



# Social Monitoring Report

---

Project Number: 32514  
November 2006

## TAJ: Road Rehabilitation Project

Prepared by Igor Ziderer  
Individual Consultant  
Dushanbe, Tajikistan

For Ministry of Transport and Communication  
Republic of Tajikistan

This report has been submitted to ADB by the executing agency and is made publicly available in accordance with ADB's public communications policy (2005). It does not necessarily reflect the views of ADB.

**Asian Development Bank**



## TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Purpose of the Report	1
1.2	Explanation of the Project Performance Management System (PPMS)	2
1.3	Data Collection	2
1.4	Organization of the Document	3
2.0	ROLE & PURPOSE OF THE PPMS “PROJECT FRAMEWORK”	4
2.1	General	4
2.2	Goals and Indicators	4
2.3	Responsibilities and Reporting	4
3.0	DESCRIPTION AND STATUS OF THE PROJECT	7
3.1	Definition of Project Area	7
4.0	INFRASTRUCTURE DEVELOPMENT ISSUES	9
4.1	Value of Cargo and Time	9
4.2	Road Conditions – Roughness Data	9
4.3	Transport Volumes and Freight Charges	10
4.4	Improvement of Road Maintenance	11
4.5	Road Safety	11
4.6	Traffic Volume	12
5.0	SOCIO-ECONOMIC MONITORING AND EVALUATION	16
5.1	Poverty Reduction	16
5.2	Income and Expenditures Trends	17
5.3	Access to Markets	18
5.4	Transformation of the Social Role of Women	18
5.5	Access to Health Facilities	19
5.6	Access to Education	19
5.7	Occupational Diversification	19
5.8	Development of Small Business and Roadside Infrastructure	20
	SUMMARY AND RECOMMENDATIONS	21
	APPENDICES	
1.	Traffic Counting Forms	
2.	References	



## LIST OF ACRONYMS

ADB	Asian Development Bank
ADT	Average Daily Traffic
BOD	Biological Oxygen Demand
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
CSC	Construction Supervision Consultant
dB	Decibel
DO	Dissolved Oxygen
EIA	Environmental Impact Assessment
FAO	Food and Agricultural Organisation (of UN)
FSU	Former Soviet Union
GPD	Gross Domestic Product
GBAO	Gorno badakhsan Autonomous Area
ICB	International Competitive Bidding
IEE	Initial Environmental Examination
km	Kilometer
LCB	Local Competitive Bidding
Leq	Sound level equivalent averaged over a sampling period.
Leq (day)	Average sound levels over a period defined as daytime.
Leq (night)	Average sound levels over period defined as night-time.
L%	Percentile distributions of sound levels.
M&E	Monitoring and Evaluation
MOTC	Ministry of Transport and Communications
MPC	Maximum Permissible Concentrations
MPL	Maximum Permissible Levels
NMT	Non-Motorized Traffic
NO	Nitrogen Oxide
PAP	Project-Affected Person
PCR	Project Completion Report
Pb	Lead
PPMS	Project Performance Monitoring System
PIA	Poverty Impact Assessment
POL	Fuel
ROW	Right-of-Way
RMD	Road Maintenance Department
R&R	Resettlement and Rehabilitation
SA	Social Analysis
SPM	Suspended Particulate Matter
SS	Suspended Solids
TOR	Terms of Reference
TSP	Total Suspended Particulate
USD	US Dollars
VOC	Vehicle Operating Cost
WB	World Bank
ZOI	Zone of Influence



## 1.0 INTRODUCTION

### 1.1 Purpose of the Report

This document is the Monitoring and Evaluation Report of Dushanbe - Kurgan Tyube – Dangara – Kulyab Road Rehabilitation Project prepared by the MOTC after the completion of the Project. The preparation of the Report is envisaged by the Project Performance Monitoring System (PPMS) and includes monitoring of infrastructure development and poverty reduction status. The monitoring of Environment impact at this stage has not been envisaged. To monitor and evaluate the impact of the Project the MOTC jointly with a consulting company prepared and submitted A Baseline M&E Report (2002) and preliminary Project Completion M&E Report ( PCR 2005).

This report is an independent document. Nevertheless in compliance with the PPMS the same data collection methods, goals and indicators as those used for the preparation of the aforementioned reports have been used in the preparation of the this document. The information required for the preparation of the project was kindly provided by the Ministry of transport, State statistics Committee and the Department of the State Transport Inspection of the RT.

The Ministry of Transport (MOT) and its Consultant for the implementation of Tajikistan's Dushanbe - Kurgan Tyube – Dangara – Kulyab Road Rehabilitation Project (the Project) share responsibilities for monitoring and evaluation (M&E) during the implementation of the Project pursuant to a Loan Agreement between the Asian Development Bank (ADB) and the Government of the Republic of Tajikistan and subsequent agreements and Terms of reference (TOR) pursuant thereto. This report has been prepared by the MOTC after the completion of the Project as will be explained below. The Loan Agreement states that:

*“The Borrower shall ensure that MOT, with the assistance of the construction supervision consultants, monitors and evaluates Project impacts to ensure that the Project facilities are managed effectively, and that the benefits are maximized. MOTC shall collect the data on the indicators agreed with the Bank as part of the Project Performance Management System (PPMS) at the commencement of rehabilitation, at Project completion, one year from Project completion, and two years after Project completion.”<sup>1</sup>*

As noted in the Loan Agreement, MOTC will be required to undertake Post-Project evaluations using PPMS, either independently with its own internal resources or in conjunction with domestic consultants familiar with its requirements, non-government organizations or other arrangements as may be subsequently determined appropriate. It is essential, therefore, for MOTC to be an active participant in the M&E activities and to be familiar with the requirement of PPMS on a managerial level. Within this context, the purposes of this document are, two-fold. They are to provide:

- ❖ **An explanation of the Project Performance Management System.** Given the requirement for MOTC to set up and use PPMS, it is important to understand what PPMS is. An explanation of PPMS is provided by Item 1.2 immediately below. Details of the Project Framework (formerly known as the Logical Framework) which provides the basic structure for PPMS are described in **Section 2.0**.

---

<sup>1</sup> Loan agreement , Schedule 6, paragraph 17

- ❖ **A Monitoring and Evaluation (M&E) Project Completion Report (PCR).** The second round of monitoring and evaluation follows on from the Baseline Monitoring and Evaluation Report prepared under this contract in 2002, a summary of which is provided in **Appendix A**.

## 1.2 Explanation of the Project Performance Management System (PPMS)

The ADB's Operational Procedures define PPMS as a structured reporting system that requires certain types of specified reports and procedures to monitor the performance of projects it funds. Portions of the "system" are the responsibility of the Bank for its internal purposes. Other portions are the responsibility of the borrowers, in this case the responsibility of MOTC as the executing agency (EA) for the Project. Within its portion of the system, and in conformance with the stipulations of the Loan Agreement and other relevant documents, MOTC is responsible for a series of reports; specifically:

- ❖ **A Baseline M&E Report.** The purpose of the Baseline M&E Report is to establish baseline values for social, environmental and poverty reduction indicators. Monitoring indicators will be measured at the necessary frequency during the project implementation. As indicated above the Baseline report has been completed (2002) and a summary is provided as **Appendix A**.
- ❖ **Project Completion M&E Report (PCR).** Within the Consultant's TOR, in addition to assisting with the Baseline M&E Report, the Consultant will prepare a Project Completion Report.
- ❖ **Post-Project M&E Reports.** Post-project reports from the borrower are not always required by PPMS. In this instance, however, as noted in the Loan Agreement above Project impacts shall be monitored and evaluated based on the data, agreed upon with the Bank, collected one year from Project completion, and two years from Project completion. The requirement presupposes that staff of MOTC and/or other local human resources (e.g., domestic consultants) will acquire sufficient familiarity with the system during Project implementation to prepare the post-Project reports and that non-Project financial resources will be available to satisfy these agreements.

**Table 1-1 PPMS Reporting Schedule**

<i>Report</i>	<i>Schedule</i>	<i>Status</i>
<i>Baseline Report</i>	<i>Report completed December 2002</i>	<i>Completed,</i>
<i>Project Completion Report</i>	<i>Report completed September 2005</i>	<i>Completed</i>
<i>Post Project Report (Year 1)</i>	<i>To be completed November 2006</i>	<i>provided herewith</i>

## 1.3 Data Collection

The Louis Berger Group, as the Construction Supervision Consultant (CSC), along with representatives from the Ministry of Transport and Communications (MOTC), collected data for this report from April 2005 – September 2005. Data collection included survey data, MOTC data and other Government produced statistical data.

As agreed with the MOTC the data collection for the review under this Project has been carried out by an Independent Consultant. The Consultant conducted surveys of Rural Road Users, Vehicle Drivers, Passengers and Farmers living and selling produce on the Project Roads. The same survey forms were used as in the Baselines survey of 2002 and 2005 to give an exact comparison of the conditions in 2002 and 2005. Examples of the survey forms used are presented as **Appendices B & C** (English and Russian).

