



# Performance Evaluation Report

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Project Number: PPE: MON 26070  
Loan Number: 1364-MON(SF)  
December 2007

## Mongolia: Roads Development Project

Operations Evaluation Department

Asian Development Bank

## CURRENCY EQUIVALENTS

|         |   | Currency Unit                     | – | togrog (MNT)                                    |
|---------|---|-----------------------------------|---|---|
|         |   | <b>At Appraisal</b><br>(May 1995) |   | <b>At Project Completion</b><br>(November 2001) |
|         |   |                                   |   | <b>At Operations Evaluation</b><br>(June 2007)  |
| MNT1.00 | = | \$0.0021                          |   | \$0.0009  |
| \$1.00  | = | MNT460                            |   | MNT1,162  |

## ABBREVIATIONS

|       |   |  |
|-------|---|--|
| ADB   | – | Asian Development Bank                     |
| ADTA  | – | advisory technical assistance              |
| DOR   | – | Department of Roads                        |
| EA    | – | executing agency                           |
| EIRR  | – | economic internal rate of return           |
| FIRR  | – | financial internal rate of return          |
| GDP   | – | gross domestic product                     |
| HDM-4 | – | Highway Development and Management-4       |
| IRI   | – | international roughness index              |
| MORTT | – | Ministry of Roads, Transport, and Tourism  |
| NTAC  | – | National Transport Advisory Committee      |
| OEM   | – | operations evaluation mission              |
| PCR   | – | project completion report                  |
| PPER  | – | project performance evaluation report      |
| PPTA  | – | project preparatory technical assistance   |
| PRC   | – | People's Republic of China                 |
| RDP   | – | Roads Development Project                  |
| RRP   | – | report and recommendation of the President |
| SDR   | – | special drawing rights                     |
| TA    | – | technical assistance                       |
| VAT   | – | value-added tax                            |
| VOC   | – | vehicle operating cost                     |

### NOTE

In this report, "\$" refers to US dollars.

### Key Words

adb, asian development bank, development effectiveness, mongolia, roads, roads maintenance, performance evaluation, transport, infrastructure

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The guidelines formally adopted by the Operations Evaluation Department (OED) to avoid conflict of interest in its independent evaluations were observed in preparing this report. Ochir Badamsed, Peter Darjes, Dunburee Dashdendev, and Tsengelmaa Sambuu were the consultants. To the knowledge of the management of OED, there were no conflicts of interest of the persons preparing, reviewing, or approving this report.

## APPENDIXES

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**BASIC DATA**  
**Loan 1364-MON(SF): Roads Development Project**

**Project Preparation/Institution Building**

| TA No. | TA Name   | Type | Person-Months | Amount (\$'000) | Approval Date |
|--------|---|------|---------------|-----------------|---------------|
| 1820   | Road Master Plan and Feasibility Study                            | PPTA | 20.5          | \$600           | 23 Dec 1992   |
| 2380   | Institutional Strengthening of the Road Sector (JSF) <sup>a</sup> | ADTA | 33.0          | \$920           | 22 Aug 1995   |

| Key Project Data (\$ million)              | As per ADB     |        |
|--|----------------|--------|
|  | Loan Documents | Actual |
| Total Project Cost                         | 31.5           | 27.4   |
| Foreign Exchange Cost                      | 21.5           | 18.4   |
| Local Currency Cost                        | 10.5           | 9.0    |
| ADB Loan Amount/Utilization                | 25.0           | 21.5   |
| ADB Loan Amount/Cancellation (SDR million) | 16.1           | 15.6   |
| ADB Loan Amount/Cancellation (SDR million) |                | 0.6    |
|  |                | 0.5    |

| Key Dates                            | Expected    | Actual         |
|--------------------------------------|-------------|----------------|
| Fact-Finding                         |             | 14–28 Feb 1995 |
| Appraisal                            |             | 16–30 May 1995 |
| Loan Negotiations                    |             | 20–21 Jul 1995 |
| Board Approval                       |             | 22 Aug 1995    |
| Loan Agreement                       |             | 4 Dec 1995     |
| Loan Effectiveness                   | 4 Mar 1996  | 18 Dec 1995    |
| First Disbursement                   |             | 22 Dec 1995    |
| Project Completion                   | Sep 1999    | 27 Jun 2000    |
| Loan Closing                         | 30 Jun 2000 | 13 Nov 2001    |
| Months (effectiveness to completion) | 45          | 54             |

| Economic Internal Rates Of Return (%) | Appraisal | PCR  | PPER |
|---------------------------------------|-----------|------|------|
| Ulaanbaatar–Altanbulag                | 22.9      | 14.6 | 17.6 |
| Ulaanbaatar–Darhan                    | 23.3      | —    | —    |
| Darhan–Altanbulag                     | 20.8      | —    | —    |

**Borrower** Mongolia

**Executing Agency** Department of Roads within Ministry of Roads, Transport, and Tourism

**Mission Data**

| Type of Mission        | No. of Missions | No. of Person-Days |
|------------------------|-----------------|--------------------|
| Fact-Finding           | 1               | 60                 |
| Appraisal              | 1               | 60                 |
| Project Administration | 8               | 72                 |
| Inception              | 1               | 5                  |
| Review                 | 6               | 57                 |
| Project Completion     | 1               | 10                 |
| Operations Evaluation  | 1               | 15                 |

— = not calculated, ADB = Asian Development Bank, ADTA = advisory technical assistance, JSF = Japan Special Fund, PCR = project completion report, PPER = project performance evaluation report, PPTA = project preparatory technical assistance, TA = technical assistance.

<sup>a</sup> Attached TA to Loan 1364-MON(SF).

## EXECUTIVE SUMMARY

The Road Development Project (RDP) was the first loan project of the Asian Development Bank (ADB) to the roads sector in Mongolia. It comprised an investment component designed to carry out periodic maintenance of about 300 kilometers (km) of the Ulaanbaatar–Altanbulag road, including the reconstruction of two bridges on the Darhan–Erdenet road, and technical assistance (TA) for policy and institutional development. The RDP was intended to contribute to the ongoing transition from a centrally planned to a market-based economy in the 1990s. ADB had been involved in the civil aviation sector in Mongolia before the Government requested ADB funding to develop the roads sector. This resulted in an expansion of the ADB assistance program in the country.

The RDP was approved in August 1995 as a special drawing rights denominated loan of \$25 million equivalent. The associated TA of \$0.92 million was approved to develop (i) road sector policies appropriate for a market-oriented economy; (ii) efficient public and private sector enterprises involved in transport services, road construction, and maintenance; and (iii) a broad-based approach to cost recovery from various classes of road users necessary for sustaining investments. The Ulaanbaatar–Altanbulag road was part of the priority routes identified by the medium-term road master plan, since it is the only road that connects the capital Ulaanbaatar and the international border with the Russian Federation. Overall, the RDP comprised project level as well as policy level interventions.

The formulation of the RDP, i.e., the preparatory process, was not carried out adequately since the road section funded by ADB was not covered by a proper feasibility study. The project preparatory technical assistance (PPTA) and feasibility study covered three other road sections that were not included under the RDP. This reduced the effectiveness of the PPTA and exposed the RDP to changes in scope during implementation. Instead of carrying out just periodic maintenance on 300 km of the road, the Government had to reconstruct and rehabilitate almost 55% of that road, causing higher-than-expected civil works costs. In addition, depreciation of special drawing rights against the US dollar resulted in a reduction in the amount of funding available. The consequential funding constraints culminated in the cancellation of a project component relating to procurement of maintenance equipment. This diluted the RDP's contribution, especially in terms of its effectiveness and sustainability. Apart from this issue, the RDP was well formulated, recognized the limitations of the local contracting industry, and ensured adequate international competition.

Policy dialogue during preparation and implementation of the RDP revolved around the resources available for the road sector in general, and more specifically to the level of cost recovery. The RDP contributed to policy development in terms of drafting legislation leading up to the Road Act, 1998, and the Road Transport Act, 1999. Mongolia uses road funds (local and national) intended to earmark funds for the road sector. However, the current mechanism of the national road fund enables the Ministry of Finance to control allocation of funds to the road sector, causing inadequate funding and inappropriate prioritization of projects. In addition, the limited funds are skewed in favor of expansion of the road network, with inadequate allocations to maintenance. This affects the sustainability of the roads. While a certain degree of oversight by the Ministry of Finance is essential in the larger interests of the national budget, there is a need to delegate technical and sector-related tasks to the line ministry—the Ministry of Roads, Transport and Tourism (MORTT).

The RDP is rated “successful” overall, downgrading the project completion report (PCR) rating of highly successful. It has had mixed success since it was completed. As the first road improvement project implemented using international standards, it has been a path breaker in

the country. However, the reduced project scope, combined with concerns on sustainability, has affected its overall success. Despite these drawbacks, the contribution of the RDP to the Mongolian economy has been positive, especially in terms of raising awareness about best practices in transport, as well as contributing to growth in economic activities.

The RDP is rated “highly relevant” owing to its consistency with the Government’s development strategy, as well as ADB’s lending strategy in the country and the region. The RDP was a rational entry for ADB into Mongolia’s roads sector, since ADB’s central objective was to support the ongoing process of transition to a market-driven economy. The road improvement was justified since it improved the efficiency of the road network linking the key economic centers of Darhan, Erdenet, and Ulaanbaatar and further to Altanbulag on the border with the Russian Federation. The RDP successfully paved the way for subsequent project loans in the roads sector. ADB now needs to graduate on to the next level where it can add value in terms of knowledge transfer and policy building as well as funding.

The RDP is rated “effective”, downgrading the PCR rating of “highly effective”. The average annual rate of growth of traffic on the project road has been about 12.8% over the last 7 years against the estimated forecast growth of about 6% at appraisal and 7% at completion. Although the amount of trade has grown since completion of the RDP, the share of freight traffic by road vis-à-vis rail has remained constant. The use of the project road for trade is constrained by customs restrictions and the absence of an all-weather road linking Ulaanbaatar and the southern border with the People’s Republic of China (PRC). Potential remains for trade with the Russian Federation as well as for transit trade between the PRC and the Russian Federation across Mongolia. In other words, the expected benefits of growth in trade have been partly achieved. The increase in traffic has had a knock-on effect on road safety, which deteriorated immediately after project completion. Currently, the intensity of accidents in terms of fatalities in Mongolia is among the highest on the RDP road.

The RDP is rated “efficient”. The recalculated economic internal rate of return (EIRR) is 17.6%, which is higher than the PCR calculation. In contrast, the EIRR at appraisal of 22.9% turned out to be overly optimistic. The viability of the RDP rests on a cost-efficient maintenance regime. Policy dialogue by ADB and other development partners has been partly effective in highlighting the importance of maintenance, and there is room for further work along these lines.

Sustainability is rated “likely” provided the Government continues to improve funding allocations to the roads sector and further efforts are made to improve the institutional resources for planning as well as execution. With 7 years of operations after project completion, the RDP road has been maintained in a reasonably good condition except in a few sections. Although it has been subjected to severe weather conditions, the low level of traffic has produced relatively low abrasion of the pavement surface. However, concern remains relating to the adequacy of policies and regulatory conditions, and this sustainability rating could deteriorate if there is a slowdown or reversal in the reform process. The current road fund needs to be reformed to ensure better transparency in the flow of funds to the roads sector as well as to provide better focus on funding of road maintenance. The sustainability of institutional resources continues to be affected by staff turnover and changes in the institutional structure. There is a need for MORTT staff to be trained on international best practices and for the Government to explore various incentives to retain staff in the public sector.

The RDP had a positive impact on the institutions in terms of creating awareness of the new construction techniques as well as better project management. The socioeconomic impact has been mixed since the RDP did contribute to improvement in livelihoods in the impact area, but was not sufficient to enable development of the free trade zone in Altanbulag. It would be

difficult to derive impacts directly attributable to the RDP, since several other national and local factors have contributed to changes in the impact area. However, improved access to markets was perceived as an important trigger for migration to the project impact area. It has also enabled diversification in alternative livelihoods (such as shop keeping, hospitality, livestock trading, etc.), with increased participation of women in some of these activities. There has been no negative impact on the environment, although it was perceived that the absence of a paved or gravel road creates multitracks—with vehicle drivers seeking alternative routes across open terrain and valleys—leading to soil erosion and loss of vegetation. Thus, an all-weather road could reduce the adverse impact on the environment.

ADB's performance is rated “satisfactory” although there was room for improvement during project preparation. Since the PPTA did not include a feasibility study for the RDP road section, the implementation stage witnessed project delays and change in scope. ADB can be credited with leading the international transport development initiative in Mongolia. This needs to be strengthened further by value addition in terms of knowledge transfer, policy development, and capacity building.

The performance of the Borrower is also rated “satisfactory”. Despite the Government's relative inexperience in implementing donor-assisted projects in the 1990s, the performance of the Executing Agency (EA) and project implementation unit was “satisfactory”. Delays in provision of counterpart funding could be attributed to prevailing fiscal problems. However, the EA continues to face delays in submitting audited project accounts to ADB. These delays continue in subsequent ADB loans. Institutional capacities within MORTT remain weak in the areas of planning and policy formulation.

The attached TA for institutional strengthening of the road sector was useful in developing road sector policies for a market-oriented economy. It has mixed outcomes in terms of the effectiveness and sustainability of its components. While the policy components were broadly effective in ensuring the creation of new legislations, the cost recovery component was “less effective” in improving the functioning of the road fund. The institutional components were effective in restructuring the Department of Roads and in training the staff, but this was not sustained because of changes in the structure of MORTT and staff turnover. Overall, it was rated “successful.”

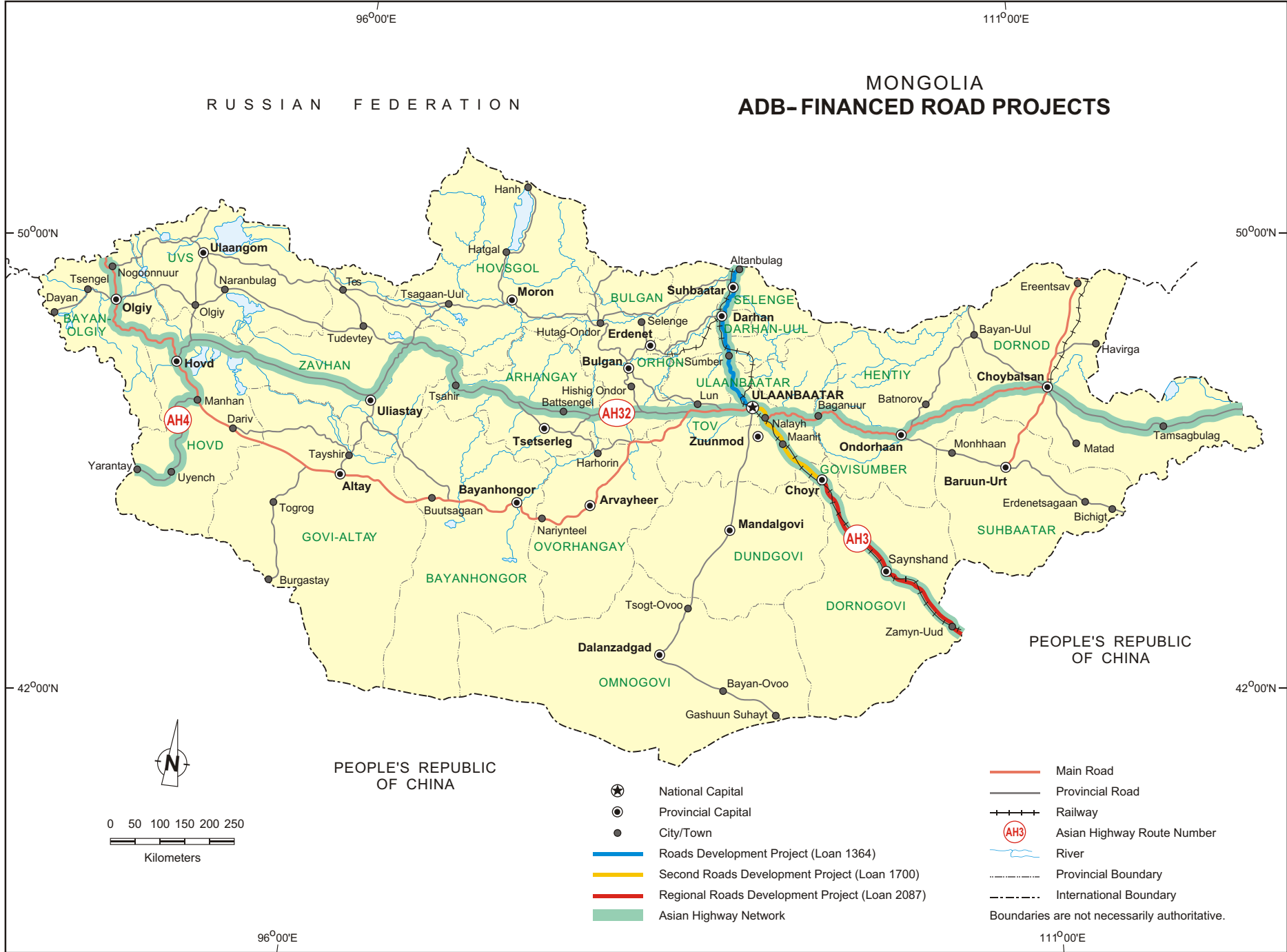
Issues identified were (i) lack of adequate institutional capacity; and (ii) absence of a robust road maintenance regime caused by inadequate funding, prioritization, availability of equipment, and inadequate construction standards to suit local weather conditions. Lessons identified were that ADB needs to (i) design projects along the lines of regional cooperation and trade to ensure national and regional benefits; (ii) add better value for Mongolia by bringing in innovative practices and ideas for improving the road sector in terms of policy advice, technical advice, and institutional capacity development; and (iii) ensure better project preparation.

Follow-up actions are for ADB (i) to initiate consultation with the Government to improve the road safety situation in key areas such as use of seatbelts, driver awareness to discourage drunken driving, better vehicle import and usage regulations, etc.; and (ii) to resolve the issue relating to delays in submission of audited project accounts, in conjunction with the Government.

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Operations Evaluation Department



# MONGOLIA ADB-FINANCED ROAD PROJECTS



RUSSIAN FEDERATION

111°00'E

50°00'N

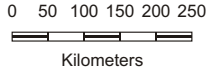
50°00'N

42°00'N

42°00'N

PEOPLE'S REPUBLIC OF CHINA

PEOPLE'S REPUBLIC OF CHINA



- National Capital
- Provincial Capital
- City/Town
- Roads Development Project (Loan 1364)
- Second Roads Development Project (Loan 1700)
- Regional Roads Development Project (Loan 2087)
- Asian Highway Network

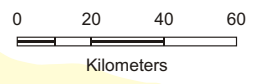
- Main Road
- Provincial Road
- Railway
- Asian Highway Route Number
- River
- Provincial Boundary
- International Boundary

Boundaries are not necessarily authoritative.

96°00'E

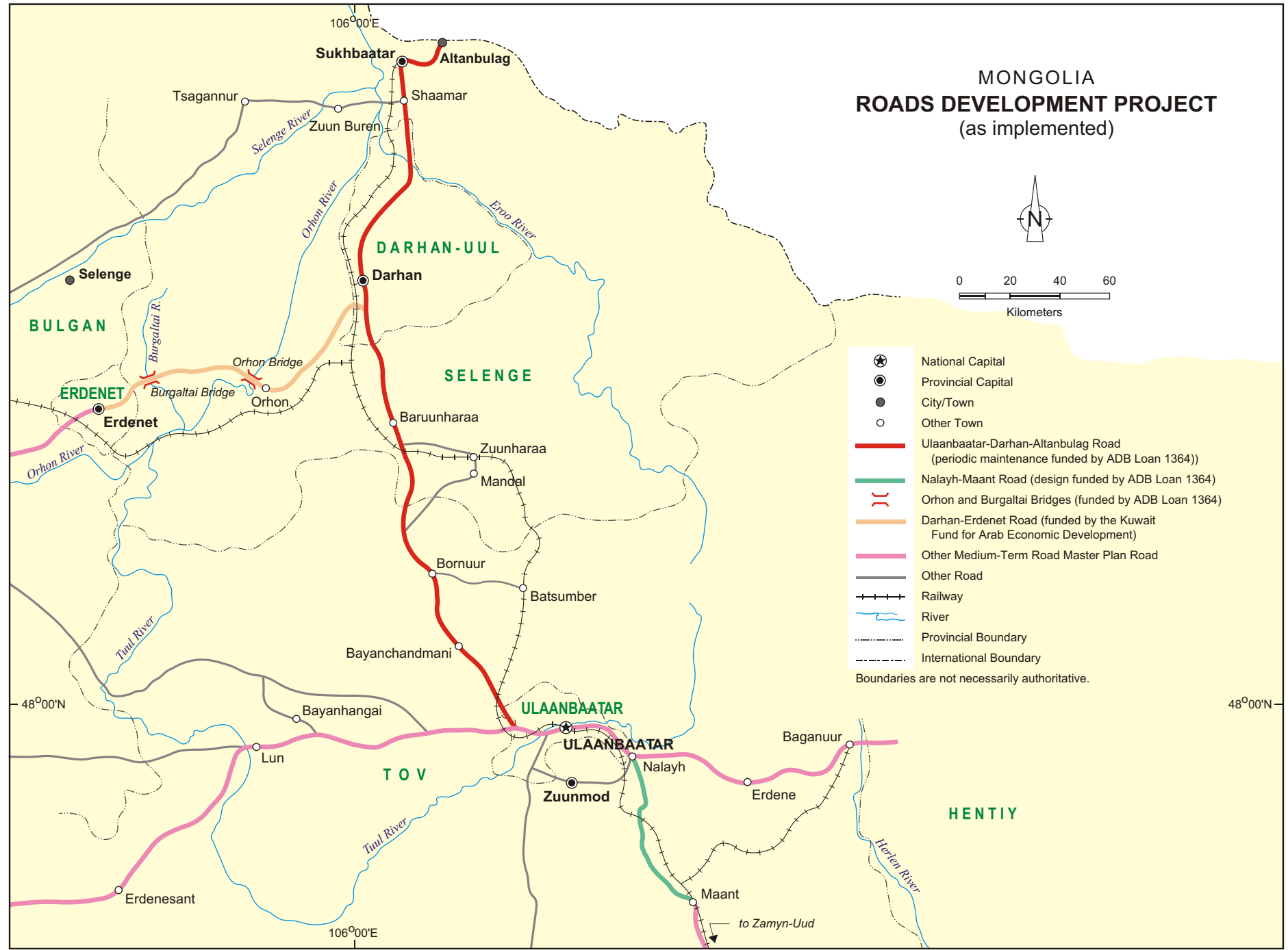
111°00'E

# MONGOLIA ROADS DEVELOPMENT PROJECT (as implemented)



- National Capital
- Provincial Capital
- City/Town
- Other Town
- Ulaanbaatar-Darhan-Altanbulag Road (periodic maintenance funded by ADB Loan 1364)
- Nalayh-Maant Road (design funded by ADB Loan 1364)
- Orhon and Burgaltai Bridges (funded by ADB Loan 1364)
- Darhan-Erdenet Road (funded by the Kuwait Fund for Arab Economic Development)
- Other Medium-Term Road Master Plan Road
- Other Road
- Railway
- River
- Provincial Boundary
- International Boundary

Boundaries are not necessarily authoritative.



## I. INTRODUCTION

### A. Evaluation Purpose and Process

1. The Roads Development Project (RDP) in Mongolia was selected for evaluation as part of a countrywide evaluation being conducted by the Operations Evaluation Department of the Asian Development Bank (ADB). As ADB's first project in the transport sector in Mongolia, the RDP provided an early insight to implementing road projects during the country's transition toward a market-oriented economy. This evaluation of the RDP aims to assess its performance at the project level with a view to obtaining key lessons for future ADB operations.

