels will not decrease even though power level is reduced. Therefore, if conservation objects such as residences and schools exist along the routes, the necessary measure will be needed to reduce the noise. To achieve this, establishment of low sound barrier with shrubs is recommended.

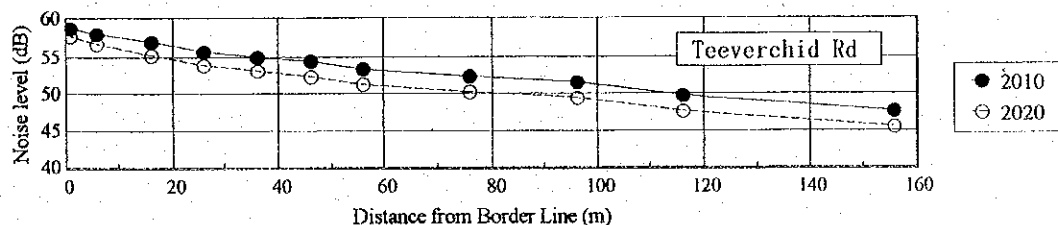


Figure 20.2.4 Distribution of Noise Level

Vibration: As a result of the calculation of the vibration level, vibration levels from future traffic are below the threshold of vibration sensation (0.01 m/s²=60dB).

20.3 Environmental Management Program

20.3.1 Mitigation Measures

Air pollution: Due to the basic reason that the speed of the vehicles will be higher and smoother on rehabilitated roads, the air pollution levels will be reduced as shown in Figure 20.3.3. However, the growth of traffic volume will counter this effect unless suitable measures are taken. Therefore, it is necessary to promote such measures as exhaust gas regulations and traffic demand management, and to establish greenbelts.

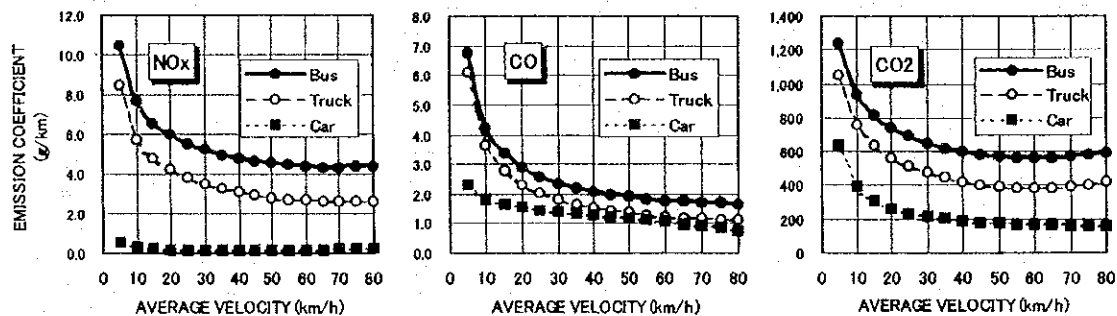


Figure 20.3.3 Emission Coefficient of Bureau of Environmental Protection, Tokyo Metropolitan Government in 2000

Noise and vibration: During the construction stage low noise producing equipment such as vibrator driver (instead of pile driver) will be used. Engine and generator with cover will be used. The following measures will be adopted for the prevention of noise propagation during the operation stage.

- Plantation of trees along both sides of the roads,
- Construction of noise barriers along the roadways particularly where the road passes through the settlement or habitat areas.

20.3.2 Implementation and Monitoring

The parameters to be monitored are air quality, noise, traffic volume, green belt and soil contamination along the New market - Stadium Rd. The cost for implementation of the environmental management plan is given in Table 20.3.4.

Table 20.3.4 Cost for Environmental Mitigation / Management

Particulars	Cost in Tug. Thousand
Avenue plantation	12,315
Net-fence	96,000
Monitoring program	36,540

Chapter 21 Road and Bridge Maintenance

21.1 Present Situation of Maintenance

As per the organization chart of the UB city, there is the division in charge of the maintenance and repair of the city roads. However, there is only one person in this division. There are no parties assigned for repair and maintenance in their organization.

In 1998, 272 million tugrugs was requested as the budget for road maintenance and repair, which was fully cut off and a budget of 491 million tugrugs was approved for construction of new roads.

To formulate a budget for the city road maintenance, a study on the existing condition of roads is carried out in October every year by a group consisting of officers of the ministries and agencies concerned. Its results are collected at the city's road maintenance division.