#### **1.4 Organization of the Document**

Pursuant to these requirements, the PCR has been prepared by as a collaborative task by MOTC and the Consultant. MOTC staff has been involved at the managerial level and both MOTC and local Project staff have been involved in the preparation of the report. Its preparation has been used as an opportunity to review MOTC's responsibilities and to introduce the ADB's PPMS and its organizational underpinnings. It is organized as follows:

- ❖ **Section 1.0: Introduction.** Section 1.0, the section in hand, provides the foregoing introductory information and overview explanation of PPMS.
- ❖ **Section 2.0: Project Framework.** The Project Framework (formerly and in some instances still referred to by the ADB as the "Logical Framework") is the pyridine (i.e., a theoretical construct or way of organizing complex concepts) within which PPMS is structured. In the words of the ADB, it is the "*basis upon which the PPMS operates*". A Project Framework has been established for the Road Rehabilitation Program as part of the loan approval process. It is presented in full in **Section 2.0**.
- ❖ **Section 3.0: Project Description and Status.** This section provides a description of Project activities and a definition of the Project Area and the Projects current status.
- ❖ **Section 4.0: Infrastructure Development.** Section 4.0 provides a detailed analysis of the existing infrastructure issues and a comparison with the baseline survey of 2002.
- ❖ **Section 5.0: Socio-Economic Issues.** This part of the report describes the results of the 2005 surveys with Farmers, Drivers, Passengers and Rural Road Users and compares this data with the surveys undertaken in 2002.
- ❖ **Section 6.0: Conclusions and Recommendations.** This section summarizes the finding of Sections 4 through 6 and provides recommendations for the follow up reports.

## **2.0 ROLE & PURPOSE OF THE PPMS “PROJECT FRAMEWORK”**

### **2.1 General**

The ADB Project Performance Management System (PPMS) relies heavily on what the ADB now refers to as the “*Project Framework*” (referred to in the Feasibility Study (September 2000) as the “*Evaluation and Monitoring Matrix*”). A full description of the Framework can be obtained as noted in the footnote below. Basically, however the Framework is described by the ADB as having “*two functions*.”

- ❖ *First, it is a design tool “a design tool.... to ensure a consequential relationship between inputs, activities, outputs, purpose, and goal. If prepared in a participatory manner, it also helps develop stakeholder understanding and ownership of projects.*
- ❖ *Second, it provides the basis upon which the PPMS operates. It does this by establishing quantified and time bound targets and measurable indicators, and identifying key risks and assumptions that are used to monitor and evaluate performance.... Given this, preparation of a quality project framework is critical. Changes in project scope during implementation should be reflected in revisions to the project framework.” (Emphasis added.)*

The technique employs a matrix in which the Project Goal, its Purpose and other criteria are displayed against “*performance indicators*” to determine how well or poorly the stated Goal, Purpose and other aspects of the Project are being achieved. The Project Framework for the Road Rehabilitation Project as agreed between the Government and the ADB and is reproduced herewith as **Exhibit 2-1**.

### **2.2 Goals and Indicators**

The Project Framework has been subdivided into two areas for analysis:

- ❖ Infrastructure Development
- ❖ Social Analysis

Within each of these sub categories goals have been specified to measure the Projects success or failure, for example one of the goals of infrastructure development is reduced road user costs. Indicators have been developed to evaluate the Projects ability to meet the specified goals, such as the value of cargo and time is an indicator of reduced road user costs.

### **2.3 Responsibilities and Reporting**

The Project Framework also specifies the agencies responsible for the collection and reporting of specific M&E data – in this instance the main responsibilities lie with the MOTC with the aid of their consultants.

**Table 2-1 The Project Framework (Goals and Indicators)**

<i>Infrastructure Development Issues</i>				
<i>Goal</i>	<i>Indicator</i>	<i>Agency Responsible</i>	<i>Frequency of Reporting</i>	<i>Source</i>
<i>Reduce Road User Costs</i>	<i>Value of cargo and time</i>	<i>MOTC &amp; CSC</i>	<i>Baseline</i>	<i>Feasibility Study Direct Measurement</i>
	<i>Road conditions, roughness data</i>		<i>Project completion</i>	
			<i>One and two years after completion</i>	
<i>Reduce Transport Service Charges</i>	<i>Freight charges on heavy and medium trucks</i>	<i>MOTC &amp; CSC</i>	<i>Baseline</i>	<i>Feasibility Study Direct Measurement and local price control authority</i>
	<i>Traffic counts on main road and connector roads</i>		<i>Project completion</i>	
			<i>One and two years after completion</i>	
<i>Expanded transport services</i>	<i>Number of motorized and non-motorized vehicles in the rural area</i>	<i>MOTC &amp; CSC</i>	<i>Baseline</i>	<i>Direct Measurement</i>
			<i>Project completion</i>	
			<i>One and two years after completion</i>	
<i>Improved Road Safety</i>	<i>Accident rates on project road sections</i>	<i>MOTC &amp; CSC</i>	<i>Baseline</i>	<i>Statistics from traffic police and local government</i>
	<i>More funds for road rehab. And maintenance</i>		<i>Project completion</i>	
			<i>Adequate Staffing</i>	
<i>Improved road maintenance</i>	<i>Improvement in equipment.</i>	<i>MOTC &amp; CSC</i>	<i>Beginning of every fiscal year</i>	<i>MOF's annual budget allocation</i>
	<i>Improvement in maintenance planning and management</i>		<i>Project completion</i>	<i>Implementation progress of improved road maintenance system</i>
			<i>One and two years after completion</i>	<i>Performance evaluation of the maintenance system</i>

**Table 2-2 Social Analysis Benefit Monitoring and Evaluation Activities**

<i>Goal</i>	<i>Indicator</i>	<i>Source</i>	<i>Responsible Agency</i>	<i>Frequency of Reporting</i>
<i>Employment generation (direct Project employment)</i>	<i>Contract provisions for procurement</i>	<i>Contractors' data.</i>	<i>Construction Contractor, MOTC &amp; CSC</i>	<i>4 per year during implementation</i>
	<i>Employment generation for women</i>	<i>Informal survey of workers.</i>		<i>At completion</i>
	<i>Employment generation in the service sector</i>	<i>Informal survey of service providers to Project personnel</i>		
	<i>Growth of road transport/construction businesses</i>	<i>Contractors' data. Informal survey of project-hired businesses.</i>		
	<i>Employment generation for construction business in road transport Road</i>	<i>Maintenance Unit data</i>	<i>MOT</i>	<i>One and five years after completion</i>
<i>Poverty reduction program</i>	<i>Employment generation</i>	<i>Direct survey methods, supplemented with secondary data from sources in the State Statistical Agency. Initially, at the Oblast and Rayon level, such data may be available from the TLSS.</i>	<i>MOTC &amp; CSC</i>	<i>Baseline survey at start of rehabilitation</i>
	<i>Income and expenditures</i>			<i>Twice during project time implementation</i>
	<i>Occupational diversification</i>			<i>One and five years after completion.</i>
	<i>Household assets</i>			
	<i>Access to health services</i>			
	<i>Access to education</i>			
	<i>Access to credit</i>			
	<i>Food sustainability</i>			
<i>Capacity building</i>				
<i>Growth of trade and commerce in the district and central markets</i>	<i>Growth of sales of agricultural inputs and outputs, commodities, daily essentials</i>	<i>Poverty impact study, using data from the SSA.</i>	<i>MOTC &amp; CSC</i>	<i>Baseline survey at start of rehabilitation</i>
<i>Employment generation</i>	<i>Employment and income earning in selected sectors</i>			<i>One and five years after completion.</i>
<i>Regional GDP and growth</i>	<i>GDP per capita (Oblast and Project Area)</i>			

### 3.0 DESCRIPTION AND STATUS OF THE PROJECT

#### 3.1 Definition of Project Area

Project Road sections are located on the route Dushanbe – Kurgan Tyube – Dangara – Kulyab. The length of this Route is 254 km and is taken as the basis for the Project Area. The Project Area in this instance shall be defined as a corridor extending 5 kilometres from either side of the Project Road. This corridor stretches south from a point approximately half-way between Dushanbe and Obikiik (58 km south of Dushanbe) through Uyali to Kizil-Kala; then eastward through Kurgan-Tyube, Dangara and Kurbanseit to Kulyab.

In addition within the Project area some rural roads were rehabilitated during the Project. Several changes have been made to the original selection scheme of the rural roads.

The data of the traffic counts and findings of the four target groups' survey have been employed for the comparative evaluation of the Project impact. The surveys were carried out among vehicle drivers on the main road, passengers on the main road, rural road users and farmers. The same social groups were assessed in the course of the preparation of the Project Completion M&E Report.