2. The Operations Evaluation Mission (OEM) visited Mongolia from 11 June 2007 to 25 June 2007. By this time, there had been over 7 years of full operations since completion of the RDP, and this provided sufficient basis for evaluating project performance. This project performance evaluation report (PPER) follows the *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations*.<sup>1</sup> The OEM evaluated the RDP using several tools. It conducted visual inspections of the Project along all the sections from Ulaanbaatar to Altanbulag, as well as the two bridges on the Darhan–Erdenet road. In parallel, 7 day–24 hour traffic counts were conducted at select locations along the project road to update the calculation of the economic internal rate of return (EIRR). A socioeconomic survey was conducted to measure the overall benefits and disbenefits of the Project felt by affected persons. A road roughness measurement survey was carried out in cooperation with the Road Supervision and Research Center. In addition to the above surveys, the OEM carried out random interviews with a typical cross-section of road users including herdsman, shopkeepers, hotel owners, and maintenance company officials.

3. The RDP was ADB's first loan to develop the road sector in Mongolia (Map 1). The 2001 project completion report (PCR) rated the RDP "highly successful". This rating was based on several subcriteria, which were broadly based on the PPER guidelines (footnote 1). However, there was limited substantiation of the ratings in the PCR. The PCR assessment was based on a standard performance rating analysis that lacked evaluative evidence. Overall, it did not adequately substantiate its ratings. In its assessment of sustainability, the PCR was less confident about the availability of funds, technology, and enabling environment for effective operation and maintenance of the project outputs. Despite this, it rated the RDP "likely to be sustainable". Although the PCR was objective in its approach, there was room for improvement in terms of sufficient supporting evidence for the ratings, particularly relating to the effectiveness and sustainability of the RDP. The report and recommendation of the President (RRP) included a logical framework of the Project, which was not updated by the PCR.

4. The PCR rated the attached technical assistance (TA) on the road sector<sup>2</sup> "successful". It helped the Government of Mongolia (the Government) to develop road sector policies to assist in the transition to a market-oriented economy.

5. Upon completion of the OEM, an aide memoire containing the initial findings was discussed with the relevant government departments. This PPER draws on the findings of the OEM, including the survey results. Copies of the draft PPER were forwarded to the Borrower

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<sup>1</sup> ADB, 2006. *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations*. Manila. Available: <http://www.adb.org/Documents/Guidelines/Evaluation/PPER-PSO/default.asp>

<sup>2</sup> ADB, 1995. *Technical Assistance to Mongolia for the Institutional Strengthening of the Road Sector*. Manila (TA 2380-MON, for \$920,000, approved on 22 August).

and the Executing Agency (EA) on 15 October 2007, and the response of the Government has been incorporated in the issues identified in the report.

## **B. Expected Results**

6. The RDP was designed to contribute to the development of the roads sector in Mongolia and to enhance the Government's capability to plan, administer, and implement road policies, programs, and projects. To achieve this, the RDP intended to improve (i) road infrastructure for better movement of freight and passengers, (ii) institutional capacity, and (iii) policy environment. In the absence of an updated design and monitoring framework in the PCR, this PPER has updated the RRP framework. Appendix 1 provides the design and monitoring framework for the RDP, showing the targets set at appraisal and the actual achievement.

7. The expected outputs of the RDP were (i) periodic maintenance of about 300 kilometers (km) of the Ulaanbaatar–Altanbulag road and reconstruction of two bridges on the Darhan–Erdenet road (Map 2); (ii) procurement of road maintenance and technical support equipment for five road maintenance units in charge of the Ulaanbaatar–Altanbulag and Darhan–Erdenet roads; (iii) consulting services for detailed design and construction supervision of the project road and bridges; and (iv) consulting services for detailed design of the Nalayh–Maant road (70 km).

8. The attached advisory technical assistance (ADTA) provided assistance in development of (i) road sector policies appropriate for a market-oriented economy; (ii) efficient public and private sector enterprises involved in transport services, road construction, and maintenance; and (iii) a broad-based approach to cost recovery from various classes of road users necessary for sustaining investments (footnote 2).

## **II. DESIGN AND IMPLEMENTATION**

### **A. Formulation**

9. ADB assistance to the transport sector in Mongolia was initiated in 1991, with the Government's request to the Country Programming Mission for development of the road sector. The resulting project preparatory technical assistance (PPTA)<sup>3</sup> was completed in September 1994 and enabled the development of a medium-term road master plan for the major national routes. The PPTA included feasibility studies for three road sections identified as priority routes by the master plan: Nalayh–Sainshand, Darhan–Erdenet,<sup>4</sup> and Nalayh–Baganuur. However, the RDP did not include these routes for improvement, but included detailed design of the Nalayh–Maant route and two bridges on the Darhan–Erdenet route. The final RDP approved improving the Ulaanbaatar–Altanbulag route, which was not included in the feasibility report. In other words, the road section that ADB ended up funding was not covered by the feasibility study or the PPTA. Therefore, there was a change in project scope between the PPTA and RRP stage and the revised scope was not adequately supported by a feasibility study.

10. It could be concluded that the feasibility study undertaken for the civil works component, which accounted for about 64% of the project cost (at appraisal), was less than adequate. This underlines the need for ensuring that project preparation, in particular PPTA outputs, are adequate before proceeding to project appraisal (paras. 26–27).

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<sup>3</sup> ADB. 1992. *Technical Assistance to Mongolia for Road Master Plan and Feasibility Study*. Manila (TA 1820-MON, for \$600,000, approved on 23 December).

<sup>4</sup> The Darhan–Erdenet road was subsequently rehabilitated using funds from the Government of Kuwait.

11. Apart from the above issue, the RDP was well formulated in terms of institutional arrangements and procurement strategy. The project design recognized the limitations of the local contracting industry, and packaged the contracts in appropriate sizes to attract international competition.

12. Coordination with other development partners, mainly the World Bank, was achieved at a preliminary level. While the World Bank had fielded consultants to prepare the road maintenance manuals and train road maintenance staff of the Department of Roads (DOR),<sup>5</sup> the RDP was expected to provide the hardware through additional road maintenance equipment. However, the equipment component of the RDP needed to be cancelled owing to inadequate availability of funds (para. 19), thereby reducing the overall effectiveness of the Project.

13. As part of the approval process within ADB, the RDP faced concerns on adequacy of institutional capacity, policy environment, sustainability, and road safety. ADB's Board emphasized the need for addressing road safety through enforcement, a public campaign, education, and institutional development. However, the RDP did not address these issues in its project design or as part of the policy dialogue during implementation. They continue to remain critical even now.

## **B. Rationale**

14. Mongolia went through a major transition phase in the 1990s from a centrally planned economy to a market-based economy. This required economic restructuring, including institutional changes and capacity building, combined with economic adjustment to rebuild the market. Trade has been an important factor supporting economic activity, and the need to develop international trade was seen as one of the priority roads when the RDP was formulated. The establishment of an efficient road network interconnecting the three key centers of Ulaanbaatar, Darhan, and Erdenet was considered essential for this development. The RDP was intended to rehabilitate the only existing road connecting Ulaanbaatar and Altanbulag on the border with the Russian Federation (via Darhan). The associated ADTA (footnote 2) was intended to enhance the Government's capabilities to structure policies appropriate for a market-oriented economy, e.g., developing a legal framework for the roads sector, privatizing select road enterprises, and developing cost recovery mechanisms for the road sector.

15. While the RDP's rationale was valid and continues to be a well-justified intervention, the underlying assumption that road improvement itself will generate substantial incremental economic activity is debatable. Poor quality roads increase transport costs, leading to inefficient growth. Generally, good roads are seen as a necessary but not sufficient condition for economic growth. Although there has been economic growth in several areas, this development could not be solely attributable to the RDP. Development of mines in the project influence area, and the increase in trade with the Russian Federation, could be associated with several other factors external to the RDP.

16. When the RDP was initiated, the Mongolian transport network was not in a position to serve the needs of an emerging market economy, e.g., road links between Ulaanbaatar and rural areas were a constraint. Unbalanced capital investments and inappropriate distribution of

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<sup>5</sup> DOR has subsequently changed its institutional status. The current structure shows that the Road Supervision and Research Centre is responsible for road maintenance, and a relatively smaller DOR is responsible for building new roads—both under the Ministry of Roads, Transport and Tourism.

human resources in the Government required several policy corrections, especially to improve the efficiency of government enterprises, as well as sustainability measures. Although there have been several interventions to address this (para. 14), a lot remains to be done.

### **C. Cost, Financing, and Executing Arrangements**

17. At loan approval, the total project cost was estimated at \$31.5 million, of which the foreign exchange component was \$21.5 million. ADB provided a special drawing rights (SDR) denominated loan of 16.05 million (\$25 million equivalent) to cover the entire foreign exchange component and 35% of local currency denominated implementation costs. The remaining \$6.5 million of local currency costs (21% of the total project cost) was funded by the Government. The actual total project cost was \$27.37 million (86.9% of the appraisal estimate). The ADB loan amount was reduced to \$22.08 million equivalent at the time of loan closure because of depreciation of SDR against the US dollar. In spite of this, the ADB share of cost did not change as it disbursed \$21.51 million (about 79%). The Government financed \$5.86 million (21% of the actual project cost) and 65% of the actual local currency cost of \$8.99 million.

18. In accordance with ADB financial management guidelines<sup>6</sup> in effect at the time the RDP was processed, ADB should have allowed physical contingencies ranging from 10% to 15% to allow for further refinement in basic designs and additional site investigations in the absence of a proper feasibility study. However, the RDP cost estimate limited the physical contingency to 10%, reducing its ability to accommodate the change in scope of works as a result of the detailed design.

19. The lowering of the US dollar value of ADB's SDR-denominated loan reduced the availability of funds. As a result, the equipment procurement component was cancelled (para. 27). The final cost of civil works was \$23.74 million, an increase of about 18.7% over the appraisal estimate. This was financed out of contingency and reallocation from other components. The average cost per km was about \$76,090 compared with the appraisal estimate of \$66,667, an increase of 14.1%. This increase in the unit cost was attributed to unfamiliarity with the terrain and a general rise in prices associated with the Asian Financial Crisis in 1997–1998. The first issue could have been addressed if there had been an adequate feasibility study (paras. 9–10). Consulting costs experienced a 22% cost overrun owing to delays in completion of the civil works. Appendix 2 gives the appraisal and actual financing plan.

20. Budget constraints faced by the Government during the transition phase were attributed by the PCR to delays in provision of counterpart funds during the implementation period.

21. The executing and implementing arrangements were as envisaged at appraisal and appear to have been satisfactory. The EA for the Project was DOR, which established a project steering committee to oversee project management and a project implementation unit to handle daily implementation activities. Despite Mongolia's lack of experience in implementing foreign-assisted projects and this being the first ADB loan to the country's road sector, implementation arrangements were well established and maintained, communications with ADB timely, and reporting was adequate.

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<sup>6</sup> ADB. 1989. *Financial Analysis of Projects, Part III – Development of Project Cost Estimates and Project Financing Plans*. Manila.

## **D. Procurement, Construction, and Scheduling**

22. Procurement of consultants and contractors was in accordance with ADB's *Guidelines on Procurement*. Advance action for consultant recruitment was beneficial to project implementation, since the consultants could carry out detailed design and assist the EA in prequalification of contractors before loan effectiveness. Procurement of maintenance equipment faced initial delays because of shortage of loan funds. As a result, only three contracts were awarded out of the 10 that were tendered following international competitive bidding procedures. However, the three contracts could not be implemented since the bid validity period had expired and the suppliers could no longer produce the equipment because of changes in their plants' configuration. This reduced the effectiveness of the RDP in terms of its ability to provide equipment.

23. The construction was completed under funding constraints, causing restrictions on the pavement width and quality of construction. Although the overall construction quality was satisfactory at completion, the extreme weather conditions caused transverse cracks (para. 30 and Appendix 3).

24. The entire civil works package was awarded to one international contractor who had limited knowledge about Mongolia.<sup>7</sup> This caused delays in equipment mobilization in the first construction season. Besides this, delays were attributed to an increase in the quantities of works, delays in releasing counterpart payments, and unfavorable weather conditions. Although the contractor made efforts to reduce further delays, completion was delayed by 9 months after the original contract completion date. Considering that this was the first project using international contractors in Mongolia, this delay is not a major issue. In addition, despite the delay, the quality of output at completion was satisfactory.

25. The use of international contractors in the RDP provided a major benefit to the domestic construction industry as well as to the Ministry of Roads, Transport and Tourism (MORTT). It introduced international practices—especially in detailed design, periodic maintenance, use of modern equipment, road construction supervision, and contractor management.

## **E. Design Changes**

26. There were two changes in the scope of the Project: (i) between the PPTA and approval of the Project, i.e., the RRP; and (ii) between approval and completion of the Project, i.e., during implementation.

27. Although the feasibility study was carried out as part of the PPTA on three road sections in Mongolia, the actual road selected for improvement under the RDP was the Ulaanbaatar–Altanbulag road, which was not covered by the feasibility study (para. 9). This indicates the insufficient preparation leading up to a cost estimate at appraisal that was lower than the actual costs. The physical contingency reduced this impact, but uncertainty remained surrounding which section needed to be reconstructed. This issue, combined with the depreciation in the value of SDR, resulted in shrinking of the total funds available for other project components. The knock-on effect was the cancellation of the project component relating to procurement of equipment.

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<sup>7</sup> It should be noted that all international contractors had limited knowledge of Mongolia at the time of procurement for the RDP. This has since changed as more contractors are working in the country.

28. Although at appraisal, the RDP intended to be mainly periodic maintenance of about 300 km of existing road, subsequent pavement investigations led the Government to adopt a combination of periodic maintenance, rehabilitation, and reconstruction. This is a consequence of the absence of a feasibility study on the RDP road section (para. 27). The feasibility study carried out under the PPTA did not cover the road section that was finally funded under the RDP.

## F. Outputs

29. **Part A: Civil Works.** The principal output of the RDP was improvement of 312 km of paved roads along the Ulaanbaatar–Altanbulag road with an asphalt thickness of 50 millimeters (mm) and average pavement width of 6 meters (m). The RRP stated that the entire route from Ulaanbaatar to Altanbulag would be subjected to periodic maintenance. However, at completion, specific sections were rehabilitated and reconstructed (i.e., more work was done compared to the appraisal estimate).

30. Appendix 4 details physical achievement and pavement interventions completed under the RDP. Periodic maintenance was completed on 139 km (45%) of 312 km. Based on the severity of pavement deterioration, three different treatments were applied for the remaining 173 km (55% of 312 km): (i) partial reconstruction (25.6%), (ii) rehabilitation (23.4%), and (iii) full reconstruction (6.4%). Periodic maintenance was used in 42.3% of the Ulaanbaatar–Darhan and 48.2% of the Darhan–Altanbulag route. About 36.8% of the Ulaanbaatar–Darhan route required either partial or full reconstruction, while 24.5% of the Darhan–Altanbulag stretch involved similar treatment. Based on the international roughness index (IRI), the OEM found road conditions in both Ulaanbaatar–Darhan and Darhan–Altanbulag to be fair.<sup>8</sup> Of the 312 km completed, 90.6 km (29%) are considered good, and the rest are judged “fair”. Although the RDP road is one of the best state roads in Mongolia today, its pavement has extensive transverse cracking (para. 23). This increases the road roughness and more importantly portends pavement failure, unless there is good maintenance and the cracks are properly sealed.

31. At numerous locations along all sections of the road, there is excessive breaking up of the outside edge of the shoulder. This is typically caused by overloaded vehicles and is aggravated by the limited pavement width. The pavement width of 6 m was found to be less than adequate since heavy freight trucks from and to the Russian Federation did not have sufficient space when passing each other on the undivided road.

32. The application of asphalt concrete at the pavement service under the RDP was considered appropriate. When the RDP was implemented, the road design standards in Mongolia were in a state of transition from Russian Federation standards to customized US standards. Although the construction procedures and guidelines have been improved over the last 6 years, the basic standards remain the same for projects currently under construction. The ongoing Regional Road Development Project<sup>9</sup> funded by ADB continues to have a pavement thickness of 50 mm of asphalt concrete. There is a need to explore alternative technologies that could withstand the extreme weather conditions and enhance sustainability.

<sup>8</sup> Based on a five-category judgment criteria of excellent (IRI < 2), good (2 ≥ IRI ≥ 4), fair (4 > IRI ≥ 6), bad (6 > IRI ≥ 8), and very bad (IRI > 8).

<sup>9</sup> ADB. 2004. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to Mongolia for the Regional Road Development Project*. Manila (Loan 2087-MON[SF], for \$37.1 million, approved on 22 July).



33. At the same time, there has been an ongoing debate on the use of gravel vis-à-vis asphalt concrete as the pavement surface. The World Bank advocated the use of gravel on its project in central Mongolia.<sup>10</sup> The implementation completion report of the World Bank concluded that gravel roads were not sustainable and advocated the use of single surface treatment, i.e., paving the roads with bitumen, asphalt, or other alternative materials. The World Bank's earlier preference of gravel surface was based on the level of traffic, but the output at completion indicates that, in the Mongolian climate, an economical surface is not necessarily sustainable.<sup>11</sup> This highlights the need for development of appropriate road standards by MORTT that take into account the climate, terrain, available labor, and materials.<sup>12</sup>

34. **Part B: Equipment.** The road construction and maintenance equipment procurement component was not implemented because of lack of funds. This reduced the overall effectiveness of the RDP. However, a subsequent ADB loan<sup>13</sup> was able to procure the equipment, although this has yet to be deployed on the RDP road.

35. **Part C: Consulting Services.** The international consultants carried out detailed design and construction supervision for the Ulaanbaatar–Altanbulag road. They also provided on-the-job training for MORTT staff, which was well received. This training included best practice awareness on project management, contract administration, construction supervision, quality control, and computer applications. This could be seen as a significant value addition of ADB assistance besides the funding of the RDP road. This project component also included detailed design of the Nalayh–Maant road. This design had to be modified subsequently since the Second Roads Development Project (footnote 13) found it unsuitable during implementation.

36. The RDP had an attached road sector ADTA (footnote 2) with several components designed to help develop road sector policies for a market-oriented economy. These components had mixed outcomes. Para. 91 analyzes the ADTA in more detail.

## G. Consultants

37. In the absence of sufficient local consulting capacity, there was adequate participation from international consultants to fill the gap as well as to add value in terms of transfer of technology and knowledge (paras. 35 and 91 on the achievements of the TA consultants).

38. The detailed design and construction supervision consultants were appointed on a direct recruitment basis because it was perceived that they were knowledgeable of the RDP since these were already on site.<sup>14</sup> This was ratified by ADB during the loan approval process. The consultants were appointed in accordance with ADB's *Guidelines on the Use of Consultants*. The performance of the consultants was diluted by the fact that the detailed design they prepared for the Nalayh–Maant road had to be modified by the Second Roads Development Project (para. 35). Apart from this, the overall performance of the consultants was found to be “satisfactory”.

<sup>10</sup> World Bank. 2001. *Transport Rehabilitation Project*. Project ID: P004342. Washington, DC.

<sup>11</sup> In addition to the shortage of materials, an inadequate labor force also affects sustainability. Gravel maintenance is highly labor intensive and maintenance crews are not easily available in the countryside.

<sup>12</sup> This needs to be accompanied by suitable capacity building to ensure that there is adequate ownership within MORTT.

<sup>13</sup> ADB. 1999. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to Mongolia for the Second Roads Development Project*. Manila (Loan 1700-MON[SF], for \$25 million, approved on 30 September).

<sup>14</sup> Intercontinental Consultants and Technocrats implemented the detailed design and construction supervision component.

39. For the attached road sector TA (footnote 2), the international consultants spent 30 person-months compared to the budgeted 33 person-months.<sup>15</sup> Overall, the Government was satisfied with the outputs of the TA and has implemented most of its recommendations.

## H. Loan Covenants

40. The status of compliance with loan covenants is in Appendix 5. Based on the information provided in the PCR and discussions of the OEM with the government officials, it was confirmed that most of the project implementation requirements were complied with. At the time of completion, three loan covenants were partly complied with: (i) availability of counterpart funds to carry out the Project, (ii) adoption of measures to improve cost recovery from the road users, and (iii) sufficiency of budgetary allocation to meet road sector requirements. A fourth covenant on equipment became irrelevant since none was procured under the Project. At the time of evaluation, the OEM found that the measures for improving cost recovery from road users were inadequate (paras. 69–70). Despite an increase in the allocation by the Ministry of Finance to the road fund revenues, actual funds allocated for maintenance are much lower than the actual requirements.<sup>16</sup> Although subsequent ADB loans did not have any specific project component to improve this allocation, ADB has continued a policy dialogue along these lines during the preparation and implementation of subsequent projects. However, a gap remains between the actual funds allocated and the requirements of the roads sector.

## I. Policy Framework

41. At appraisal, policy formulation and planning in the transport sector were based on concepts used in centrally planned economies. They were supply-driven, using rigid engineering norms and input-output relationships. The early 1990s witnessed the absence of a clear national transport policy, resulting in problems relating to resource allocation problems and mobilizing financing for the development of infrastructure links to overcome the natural obstacles of distance and isolation. The transition to a market-oriented economy required changes to the country's legal framework and to the organizational and institutional setting in the transport sector. To this end, the Government issued a Road and Road Transport Sector Policy Statement in 1995, which provided for a restructuring of the road sector to separate regulatory and commercial functions by devolving commercial activities from DOR to private companies. A road act was enacted by parliament in 1998, based on which the National Transport Advisory Committee (NTAC) was established in the same year and reorganized in 1999.<sup>17</sup> The Road Transport Board and the Passenger Service Center were combined to form the Road Transport Agency to regulate tariffs for freight and passenger traffic. However, these policy actions have remained on paper only since these institutions have not been effectively empowered. MORTT continues to retain the main policy role.

42. Policy dialogue during implementation of the RDP revolved around resources available for the road sector in general, and more specifically to the level of cost recovery and the pricing policy that the Government wanted to pursue. ADB TA projects<sup>18</sup> clarified this relationship,

<sup>15</sup> N.D. Lea Consultants, Inc. implemented the road sector TA.

<sup>16</sup> In 2002, only 30% of the amount requested for road maintenance had been made available. This percentage has increased steadily and fund allocation for 2005 reached 80% of the amount requested.

<sup>17</sup> NTAC was established with representation from DOR, Road Transport Board, State Control Board, Road Transport Agency, Traffic Police Department, Urban Transport Department, Road Workers Trade Union, Neft Import Concern, Road Company ASBI, Trade Union for Transport Workers and Communication and Petroleum, and Transport Company (Mongol Taakh).

<sup>18</sup> Road sector TA (footnote 2) and ADB. 1999. *Technical Assistance to Mongolia for Policy Support in the Road Sector*. Manila (TA 3268-MON, for \$670,000, approved on 30 September).

recommended allocation of revenue from vehicle license fees to the road fund, and introduced the “user-pays” principle. In addition, revenue collection from road users was improved by the Act on Taxation on Gasoline and Diesel in 1995. The act clarified the obligation of the Ministry of Finance to levy road user charges for financing of the road funds (local and national) and earmarking the proceeds for the use of DOR. Whether the road fund is an appropriate mechanism for channeling funds into the road sector is debatable (Box 1). However, a clear need remains for reforming the current structure of the road fund to improve the allocations to maintenance.