Orders for the implementation of the city road maintenance and repair works are forwarded to and implemented by the registered 5 companies. Either company has a small-scale organizational structure with total staff of between 35-100 persons including 5-10 engineers and each owns about 10 pieces of equipment.

21.2 Road Maintenance and Repair for Medium and Long-Term Plans

A concept of life cycle to be reflected in the pavement design is shown on Figure 21.2.1. The serviceability of pavement gradually reduces after its construction. However, it could be recovered through the appropriate maintenance and repair.

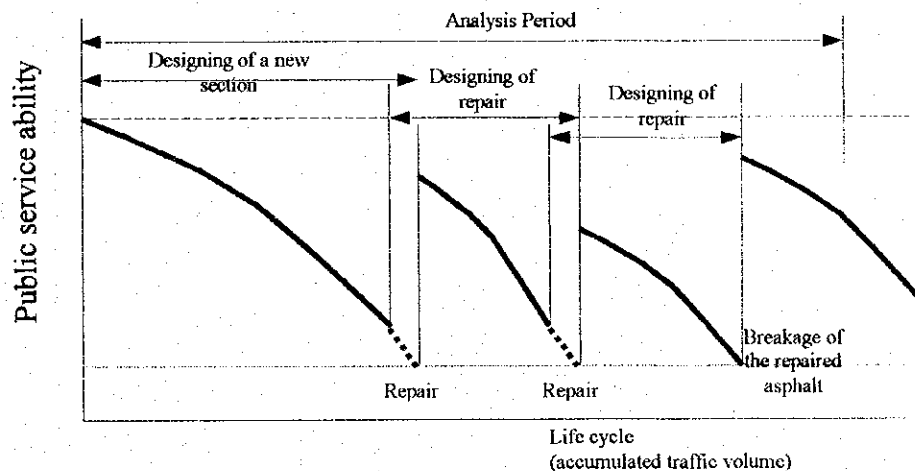


Figure 21.2.1 Life Cycle of Pavement

Inspection is required to carry out appropriate maintenance and repair. The purpose is to ensure the public service ability and functions at a low cost. The inspection form is an inventory form used during this study and is attached to the Final Report.

An example of the contents of the maintenance inspection is shown in Figure 21.2.4. Such inspection describes the rate of asphalt crack appearance and the method of execution depending on traffic volume. Figure 21.2.5 is given here as a reference for the selection of the method of execution.