The following road sections codes and names were used:

- A384 refers to Dushanbe – Kizil Kala (85 km)
- L23 refers to Kizil Kala – Kurgan Tyube (10 km)
- R15 refers to Kurgan Tyube – Dangara (72 km)
- A385 & R23 refers to Dangara – Gulistan – Kulyab (85 km)

**Table 3-1 Sections of the Main Road Rehabilitated during the Project Implementation**

Road	Section & total length	Length of rehab. section	Description
<b>A384</b>	Dushanbe to Kizil-Kala – 85 km	16 km	<p>Rehabilitation activities included the following three sections:</p> <p><b>1</b> between km 26 - km 29 of Dushanbe–Aivadj. This section includes stretches on 3 locations of about 100-200m long each, totalling 500 m. These stretches require light rehabilitation of the existing carriageway by means of resealing and corrections to the earthworks on failed fill slopes with extensive earth works.</p> <p><b>2</b> between km 57 – km 72.5 of Dushanbe–Aivadj Road which includes one bridge. Required improvements include rehabilitation by means of structural overlay and reconstruction of existing pavement from the base course of existing pavement. This section also required provision of adequate drainage facilities.</p> <p><b>3</b> between km 79 – km 80 of Dushanbe–Aivadj. This section includes upgrading of drainage facilities and light rehabilitation to the pavement along with rectification of earth works damaged by the erosion due to inadequate drainage facilities.</p>

<b>L23</b>	Kizil-Kala to Kurgan-Tyube -10 km	10 km	<p>The L23 is the ten-kilometre road connecting the A384 to Kurgan Tyube and is vital as it is the only link available between these roads. This section also has the highest traffic volume in terms of ADT of all project roads.</p> <p>Rehabilitation activities include: Vakhsh River Bridge and most of the 10 km long section between the Dushanbe - Aivadj road (A384) and the Kurgan-Tyube – Dangara Road (12R15) and was in need of minor rehabilitation such as resealing/overlay to maintain the road in good condition.</p>
<b>R15</b>	(Kurgan-Tyube - Dangara).– 72 km	9 km	<p>The R15 is the road that connects Kurgan Tyube to the A385 at Dangara. Project activities focus on the section between km 23 - km 32, which has very steep gradients all along the section, ranging from 8% to 11 %. This does not meet geometric criteria, and the vehicle fleet has difficulty traversing these grades. The section is also deficient in vertical curves that do not meet stopping sight distance criteria. The section also has some drainage problems. It required earthworks and new reconstruction.</p>
<b>A385</b>	(Dangara to Gulistan).– 50 km	50 km	<p>The entire A385 from Dangara to Kurbansheyt was rehabilitated. This section starts at km 90.75 at Dangara at the T-junction of the Kofarnihon - Pyanj road (A385) and Kurgan-Tyube – Dangara Road (12R15), and ends at km 141.5 of A385. It includes 2 bridges. The pavement was aged and deteriorated due to oxidation and lack of major periodic maintenance works.</p>
<b>R23</b>	(Gulistan -Kulyab).– 35 km	35 km	<p>This stretch of R23 has a total length of 35 km and includes five bridges.</p>

**Table 3-2 Rural Roads Rehabilitated under the Project**

	<b>Start</b>	<b>Finish</b>	<b>Length (km)</b>
<b>1</b>	Obikiik	Uyali special economic entity	26.0
<b>3</b>	Main road Kurgan-Tyube - Dangara	Zamini Nav (km 13)	4.0
<b>4</b>	Main road (km 8)	Ak Gaza	4.0
<b>6</b>	Main road (km 4)	“Sabzavot” Sovhoz	2.6
<b>7</b>	Kurgan-Tyube - Vakhsh	“Khatlon” Kolhoz	2.5
<b>8</b>	“Safarov” Kolhoz	k-k Pahta Kainar	2.6
<b>19</b>	Oktyabrsk	“Sabzavot” Sovhoz	11
<b>11</b>	Boshbulok k-k	Huseinshute k-k	12
<b>13</b>	Aksu k-k	Malikov k-k	4.0
<b>15</b>	“Safarov” Sovhoz	Kaduchi k-k	5.0
<b>16</b>	Guliston settlement	Sarichashma k-k	10.0
<b>17</b>	“Nazarov” Sovhoz	Tudovkash k-k	3.0
<b>18</b>	Kulyab	Tugmachi k-k	4.0

#### **4.0 INFRASTRUCTURE DEVELOPMENT ISSUES**

As indicated by the Project Performance Monitoring System (PPMS) infrastructure development is one of the two key sets of parameters of road effectiveness to be monitored at this stage of the Project for the preparation of this Report. For the purpose of evaluation and analysis in this M&E Report, the indicators and goals accepted in the baseline survey (2002) and monitoring survey (2005) have been applied. This M&E Report contains the comparison only of parameters set in the abovementioned reports. Extensive analysis of all indicators necessitates the review of the original documentation of preliminary surveys which either is not available or there is no access to it.

For convenience of calculations in constant prices an estimated deflator of 1.4 was applied with an allowance for the inflation rate. However to assess the impact of the road on freight carriage and passenger carriage it is necessary to take into account the particularities of the past period while bringing calculations to general prices. In comparing prices with those of 2005 proper consideration must be given to the fact that petrol and diesel oil price escalation by far surpasses the inflation rate (consumer prices growth) and naturally significantly impacts transportation services costs. Thus, according to the State Statistics Committee of the Republic of Tajikistan in early autumn 2005 1 litre of petrol A-93 cost 1.75 somoni while in early October 2006 it reached 2.80 somoni (i.e. 60% of actual price escalation) while the general inflation rate in the Republic of Tajikistan for 2005 was 7.1 % (The World Fact book) and for 9 months of 2006 the growth of consumer prices was 6.6% according to the CIS Interstate Statistics Committee. However the average growth rate for transportation services correlates with general inflation rates.

#### **4.1 Value of Cargo and Time**

Traffic speed is one of the key characteristic affecting the value of cargo. It is especially true for the perishable products which must be delivered to consumers in the shortest possible time. Farmers have acknowledged 4% losses of the cargo value at its transportation, which is somewhat less than previously noted 5% before the start of the road rehabilitation.

Typical road rehabilitation projects aim primarily at reducing vehicle operating costs and saving time for road users. In this respect, the Team assessed the extent to which the road rehabilitation project from Dushanbe to Kulyab has affected these road user costs through two indicators: (i) the value of cargo and time; and (ii) the road condition and level of roughness.

A trend of reducing journey time losses continues thus improving access to health and educational facilities. 75 percent of drivers in the survey of 2006 against 33 percent in 2002 stated that a better condition of the road told favourably on the value of cargo.

#### **4.2 Road Conditions – Roughness Data**

Despite the improved condition of the Project road according to the recent drivers' survey a trend of vehicle repair and maintenance costs continues. This may partly be due to the fact that only 114 km of the 254 km long road was rehabilitated and the un-rehabilitated sections have deteriorated since the beginning of the Project. Thus average annual vehicle repair costs have risen this year from 239 somoni to 309 somoni in constructed value of 2002. The expenses growth may result from a higher intensity of vehicle operation and appearance of a larger quantity of expensive vehicle models inducing higher maintenance costs. As far as rural roads are concerned the key indicator of the road condition after its rehabilitation is reduced time required to get to the main road. If before the rehabilitation it took on the average 40 minutes after the rehabilitation completion it took 30 minutes and the journey time according to the survey of 2006 has reduced on the average to 26

minutes. Such a significant change relates mainly to an increase of the cars' quantity on rural roads. Though no traffic count was done on rural roads the increase of traffic volume is evident. Many rural road users responded that the road rehabilitation prompted the purchase of a private car, those who have had their own car stated that before the rehabilitation they had driven their car rarer than currently.

### 4.3 Transport Volumes and Freight Charges

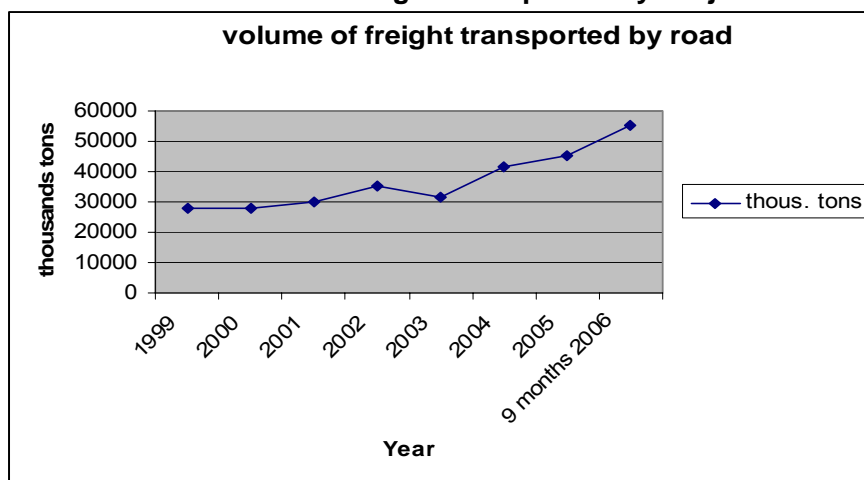
According to Government statistics a 1 t freight charge for intercity transportation set by transportation companies in absolute figures increased by 14% on the average, considering significant inflation rate and POL price escalation there are no notable changes of freight charges for intercity transportation. A significant indicator is a growth of transportation volumes on the main road which is substantial as it is with a trend to increase. The changes in the transportation volume since 1999 are illustrated by Table 4-1 below.