### Box 1: Global Debate on Road Funds

Currently, the use of road funds is a subject of global debate. The World Bank contends that experience with other road funds indicates that many rarely achieve their objectives, and the conditions that might make such an achievement possible are difficult to bring about.<sup>a</sup> The main objections to the road fund relating to the fiscal arrangements include the following: (i) earmarked taxes are bad, (ii) excessive revenues to the road fund can lead to gold plated investments, (iii) road funds are an inefficient use of public funds, and (iv) an independent road fund takes fiscal control away from the Ministry of Finance.<sup>b</sup>

A recent World Bank evaluation<sup>c</sup> of road funds all over the world shows that there is no right or wrong approach to road maintenance finance, and that the road funds appear to work and be effective under some conditions, but not under others. The World Bank evaluation noted that the road funds provide a better guarantee that funding will be assigned to road maintenance as a priority, as long as the road fund design has appropriate prioritization. Overall, there is no clear argument against or in favor of road funds.

<sup>a</sup> World Bank. 2007. *Foundation for Sustainable Development: Rethinking the Delivery of Infrastructure Services in Mongolia*. Washington, DC.

<sup>b</sup> Carruthers, Robin. 2005. *Why and When Road Funds are a Good Idea*. Paper presented at the World Bank's Transport Forum 2005. World Bank, Washington, DC.

<sup>c</sup> World Bank. 2007. *Evaluation of Bank Support for Road Funds*. Washington, DC.

Source: Operations Evaluation Mission.

43. The existing national road fund in Mongolia relies on three main sources of income tax on fuel, vehicle import duties, and vehicle license fees, which were allotted to the national road fund. The local road funds relied on the local authorities' levy at entries to towns and villages and at improved road sections.<sup>19</sup> They were designed to bring focus on allocating sufficient funds for routine maintenance and periodic maintenance. Over time, increasing amounts were used to finance counterpart funding for externally financed road projects, thus weakening the maintenance objective of the funds (Table 1).

**Table 1: Road Fund**

| Items   | 2002   | 2003    | 2004    | 2005    | 2006    |
|---|--------|---------|---------|---------|---------|
| <b>Inputs to Road Fund</b>                        |        |         |         |         |         |
| Road user payments (with VAT) (MNT million)       | 63,530 | 102,577 | 142,443 | 157,020 | 196,477 |
| % of passed to Road Fund                          | 22.5   | 19.4    | 12.3    | 14.1    | 14.2    |
| <b>Outputs of Road Fund</b>                       |        |         |         |         |         |
| Roads and bridges maintenance (as % of Road Fund) | 15.7   | 11.7    | 24.8    | 25.8    | 19.5    |

MNT = togrog, VAT = value-added tax.

Sources: ADB. 2006. *Technical Assistance to Mongolia for Preparing the Western Regional Road Development Project*. Manila (TA 4785-MON, for \$650,000, approved on 10 May); consultants from Department of Roads data, and from Road Supervision and Research Center data.

<sup>19</sup> These levies are not structured uniformly across the country.

44. ADB's main concern at appraisal was that the collection and use of the funds should be transparent and that an adequate supply of funds for road maintenance be assured through policy changes. These objectives were only partly achieved. Through the involvement of the Ministry of Finance, the road funds have become more transparent. However, the current system is a hybrid between traditional government budget funding systems (with the disadvantage of being subject to fluctuations) and a semi-independent fund that provides earmarked financing for road construction and maintenance. Appendix 6 summarizes the status of road sector funding in Mongolia.

45. The Mongolian economy has been expanding at a rapid pace, with real gross domestic product (GDP) growth averaging almost 7% during the last 5 years. Real GDP is expected to grow by around 7–8% a year in 2007–2008, largely driven by strong growth in the mining sector.<sup>20</sup> This has encouraged the Government to expand its infrastructure as part of a wider expansionary fiscal policy.<sup>21</sup> The impact on the overall budget position is seen in 2007, when growth in expenditure outpaced growth in revenues. As a result, the general government surplus has shrunk. The long-term repercussions of the continuation of this expansionary policy can be felt on the sustainability of the infrastructure that is created. Currently, MORTT is not sufficiently equipped with the correct mix of policy and institutional support to manage a massive increase in the size of the roads network, in addition to the other transport networks. Hence, there is a need to adopt a more realistic approach to infrastructure expansion—giving adequate importance to areas such as road maintenance allocations and policy strengthening in road safety, vehicle import and usage, sector regulation, and several other areas in the transport sector.

46. The objectives underlying MORTT's investment plan for roads are stated in the MDG Based Comprehensive National Development Strategy 2007–2021, and focus on capacity building measures and physical investments. In terms of capacity building, the National Development Strategy envisages legal reforms on road ownership, road classification, and road usage measures that have been included under the ADB TA. However, highway design standards need to be improved and international agreements on road transport need to be ratified. Research into low-cost roads is to be promoted and road maintenance management to be improved.

47. In general, current government plans for the transport sector raise the issue of affordability and point to an urgent need for an adequate policy framework, and to chart a course for the development of the transport sector based on explicit market-based principles. The need for a policy framework results from the challenges posed by substantial future investment requirements and institutional changes to underpin such investments. Box 2 identifies the key questions that need to be addressed at this stage. Although there has been a dialogue between the Government and development partners (including ADB) to address these questions, there is no clear solution in sight.

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<sup>20</sup> Economic Intelligence Unit. August 2007. *Mongolia Country Report*. United Kingdom. Available: <http://www.eiu.com>

<sup>21</sup> During 2002–2005, the bulk of public expenditure comprised current expenditure of 71–79%. Capital expenditure formed 11.8–14.7%. A continued expansionary policy will have a short-term impact on the capital expenditure, but long-term impact on current expenditure.

### Box 2: Key Policy Questions to be Addressed

1. Taking into consideration the policy changes made over the last decade, what more needs to be done to improve resource allocation efficiency?
2. How can financial sustainability be achieved for the transport sector in light of the expanding road network?
3. How can regulatory frameworks for road safety, transport services, and other transport areas be developed to address operational efficiency better?
4. How can institutional and human capacity be developed to meet the sector's needs?

Source: Operations Evaluation Mission.

48. With adequate funding being a constraint even for the existing basic network, any expansion of the network should be based on rigorous investment analysis that can demonstrate that the proposed investments are economically viable. Traffic volumes and loads should be the guiding principle in determining road designs. Road construction standards should be differentiated according to current and anticipated traffic loads, rather than applying one design across the board. Further potential for reducing the investments is seen in phasing construction and varying standards on the same road in line with traffic. There is scope to mobilize resources and manage them better. Increasing the level of tolls and the rate of fuel taxes would make a much-needed contribution to enhanced cost recovery. The issue of adequate designs for roads requires further study, notably with regard to developing low-cost solutions for road construction.

## III. PERFORMANCE ASSESSMENT

### A. Overall Assessment

49. The RDP is rated “successful” overall, downgrading the PCR rating. This is based on four evaluation criteria: relevance (20% weight), effectiveness (30%), efficiency (30%), and sustainability (20%). The overall assessment is summarized in Table 2. This assessment combined the evaluation of the two main project components—civil works for road improvement and consulting services. Since there was no output for the equipment supply component (paras. 27 and 34), this component was not rated.

**Table 2: Overall Performance Assessment**

| Criterion           | Weight (%) | Project Rating | Overall Rating Value |
|---------------------|------------|----------------|----------------------|
| 1. Relevance        | 20         | 3              | 0.6                  |
| 2. Effectiveness    | 30         | 2              | 0.6                  |
| 3. Efficiency       | 30         | 2              | 0.6                  |
| 4. Sustainability   | 20         | 2              | 0.4                  |
| <b>Total Rating</b> |            |                | <b>2.2</b>           |

Note: Highly successful > 2.7; 2.7 ≥ successful ≥ 1.6; 1.6 > partly successful ≥ 0.8; unsuccessful < 0.8.

Source: Operations Evaluation Mission.

50. The RDP has had mixed success since it was completed. It has been a path breaker in terms of being the first road improvement project implemented using international standards (para. 21). At the same time, the reduced project scope, combined with concerns on sustainability, has affected the overall success of the Project. The lack of an adequate policy framework is a sector-wide issue, but it has an impact on the success of the RDP in terms of

sustainability of the outcomes. Despite these drawbacks, the contribution of the RDP to the Mongolian economy has been positive, especially in terms of raising awareness about best practices in transport, as well as contributing to the growth in economic activities.

## **B. Relevance**

51. The RDP is rated “highly relevant” owing to its consistency with the Government’s development strategy, as well as ADB’s lending strategy in the country and the region.

52. The RDP was formulated when Mongolia was going through a period of transition in its economy. In these circumstances, it quite appropriately assisted in contributing to the development of the road sector and enhancing the Government’s capability to plan, administer, and implement road programs. It was in line with the medium-term road master plan, which provided the Government’s overall development strategy for the sector at that time. Linked to this was the Road and Road Transport Sector Policy Statement, which the Government adopted to provide direction for the transition process in the sector (para. 41). The statement described several activities that were appropriately included as components of the RDP. During the last decade, the road sector strategy has revolved around implementation of the master plan. The RDP remains relevant even now, since it provides the key link with the border with the Russian Federation. Government ownership has been adequate, although there is room for improvement in terms of allocation of funds for maintenance.

53. The RDP was a rational entry for ADB into Mongolia’s roads sector, since ADB’s central objective was to finance necessary transport infrastructure to support the ongoing process of economic transition to a market-driven economy. The combination of funding of road improvement and policy level assistance has successfully contributed to the transition. The road improvement was justified since it established an efficient road network linking the key economic centers of Ulaanbaatar, Darhan, and Erdenet, and further to Altanbulag on the border with the Russian Federation. Although the effectiveness in terms of increase in trade has been slow, the rationale remains very sound. There have been several concerns expressed regarding the pavement width, which is 6 m instead of the normal 9 m for highways. Taking into consideration the fund constraints faced by the RDP, this could not be avoided. However, there is a case for widening the road in future.

54. Although there was adequate assessment of problems, opportunities, and lessons at the time of the approval, the RDP had a few issues relating to quality at entry owing to a change in scope necessitated by inadequate preparation at the PPTA stage. Although the Project was formulated for carrying out periodic maintenance of about 300 km, the completed project saw a combination of periodic maintenance, rehabilitation, and reconstruction. In other words, the actual scope of work turned out to be larger than that estimated at appraisal. Although it is recognized that project designs require a certain degree of flexibility, this change could have been foreseen at appraisal. Nevertheless, taking into consideration the limited information available at appraisal, the choice of lending modality and the project formulation adopted the correct solution in terms of institutional arrangements and contractual structures. Flexibility in implementation of project design was used to ensure that the final output was robust.

55. ADB’s overall presence in the roads sector has been dominated by funding for road rehabilitation. Although capacity building has figured as a project component, this has been less effective in terms of applicability and sustainability. The RDP was the first ADB-funded road project in Mongolia, and there was a need for ADB to understand the sector and the country (paras. 3 and 21). However, after more than 10 years, ADB needs to graduate on to the next

level where it can add value in terms of not just funding but also knowledge transfer and policy building as outlined in Box 1. This calls for innovation in ADB's approach to providing development assistance in Mongolia.

56. Coordination and complementarity with other development partners, especially the World Bank, were adequate. Besides policy initiatives, the World Bank had provided assistance in rehabilitating the country's transport fleet and routine road maintenance, which complemented the RDP. Correspondingly, Japanese aid in the early 1990s comprised TA for exploring alternative road construction technologies and supply of construction equipment. Synergies continue along these lines with ADB, World Bank, and the Government of Japan adopting geographical distribution of their areas of operation within Mongolia.

### **C. Effectiveness**

57. The RDP is rated "effective". This is based on the level of achievement of the expected outcomes at appraisal: (i) improved road infrastructure for more efficient movement of freight and passengers along the project road, and (ii) improved institutional capacity and policy support environment for road sector development.

58. The main benefit of the RDP was an improvement in the transport services on the project road, including all-weather access. During interviews with the OEM, road users attributed the road improvement to result in reduced travel time, improvement in the comfort levels, and reduction in vehicle operating costs (VOCs). Interviews with road users indicated that, after completion of the RDP, the reduction in travel time prompted people from rural areas to commute to the capital Ulaanbaatar for work—opening up new means of livelihood for them.

59. The overall volume of traffic in Mongolia is low compared to other Asian countries. In addition, since the RDP road was a paved road existing before the start of the Project, the incremental benefits of the road improvement are limited and cannot be expected to be large.<sup>22</sup> However, overall traffic has grown at an average annual rate of 12.8% over the last 7 years against estimated forecast growth of 5.8–6.0% at appraisal and 7.1% at project completion. In other words, actual traffic growth has been higher than expected at appraisal as well as at completion. These improvements in road transport services were expected to improve the efficiency of trade with the Russian Federation. Current estimates indicate that trade volume by road with the Russian Federation increased by almost 50% from 1995 to 2006. The benefit of the RDP has been seen in facilitating export diversification. Before improvement of the road, it was difficult to bring perishable food items from the Russian Federation to Ulaanbaatar. After the improvement, this has become possible. Section IV analyzes other impacts associated with the RDP.

60. While these are positive contributions by the RDP, their effects are localized and do not remove bottlenecks in the transport system as a whole. Taking into account the growth in trade, the OEM noted that there is larger potential for trade with the Russian Federation (Table 3). Although the amount of trade has grown since completion of the RDP, the share of trade by road vis-à-vis rail has remained constant. Current customs restrictions, in terms of plying of vehicles across the border, as well as time taken for customs clearances has limited the amount of trade by road with the Russian Federation. The road from Ulaanbaatar to Zamyn Uud on the southern border with the People's Republic of China (PRC) is under construction. Once completed, the RDP could be more effective for transit trade between the PRC and the Russian

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<sup>22</sup> The benefits were commensurate with the level of road pavement deterioration before and after the Project.

Federation. This will require a tripartite agreement between PRC, Mongolia, and Russian Federation, which is currently being negotiated.

**Table 3: Trade with the Russian Federation**

| Year                | Trade Volume by Road |                            | Trade Volume by Rail |                            | Total Trade<br>MT |
|---------------------|----------------------|----------------------------|----------------------|----------------------------|-------------------|
|                     | MT                   | Share of Road<br>in TT (%) | MT                   | Share of Rail<br>in TT (%) |                   |
| 1995 (construction) | 31.4                 | 5                          | 559.3                | 95                         | 590.7             |
| 2000 (completion)   | 37.8                 | 4                          | 968.1                | 96                         | 1,005.9           |
| 2001                | 47.1                 | 5                          | 911.1                | 95                         | 958.2             |
| 2006                | 47.0                 | 5                          | 856.2                | 95                         | 903.2             |

MT = million ton, TT = total trade.

Source: Operations Evaluation Mission.

61. The increase in traffic has had a knock-on effect on road safety. Improved road conditions, resulting in higher traffic speeds and increase in the absolute number of vehicles, have resulted in a higher number of traffic accidents—in particular, fatal accidents—on the RDP road. Table 4 provides a summary of the accident rate. The RDP road forms about 3% of the total state roads in Mongolia. However, the number of fatalities on this road in 2001 was 7% of the total fatalities in the country and it has remained at that level since then.<sup>23</sup> This indicates that the intensity of accidents on the RDP road is higher than in the rest of the country. Driving at speeds far above the 80 km per hour speed limit is common. Safety on the RDP road has deteriorated further because of the narrow width of the road pavement. Appendix 7 provides details of the road safety situation in Mongolia and on the RDP road. There appears to be a clear link between completion of the RDP and increase in the number of accidents. Although truck traffic is low, there have been several accidents on the road. Specific black spots were identified by the OEM, confirming road safety concerns attributable to the narrow pavement width. It is understood that the decision to limit pavement width was considered because of financial constraints at the project appraisal stage.

**Table 4: Road Accidents, 2001 and 2006**

| Item  | 2001<br>(project<br>completion) | 2006  |
|---|---------------------------------|-------|
| Ratio of Fatalities per Road Accident                                     |                                 |       |
| National  | 0.06                            | 0.06  |
| Rural Areas   | 0.26                            | 0.18  |
| RDP (Selenge and Tuv Aimags)  | 0.52                            | 0.53  |
| Ratio of Injuries per Road Accident                                       |                                 |       |
| National  | 0.30                            | 0.21  |
| Rural Areas   | 0.79                            | 0.42  |
| RDP (Selenge and Tuv Aimags)  | 1.50                            | 1.25  |
| Road Accidents in Rural Areas as Percent of Road Accidents in the Country | 17.40                           | 21.30 |
| RDP Accidents as Percent of Road Accidents in Rural Areas                 | 5.00                            | 3.20  |
| RDP Fatalities as Percent of Road Accident-caused Deaths in Rural Areas   | 10.10                           | 9.30  |
| RDP Injuries as Percent of Injuries from Road Accidents in Rural Areas    | 9.40                            | 9.60  |

RDP = Roads Development Project.

Sources: Operations Evaluation Mission and Traffic Police Department of Mongolia, 2007.

62. Although the subsequent ADB-funded Regional Road Development Project (footnote 9) has attempted to incorporate road safety in its project design, this has been at a superficial level.

<sup>23</sup> The number of fatalities on the RDP road in 2006 was 6% of the total fatalities in the country.



Components such as road signage, road safety audit, and supply of police vehicles are necessary but not sufficient to ensure road safety. Taking into consideration the distinct trend of rise in fatalities after road improvement, there is a need for ensuring better legislation and improved enforcement of road safety measures, such as wider public awareness campaigns and better enforcement of traffic rules and regulations.

63. The attached road sector ADTA (footnote 2) contributed to the development of the policy and strengthening of the road sector institutions. However, this assistance had mixed results in terms of effectiveness of various components (para. 90 provides details of the attached TA).

#### **D. Efficiency**

64. The RDP is rated “efficient”, bordering on “highly efficient”. The OEM quantified the major benefits using a Highway Development and Management-4 (HDM-4) model: (i) VOC savings caused by better road conditions and higher speed, and (ii) travel time savings for passengers and freight.<sup>24</sup> The OEM updated the information on the physical condition of the project road, current and anticipated traffic, and VOCs to recalculate an EIRR as the principal indicator for efficiency. Appendix 8 provides an analysis of these benefits. The recalculated EIRR is 17.6% and is higher than that calculated by the PCR, which estimated the EIRR at 14.6%.<sup>25</sup> In contrast, the EIRR of 22.9% estimated at appraisal turned out to be overly optimistic.

65. Overall, the viability of the RDP is robust and can tolerate adverse developments of the main benefit and cost parameters. This was tested in the sensitivity analysis accompanying the EIRR recalculation. The assumptions and methodology used for the revised traffic forecast and the recalculation of the EIRR are in Appendix 8. The viability of the RDP rests on a cost-efficient maintenance regime. This includes carrying out of civil works in the form of pavement overlays to restore deteriorated sections of the road. Periodic maintenance interventions are usually scheduled at intervals of between 8 and 10 years, depending on traffic loads and climatic influences. In the absence of such periodic maintenance, routine annual maintenance expenditures increase rapidly to mitigate rapid pavement deterioration. However, as shown in Appendix 8, routine maintenance alone can only slow the process but cannot stop pavement deterioration.

66. While gradual pavement deterioration was analyzed under the with-project scenario, it was found to occur at a lower rate and gives rise to savings in VOCs in relation to the without-project case. The with-project case is thus a more cost-efficient maintenance alternative. The viability of the RDP emanates from comparing an efficient maintenance regime (with-project scenario) with a regime that may be considered inadequate and less than rational (without-project scenario). The issue that arises in this context is to what extent the less-than-optimal alternative can be considered empirically relevant. Experience on the RDP and in other parts of Mongolia shows that, owing to budget constraints and inadequate maintenance management, road authorities frequently adopt the less-than-optimal maintenance option. The neglect of maintenance typically causes premature pavement deterioration and pavement failure, eventually making the remedial measures more costly. The ensuing substantial financing requirements provide a rationale for international development assistance to remove the significant backlog of deferred maintenance and to rehabilitate or reconstruct the deteriorated

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<sup>24</sup> The HDM-4 is computer software for the Highway Development and Maintenance Management System. It is a decision-making tool for checking the engineering and economic viability of investments on road transport infrastructure.

<sup>25</sup> ADB. 2001. *Project Completion Report on the Roads Development Project in Mongolia*. Manila.

pavement. In parallel, policy dialogue needs to continue along these lines to ensure that adequate funding allocations are made by the Government for the road sector in general and for maintenance in particular.

67. The RDP highlights two interrelated issues. First, there is a need to balance budget allocations for routine and periodic maintenance in such a way that they complement each other. Substantial savings could be achieved by allocating more funds to regular maintenance to avoid premature deterioration of pavements, and, consequently, less to capital expenditures. The practice of neglecting routine maintenance shifts the emphasis on costly periodic maintenance, and has given rise to the pattern of development assistance substituting recurrent maintenance budgets. Second, international development grant or loan financing for large periodic maintenance is effective only if the country can set up an efficient and rational maintenance regime and can implement it. The policy dialogue by ADB and other development partners has been partly effective, and there is room for further work along these lines.

## **E. Sustainability**

68. Sustainability is rated “likely” provided the Government continues to improve funding allocations to the roads sector and further efforts are made to improve the institutional resources for planning as well as execution. The OEM found the RDP road to be in fair condition (Appendix 4). With 7 years of operations after project completion, a reasonably long period has elapsed and the current condition of the road is considered sustainable from a long-term perspective. This is a reflection of the level of traffic and the maintenance regime on the RDP road, which is one of the key state roads in the country. The Road Supervision and Research Center of MORTT ensures that adequate funds are deployed for the maintenance of this road.<sup>26</sup> However, concern remains relating to the adequacy of policies and regulatory conditions, and this rating of sustainability could deteriorate if there is a slowdown or reversal in the current process (para. 44).

69. Two main issues are associated with the road fund. First, the Ministry of Finance has allocated on average 16% of the road user payments to the road fund.<sup>27</sup> In other words, although the road users have made contributions to the road sector through fuel tax and vehicle tax, these contributions have not found their way to the road fund. Second, the average allocation for maintenance has been 20% of the total road fund, and the remaining funds have been spent on construction and rehabilitation of new roads. This has caused a skew in allocation in favor of new roads at the cost of the maintenance of existing roads. This was confirmed during discussions with MORTT, which confirmed a substantial shortfall in fulfilling the maintenance requirements (Appendix 6).<sup>28</sup>

70. Aside from the above issues, the OEM noted that MORTT is making efforts to improve the size of the road fund, although this will require stronger ownership and commitment from the Government, especially the Ministry of Finance. There is also a need for setting up adequate maintenance planning mechanisms to ensure efficient prioritization and cost-effective solutions.

<sup>26</sup> It could be argued that the funds for the RDP road must be deployed from a limited pool of the road fund, which could deny adequate funding for other roads. This requires better prioritizing of the road fund's maintenance expenditures.

<sup>27</sup> Based on data provided by ADB's consultants for ADB. 2006. *Technical Assistance to Mongolia for Preparing the Western Regional Road Development Project*. Manila (TA 4785-MON, for \$650,000, approved on 10 May).

<sup>28</sup> Overall routine maintenance requirements are estimated at \$12.5 million per annum. However, this amount may be regarded as low, as it was based on minimal maintenance standards. MORTT acknowledged a substantial shortfall over the estimated total maintenance need (routine and periodic) of \$28 million per annum.

Finding an appropriate technology solution for constructing the road pavement surface is a major issue that has repercussions on both the economic viability and sustainability of the Project. ADB assistance along these lines will be crucial in identifying appropriate interventions that promote better sustainability.

71. The sustainability of institutional resources has been affected by staff turnover and changes in institutional structure. Mongolia faces several difficulties in obtaining suitably qualified people to work in MORTT because of its low population. The existing experienced staff are more familiar with the procedures of a planned economy, and the relatively younger staff tend to gain experience and move on to the private sector. The Government has recognized this and is making efforts to offer incentives such as overseas training and better remuneration to retain and attract staff. There is a need to ensure that staff are trained in international best practices. Assistance from ADB and other aid agencies has been effective in this respect, but it needs to be continued and scaled up. The recommendations of the affected road sector ADTA (footnote 2) were useful in suggesting a new structure for MORTT and DOR. However, with the revision of this institutional structure in 2004 by the new government administration, there has been uncertainty about the roles of various divisions. Similarly, the training provided to DOR staff was effective in creating awareness but was not sustainable, since the trained staff did not have the opportunity to use the new knowledge or left the organization.