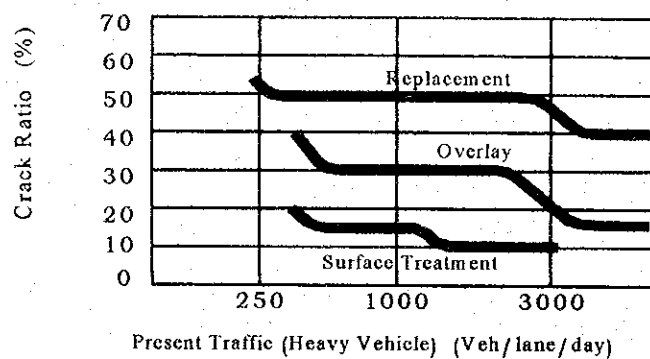


Figure 21.2.4 Example for Selection of Execution Method for Repair of Cracks

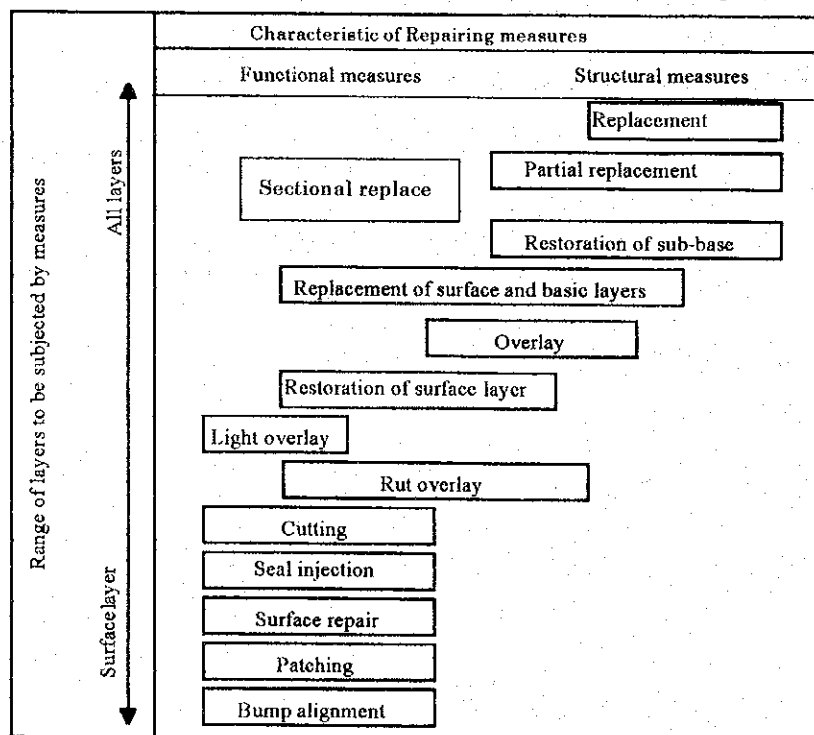


Figure 21.2.5 Example for Making a Decision on Execution Method of Maintenance

21.3 Maintenance and Repair Costs

It is likely that there is no clear method for the estimation of pavement maintenance and repair cost in Mongolia and the budget is decided by every institution concerned based on the results of the previous year.

The Study Team assumed the maintenance cost as 10% of the annual construction cost proceeding from the actual lifetime of pavement of 7-10 years. Table 21.3.1 shows the required maintenance cost based on the above assumption. It is almost the same as that proposed by the ADB.

Table 21.3.1 Maintenance and Repair Cost for Existing Pavement Roads

Evaluation of road	*Total area of each roads m ²	Estimated unit cost (yearly) \$ / m ² / year	Estimated cost (yearly) \$ / year	** Estimated cost by ADB \$ / m ² / year
4	570,960	0.15	85,644	1.16 x 186,000 = 2,160,000
3	1,284,880	0.73	937,962	
2	70,050	3.33	233,267	
1	93,500	6.50	607,750	
Total:	1,860,000		1,864,623	

Source: JICA Study Team

*: Based on the Road inventory sheet

**: Second Roads Development Project (F/S), August 1998

The following is an estimate of maintenance cost of roads covered in the FS.

Group (Route)	UB Rd No.	Road name	Road Length (km)	Pave Width (m)	Pave area (m ²)	Estimated unit cost (Financial) (\$/m ² /year)	Estimated unit cost (Financial) (1000\$/year)	Cost of Group (Financial) (1000\$/year)
Central Route	new	Tolgoit-Songolon cross	0.413	18	7434	*	41	240
	new	South Tolgoit Rd	0.346	18	6228	5.59	34	
	82	South Tolgoit Rd	1.671	18	30078		165	
North Route	3	Tolgoit-Songolon cross	0.413	18	7434	*	41	747
	84,8	N/W Tolgoit	3.627	18	65286	5.49	359	
	5							
	New	WestNaran~ArdAyush	3.006	18	54108		297	
	new	South of TV~N/Rd.88	0.391	11.5	4496.5		25	
South Route	88	N/Rd.88~IS 11	0.454	10.5	4767		26	
	41	Teeverhid Rd.	8.368	18	150624		827	1,584
	new	Teeverhid SW Ext.	0.71	18	12780	5.49	70	
	117	Dund Gol River Side Rd	1.00	18	18000		99	
	39	South of PS4	5.942	18	106956		587	
Middle Ring Rt	new	Stadium ~ New Market	3.12	18	56160		308	308
Total								2,880

Notes: * is counted on both routes. If one route is improved first, the cost of \$41,000 is no need to be included in the second route.

Chapter 22 Implementation Program for F/S Projects

22.1 Projects to be Implemented at the First Stage

For the realization of the whole of projects selected for feasibility study in Chapter 15, it needs a huge amount of the cost. Implementation schedule of the projects shall be studied under the consideration of the following items:

- 1) Execution of high priority projects in early occasion, which are selected from the most appropriate long-term road network for 2020.
- 2) Maintenance and repair works for existing and future road networks.
- 3) Countermeasures to sustain current public transportation systems in future.

22.1.1 Execution of High Priority Road Development Projects

Current road network will become congested in 2020 as mentioned in Chapter 8. Traffic congestion is forecasted especially on “the west part of Enkh Taivan Avenue”, “the roads to the satellite towns” including “road to airport (Nadamchin Rd)” and “access road to northern ger villages”.