**Table 4-1 Changes in Transportation Volumes since 1999**

Year	Freight Transported (1000 tons)
1999	27,742
2000	27,676
2001	30,012
2002	35,491
2003	31,670
2004	41,718
2005	45,126
9 months of 2006	55,114

The correlation between the growth of transportation volumes and the rehabilitation of the road is evident, though there is no denial of impact of other factors. The growth of transportation volumes could as well be induced by other factors like increase of the road importance as a transit corridor for freight flows to Afghanistan and the GBAO. Regarding the latter the role of the Project road becomes even more important in winter time when the Project road serves as a single linking route to connect this remote province of Tajikistan with the central regions of the country. Table 4-1 and Exhibit 4-1 show the dynamics of changes from 1999 before the start of rehabilitation up to 2006.

**Exhibit 4-1 Volume of Freight Transported by Project Road**



#### 4.4 Improvement of Road Maintenance

One of the indicators of efficient road use is allocation of maintenance budget. According to the MOTC data the maintenance budget is constantly growing. This year repair and maintenance budget of the Project road is 15,900 somoni/km.

**Table 4-2 Annual MOTC Maintenance Budget for the Project Road**

Years	Annual MOTC repair and maintenance budget for the Project road	
2000	103.2	
2001	118.8	+ 15 %
2002	148.8	+ 25 %
2003	201.6	+ 35 %
2004	649.2	+ 222 %
2005	1156.8	+ 78 %
2006	1594.8	+73 %

Thus after the completion of the civil works the maintenance allocations for the Project road have increased by 73%. According to MOTC for the Project road repairs and maintenance 4 graders (12H), 2 bulldozers (D6N), 5 excavators and 1 front lift were purchased, totally 12 pieces of maintenance equipment.

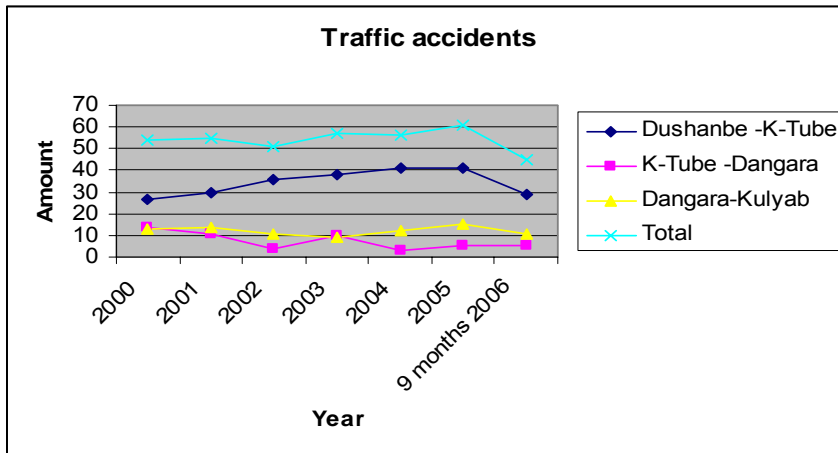
#### 4.5 Road Safety

According to Traffic Police data there is no outstanding reduction in accident rates on the sections of Project Road. However it is worth noting that Government statistics refers to the whole length of the route Dushanbe – Kulyab without details of the rehabilitated sections. Nevertheless considering the rapid traffic intensification on the busiest section Dushanbe – Kurgan-Tyube there is no exceptional increase in the rate of traffic accidents which indirectly testifies to a considerable decrease of relative accident rate. If directly after the Project road rehabilitation there was a trend of a certain increase of road traffic accidents as the drivers could not fit in the new capacities of the Project road and would frequently loose the sense of proportion at high speed, at present the situation is being stabilized and there is a tendency of decrease of road traffic accidents.

**Table 4-3 Persons Wounded in Traffic Accidents on Project Road**

Road Section	2002	2003	2004	2005	9 months of 2006
Dushanbe – Kurgan Tyube	64	53	67	67	46
Kurgan Tyube – Dangara	6	10	2	5	7
Dangara - Kulyab	10	15	11	15	13
<b>Total</b>					

**Exhibit 4-2. Traffic Accidents on Project Road**



#### 4.6 Traffic Volume

The growth of traffic volume is an important indicator of the road rehabilitation impact. Traffic count on Project road was carried out on all sections of the main road in 2000 before the start of the rehabilitation and in 2005 at completion of the Project. The results of the traffic count and a detailed comparative analysis of traffic volumes have been provided in the Preliminary Report (PCR) prepared in 2005. This Section assesses new findings of the 2006 traffic count. The goal of the current survey was to verify the trends revealed earlier and to study the distribution evolution of the traffic flows.

In the 2006 survey a 12-hour-traffic-count mode was applied with a day-night factor adjustment of 1.2 for night time. Besides on Kizilkala – Kurgan-Tyube section there was a 24 Hour Traffic Count was carried out to verify the coefficient applied and reveal types of traffic volume distribution at different time periods of day and nights.

**Table 4-4 Comparison of Average Daily Traffic Volume in 2005 and 2006**

Section	Year	Comparison of Average Daily Traffic Volume in 2005 and 2006 (24 Hour Traffic Count)							
		Car	Pickup	Minibus	Bus	2-axle Truck	3-axle Truck	Articulated Truck	Total
A 384	2005	3,365	59	274	138	161	163	26	4,186
	<b>2006</b>	<b>4564</b>	<b>45</b>	<b>198</b>	<b>40</b>	<b>110</b>	<b>95</b>	<b>54</b>	<b>5106</b>
L23	2005	3,666	35	350	102	146	217	37	4,554
	<b>2006</b>	<b>4955</b>	<b>91</b>	<b>242</b>	<b>39</b>	<b>173</b>	<b>242</b>	<b>71</b>	<b>5813*</b>
R15	2005	1,522	24	130	58	90	107	30	1,960
	<b>2006</b>	<b>1680</b>	<b>48</b>	<b>62</b>	<b>40</b>	<b>68</b>	<b>44</b>	<b>4</b>	<b>1946</b>
Total A385 & R23	2005	3,162	74	335	97	121	160	68	4,018
	<b>2006</b>	<b>3330</b>	<b>29</b>	<b>82</b>	<b>26</b>	<b>43</b>	<b>62</b>	<b>12</b>	<b>3584</b>
Average	2005	2,782	53	256	100	127	148	42	3,508
	<b>2006</b>	<b>3632</b>	<b>53</b>	<b>146</b>	<b>36</b>	<b>99</b>	<b>111</b>	<b>35</b>	<b>4112</b>

Section L23 gives actual day and night values received in the course of actual 24 hour traffic count, in other cases 1.2 coefficient was applied for 12 hour count.

Average daily traffic volume within the specified period has increased by 17%. Especially significant changes have been recorded in sections A385 and L23 with an increase of 21% and 27% respectively. A certain traffic decrease at Dangara – Kulyab section against the data of 2005 may be attributed to seasonal reasons, for the count was carried out at a relatively short idle time between the end of harvesting and full redirectioning of the GBAO traffic to the Project road during the winter time. A substantial increase of the cars quantity is notable for all sections of the Project road. An important feature is a shift of a considerable portion of freight transportation to the night hours. One of the objectives of a 24 hour count was the substantiation of the trend illustrated in Exhibits 4.3 – 4.7. It should be noted that the same trend was recorded in many countries of the world and may be regarded as yet another sign of improved road safety. Heavy truck drivers prefer to drive at night because the increased car traffic in the day time impedes their driving. It is worth mentioning that many of the newly licensed car drivers do not have either sufficient experience or high qualification. Another reason pertaining to it is the decrease of GAI check-points and other points of control and registration of freight traffic at night time. The preliminary report (PCR 2005) states a considerable decrease of busses in comparison with cars' increase against the pre-rehabilitation period. This trend continuously developed the number of busses on the road decreased by 64% against the value of 2005. Exhibits 4-3, 4-4 and 4-5 illustrate 24-hour traffic distribution by vehicle types and traffic features in the day and night time.

