



Completion Report

Project Number: 29566
Loan Number: 1700(SF)
September 2007

Mongolia: Second Roads Development Project

CURRENCY EQUIVALENTS

Currency Unit – togrog (MNT)

		At Appraisal (31 August 1999)	At Project Completion (25 September 2005)
MNT1.00	=	\$0.00099	\$0.00084
\$1.00	=	MNT1,027	MNT1,193
SDR1.0	=	\$1.3876	\$1.4169

ABBREVIATIONS

ADB	–	Asian Development Bank
ADTA	–	advisory technical assistance
DBST	–	double bituminous surface treatment
DOR	–	Department of Roads
DEIA	–	detailed environmental impact assessment
EA	–	executing agency
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
GDP	–	gross domestic product
ICB	–	international competitive bidding
IEE	–	initial environmental examination
JOC	–	Japan Overseas Consultants Co. Ltd.
MCPC	–	Mongolian Construction Project Consultants Co. Ltd.
MID	–	Ministry of Infrastructure Development
MOF	–	Ministry of Finance
MONE	–	Ministry of Nature and Environment
MRTT	–	Ministry of Roads, Transport and Tourism
PPTA	–	project preparatory technical assistance
PIU	–	project implementation unit
PRC	–	People's Republic of China
PSC	–	project steering committee
RRP	–	report and recommendation of the President
RSRC	–	Road Supervision and Research Center
SARS	–	severe acute respiratory syndrome
SDR	–	special drawing rights
TA	–	technical assistance
VOC	–	vehicle operating cost

NOTES

- (i) The fiscal year (FY) of the government and its agencies ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country	Mongolia
2.	Loan Number	1700(SF)
3.	Project Title	Second Roads Development Project
4.	Borrower	Mongolia
5.	Executing Agency	Department of Roads
6.	Amount of Loan	SDR18,336,000
7.	Project Completion Report Number	PCR: MON 989

B. Loan Data

1.	Appraisal	
	– Date Started	01 June 1999
	– Date Completed	14 June 1999
2.	Loan Negotiations	
	– Date Started	26 August 1999
	– Date Completed	27 August 1999
3.	Date of Board Approval	30 September 1999
4.	Date of Loan Agreement	24 January 2000
5.	Date of Loan Effectiveness	
	– In Loan Agreement	24 April 2000
	– Actual	2 March 2000
	– Number of Extensions	none
6.	Closing Date	
	– In Loan Agreement	31 January 2005
	– Actual	27 February 2007
	– Number of Extensions	1
7.	Terms of Loan	
	– Interest Rate	1% per annum during grace period and 1.5% per annum thereafter
	– Maturity (number of years)	32
	– Grace Period (number of years)	8

8. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
8 May 2000	20 December 2006	80 months
Effective Date	Original Closing Date	Time Interval
2 March 2000	31 January 2005	59 months

b. Amount (\$'000)

Category ^a	Original Allocation	Last Revised Allocation ^b	Amount Cancelled	Net Amount Available	Amount Disbursed	Undisbursed Balance ^c
01	16,201.73	18,923.83	0	18,923.83	15,638.07	3,285.75
02	2,699.61	2,805.62	0	2,805.62	2,629.82	175.79
03	1,799.74	3,421.93	0	3,421.93	2,979.12	442.82
04	798.97	830.35	0	830.35	486.79	343.56
05	3,499.95	0.00	0	0.00	0.00	
Total	25,000.00	25,981.73	0	25,981.73	21,733.80	4,247.92

^a 01 = civil works, 02 = equipment, 03 = consulting services, 04 = interest charge, 05 = unallocated.

^b The difference between the original amount and the revised total amount was due to the (i) reallocation of the unallocated amount to civil works and consulting services, and (ii) exchange rate variation between the SDR and \$.

^c The surplus loan proceeds of the Project were transferred in February 2007. The details are presented in ADB. 2007. *Regional Road Development Using Surplus Loan Proceeds*. Manila (Loan 2087-MON, approved in February).

10. Local Costs (Financed)	
- Amount (\$)	\$2,384,965
- Percent of Local Costs	22.0
- Percent of Total Cost	7.9

C. Project Data

1. Project Cost (\$'000)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	21,500.00	19,348.84
Local Currency Cost	12,000.00	10,834.96
Total	33,500.00	30,183.80

2. Financing Plan (\$'000)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower-Financed	8,500.00	8,450.00
ADB-Financed	24,200.00	21,247.01
Other External Financing	0.00	0.00
Total	32,700.00	29,697.01
IDC Costs		
Borrower-Financed	0.00	0.00
ADB-Financed	800.00	486.79
Other External Financing	0.00	0.00
Total	33,500.00	30,183.80

ADB = Asian Development Bank, IDC = interest during construction.

3. Cost Breakdown by Project Component (\$ million)

Component	Appraisal Estimate	Actual
A. Base Costs		
1. Civil Works	23.2	24.1
2. Equipment	3.0	2.6
3. Consulting Services	1.8	3.0
Subtotal (A)	28.0	29.6
B. Contingencies		
1. Physical Contingencies	2.7	0.0
2. Price Escalation	2.0	0.0
Subtotal (B)	4.7	0.0
C. Interest and Other Charges during Construction	0.8	0.5
Total	33.5	30.2

4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants	March 2000	11 April 2000
Completion of Engineering Designs	October 2000	October 2000
Civil Works Contract		
Date of Award	January 2001	5 December 2001
Completion of Work	July 2004	19 September 2005
Road Maintenance Equipment Dates		
First Procurement	May 2001	17 July 2002
Last Procurement	September 2001	19 August 2005

5. Project Performance Report Ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 30 September 1999 to 31 August 2000	S	S
From 30 September 2000 to 31 May 2001	S	HS
From 30 June 2001 to 30 April 2007	S	S

HS = highly satisfactory, S = satisfactory

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members ^a
Fact-Finding	10–25 Mar 1999	3	32	a, b, c
Appraisal	1–14 Jun 1999	4	37	a, b, c, i
Review 1	27–31 Mar 2000	1	5	d
Inception	4–8 Sep 2000	2	10	a, e
Midterm Review	10–20 May 2002	1	11	e
Review 2	10–14 Feb 2003	1	5	e
Review 3	23–28 Jun 2003	1	6	e
Review 4	5–6 Jul 2003	1	2	a
Review 5	23–28 July 2004	3	17	f, a, h
Special Loan Administration	20–22 Sep 2004	1	3	f
Review 6/Handover	4–9 May 2005	3	18	f, i, h
Project Completion Review	30 July–8 Aug 2007	2	18	j, e

^a a - economist, b - engineer, c - programs officer, d - consulting services specialist, e - transport specialist, f - financial analyst, g - counsel, h - project officer, i - director, j - transport economist.

RUSSIAN FEDERATION

MONGOLIA SECOND ROADS DEVELOPMENT PROJECT (as completed)



-  National Capital
 -  Provincial Capital
 -  City/Town
 -  Project Road
 -  Roads Development Project Loan No. 1364-MON(SF)
 -  Priority Links Included in the Medium-Term Road Master Plan
 -  Paved Road
 -  Unpaved Road
 -  Railway
 -  Bridge
 -  River
 -  Provincial Boundary
 -  International Boundary
- Boundaries are not necessarily authoritative.

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I. PROJECT DESCRIPTION

1. Mongolia is a poor landlocked country. Its overall poverty rate is approximately 36%. Rural areas have 43% of the country's total population and urban areas have 30%.¹ Mongolia's road sector is underdeveloped and is unable to fulfill its objective of fostering economic and social development. The key problem in that sector is underdevelopment of the road network, even taking into account the country's low population density. Both road density and the share of paved roads in Mongolia are close to the low end of the countries in the world. Moreover, many paved and gravel roads are deteriorating and a large proportion remain impassable during the rainy season or winter due to inadequate maintenance. The development of the road sector, however, has been constrained due to inadequate funding.

2. Against this backdrop, the Project's objective is to promote Mongolia's economic and social development through an efficient road sector by upgrading the Nalayh–Choyr road. This road, which is located in the poor areas of the Tuv and Govisumber aimags (province), is part of the north-south road link connecting Ulaanbaatar to the Russian Federation (Russia) and the People's Republic of China (PRC). The project scope includes (i) civil works to upgrade about 200 kilometers (km) of the state road between Nalayh and Choyr; (ii) procurement of road maintenance equipment; and (iii) consulting services for detailed design and construction supervision, monitoring and evaluation, and capacity development. Advisory technical assistance (ADTA) in conjunction with the Project is provided to support the Government's policy reforms and institutional strengthening.

3. Given the importance of roads to support trade with Russia, PRC, and other Asian countries, the Government decided to build within Mongolia key roads that are sections of the Asian Highway network. The project road, which is a part of Asian Highway 3, traverses Ulaanbaatar, which contributes over one half of the country's industrial production. It also connects with one of the PRC's national trunk highway corridors at the border, leading to Beijing and the ports on the east coast. About 312 km of the road northward from Ulaanbaatar to Altanbulag was improved under the Asian Development Bank (ADB)-financed roads development project.² Upgrading of the southern part from Ulaanbaatar to Zamyn-Uud is essential for efficient transport of goods and passengers. The Project improves about one third of the southern part. In three towns (Nalayh, Maant, and Choyr) that the Project traversed, there were about 27,000 poor people, about two thirds of the total population. Most towns in the project area lacked access to all-weather roads and a reliable road connection to the paved road system leading to Ulaanbaatar. The goal of the Project was to promote economic growth, and to reduce poverty through improved efficiency of the road sector. The project framework³ is in Appendix 1 and the chronology of major events is in Appendix 2.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

4. At appraisal, ADB recognized that as a large landlocked country with a low population density of 1.5 persons per square kilometer (km²), Mongolia faced a natural barrier to the cost-effective development and operation of its transport network. Situated between the PRC and

¹ World Bank. 2006 *Mongolia Poverty Assessment*. Washington, DC (April)

² ADB, 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for Roads Development Project*. Manila

³ The project framework was formulated by the project completion review mission.

Russia, Mongolia's transport system enabled the country to benefit from a growing role in supporting the expanding regional trade. Mongolia's transport infrastructure was inadequate to serve the size of the country and the economy's requirements for transport services. Facilities were poorly maintained and investment in new transport infrastructure was constrained by lack of resources. The existing transport network was developed for a centrally planned economy and was inappropriate for the emerging market economy. The Project's goal was to promote Mongolia's economic and social development by improving the efficiency of the road sector. The Project was designed to (i) support road sector policy and institutional reforms by enhancing the capacity to respond to market demands, (ii) upgrade priority sections of the state road network, and (iii) develop domestic capacity in road construction and maintenance.⁴ The Project also aimed to help reduce poverty in the project area by increasing employment opportunities both during and after construction, to accelerate agricultural development by lowering transport costs, and to improve access of goods and people to the economic mainstream for poor towns. The Project is, therefore, fully consistent with that strategy.

5. The Project was formulated under a project preparatory technical assistance (PPTA)⁵ which reviewed the Government's feasibility study and environmental impact assessment, thereby strengthening the project preparatory work.

B. Project Outputs

1. State Road

6. The project section of the state road is between Nalayh and Choyr. The section is 200 km long, with a 7 m wide pavement, 1.5 m wide gravel shoulders, 5 cm deep asphalt concrete pavement⁶, and a design speed of 80 km/hour. The starting point of the Project corresponds to 31 km from Ulaanbaatar. The project road passes through two capital districts and four soums (administrative unit of a province) of two aimags. The road runs 2.5 km through Nalayh district and 15 km through Bagakhangai district of Ulaanbaatar, further passes 42.5 km through Sergelen soum of Tuv aimag, 60 km through Bayan soum of Tuv aimag, 46 km through Bayantal soum of Govisumber aimag, and 43 km through Sumber soum of Govisumber aimag.

7. The state road is of good quality and retains comfortable riding conditions even after 2 years of operation. Road roughness between Nalayh and Choyr was 2.3 in 2005. The project completion review mission (the Mission) found that the alignment of the road and the quality of the roadbed were good, as attested by the smoothness of riding conditions. Although the roadbed was well-constructed, the road had cracks due to the severe climate in the project area. The hottest air temperature is higher than 38°C in summer and the minimum air temperature is lower than -45°C in winter. The actual difference in pavement temperatures would be larger than that of air. The cracks, however, had already been fixed adequately when the Mission was

⁴ This was initially prepared under ADB. 1992. *Technical Assistance to Mongolia for the Road Master Plan and Feasibility Study*. Manila (TA 1820-MON, approved in December).

⁵ ADB. 1997. *Technical Assistance to Mongolia for the Second Roads Development Project*. Manila (TA 2827-MON, for \$500,000, approved in July).

⁶ The initial design of the pavement was for double bituminous surface treatment (DBST) because it was a good option for a relatively lightly trafficked pavement and was considerably cheaper than asphalt concrete pavement. However, the pavement design was changed from DBST to asphalt concrete pavement during construction in March 2003, because asphalt concrete is more durable than DBST. In addition, for severe climatic conditions, slurry seal was applied on some stretches to improve the quality of the asphalt concrete sufficing and durability of the road.

fielded. The fixed cracks appeared not to have damaged the roadbed, but the thermal cracks should be carefully monitored and properly maintained.