72. Most of the issues identified above imply the lack of an overall roads sector strategy required to provide clear direction and realistic planning for network expansion and management. The OEM noted that such a policy document is being drafted. The sustainability of projects and institutional capacity should improve if a consistent and rationale approach is adopted across the sector.

#### **IV. OTHER ASSESSMENTS**

##### **A. Impact**

##### **1. Impact on Institutions**

73. Paras. 44 and 71 identify various issues relating to institutional capacity. The road sector ADTA (footnote 2) has had substantial impact on the development of DOR specifically and MORTT in general. Para. 90 analyzes the institutional benefits of the various components of the TA. The main impact of ADB interventions has been to bring in international best practices in the form of better project implementation.<sup>29</sup> In terms of the private sector, the RDP contributed to the development of the roads contracting industry in Mongolia wherein the local contractors learned new techniques from the international ones. Some of these interventions were effective in creating awareness but did not create substantial impact since they were not sustained, especially by the public sector. Lack of adequate planning for capital investment, as well as maintenance, remains a weak area within the current institutional structure. Centralized planning for network expansion and maintenance, controlled by the Ministry of Finance, continues and shows no signs of change. Thus, while ADB assistance has had a favorable impact at the project execution level, there is room for improvement at the policy level, e.g., in terms of encouraging decentralization. However, policy changes take considerable time and require a broad consensus.

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<sup>29</sup> For example, the use of international competitive bidding for the consulting and civil works contracts exposed MORTT to international standards for better access to advanced technologies at competitive prices. However, the training provided on the use of HDM-4 model was not sustained, so it had a limited impact.

## 2. Socioeconomic Impact

74. The RDP contributed positively to economic development at various levels. However, the impact of the RDP needs to be seen in light of the fact that a road existed before the RDP was implemented. Besides the RDP, other factors might have driven economic growth—such as GDP, rural-urban migration caused by factors other than road access, growth in the number of private cars in urban areas, and other reasons. However, the RDP made a contribution to facilitating efficient economic development (Appendix 9).<sup>30</sup>

75. The OEM carried out a household level sample survey in the three *aimags* (provinces) comprising the project impact area—Darhan–Uul, Selenge, and Tuv. To identify the changes attributable to the RDP in a better manner, the sample included households close to the road project impact area and those located in remote areas and with poor road access (control area). The survey found that livelihoods in the project impact area were better than those in the control area. With improved access to the market, 80% of households residing near the project road made 53% more profit from agricultural activities compared to those residing in the control area. Improvement in the road access triggered growth in small-scale household businesses such as hotels, restaurants, shops, automobile services, etc.

76. The RDP was expected to support the development of a free trade zone in Altanbulag (Appendix 3). Although the free trade zone was established, it did not prove to be successful since no new industries were set up. The area has merely been used by local businesspersons for trading consumer goods across the border. Government sources indicated that about 75% of the country's agro-processing industries are located in the cities of Darhan, Erdenet, and Ulaanbaatar, in addition to Selenge and Tuv *aimags*. Since the RDP connected all these locations, it could be concluded that the road improvement contributed to the development, although other factors such as proximity to urban areas had a stronger impact. The RDP has also contributed to improvement in mining activities since several new mineral reserves have been explored and developed in the last 7 years. Several such secondary benefits could be attributed to road improvement.

77. Improved access to market has been identified as the most important reason for migration to the project impact area. Better opportunities to sell farm products and shorter travel distance are seen as incentives for migrating. In the control area, large quantities of milk were wasted during summer because herders could not transport it. In situations where they could sell it to traders who visited their farms, the herders were paid below market prices.

78. A comparison of commodity prices between the project impact area and control area indicated that prices were higher in the control area. The OEM interviews indicated that prices, market competition, and variety of market products depend on the accessibility of the road. In terms of impact on gender, the OEM survey indicated that women's participation in small-scale business activities had increased along the project road. Activities such as shop keeping, hospitality, selling livestock products, etc., witnessed increased presence of women.

79. As a result of the improvement in road quality, vehicle speeds increased at project completion (para. 61). This had a knock-on effect on road safety, as the number of fatal

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<sup>30</sup> During implementation, the RDP created temporary job opportunities for local people, generating about 510 person-years of direct local employment. Moreover, since the road improvement did not entail changing the road alignment or widening the road, no apparent resettlement was seen by the OEM.

casualties increased from 14 in 1995 to 28 in 2000 when the RDP was completed. The number of fatal casualties has, since then, fluctuated and was 21 in 2006. Appendix 7 elaborates on the road safety issue.

### **3. Environmental Impact**

80. The RDP involved improving the existing road without changing its alignment and did not have any major impact on the environment. Some of the stone quarries used for sourcing the material were left open. However, this did not create any specific safety hazard or environmental problem. The RDP included the reconstruction of two bridges on the Darhan–Erdenet road. The OEM inspection did not find any residue construction materials in the river.

81. In the absence of a paved or gravel road, during the OEM site visit it was seen that multitracks are created by drivers seeking alternative routes, which leads to major soil erosion and loss of vegetation (Appendix 3). In other words, the presence of a distinct road could have a beneficial impact on the environment in terms of restricting the plying of vehicles outside the right-of-way. However, there is a limitation to the extent to which construction of a new road can address this issue. It requires a wider intervention in terms of creating awareness and expanding the network in a systematic manner.

82. Vehicular pollution could become a potential issue in future if Mongolia continues to import used vehicles from other countries such as Japan and Korea without adequate monitoring of the impact on environment, safety, and reliability. None of the road sections visited by the OEM had any form of vehicle emission testing. In the context of the RDP, vehicle emissions is not yet a major issue since the levels of traffic and congestion are low in the rural areas. The issue of vehicle emissions is likely to become more important in Ulaanbaatar city.

### **B. ADB Performance**

83. The RDP was ADB's first road project in Mongolia. ADB's performance during project preparation was partly satisfactory since the PPTA did not include a feasibility study for the RDP route (paras. 9–10). Subsequent project delays and change in project scope could have been reduced with better project preparation. Implementation supervision and policy dialogue were also adversely affected by frequent change in ADB project officers. Apart from this, ADB's performance in implementing the Project was satisfactory. Overall, ADB's performance is rated "satisfactory".

84. Taking into account ADB's activities, it can be credited with leading the international transport development initiative in Mongolia. However, this needs to be strengthened by an improved dialogue between ADB and the Government. The current dialogue involving finalizing a transport sector strategy for Mongolia indicates that there is a difference in the approaches of ADB and the Government. However, efforts need to be made by both sides to reach an understanding so that the development process is not delayed.

85. ADB's assistance in the roads sector has been heavily focused on preparing draft policies, with capacity building outcomes as a side item. This was appropriate in the 1990s given the need for assisting the transition process toward a market-oriented economy. However, ADB now needs to recognize the progress and fine-tune its approach by bringing in more focus on the capacity building elements.

86. Recent discussions with ADB staff and the Government indicate that there is a greater need for ADB to add value to its products rather than limiting itself to the provision of funds.

ADB performance could be improved with innovative approaches in capacity building, socially inclusive project components, better stakeholder participation, and specific governance activities. Taking into account the difficulties faced in constructing roads in the Mongolian climatic conditions, ADB could explore alternative technology solutions. ADB could transfer lessons from other countries where their road fund is managed in a more transparent and efficient manner.

### **C. Borrower Performance**

87. Despite the Government's relative inexperience in implementing donor-assisted projects in the 1990s, the performance of the EA and the project implementation unit was satisfactory. The project steering committee provided adequate coordination, supervision, and commitment for the Project. The loan effectiveness was delayed owing to the delays in meeting ADB requirements. These delays were rectified in the second RDP (footnote 13). One of the major causes of delays in implementation of the RDP was associated with the provision of counterpart funding. This resulted in difficulties in complying with ADB loan covenants. The EA was also unable to submit audited project accounts to ADB during the first 2 years of implementation. This deficiency has also continued in the second RDP, despite the establishment of a State Audit Board in 1997. ADB, in conjunction with the Ministry of Finance, needs to assess the cause of the delays and resolve it. Overall, the Borrower's performance is rated "satisfactory".

88. As mentioned in para. 72, there is a need for the Government to finalize the transport sector strategy. Several crucial policy initiatives have been undertaken by the Government, such as passing the Road Law in 1998 and the Road Transport Act in 1999, establishment of the NTAC to monitor policy implementation, and the Road Board to manage the road fund. However, these initiatives need to be supplemented with further policy support in several areas (paras. 46–47). Unless Mongolia has a clear policy that is supported by adequate legislation, expansion of its road infrastructure might not be sustainable. There is, thus, a need for the Government to work closely with ADB to obtain expertise in identifying the gaps in policy structure and fill the gaps with appropriate TA.

89. Institutional capacities for policy formulation remain weak within MORTT. High staff turnover, frequent reorganizations, and tasking MORTT with project implementation responsibilities have made it difficult to develop requisite policy making capacities. This affects the extent to which MORTT can fulfill its roles of policy making and regulating.

### **D. Technical Assistance**

90. The road sector ADTA (footnote 2) was successful, but on the lower side. The TA made several contributions at the policy level but fell short of expectations at the institutional level. Below is an assessment of each component of the TA.

#### **1. Part A – Road Act and Cost Recovery**

- (i) **Development of a legal framework for the road sector.** This component succeeded in preparing the Road Act, 1998, and the Road Transport Act, 1999. As envisaged by the TA, the NTAC was established in February 1998. However, since then, the NTAC has not been effective in monitoring policy implementation or in contributing substantially to improving transport efficiency in the country (para. 40).
- (ii) **Improve the operation and management of selected state-owned road enterprises.** The TA was effective in initiating the process of privatizing part of the government-controlled activities. Almost all the construction companies have

been privatized. The maintenance companies have not yet been privatized since the Government is of the view that road maintenance needs to be properly funded before full privatization can take place. In the transport services segment, almost all freight services and interurban bus services have been privatized.

- (iii) **Development of a broad-based approach to cost recovery from various classes or road users.** Before the start of the TA, Mongolia had a road fund to collect fuel tax and vehicle fees. However, the TA concluded that the collections were insufficient and that inadequate priority was accorded to allocating funds for road maintenance. Generally, the road fund expenditures do not match the revenues, i.e., the allocation for maintenance is much less compared to the funds collected from road users. Effectiveness of the road fund and its sustainability continue to remain key issues that need to be addressed.

## 2. Part B – Institutional Strengthening of the Road Sector

- (i) **Refine the organizational structure of DOR, define its role, and establish its initial operational systems.** DOR and MORTT were restructured in accordance with the recommendations of the TA. This structure was revised in 2004, causing uncertainties in the distribution of roles between the various departments, e.g., the planning task was withdrawn from DOR without specific reassignment.
- (ii) **Strengthen the financial and planning capabilities of DOR and new road construction companies.** This component attempted to transfer best practices in feasibility analysis, programming, and budgeting for improvement of road links. MORTT confirmed that the TA consultants provided training on the HDM-4 model. However, this training was not sustainable since the majority of staff moved out of MORTT. Currently, MORTT lacks financial and planning capabilities and there is little evidence about the effectiveness of this component.
- (iii) **Develop a human resources development plan for the road sector.** The TA consultants prepared a broad human resources development plan for MORTT and DOR. This included a training needs assessment. However, MORTT continues to face resources constraint, both in terms of number of staff as well as technical knowledge. This component was less effective in mainstreaming its results.

## V. ISSUES, LESSONS, AND FOLLOW-UP ACTIONS

### A. Issues

91. **Adequacy of Institutional Capacity.** This continues to be a major issue in Mongolia, owing to the limited trained resources available in the public sector as well as the private sector. The efforts by ADB at capacity building have had short-term results that have not always been sustainable. This issue does not have a clear solution. A dialogue between the Government and development partners is required to evolve a long-term solution.

92. **Road Maintenance.** There has been increasing awareness within Mongolia of the need to maintain roads adequately. However, the allocation for maintenance as a proportion of overall road fund is still low. The absence of a robust maintenance regime for the entire country has become distinct, especially in light of the expanding road network. The lack of adequate road maintenance equipment and construction standards are a subset of a larger problem associated with the entire road network. Although current dialogue between the Government and development partners has focused on this issue, there is a long way to go before Mongolia has an efficient maintenance planning mechanism supported by adequate funding allocation.

## B. Lessons

93. **Regional Cooperation.** From a strategic perspective, ADB had appropriately chosen the Ulaanbaatar–Altanbulag road for improvement taking into account the benefits of regional cooperation and trade with the Russian Federation. This has continued in two subsequent projects, which aimed at improving the link with the PRC. ADB needs to continue along these lines and expand its project selection criteria to include regional benefits in addition to the national benefits.

94. **Value Addition through Innovations in Project Design and TA Projects.** Funding of road projects has been ADB’s comparative assistance advantage in the past. However, there is a need for ADB to add better value for Mongolia by bringing in innovative practices and ideas for improving the road network and institutional capacity. Innovative approaches could be adopted in several areas (para. 86), and lessons from other countries could be used with appropriate cognizance to the local context.

95. **Project Preparation.** ADB needs to ensure that adequate project preparation, in particular good quality feasibility studies, are conducted before loans are processed. Compromising on the detail and length of the feasibility study could result in implementation issues and time and cost overruns.

## C. Follow-Up Actions

96. Recommended follow-up actions are detailed in Table 5.

**Table 5: Follow-Up Actions**

| Follow-Up Action   | Responsibility  |
|--|---|
| <p>1. <b>Road Safety.</b> Improvement of roads has a direct correlation with deterioration of road safety. The Government needs to strengthen its policy on key transport areas such as road safety, vehicle import and usage, and sector regulation. For example, use of seatbelts and banning drunken driving could be subject to legislation. This will enable better enforcement by agencies such as the traffic police. In addition, the Government needs to establish quality control procedures for imported vehicles to ensure that impact on environment, safety, and reliability is not compromised. Finally, public awareness needs to be improved through national and local media, including schools and community centers. The Asian Development Bank (ADB) and the Government could design specific technical assistance to address such deficiencies in addition to policy strengthening in areas such as sustainability and capacity development.</p> | <p>ADB to initiate consultation with the Government</p> |
| <p>2. <b>Submission of Financial Statements.</b> There has been a consistent delay in submission of audited project accounts on Loan 1364 and Loan 1700.<sup>a</sup> The Government needs to assess the cause of the delays and resolve it.</p>  | <p>ADB to initiate consultation with the Government</p> |

<sup>a</sup> ADB. 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to Mongolia for the Roads Development Project*. Manila (Loan 1364-MON[SF], for \$25 million, approved on 22 August); and ADB. 1999. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to Mongolia for the Second Roads Development Project*. Manila (Loan 1700-MON[SF], for \$25 million, approved on 30 September).



## SUMMARY DESIGN AND MONITORING FRAMEWORK

| Design Summary   | Project Targets/Indicators  | Actual Achievement  | Source of Information  |
|--|---|---|--|
| <p><b>Impact</b><br/>To develop the road sector and promote domestic and international trade and sustainable economic growth along the north–south corridor between Ulaanbaatar and Altanbulag</p> | <ul style="list-style-type: none"> <li>• Increase in trade using the RDP road</li> <li>• Development of industries in the free trade zone at Altanbulag</li> <li>• Reduction in poverty in the project area</li> <li>• New job opportunities for local people</li> <li>• Increased private sector participation in road sector</li> </ul> | <ul style="list-style-type: none"> <li>• Trade increased at an average annual rate of 4% over the 7 years after completion</li> <li>• The free trade zone was not able to attract sufficient industries</li> <li>• Income poverty decreased from 43% in 1998 to 36% in 2005 in the country. Average household per capita income was 42% higher in the project impact area than a control area.</li> <li>• Implementation of the RDP created 510 person-years of direct local employment. Upon completion, there was a growth in small-scale household businesses, such as hotels, restaurants, shops, etc.</li> <li>• Almost all road construction companies have been privatized. Maintenance companies have remained in the public domain.</li> </ul> | <ul style="list-style-type: none"> <li>• Secondary data from the Government</li> <li>• OEM socioeconomic survey</li> <li>• PCR and socioeconomic survey</li> <li>• Discussions with government officials</li> </ul>  |
| <p><b>Outcome</b><br/>Improved road infrastructure for more efficient movement of freight and passengers along the north–south corridor between Ulaanbaatar and Altanbulag</p>                     | <ul style="list-style-type: none"> <li>• EIRR of about 20% on the project road achieved by 2000</li> <li>• Increase in traffic and all-weather access</li> <li>• Reduced travel time</li> <li>• Road safety</li> </ul>  | <ul style="list-style-type: none"> <li>• Recalculated EIRR of 17.6% compares favorably with the result of PCR estimate of 14.6% and appraisal estimate of 22.9%, which turned out to be overly optimistic</li> <li>• Traffic volumes have increased at an average annual growth rate of 12.8% since completion. The road is passable throughout the year.</li> <li>• With the improvement in road roughness, vehicle speeds have increased and travel time reduced by 40–50% after project completion</li> <li>• Increased number of accidents along the project road, resulting in damages to vehicles, freights, and losses to human life</li> <li>• Severity of traffic accidents increased on the project road</li> </ul>                           | <ul style="list-style-type: none"> <li>• OEM traffic survey and economic analysis</li> <li>• OEM traffic survey and economic analysis</li> <li>• PCR and OEM estimates</li> <li>• Secondary data from the Government</li> </ul>                            |
| <p>Improved institutional capacity and policy support environment for road sector development</p>  | <ul style="list-style-type: none"> <li>• Improved awareness of international best practices and improved capacity of DOR/MORTT to handle international contracts</li> <li>• Improvement in legislative environment for road sector</li> <li>• DOR/MORTT using new techniques in financial analysis and planning</li> </ul>                | <ul style="list-style-type: none"> <li>• DOR/MORTT using new practices in detailed design, periodic maintenance, use of modern equipment, road construction supervision, and contractor management</li> <li>• DOR/MORTT undertaking international competitive bidding for subsequent projects</li> <li>• Road Act and Road Transport Act passed by parliament to set the policy. However, gaps in policy remain as identified in the PPER.</li> <li>• DOR/MORTT were trained in the new techniques, but this training was not sustainable since the majority of staff moved to the private sector</li> </ul>  | <ul style="list-style-type: none"> <li>• Discussions with government officials, including DOR/MORTT</li> <li>• Discussions with government officials, including DOR/MORTT</li> <li>• Discussions with government officials, including DOR/MORTT</li> </ul> |

| Design Summary   | Project Targets/Indicators  | Actual Achievement  | Source of Information  |
|--|---|---|--|
| <b>Outputs</b>   |   |   |  |
| Part A. Civil Works  | <ul style="list-style-type: none"> <li>• Periodic maintenance of about 300 km sections of paved road</li> <li>• Physical condition of the project roads, including international roughness standard, improved</li> <li>• Reconstruction of two bridges completed</li> </ul> | <ul style="list-style-type: none"> <li>• More intensive pavement interventions were done than estimated at appraisal from the 312 km of completed roads: periodic maintenance of 139 km, rehabilitation of 73 km, partial reconstruction in 80 km, and full reconstruction in 20 km</li> <li>• RDP road is one of the best state roads in Mongolia today although the pavement has extensive transverse cracking, which increases road roughness</li> <li>• Based on a five-category judgment criteria of excellent, good, fair, bad, and very bad, road conditions between Ulaanbaatar and Darhan, and between Darhan and Altanbulag are both rated "fair"</li> <li>• Of the 312 km completed, 90.6 km (29.0%) are considered "good" and the rest are judged "fair"</li> <li>• Orkhon and Burgaltai timber bridges were replaced with concrete bridges</li> <li>• General condition of both bridges is acceptable, given that no maintenance has been undertaken except permanent cleaning of waste, snow, and ice all year round</li> </ul> | <ul style="list-style-type: none"> <li>• OEM road engineer's report</li> <li>• OEM road engineer's report</li> <li>• OEM road engineer's report</li> </ul> |
| Part B. Road Maintenance Equipment and Technical Support Equipment | <ul style="list-style-type: none"> <li>• Provision of 28 units of road maintenance equipment to the Bayanchandmani, Baruunharaa, Darhan, Selenge, and Erdenet maintenance units</li> </ul>  | <ul style="list-style-type: none"> <li>• No equipment was procured, as this component could not be implemented because of lack of funds</li> <li>• A subsequent ADB loan was able to procure equipment, although these have yet to be deployed on the RDP road</li> </ul>   | <ul style="list-style-type: none"> <li>• PCR</li> <li>• Discussions with government officials</li> </ul>   |
| Part C. Consulting Services  | <ul style="list-style-type: none"> <li>• Detailed design for improvement of 70 km road section from Nalayh–Maant</li> </ul>   | <ul style="list-style-type: none"> <li>• Detailed design of the Nalayh–Maant road was subsequently modified since the Second Roads Development Project found it unsuitable during implementation</li> </ul>   | <ul style="list-style-type: none"> <li>• Discussions with government officials</li> </ul>  |

ADB = Asian Development Bank; DOR = Department of Roads; EIRR = economic internal rate of return; km = kilometer; MORTT = Ministry of Roads, Transport and Tourism; OEM = Operations Evaluation Mission; PCR = project completion report; PPER = project performance evaluation report; RDP = Roads Development Project.  
Source: Operations Evaluation Mission.

## COMPARISON OF PROJECT COST AND FINANCING

**Table A2.1: Appraisal and Actual Project Costs and Financing**  
(\$ million and percent)

| Item                                   | Appraisal    |              |              | Actual       |             |              | Actual/<br>Appraisal (%) |
|--|--------------|--------------|--------------|--------------|-------------|--------------|--------------------------|
|  | Foreign      | Local        | Total        | Foreign      | Local       | Total        |                          |
| <b>A. Base Cost</b>                    | <b>17.75</b> | <b>7.49</b>  | <b>25.24</b> | <b>17.84</b> | <b>8.96</b> | <b>26.83</b> | <b>106.3</b>             |
| 1. Civil Works                         | 13.10        | 6.90         | 20.00        | 14.78        | 8.96        | 23.74        | 118.7                    |
| 2. Equipment                           | 2.45         | 0.25         | 2.70         | 0.00         | 0.00        | 0.00         | 0.0                      |
| 3. Consulting Services                 | 2.20         | 0.34         | 2.54         | 3.06         | 0.03        | 3.09         | 121.7                    |
| <b>B. Contingencies</b>                | <b>3.05</b>  | <b>2.51</b>  | <b>5.56</b>  | <b>0.00</b>  | <b>0.00</b> | <b>0.00</b>  | <b>0.0</b>               |
| <b>C. Interest During Construction</b> | <b>0.70</b>  | <b>0.00</b>  | <b>0.70</b>  | <b>0.54</b>  | <b>0.00</b> | <b>0.54</b>  | <b>77.1</b>              |
| <b>Total</b>                           | <b>21.50</b> | <b>10.00</b> | <b>31.50</b> | <b>18.38</b> | <b>8.99</b> | <b>27.37</b> | <b>86.9</b>              |
| <b>Financing</b>                       |              |              |              |              |             |              |                          |
| ADB Loan                               | 21.50        | 3.50         | 25.00        | 18.38        | 3.13        | 21.51        | 86.0                     |
| Borrower                               | 0.00         | 6.50         | 6.50         | 0.00         | 5.86        | 5.86         | 90.2                     |
| <b>Total</b>                           | <b>21.50</b> | <b>10.00</b> | <b>31.50</b> | <b>18.38</b> | <b>8.99</b> | <b>27.37</b> | <b>86.9</b>              |

ADB = Asian Development Bank.