The current “access road to northern ger villages” shall be maintained, however without new road development, from engineering and environment points as mentioned in Chapter 3 and 7.

“Access road to satellite towns” shall be developed in parallel with the regional development. It will not be effective to put large amounts of investment to the roads only. As the scope of this FS study is limited within urbanized UB, actual execution plan for these access roads is expected to be studied in detail by another project.

The role of Enkh Taivan road will become more important as the transverse trunk road between east and west of UUB. As mentioned in Chapter 8, the development of alternative routes of east-west transverse road will contribute to the solution of the congestion by dispersing the traffic rather than the widening of the Enkh Taivan alone. Three alternative routes were studied in Chapter 10. The results of economic evaluation shows that, for all routes together, the B/C is 0.94 and EIRR of is 9.3%, which is close to the values required for project to be economically viable.

From the view point of cost and benefit, the improvement of the West End of the Central route has the best cost-efficiency followed by the southern route. The economical performance of Northern Route is low at B/C of 0.71 and IRR of 6.4%. This is because of its high cost. This route passes through mountainous terrain and there are 6 bridges on this route. Middle ring route is economically viable at B/C of 1.03 and IRR of 10.5%.

Total construction periods are assumed to be about 8 years as mentioned in 17.4 of Chapter 17 of Main Text. While the total cost of FS projects is about US\$ 116 million. Whole of the projects would be divided into 3 implementation stages and average expenditure for one stage should be about US\$ 30 to 40 million.

Considering the above budgetary implementation constraint, current developing conditions of the lands along the expected project roads and the urgency, especially against the opening of new central market, following 3 projects are selected as the most high priority projects to be implemented at first stage.

Projects	Cost/Term	Reasons	Remarks
Improvement of irregular Cross section with railway at western part of Enkh Taivan and development of road for the access to northern route.	US\$ 5.6 million 3years	The largest efficiency is ensured by small cost. It will contribute to solve the forecasted traffic congestion in the Central route and to prevent accidents with railway.	The efficiency may become larger after the completion of the northern route in future. EIRR=14.7%
Widening of Teeverchid Road (Length:8.4km)	US\$ 17.0 million 4years	First, this widening is effective for the solution of traffic congestion immediately due to the opening of new central market in 1999. Second, this project has a position as the part 1 of Southern route, which should be completed as the alternative route of the congested central route in 2020.	Recently the development of the land along the road is in good progress and the acquisition of land is becoming difficult. EIRR=11.3%
Fly-over on East cross intersection	US\$ 2.4 million 3years	This is a part of Middle Ring Road and the flyover will contribute to the solution of traffic congestion due to the opening of new central market.	Although the B/C of Middle Ring Road reaches minimum requirement, the East Cross intersection is considered in urgent need of improvement for reducing the future traffic congestion in city center area. EIRR=10.5%
Total Cost	US\$ 25.0 million		

Simultaneously the development of the following facilities is expected in early occasion from the view point of safety of which cost were included in future road network study of Chapter 12, but not in Feasibility Study of Chapter 18. Any of them shall be implemented, if budgetary allocation is available.

- Improvement of 2 intersections US\$ 0.7 million
- Development of Traffic Signal US\$ 4.4 million
- Traffic Sign and Road Marking US\$ 1.0 million
- Improvement of Existing Bus Stops US\$ 0.7 million
- Development of Drainage system in UUB US\$ 12.0 million

22.1.2 Maintenance and Repair Works for Existing and Future Road Network.

There is a general tendency of making a political decision in favor of new roads but not of maintenance during the planning of road network within very limited budget. However in the long term, it means to waste the precious budget if new roads are left without maintenance. While there is an international tendency to seek the responsibility of road management / maintenance of government, if accidents occur.

The roads in UB are under rapid destruction even at this moment. They need urgent repair work.

The following idea is proposed as the priority for the maintenance and repair

Priory	Length of road	Expected yearly maintenance cost (Assumed: \$5/ m2-year:width 10m)
1. The roads for public bus routes	158km	1,580,000*5= US\$7.9 million
2. Busy roads	About 60km	600,000*5= US\$3.0 million
3. Political important roads	About 20km	200,000*5= US\$1.5 million
4. District roads	95km	950,000*5= US\$4.7 million

Note : Total length of UB road is about 450km as mentioned in Chapter 4. While the above figures of road length has double counting.