8. In line with the Road and Road Transport Policy Statement adopted in 1995, the State and Local Property Act of 1996, and Government Resolution on Privatization No.160 of 1997, the Government started privatizing the government-owned contracting units and maintenance enterprises. An ADTA⁷ was provided to support the Government for privatization (para 23). Based on the recommendations of the ADTA, the Ministry of Infrastructure Development (MID) carried out the three pilot concessions that were satisfactorily completed. The Government established 22 maintenance companies, 4 of which are private and the rest are state-owned companies. The Ministry of Road, Transport and Tourism (MRTT)⁸ through its agency, the Road Supervision and Research Center (RSRC), awarded maintenance contracts for the project road to two companies: Ulaanbaatar AZZA Co. Ltd and Tuv AZZA Co. Ltd for a 122 km long section⁹ from Nalayh to Davaintal settlement and a 78 km long section from Davaintal settlement to Choyr, respectively. The contracts will be renewed every year if performance is satisfactory.

2. Equipment

9. The equipment for road maintenance was procured through international competitive bidding (ICB) and international shopping. Various equipment worth \$2.6 million¹⁰ were leased to the equipment leasing company, whose leasing system¹¹ was developed by the ADTA in conjunction with the Project. All pieces of equipment had been procured by September 2004 and were leased before completion of the state road. The ADTA established the leasing system and the loan financed the purchase of equipment by the Government for the equipment leasing company. Coordination between the implementation of the Project and its associated ADTA was timely and efficient. The Mission noted that MRTT had constructed a proper storage for maintenance equipment at the tollgate.

3. Consulting Services

10. An international consulting firm, Japan Overseas Consultants Co. Ltd (JOC) in association with Sergelt Avtozam SE Mongolia, which was privatized and renamed as Mongolian Construction Project Consultants Co. Ltd. (MCPC) in 2002, was engaged in accordance with ADB's *Guidelines on the Use of Consultants*. The contract was signed in April

⁷ ADB. 1999. *Technical Assistance to Mongolia for Policy Support in the Road Sector*. Manila (TA 3268-MON, for \$670,000, approved in September).

⁸ MRTT succeeded to the role of MID due to the reorganization of the Government in September 2004. The details are explained in para. 21.

⁹ The contract to Ulaanbaatar AZZA includes the other 26 km long section from Bayanzurkh to Nalayh. The total length of the contract to Ulaanbaatar AZZA is 148 km.

¹⁰ 3 tandem rollers; 3 asphalt distributors; a bitumen lorry; 6 hand vibrating rollers; 2 snow removers; 3 wheel tractors rear mounted backhoe; 3 motor graders, 3 chip spreaders; 6 dump trucks; a mobile workshop; and 3 water tank trucks by ICB, and 3 air compressors; 6 asphalt concrete cutting saws; 3 diesel engine generators; 6 small equipment for pavement construction; 9 vibrator plate compactors; 3 hand cart type asphalt sprayers; 3 mobile living houses; and 3 double cab pickup trucks by international shopping.

¹¹ Its establishment is part of the Project and Road Transport Policy Statement, which ensures (i) availability of equipment for road construction and maintenance; (ii) promotion of private sector participation; (iii) repair and regular maintenance of equipment; (iv) proper accounting of equipment operation costs; (v) establishment of market-driven hire rates, including an equipment replacement fund; (vi) efficiencies in receipt and distribution of spare parts; (vii) an end to an equipment-use monopoly and the introduction of a competitive environment; and (viii) a reduction in contractors' equipment fleets with a corresponding reduction in facilities for repair and workshop maintenance.

2000. The consulting services for the construction of 200 km of the state road included these activities: (i) review of the design of the Nalayh–Maant road section (70 km), (ii) detailed engineering design of the road between Maant and Choyr (130 km), (iii) preparation of bidding documents, (iv) assistance to the Department of Roads (DOR) in prequalifying contractors, (v) assistance to DOR in inviting and evaluating contractors' bid documents, (vi) preparation of documentation on procurement of equipment, (vii) construction supervision for the Nalayh–Choyr road, and (viii) preparation of the monitoring and evaluation report. The original consultant's contract amounting to \$1.8 million was amended three times to (i) redesign a 40 km long section beyond Hooltiin Pass between Nalayh and Maant to reduce the construction cost by \$1 million; (ii) facilitate the supervision work adequately, corresponding to an increase in the number of construction sites; and (iii) redesign for the change of pavement structure of a 172 km road from DBST to asphalt concrete pavement and extend the consulting services for 4 months, corresponding to a delay in project completion. The revised consulting services contract amounted to \$2.8 million.

11. The consulting services with JOC were concluded in December 2004. However, due to the extension of the civil works for the state road, additional consulting services were required. MCPC was engaged in accordance with ADB's *Guidelines on the Use of Consultants*. The contract was signed in June 2005. The consulting services for construction supervision included these activities: (i) checking, inspecting, and testing on drawings, material, and works; (ii) reviewing the contractors' quality control; (iii) advising and supporting MRTT's supervision work; and (iv) collecting baseline data and preparing evaluation and monitoring reports. The contract amounted to \$0.2 million.

C. Project Costs

12. The actual final cost of the Project was \$30.2 million, compared with the \$33.5 million estimate at appraisal. The actual final cost comprised \$19.4 million in foreign exchange (\$21.5 million at appraisal) and \$10.8 million equivalent in local currency (\$12.0 million at appraisal). The civil works cost estimate at appraisal was \$23.2 million versus the actual cost of \$24.1 million, of which \$15.6 million was financed by ADB. The undisbursed balance of the contract is mainly due to the fact that the actual quantity of civil works was less than expected and penalty deductions were assessed for delayed completion of works.

13. Actual equipment costs were lower than estimated (\$2.6 million compared with the \$3.0 million estimate at appraisal), due to the conservative estimation at appraisal. The cost of consulting services increased more significantly (from \$1.8 million at appraisal to an actual cost of \$3.0 million). This increase of about 60% is attributable to delays in implementing the civil works contract and to the need for redesigning because the pavement structure was changed.

14. The financing plan prepared at appraisal called for ADB to finance 100.0% (\$21.5 million) of the estimated foreign exchange expenditures. Local currency expenditures were to be covered by MRTT (\$8.5 million) and ADB (\$3.5 million). While ADB was called to finance 74.6% of the total cost at appraisal, 72.0% (\$21.7 million) of the total cost was actually financed. The remaining actual local currency expenditures were financed by MRTT (\$8.5 million). Appendix 3 presents a detailed comparison of the appraisal estimates with actual costs and the appraisal and actual financing plans.

D. Disbursements

15. Disbursement was generally accomplished through reimbursement, commitment letters, and direct payment. Disbursement from the loan account began in May 2000 and was completed in December 2006.¹² ADB transferred the savings of loan proceeds of \$4.3 million (equivalent to SDR2,838,456.9) to the Regional Road Development Project¹³ as a surplus, reducing the size of the loan to \$21.7 million, or SDR15,497,543.1. The initial disbursement was delayed compared with the schedule, because of the delayed implementation of the civil works contracts and equipment procurement. An imprest account facility was also used to help reduce the cash flow difficulties in financing project expenditures during implementation. MRTT had sufficient accounting capabilities and had established adequate internal control, accounting, and auditing procedures to ensure the efficient use of the imprest fund. An imprest account and statement of expenditure procedures were utilized for local expenditures of consulting services. Appendix 4 shows the actual annual disbursement during project implementation.

E. Project Schedule

16. The loan was approved on 30 September 1999, signed on 24 January 2000, and became effective on 2 March 2000. ADB approved advance procurement action for the procurement of civil works. The advance action involved (i) issuing a general procurement notice, (ii) prequalifying the bidders, (iii) issuing invitations to bid, (iv) opening and evaluating bids, and (v) completing related activities up to the stage of contract award.

17. Although advance procurement action for civil works had been taken, civil works actually started in May 2002, compared with the original schedule of April 2001. The delay was attributed to contractors' lack of international experience and delays in approving the design, prequalification, and bid evaluation reports. Civil works were finally completed by October 2005, or 14 months later than envisaged.

18. The supply of road maintenance equipment was expected to start in May 2001, but actually started in August 2002, about 15 months late, mainly due to tendering delay and the severe acute respiratory syndrome (SARS) epidemic in 2003. Procurement of the maintenance equipment was completed in September 2004, about 18 months late. The contract for consulting services for detailed design and construction supervision was awarded in January 2000. Detailed design was completed in accordance with the appraisal schedule, i.e., by October 2000. However, construction supervision was actually delayed by 14 months to start in May 2002, because of the delay in civil work contract mobilization and commencement. Consulting services were completed in September 2005, about 13 months late.

19. The loan closing date was extended once by 12 months, from January 2005 to January 2006. The extension was prompted by delays due mainly to (i) contractors' lack of experience in international contracting and insufficient work force and equipment, and (ii) the SARS epidemic in 2003. A graphical comparison of the appraisal and actual implementation schedules is presented in Appendix 5.

¹² The actual date of loan closing was 27 February 2007.

¹³ ADB. 2004. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for the Regional Road Development*. Manila (Loan 2087-MON, for SDR25,505,000 [\$37.13 million equivalent], approved in July). Due to the cost overrun of this project, the surplus loan proceeds of the Project were transferred in February 2007. The details are presented in ADB. 2007. *Regional Road Development Using Surplus Loan Proceeds*. Manila (Loan 2087-MON, approved in February).

F. Implementation Arrangements

20. The Executing Agency (EA) was DOR of MID. The Project Steering Committee (PSC) was established in May 1999. Its functions were to (i) oversee and coordinate all project activities including liaison with the consultants and the agencies involved in project implementation and sector reform; (ii) review the status of implementation of project components; (iii) monitor the progress achieved and resolve difficulties encountered; and (iv) serve as a forum for discussions on, and review of, the Project's impact on regional development. The committee was chaired by the State Secretary of MID, and was made up of representatives from the Ministry of Finance (MOF), Ministry of External Relations, Bank of Mongolia, and DOR. To ensure efficient and timely implementation of the Project, the Government established a project implementation unit (PIU) within DOR. It was headed by a project manager and had technical and administrative personnel. The Government ensured that the PIU remained adequately staffed during project implementation. International and national consultants provided assistance in project design, construction supervision, traffic engineering, and monitoring and evaluation. The organizational chart of MID is in Appendix 6.

21. The reorganization of the central Government was carried out in September 2004. MID was divided into three ministries: MRTT, Ministry of Fuel and Energy, and Ministry of Construction and Urban Development. DOR, which was transferred to MRTT, took over the Project. The PIU was also moved to DOR of MRTT. The organizational chart of MRTT is in Appendix 6.

G. Conditions and Covenants

22. The status of compliance with the major loan covenants is presented in Appendix 7. The EA generally complied with the standard covenants, with some exceptions. Covenants related to the audit of financial statements and road fund accounts were complied with, but with almost 1 year delay due to the resource constraints of MOF and MRTT. No covenants were modified, suspended, or waived during implementation.

H. Related Technical Assistance

23. The objectives of the ADTA were to (i) introduce financial management in DOR, (ii) improve road financing and set up a road board, (iii) privatize road sector companies, and (iv) establish an equipment leasing company for road maintenance operations. The technical assistance (TA) agreement was signed on 14 October 1999 and the TA was completed in September 2000 but financially closed in June 2002. The detailed evaluation is in the TA Completion Report circulated to the Board of Directors on 28 August 2002.¹⁴

I. Consultant Recruitment and Procurement

24. **Consulting Services.** An international consulting firm associated with a domestic consulting firm was recruited in accordance with ADB's *Guidelines on the Use of Consultants*. The contract was signed in April 2000, but was amended three times in July 2000, November 2002, and October 2003 for the reasons discussed in para 10. The contract period was

¹⁴ ADB. 2002. *Technical Assistance Completion Report on Policy Support in the Road Sector Mongolia*. Manila (TA 3268-MON)

extended to December 2004, accordingly. Due to delays in completing the civil works, further extension of the consulting services to September 2005 was required.¹⁵

25. **Procurement for Civil Works.** The civil works contract for \$24.1 million was signed with China Tiejisu Civil Engineering Group's 5th Construction Company in December 2001. The contract was procured using ICB procedures in accordance with ADB's *Guidelines for Procurement*. It was 8 months behind the original schedule due to delays in the approval of the design, bidding documents, and bid evaluation reports by ADB. The details of the contract packages are in Appendix 8.