Source: ADB. 2001. *Project Completion Report on the Roads Development Project*. Manila.

**Table A2.2: Appraised and Actual Road Construction Costs per Kilometer**

| Item                |                  | Appraisal   | Actual      | Actual/<br>Appraisal (%) |
|---------------------|------------------|-------------|-------------|--------------------------|
| Cost of Civil Works | \$ million       | 20.00       | 23.74       | 118.70                   |
| Road Length         | Kilometer (km)   | 300.00      | 312.00      | 104.00                   |
| Cost per Kilometer  | US dollar per km | \$66,666.67 | \$76,089.74 | 114.13                   |

Sources: Asian Development Bank (ADB). 2001. *Project Completion Report on the Roads Development Project*. Manila; and ADB. 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to Mongolia for the Roads Development Project*. Manila.

## PHOTOGRAPHS

Photo A3.1: Altanbulag Free Trade Area



Photo A3.2: Improved Economic Activity



**Photo A3.3: Lack of Road Signage**



**Photo A3.4: Multitracks Impacting Environment**



**Photo A3.5: Multitracks Impacting Environment**



**Photo A3.6: Overloaded Vehicles – Large Trucks**



**Photo A3.7: Transverse Road Cracking**



**Photo A3.8: Road Black Spot**



## SUMMARY OF PHYSICAL ACCOMPLISHMENTS

**Table A4.1: Physical Accomplishments**

| Item                                     |       | Appraisal                             | PCR | PPER | Remarks  |
|--|-------|---------------------------------------|-----|------|--|
| Civil Works                              | km    | about 300                             | 312 | 312  | Of the 345 km of road between Ulaanbaatar and Altanbulag, 33.04 km were excluded since they fall within the municipal limits of Ulaanbaatar (Ulaanbaatar to Km18.80) and Darhan (from Km212.00 to Km226.24). |
| Periodic Maintenance <sup>a</sup>        | km    | 300                                   | 139 | 139  |  |
| Rehabilitation                           | km    |                                       | 73  | 73   |  |
| Partial Reconstruction                   | km    |                                       | 80  | 80   |  |
| Full Reconstruction                      | km    |                                       | 20  | 20   |  |
| Bridge Rehabilitation/<br>Reconstruction |       | Replacement<br>of 2 timber<br>bridges |     |      |  |
| Road Maintenance Equipment               | Units | 28                                    | 0   | 0    |  |
| Bayanchandmani Maintenance Unit          | Units | 5                                     | 0   | 0    | Appraisal requirements: Road roller, loader, water tanker, patch repair machine, pick-up   |
| Baruunharaa Maintenance Unit             | Units | 7                                     | 0   | 0    | Appraisal requirements: Road roller (2), loader, water tanker, patch repair machine, pick-up, mobile workshop  |
| Darhan Maintenance Unit                  | Units | 8                                     | 0   | 0    | Appraisal requirements: Grader, trailer, loader, tractor, water tanker, patch repair machine, pick-up, mobile workshop   |
| Selenge Maintenance Unit                 | Units | 5                                     | 0   | 0    | Appraisal requirements: Trailer, loader, tractor, patch repair machine, pick-up  |
| Erdenet Maintenance Unit                 | Units | 3                                     | 0   | 0    | Appraisal requirements: Water tanker, patch repair machine, pick-up  |

km = kilometer, PCR = project completion report, PPER = project performance evaluation report.

<sup>a</sup> Periodic maintenance limited to crack and pothole repairs and resurface dressing.

Sources: Operations Evaluation Mission and Asian Development Bank. 2001. *Project Completion Report on the Roads Development Project*. Manila.



**Table A4.2: Summary of Pavement Intervention and Road Conditions**  
(kilometer)

| <b>Route</b>           | <b>Periodic Maintenance</b> | <b>Rehabilitation</b> | <b>Partial Reconstruction</b> | <b>Full Reconstruction</b> | <b>Total</b> | <b>Pavement Condition</b> |
|------------------------|-----------------------------|-----------------------|-------------------------------|----------------------------|--------------|---------------------------|
| Ulaanbaatar–Bornuur    | 39.6                        | 15.4                  | 21.1                          | 5.1                        | 81.2         | Fair                      |
| Bornuur–Baruunharaa    | 4.4                         | 15.8                  | 29.4                          | 5.5                        | 55.1         | Good                      |
| Baruunharaa–Darhan     | 37.7                        | 9.3                   | 9.1                           | 0.7                        | 56.8         | Fair                      |
| Darhan–Shaamar         | 48.5                        | 15.3                  | 12.4                          | 7.2                        | 83.4         | Fair                      |
| Shaamar–Altanbulag     | 8.8                         | 17.2                  | 8.0                           | 1.5                        | 35.5         | Good                      |
| Ulaanbaatar–Altanbulag | 139.0                       | 73.0                  | 80.0                          | 20.0                       | 312.0        | Fair                      |
| Ulaanbaatar–Darhan     | 81.7                        | 40.5                  | 59.6                          | 11.3                       | 193.1        | Fair                      |
| Darhan–Altanbulag      | 57.3                        | 32.5                  | 20.4                          | 8.7                        | 118.9        | Fair                      |

Note: Pavement condition assessment is based on a five-category judgment criteria: excellent, good, fair, bad, and very bad.  
Source: Operations Evaluation Mission.

### STATUS OF COMPLIANCE WITH LOAN COVENANTS

| Covenants Reference to Loan Agreement   | Status of Compliance   |   |
|---|--|---|
|   | PCR  | PPER  |
| 1. The Project and operation of project facilities will be carried out with due diligence and efficiency and in conformity with sound administrative, financial, engineering, environmental, and road construction practices. Loan Agreement (LA), Sections 4.01(a), 4.04, and 4.09   | Complied with.   | Complied with.  |
| 2. Funds, facilities, services, land, and other resources, which are required in addition to loan proceeds to carry out the Project, and to operate and maintain project facilities will be made available. LA, Section 4.02  | Partly complied with. The Government had difficulty providing timely counterpart payments for civil works. | Partly complied since the allocations for maintenance are less than adequate. |
| 3. Competent and qualified consultants and contractors will be employed on terms and conditions acceptable to the Borrower and the Asian Development Bank (ADB). The Project and each subproject will be carried out in accordance with plans, design standards, specifications, work schedules, and construction methods likewise acceptable to the Borrower and ADB. Such plans and design standards, specifications, and work schedules, and any material modifications subsequently made will be furnished to ADB. LA, Section 4.03 (a) and (b) | Complied with.   | Complied with.  |
| 4. Equipment financed out of the loan proceeds will be ensured against risks, consistent with sound practice. Goods to be imported for the Project and financed out of the loan proceeds will be ensured against hazards incident of the acquisition, transportation, and delivery. LA, Section 4.05 (a) and (b)  | Not applicable, since no equipment was procured.   | Not applicable.   |
| 5. Records and accounts adequate to identify the goods and services financed out of the loan proceeds will be maintained. LA, Section 4.06 (a)  | Complied with.   | Complied with.  |
| 6. Certified copies of audited copies of accounts and financial statements will be submitted not later than 12 months after the end of each related fiscal year, all in the English language. LA, Section 4.06 (b)  | Complied with.   | Complied with, although after delay of more than 12 months.                   |
| 7. Brief monthly and quarterly progress reports on project implementation and on the operation and management of project facilities will be submitted. LA, Section 4.07(b)  | Complied with.   | Complied with.  |

| Covenants Reference to Loan Agreement  | Status of Compliance   |                |
|--|--|----------------|
|  | PCR  | PPER           |
| 8. Within 6 months of loan closing, the Borrower's report on the Project's execution and initial operations, including cost, the Borrower's performance of its obligations under the LA, and the accomplishment of the purposes of the Loan will be submitted. LA, Section 4.07 (c)  | Complied with.   | Complied with. |
| 9. The Project Steering Committee (PSC) will be chaired by the deputy minister of the infrastructure department. The committee members will be the director general of the Department of Roads (DOR); the director general of the Department of Transportation (DOT); the representatives of the National Development Board, Ministry of Finance (MOF), and Bank of Mongolia; and the project implementation unit (PIU), consisting of the project manager, two civil engineers, a materials and soil engineer, a bridge engineer, and sufficient number of supporting staff. LA, Schedule 6, paras. 2 and 3 (b) | Complied with.   | Complied with. |
| 10. Within 1 month of the completion of site surveys, design parameters will be reviewed and final design submitted to ADB. LA, Schedule 6, para. 4  | Complied with.   | Complied with. |
| 11. In 1998, the Borrower, Ministry of Infrastructure Development (MID), and ADB will conduct the project midterm review. LA, Schedule 6, para. 5  | Complied with.<br>Midterm review was undertaken on 8–12 February 1999.   | Complied with. |
| 12. The benefit monitoring and evaluation team will compile and analyze traffic and socioeconomic data for project roads and influence areas. LA, Schedule 6, para. 6  | Complied with.   | Complied with. |
| 13. By 30 June 1996, MID will establish the Committee for Legal Reforms comprising deputy minister of MID. LA, Schedule 6, para. 7 (a) and (b)   | Complied with.<br>Parliament approved the Road Act on 2 January 1998, and the chair, and representatives of the Ministry of Justice, DOR, DOT, and the Parliamentary Standing Committee for Legal Affairs as members. With the help of the technical assistance (TA) consultants, the committee will prepare a draft Road and Road | Complied with. |

| Covenants Reference to Loan Agreement   | Status of Compliance   |  |
|---|--|--|
|   | PCR  | PPER   |
|   | Transport Act and implement regulations consistent with the Road and Road Transport Sector Policy Statement (RRTSPS). Road Transport Act on 4 June 1999. |  |
| 14. By 31 December 1995, MID will establish the National Transport Advisory Committee (NTAC). It will be chaired by the minister of MID and its members will be the National Development Board, DOR, DOT, state-owned road transport enterprises, and the private sector. LA, Schedule 6, para. 8   | Complied with. NTAC established on 30 February 1998.   | Complied with. The NTAC was established but did not have appropriate transfer of authority and responsibilities, thereby restricting participation of nongovernment bodies in policymaking. The NTAC exists only on paper and has no specific role in the policy development and monitoring. |
| 15. From 1 January 1998 onward, MID will grant full autonomy to the management of state-owned enterprises. LA, Schedule 6, para. 9  | Complied with, in line with the Law on State and Local Property.   | Complied with.   |
| 16. By 31 March 1997, MID will reorganize the Road Transport Board and passenger service centers so that their functions are limited to monitoring, regulating, and carrying out inspections and safety audits. LA, Schedule 6, para. 10  | Complied with.   | Complied with.   |
| 17. By 31 March 1997, MID will prepare and start a program to (i) devolve from DOR all construction-related activities, personnel, and equipment to separate incorporated companies; and (ii) prepare for such companies corporate strategies, company plans (including privatization plans), and performance contracts. LA, Schedule 6, para. 11 | Complied with.   | Complied with.   |
| 18. MOF and MID will establish an annual budget for DOR starting December 1995 for FY1996 to be funded from Road Fund collections. MOF will directly release the Road Fund collections. If these are less than the agreed upon budget, MOF will supplement the difference from the national budget. LA, Schedule 6, para. 12                      | Road sector budgetary allocation did not meet the requirements from 1996 to 2000.  | Partly complied with. Sector budget allocation is improving but falls short of requirements. DOR requirements for road sector increased from MNT22.8 billion in 2002 to MNT27.0 billion in 2005 while funding averaged around 75% of DOR requirements during                                 |

| Covenants Reference to Loan Agreement  | Status of Compliance   |  |
|--|--|--|
|  | PCR  | PPER   |
|  |  | 2002–2005 and has increased from MNT14.2 billion in 2002 to MNT22.1 billion in 2005. Funding for road sector amounted to MNT28 billion in 2006 or about 91% of the DOR requirements of MNT30.8 billion. While still below the requirements of DOR of MNT7.5 billion per year, funding for road maintenance has more than doubled from an average of MNT2.2 billion in 2002 to MNT5–6 billion during 2004–2006. |
| 19. By 31 December 1997, MID will adopt measures to improve cost recovery from road users. LA, Schedule 6, para. 13  | Partly complied with. The Road Act provides for inclusion of the vehicle license fees as a revenue source for the Road Fund. However, the proceeds are not allocated to the Road Fund but to the Ulaanbaatar municipality and provinces, and are not fully used for road expenditures. | Partly complied with. The status of the Road Fund is uncertain. It has been useful in channeling revenues but has been ineffective in ensuring that these are deployed for maintenance. Actual expenditure is made from the central budget and is not linked to the revenues of the Road Fund.   |
| 20. Beginning in 2000, the Government will allocate at least the equivalent of \$330,000 per year for the routine maintenance of Ulaanbaatar–Altanbulag road. LA, Schedule 6, para. 14 | Complied with.   | Complied with.   |

Sources: Operations Evaluation Mission and Asian Development Bank. 2001. *Project Completion Report on the Roads Development Project in Mongolia*. Manila.

## ROAD SECTOR FUNDING

1. Road sector financing is primarily through the road fund established in 1991. The road fund is managed by the Department of Roads (DOR) within the Ministry of Roads, Transport and Tourism (MORTT). Overall funding decisions are under the control of the Ministry of Finance. Replenishment of the road fund is part of the Government's budget process through appropriations from the state budget and road user taxes. Road fund revenues increased by 18.3% per annum from MNT14.3 billion in 2002 to MNT28.0 billion in 2006, with about 69% of average annual allocations from the state budget and the balance from gasoline, diesel, and user taxes (Table A6.1).

**Table A6.1: Sources of Road Fund Revenues, 2002–2006**  
(MNT million and %)

| Source                                       | 2002         | 2003         | 2004         | 2005         | 2006         | Period Avg.  |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
|  | % of Total   | % of Total   | % of Total   | % of Total   | % of Total   | % of Total   |
| RF Fuel and MV Tax <sup>a</sup> and User Tax | 33.9         | 29.4         | 35.9         | 37.5         | 20.6         | 30.5         |
| State Budget                                 | 65.3         | 70.5         | 64.1         | 62.5         | 79.4         | 69.4         |
| Donations                                    | 0            | 0.1          | 0.1          | 0            | 0            | 0            |
| Special Fee                                  | 0.1          | 0            | 0            | 0            | 0            | 0            |
| Others                                       | 0.7          | 0            | 0            | 0            | 0            | 0.1          |
| <b>Total</b>                                 | <b>100.0</b> | <b>100.0</b> | <b>100.0</b> | <b>100.0</b> | <b>100.0</b> | <b>100.0</b> |
| Total RF Revenues (MNT)                      | 14,283.0     | 19,891.7     | 17,544.9     | 22,176.2     | 27,966.3     | 20,372.4     |

Avg = average, RF = road fund, MV = motor vehicle.

<sup>a</sup> Excise duty motor benzene and fuel/diesel/plus excise duty for motor car and self-propelled vehicles.

Source: ADB. 2006. *Technical Assistance to Mongolia for Preparing the Western Regional Road Development Project*. Manila. (TA 4785-MON, for \$650,000, approved on 10 May) consultant from Road Supervision and Research Center data.

2. During 2002–2005, revenues from the road fund accounted for about half of total road sector expenditures, with the rest coming from foreign loans and grants. Besides financing routine maintenance and capital expenditures for periodic maintenance, the road fund was intended to ensure adequate funding of the roads sector. However, the road fund design did not have a clear link between revenues and expenditures. In addition, there was no clear prioritization of the funding allocation. Over time, increasing amounts were used to finance counterpart funding for externally financed road projects, thus weakening the maintenance objective of the funds. Sector priority has been given to road construction and rehabilitation (56.2% of total road fund revenues) and counterpart funding for externally assisted projects (21.6% of total road fund revenues). The share of road and bridges maintenance averaged 19.5% and improved from 15.7% in 2002 to 25.8% in 2005 (Table A6.2).

**Table A6.2: Distribution of Road Fund Expenditure, 2002–2005 (% of total)**

| Item   | 2002         | 2003         | 2004         | 2005         | Period Avg   |
|--|--------------|--------------|--------------|--------------|--------------|
| Construction/Rehabilitation of Roads and Bridges         | 57.9         | 65.1         | 47.9         | 53.6         | 56.2         |
| Roads and Bridges Maintenance                            | 15.7         | 11.7         | 24.8         | 25.8         | 19.5         |
| Equipment  | 1.0          | 0.5          | 2.6          | 0.0          | 1.0          |
| Counterpart Portion of Foreign Loan Projects             | 24.4         | 22.5         | 24.1         | 15.4         | 21.6         |
| Other  | 1.0          | 0.2          | 0.6          | 5.2          | 1.7          |
| <b>Total from Road Fund</b>                              | <b>100.0</b> | <b>100.0</b> | <b>100.0</b> | <b>100.0</b> | <b>100.0</b> |
| Note:  |              |              |              |              |              |
| RF as % of Total Road Expenditures                       | 47.1         | 47.6         | 55.0         | 49.9         | 49.9         |
| Foreign Loans and Grants as % of Total Road Expenditures | 52.9         | 52.4         | 45.0         | 50.1         | 50.1         |

Source: ADB. 2006. *Technical Assistance to Mongolia for Preparing the Western Regional Road Development Project*. Manila. (TA 4785-MON, for \$650,000, approved on 10 May) consultants from Department of Roads data.

3. Findings of the Western Regional TA<sup>1</sup> on preparing the western region road development project confirmed that taxes and fees paid by road users (including value-added tax [VAT]) have been increasing steadily, but only a minor percentage has been passed on to the road fund (Table A6.3) During 2002–2006, road user payments were estimated to have risen by 32.6% per annum from MNT63.5 billion in 2002 to MNT196.5 billion in 2006. On the other hand, the ratio of road fund revenues to road user payments (with VAT) actually declined from 20.6% during 2002–2003 to 13.6% during 2004–2006. On a cumulative basis, only about MNT0.2 of every MNT1.0 of road user payments reached the road fund during 2002–2006. Road fund revenues amounted to only MNT14.3 billion in 2002 and MNT28.0 billion by 2006, with the percentage of road user payments passed to road fund declining from 22.5% in 2002 to about 14.2% during 2005–2006. Without VAT, the percentage of road user payments passed to the road fund declined from 36.7% during 2002–2003 to an estimated 29.7% during 2005–2006.

**Table A6.3: Road User Payments and Road Fund Revenues, 2002–2006**  
(MNT million and %)

| Item                             | 2002     | 2003      | 2004      | 2005      | 2006      | Pd. Avg.  |
|----------------------------------|----------|-----------|-----------|-----------|-----------|-----------|
| Road Fund Revenues               | 14,283.0 | 19,891.7  | 17,543.9  | 22,176.2  | 27,966.3  | 19,556.3  |
| Road User Payments (with VAT)    | 63,530.3 | 102,577.1 | 142,443.5 | 157,020.2 | 196,476.8 | 132,409.6 |
| % of passed to Road Fund         | 22.5     | 19.4      | 12.3      | 14.1      | 14.2      | 16.1      |
| Road User payments (without VAT) | 39,660.2 | 53,370.6  | 66,214.5  | 74,314.3  | 87,591.5  | 64,230.2  |
| % of passed to Road Fund         | 36.1     | 37.3      | 26.5      | 29.8      | 31.9      | 31.4      |

Pd. Avg. = period average, VAT= value added tax.

Source: Operations Evaluation Mission from Road Supervision and Research Center data.

4. DOR has estimated annual budgetary requirements based on needs. However, Ministry of Finance allocations to the road fund do not adequately cover sector requirements (Table A6.4). Annual road fund revenues were consistently lower than the needs estimated by DOR, although this gap has narrowed in recent years. Road sector funding from 2002 to 2006 averaged 78% of the amount requested by DOR. Funding for road maintenance continued to lag behind and averaged 59% of the amount requested by DOR during the same period. However, recent steps taken by the Government to increase road maintenance funding have significantly improved the proportion of maintenance funding to the amount requested by DOR from about 31% during 2002–2003 to around 78% during 2004–2006.

**Table A6.4: Department of Roads Sector Funding Request, 2002–2006** (MNT million)

| Item                        | 2002   | 2003   | 2004   | 2005   | 2006   | Pd. Avg. |
|-----------------------------|--------|--------|--------|--------|--------|----------|
| <b>For Road Sector</b>      |        |        |        |        |        |          |
| Amount Requested by DOR     | 22,770 | 22,770 | 27,000 | 27,000 | 30,770 | 26,062   |
| Amount Funded by Government | 14,283 | 19,892 | 17,543 | 22,176 | 27,966 | 20,372   |
| Percent Funding             | 62.7   | 87.4   | 65.0   | 82.1   | 90.9   | 78.2     |
| <b>For Road Maintenance</b> |        |        |        |        |        |          |
| Amount Requested by DOR     | 7,500  | 7,500  | 7,500  | 7,500  | 6,413  | 7,283    |
| Amount Funded by Government | 2,228  | 2,440  | 5,000  | 6,000  | 5,761  | 4,286    |
| Percent Funding             | 29.7   | 32.5   | 66.7   | 80.0   | 89.8   | 58.9     |

DOR = Department of Roads, Pd. Avg. = period average.

Source: Operations Evaluation Mission estimates from Road Supervision and Research Center data.

<sup>1</sup> ADB. 2006. *Technical Assistance to Mongolia for Preparing the Western Regional Road Development Project*. Manila (TA 4785-MON, for \$650,000, approved on 10 May).

5. In line with several other developing member countries, fiscal constraints have made it increasingly difficult for the Government to provide adequate funds for the road sector and road maintenance in particular. The concern of the Asian Development Bank (ADB) during processing of the RDP was that the collection and use of funds should be transparent, and that an adequate supply of funds for road maintenance be assured. Through the involvement of the Ministry of Finance, the road funds have become more transparent. However, the current system is a hybrid between the traditional government budget funding systems (with the disadvantage of being subject to fluctuations) and a semi-independent fund that provides earmarked financing for road construction and maintenance.<sup>2</sup> Recent findings under the Western Regional TA (footnote 1) indicate that there is more room to increase funding to the Road Fund by further earmarking road user contributions to road programs.

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<sup>2</sup> There needs to be a proportionate allocation to the roads sector and maintenance in particular from the road user charges (e.g., road user taxes and fees) for road users to receive adequate value for money. Part of the road revenues will be allocated to other related sectors such as health, but this should not be at the cost of road maintenance.



## ROAD SAFETY

1. Improved road conditions have resulted in significantly high vehicle speeds. This, combined with a rise in the number of vehicles, has resulted in serious road traffic safety issues in rural Mongolia, particularly along the Roads Development Project (RDP) road. Road traffic accidents have an economic cost, in addition to the social and personal impacts on victims and their relatives. General data on road traffic accidents from the Traffic Police Department of Mongolia are provided in Table A7.