22.1.3 Measures to Sustain Public Transportation System for the Future

As discussed in Chapter 5 and 9, the existing 4 bus companies were separated from the city organization into self-supported ones in 1996. Their total annual income is TG 7 billion (US\$8.4 million), and expenditure is TG 9.2 billion (US\$11.0 million) in the first half of 1998. Therefore the annual loss would be US\$ 2.6 million.

School children receive a discount of a half of the passenger tariff. And Tug570 million (US\$0.68 million) comes as a subsidy from city office in 1997 for the discount of university students (approximately 8% of the total revenue). While free bus service is provided for aged or handicapped persons without any subsidy. The lost revenue corresponds to 10 % - 20% of the total income. Also it is now a serious issue that about 10 % of passengers do not pay their fare.

They need US\$23.3 million for the renewal of buses during 4 years from 1999 to 2002 in order to sustain the service level of public transportation as mentioned in Chapter 9. It corresponds US\$6 million per annum.

It is usual to receive government assistance for public transport organization in other countries, however current expenditure of the city is TG28 billion (US\$36 million : 1997) only. It is

difficult to increase the subsidy from the city. Also it is necessary that the bus companies should prepare US\$ 6 million per annum by themselves.

Income \$8.4 million, '98	\$0.7 subsidy for students	10-20% compensat ion for aged etc.	10% for non qualified free pass.
---------------------------	-------------------------------------	---	---

Expenditure \$11 million, '98	\$6.mil for the use of renewal per annum
-------------------------------	---

If subsidy from the city is not expectable, some measures are required. They are proposed as follows:

1. Re-organization between companies and within each company.
2. Raising of fare from 100Tg to 150Tg in 2000, and 150Tg to 200 Tg in 2006. Reduction of the scope of people applicable to free bus service should be necessary. Actions by conductors to delete the nonqualified passengers should be enforced by legislative authorization as discussed in Chapter 9. These actions would increase the revenues during the years up to 2010, and can accumulate the funds for vehicle renewal.
3. Introduction of new ticket system for allowing free transfer among routes , and unlimited use of multi-ride ticket within a stipulated time.
4. Sale of the existing and new bus routes to private sectors should be considered, if the revenue shortages continue. This would require a number of preparatory arrangements, the scale of four bus corporations should be reduced; legal arrangements to privatization are necessary. (Staff of bus companies shall receive some advantages in bidding for obtaining the route operation), regulation and control of the operation by TCD should be prepared and so on.
5. Government and city office should take measures to increase the efficiency of bus operation. (e.g. bus exclusive lane, improvement of bus stop, re-arrangement of bus routes, etc.)

22.2 Premises for Implementation

22.2.1 Financial backup by self effort

Total amount of three projects to be implemented is US\$ 25.0 million. or about US\$ 6 million per annum for 4 years mentioned in 22.1.1. While the maintenance cost is US\$ 10 million per annum as mentioned in 21.1.2.

30% of the budget of UB city (US\$11 million) is not only enough for new development but also for maintenance. Income from the entrance fare to the city area by the new roads fund comes to only Tg 110 million (US\$0.13 million).

Mongolian government is requested to establish the system in early chance to procure the necessary budget for the development of roads with effort themselves. The principle here is that the road development costs should be paid by road users. For example, registered vehicles in UB city are now at 36,000. Funds can be raised from several kind of sources such as fuel tax, registration fee and sales tax (for purchasing of vehicles), etc.

The research for increase of the tax revenue is now under implementation by the JICA assistance. Revolutionary changes in tax system and organization is required in Mongolia based on the principle that the cost should be borne by the beneficiaries.

As an example, following methods could be proposed:

	Consumption	Fuel tax increase from 33Tg/L to 100TG/L	Annual increasing cost ratio for the vehicles (US\$10,000)
Fuel Tax	30,000veh x4,000 lit =120 million Litter	120 x 77/840tg = US\$11 million	11 %
Registrati on Fee		Reg. Fee increase from Tg 30,000 to 100,000 30,000 x 70,000/840= US\$ 2.5 million	2.5 %
		Total tax increase US\$13.5 million	13.5 %

The influence for the social prices will occur due to the increased cost of vehicles of 13 %. However, macro economic analysis was not conducted in this study.

22.2.2 Maintenance system

New road construction is the investment for the future. Their maintenance and repair should be conducted to sustain the investment of the past and the present at adequate conditions.