J. Performance of Consultants, Contractors, and Suppliers

26. Both the international and national consultants performed well. The international consultants established a smooth working relationship with DOR and the associated domestic consulting firm. The consultants took into account Mongolian situations well, and provided useful support for DOR to catch up on the delay in civil works and to improve the road design including pavement structure and its width. The international consultants supported capacity building for DOR staff and national consultants for formulating a road transport policy, road construction, project management, contract administration, construction supervision, and quality control through on-the-job training, seminars, and a study tour. DOR staff and the national consultants also learned practical applications of the International Federation of Consulting Engineers (FIDIC) contract system through the international consultants. The performance of the contractor was satisfactory. However, the completion of the state road was delayed by about 14 months. The reasons for the delay related to the contractor were (i) lack of knowledge of Mongolian conditions including customs clearance procedures, the third-party liability insurance contract, and procurement of equipment;¹⁶ (ii) delay in mobilizing construction equipment; (iii) shortage of cash flow;¹⁷ (iv) poor management and internal quality control system; (v) insufficient plants for rock crushing, concrete asphalt pavement; and (vi) use of old equipment, resulting in frequent downtime. The project road was accepted by final inspection of the civil works carried out in Nalayh–Maant in August 2005 and in Maant–Choyr in September 2005. The overall performance of the consultants, contractors, and suppliers was considered satisfactory.

K. Performance of the Borrower and the Executing Agency

27. DOR was the EA for the Project and was responsible for project planning, management, supervision, and coordination. The performance of MOF, DOR, PSC, and PIU was satisfactory. Communications with ADB were timely, implementation arrangements were well-established and maintained, and reporting was adequate. With the assistance of the international consultants, DOR could follow ADB's *Procurement Guidelines* properly. The civil works were completed within the budget. During implementation, the pavement structure was changed from DBST to asphalt concrete for the entire 200 km length. Considering the severe climate conditions in Mongolia, this modification was appropriate. Several violent incidents between the

¹⁵ Based on the audit result in 2004 by the Mongolia National Audit Office, the EA terminated the contract with JOC and decided to sign a contract with MCPC. The EA submitted a proposal to ADB, including terms of reference (TOR), cost estimates, and the justification that MCPC was a capable supervision consultant firm for the Project. ADB approved the proposal in June 2005. The MCPC was recruited for the additional consulting services in accordance with ADB's *Guidelines on the Use of Consultants*.

¹⁶ The contractor did not fully comprehend the logistical difficulties. As a result, there was a significant shortage of equipment mobilization during the first construction season, so that the contractor had progressed by only about 10% by the end of 2002

¹⁷ VAT charged to equipment was refunded, but the contractor faced difficulty in preparing advance money for VAT.

contractor's employees and local residents were reported in 2002, but the EA intervened in coordination with the concerned local police and governments. All the incidents were immediately resolved and did not affect the progress of project implementation. To improve relations, the EA took the initiative to hold in 2003 a public relations event in which 150 local residents and 500 workers participated. The completion of the state road was delayed by about 14 months. Although it was admitted that the delays were basically caused by the contractor's lack of international experience in construction works and the prevailing SARS epidemic that occurred in the PRC in 2003, the delay was partly attributable to the fact that the Borrower and DOR did not implement administrative procedures quickly.¹⁸ All conditions and covenants stipulated in the Loan Agreement over which DOR had direct control were complied with, although with some delay. The overall performance of the Borrower and the EA was considered generally satisfactory.

L. Performance of the Asian Development Bank

28. ADB conducted loan review missions regularly during project implementation and provided DOR with effective advice on project implementation and procurement matters. During the later stages of implementation, administration of the Project was delegated to the Mongolia Resident Mission to ensure close monitoring. DOR appreciated the assistance provided by every mission, but would have preferred dealing with the same project officer throughout project implementation for easier coordination and consultation. ADB coordinated the Project with its associated ADTA in a timely and efficient manner, which made it possible to utilize the equipment leasing company system developed by the ADTA and to lease the equipment procured by the loan through the equipment leasing company. ADB also supported the Government in privatizing the government-owned construction and maintenance enterprises as recommended by the ADTA. Consequently, the state road financed by the loan has been maintained by two Mongolian private companies (para 8). The performance of ADB is considered satisfactory.

III. EVALUATION OF PERFORMANCE

A. Relevance

29. The Project is rated highly relevant. Its rationale is sound, given the high priority accorded to the development of a more direct and efficient transportation corridor to link the PRC and Russia, and given the importance of supporting the trade with PRC, Russia, and other Asian countries. Strengthening its transport linkages to one of the largest and fastest growing economies in the world will considerably enhance Mongolia's midterm growth prospects. The increased transport capacity will encourage development of other natural resources and establishment of new industries in the project influence area.

30. The road traverses Ulaanbaatar — which has a third of the total population of the country — and connects at the border with one of PRC's national trunk highway corridors leading to Beijing and the Tianjin port. This makes the road an important international link for the rapidly growing trade with the PRC and beyond. Without the Project, the existing track would

¹⁸ (i) The civil works contract was signed in December 2001, 8 months behind the original schedule due to delays in procurement; (ii) Mongolia had no previous experience in tax-free procurement and it took a long time to get the required approval to import construction equipment, causing a delay in mobilizing equipment. (Afterwards, the contractor acquired permission to import equipment VAT free for a year and with a potential extension for 6 months.); and (iii) consultant's check and inspection and DOR's approval for the newly completed work were slow, resulting in the civil works delay.

have been overcrowded and its road upgrading to accommodate the projected freight and passenger loads would have been a massive undertaking. The railway, the only alternative means of transport in the project area, is not flexible to meet the demands of small- and medium-volume traders who are increasingly turning to the PRC for commodities and tradable materials. Without the project road, economic development in the area would have been much slower or even stifled, and road accidents and deaths would have increased. The Project provided the national network with travel time savings by upgrading the roads for north-south traffic. Economic transport provided by the Project induces new industrial and natural resources development that will generate significant economic activities in the project area and reduce poverty.

31. Taking into account the fact that Mongolia is a small economy highly dependent on the development of its international trade to support growth, the north-south road link connecting the Russian Federation and the PRC provides for added capacity of cost-effective transport for both industrial outputs and people in the project area. While the existing parallel railway is suitable for carrying long-haul bulk cargoes such as coal and steel, the project road plays an important role in moving perishable and high-value goods such as cashmere and semi-processed copper and gold as well as in distributing goods over shorter distances. The Project, therefore, (i) enables the economy to grow and endemic poverty to be reduced through increased employment and higher income levels; (ii) provides for safer transportation of both freight and passengers; and (iii) facilitates the delivery of health, education, communication, and other public services to the rural poor.

B. Effectiveness in Achieving Outcome

32. The Project is considered highly effective. The traffic analysis for the project road is presented in Appendix 9. The traffic growth pattern from 2007 to 2024 is based on (i) actual traffic (2003–2005), (ii) actual and expected industrial and population growth in the project area, and (iii) industry development in the project area. The revised forecasts exceed the appraisal estimates, reflecting strong and sustained economic performance in Mongolia. The growth in traffic volume is forecast to continue to be more rapid, indicating that economic prospects for mining, agriculture, and raising livestock along the project road remain brisk. Once the current ongoing project (see footnote 13) to connect the remaining section of Mongolia's north-south road transport corridor between Choyr and the border with the PRC in Zamyn-Uud is completed by 2009, the project road will generate full benefits as an important route for domestic and international transit traffic, promoting trade among countries in the region.

33. As formulated, the Project expected benefits from reduced vehicle operating cost (VOC) savings. With the new road in operation, travel time has been reduced significantly: from 4~5 hours to 2~3 hours (50%) for light vehicles, from 8~10 hours to 5~6 hours (40%) for trucks, and from 5~6 hours to 3~4 hours (60%) for minibuses. The average daily traffic has reached the volume envisaged at appraisal. Reflecting that the remaining section of Mongolia's north-south road transport corridor between Choyr and the border with the PRC is under construction, completion of the total length from Ulaanbaatar to the border with the PRC will serve to maximize the economic benefits arising from improved international trade and to facilitate regional cooperation among Mongolia, PRC, and Russia.

34. The Government established the equipment leasing company and the related regulations. Various equipments worth \$2.6 million procured by the Project were leased to the equipment leasing company. To achieve the objective of the equipment leasing company (para 10), the ADTA established the leasing system and the loan provided equipment to the

equipment leasing company. Coordination between the implementation of the Project and its ADTA was timely and efficient. To ensure effective and transparent lease and use of equipment, a review mission that ADB fielded in June 2004 also recommended that all leasing agreements should be properly documented. MRTT has been successful in attracting private sector participation in road construction and in transport services. Private sector participation in the road sector has been effectively achieved.

35. MRTT's project management capacity has improved. The international consultants effectively supported capacity building for DOR staff and national consultants for formulating a road transport policy, road construction, project management, contract administration, construction supervision, and quality control (para. 26).

C. Efficiency in Achieving Outcome and Outputs

36. MRTT and the Borrower implemented the Project efficiently and made the necessary counterpart funds available on time. Although implementation experienced 14-month delays due to the limited experience of the contractor in construction works and the SARS epidemic in 2003, the pace of implementation picked up and the Project was completed successfully within the appraisal budget. The first section of the works, the Nalayh–Maant section, was completed and in operation in July 2005, and the remaining Maant–Choyr section completed and in operation in September 2005, 14 months later than the appraisal's schedule of completion in July 2004. The traffic analysis in Appendix 9 shows that traffic volumes in both sections have already exceeded the appraisal estimates.

37. The economic reevaluation in Appendix 10 uses the same with- and without-project approach used at appraisal. The economic internal rate of return (EIRR) based on current data is 19.6%, compared with 16.6% at appraisal, due primarily to the higher traffic than in the original estimate. The economic reevaluation is considered conservative since benefits arising from the Project-related access/link roads and the cost savings due to accident avoidance were not been included in the calculations. Time savings from the upgraded project road were not included in the analysis. Various categories of road users benefit from the Project. Farmers and the mining industry business in soums and aimags in the project area have cheaper access to the market, in particular. Local people enjoy better access to social services like schools, hospitals, and communication centers. The EIRR would increase significantly if these additional benefits were included. The rapid industrial development along the project road will increase the production of minerals, coal, and other industrial outputs. On the basis of these analyses, the Project is rated highly efficient.

38. Since the Project by itself does not generate revenues, its financial performance was not evaluated.

D. Preliminary Assessment of Sustainability

39. The sustainability of the Project is rated likely. The Project is technically and financially sound. The completion of the project road improved the efficiency of road transport in the project area and has also provided easier access by road to poor remote villages. The project road provides critical network connections for north-south traffic, shortening traveling time between Russia and the PRC through Mongolia. The opening of the road has significantly reduced VOCs, and has contributed to a higher GDP growth rate in the affected area and to poverty reduction through robust economic growth. Production trends indicate that mineral production will continue to increase significantly. Both external and local demand for minerals

will continue, and as other industries are established and their operations expand, use of the project road will continue to rise. MRTT, responsible for the operation of the project road has appropriate, trained staff capable of maintaining the roads very well. Most of the Road Fund, which had been set up in the 1990s to finance the road sector budget in accordance with the Road Act, however, has been deployed for road sector construction rather than maintenance.

40. The current mineral export pattern to the PRC ensures that the demand for and production of minerals in the Choyr area will continue to rise. Further, use of the project road will continue to rise as other industrial operations continue to expand.

41. The Mission noted that a tollgate was installed at Hoolt, 13 km south of Nalayh. MRTT set up the tollgate in 2006 to collect user fees to relieve the road maintenance burden. The user fees are transferred to the Road Fund and then allocated for road maintenance. There are 16 tollgates including the one at Hoolt in Mongolia. RSRC administers all tollgates and collects toll fees, which amounted to about MNT560 million in 2006. RSRC started operating the tollgate at Hoolt in June 2006.¹⁹ The toll structure and the revenue from this tollgate are summarized in Appendix 11. The Road Fund by itself was not, however, sufficient to meet the needs of the road network, because the Road Fund not only should cover the annual maintenance cost of the project road, but also should contribute to the maintenance of other priority roads in the country.

E. Impact

42. The construction of the Project has improved road transport in the project area. Transport is more efficient and more economical, as evidenced by road roughness, traveling time, and so on. Road roughness between Nalayh and Choyr improved from approximately 6 in 2000 to 2.3 in 2005, which is of satisfactory standard for periodic maintenance and rehabilitation works. Improved conditions on the Nalayh–Maant road significantly increased traffic speed. Between Ulaanbaatar and Choyr, private minibuses and buses now operate regularly and are able to make two round-trips a day, compared to one a week in 2000. Putting the new road into operation has significantly reduced travel time. Also, the reduced travel time has caused passengers to shift from the railway to the road.

43. Together with rising traffic growth, the number of traffic accidents has increased as well. Road safety, therefore, becomes a serious issue. The current increasing trend of traffic accidents is mainly due to a combination of speeding as a result of the absence of formal speed limits, lack of enforcement of traffic laws, limited traffic police resources, poor coordination between road transport management and enforcement agencies, and road users' lack of general awareness of road safety.²⁰ During the field visit, the Mission met the Governor of Govisumber aimag. He requested that (i) in resident areas, structures to segregate pedestrians from high-speed traffic and crossovers should be provided; and (ii) access roads to residential

¹⁹ The standard unit cost of road maintenance was MNT1.8 million per km. The maintenance cost for the 200 km state road financed by the Project is projected to be MNT360 million in the future. DOR allocated only MNT68 million because the section was newly constructed and requires less maintenance work. The revenue from toll fees covers about 60% of the required budget for road maintenance for the section in 2007. That percentage is likely to gradually fall, taking into account the fact that the required budget for maintenance continues to rise, while toll fee collection is not expected to increase much.