**Table A7: Road Accident Statistics, 2001–2006**

| Item  | 2001    | 2002    | 2003    | 2004    | 2005    | 2006    | Average |
|---|---------|---------|---------|---------|---------|---------|---------|
| <b>Mongolia</b>                                       |         |         |         |         |         |         |         |
| Total Number of Registered Vehicles                   | 123,700 | 136,700 | 143,505 | 154,576 | 164,590 | 177,313 | 150,064 |
| Number of Road Accidents                              | 5,325   | 5,553   | 5,118   | 4,814   | 5,123   | 5,911   | 5,307   |
| Number of Fatalities                                  | 335     | 327     | 389     | 394     | 363     | 378     | 364     |
| Number of Injuries                                    | 1,612   | 1,636   | 1,096   | 1,133   | 1,064   | 1,265   | 1,301   |
| Road Accidents per Registered Vehicle                 | 0.043   | 0.041   | 0.036   | 0.031   | 0.031   | 0.033   | 0.035   |
| Fatalities per Road Accident                          | 0.06    | 0.06    | 0.08    | 0.08    | 0.07    | 0.06    | 0.07    |
| Injuries per Road Accident                            | 0.30    | 0.29    | 0.21    | 0.24    | 0.21    | 0.21    | 0.25    |
| <b>Rural Areas</b>                                    |         |         |         |         |         |         |         |
| Number of Road Accidents                              | 927     | 1,195   | 1,138   | 1,150   | 1,108   | 1,257   | 1,129   |
| Number of Fatalities                                  | 238     | 205     | 234     | 240     | 186     | 226     | 222     |
| Number of Injuries                                    | 734     | 818     | 511     | 465     | 403     | 522     | 576     |
| Fatalities per Road Accident                          | 0.26    | 0.17    | 0.21    | 0.21    | 0.17    | 0.18    | 0.20    |
| Injuries per Road Accident                            | 0.79    | 0.68    | 0.45    | 0.40    | 0.36    | 0.42    | 0.51    |
| Percent of Road Accidents in Mongolia                 | 17.4    | 21.5    | 22.2    | 23.9    | 21.6    | 21.3    | 21.3    |
| Percent of Fatalities in Mongolia                     | 71.0    | 62.7    | 60.2    | 60.9    | 51.2    | 59.8    | 60.8    |
| Percent of Injuries in Mongolia                       | 45.5    | 50.0    | 46.6    | 41.0    | 37.9    | 41.3    | 44.2    |
| <b>Selenge and Tuv Aimags (RDP Project Provinces)</b> |         |         |         |         |         |         |         |
| Number of Road Accidents                              | 46      | 51      | 43      | 45      | 41      | 40      | 44      |
| Number of Fatalities                                  | 24      | 26      | 24      | 26      | 24      | 21      | 24      |
| Number of Injuries                                    | 69      | 85      | 60      | 52      | 49      | 50      | 61      |
| Fatalities per Road Accident                          | 0.52    | 0.51    | 0.56    | 0.58    | 0.59    | 0.53    | 0.55    |
| Injuries per Road Accident                            | 1.50    | 1.67    | 1.40    | 1.16    | 1.20    | 1.25    | 1.37    |
| Percent of Rural Road Accidents                       | 5.0     | 4.3     | 3.8     | 3.9     | 3.7     | 3.2     | 3.9     |
| Percent of Fatalities in Rural Areas                  | 10.1    | 12.7    | 10.3    | 10.8    | 12.9    | 9.3     | 10.9    |
| Percent of Injuries in Rural Areas                    | 9.4     | 10.4    | 11.7    | 11.2    | 12.2    | 9.6     | 10.6    |

RDP = Roads Development Project.

Sources: Operations Evaluation Mission and Traffic Police Department of Mongolia, 2007.

2. Table A7 indicates that the countrywide ratio of road accidents per registered vehicle has fallen marginally from 0.43 in 2001 to 0.33 in 2006, mainly because of the progressive and distinct increase in vehicle numbers. At the same time, rural areas experienced an increase in the number and severity of road accidents during 2001–2006. Reported road accidents increased from 927 in 2001 to average 1,170 per year from 2002 to 2006. Accordingly, the share of road accidents in rural areas attributed to countrywide road accidents increased from 17.4% in 2001 to 21.3% in 2006. Fatalities and injuries per road accident averaged 0.2 in 2001 and 0.51 in 2006. This was at least twice the estimated national average for fatalities and

injuries per road accident of 0.07 in 2001 and 0.25 in 2006. While the ratio of rural road accidents to total reported road accidents in Mongolia averaged only 21.3%, fatalities from these accidents averaged 60.8% of total road accidents nationwide and injuries averaged 44.2%. However, the positive aspect at the national level is that the fatalities per road accident declined from a high of 0.26 in 2001 to 0.18 in 2006, and injuries fell from 0.79 in 2001 to 0.42 in 2006.

3. While the number of reported road accidents in two of four project provinces (Selenge and Tuv) traversed by the project road averaged 3.9% of accidents in rural areas from 2001 to 2006, these continue to be more severe in nature. Fatalities and injuries from these road accidents accounted for 10.9% of deaths and 10.6% of injuries caused by rural road accidents. Fatalities per road accident averaged 0.55 and injuries averaged 1.37, or more than twice the average of 0.2 (fatalities) and 0.51 (injuries) per road accident in rural areas. While the number of accidents in the two project provinces declined from 46–51 in 2001–2002 to 40–41 in 2005–2006, performance in reducing fatalities and injuries per road accident was mixed. Fatalities per road accident remained above the 2001 level of 0.52 in 2001 after peaking at 0.9 in 2004. On the other hand, the ratio of injuries per road accident improved from 1.50–1.67 during 2001–2002 to 1.20–1.25 during 2005–2006.

4. Overall, the Operations Evaluation Mission (OEM) noted that the number of traffic accidents, particularly fatal accidents on the RDP road, have increased—resulting in damages to vehicles and freight and losses in human life. With the improvement in road roughness, traffic volume and vehicle speed have increased and both appear to have a causal relationship to accidents along the project road. Along the Ulaanbaatar–Altanbulag road, many drivers go far above the road design speed limit of 80 kilometers (km) per hour while the people living along the road are not accustomed to high-speed vehicles.<sup>1</sup> Besides increased vehicle speeds, road safety is being compromised by poor driving practices such as no vehicle lights usage during nighttime, ignorance about the safe distance between vehicles, etc. The perception of residents in the project impact area is summarized in Box A7.

#### **Box A7: Perceptions of the Negative Impacts of the RDP Road Improvement**

“Drivers are not conscious that they drive through crowded *soum* (district) centers. They drive as fast as they can, causing accidents and fatalities. Related with this there were several cases of death casualties in Bayanchandmani *soum*. To avoid this, speed breakers have been installed along this road. Although there is a rule that drivers cannot exceed the speed by more than 60 km per hour in residential areas, nobody follows it.”

km = kilometer, RDP = Roads Development Project.  
Source: Governor, Bayanchandmani *soum*, Tuv *aimag*.

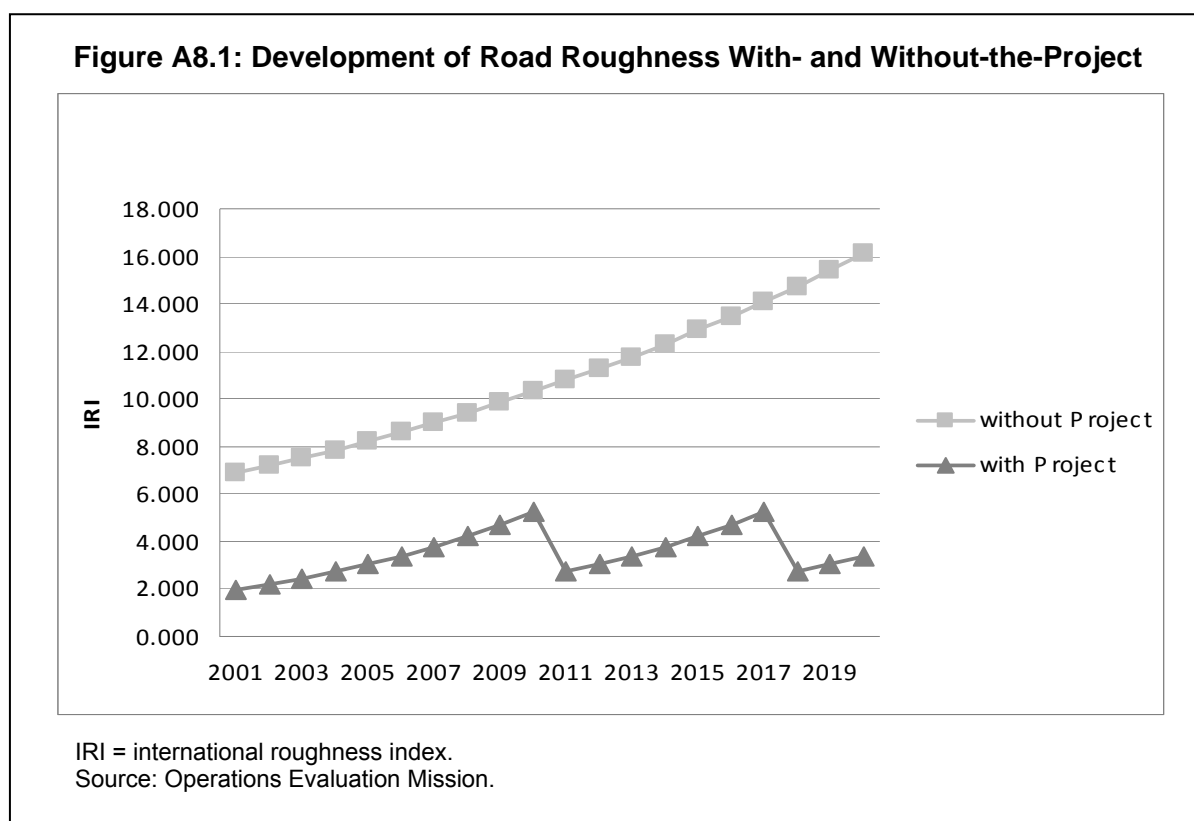
5. The design of the road needs to include proper pavement marking and roadside signage. During the site visit, the OEM observed black spots on the RDP road where the frequency of accidents has been high. The absence of adequate road signs has been compounded by the lack of centerline road markings, as well as shoulder markings. Road signs were visible near residential school areas, but were lacking in other areas. Drivers need to be informed about the safe driving rules, and this needs to be enforced by the traffic police using appropriate legislation.

<sup>1</sup> The speed limit is 60 km per hour in residential areas and 80 km per hour in nonresidential areas.

## ECONOMIC REEVALUATION

### A. General

1. The economic viability of the Project was reevaluated with updated information on traffic and vehicle operating cost (VOC). The methodology followed the approach adopted at appraisal and by the project completion report (PCR) and is based on with- and without-project scenarios. The with-project case is defined by a maintenance regime, from which the Project accrued its principal rationale: to provide periodic maintenance to restore pavement conditions to cost-efficient levels, and to continue with a balanced mix of routine and periodic maintenance interventions. The without-project case is defined by the maintenance practice that prevailed before the Project—a neglect of proper maintenance—creating a backlog of maintenance and leading to premature deterioration of the road pavement. The behavior of pavement conditions over time, reflecting different maintenance regime and traffic loads, is expressed in terms of the international roughness index (IRI).<sup>1</sup> A comparison of the with- and without-project cases is shown in Figure A8.1.



2. Before the Project, the IRI on the project road measured somewhere between 6,500 and 7,000 millimeters (mm). The maintenance intervention under the Project reduced the IRI to about 2,000 mm. Under the without-project case, the pavement would gradually deteriorate, the

<sup>1</sup> The IRI is used to define a characteristic of the longitudinal profile of a traveled wheel track and constitutes a standardized roughness measurement. The measurement units are meters per kilometer (m/km) or millimeters per meter (mm/m). The IRI is based on the ratio of a standard vehicle's accumulated suspension motion caused by roughness (in mm, cm, or inches) divided by the distance traveled by the vehicle during the measurement (m, km). The IRI scale is open-ended.

pace of deterioration being slowed by increasing routine maintenance expenditures. In contrast, the with-project case allows for a balance of routine and periodic maintenance interventions, whereby the periodic interventions reduce the pavement roughness to about the original levels.

3. The main differences in assumptions and developments underlying the analyses undertaken at the three stages in the project cycle are summarized in Table A8.1.

**Table A8.1: Comparison of Assumptions Used in the EIRR Calculations**

| Item                  | Appraisal  | Project Completion   | PPER   |
|-----------------------|--|--|--|
| <b>EIRR</b>           | <b>22.9%</b>   | <b>14.6%</b>   | <b>17.6%</b>   |
| Cost                  | Project cost included equipment procurement  | Cost of civil works increased to preclude procurement of equipment                     | With the rise in cost of civil works, de facto project cost increased over appraisal   |
| Implementation Period | Underestimation of implementation period contributes to a 1.8 percentage point increase in the EIRR  | Use of factual (longer) implementation period explains a 1.8 percentage gap in EIRRs   | Use of factual implementation period explains a 1.8 percentage gap in EIRRs  |
| Traffic               | Conservative estimates are below traffic volumes that have emerged since 2002<br><br>Share of heavy trucks was overestimated and has contributed to a relatively high EIRR         | Conservative estimates are below traffic volumes that have emerged since 2002          | Significantly higher actual traffic growth and economic growth prospects have led to more favorable traffic growth assumptions<br><br>Composition of fleet is marked by a high share of imported secondhand vehicles and a low share of trucks |
| Other Assumptions     | Assumptions regarding pavement deterioration, maintenance regime, and vehicle operating cost savings were at variance with those of the road decision model referred to in the RRP | Realistic assumptions based on traffic and road conditions prevailing at the PCR stage | Assumptions consistent with those of PCR, with exception of traffic growth that turned out to be much higher than expected at the PCR stage  |

EIRR = economic internal rate of return, PCR = project completion report, PPER = project performance evaluation report, RRP = report and recommendation of the President.

Source: Operations Evaluation Mission.

## **B. Costs**

4. The actual investment cost was converted to economic cost, reflecting consumption of economic resources. As a consequence, taxes and duties were eliminated from the cost, and wages were adjusted to reflect opportunity cost—indicating the actual scarcity of labor in Mongolia. Based on these considerations, a conversion factor of 0.89 was used to convert financial to economic costs. Historical maintenance cost data were obtained from the Executing Agency, whereas future data were calibrated based on anticipated traffic loads, and

relationships provided by a pavement deterioration model. Periodic maintenance is assumed to be carried out at 10-year intervals based on the existing and forecast traffic loads.

### C. Traffic

5. The actual traffic data and traffic forecasts were reviewed and updated based on the PCR and data collected at traffic counts carried out in July 2007. Traffic has grown at 12.8% over the last 7 years and is forecast to grow by on average 8.7% over the rest of the investment period. This growth rate was adopted consistent with forecast economic growth in Mongolia and would lead to traffic volumes of about 6,600 vehicles per day. Given the significance of the project road as the main transport artery in Mongolia's road network, the projected traffic would still appear moderate.

6. Compared to the situation at appraisal, the composition of traffic has changed significantly. The number of both heavy buses and trucks declined. The underlying causes are an increase in private passenger vehicles supported by a favorable customs terms for the importation of used cars and the decline of general freight traffic from the Russian Federation to Ulaanbaatar. The development of traffic on the two sections of the project road over the past decade is shown in Table A8.2.

**Table A8.2: Development and Composition of Traffic (1997–2007)**

| Year                            | Car and Jeep | Small and Medium Truck | Bus | Heavy Truck | Total |
|---------------------------------|--------------|------------------------|-----|-------------|-------|
| <b>A. Ulaanbaatar to Darhan</b> |              |                        |     |             |       |
| 1997                            | 302          | 129                    | 76  | 101         | 608   |
| 1998                            | 426          | 165                    | 65  | 72          | 728   |
| 1999                            | 426          | 163                    | 154 | 78          | 821   |
| 2000                            | 537          | 109                    | 147 | 49          | 842   |
| 2001                            | 632          | 133                    | 151 | 52          | 968   |
| 2002                            | 744          | 161                    | 155 | 53          | 1,114 |
| 2003                            | 876          | 196                    | 154 | 56          | 1,281 |
| 2004                            | 1,031        | 238                    | 146 | 58          | 1,473 |
| 2005                            | 1,213        | 290                    | 131 | 60          | 1,694 |
| 2006                            | 1,428        | 352                    | 106 | 62          | 1,948 |
| 2007                            | 1,677        | 429                    | 76  | 65          | 2,247 |
| <b>B. Darhan to Altanbulag</b>  |              |                        |     |             |       |
| 1997                            | 81           | 62                     | 19  | 57          | 219   |
| 1998                            | 181          | 72                     | 7   | 17          | 277   |
| 1999                            | 150          | 75                     | 42  | 13          | 280   |
| 2000                            | 207          | 45                     | 40  | 31          | 323   |
| 2001                            | 242          | 53                     | 42  | 33          | 369   |
| 2002                            | 283          | 61                     | 43  | 34          | 422   |
| 2003                            | 332          | 72                     | 42  | 36          | 482   |
| 2004                            | 388          | 84                     | 41  | 38          | 551   |
| 2005                            | 454          | 98                     | 37  | 40          | 630   |
| 2006                            | 531          | 115                    | 31  | 43          | 720   |
| 2007                            | 622          | 134                    | 22  | 45          | 823   |

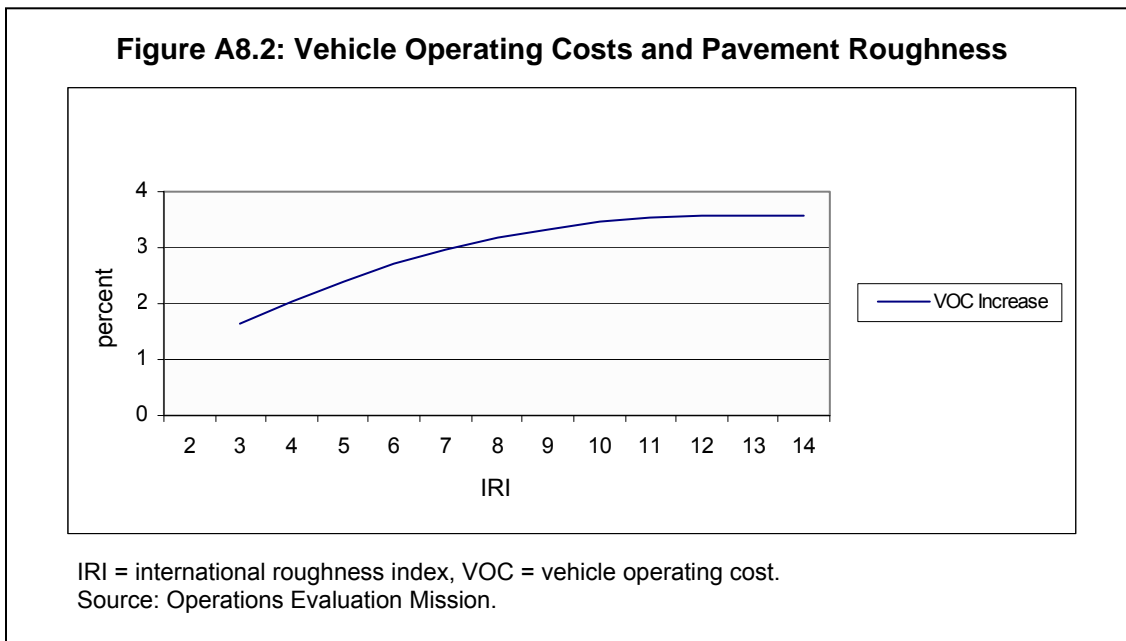
Sources: Data from Asian Development Bank (ADB). 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to Mongolia for the Roads Development Project*. Manila (Loan 1364-MON[SF], for \$25 million, approved on 22 August); and ADB. 2001. *Project Completion Report on the Roads Development Project in Mongolia*. Manila; and traffic counts carried out in July 2007. Mission estimate for data extrapolated between 2002 and 2006.

**D. Benefits**

7. Traffic data collected through traffic counts were translated into traffic output figures in terms of vehicle kilometers. This was done based on travel patterns established through origin-destination surveys carried out in conjunction with the Operations Evaluation Mission. Recalculated benefits include (i) VOC savings caused by better road conditions and higher speed, (ii) travel time savings for passengers, and (iii) freight time savings.

**1. Vehicle Operating Cost Savings**

8. The reevaluation is based on VOC relationships generated by the Highway Development and Management System (HDM-4) calibrated for road and traffic conditions in Mongolia. Figure A8.2 shows percentage increases in VOC as a function of increases in roughness.



9. The determinants of VOC based on the vehicle fleet in Mongolia are in Table A8.3.

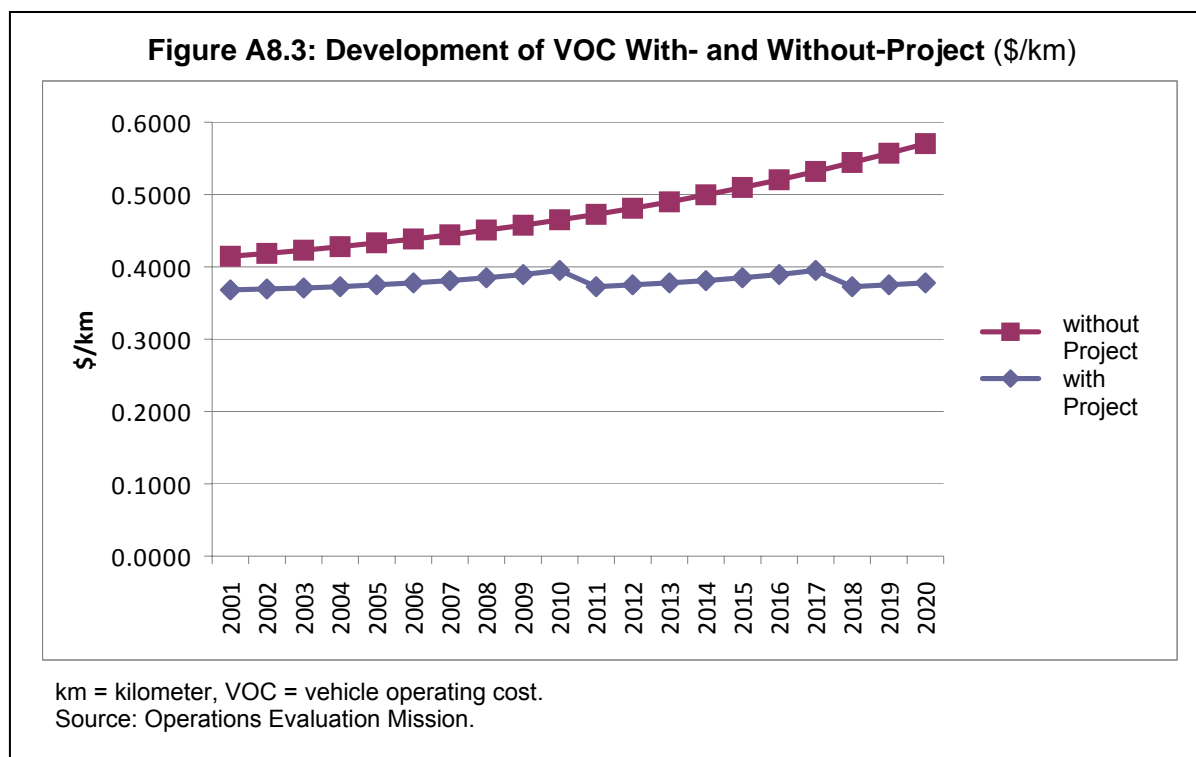
**Table A8.3: Vehicle Fleet Characteristics**

| <b>Cost and Operations</b>     | <b>Car and Jeep</b> | <b>Small and Medium Truck</b> | <b>Bus</b> | <b>Heavy Truck</b> |
|--------------------------------|---------------------|-------------------------------|------------|--------------------|
| <b>Parameters</b>              |                     |                               |            |                    |
| New Vehicle Cost (\$/vehicle)  | 15,000.0            | 30,000.0                      | 50,000.0   | 60,000.0           |
| Fuel Cost (\$/liter)           | 0.7                 | 0.6                           | 0.6        | 0.6                |
| Lubricant Cost (\$/liter)      | 2.4                 | 2.4                           | 2.4        | 2.4                |
| New Tire Cost (\$/tire)        | 45.0                | 110.0                         | 220.0      | 255.0              |
| Maintenance Labor (\$/hour)    | 0.6                 | 0.6                           | 0.7        | 0.7                |
| Crew Cost (\$/hour)            | 0.3                 | 1.4                           | 1.4        | 1.4                |
| Interest Rate (%)              | 14.0                | 14.0                          | 14.0       | 14.0               |
| <b>Utilization and Loading</b> |                     |                               |            |                    |
| Kms Driven per Year            | 18,000.0            | 50,000.0                      | 50,000.0   | 50,000.0           |
| Hours Driven per Year          | 500.0               | 1,800.0                       | 2,000.0    | 2,000.0            |
| Service Life (year)            | 8.0                 | 7.0                           | 8.0        | 8.0                |
| % of Time for Private Use      | 80.0                | 0.0                           | 0.0        | 0.0                |
| Gross Vehicle Weight (ton)     | 1.4                 | 6.0                           | 11.0       | 20.0               |
| Number of Passengers           | 4.0                 |                               | 40.0       |                    |
| Trips per Year                 | 54.0                | 149.0                         | 149.0      | 149.0              |
| VOC at IRI = 2,000 (\$/km)     | 0.211               | 0.364                         | 0.284      | 0.613              |

IRI = international roughness index, km = kilometer, VOC = vehicle operating cost.