**Exhibit 4-3**

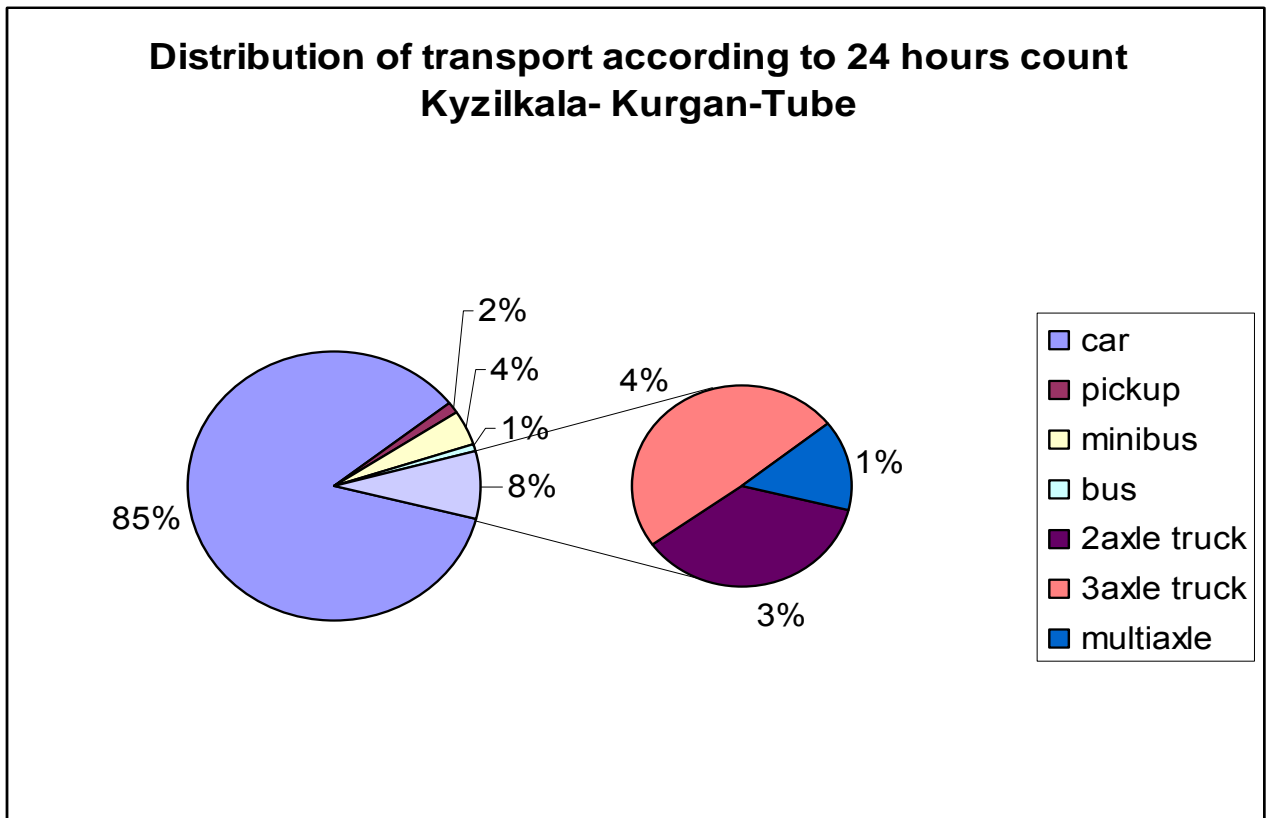


Exhibit 4-4

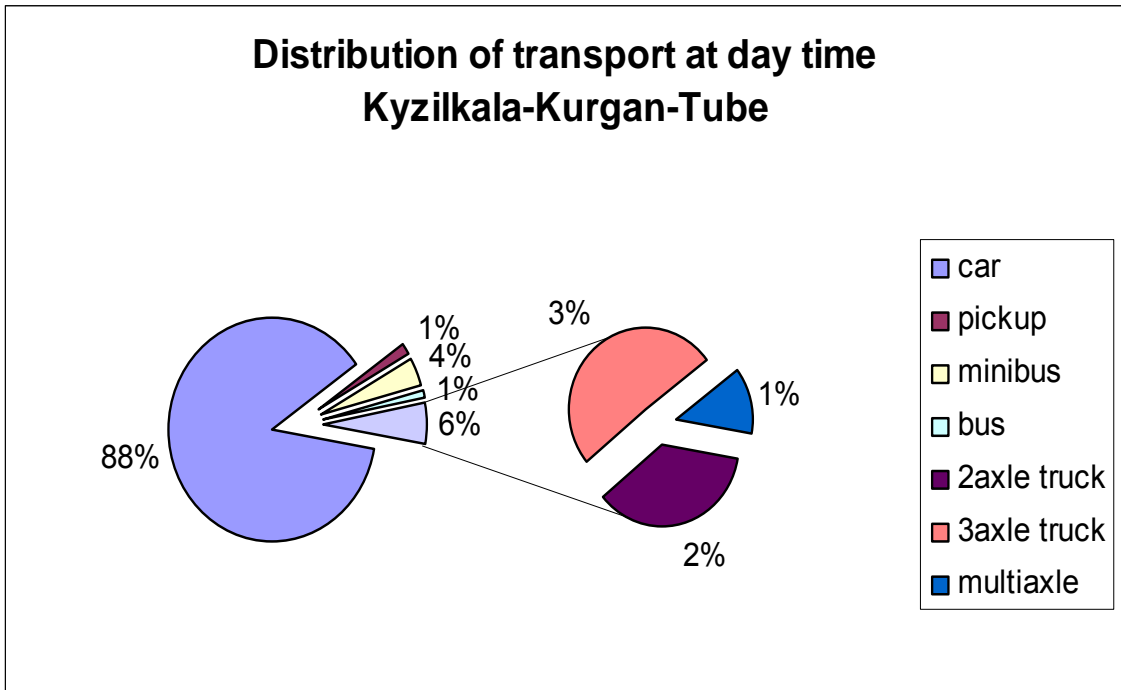
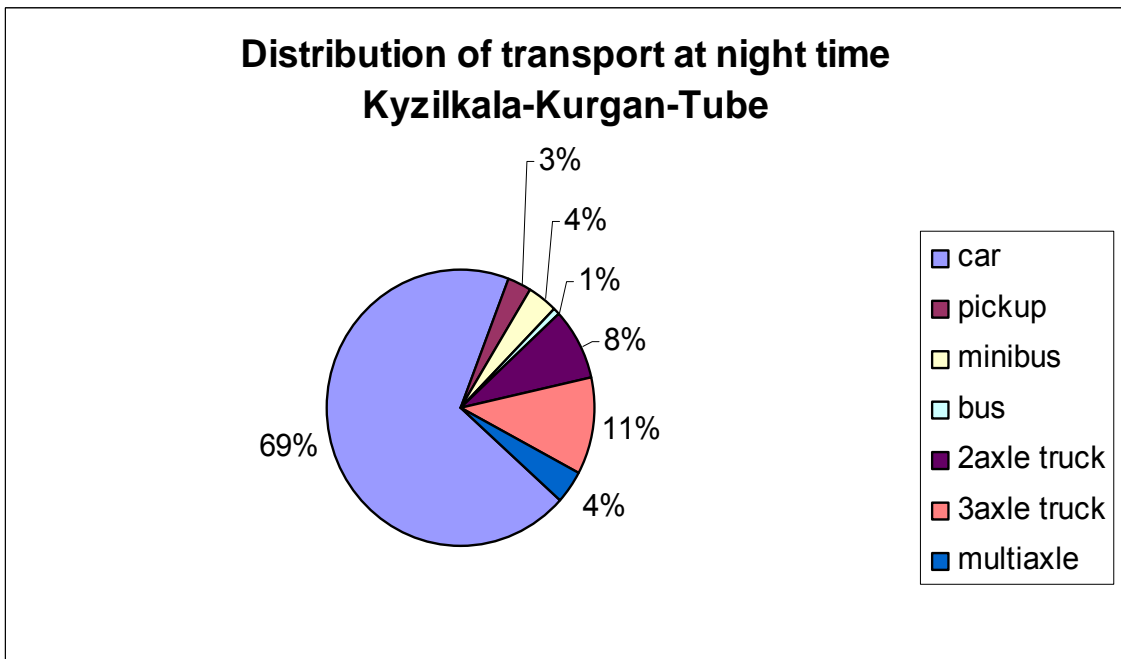


Exhibit 4-5





## 5.0 SOCIO-ECONOMIC MONITORING AND EVALUATION

### 5.1 Poverty Reduction

The Project road is restricted nearly completely to the territory of Khatlon Province with the 45% <sup>(1)</sup> of the country's population according to the data of international experts which under the experts' classification is attributed to poor strata of the population. The absolute poverty line according to the World Bank data was accepted as 2.55 somoni/person/day. Operational Gross Domestic Product of the country by the end of 2007 reached 7,291,000 somoni, equal to 106.7% against the data of early 2005. By the end of the first half of 2006 the GDP growth rate reached 7.1 %. Irrespective of the steady reduction of poverty level Tajikistan remains one of the poorest countries of the world.