The Ulaanbaatar city's budget for road maintenance is formed from the allocations made by the Road Department, which is decided by Government under the approval of Parliament. But that is not enough for maintenance of the city roads. On the other hand, there is a shortage of pavement repair equipment as well as of materials procured from abroad. Under such a situation,

roads, structures, etc. are now rapidly deteriorating, not gradual process as in the past. The road maintenance and management could not be observed during the study period, while cracks, pot-holes have appeared on the surface. The life expectancy of road pavement, structures, etc. is obviously shortened due to unfavorable conditions. Weather conditions and poor administration would affect unfavorably.

The urgent repair works and periodical maintenance works should be conducted to save high costs in future.

22.2.3 Recognition of Quality Control of Project

There is an example of bad quality control in UB. The officially admitted durability of repair of potholes is only one year. And the same places are repaired every year.

There is a system of one-year guarantee for the road works, but this is not adhered strictly. The staff of the government and the company had come from the same government organization under the socialist system. They are too good friends to point out the defaults of the works. Review of contract documents for clear definition of the guarantee system and of organization responsible for the guarantee system in necessary strict execution of the contracts should be ensured. Otherwise the desirable quality control could not be achieved.

22.2.4 Strengthening of Organization for Management and Supervision

Current city organization for road maintenance does not function due to the lack of budget as mentioned in Chapter 21. The new efficient and reasonable organization should be re-established to meet with the above new large works. It should be avoided that the budget of a state organization is just the same to the total salary of the officers engaged.

22.2.5 Contractors and their Equipment

There are five registered contractors in UB city and they have about 120 pieces of construction equipment. However, most of them are old and not useful as mentioned in 21.2.6 of Chapter 21.

Policy for upgrading the contractors to the international level shall be adopted. At the same time competitions among national or foreign contractors should be introduced through fair bidding to ensure the above 5 contractors are not exclusive contractors for the city projects.

22.2.6 Road Inventory Data

Roads and streets have no kilometer posts. The inventory sheets of roads and bridges in UB City are not edited satisfactorily. The records for overlay, presence of improvement and date of the works are not clear. Bridges and structures on the roads in UB City have no as-built drawings and construction records. A development of database of inventory data in UB City is strongly recommended for ensuring proper maintenance work.

22.2.7 Improvement of the Organization of Bus Companies and Bus Fare

It is essential for the public transportation organization to get the official financial assistance. However it is absolutely difficult now for the UB city government. It is expected to solve the situation for the time being by raising the fare step by step, improvement of their organization and sell out of the right of some bus routes to the outside.

22.2.8 Advisers to TCD

The transport situation of the city is changing as the city develops in various aspects, to which TCD should respond in planning, regulation and implementation. Problems are -1 demand from New Central Market, -2 participation and competition of private buses (an issue of privatization), -3 periodic revision of route and trips, -4 restructure financial positions and so on.

It is recommended to have urgently one or two advising experts of survey and planning for 2 years in Network Planning Division in TCD of Ulaanbaatar City in order to strengthen capabilities of the staff. The employment fund may be requested to the technical assistance program of ADB, World Bank, or JICA

22.3 Proposals

22.3.1 Establishment of Long Term Policy and Regulations

In the planning and implementation cycle of projects for the development of transport sector, a conceptual long term plan is determined at first. This long term plan should not be changed easily. It should be followed by the present and every succeeding cabinets for a long- term period as the base of national policy. New governor or mayor should not revise the basic plan for the implementation of his political idea. During the years of implementation, a need may arise to revise the conceptual long term plan because of changes in development forecast. The revision should be decided after careful re-study of the basic plan and the spirit of the original plan should be respected as much as possible.

Right of way should be ensured within long years period under the city master plan law and land acquisition law. The land for the future road network should not be allowed for any new construction or improvement of building even if it is standing now.

22.3.2 Establishment of Regulation for the Use of the Empty Private Lands

The drainage system in UUB has many problems as mentioned in 4.4 of Chapter 4. It is difficult to design an appropriate drainage system with enough capacity for floods caused by the rain water flowing from the upper side of the city. Financially it is not reasonable to construct a huge drainage system to meet with all occasions. However, we may recommend to utilize empty land as the emergency pond. Now there are still many empty lands inside of the city area. Some of them are kept for future construction of buildings. These open lands should be excavated as a pond until their actual development. Tax for land should be exempted during the utilization of land as an emergency pond. This idea should be backed up by the new regulations.