Source: HDM-4 VOC model and mission inputs.

10. The VOCs are assumed to increase as a result of pavement roughness. The relationships for the with- and without-project cases are shown in Figure A8.3.



## 2. Time Savings

11. Time savings are related to passengers and freight. For the reevaluation, all passengers were assumed to accrue monetary benefit from the saving in travel time. Based on travel on the project road, the reduction in travel time caused by pavement improvements was estimated at 0.5 hours per trip. For freight, the same reduction was assumed and applied to the value of freight estimated at \$850 per ton carried. The interest rate applied was 14%.

### E. EIRR Reevaluation for the Expressway

12. The recalculated economic internal rate of return (EIRR) is 17.6% (Table A8.4), compared with 22.9% at appraisal. The net present value at 12% is \$16.8 million.

**Table A8.4: EIRR Recalculation for the Project (\$)**

| Year | Project Cost |              | Project Benefits |         |                   | VOC Savings  | Net Benefits        |
|------|--------------|--------------|------------------|---------|-------------------|--------------|---------------------|
|      | Investment   | Maintenance  | Time Savings     |         | Total             |              |                     |
|      |              |              | Passengers       | Freight |                   |              |                     |
| 1996 | 3,641,813.29 |              |                  |         |                   |              | (3,641,813.3)       |
| 1997 | 1,831,381.13 |              |                  |         |                   |              | (1,831,381.1)       |
| 1998 | 6,252,716.66 |              |                  |         |                   |              | (6,252,716.7)       |
| 1999 | 8,567,026.71 |              |                  |         |                   |              | (8,567,026.7)       |
| 2000 | 3,733,327.21 |              |                  |         |                   |              | (3,733,327.2)       |
| 2001 |              | 523,940.0    | 383,278.6        | 866.0   | 384,144.6         | 1,648,834.9  | 1,509,039.4         |
| 2002 |              | 537,923.0    | 401,223.4        | 967.6   | 402,190.9         | 2,049,719.7  | 1,913,987.6         |
| 2003 |              | 552,308.3    | 408,863.3        | 1,089.9 | 409,953.3         | 2,540,436.8  | 2,398,081.8         |
| 2004 |              | 567,108.2    | 406,487.0        | 1,237.0 | 407,724.0         | 3,138,105.4  | 2,978,721.2         |
| 2005 |              | 582,335.5    | 389,311.2        | 1,404.1 | 390,715.3         | 3,861,785.9  | 3,670,165.8         |
| 2006 |              | 598,003.3    | 354,319.6        | 1,602.2 | 355,921.8         | 4,732,023.1  | 4,489,941.6         |
| 2007 |              | 614,125.3    | 308,647.8        | 1,844.4 | 310,492.2         | 5,786,341.2  | 5,482,708.1         |
| 2008 |              | 630,715.5    | 333,339.6        | 1,973.6 | 335,313.2         | 6,579,484.4  | 6,284,082.1         |
| 2009 |              | 647,788.4    | 360,006.8        | 2,111.7 | 362,118.5         | 7,431,708.9  | 7,146,038.9         |
| 2010 |              | 665,359.0    | 388,807.3        | 2,259.5 | 391,066.8         | 8,328,386.6  | 8,054,094.4         |
| 2011 |              | 25,125,000.0 | 423,800.0        | 2,451.6 | 426,251.6         | 12,532,495.9 | (12,166,252.5)      |
| 2012 |              | 523,940.0    | 461,942.0        | 2,660.0 | 464,601.9         | 14,669,479.2 | 14,610,141.1        |
| 2013 |              | 537,923.0    | 503,516.8        | 2,886.1 | 506,402.8         | 17,123,281.9 | 17,091,761.7        |
| 2014 |              | 552,308.3    | 548,833.3        | 3,131.4 | 551,964.6         | 19,925,466.9 | 19,925,123.2        |
| 2015 |              | 567,108.2    | 598,228.3        | 3,397.6 | 601,625.8         | 23,104,990.7 | 23,139,508.3        |
| 2016 |              | 582,335.3    | 652,068.8        | 3,686.3 | 655,755.1         | 26,685,300.1 | 26,758,719.8        |
| 2017 |              | 598,003.3    | 710,755.0        | 3,999.7 | 714,754.7         | 30,680,287.9 | 30,797,039.2        |
| 2018 |              | 614,125.3    | 774,722.9        | 4,339.7 | 779,062.6         | 40,884,681.8 | 41,049,619.1        |
| 2019 |              | 630,715.5    | 844,448.0        | 4,708.5 | 849,156.5         | 47,721,399.9 | 47,939,841.0        |
| 2020 |              | 647,788.4    | 920,448.3        | 5,108.8 | 925,557.1         | 55,565,314.3 | 55,843,082.9        |
|      |              |              |                  |         | <b>EIRR</b>       |              | <b>17.6%</b>        |
|      |              |              |                  |         | <b>NPV at 12%</b> |              | <b>16,773,819.2</b> |

EIRR = economic internal rate of return, NPV = net present value, VOC = vehicle operating cost.  
Source: Operations Evaluation Mission.

13. The sensitivity of the EIRR to changes in key determinants was tested. The result is shown in Table A8.5.



**Table A8.5: Sensitivity Calculations**

| <b>Item</b>                   | <b>Independent Variable<br/>(%)</b> | <b>EIRR<br/>(%)</b> | <b>Sensitivity<br/>Indicator</b> |
|-------------------------------|-------------------------------------|---------------------|----------------------------------|
| Base Case                     |                                     | 17.6                |                                  |
| Reduction in Net Benefits     | (10)                                | 16.7                | (0.51)                           |
| Increase in Maintenance Costs | 10                                  | 17.4                | 0.11                             |
| Combination of Both Variables |                                     | 16.3                |                                  |

EIRR = economic internal rate of return.

Note: The sensitivity indicator is defined as the percentage change of the dependent variable (EIRR) over the percentage change in the independent variable. A sensitivity indicator of above 1 or below -1 would signal a strong impact of the chosen independent variable on the EIRR. As indicated above, none of the chosen parameters has such an impact.

Source: Operations Evaluation Mission.

## SOCIOECONOMIC IMPACT ASSESSMENT

### A Introduction

1. A socioeconomic survey was carried out in the project impact area of the Road Development Project (RDP) road connecting Ulaanbaatar and Altanbulag in June–July 2007, about 7 years after completion. The survey covered three *aimags* (provinces) in the Central region: Tuv, Darhan–Uul, and Selenge.<sup>1</sup> About 17% of the population of Mongolia and 19.0% of the poor resides in the Central region. The resident population of the three *aimags* accounts for 62.8% of the total population in the Central region. In 2006, it was estimated that 86,400 persons lived in Tuv *aimag*, 100,100 in Selenge *aimag*, and 87,500 in Darhan–Uul *aimag*.

2. The Mongolian economy has been growing at almost 7% during the last 5 years. This has been a major driver for the rise in vehicle ownership in the country. The increase in vehicle fleet size has been substantial (Table A9.1). Private car ownership has also grown rapidly (Table A9.2).<sup>2</sup>

**Table A9.1: Number of Vehicles in Mongolia**

| Item        | 2001   | 2002    | 2003    | 2004    | 2005    | 2006    |
|-------------|--------|---------|---------|---------|---------|---------|
| Darhan–Uul  | 2,979  | 2,594   | 2,766   | 3,012   | 2,652   | 3,499   |
| Selenge     | 2,907  | 2,798   | 3,000   | 3,395   | 3,368   | 3,306   |
| Tuv         | 2,401  | 1,717   | 1,820   | 2,974   | 3,218   | 3,578   |
| Ulaanbaatar | 48,167 | 59,285  | 57,646  | 67,361  | 73,740  | 79,135  |
| National    | 93,071 | 103,805 | 105,775 | 120,418 | 131,184 | 14,0872 |

Source: National Statistics Office, 2001–2006, statistical yearbooks.

**Table A9.2: Number of Private Vehicles in Mongolia**

| Item        | 2001   | 2002   | 2003   | 2004   | 2005    |
|-------------|--------|--------|--------|--------|---------|
| Darhan–Uul  | 2,023  | 1,880  | 2,046  | 2,331  | 2,046   |
| Selenge     | 1,868  | 1,882  | 2,095  | 2,452  | 2,375   |
| Tuv         | 1,770  | 1,338  | 1,328  | 2,470  | 2,711   |
| Ulaanbaatar | 32,139 | 34,584 | 39,754 | 46,217 | 52,239  |
| National    | 67,448 | 70,816 | 79,045 | 89,730 | 101,563 |

Source: National Statistics Office, 2001–2006, statistical yearbooks.

### B. Methodology

3. The survey covered 469 households from rural and urban areas of the three *aimags*. This sample included households located adjacent to the RDP road (project impact area), as well as households located in remote areas with poor road access (control area). The use of the control area was aimed to identify the distinct changes attributable to improvement of the

<sup>1</sup> Mongolia is divided into four main regions: West, Highland, Central, and East. The country is administratively divided into a capital city and 21 *aimags*. *Aimags* are subdivided into *aimag* center and *soums*, which are further subdivided into bags.

<sup>2</sup> Thirty-five percent of the sample households of this socioeconomic survey owned motorized transport. There was not a significant difference in car ownership between the project impact area (34.6%) and the control area (35.8%). Almost half of the population in the project impact area travels by car, whereas train was the main means of transport mean for the majority of the population (46%) 10 years ago.

Ulaanbaatar–Altanbulag road. Out of the total sample, 321 households were located adjacent to the RDP road and 148 households were remote from the road. The total number of individual household members covered in the sample was 2,037, out of which 1,342 were adults and 695 were children under 18. The research combined both quantitative and qualitative data gathered through a household survey, and focus groups and interviews.

4. Research sites were selected from the project-affected *aimags* based on proximity to the road, similarity in economic activities, and population size. These comprised 3 *soums* (districts) in Selenge *aimag*, 3 *soums* in Tuv *aimag*, and 4 *soums* in Darhan–Uul *aimag*.

5. Households in the control area were located between 31 kilometers (km) and 45 km from the Ulaanbaatar–Altanbulag road. At least 50 households were interviewed in each selected *soum*. Households were selected randomly from different locations of the *soum*, but the sample represented the rural and *soum* center population proportionally. For instance, if rural households comprised 40% of the *soum* population, the sample of rural households was also 40%.

6. Household survey data was processed by the Statistical Package for Social Science application. The overall data quality is considered a good standard. At the analysis stage, the dataset was also checked for internal consistency.

## C. Findings of the Socioeconomic Survey

### 1. Contribution to Poverty Reduction

7. The national poverty incidence in Mongolia fell from 43% to 36% between 1998 and 2005.<sup>3</sup> The poverty incidence in the Central region is lower than other regions of Mongolia except Ulaanbaatar (Table A9.3). The RDP was seen to have a minimal impact on poverty reduction, since the project road existed before 1995 and the incremental benefits of the RDP in terms of impact on poverty were overshadowed by larger macroeconomic changes. Despite this, the Country Economic Growth Support and Poverty Reduction Strategy noted that improvement of road and transport services has become a factor in poverty reduction, especially by bringing herders closer to the market, delivering social and public services to the population, and creating numerous new jobs in the countryside.<sup>4</sup>

**Table A9.3: Poverty and Geography**

| Item                              | National | West  | Highland | Central | East  | Ulaanbaatar |
|-----------------------------------|----------|-------|----------|---------|-------|-------------|
| Incidence of Poverty (%)          | 36.1     | 51.1  | 38.7     | 34.4    | 34.5  | 27.3        |
| Share below Poverty Line (%)      | 100.0    | 24.0  | 25.8     | 18.6    | 8.9   | 22.8        |
| Population Share <sup>a</sup> (%) | 100.0    | 15.8  | 21.3     | 16.8    | 7.7   | 32.3        |
| Population <sup>a</sup> ('000)    | 2,594.8  | 410.0 | 553.8    | 436.5   | 200.2 | 994.3       |
| Urbanization (%)                  | 55.4     | 34.8  | 31.3     | 40.6    | 42.0  | 100.0       |

<sup>a</sup> Reestimated based on 2006 population data.

Sources: National Statistics Office, World Bank, United Nations Development Programme, 2004, Main report of "HIES/LSMS", 2002–2003, Ulaanbaatar.

<sup>3</sup> World Bank. 2006. *Mongolia Poverty Assessment*. Ulaanbaatar.

<sup>4</sup> Government of Mongolia. 2003. *Economic Growth Support and Poverty Reduction Strategy*, page 98.

8. In 2006, the monetary equivalent of the poverty line ranged from MNT37,000 to MNT42,800 (\$31 to \$36) per capita per month depending on the region (Table A9.4).<sup>5</sup> Survey findings and interviews with key informants suggest that the RDP had a positive contribution in increasing household income, thus triggering a poverty reduction effect in the project influence area. Overall, average household per capita per month income in the project influence area was 42.1% higher than the poverty line and 16.4% over the poverty line in the control area.

**Table A9.4: Poverty Line by Region in 2006 and 2007**

| Region      | Poverty Line (monthly household income /number of household members) |                   |
|-------------|--|-------------------|
|             | 2006 <sup>a</sup>  | 2007 <sup>b</sup> |
| West        | 37,000 (\$32)  | 54,700 (\$46.1)   |
| Highland    | 38,300 (\$33)  | 54,600 (\$46.1)   |
| Central     | 39,000 (\$34)  | 56,700 (\$47.8)   |
| East        | 34,800 (\$30)  | 51,800 (\$43.7)   |
| Ulaanbaatar | 42,800 (\$37)  | 60,100 (\$50.7)   |

<sup>a</sup> Source: Appendix to Resolution 01/35 of Head of National Statistics Office, 12 April 2006.

<sup>b</sup> Source: National Statistics Office, 15 May 2007. Available: <http://www.nso.mn>

9. Households in the project impact area were seen to have more income sources besides higher income than households in the control area. This was attributed to diversified small-scale business activities such as vegetable growing, catering, shop keeping, hotels, handcrafts, transport service, etc., which supplemented their household income. Over a quarter of households in the project impact area had three or more sources of household income, whereas only one fifth of households in the control area had three or more income sources (Table A9.5). Box A9.1 provides the perceptions of the local business community.

**Table A9.5: Number of Household Income Sources**

| Number of Income Sources | Project Impact Area |              | Control Area  |              |
|--------------------------|---------------------|--------------|---------------|--------------|
|                          | Number of HHs       | %            | Number of HHs | %            |
| 1                        | 49                  | 15.3         | 26            | 17.6         |
| 2                        | 184                 | 57.3         | 94            | 63.5         |
| 3                        | 73                  | 22.7         | 24            | 16.2         |
| 4<                       | 15                  | 4.7          | 4             | 2.7          |
| <b>Total</b>             | <b>321</b>          | <b>100.0</b> | <b>148</b>    | <b>100.0</b> |

HH = household.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

#### **Box A9.1: Perceptions of Local Business Community**

“There was an increase of vehicle numbers and service facilities along this road. This trend is directly associated with the roads development. Without the road, such services would not be available. Being a remote location, our *soum* has only 3,000 residents. We would not run so many shops and canteens if there were no customers. If there were no road, we would be unable to provide such services to the people. This road connects Ulaanbaatar with the northern region and this becomes the main source of our income. Thus, there is a huge economic benefit from the roads development.”

Source: Focus Group Discussion with Bayanchandmani *soum* businesspersons, Tuv *aimag*.

<sup>5</sup> Poverty in Mongolia is income-based (i.e., the result of lack of employment and insufficient incomes) and is defined using the minimum living standards approach.

10. Households in the project impact area have an average annual income of MNT2,660,242 (\$2,283), with an average of four persons per household. This is significantly higher than the household average annual income of MNT2,179,435 (\$1,870) per household for the control area. Moreover, there is a substantial difference in the amount of earnings from the same economic activities; households in the project impact area have higher incomes in all means of livelihoods compared to households in the control area, with the exception of pension and social welfare, which indicates the incremental support required by households in the control area from the Government. Average annual income from crop production in the project impact area is 52.6% higher than the control area, self-employment income is 44.3% higher, and livestock herding income is 6.8% higher. This could be attributed to the better access to market of households in the project impact area.

**Table A9.6: Annual Income by Income Source (MNT)**

| Item                            | Project-Impact Area | Control Area | Difference (%) |
|---------------------------------|---------------------|--------------|----------------|
| Salary                          | 1,685,254           | 1,554,062    | 108.4          |
| Pension and welfare benefits    | 589,991             | 694,566      | 84.9           |
| Livestock herding               | 1,298,442           | 1,215,880    | 106.8          |
| Crop production                 | 1,081,386           | 708,461      | 152.6          |
| Self employment                 | 2,331,293           | 1,615,484    | 144.3          |
| Average household annual income | 2,660,242           | 2,179,435    | 122.1          |

Source: Socioeconomic Survey of the Operations Evaluation Mission in July 2007.

11. Respondents were asked to evaluate their household economic situation comparing (i) before and after the road improvement for the project impact areas; and (ii) 10 years ago and now, for the control area. One in every eighth household in the project impact area noted an improvement in the household economic situation, against the control area where one in every 40<sup>th</sup> household claimed a significant improvement. More households faced worsening of household economic situation in the control area than the project impact area—one in every eighth household in the control area as against one in every 30<sup>th</sup> household in the project impact area.

**Table A9.7: Changes in Household Economic Situation**

| Item                     | Project-Impact Area |              | Control Area  |              |
|--------------------------|---------------------|--------------|---------------|--------------|
|                          | Number of HHs       | %            | Number of HHs | %            |
| Improved very much       | 28                  | 12.1         | 3             | 2.6          |
| Improved a bit           | 111                 | 48.05        | 53            | 46.08        |
| Almost no change         | 84                  | 36.4         | 45            | 39.1         |
| Got a bit worse          | 6                   | 2.6          | 12            | 10.4         |
| Got much worse           | 2                   | 0.9          | 2             | 1.7          |
| <b>Total<sup>a</sup></b> | <b>231</b>          | <b>100.0</b> | <b>115</b>    | <b>100.0</b> |

HH = household.

<sup>a</sup> Excluded migrant households.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

**Table A9.8: Changes in Household Income**

| Item                     | Project-Impact Area |              | Control Area  |              |
|--------------------------|---------------------|--------------|---------------|--------------|
|                          | Number of HHs       | %            | Number of HHs | %            |
| Improved                 | 133                 | 57.6         | 60            | 52.2         |
| No change                | 82                  | 35.5         | 39            | 33.9         |
| Worsened                 | 15                  | 6.5          | 16            | 13.9         |
| Do not know              | 1                   | 0.4          | 0             | 0.0          |
| <b>Total<sup>a</sup></b> | <b>231</b>          | <b>100.0</b> | <b>115</b>    | <b>100.0</b> |

HH = household.

<sup>a</sup> Excluded migrant households and newly formed households.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

## 2. Internal Migration

12. Migration is one of the important social indicators in Mongolia for assessing local socioeconomic development. Rural to urban migration has increased dramatically in the last decade in most areas of Mongolia—reflecting lower infrastructure development, poor access to basic social services, poor livelihood, and lack of economic opportunities. Consequently, the population density of Ulaanbaatar increased from 180.1 persons per square kilometer (km<sup>2</sup>) in 2002 to 211.6 per km<sup>2</sup> in 2006. The Government has recognized the challenges and impacts that such levels of migration bring. Box A9.2 summarizes the perceptions and provides a broad indication of the factors contributing to this migration. Table A9.9 compares migration in the project impact area vis-à-vis the control area, but several factors other than the RDP road could cause this migration. Changes in the macroeconomic situation and the relative diversification in the livelihoods caused by the improving national economy have given rise to several changes at the local level. It is difficult to identify these factors distinctly using a brief socioeconomic survey as the one applied by the Operations Evaluation Mission (OEM).

### Box A9.2: Perceptions on Migration

“There was a big flow of migrants from our *soum* during 1996–2000, but now the situation is reverse, more people coming to settle in. The main reason for coming to our place is proximity to the market, availability of good pastures and water sources. People are coming from remote western *aimags* such as Khovd, Gobi–Altai and Uvs.”

“The main reason why people come from western *aimags* and Ulaanbaatar city is the improved road. Opposite to our *soum*, the neighboring Bayanjargal and Ugtaal *soums* cannot attract new comers but proximity to the road attracts them and they are considering the option to start profitable farms. This road is very important for our development. Resort homes and farms are being founded along this road.”

Source: Governor of Bayanchandmani *soum*, Tuv *aimag*. Socioeconomic survey of the Operations Evaluation Mission. July 2007.

**Table A9.9: Migrant Households**

| Item                            | Project-Impact Area |              | Control Area  |              |
|---------------------------------|---------------------|--------------|---------------|--------------|
|                                 | Number of HHs       | %            | Number of HHs | %            |
| Non-migrant                     | 117                 | 36.4         | 81            | 54.7         |
| Moved in more than 12 years ago | 123                 | 38.3         | 44            | 29.7         |
| Moved in less than 12 years     | 45                  | 14.0         | 18            | 12.2         |
| Moved in last 2 years           | 36                  | 11.2         | 5             | 3.4          |
| <b>Total</b>                    | <b>321</b>          | <b>100.0</b> | <b>148</b>    | <b>100.0</b> |

HH = household.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

13. Most migrant households in the project influence area appear to be migrating from rural areas (30.8%) and *soum* centers (28.4%); and from *aimag* centers (19.7%) and Ulaanbaatar and other cities (20.9%).

14. Survey findings suggest that migration is a continuous process, with the project impact area witnessing an increase of 69.8% of migrants to date (Table A8.10). Migrants mainly come from the West region (mostly Uvs, Zavhan, Hovd *aimags*), suggesting that migrant households from the remote West region are more likely to move to the Central region in search of a better livelihood and better access to basic facilities. While the project impact has experienced net in-migration, the control area has witnessed net out-migration. For example, the population in Tuv *aimag* of Bayantsogt *soum* (control area) has decreased at a higher rate compared to the project impact area since 1995 (Table A9.11). In Tuv *aimag*, the population of Bayantsogt *soum* (control area) decreased by almost 50% from 1995 to 2006, while the Tuv *aimag* population as whole decreased by only 15.5%. Compared to that in the project impact area, the population of Bayanchandmani *soum* fell by 13.3% from 3,831 to 3,322 from 1995 to 2006, and the population of Bornuur *soum* reduced by 2.4% from 4,748 to 4,634 from 1995 to 2006 (Table A9.11).