²⁰ On the project road, the speed limit has been pegged at 80 km/hour, but vehicles have been observed to travel at speeds higher than 120 km/hour. As a wide area of grazing land is along the project road, the number of traffic accidents involving livestock like cattle and horses has rapidly risen, even though safety fences were installed along the road to prevent livestock from crossing the road. The structure for road traffic signs was not so strong and traffic signs are knocked down by cattle.

areas and roads within residential areas should be developed because the traffic volume within residential areas has risen in parallel with the traffic on the state road.

44. The goal of the Project was to promote economic growth in Mongolia as well as in the project area, and to reduce poverty. The average annual per household income for the Ulaanbaatar area increased from MNT92,135 to MNT175,116 between 2000 and 2005 and the annual net income for the Project-affected rural area rose from MNT72,854 to MNT162,495 during the same period. During implementation of the Project, the percentage of poor households fell from 63.9% in 2000 to 48.5% in 2005 in Nalayh, from 30.1% to 27.5% in Choyr, and from 16.5% to 16.3% in Maant during the same period. The Project has provided better access to (i) health care; (ii) larger markets; (iii) better employment opportunities; and (iv) safer, low-cost transportation. Appendix 12 presents a detailed review of the social and poverty reduction impact of the Project in the project area.

45. The Project annually engaged on average 1,000 skilled and unskilled workers in road construction, compared with 550 workers as estimated at appraisal. During construction, specific tasks such as drainage works, ditch lining, masonry construction, planting and seeding, and supplying water were targeted as labor-intensive, and the contractors hired more than 20% workers for civil works from local people in the project area, as mandated by DOR.

46. To ascertain how much economic impact the Project had on the affected area, the Mission visited some selected sections (Nalayh, Maant, Bayan, and Choyr) and interviewed various affected people including local residents and government officials. The Mission noted that local people could increase their income by selling livestock in various markets located in Ulaanbaatar by using the project road, and opening restaurants and shops to the contractors. This implies that the road project has been an effective tool for poverty reduction.

47. The project road accelerates industrial production in Nalayh, Maant, and Choyr, which the project road traverses, and new developments in the mining industry, including (i) cooperative mineral deposit mining with investments from the Russian and Mongolian joint venture Gobi-Ural, (ii) mines in Dalanjargal soum with investments from the PRC, and (iii) coal mines near Choyr, to mention a few. Benefiting from the increase in the traffic and industrial development, small roadside service businesses such as kiosks, canteens, restaurants, shops, and hotels have opened along the project road as well.

48. As population density in Mongolia is very low and the ADB road projects have so far upgraded only roads along an existing alignment, resettlement was not an issue. No land and other nonland assets had to be acquired, but one household living in Bayan soum was resettled. The resettled family received a compensation of MNT1.8 million. The Mission found that the actual compensation was in compliance with the ADB resettlement policy. The affected household when interviewed by the Mission showed their general satisfaction with the compensation paid. The Mission noted in the interview, however, that the affected household was inconvenienced because the resettled house could not be supplied with electricity.²¹ The Project did not encounter any indigenous people issues during implementation.

49. As the Project only worked along an existing alignment and required no land acquisition for right-of-way, there were no significant adverse environmental impacts. The initial environmental examination (IEE) did not identify any comprehensive, broad, diverse, or

²¹ The new housing plot selected by the affected household was too far from the grid, and connecting to it will require a high connection cost.

irreversible adverse environmental impacts associated with the Project. The main features of mitigation measures to minimize negative impacts proposed in the design and construction process included (i) an adequate drainage system, (ii) erosion prevention solutions, and (iii) requirements for traffic management provisions. In 2001, the detailed environmental impact assessment (DEIA) was prepared by an external consulting firm guided by the Ministry of Nature and Environment (MONE) and ADB, and was approved by MONE.

50. During construction, the diversion roads in windy areas were kept wet to reduce air pollution and dust nuisance. The access roads to borrow pits were selected at a distance as far as possible from water streams to reduce any negative effect on the environment. Flood protection works such as digging additional drainage channels, constructing water collecting wells and earth dikes were completed as well. DOR engaged a consulting firm to carry out a detailed environmental evaluation and prepare and implement an environmental monitoring plan. The State Professional Inspection Authority (SPIA) monitored and assessed environmental mitigation measures regularly by coordinating with the concerned local government and DOR. SPIA inspected the construction site to verify compliance with the IEE. The contractor satisfactorily implemented the environmental protection measures envisaged in the IEE. All the environmental mitigation measures were done adequately (Appendix 13).

51. Overall, the socioeconomic, environmental and other impacts as a result of the Project are rated positive.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

52. The Project has been implemented as planned with no significant changes and was physically completed by September 2005. The formulation and design were technically sound and highly relevant to the achievement of its development goals at appraisal and at completion. The main outputs have been implemented well except for the delays. The effects on poverty and the increased economic growth may not be entirely due to the Project. However, the project road has acted as a primary catalyst for improved economic growth in the area. It can therefore be concluded that the Project achieved its main impacts: increasing per capita incomes and reducing the proportion of the population living below the poverty level in the project area. The primary impact, as stated in the report and recommendation to the President (RRP), to promote economic growth in the poor interior provinces to raise living standards and reduce poverty has been achieved (para. 44 and Appendix 12).

53. The reevaluation by the Mission showed that the Project remains economically viable, with an EIRR of 19.6%. The Project saved \$4.3 million, costing 12.8% less than the appraisal estimates. If the contractor had not lacked international experience in construction works and if the SARS epidemic had not occurred, then, the planned outputs could have been completed on time. Overall, the Project was well-implemented and is rated highly successful.

B. Lessons

54. The Government's repeated difficulties in meeting funding requirements for road maintenance through the state budget highlight the need to establish a sustainable funding mechanism. In the past years, Road Fund revenues have not been sufficient to meet the road

sector requirements.²² The detailed Road Fund revenue and its expenditure are presented in Appendix 11. MRTT needs, therefore, to establish a sustainable funding mechanism for the road sector. Without such a mechanism and in view of the Government's difficult financial situation, road assets will not be adequately maintained.

55. Timely mobilization of equipment and supply of construction materials from ADB member countries constituted a major source of difficulty. The following specific conditions in Mongolia should be taken into account to reduce implementation risk in future road projects: (i) limited experience of implementing agencies and contractors; (ii) Mongolia's extreme winter conditions that limit the annual construction season to only 6 months (April–October), which means that even minor delays in contractors' mobilization schedule or processing of project documents may result in slippage of 1 year in project implementation; and (iii) the complexity of resolving cross-border issues.

56. While MRTT's project management capacity has improved through training, it should be further strengthened. Due mainly to resource constraints, the roles and responsibilities of both DOR and RSRC were not clearly defined after the reorganization of MRTT. This was the main reason why the submission of various audited financial statements for the Project and the Road Fund among loan covenants to be complied with has not been on time since 2005. Submissions were significantly delayed by more than 1 year on average. Special attention should be paid to strengthening human and financial resources in MRTT, and improving budgeting and the financial management system.

57. Although the State Road Board was supposed to be established by June 2001 according to the loan covenants, the Board was actually organized in October 2003, more than 2 years late, which made for late compliance with a relevant loan covenant. Perhaps a long lead time is required for establishing administrative bodies, and covenants need to provide sufficient time for such purposes. Also taking into account the fact that the Road Board has not been functional since its establishment, necessary steps should be taken to strengthen its role.

58. Private sector participation in the road sector has been achieved by establishing an equipment leasing company. Road maintenance, however, still remains under state ownership. MRTT should continue to make an effort to establish full private sector participation in road maintenance. MRTT needs to recognize that the success of the Government's privatization program for road construction and maintenance companies depends on the existence of a market for them.

59. The pavement design was changed from DBST to asphalt concrete pavement during construction taking into account the fact that asphalt concrete is more durable than DBST (para 6). Although DBST was considerably cheaper than asphalt concrete pavement, the decision to change pavement design was evaluated highly relevant, reflecting the severe climatic conditions in Mongolia. It is notable that the asphalt concrete pavement option has been adopted in the ongoing road project in Mongolia (see footnote 13), and has been proposed for the project that is currently under development.²³

²² Although the Road Fund revenue, which amounted to MNT6.4 million in 1999, more than tripled to MNT21.9 million in 2005, the Road Fund was mainly deployed for new road construction rather than maintenance. This is mainly due to the fact that although the Road Fund has been useful in channeling revenues, it has not been emphasized that the revenues are also to be used for maintenance. During the period from 1999 to 2006, the expenditure for constructing new roads utilized 54.6% of the Road Fund, while only 19.2% was used for maintenance.

²³ The Government of Mongolia is proposing to develop a 784 km road corridor through the Western Region of Mongolia connecting Yarant at PRC border to Ulaanbaishint at Russia border via Hovd and Olgiy.

60. Because violent incidents on the sites may affect the successful implementation of future projects, the following preventive measures need to be considered: (i) better promotion of project activities in the local community, (ii) civil works contract conditions to enforce replacement of contractor's staff if they violate local laws or regulations; (iii) educational activities for contractor's employees to familiarize them with local laws and regulations; and (iv) establishment of a conflict mediation group, comprising representatives from the EA, local government, police, and contractors to handle incidental issues such as safety, labor conditions, relations with the local community, and contagious diseases including HIV/AIDS.

C. Recommendations

1. Project-Related

61. It is recommended that a maintenance center/depot be constructed every 100–200 km, according to geographical, climate, and other related conditions, and be ready to deal with any situation. The Mission also noted that the fixed cracks on the pavement have not damaged the roadbed. DOR, however, needs to monitor the thermal cracks carefully and to maintain the pavement properly.

62. Although the members of the single affected household expressed their general satisfaction, they feel somewhat inconvenienced due to lack of access to electricity, which they had before the resettlement. MRTT is requested to assist the affected household to obtain a new electricity connection in coordination with the concerned local government.

63. For successful implementation of ongoing and future projects, MRTT needs to monitor how leased equipment is managed by the equipment leasing company and how well the company is performing, to get the full benefit from privatization.

64. The full benefit from the project road will have been generated in 2009 when the Regional Road Project connects the project road to the PRC border, at which time the project performance rating assessment could be undertaken.

2. General

65. The Road Fund needs to be strengthened for the maintenance purpose. Fund allocation for maintenance expenditures from MOF, responsible for controlling the revenue of the Road Fund, needs to be entirely based on the road conditions or on the traffic volume. MRTT may also do a study on a toll road strategy as a practical option to enhance the Road Fund's sustainability by increasing revenue.

66. The road safety issue should be emphasized. The various suggestions from the local governments (para. 43) should be considered in ongoing and future projects. Taking into account the rapidly increasing traffic, traffic laws should be strictly enforced and traffic police resources enhanced immediately.

67. Regional cooperation is increasingly seen as a key driver for Mongolia's transport strategy. Several high-level dialogues among the concerned governments — Mongolia, PRC, and Russia — have been held. A tripartite agreement to reduce trade barriers could realize more benefits from the roads. Further efforts should, therefore, be made to facilitate regional cooperation.