22.3.3 Decision of Priority of Projects

We should recognize that all selected projects above are studied in the scope of infrastructure development of UB road network. Mongolian government is expected to decide the priority of projects among all Mongolian projects irrespective of whether they will develop the project by their own budget or by the assistance of foreign organizations. It is expected relevant authorities may discuss, decide and move for realization of the selected ones at an earlier occasion.

Table 23.1.1 List of Members Concerned

JICA Headquarters, Advisory Committee and Study Team

JICA Headquarters

- | | |
|-------------------|--|
| 1) Takao KAIBARA | : Director, First Development Study Division, Social Development Study Department |
| 2) Eri HONDA | : Deputy Director, First Development Study Division, Social Development Study Department |
| 3) Mutsumi NARAWA | : Staff, First Development Study Division, Social Development Study Department |

JICA Advisory Committee

- | | |
|---------------------------|--|
| 1) Katustuyoshi NISHIKAWA | : Chairman, Deputy Director, Kagoshima National Highway Work Office, Kyushyu Regional Construction Bureau, Ministry of Construction |
| 2) Kusumu NAGAE | : Assistant Manager, Maintenance Division 2, Engineering Department, Tokyo Second Operation Bureau, Japan Highway Public Corporation |
| 3) Eiichiro MITAKE | : Deputy Director, 1 st Division, Operations Department 2, The Overseas Economic Cooperation Fund |

JICA Study Team

- | | |
|-------------------------|---|
| 1) Koki KANEDA | : Team Leader / Road Planner |
| 2) Kanao ITOH | : Regional Planner |
| 3) Teruhiko HORIE | : Public Transportation Planner |
| 4) Yoshiki TAKAI | : Road & Structural Engineer |
| 5) Hajime KINUGAWA | : Pavement Specialist |
| 6) Ravinder KATTIYAR | : Traffic Demand / Economic Analysis |
| 7) Yukio URANO | : Traffic Survey Specialist |
| 8) Akira ISHIDO | : Road Administration Specialist |
| 9) Fumiaki SHINO | : Environmental specialist |
| 10) Yukio KOUSAKA | : Construction Planner / Cost Estimator |
| 11) Morichika TAKAHASHI | : Topographic Geographical Surveyor |

Steering Committee and Counter Parts

Steering Committee

- | | |
|-----------------------|---|
| 1) Mr. Ts. Damiran | : Chairman, State Secretary, Ministry of Infrastructure Development |
| 2) Mr. Ts. Oyunbileg | : Secretary, Officer, Strategic Planning and Overall Policy Department, MID |
| 3) Mr. R. Bud | : Director, Information, Control, Analysis and Evaluation Department, MID |
| 4) Mr. B. Batjav | : Director, Policy Implementation and Coordination Department, MID |
| 5) Mr. Ts. Sukhbaatar | : Deputy Director, Policy Implementation and Coordination Department, MID |
| 6) Mr. B. Byambajav | : Officer, Government of Mongolia |
| 7) Mr. B. Manduul | : Officer, Policy Implementation and Coordination Department, MID |
| 8) Mr. E. Gombojav | : General Manager, UB City |
| 9) Mr. Ch. Bat | : Director, Strategic Policy and Planning Department, UB City |
| 10) Mr. L. Nyamsuren | : Chief Architect, UB City |
| 11) Mr. Ch. Gankhuu | : City Chief Engineer and Director of Building and Capital Investment Department |
| 12) Mr. N. Nyamdavaa | : Director, Public Transport Department |
| 13) Mr. L. Battsooj | : Officer, Strategic Policy and Planning Department, UB City |
| 14) Mr. S. Ochirbat | : General Director, Road Department (Government Agency) |
| 15) Mr. L. Dashdorj | : Director, Budget Policy Department, Ministry of Finances |
| 16) Mr. L. Davaadorj | : Deputy Director, Foreign Trade and Cooperation Department, Ministry of External Relations |
| 17) Mrs. Dolgormaa | : Officer, Cooperation Division, Ministry of Nature and Environment |
| 18) Mr. S. Pioneer | : Deputy Chief, Traffic Police Department |
| 19) Ms. Sarandulam | : Project Coordinator, Road Department (Government Agency) |

Counterparts

- | | |
|--------------------|--|
| 1) Mr. L. Battsooj | : Officer, Strategic Policy and Planning Department, UB City |
| 2) Ms. Sarandulam | : Project Coordinator, Road Department (Government Agency) |

JICA