**Table A9.10: Changes in Migration Patterns**

| Item                    | Project-Impact Area |              | Control Area  |              |
|-------------------------|---------------------|--------------|---------------|--------------|
|                         | Number of HHs       | %            | Number of HHs | %            |
| Out-migration increased | 41                  | 12.8         | 63            | 42.6         |
| In-migration increased  | 224                 | 69.8         | 40            | 27.0         |
| No change               | 33                  | 10.3         | 30            | 20.3         |
| Do not know             | 23                  | 7.2          | 15            | 10.1         |
| <b>Total</b>            | <b>321</b>          | <b>100.0</b> | <b>148</b>    | <b>100.0</b> |

HH = household.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

**Table A9.11: Population in Tuv *Aimag***

| Item           | 1995  | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Bayantsogt     | 3,961 | 2,612 | 2,267 | 2,185 | 2,109 | 1,956 | 1,890 | 2,018 |
| Bayanchandmani | 3,831 | 3,378 | 3,272 | 3,309 | 3,321 | 3,287 | 3,268 | 3,322 |
| Bornuur        | 4,748 | 4,318 | 4,297 | 4,411 | 4,438 | 4,311 | 4,372 | 4,634 |

Source: Statistics Department, Tuv *Aimag*, 2007.

15. Many families from rural areas move in search of employment opportunities, and better education and health services. Migrant households in the project impact area cited that the main reasons for migrating were to be close to the market (42.0%); to work and run a business (30.8%); and to join or be close to parents, children, relatives (30.8%). They found that living close to the RDP road offered several livelihood alternatives. Secondary data from United Nations research confirms that migration has resulted in a general improvement in employment, education, housing conditions, access to public transport, markets, environment, income, and health.<sup>6</sup> The perception of migrants is in Box A9.3. Table A9.12 provides a comparative indication of the change in the livelihoods and access to basic services after migration.

### Box A9.3: Perception of Migrants

“Originally I am from Hyargas *soum* of Uvs *aimag*. We moved from there in 1996 and settled down in Ugtaal *soum* of Tuv *aimag*. Then we moved again come to Bayanchandmani *soum* of Tuv *aimag* in 2003. I consider that life is better in proximity to the road. Paved roads allow us to reach any place as you wish, otherwise it is quite difficult. In 1980–1990s we spent at least 7 days to reach Ulaanbaatar from Hyargas *soum*. That consumed lot of expenses and time. By settling down adjacent to the road I am able to make more profits from livestock herding by selling livestock products at a good price. Travel expenses have gone down. I have saved some money to buy a small car and now I am driving my car to sell meat and other livestock products at good price in the capital and in return I buy consumer goods at lower prices.”  
Migrant herder of Bayanchandmani *soum*, Tuv *aimag*

“We lived in Buyant *soum* of Hovd *aimag* and migrated to Selenge *aimag*. Hovd is very remote, 1,400 km from Ulaanbaatar. It used to take 2 days to reach Ulaanbaatar from Hovd. Due to poor road development not many cars travel to Ulaanbaatar. We had to wait for a bus 2 or 3 days. Sometimes bus seats were not fully occupied. Then, bus drivers did not move unless all the seats were filled up. In order make profit, 20 people had to travel in a bus with just 12 seats. In Hovd, we had to grow our own vegetables. Due to remoteness and lack of road development we could not sell our crops and could not make any profit out of it. End of harvest season the price of vegetables reduced to low levels; despite potato cost of just MNT50 per kilo and nobody bought it, but in Ulaanbaatar potato cost is least MNT300. Now in Selenge we grow vegetables for household consumption, but we are planning to expand it. Since we have a good road I can sell it in Ulaanbaatar at higher price. Here in Selenge we can travel at any time we want, even drivers will pick you up from your doorways.”

Resident, Altanbulag *soum*, Selenge *aimag*

Source: Socioeconomic Survey of the Operations Evaluation Mission. July 2007.

**Table A9.12: Changes in Household Livelihood after moving into the PIA Migrants**

| Item                     | Improved |       | No Change |       | Worsened |       | Do Not Know |       |
|--------------------------|----------|-------|-----------|-------|----------|-------|-------------|-------|
|                          | HHs      | %     | HHs       | %     | HHs      | %     | HHs         | %     |
| Household income         | 40       | 55.56 | 30        | 41.67 | 2        | 2.78  |             |       |
| Housing condition        | 15       | 20.83 | 55        | 76.39 | 2        | 2.78  |             |       |
| Employment               | 28       | 38.89 | 38        | 52.78 | 6        | 8.33  |             |       |
| Access to health service | 23       | 31.94 | 30        | 41.67 | 14       | 19.44 | 5           | 6.94  |
| Access to education      | 33       | 45.83 | 24        | 33.33 | 7        | 9.72  | 8           | 11.11 |
| Access to transport      | 61       | 84.72 | 9         | 12.50 | 1        | 1.39  | 1           | 1.39  |
| Access to market         | 64       | 88.89 | 5         | 6.94  | 3        | 4.17  |             |       |

HH = household, PIA = project-impact area.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

<sup>6</sup> Population and Training Research Institute, Ministry of Social Welfare and Labor, and United Nations Population Fund. 2001. *A Microstudy of Internal Migration in Mongolia*. Ulaanbaatar.



### 3. Changes in Employment

16. The employment status of respondents was better in the area adjacent to the RDP road compared to remote areas. Some 64.2% of respondents in the project impact area were found to be working in formal or informal sectors, compared to 47.3% of respondents in the control area (Table A9.13). In the project impact area, 15.6% of individuals interviewed were unemployed compared to 25.7% in the control area; and 32.9% of people in the project impact area stated an improvement in the employment condition compared to 21.7% in the control area (Table A9.14).

**Table A9.13: Respondent Employment Status**

| Item                   | Control Area  |              | Project-Impact Area |              |
|------------------------|---------------|--------------|---------------------|--------------|
|                        | Number of HHs | %            | Number of HHs       | %            |
| Formal sector employee | 21            | 14.2         | 62                  | 19.3         |
| Informal sector worker | 17            | 11.5         | 85                  | 26.5         |
| Herder                 | 32            | 21.6         | 59                  | 18.4         |
| Unemployed             | 38            | 25.7         | 50                  | 15.6         |
| Retired                | 22            | 14.9         | 49                  | 15.3         |
| Disabled               | 15            | 10.1         | 9                   | 2.8          |
| Student                | 2             | 1.4          | 6                   | 1.9          |
| Housewife              | 1             | 0.7          | 1                   | 0.3          |
| <b>Total</b>           | <b>148</b>    | <b>100.0</b> | <b>321</b>          | <b>100.0</b> |

HH = household.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

**Table A9.14: Changes in Employment**

| Item                     | Project-Impact Area |              | Control Area  |              |
|--------------------------|---------------------|--------------|---------------|--------------|
|                          | Number of HHs       | %            | Number of HHs | %            |
| Improved                 | 76                  | 32.9         | 25            | 21.7         |
| No change                | 104                 | 45.0         | 63            | 54.8         |
| Worsened                 | 49                  | 21.2         | 27            | 23.5         |
| Do not know              | 2                   | 0.9          | 0             | 0.0          |
| <b>Total<sup>a</sup></b> | <b>231</b>          | <b>100.0</b> | <b>115</b>    | <b>100.0</b> |

HH = household.

<sup>a</sup> Excluded migrant households.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

17. After road development, the project impact area witnessed an increase in employment in national companies, which set up manufacturing units to take advantage of the infrastructure development and proximity to markets such as Darhan and Erdenet. According to the National Statistical Office of Mongolia, out of 407 agro-processing enterprises in the country, 75.8% are located in areas with relatively developed infrastructure and proximity to markets, such as the cities of Ulaanbaatar, Darhan, Erdenet, and Selenge and Tuv aimags.<sup>7</sup> Box A9.4 provides perceptions of the changes in the employment patterns.

<sup>7</sup> Government of Mongolia. 2003. *Economic Growth Support and Poverty Reduction Strategy*, page 106.

#### Box A9.4: Changes in Employment

“As you know, unemployment is a huge problem in rural areas. Luckily, our *soum* is experiencing a boom of tourist industry. Many tourist and resort camps have been established and an easy access to those places along the Project road attracts local and international holidaymakers. Bayanchandmani tour camp is located at the north; this camp also has been established because of the proximity to the road. There are many benefits from the boom of a tourist industry. Firstly, tourist camps pay taxes to the *soum* development fund. Secondly, unemployed local youth find a job at these tourist camps and resorts.”

FGD with Bayanchandmani *soum* businesspersons, Tuv *aimag*

“Recently, Gatsuurt company (company is registered in Ulaanbaatar) has started its crop production activity in our *soum*, on abandoned land with despoiled irrigation system. Thanks to their efforts such as introduction of electric grid, use of fertilizers and pesticides, they were able to harvest 3 tons of crops per hectare which never happened in our *soum* before. Moreover, 80 workplaces have been created by this company alone. They have simply utilized hidden potentials and opportunities of our *soum*.”

Governor, Altanbulag *soum*, Selenge *aimag*

“In 1998 this road has gone through rehabilitation. Before that, there were few shops. After the road improvement, the number of stores has increased dramatically. Our *soum* population is comparatively small but there are about 30–40 shops in operation. It’s directly related with increase of passengers’ turnover. All these service centers survive here; this means that their business make profit.”

Shop owner, Bornuur *soum*, Tuv *aimag*

Source: Socioeconomic Survey of the Operations Evaluation Mission. July 2007.

18. There has been an increase in the number of people in the project impact area engaged in small-scale local trading activities such as shop keeping, hotels, tire repair shops, selling livestock products, etc. The key informants’ interviews indicated that there had been an increase in the participation of the women in small-scale business activities. In some cases, these activities were operated by women independently.

19. The RDP road has helped improve employment opportunities by enabling people to commute to Ulaanbaatar daily. The lack of jobs in rural areas makes the city more attractive for those who can find daily or other temporary work. With the improved project road, local people need not move to Ulaanbaatar to find work. Instead, they commute daily to Ulaanbaatar (Box A9.5).

#### Box A9.5: Perception about Enabling Daily Commute

“One of many examples of the benefits of road development is that local people started to work in Ulaanbaatar city, this phenomenon never existed before. With a reduced travel time by half an hour, employees work in the city and come back in evening. I consider that this is extremely important to eliminate rural, urban disparities.”

Focus Group Discussion with Bayanchandmani *soum* businesspersons, Tuv *aimag*

Source: Socioeconomic Survey of the Operations Evaluation Mission. July 2007.

20. The road is necessary for the industrial development but it is not the only factor. It does not seem to have resulted in any major increase in the number of local small and medium-sized enterprises. In fact, there could be some drawbacks (Box A9.6).

### Box A9.6: Perceptions about the Downsides despite Road Improvement

“Although the quality of the road has improved, it is still difficult to develop industries here due to proximity to Darhan city. It is more profitable to sell wholesale bread bought from Darhan than operate a small bakery. Therefore, I consider that it is still problematic to run small and medium enterprises here.”

Acting Governor, Khongor *soum*, Darhan–Uul *aimag*

“Darhan is 15 minutes drive away, therefore people traveling along this road do not stop over here. We do not have hotel, restaurant here because no one stops and asks this type of service. It is one of the drawbacks locating close to big city, but besides that we have many advantages.”

Focus group discussions with Khongor *soum* residents, Darhan–Uul *aimag*

“One of the biggest drawbacks is lack for of rich local businessmen here. Usually, crop cultivation does not exceed 1 hectare of land. If big investment shall be done, then more work places will be created here. Instead of small crop cultivation in less than 1 hectare, investment should be done for 100 hectare of land, and then taxes to the state shall increase accordingly. We encourage national companies to run a business here but at the same time we put conditions to employ up to 80–90% of local people in their activities.”

Head of Citizen’s Representative Khural, Altanbulag *soum*, Selenge *aimag*

“Local people cannot afford engaging in tourism and farming activities. It requires minimum MNT20–30 million to establish a small-scale tourist or resort camp. Neither local people are financially capable nor have access to a bank credit. Thus, only people from Ulaanbaatar city can afford to run tourist and resort camps here.”

Governor, Bayanchandmani *soum*, Tuv *aimag*

Source: Socioeconomic survey of the Operations Evaluation Mission. July 2007.

21. The country’s Economic Growth Support and Poverty Reduction Strategy stated that “free trade zones play a significant role in the reduction of disparities in rural and urban development and raising the living standards of the population as part of implementation of the concept on regional development. Altanbulag and Zamyn–Uud were the pilot zones” (footnote 6, page 112). However, not much has happened in the Altanbulag free trade zone, besides local people engaged in clothing delivery for traders to the Russian Federation (Box A9.7).

### Box A9.7: Perceptions on Establishment of Altanbulag Free Trade Zone

“Only fences were erected for the establishment of a free trade zone here. But already 10 years passed nothing has been done so far. Nothing is going on related to the free trade zone; only a few guards have been employed. Previously this place was a pastureland. Instead of such waste we could allocate this land to the people.”

Governor, Altanbulag *soum*, Selenge *aimag*

“We employ local people to deliver our goods to Russia. Because of restricted custom rules of Russia we are not permitted take many clothes, it will be confiscated. Since the *soum* was declared as a free trade zone nothing has changed. Many people moved in hoping for doing business in free trade zone, but they waited for 2 or 3 years and left.”

Focus group discussions with traders between the People’s Republic of China and the Russian Federation, Altanbulag *soum*, Selenge *aimag*

Source: Socioeconomic Survey of the Operations Evaluation Mission. July 2007.

#### 4. Access to Transport Service

22. Transport services existed before implementation of the RDP. The road improvement in 2001 helped a minor improvement in the transport services (Table A9.15). The growth in the number of self-driven vehicles has increased alongside a rise in the number of vehicles throughout the country. However, there is only a minor increase in travel by hired vehicles.

**Table A9.15: Means of Travel to Ulaanbaatar**

| Item  | Project Impact Area (%) |              | Control Area (%) |              |
|---|-------------------------|--------------|------------------|--------------|
|   | 1995                    | 2007         | 1995             | 2007         |
| Train   | 46.3                    | 26.2         | 46.1             | 31.1         |
| Own vehicle                                     | 5.6                     | 14.1         | 8.6              | 15.6         |
| Hired vehicle (bus, car, truck, etc.)           | 34.6                    | 36.4         | 36.5             | 33.1         |
| Any other transport (train, mix of modes, etc.) | 7.3                     | 15.3         | 3.5              | 12.8         |
| Never traveled                                  | 6.1                     | 8.1          | 4.3              | 7.4          |
| <b>Total</b>                                    | <b>100.0</b>            | <b>100.0</b> | <b>100.0</b>     | <b>100.0</b> |

Source: Socioeconomic Survey of the Operations Evaluation Mission. July 2007.

23. Time savings have been a major benefit of the road improvement (Box A9.8). Seventy-eight percent of respondents in the project impact area stated that travel time had reduced after road improvement and 45.8% noted a reduction in vehicle running costs.

#### **Box A9.8: Perceptions on Reduction in Travel Time**

“It takes 15–20 minutes to reach Darhan city whereas earlier it was more than 40 minutes”.

Acting Governor, Khongor *soum*, Darhan–Uul *aimag*

“The road has many benefits. First of all, drivers benefit from the roads development. Then it saves time for passengers going to Ulaanbaatar, Darhan cities and Sukhbaatar *soum*. Earlier it required 7–8 hours of travel and trucks had to start their journey early in the morning to reach their desired destination. Now it requires only 5–6 hours for trucks and around 4 hours to small cars. Thus, this highway really saves time. Moreover, expenses on fuel, lubricants all went down.”

Head of the Citizens Representatives Khural, Altanbulag *soum*, Selenge *aimag*

“There are many benefits from the roads development. One of them is time saving. Earlier it was required at least an hour to reach Ulaanbaatar but now it takes only a half of that time. In economic terms, it is also beneficial. Without this road, we had to pay MNT3,000 to travel 50 km but now we travel 67 km by this road to reach Ulaanbaatar but pay only MNT2,000. Thus, favorable conditions for our residents to travel have been created.”

Focus group discussions with Bayanchandmani *soum* businesspersons, Tuv *aimag*

Source: Socioeconomic Survey of the Operations Evaluation Mission. July 2007.

#### 5. Access to Market

24. Respondents mostly perceived an improvement in access to market in terms of better buying and selling opportunities, a reduced gap between local prices and Ulaanbaatar market prices, and an improved range of available goods locally (Box A9.9 and Tables A9.16 and A9.17). This contributed positively to achievement of the Government’s poverty reduction strategy on improving access to market by creating channels to buy agricultural products from herders and deliver consumer goods to them—to reduce the gap in prices of consumer goods

between rural and urban areas; and reduce time, effort, and costs incurred by herders (footnote 6, page 105).

#### Box A9.9: Perception on Market Access

“Comparing with western *aimag* people, we have better opportunities to sell our products such as vegetables, livestock products, wood crafts. Short distance and fast travel keeps vegetable fresh and this is one of advantages of people settled near to road.”

Focus group discussion with Bayanchandmani *soum* businesspersons, Tuv *aimag*

Source: Socioeconomic Survey of the Operations Evaluation Mission. July 2007.

**Table A9.16: Ways of Access to the Market Improved After the Project Completed**

| Item  | Project-Impact Area |      |
|---|---------------------|------|
|   | Number of HHs       | %    |
| Better access to transport service  | 109                 | 59.6 |
| Necessary goods could be purchased from local shops at the market prices                                  | 57                  | 31.1 |
| Variety of new services available in the <i>soum</i>  | 11                  | 6.0  |
| Local traders import goods from the People’s Republic of China and Russia at reduced travel time and cost | 25                  | 13.7 |
| Became easier to sell self-produced products  | 42                  | 22.9 |

HH = household.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

**Table A9.17: Changes in Access to Market After the Project or Over Past 12 Years**

| Item                     | Project-Impact Area |              | Control Area  |              |
|--------------------------|---------------------|--------------|---------------|--------------|
|                          | Number of HHs       | %            | Number of HHs | %            |
| Improved                 | 195                 | 84.4         | 65            | 56.5         |
| No change                | 33                  | 14.3         | 34            | 29.6         |
| Worsened                 | 0                   | 0.0          | 10            | 8.7          |
| Do not know              | 3                   | 1.3          | 6             | 5.2          |
| <b>Total<sup>a</sup></b> | <b>231</b>          | <b>100.0</b> | <b>115</b>    | <b>100.0</b> |

HH = household.

<sup>a</sup> Excluded migrant households.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

25. In rural areas remote from the road, transportation is not commonly available. People rely on their own vehicles or animals or borrow these. A large amount of milk is wasted during the summer because herders are unable to deliver milk and other dairy products to markets daily. Because of lack of transport, herders depend on traders who come to their campsites and purchase produce directly from them (e.g., hides, milk, and cashmere) at prices that are substantially below the market price and without differentiation for higher quality products. Thus, herders are unable to capture the full economic value of their products in remote areas (Tables A9.18 and A9.19).

**Table A9.18: Place where Farm Products are Sold in 2007**

| Item                                | Project-Impact Area |              | Control Area  |              |
|-------------------------------------|---------------------|--------------|---------------|--------------|
|                                     | Number of HHs       | %            | Number of HHs | %            |
| In own shop                         | 4                   | 1.2          | 0             | 0            |
| Ulaanbaatar                         | 63                  | 19.6         | 28            | 18.9         |
| Aimag center                        | 41                  | 12.8         | 7             | 4.7          |
| Soum center                         | 14                  | 4.4          | 7             | 4.7          |
| To wholesaler who comes to the farm | 39                  | 12.1         | 23            | 15.5         |
| No spare products to sell           | 23                  | 7.2          | 19            | 12.8         |
| Do not produce any products         | 137                 | 42.7         | 64            | 43.2         |
| <b>Total</b>                        | <b>321</b>          | <b>100.0</b> | <b>148</b>    | <b>100.0</b> |

HH = household.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

**Table A9.19: Place where Farm Products were Sold in 1995**

| Item                                | Project-Impact Area |              | Control Area  |              |
|-------------------------------------|---------------------|--------------|---------------|--------------|
|                                     | Number of HHs       | %            | Number of HHs | %            |
| In own shop                         | 1                   | 0.4          | 0             | 0.0          |
| Ulaanbaatar                         | 33                  | 14.3         | 24            | 20.8         |
| Aimag centre                        | 31                  | 13.4         | 5             | 4.3          |
| Soum centre                         | 11                  | 4.8          | 7             | 6.1          |
| To wholesaler who comes to the farm | 14                  | 6.1          | 10            | 8.7          |
| No spare products to sell           | 20                  | 8.6          | 18            | 15.6         |
| Do not produce any products         | 121                 | 52.4         | 52            | 45.2         |
| <b>Total</b>                        | <b>231</b>          | <b>100.0</b> | <b>115</b>    | <b>100.0</b> |

HH = household.

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

## 6. Adverse Impacts of the Project

26. Some of the interviewed households noted that they faced inconvenience during road construction, such as an increase in dust and air pollution and noise of heavy trucks. Consultation with project affected persons confirmed that contractors carried out restoration of environment appropriately. General perceptions are in Box A9.10.

### Box A9.10: Perceptions on Issues during Construction of the Roads Development Project

“Sometimes workers had to use explosives during the construction. In this few cases, window glasses in the apartments were blown out but broken ones were replaced by the workers. It is necessary to mention that spots damaged by the explosions at the construction site have been restored completely.”

Focus group discussions with Bayanchandmani *soum* businesspersons, Tuv *aimag*

Source: Socioeconomic Survey of the Operations Evaluation Mission. July 2007.

27. After project completion, residents of the project impact area noted three major negative impacts: an increase in traffic accidents, air and environmental pollution, and fallout of the increase of in-migration (Table A9.20).

**Table A9.20: Negative Impacts of Roads Development**

| <b>Item</b>  | <b>Male</b> |      | <b>Female</b> |      |
|--|-------------|------|---------------|------|
| Increase of in-migration and outsiders taken over land or business opportunity | 6           | 15.8 | 10            | 22.2 |
| Increase of traffic accidents  | 24          | 63.1 | 26            | 72.2 |
| Air and environmental pollution  | 14          | 36.8 | 17            | 47.2 |
| Increase of crime (livestock theft, burglary, alcoholism, etc.)                | 7           | 10.5 | 5             | 13.9 |
| Increase of noise  | 1           | 2.6  | 1             | 2.8  |
| Few persons, who have a private car or run a business benefit more             | 1           | 2.6  | 1             | 2.8  |
| Road became narrow, quality of road rehabilitation was poor                    | 5           | 13.1 | 0             | 0.0  |
| Other  | 0           | 0.0  | 1             | 2.8  |

Source: Socioeconomic survey of the Operations Evaluation Mission in July 2007.

28. The project impact area has attracted migrants from other aimags. This has affected the livelihoods of rural people, especially herders and agricultural workers. Because of the increased number of livestock, the carrying capacity of the pasture is being stretched—causing a decrease in the availability of hay (Box A9.11).

#### **Box A9.11: Perceptions of Rural People**

“After roads development we had many migrant herders from Western *aimags*. They had more livestock than us, and we gradually been chased. Can you imagine herding 10 sheep against 100 sheep?”  
*Soum* center resident, Bayanchandmani *soum*, Tuv *aimag*

“Herders from western *aimags* are coming more and more to our place to become closer to the market. Therefore, the carrying capacity of the pastures is being exhausted. People from Ulaanbaatar city establish here tourist resorts and farms. Initially they have been allocated 5–10 hectares of land but when it comes to the reality they occupy the whole mountain valley by erecting fences. This situation makes local people quite anxious. Hay fields and pastureland are being occupied by newcomers. Even they restrict local people’s access to forest to collect firewood. We are considering options and solutions how to resolve this situation. It will be not allowed to settle down for newcomers with more cattle equivalent to 100 heads of sheep, but this is very difficult although a decision on this matter has been issued.”  
 Governor, Bayanchandmani *soum*, Tuv *aimag*

Source: Socioeconomic Survey of the Operations Evaluation Mission. July 2007.

29. Road safety is a major issue in the project impact area. Appendix 7 discusses this issue in more detail.