In view of the fact that Khatlon Province has always been mainly an agrarian region the impact of the Project road on the modification of the farmers' living standards was accepted as a criteria for the assessment of the Road Rehabilitation Project's contribution to the reduction of poverty level. Agriculture accounts for 23.4% of Tajikistan GDP and involves 67.2% of labour force in the Republic of Tajikistan. According to State Statistics Agency data as of January 1, 2006 there were 11,338 dehkon<sup>2</sup> entities (individual farms) registered in the Khatlon Province holding certificates of general land tenancy. Farmers as a social group largely depending upon the communications' and utilities' conditions were set into a separate target group for the purpose of social surveys at the feasibility study stage and for data collection for this report. One of the factors influencing the survey results was the farmers' identification difficulty regarding the criteria set in the course of the baseline survey. According to the accepted definition farmers are persons using the land legally or illegally to generate agricultural produce and income resulting from its sales.

Currently the agricultural sector is in the process of reformation yet far from its completion. Large collective farms have split up into individual farms. In most of the cotton growing regions those are large enough agricultural entities using hundreds of hectares of arable-land on the general land tenancy basis, because private land ownership is not practiced in the country. It should be noted that the use of expansive fields for cotton growing would be regulated mostly through administrative rather than market instruments. In such circumstances farmers and managers of the entities would not differ a lot from chairmen of former collective farms using the hired labour. Frequently arable land is redistributed internally among dehkons on a sub tenancy basis although tenants are usually are alienated from their produce and have no choice in choosing the sales market for raw cotton.

However lately there are other positive trends rooting and developing in the agricultural sector. The survey results revealed a considerable amount of creative farmers possessing substantial enterprising independence who have accumulated a certain starting capital and successfully manage their own business. According to FAO Khatlon Province is the major wheat producer in Tajikistan, it produces more than a half of the grain produced on the irrigated fields of the country and not less than 66% of wheat on dry land; in which connection Khatlon is the only region with a potential to satisfy its own needs in wheat.

The size of farms varies from a dozen of sotka<sup>3</sup> allotted to dehkons under a special President's decree to several hundreds of hectares. An interesting finding is a trend to diversify farmers' activities and an aspiration to introduce innovative know-how. Thus an owner of a large farm growing wheat in the vicinity of Dangara stated that he is starting to raise cattle and showed calves of English breed purchased in Hissor District. Approximately 57% of farmers use intermediaries' services which is considerably higher than the findings 30% of the previous report (PCR 2005).

---

<sup>2</sup> local for a villager engaged in farming

<sup>3</sup> one hundred part of hectare

The main motivation is reluctance to waste time which is acquiring more value. The trend of selling produce at remote markets is characteristic of large farms which can afford to deliver to the market substantial quantities of produce. They are the main beneficiaries of the main road rehabilitation Project, while small farmers accounting for 90% of the interviewed, who seem to be main fruit and vegetable suppliers to town-type settlements within the Project area, benefit mainly of the rural roads rehabilitation. The rural roads rehabilitation pertained to the reduction of produce transportation losses within one year from 5% to 4%.

One of the Poverty Reduction Indicators is the increase of private vehicles. According to the survey findings the share of cars in general transport flow has reached 88% of the total traffic.

The Project road serves as one of the most important arteries of the country. Therefore though all interviewed drivers stated that they use the Project road it does not imply that they use the road at all its length.

Drivers' survey revealed that the proportion of drivers' ownership of vehicles again increased to approximately 83 percent. Within the period from 2002 to 2005 this indicator had decreased from 80% to 75%. Among car drivers the car ownership reached 95%. The proportion of drivers that privately leased vehicles had slightly decreased within this year from 14 percent to 12 percent, while those who worked directly for the Government or leased a vehicle from a large joint stock company counted only 7 percent. Before the rehabilitation they were reported as 15% reducing to nine percent in 2005. Among lease holders the proportion of truck, bus and minibus drivers reaches 40%. The survey was carried out on all main sections of the road and it confirms that the proportion of Government vehicles in the total volume of commercial transportation is extremely small. It should be noted that vehicles of law enforcement bodies (say the army, militia etc.) were not embraced by the survey and are not subject to analyses of the current report. Practically all leasing drivers stated that their lessor was a small operator who, to the best of their knowledge, owned only one vehicle. Nevertheless, 30% of the drivers stated that passenger and freight transportation prices were regulated by the tax authorities, by licensing bodies or by local authorities.

Within the last year travel time per bus or minibus trip that decreased according to the data of the preliminary report (PCR 2005) due to road rehabilitation by 26 and 11% saw no further changes. Of course after a rapid increase of fuel prices (60%) within a year after the last survey of 2005 there was no escape of its impact on passenger fares. However in real terms passenger fares that changed insignificantly since the last survey (2005) and cost 4.5 somoni (2006) against 3.7 somoni. There were also changes noted for minibus fares from 5.3 Somoni (2005) up to 7.2 somoni (2006) in the prices of 2002. It should be noted that passenger fares grew considerably despite drivers' assertions that they try to be flexible and regulate fares regarding the passenger volumes. Therefore car-taxis gradually drive mini-busses out from the market, in addition to busses which a year ago prevailed in passenger transportation on the major traffic routes of the Project road.

One of the reasons is the rehabilitation of the road which induced competitiveness in the transportation market and substantially mitigated the inevitable consequences of the POL price increase.

## **5.2 Income and Expenditures Trends**

To receive answers to questions related to expenditure and income was one of the most complicated tasks during the survey. Up to recently there was no practice of regular social surveys and people feel certain discomfort when asked questions related to their income.

Therefore in the analyses there should be a certain correlation to the respondents' inclination to decrease their income and conceal their income sources. In the assessment of the living standards it is a more reliable approach to assess expenditures. Farmers' average monthly expenditures reached 374 somoni in the prices of 2002, though there is a significant income gap between the poorest and the richest. There are evidences of a notable farmers' income growth, though there are no accurate records regarding it in the findings of the previous studies. None of the farmers acknowledged that exactions at GAI check points caused a substantial hindrance for business. Greater part of drivers also refused to answer the question. Nevertheless, 10% respondents involved in commercial freight and passenger transportation stated that they would pay from one to five somoni even without any violations of traffic rules or license or waybill validation. In comparison with the last year drivers' household expenditure has grown from 397 somoni per family to 473 somoni. The growth in current prices makes 17%. An average expenditure of passengers reached 560 somoni per month. The exact data of their expenditures received in the course of the survey did not hold out, but it is evident that the growth and diversification of all surveyed target group expenditures will be approximately the same.

### **5.3 Access to Markets**

Within one year the number of farmers' selling their produce at the nearest market decreased from 48% to 43%. One of the evident results of the road rehabilitation is a trend of division of labour and activities diversification. Thus the number of farmers selling their own produce at the market went down. If according to 2002 survey their number was assessed at 70%, the data of 2005 gave 61%, nowadays the number of such farmers reduced to 43%. An interesting consequence of the rehabilitation was the attraction of local markets for farmers and second-hand dealers living far from the Project area (i.e. in Hissor), but using the Project road for delivery of perishable goods from outside to the local markets. The reduction of transport expenses in the produce price from 7.8 % to 5.8% testifies both about the road improvement and the increase of the market specialization due to the completed rehabilitation.

### **5.4 Transformation of the Social Role of Women**

The survey results confirmed a current trend to safeguard traditional values and mode of living. Thus the majority of respondents had considerable difficulty in determining the amount of time spent by women for leisure and recreation. The majority of the respondents' families (95%) have many children and rest for women though referred to as 'unemployed' is restricted to hours necessary for a sleep, the main recreations for women are attendance of various family festivities and watching TV in the evening.

At the same time due to economic environment the role of women is undergoing considerable changes. In the circumstances of unemployment reaching 45% according to the survey data a lot of men leave their homes and go to Russia to earn their living and women have to take upon themselves the responsibility to support their families. Besides in many cases women much easier than men fit in the small business. Though the number of interviewed women in the target groups was considerably less than men (which is explained mainly by a tradition especially strong in rural areas when women are not encouraged to talk with strangers) at least 10% of women positioned themselves as farmers or businesswomen. According to State Statistics Agency from 10 to 14% of households in the Project area are managed by women (Socio-economic Atlas of Tajikistan 2005). The data is backed up by the social survey. The rehabilitation of the Project road did play a significant role in the process of stimulating the enterprising activities of women because business trips for women have become safer in all aspects. Another important indicator of the modification of the role of women is the increase of the number of women driving a car. If according to the

survey data of 2005 the majority of drivers said they could not recall more than one woman driving a car for the past year the findings of the last survey assert that many drivers saw dozens of women driving a vehicle. The trend is confirmed by the observations during the traffic counts. However it is true about Dushanbe – Kurgan-Tyube Section of the Project road.

## **5.5 Access to Health Facilities**

The improvement of access to health services is one of the most important indicators of the Project road impact on poverty alleviation. The survey of 2005 of different target groups confirmed a considerable improvement of access to health institutions. Eighty eight percent of all respondents said that it took them less than one half hour to get to the closest health facilities. According to the 2005 survey 77% of respondents in rural area said that it took less than one half hour to get to the closest health facilities against 50% in 2002. In 2006 similar answer was given already by 90% of all respondents. In which connection the number of respondents using bus services reduced twice against the data of 2005. For example as a result of rehabilitation of rural road №1 regular bus connection between Khuroson and Uyali has practically stopped, as private taxis ousted the busses from the service because for small extra fare they provide comfort and time saving.