PROJECT FRAMEWORK

Design Summary	Performance Indicators/Targets		Monitoring Mechanisms	Assumptions and Risks
	Appraisal	Actual		
Goal				
To promote economic development and reduce poverty through improved efficiency of the road sector	<ul style="list-style-type: none"> Transport services enhanced, and efficiency of traffic movement improved; local economy developed 	<ul style="list-style-type: none"> Public transportation service from Ulaanbaatar (UB) to Choyr is improved from 1 minibus/week in 2000 and 1 big bus/day in 2005. Travel time from UB to Choyr is reduced from 4~5 hours in 2000 to 1.5~2 hours in 2005. 	<ul style="list-style-type: none"> State statistical office, provincial, and township statistical office 	<ul style="list-style-type: none"> Government initiatives in facilitating policy reforms and improving transport infrastructure to enhance sector efficiency, thereby promoting economic and social development.
Purpose				
1. Policy and institutional reforms of the road sector institutions to enhance their capacity to respond more effectively to market demands	<ul style="list-style-type: none"> Policy and institutional reform initiatives covering the areas of policy and regulatory framework, institutional reform, private sector participation, road funding and cost recovery, and capacity building implemented 	<ul style="list-style-type: none"> The Road Transport Act was approved by Parliament in June 1999 and took effect in July 1999. National Transport Advisory Committee established in 1998 was reorganized in May 2000 to monitor policy implementation in the road sector. 	<ul style="list-style-type: none"> Project review missions and progress reports on project implementation 	<ul style="list-style-type: none"> Government's commitment to policy and institutional reforms
2. More efficient movement of freight and passenger traffic	<ul style="list-style-type: none"> Physical conditions of the project road sections improved and are maintained at less than international roughness index (IRI) of 4. 	<ul style="list-style-type: none"> IRI is improved from 6 in 2000 to 2.3 in 2005. 	<ul style="list-style-type: none"> Progress report on project implementation and construction supervision, and project completion report (PCR) 	<ul style="list-style-type: none"> Diligent construction supervision and support of the Department of Roads (DOR) for contract management Full economic benefits may not be achieved if the entire road to the People's Republic of China (PRC) border is not completed in a reasonable time frame.
3. Reduced transport costs	<ul style="list-style-type: none"> Vehicle operating cost (VOC) on the project road is reduced by 20 to 40% 	<ul style="list-style-type: none"> Reduced travel time; from 4~5 hours to 2~3 hours for light vehicles; from 8~10 hours to 5~6 hours for trucks; and from 5~6 hours to 3~4 hours for minibuses. 	<ul style="list-style-type: none"> DOR statistics on VOCs and monitoring of traffic counts; monitoring and evaluation report by construction supervision consultants 	<ul style="list-style-type: none"> Quality of surveys to be conducted and quality of statistics

Design Summary	Performance Indicators/Targets		Monitoring Mechanisms	Assumptions and Risks
	Appraisal	Actual		
4. Enhanced financing of road maintenance and development	<ul style="list-style-type: none"> Revenues from the vehicle license fees are deposited in the Road Fund starting January 1999. Road fund management improved with the setting up of a road board 	<ul style="list-style-type: none"> TA3268 provided recommendations to improve Road Fund management. The Road Board was set up in 2003. It comprises 9 members to represent concerned departments Revenues from the Road Fund are sufficient road expenditures. The revenue in 2007 is projected at MNT74.6 billion, while revenue in 1999 was MNT6.4 billion. 	<ul style="list-style-type: none"> Project review missions and Government budget allocation from the Road Fund; audit report of the Road Fund account 	<ul style="list-style-type: none"> Government initiatives to improve its institutional performance and upgrade its administrative/policy management
5. Capacity development in local road construction and maintenance	<ul style="list-style-type: none"> Domestic road construction and maintenance companies to be privatized in line with the Government's privatization plan, and trained to participate in bidding works for road works 	<ul style="list-style-type: none"> In February 2001, the Government approved a Program for State Property Privatization. As of July 2007, 5 firms for construction and 17 firms for maintenance were privatized or restructured with public-private partnership. 	<ul style="list-style-type: none"> Project review missions and progress reports on project implementation 	<ul style="list-style-type: none"> Training provided effectively by experienced consultants
Project Outputs				
1. 200 km of road upgraded	<ul style="list-style-type: none"> Realization of project design and compliance with all technical specifications during implementation 	<ul style="list-style-type: none"> Road construction was completed in August 2005. Final acceptance took place in September 2006. 	<ul style="list-style-type: none"> Review of bidding documents and performance of procurement; reports from consultants for detailed design and construction supervision; project review missions 	<ul style="list-style-type: none"> Demonstrated preparation and implementation capacity of DOR Risk of pavement cracking due to extreme climatic conditions Risk of adopting double bituminous surface treatment as surfacing option due to lack of experience
2. Policy and regulatory framework enhanced	<ul style="list-style-type: none"> The Road Transport Act enacted by the Parliament on 4 June 1999 	<ul style="list-style-type: none"> The Road Transport Act took effect in July 1999. The National Transport Advisory Committee was reorganized in May 2000. 		
3. Institutional strengthening of DOR	<ul style="list-style-type: none"> Competitive bidding procedures of DOR strengthened, including prequalification procedures and tender documents 	<ul style="list-style-type: none"> One international competitive bidding contract for civil works and six for road maintenance equipment 	<ul style="list-style-type: none"> Project review missions and reports from the consultants 	<ul style="list-style-type: none"> Adequate consultant input to provide training in bidding procedures

Design Summary	Performance Indicators/Targets		Monitoring Mechanisms	Assumptions and Risks
	Appraisal	Actual		
	<ul style="list-style-type: none"> Financial and management accounting systems of DOR strengthened to meet the requirements of the Government and the Asian Development Bank New road design and construction standards adopted by the Government by 31 March 2000 	<ul style="list-style-type: none"> Submission of certified copies of audited accounts, financial statements, and road fund statements not later than 12 months at the end of each fiscal year. Adoption had actually occurred by April 2000. 	<ul style="list-style-type: none"> Review of audited financial statements of the Project submitted by DOR Project review missions and reports from the consultants for detailed design and construction supervisions 	<ul style="list-style-type: none"> Adequate consultant input will ensure that DOR shifts to new financial and management accounting systems Shortage of budget to modify the standards to suit local conditions prior to adoption
4. Privatization and private sector participation in road construction and maintenance encouraged	<ul style="list-style-type: none"> Privatization of road sector companies implemented Equipment leasing company established to lease maintenance equipment on a commercial basis to private companies Road maintenance by contract introduced so that maintenance works could be undertaken more efficiently by private companies 	<ul style="list-style-type: none"> In February 2001, the Government approved a Program for State Property Privatization in 2001. As of July 2007, 5 firms for construction and 17 firms for maintenance had been privatized or restructured with public-private partnership. 	<ul style="list-style-type: none"> Project review mission, and technical assistance (TA) consultants' report Project review mission, and TA consultants' report Project review mission and TA consultants' report 	<ul style="list-style-type: none"> Government's commitment to privatization As the concept of equipment leasing is new, there may be an initial delay in operationalizing the company. Due to DOR's unfamiliarity with maintenance by contract, there may be procedural problems.

Activities – Milestones	Actual	Inputs
1. Provide counterpart funds on time for project implementation	<ul style="list-style-type: none"> Sufficient fund allocation from Government budget and Road Fund 	<ul style="list-style-type: none"> No delay due to the funding problem.
2. Recruit consultants for detailed design and construction supervision	<ul style="list-style-type: none"> Sufficient fund allocation from Government budget and Road Fund 	<ul style="list-style-type: none"> Progress reports on project implementation and DOR's budget plans
3. Carry out survey and design	<ul style="list-style-type: none"> Consultants recruited by March 2000 	<ul style="list-style-type: none"> April 2000
4. Tender civil works contracts and award the contracts	<ul style="list-style-type: none"> Survey and design completed by October 2000 	<ul style="list-style-type: none"> Finished on time
5. Implement and complete the Project	<ul style="list-style-type: none"> Civil works contracts awarded by March 2001 	<ul style="list-style-type: none"> December 2001
6. Train project implementation unit and DOR staff on project management and financial management	<ul style="list-style-type: none"> Physical work completed by July 2004 	<ul style="list-style-type: none"> October 2005
	<ul style="list-style-type: none"> Staff training scheduled during the course of project implementation by consultants recruited under the loan 	<ul style="list-style-type: none"> 5 DOR staff attended overseas training for 14 days in Feb 2001.
		<ul style="list-style-type: none"> Contract documents Final report of survey and design Contracts documents Project completion report and review mission Progress reports of implementation and review missions; performance of project implementation unit and DOR in project implementation; and consultants' training reports

CHRONOLOGY OF MAJOR EVENTS

Date	Event
August 1999	Loan negotiations held at ADB headquarters
30 September 1999	Loan approval
24 January 2000	Loan signing
2 March 2000	Loan effective
8 May 2000	First disbursement of \$270,000 as mobilization fee to the consultant
24 January 2000	Consulting services contract for detailed design and construction supervision awarded
18 March 2000	Start of consulting services for TA 3268-MON: Policy Support in the Road Sector
30 April 2000	Start of first consulting services contract
September 2000	Completion of consultants' work under the ADTA
December 2001	Signing of civil works contract
May 2002	Midterm review was fielded.
May 2003	Minor change in scope under road maintenance equipment was approved by ADB.
10 November 2003	First extension of loan closing date from 31 January 2005 to 31 January 2006
	ADB approves reallocation of unallocated amount of \$2,553,155 to civil works (\$2,101,501) and consulting services (\$451,654).
31 July 2004	Original targeted completion date of the Project
31 January 2005	Original closing date
9 May 2005	Project administration was delegated to MNRM.
September 2005	Completion of civil works and commissioning of the Project road
27 February 2007	Actual loan closing date.
	\$4,247,921 cancelled and its loan savings were transferred as a surplus to the Loan 2087-MON: Regional Roads Development Project.
August 2007	Project completion review mission was fielded.

ADB = Asian Development Bank, ADTA = advisory technical assistance, MNRM = Mongolia Resident Mission, MON = Mongolia, TA = technical assistance.

Source: Asian Development Bank and Ministry of Roads, Transport and Tourism.

PROJECT COST AND FINANCING SOURCE
(\$ million)

Item	Appraisal					Actual				
	ADB			MRTT		ADB			MRTT	
	Foreign Currency	Local Currency	Sub- Total	Local Currency	Total	Foreign Currency	Local Currency	Sub- Total	Local Currency	Total
A. Base Cost										
1. Civil Works	13.90	2.30	16.20	7.00	23.20	13.40	2.23	15.64	8.42	24.06
2. Road Maintenance Equipment	2.70	0.00	2.70	0.30	3.00	2.63	0.00	2.63	0.03	2.66
3. Consulting Services for Detailed Design, Construction Supervision, and Related Activities	1.10	0.70	1.80	0.00	1.80	2.83	0.15	2.98	0.00	2.98
Sub-Total	17.70	3.00	20.70	7.30	28.00	18.86	2.38	21.24	8.45	29.69
B. Contingencies										
1. Physical Contingencies	1.70	0.30	2.00	0.70	2.70	0.00	0.00	0.00	0.00	0.00
2. Price Contingencies	1.30	0.20	1.50	0.50	2.00	0.00	0.00	0.00	0.00	0.00
Sub-Total	3.00	0.50	3.50	1.20	4.70	0.00	0.00	0.00	0.00	0.00
C. Interest and Other Charges										
During Construction	0.80	0.00	0.80	0.00	0.80	0.49	0.00	0.49	0.00	0.49
Total	21.50	3.50	25.00	8.50	33.50	19.35	2.38	21.73	8.45	30.18

ADB = Asian Development Bank, MRTT = Ministry of Road, Transport and Tourism.
Source: Asian Development Bank.

PROJECTED AND ACTUAL DISBURSEMENTS

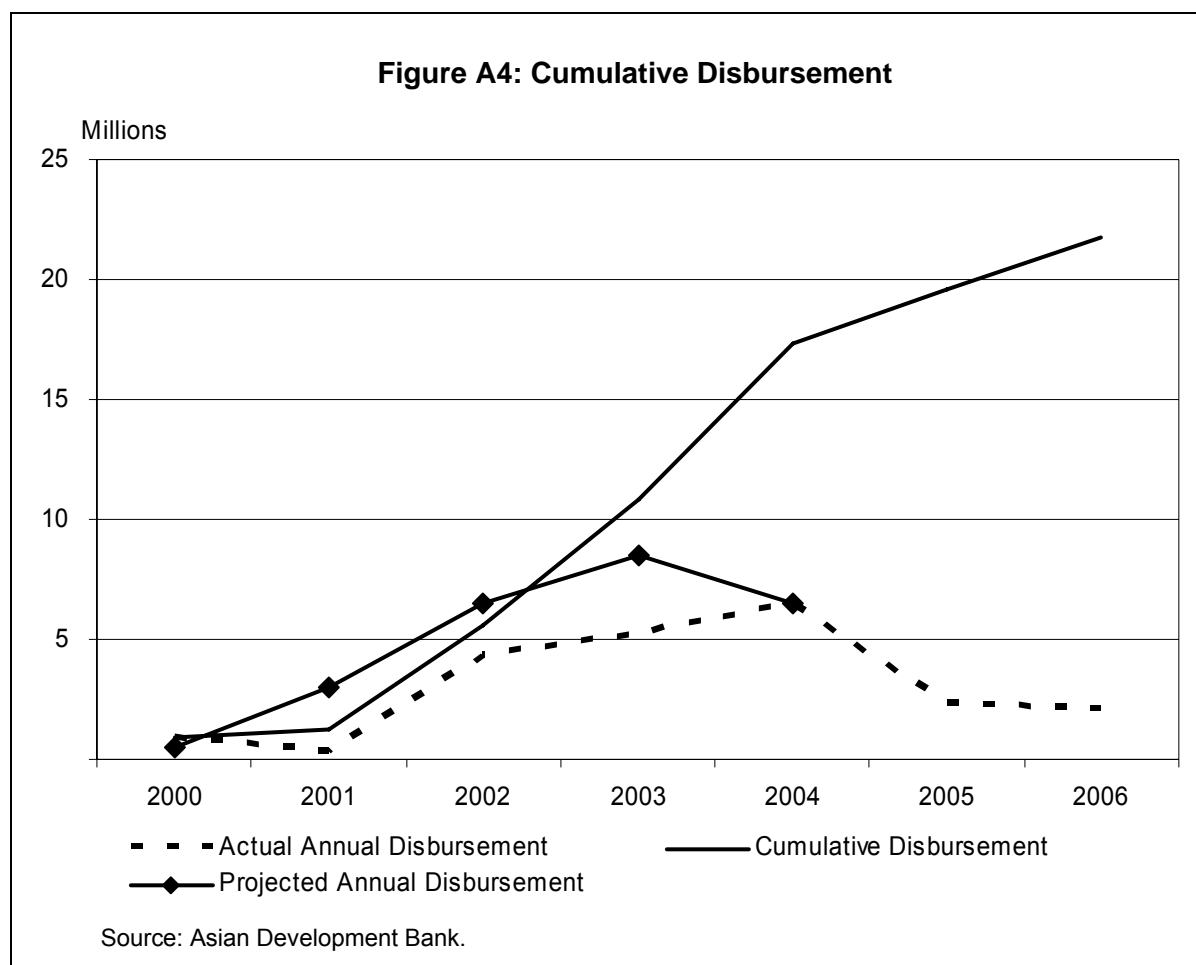
Table A4: Disbursement by Schedule

Year	Projected Disbursement		Actual Disbursement		Cumulative Disbursement	
	\$	SDR	\$	SDR	\$	SDR
2000	500,000	366,720	919,039	707,236	919,039	707,236
2001	3,000,000	2,200,320	349,619	275,826	1,268,658	983,062
2002	6,500,000	4,767,360	4,310,791	3,346,899	5,579,449	4,329,961
2003	8,500,000	6,234,240	5,224,450	3,708,411	10,803,899	8,038,372
2004	6,500,000	4,767,360	6,521,406	4,420,227	17,325,305	12,458,599
2005			2,294,063	1,585,691	19,619,368	14,044,290
2006			2,114,439	1,453,253	21,733,807	15,497,543
Total	25,000,000	18,336,000	21,733,807	15,497,543		

SDR = special drawing rights.

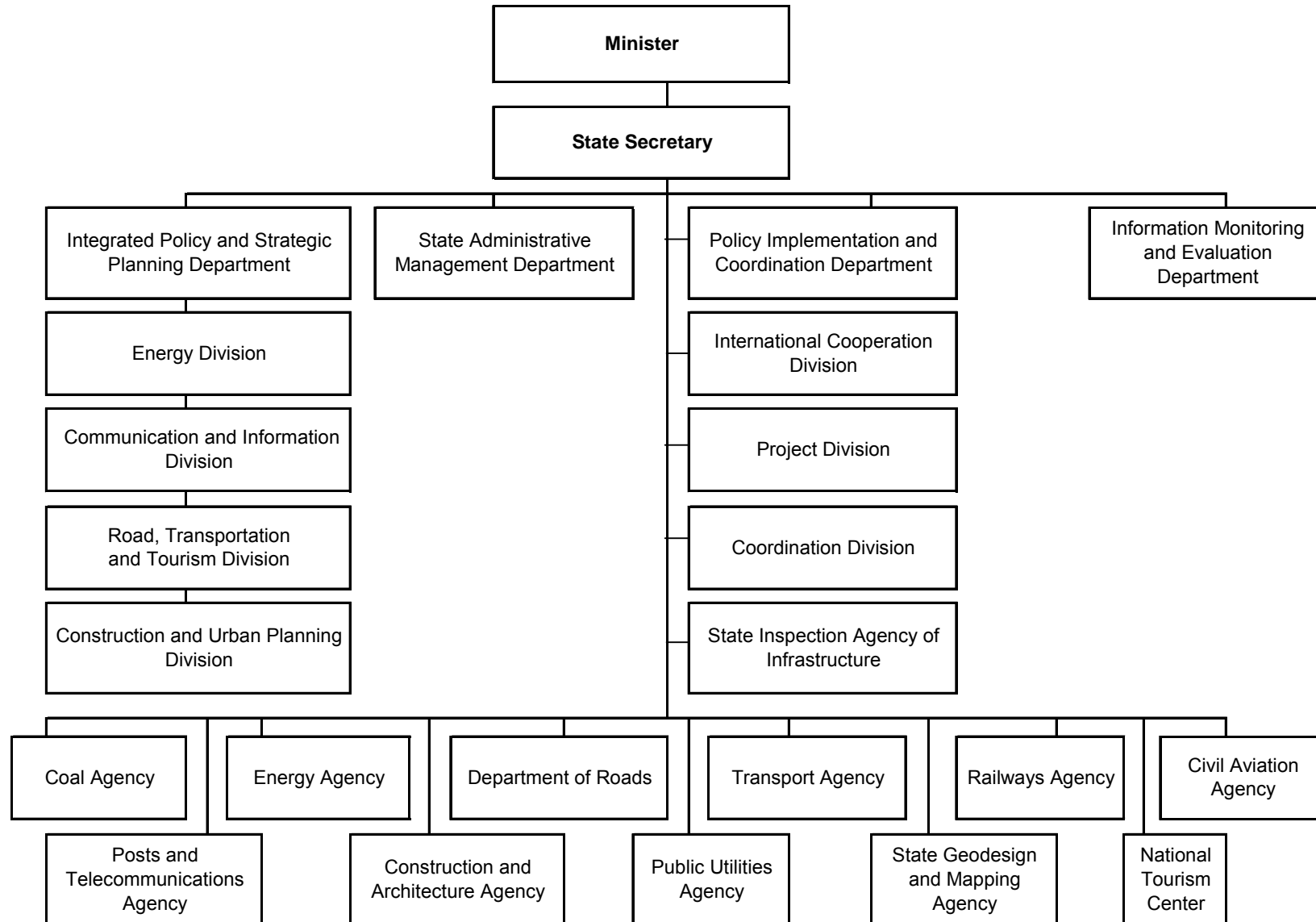
Source: Asian Development Bank.

Figure A4: Cumulative Disbursement



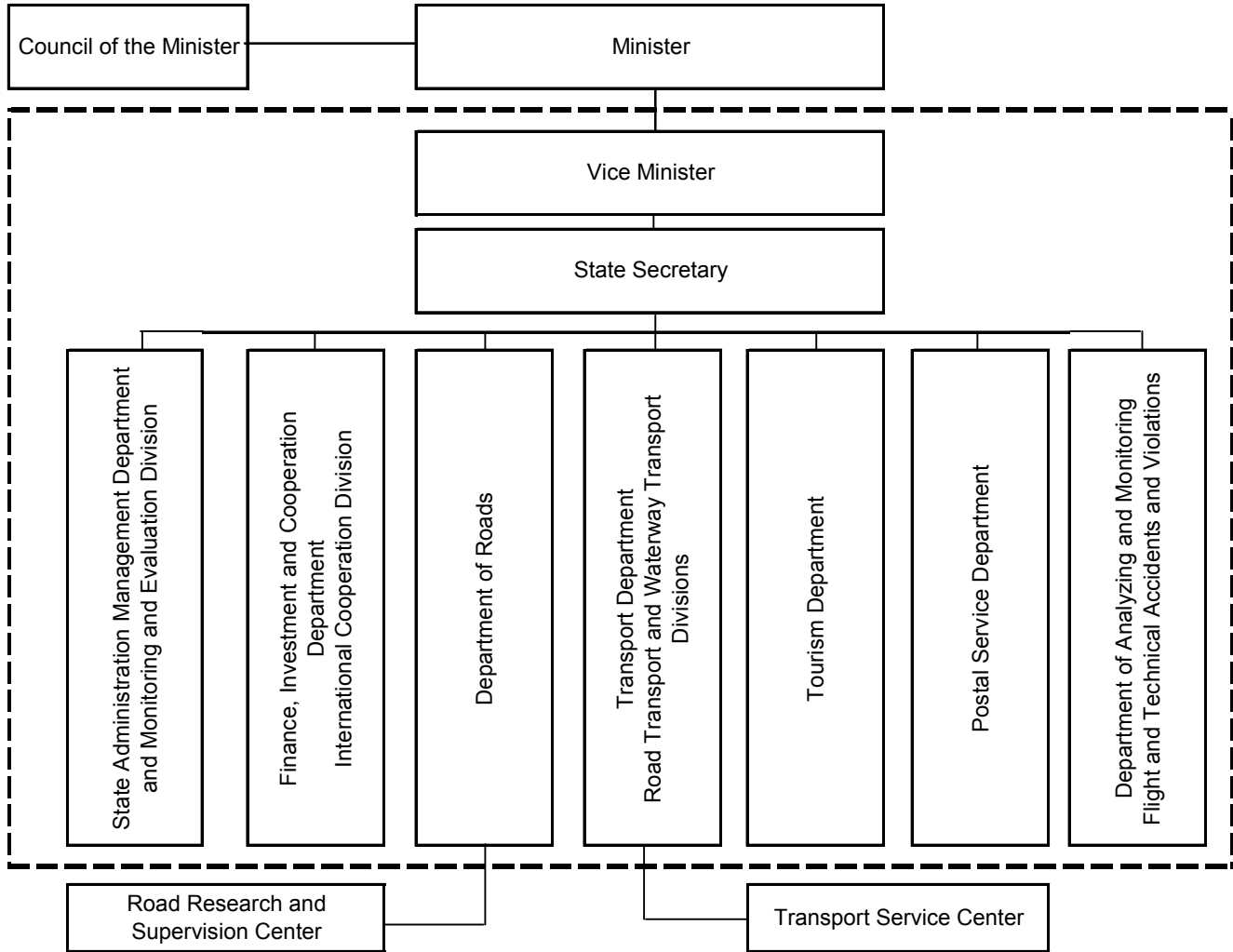
ORGANIZATION CHARTS

Figure A6.1: Ministry of Infrastructure Development



Source: Ministry of Roads, Transport and Tourism.

Figure A6.2: Ministry of Road, Transport and Tourism



Source: Ministry of Roads, Transport and Tourism.

COMPLIANCE WITH LOAN COVENANTS

Covenants	Reference	Status
Sector		
1. Due diligence and efficiency and in conformity with sound administrative, financial, engineering, environmental, road construction practices in carrying out the Project and operation of the Project facilities.	Loan Agreement, Section 4.01	Complied with.
2. Availability of funds, facilities, services, and other resources which are required, in addition to loan proceeds, for the carrying out of the Project and for operation and maintenance of the Project facilities.	Loan Agreement, Section 4.02	Complied with.
3. Insurance of the equipment financed out of the Loan proceeds against risks consistent with the sound practice and the goods to be imported for the Project and financed out of the Loan proceeds against hazard incident of the acquisition transportation and delivery.	Loan Agreement, Section 4.05 (b)	Complied with
4. Maintenance of records and accounts adequate to identify the goods and services financed out of the loan proceeds.	Loan Agreement, Section 4.06 (a)	Complied with.
5. In 2002, mid-term review of the Project to be carried out by the Borrower, Ministry of Infrastructure Development (MID) and the Bank.	Loan Agreement, Schedule 6, para. 11	Complied with.
6. By 31 March 2000, the Borrower shall, through an appropriate decree, adopt the road design and construction standards prepared under the Bank's financed Regional TA No. 5733: A Review of Road Design and Construction Standards.	Loan Agreement, Schedule 6, para. 13	Complied with.
7. MID shall establish by 30 June 2001 a Road Board as an autonomous body authorized to manage the Road Fund. The Road Board shall report to the Secretary of State, MID, and comprise representatives of MID, Ministry of Finance, DOR, and major road transport operators and their clients.	Loan Agreement, Schedule 6, para. 14	Late complied with. The State Road Board was established in October 2003.

Covenants	Reference	Status
8. MID and the State Property Committee shall complete the privatization program for road construction and maintenance companies by 31 December 2000, including the establishment of a leasing company for road construction and maintenance equipment.	Loan Agreement, Schedule 6, para. 16	Complied with. Three regional road maintenance companies were established.
9. By 30 June 2001, DOR shall introduce maintenance by contract for periodic and routine maintenance work on a pilot basis on selected roads (both paved and unpaved). If successful, it shall be adopted for all periodic and routine maintenance works.	Loan Agreement, Schedule 6, para. 17	Complied with. As of June 2001, road maintenance companies were established. 5 private companies and 280 individuals work. As of July 2007, 22 companies (18 public-private, 4 state owned) work
10. The Borrower shall exercise its best efforts to enter into a transit traffic framework agreement among the Borrower, the PRC and Russia by 31 December 2002.	Loan Agreement, Schedule 6, para. 18	Complied with. As of July 2007, seven meetings between governments of Mongolia, Russia and PRC were held with support of UNESCAP. Draft transit traffic agreement was prepared and is under negotiation.
Environmental		
1. Environmental protection and safety measures included in the design of the Project facilities in accordance with the Borrower's environmental laws and regulations; Project facilities constructed, operated and maintained in accordance with the IEE, the Bank's "Environmental Assessment Requirements", and the Bank's "Environmental Guidelines for Selected Infrastructure Projects".	Loan Agreement, Schedule 6, para. 7	Complied with.
Social		
1. DOR to take all necessary actions to encourage women living in the Project area to participate in planning and implementing the Project, including construction work. Effects on women to be monitored through the monitoring and evaluation system Fund.	Loan Agreement, Schedule 6, para. 9	Complied with.