## **5.6 Access to Education**

Surveys in 2006 did not reveal significant changes in comparison with last year findings and the period preceding the rehabilitation. School children used to walk and would walk nowadays. This is explained by close layout of dwellings and school buildings in practically every settlement. Average distance to a school would not exceed 500 meter therefore the rehabilitation of the road had no effect on this indicator. Only students evidently benefited from the rehabilitation of rural roads. Though their number among interviewed passengers and rural road users is only 4%, but half of them stated that due to the rehabilitation of the road they can regularly come home by taxi, which is a peculiar statement for one of the poorest countries of the world.

## **5.7 Occupational Diversification**

Results of the surveys indicated that previously identified trends of diversification the population occupations alongside with market specialization. People are impelled to change their occupation and move from one trade to another or would be frequently involved in different types of activities. It can be attributed to rapid growth of economy and its transitional character, all these hinder self-identification of the respondents. Thus a militiaman admitted that he leased two hectares of field to grow wheat for sale, thus he could be regarded as a farmer. A respondent who called himself a schoolteacher informed that most of his time he spends for small size wholesale purchase and delivery of manufactured goods by the Project road to his settlement for subsequent resale to retail dealers. It is worth mentioning that in most households a sort of specialization and division of responsibilities in small business is practiced, though members of the household regard themselves unemployed, their role is essential in the distribution of household responsibilities. A general trend currently observed is the respondents' involvement in small business and the increase of the respondents' number identifying themselves as construction workers (10%) which is connected with general business activities and increase of the construction volumes.

## 5.8 Development of Small Business and Roadside Infrastructure

The Project road rehabilitation stimulated rapid development of small business in the adjacent territory. At a stage prior to rehabilitation there was no research of the status of small business directly involved in relevant road services. However the findings of 2006 survey revealed that the number of petrol stations, roadside canteens and maintenance service centres increased within the last year at least by 20%. According to one of the road users, working as a petrol station operator the growing competition compelled the petrol stations owners only within October 2006 to lower POL prices by 5%. According to State Statistics Agency revenue in the sector of goods and services sale provided by small business (less than 15 persons employed) in Khatlon Province was more than 9,681,360 somoni as of January 1, 2006. Though according to official statistics average monthly wages at Khatlon small business enterprises in 2005 was 73.26 somoni real incomes were likely to be higher. In the Project road corridor the number of dehkun farms (see Table 5.1) grew considerably. It is rather difficult to determine a true causative correlation between the Project implementation and the above mentioned socio-economic processes. However one can be positive that the road rehabilitation was a well-timed step and contributed substantially to the socio-economic regional development.

**Table 5.1 Increase of Small and Middle Size Businesses and Dehkun Farms in the Project Road Corridor in Khatlon Province (provided by State Statistics Agency)**

District	Small Businesses (up to 50 persons)			Large Businesses (more than 50 persons)			Dehkun Farms		
	1.01.04	1.01.05	1.01.06	1.01.04	1.01.05	1.01.06	1.01.04	1.01.05	1.01.06
Voseh	47	55	67	4	4	5	452	577	715
Dangara	32	37	44	7	7	7	259	376	509
Khuroson	11	14	15				354	384	408
Jami	13	17	20	1	1	1	272	336	398
Bohtar	15	17	22	1	1	2	72	93	103
Kulyab	6	8	12				130	135	137
Hamadoni	20	26	30				200	215	299
Sarband	1	1	1	0	0	0	9	9	14
Temurmalik	5	9	10				200	311	379

## **SUMMARY AND RECOMMENDATIONS**

On the whole practically all indicators set for evaluation of the rehabilitation project have confirmed the correlation of the findings with the goals set. The expenditure statistics confirms a certain improvement and diversification of life which the road rehabilitation could not fail to influence though it is not necessarily correlated directly. The road rehabilitation undoubtedly contributed to the investment increase in the development of small business and the growth of the farms quantity and their earnings. Surveys have also confirmed the importance of the rural road rehabilitation for social development. Positive effects are especially notable at relatively lengthy roads, such as rural road №1. For majority of the farmers the main standing restraint to production is the shortage of water and land.

Some negative aspects relevant to rural roads rehabilitation should be mentioned so as to avoid them in subsequent projects. There were complains that after rehabilitation drivers do not follow speed restrictions within settlements. Villagers insisted that the road should be supplied with speed limiting facilities within settlements and this request is an imperative due to a large number of children in rural settlements. Special accident reducing measures should be implemented on the main road.

Despite the definition of the Project corridor as 5 km on both sides of the Project road the impact of the road area is unquestionably stronger for it causes not only nation-wide but also international effect. The Project road is an important link contributing to the socio-economic development of the country and implementation of the Government Poverty Alleviation Programme.

## **Appendix 1 Traffic Counting Forms**

03.09.06.

Direction Kulyab - Dangara (km 93)

Time	Car	Pickup	Minibus	Bus	2 axis Truck	3 axis Truck	Other Vehicles	Total Vehicles
07-00 to 08-00	79	1	2	1		2		85
08-00 to 09-00	158		3		1			162
09-00 to 10-00	205		3	2	3	1		214
10-00 to 11-00	184		6	4	1	5		200
11-00 to 12-00	114	2	2	2	2	5		127
12-00 to 13-00	106	2	3	2	3	2	2	120
13-00 to 14-00	74		1		1			76
14-00 to 15-00	75	4	3			1		83
15-00 to 16-00	80		3		4	2	1	90
16-00 to 17-00	89	2	1	1	2	3		98
17-00 to 18-00	59		1		1	1		62
18-00 to 19-00	50	3			1	2		56
<b>TOTAL:(12 h traffic count)</b>	<b>1273</b>	<b>14</b>	<b>28</b>	<b>12</b>	<b>19</b>	<b>24</b>	<b>3</b>	<b>1373</b>
<b>Total (24 h traffic count)</b>								<b>1649</b>
<b>Coef. 1.2</b>	<b>1528</b>	<b>17</b>	<b>34</b>	<b>14</b>	<b>23</b>	<b>29</b>	<b>4</b>	

03.09.07.

Direction Dangara – Kulyab (km 93)

Time	Car	Pickup	Minibus	Bus	2 axis Truck	3 axis Truck	Other Vehicles	Total Vehicles
07-00 to 08-00	39		2	1		4		46
08-00 to 09-00	76	1	3			1	1	82
09-00 to 10-00	127		2		1	3		133
10-00 to 11-00	142	2	5	1	3	1	1	155
11-00 to 12-00	157	1	6	1	1		1	167
12-00 to 13-00	140		3	2	2	1		148
13-00 to 14-00	112	1	5	2	1	2		123
14-00 to 15-00	141	2	3	2	2	2	1	153
15-00 to 16-00	140		3	1	2	10	1	157
16-00 to 17-00	160	1	6		2	1	2	172
17-00 to 18-00	150	2	1		1	3		157
18-00 to 19-00	118		1		2			121
<b>TOTAL:(12 h traffic count)</b>	<b>1502</b>	<b>10</b>	<b>40</b>	<b>10</b>	<b>17</b>	<b>28</b>	<b>7</b>	<b>1614</b>
<b>Total (24 h traffic count) Coef. 1.2</b>	<b>1802</b>	<b>12</b>	<b>48</b>	<b>12</b>	<b>20</b>	<b>34</b>	<b>8</b>	<b>1936</b>

03.09.08.

Direction Kurgan–Tyube - Dangara (69 km)

Time	Car	Pickup	Minibus	Bus	2 axis Truck	3 axis Truck	Other Vehicles	Total Vehicles
07-00 to 08-00	44		4		3	3		54
08-00 to 09-00	78	1	2	4	4			89
09-00 to 10-00	73	2	5	1	4	1		86
10-00 to 11-00	71	2		3	2			78
11-00 to 12-00	71	3	5	2		4		85
12-00 to 13-00	54	2	3	2	3	5		69
13-00 to 14-00	46	1	2	1	2	1		53
14-00 to 15-00	47	3	3	2	1	1		57
15-00 to 16-00	46	2	1		4			53
16-00 to 17-00	49	2	2	1	4	2		60
17-00 to 18-00	48			2	2	2		54
18-00 to 19-00	38	2			3	2	1	46
<b>TOTAL:(12 h traffic count)</b>	<b>665</b>	<b>20</b>	<b>27</b>	<b>18</b>	<b>32</b>	<b>21</b>	<b>1</b>	<b>784</b>
<b>Total (24 h traffic count) Coef. 1.2</b>	<b>798</b>	<b>24</b>	<b>32</b>	<b>22</b>	<b>38</b>	<b>25</b>	<b>1</b>	<b>940</b>

03.09.09.