Covenants	Reference	Status
2. DOR to cause contractors to disseminate information on risks of socially transmitted disease to those employed during Project implementation and to disseminate similar information to transport operators during operation of the Project Fund.	Loan Agreement, Schedule 6, para. 10	Complied with.
Monitoring and Evaluation		
1. Carry out monitoring and evaluation (BME) of the Project by compiling and analyzing necessary traffic, economic, social and environmental data for the Project road and their influence areas.	Loan Agreement, Schedule 6, para. 12	Complied with.
Financial		
1. Submission of certified copies of audited accounts and financial statements not later than 12 months after the end of each related fiscal year, all in the English language.	Loan Agreement, Section 4.06(b)	Late complied with. 2004 APA and AFS were submitted in December 2006, but the submission falls into the complied late category, as ADB received audit report with almost 12 month's delay. Both Audited Project Account (APA) and AFS (Audited Financial Statements) for 2005 and 2006 were submitted in September 2007.
2. Adequate counterpart funds allocated in a timely manner during project implementation.	Loan Agreement, Schedule 6, para. 5	Complied with.
3. The Borrower shall allocate sufficient funds (at least TUG100 million annually) for road maintenance from the Road Fund.	Loan Agreement, Schedule 6, para. 6	Complied with.
4. DOR, the Road Board, when established, shall maintain accounts for the Road Fund, have such accounts audited annually by independent auditors and furnish such audited accounts to the Bank within 12 months from the end of each fiscal year.	Loan Agreement, Schedule 6, para. 15	Late complied with. Audited accounts of the Road Fund for the year ending 31 Dec 2004 and for subsequent years were submitted in September 2007.

Covenants	Reference	Status
Others		
1. Established, Staffed, and Operating PMU/PIU Establishment of (i) a Project Steering Committee (PSC) chaired by State Secretary/MID and including representatives of Ministry of Finance, the Ministry of External Funds, Bank of Mongolia and DOR; meetings of PSC at least twice a year; and (ii) Project Implementation Unit (PIU) consisting of Project Manager, supported by qualified technical and administrative personnel.	Loan Agreement, Schedule 6, paras. 2 & 3	Complied with. PSC was established in May 1999. By reorganization of the government in September 2004, the previous PSC was abolished and new PSC re-established in November 2004.
2. Fielding of competent and qualified consultants and contractors under the terms and conditions acceptable to the Borrower and the Bank. The Project and each subproject to be carried out in accordance with plans, design standards, specification, work schedules, and construction methods likewise acceptable to the Borrower and the Bank and subsequently should be furnished to the Bank.	Loan Agreement, section 4.03	Complied with.
3. Submission of brief monthly and quarterly progress reports on the carrying out of the Project and on the operation and management of the Project facilities.	Loan Agreement, Section 4.07 (b)	Complied with
4. Preparation and submission to the Bank, within three months of loan closing, the Borrower's report on the execution and initial operations of the Project, including its cost, the performance by the Borrower of its obligations under the Loan Agreement and the accomplishment of the purposes of the Loan.	Loan Agreement, Schedule 6, para. 4.07(c)	Late complied with. In March 2007, EA's PCR was submitted but EA was requested to resubmit the report, because the report did not satisfy the requirements. In July 2007, EA submitted a revised PCR.

LIST OF CONTRACT PACKAGES

Contract and Description	Appraisal			Actual		
	Contracts (number)	Contract Value (\$ million)	Method	Contracts (number)	Contract Value (\$ million)	Method
A. Civil Works						
Upgrading of about 200 km of Nalayh–Choyr Road	1	23.200	ICB	1	24.050	ICB
B. Road Maintenance Equipment	6	2.987	ICB/IS/DP	5	2.634	ICB/IS
Lot A: Road Maintenance Equip.		1.200	ICB	1	1.169	ICB
Lot B: Road Maintenance Equip.		0.596	ICB	1	0.487	ICB
Lot C: Road Maintenance Equip.		0.497	IS			
Lot D: Crusher Plant		0.620	ICB	1	0.631	ICB
Lot E: Double-Cab Pickup truck		0.024	IS	1	0.305	IS
Lot F: Office Equipment		0.050	DP	1	0.042	IS
C. Consulting Services	1	1.800	ICR	2	2.978	ICR/DP
Detailed Design and Construction Supervision (International)				1	2.827	ICR
Construction Supervision (National)				1	0.151	DP

ICB = international competitive bidding, ICR = international competitive recruitment, IS = international shopping, DP = direct payment.

Source: Asian Development Bank and Ministry of Roads, Transport and Tourism.

TRAFFIC FORECAST

1. The actual traffic volume in 2004 for the section from Nalayh to Choyr constructed by the Second Roads Development Project was higher than that forecast at appraisal by 55%. The actual traffic counts from Nalayh to Choyr were 424 average annual daily traffic (AADT) in 2004, while the appraisal had projected the traffic in 2004 to be 273 AADT. The rapid growth in traffic volumes is mainly attributable to the good performance of the mining industry along the project road. As an economy based on agriculture (which supports nearly half the population) and mining, the favorable weather and buoyant commodity markets since 2003 made the Mongolian economy do very well. Besides, some traffic to Ulaanbaatar from two aimags (province) — Omnogovi and Dundgovi located far from the project road, but which have a direct unpaved route to Ulaanbaatar— are now using the project road because it can significantly reduce traveling time. As a result, both freight and passenger traffic have been rising rapidly since 2003.
2. The traffic growth pattern from 2007 to 2024 is based on (i) actual traffic (2003–2005), (ii) actual and expected industrial and population growth in the project area, and (iii) industry development in the project area. Taking into the account the observation that traffic volume varied considerably depending on the season of the year, traffic volume was assessed and projected based on the July traffic when the export of steel and raw material to the People's Republic of China (PRC) was opened and traffic volume was relatively high, accordingly.
3. The growth in traffic volume is forecast to continue to be more rapid, reflecting the projected sustained economic growth in Mongolia.¹ In particular, economic prospects for mining, agriculture, and the clothing industry remain high and may induce the transport sector's robust growth. Once the current ongoing Project² to connect the remaining section of Mongolia's north-south road transport corridor between Choyr and the border with the PRC in Zamyn-Uud is completed as scheduled by 2009, the project road will serve as an important route for domestic and international transit traffic, promoting trade among countries in the region.

Table A9: Traffic Forecast

Item	1998	2000	2002	2003	2004	2005	2014	2023
Traffic Counts								
Nalayh–Maant	53	111	130	156	199	204	536	1,116
Maant–Choyr	101	135	154	158	172	243	638	1,329
Nalayh–Choyr	176	281	325	359	424	511	1,342	2,795
Annual growth rate (%)	..	26.4	7.5	10.5	18.1	20.5	11.3	8.5
At Appraisal								
Nalayh–Choyr	176	..	..	..	273	..	518	822
Annual growth rate (%)	..	..	..	..	7.6	..	6.6	5.3

Source: Asian Development Bank estimates.

¹ According to ADB. 2007. *Asian Development Outlook 2007*. Manila, Mongolia's economic performance during the last 3 years grew at more than 9% on average and future growth rates are projected at 7.0% for both 2007 and 2008.

² ADB, 2004. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for the Regional Road Development Project*. Manila.

ECONOMIC REEVALUATION

A. Background

1. This economic analysis was based on the actual costs of the Project and updated traffic data collected during the project completion review mission (the Mission). The economic reevaluation followed the methodology used in the economic analysis at appraisal, by using the domestic price numeraire and comparing the project's net benefits in with- and without-project situations. All costs and benefits were estimated in constant 1999 prices. To be consistent with the analysis in the report and recommendation to the President (RRP), the study period (2000–2023) includes 5 years of the construction period and the subsequent 20 years of operation, as did the RRP.

B. Cost-Benefit Analysis

2. The actual final cost of the Project was \$30.2 million, compared with \$33.5 million appraisal estimate. Considering that most of the savings were attributed to unused contingency allowance, the difference is less than 1 percent. Although the actual financial cost was less than the estimates at appraisal, the actual base cost (\$29.7 million) of the Project to affect economic costs was more than the appraisal (\$28.0). Financial costs were therefore converted to economic costs by dividing goods and services into tradables and nontradables. Following the assumptions in the RRP, a standard conversion factor of 0.88 was used to convert the financial costs of the nontradables into economic costs. Maintenance cost was defined to include both routine and periodic maintenance.¹

3. Consistent with the RRP, the economic analysis was based on a comparison of the with- and without-Project scenarios. The main source of economic benefits from the Project is savings in vehicle operating costs (VOCs). Unit economic VOC for passenger and freight vehicles in the with- and without-Project scenarios were estimated by using the VOC submodel of the Highway Design and Maintenance Standards Model version III. VOC savings accrue primarily from improvements in the road surface, horizontal and vertical alignment, and average vehicle speeds. The same assumptions used at appraisal were applied to the reevaluation of savings in VOCs. The expected economic internal rate of return (EIRR) is 19.6%. The detailed EIRR calculation is in Table A10.1. The EIRR of 19.6% is much higher than the 16.6% at appraisal due primarily to higher than the original traffic estimate. The economic reevaluation is considered conservative since benefits arising from the project-related access/link roads and the cost savings due to accident avoidance were not included in the calculations. Time savings from the upgraded project road were not included in the analysis. Various categories of road users benefit from the Project. Farmers and the mining industry business in soums (administrative unit of a province) and aimags (province) in the project area have cheaper access to the market, in particular. Local people enjoy better access to services such as schools, hospitals, and communication centers. The EIRR would increase significantly if these additional benefits were included as Project-related benefits.

4. A sensitivity analysis, conducted by testing key variables, shows that the result is robust (Table A10.2). The sensitivity analysis indicates that it would need a 47% decrease in total traffic to reach the cutoff EIRR of 12%. A change of this magnitude is considered unlikely, given

¹ Maintenance was defined to include routine maintenance (ditch cleaning, culvert and bridge cleaning and repair, shoulder maintenance, erosion control, patching potholes, and resealing) every 5 years, and overlay every 10 years.

the expected traffic situation where the project road will do full-fledged service as an important route for domestic and international transit traffic from the completion of the project to connect the remaining section of Mongolia's north-south road transport corridor between Choyr and the border with the PRC in Zamyn-Und in 2009. Given the conservative nature of the benefit estimation, it is not likely that the EIRR would fall below 12% percent as well.

Table A10.1: Economic Internal Rate of Return
(\$ million)

Year	Costs			Benefits	Net Benefits	
	Capital	Maintenance	Total Costs	VOC Savings	PCR	RRP
2000	0.10	0.00	0.10	0.00	(0.10)	(0.46)
2001	1.23	0.00	1.23	0.00	(1.23)	(3.36)
2002	5.22	0.00	5.22	0.00	(5.22)	(6.09)
2003	8.53	0.00	8.53	0.00	(8.53)	(8.53)
2004	5.84	0.00	5.84	0.00	(5.84)	(4.57)
2005	3.64	0.04	3.68	1.32	(2.36)	3.77
2006	0.00	0.04	0.04	3.81	3.77	4.01
2007	0.00	0.04	0.04	4.33	4.29	4.27
2008	0.00	0.04	0.04	4.90	4.86	4.54
2009	0.00	0.04	0.04	5.53	5.49	4.84
2010	0.00	0.04	0.04	6.23	6.19	4.63
2011	0.00	0.55	0.55	6.97	6.42	5.41
2012	0.00	0.04	0.04	7.71	7.67	5.69
2013	0.00	0.04	0.04	8.51	8.47	5.99
2014	0.00	0.04	0.04	9.37	9.33	3.46
2015	0.00	3.09	3.09	10.53	7.44	5.44
2016	0.00	1.56	1.56	11.63	10.07	7.35
2017	0.00	0.04	0.04	12.68	12.64	7.74
2018	0.00	0.04	0.04	13.77	13.73	8.16
2019	0.00	0.04	0.04	14.96	14.92	8.60
2020	0.00	0.04	0.04	16.23	16.19	8.55
2021	0.00	0.55	0.55	17.58	17.03	9.54
2022	0.00	0.04	0.04	19.03	18.99	10.05
2023	(4.18)	0.04	(4.14)	20.58	24.72	14.74
EIRR =					19.6%	16.6%

() = negative, EIRR = economic internal rate of return, PCR = project completion report, RRP = report and recommendation of the President, VOC = vehicle operating cost.

Source: Asian Development Bank estimates.

Table A10.2: Sensitivity Analysis

Scenario	EIRR	Switching Value
1. Base Case	19.6%	
2. Increase in Maintenance Cost by 10%	19.5%	1,350.0%
3. Decrease in Total Traffic by 10%	18.2%	47.2%
4. Increase in Total Traffic by 10%	20.9%	
5. Combination of 2 and 3	18.1%	

Source: Asian Development Bank estimates.