Direction Dangara - Kurgan-Tyube (69 km)

Time	Car	Pickup	Minibus	Bus	2 axis Truck	3 axis Truck	Other Vehicles	Total Vehicles
<b>07-00 to 8-00</b>	35		2		3	1		<b>41</b>
07-00 to 08-00	69	1	2	2	2	1		<b>77</b>
08-00 to 09-00	110	2	2	1	1	4		<b>120</b>
09-00 to 10-00	100	2	6	4	2	2		<b>116</b>
10-00 to 11-00	62	2	3	2	1			<b>70</b>
11-00 to 12-00	62	2	3	2	2			<b>71</b>
12-00 to 13-00	56	2	4	2	2	3	1	<b>70</b>
13-00 to 14-00	64	4	1					<b>69</b>
14-00 to 15-00	61	2	1	1	3	2	1	<b>71</b>
15-00 to 16-00	55	1	1	1	6	2		<b>66</b>
16-00 to 17-00	37	2			1	1		<b>41</b>
17-00 to 18-00	24				2			<b>26</b>
18-00 to 19-00	<b>735</b>	<b>20</b>	<b>25</b>	<b>15</b>	<b>25</b>	<b>16</b>	<b>2</b>	<b>838</b>
<b>TOTAL:(12 h traffic count)</b>	<b>882</b>	<b>24</b>	<b>30</b>	<b>18</b>	<b>30</b>	<b>19</b>	<b>2</b>	<b>1005</b>

**03.09.10. Direction Kizil-Kala - Kurgan-Tyube (3 km)**

Time	Car	Pickup	Minibus	Bus	2 axis Truck	3 axis Truck	Other Vehicles	Total Vehicles
07-00 to 08-00	182		8	2	1	6	2	201
08-00 to 09-00	205	1	6	3	2	2	3	222
09-00 to 10-00	232	1	11	1	5	3	3	256
10-00 to 11-00	233	3	8	2	1	11	3	261
11-00 to 12-00	232	2	9	3	6	14	1	267
12-00 to 13-00	198	1	10	2	8	11	3	233
13-00 to 14-00	204	4	7		2	6		223
14-00 to 15-00	143	10	10	4	4	6	1	178
15-00 to 16-00	174	8	8		8	8	1	207
16-00 to 17-00	186	6	12	3	9	5	2	223
17-00 to 18-00	154	6	13		13	11		197
18-00 to 19-00	114	5	7		15	3	3	147
<b>TOTAL:(12 h traffic count)</b>	<b>2257</b>	<b>47</b>	<b>109</b>	<b>20</b>	<b>74</b>	<b>86</b>	<b>22</b>	<b>2615</b>
19-00 to 20-00	67	4	1	1	3	5	1	82
20-00 to 21-00	46		1		3	13	3	66
21-00 to 22-00	17	1			1	9	2	30
22-00 to 23-00	19				1	4	2	26
23-00 to 24-00	19				3	1	1	24
24-00 to 01-00	2		2			3	2	9
01-00 to 02-00	5		3			3	3	14
02-00 to 03-00	7							7
03-00 to 04-00	11		1		5	6		23
04-00 to 05-00	7			2	8	1		18
05-00 to 06-00	19	1	4	1	10	2	2	39
06-00 to 07-00	55	1	1		5	3	3	68
<b>Total night:</b>	<b>274</b>	<b>7</b>	<b>13</b>	<b>4</b>	<b>39</b>	<b>50</b>	<b>19</b>	<b>406</b>
<b>Total (24 h traffic count)</b>	<b>2531</b>	<b>54</b>	<b>122</b>	<b>24</b>	<b>113</b>	<b>136</b>	<b>41</b>	<b>3021</b>

03.09.11.

## Direction Kurgan–Tyube - Kizil–Kala (3 km)

Time	Car	Pickup	Minibus	Bus	2 axis Truck	3 axis Truck	Other Vehicles	Total Vehicles
07-00 to 08-00	139	2	6	1		4	1	153
08-00 to 09-00	226	1	9		2	8		246
09-00 to 10-00	274		16	1	6	4	1	302
10-00 to 11-00	210	1	14	2	5	1		233
11-00 to 12-00	207	3	8	3	2	6	1	230
12-00 to 13-00	177	3	7	1	3	6	1	198
13-00 to 14-00	165	6	8	2	3	8	2	194
14-00 to 15-00	217	2	6	2	6	11	2	246
15-00 to 16-00	165	3	6		3	7	2	186
16-00 to 17-00	198	3	14			14	4	233
17-00 to 18-00	145		8		5	6	5	169
18-00 to 19-00	72		5		4	2	1	84
<b>TOTAL:(12 h traffic count)</b>	<b>2195</b>	<b>24</b>	<b>107</b>	<b>12</b>	<b>39</b>	<b>77</b>	<b>20</b>	<b>2474</b>
19-00 to 20-00	39		2		4	2	1	48
20-00 to 21-00	35	1			1	7		44
21-00 to 22-00	30	2	2	2	1	6		43
22-00 to 23-00	30	1			2	2	1	36
23-00 to 24-00	8		2	1	5	3		19
24-00 to 01-00	6		2		2	3		13
01-00 to 02-00	7		1		3	4	4	19
02-00 to 03-00	6				2	1	2	11
03-00 to 04-00	7							7
04-00 to 05-00	9	3						12
05-00 to 06-00	13	4				1		18
06-00 to 07-00	39	2	4		1		2	48
<b>Total night:</b>	<b>229</b>	<b>13</b>	<b>13</b>	<b>3</b>	<b>21</b>	<b>29</b>	<b>10</b>	<b>318</b>
<b>Total (24 h traffic count)</b>	<b>2424</b>	<b>37</b>	<b>120</b>	<b>15</b>	<b>60</b>	<b>106</b>	<b>30</b>	<b>2792</b>

## Direction Kurgan–Tyube – Dushanbe (53 km)

Time	Car	Pickup	Minibus	Bus	2 axis Truck	3 axis Truck	Other Vehicles	Total Vehicles
07-00 to 08-00	146	1	4	1		4	2	158
08-00 to 09-00	219	2	6	4	3	4	2	240
09-00 to 10-00	300		9		3	1	1	314
10-00 to 11-00	280	1	14	2	6	4	2	309
11-00 to 12-00	210	2	8	2	10	4	2	238
12-00 to 13-00	174	2	6	3	10	3	1	199
13-00 to 14-00	160	1	10	1	5	5	3	185
14-00 to 15-00	183	3	4	3	3	1	2	199
15-00 to 16-00	186	1	7	1	4	6		205
16-00 to 17-00	179	3	6	1	5	5	2	201
17-00 to 18-00	155	2	8		6	5	4	180
18-00 to 19-00	125	3	4		3	4	2	141
<b>TOTAL:(12 h traffic count)</b>	<b>2317</b>	<b>21</b>	<b>68</b>	<b>18</b>	<b>58</b>	<b>46</b>	<b>23</b>	<b>2569</b>
<b>Total (24 h traffic count) Coef. 1.2</b>	<b>2780</b>	<b>25</b>	<b>103</b>	<b>22</b>	<b>70</b>	<b>55</b>	<b>28</b>	<b>3083</b>

Direction Dushanbe - Kurgan-Tyube (53 km)

Time	Car	Pickup	Minibus	Bus	2 axis Truck	3 axis Truck	Other Vehicles	Total Vehicles
07-00 to 08-00	83		1		3			87
08-00 to 09-00	114		5		3	3	2	127
09-00 to 10-00	189	1	9	1	3			203
10-00 to 11-00	257	2	15	4	3	3	4	288
11-00 to 12-00	198	2	16	2	6	6		230
12-00 to 13-00	187	1	8	4	3	4	1	208
13-00 to 14-00	212	4	10	4	5	7	2	244
14-00 to 15-00	215	5	12	3	6	6	3	250
15-00 to 16-00	221	3	14	1	11	5	5	260
16-00 to 17-00	234	3	6	2	5	5	6	261
17-00 to 18-00	228		8	1	2	5	4	248
18-00 to 19-00	109	3	8		2	5	4	131
<b>TOTAL:(12 h traffic count)</b>	<b>2247</b>	<b>24</b>	<b>112</b>	<b>22</b>	<b>52</b>	<b>49</b>	<b>31</b>	<b>2537</b>
<b>Total (24 h traffic count) Coef. 1.2</b>	<b>2696</b>	<b>29</b>	<b>134</b>	<b>26</b>	<b>62</b>	<b>59</b>	<b>37</b>	<b>3043</b>

## Appendix 2

### References

1. Project Completion Monitoring and Evaluation Report of the Dushanbe - Kurgan Tyube - Dangara – Kulyab Road Rehabilitation Works, 2005.
2. Social-Environmental Atlas of Tajikistan, 2005
3. CIA. World Fact book, 2005
4. State Committee of Statistics of Republic of Tajikistan. Data on small and medium size businesses as of 2005. [www.stat.tj](http://www.stat.tj)
5. Crop and Food Supply Assessment. Tajikistan 2005,