ROAD SECTOR FUNDING

1. The Road Fund consists of fuel taxes and toll fees from 16 tollgates. The details are presented in the following tables.

Table A11.1: Toll Structure and Fee
(Toll Pass at Hooltyn)

Passenger Car	Truck (ton)			Bus (passengers)			SPV
	3.5 and Below	3.6–12	13 and Above	12 and Below	13–24	25 and Above	
500	800	1,000	1,500	800	1,000	1,500	1,000

SPV = special purpose vehicle.

Source: Ministry of Roads, Transport and Tourism.

Table A11.2: Revenue from Toll Fee Collected
(Ulaanbaatar–Nalayh–Choyr Road)

Type of Ticket	Unit	2006						Total
		Jul	Aug	Sep	Oct	Nov	Dec	
500	Vehicle	5,703	7,986	5,738	5,286	4,781	2,550	32,044
800		247	289	271	293	274	157	1,531
1000		390	383	346	385	330	173	2,007
1500		126	118	134	151	133	70	732
Total		6,466	8,776	6,489	6,115	5,518	2,950	36,314
Revenue (MNT million)		3.63	4.78	3.63	3.49	3.14	1.68	20.35

Type of Ticket	Unit	2007						Total
		Jan	Feb	Mar	Apr	May	Jun	
500	Vehicle	3,754	4,255	2,870	4,804	5,492	4,635	25,810
800		279	312	211	279	427	633	2,141
1000		210	162	160	290	432	376	1,630
1500		110	76	56	126	167	108	643
Total		4,353	4,805	3,297	5,499	6,518	5,752	30,224
Revenue (MNT million)		2.48	2.65	1.85	3.10	3.77	3.36	17.21

Note: The size of a fee was approved by the Government's Resolution No. 177 in September 2002.
Source: Ministry of Roads, Transport and Tourism.

Table A11.3: Road Fund Revenues and Expenditures
(MNT million)

Item	1999		2000		2001		2002	
	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Revenues	8,842	6,423	9,962	7,942	10,665	10,688	14,163	14,163
1. Fuel Tax	4,773	3,481	4,384	4,222	4,655	4,655	4,850	4,850
2. Balance from Previous Year								
3. State Budget	4,069	2,342	5,579	3,672	6,010	6,010	9,312	9,312
4. Others		601		47		23		
Actual / Plan (%)	72.6		79.7		100.2		100.0	
Expenditures	8,842	6,422	9,962	7,910	10,490	10,688	14,163	14,163
1. Road Construction	4,015	2,275	2,558	2,380	3,492	3,492	8,209	8,209
2. Maintenance and Design	400	374	1,475	1,469	2,019	2,019	2,228	2,228
3. Expenditure for Counterpart Funds	4,427	3,539	5,735	3,844	4,772	4,772	3,452	3,452
4. Equipment		182	100	97	129	129	138	138
5. Others		52	94	121	78	277	135	135
Actual / Plan (%)	72.6		79.4		101.9		100.0	

Item	2003		2004		2005		2006	
	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Revenues	14,162	19,823	19,823	17,378	22,091	21,908	31,400	27,966
1. Fuel Tax	4,850	5,789	5,789	6,139	8,300	8,055	6,412	5,761
2. Balance from Previous Year								
3. State Budget	9,312	14,034	14,034	11,239	13,791	13,853	24,988	22,205
4. Others								
Actual / Plan (%)	140.0		87.7		99.2		89.1	
Expenditures	14,027	19,961	19,791	17,378	21,873	21,908	23,277	27,966
1. Road Construction	8,209	12,911	12,911	8,324	9,125	12,484	16,877	18,941
2. Maintenance and Design	2,228	2,310	2,310	4,306	5,452	5,837	6,400	5,761
3. Expenditure for Counterpart Funds	3,452	4,469	4,469	4,196	6,966	3,588		3,265
4. Equipment	138	138	102	450	330			
5. Others		133		102				
Actual / Plan (%)	142.3		87.8		100.2		120.1	

Source: Ministry of Roads, Transport and Tourism.

SOCIAL IMPACT AND POVERTY REDUCTION IN THE PROJECT AREA

A. Introduction

1. The Nalayh–Choyr Road traverses Tuv and Govisumber provinces. The project areas include three affected towns: Nalayh, Maanit, and Choyr. Therefore, the social analysis is focused mainly on the three towns.

B. Stakeholder Analysis

2. The main project stakeholders are the residents along the road and its peripheral areas, local governments at various levels, and agencies providing services. The number of poor households in the project area was reduced by 1.2% points to 24.1% points and the unemployment level went down significantly between 2000 and 2005 (Table A12.1). The Project has provided better access to (i) urban markets; (ii) better employment opportunities; and (iii) safer, faster, and low-cost transportation.

Table A12.1: Number of Poor Households and the Unemployed

Indicator		Nalayh	Maant	Choyr
Population	2000	23,400	2,309	12,100
	2005	23,800	2,064	12,800
	Change (%)	1.71	-13.04	5.78
Household	2000	4,740	568	2,900
	2005	5,988	596	3,111
	Change (%)	26.3	4.9	7.3
Poor Households as % of Total Households	2000	63.9%	16.5%	30.1%
	2005	48.5%	16.3%	27.5%
	Change (%p)	-15.4	-0.2	-2.6
Unemployed	2000	2,072	29	—
	2005	2,056	12	—
	Change (%)	-0.77	0.06	—

— = not available.

Sources: Mongolian Statistical Yearbook 2001 and 2006, Tuv aimag statistical yearbooks 2001 and 2006, Statistical Handbook of Ulaanbaatar 2004, and statistical data from Statistical Office of Choyr.

3. The average annual income per household for the Ulaanbaatar area increased from MNT92,135 to MNT 175,116 between 2000 and 2005 and the annual net income for the Project-affected rural area rose from MNT72,854 to MNT162,495 during the same period (Table A12.2). During project implementation (1999–2006), the percentage of the rural population living below the poverty level was reduced significantly from 32.3% to 25.5% in Choyr, in particular.

Table A12.2: Monthly Average Total Income Per Household

Indicator	Year	Urban	Rural
Total income (MNT)	2000	92,135	72,854
	2005	175,116	162,495
	Change (%)	90.1	123.0

Sources: Mongolian Statistical Yearbook 2001 and 2006.

4. The construction for the Project provided the local people with more job opportunities, and brought a higher demand for construction materials and services. In the contracts between the Department of Roads (DOR) and the contractor, at least 20% of total laborers hired were local residents. One minor issue is that the monitoring of local labor engagement by DOR was not properly carried out.

C. Interviews with Affected People

5. The first interviewee, D. Khenmedekh, resident of the second khoroo (administrative unit of a district), Nalayh district, said that project implementation had no adverse impact. The Project brought the following beneficial effects: (i) the population has increased along the project road; (ii) villagers can have a safer and comfortable travel, especially in winter and the rainy season, and transportation cost has been significantly reduced as well; and (iii) the supply and variety of household commodities have increased.

6. The second interviewee, D. Jamsranjav, resident of the fourth khoroo, Bayan soum (administrative unit of a province), Tuv aimag (province), expressed the opinion that there was no adverse impact from the Project. The main benefits from the Project are the increased supply of goods, sufficient number of vehicles, lower transportation cost, and safer and faster travel to Ulaanbaatar. He added that two new small service shops and a tea shop have opened along the road since the construction began.

7. The third Interviewee, S. Bayaraa, resident of the third *bag* (administrative unit of a soum), Choyr soum, Govisumber aimag, mentioned that his family has four members and his household is very poor with a monthly income of MNT20,000. There was no adverse impact on this household during and after construction; however, he added that he did not feel any beneficial effect besides lower transportation cost.

D. Gender and Resettlement

8. During the construction phase, some women were employed by the contractors. Road improvement improved women's living conditions and gave them better access to jobs and health care in the larger cities.

9. The project road had to traverse the hedge and house of D. Jamsranjav, a citizen of the fourth *bag*, Bayan soum, Tuv aimag. It was necessary to resettle this household. The resettled family received a compensation of MNT1.8 million. The project completion review mission (the Mission) found that the actual compensation was in compliance with the ADB resettlement policy. The affected household when interviewed showed their general satisfaction with the compensation paid. The Mission noted in the interview, however, that the affected household was inconvenienced because no electricity could be supplied to the resettled house for technical reasons.

G. Conclusion

10. In the project areas, the desired benefits and poverty reduction have been achieved. The Project engaged skilled and unskilled workers in road construction as planned. It has contributed to socioeconomic development by providing cheaper, safer, and more comfortable access to markets, employment opportunities, and social services. After the completion of the Project, the socioeconomic conditions in the project areas have improved and the Project's poverty reduction objectives have been met.

ENVIRONMENTAL IMPACT ANALYSIS

A. Introduction

1. The Nalayh–Choyr road is located in Tuv and Govisumber aimags (province). The Project is classified as environmental category B. The overall conclusion of the environmental impact assessment (EIA) was that the adverse environmental impacts arising from the construction and operation of the road could be mitigated to acceptable levels by implementing a set of clearly identified mitigation measures.

2. In September 2001, a detailed EIA (DEIA) was prepared by the local consulting firm ENCO Co. Ltd, which was engaged by the Department of Roads (DOR). The DEIA was approved by the Ministry of Nature and Environment (MONE).

B. Environmental Protection and Management

3. When the road alignment was finished, further efforts to minimize environmental impacts were made by adopting appropriate engineering designs. According to the DEIA, DOR, the local environmental inspection department, and contractors were responsible for environmental management and supervision for the Project. During construction, inspection engineers of the Ministry of Road, Transport and Tourism (MRTT) and contractors were in charge of the mitigation measures set out in the DEIA.

4. In the DEIA, the total cost of environmental protection and mitigation measures was estimated to be about MNT55 million.

C. Environmental Monitoring

5. An environmental monitoring plan (EMP) was set out in the DEIA. During construction, the contractors did not fulfill their obligation to implement the monitoring plan. However, the contractors, construction supervision companies, and local staffs were scheduled to monitor ambient air quality and noise pollution periodically in accordance with the EMP.

6. Inspection engineers of MRTT daily monitored the restoration of borrow areas and quarries and implemented the mitigation plan according to the EIA. Borrow pits and quarries were backfilled with topsoil, which was peeled away according to standards (MNS 4917:2000). In 2005, MCPC Co., Ltd prepared the report, Monitoring and Evaluation for Nalayh–Choyr Road and submitted it to MRTT and the Asian Development Bank (ADB).

D. Implementation of Mitigation Measures

7. The environmental monitoring and mitigation measures were carried out according to the DEIA. The following main measures were taken to minimize adverse environmental effects: (i) using new construction vehicles, (ii) covering construction materials on delivery trucks, (iii) watering unpaved supplementary roads during dry periods to reduce dust, (iv) limiting working time between the hours 10 pm and 6 am at construction sites, (v) peeling away topsoils at construction areas and using them to backfill borrow areas and quarries, and (vi) restoring borrow areas and quarries.

E. Environmental Impact

1. Noise

8. To reduce noise at sensitive points mentioned in the DEIA, contractors adopted noise mitigation measures. Once a week, noise was measured within 150 meters from the part of the road being upgraded, in accordance with the DEIA. The requested measurement was made, however, some data and statistics on noise monitoring were not kept in order.

9. Noise walls and sound insulation of buildings proposed at appraisal were not installed because the local government judged those measures as unnecessary. Other measures such as delivery of construction materials during off-peak hours, however, were taken as recommended.

2. Environmental Air

10. A number of mitigation measures were available to reduce or eliminate potential air pollution impacts from the Project. Contractors adopted air pollution mitigation measures during construction. At the operation phase, the air pollution sources were mainly waste gas discharged by vehicles according to the DEIA. The monitoring result, however, was carelessly kept.

11. Although some localized negative impacts such as hot spots were expected at appraisal, they have not turned out so far because the congestion in roadside market areas was much lighter than expected. MRTT is, however, requested to do continuous monitoring.

3. The Ecology

12. During construction, the contractors carried out the environmental protection provisions in their contracts and backfilled borrow areas and quarries with topsoils from the road alignment. Therefore, soil erosion was controlled, and construction did not adversely affect the surrounding environment. At the operation stage, no significant impacts to the ecology are expected

13. MONE is the agency primarily responsible for environmental policy. Some functions of MONE are to approve a license for local firms to conduct an EIA, make guidelines, make rules and regulations, design an EIA, and approve EIA reports. The State Professional Inspection Authority (SPIA) provides environmental inspection service nationwide. Environmental inspectors of SPIA are responsible for environmental monitoring and inspection during operation. Inspectors are authorized to enter any economic entity or organization to control environmental impacts, and take samples and have them analyzed.

F. Conclusion

14. During construction, all the mitigation measures requested were implemented properly. The adverse effects of construction on the surrounding environment were therefore minimized.

15. During the field visit of the project completion review mission, local residents and government officials interviewed expressed the opinion that they have not been affected by noise and air pollution during construction and operation.