

Tajikistan

Ex-Post Evaluation of Japanese Grant Aid Project
“The Project for Improvement of Dusty – Nijiny Pyandzh Road”

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0. Summary

This project, in which major arterial roads were rehabilitated to ensure safe and stable traffic and transportation in the south-western part of the landlocked country of Tajikistan, was consistent with the development plan and needs of the country both during planning and ex-post evaluation. It was also relevant with the ODA policy of Japan during the planning stage. The effectiveness and impact of the project was high as this project achieved considerable reductions in travel time and flooding on the international highway. It also underpinned increased traffic and freight volumes and contributed to the improvement of access to a market and major cities. However, the efficiency of the project was low due to the excesses in project cost and periods compared to the plan, as the prices of construction materials escalated and more time was spent on countermeasures to the changes in procurement conditions. Also, some sections of the road began showing damage soon after the completion and some of the road surfaces still needed to be improved even during the ex-post evaluation. While the major causes are assumed to be an increased traffic volume and the passage of overloaded vehicles after project completion, shortages of budget and repair equipment of the executing agency have also resulted in insufficient repair works on the damaged sections. On the other hand, installations of vehicle weighing equipment and an establishment of management structure to crack down on overloaded transport vehicles were being explored. Also, concrete initiatives were taken for the appropriate procurement of maintenance equipment and materials, as well as for capacity building of the engineers concerned. Therefore, the sustainability of the project can be judged to be fair.

In light of the above, this project is evaluated to be partially satisfactory.

1. Project Description



Project Location



International highway developed in the project

1.1 Background

In Tajikistan, where more than 90% of the area is mountainous, regional highways connecting Tajikistan's major cities and neighbouring countries are one of the most important infrastructure facilities. Nevertheless, most of these arterial roads were built during the times of the former Soviet Union and had been left damaged for a long time, becoming a bottleneck to the growth of national economy heavily dependent on road networks for logistics and trade with its neighbouring countries. Under these circumstances, Tajikistan, with a view to developing infrastructural facilities in a systematic manner, prepared the 'Programme of Socio-Economic Development of the Transport Complex of the Republic of Tajikistan' every five years since independence, and preferentially promoted the development of major roads.

The target road of this project was planned to form part of the major arterial road connecting Tajik and Afghan capitals. This route was not only listed as the priority road in the 'Programme of Socio-Economic Development of the Transport Complex of the Republic of Tajikistan 2001 – 2005' but was also regarded as a section of the Asian Highway network. However, the project road had been damaged and left as they were since the times of the former Soviet Union. Despite routine maintenance activities within budget constraints, neither thorough rehabilitation nor reconstruction of this road section had been implemented due to a lack of equipment. It was considered necessary to repair the roads urgently to secure the functions of the regional highway¹ after the opening of

¹ Of the entire highway section from the capital city of Dushanbe to the Afghan border point, a road section between Dushanbe and Kurgan Tyube was rehabilitated by the Asian Development Bank (ADB). For the Kurgan Tyube – Dusty section, a subsequent grant aid project 'The Project for Rehabilitation of Kurgan Tyube - Dusti Road' is currently implemented. This project was implemented, with the request of Tajikistan, to rehabilitate a 23.7km section from Dusty to Nijiny Pyandzh, located at the border with Afghanistan.

the international border bridge² between Tajikistan and Afghanistan.

In light of the above, this project was implemented as a grant aid project.

1.2 Project Outline

The objective of this project was to ensure safe and stable traffic and transportation and to strengthen the functions as a regional highway by improving the national road between Dusty and Nijiny Pyandzh and two road sections in Dusty Township.

Grant Limit / Actual Grant Amount	Phase I: 595 million yen / 580 million yen Phase II: 1,324 million yen / 1,261 million yen (Initial Grant Limit for Phase II: 737 million yen)
Exchange of Notes Date / Grant Agreement Date	Phase I: September, 2006 / No Grant Agreement signed ³ Phase II: January, 2009 / January, 2009 (Initial Exchange of Notes Date for Phase II: July, 2007)
Executing Agency	Ministry of Transport and Communication (currently the Ministry of Transport: MOT)
Project Completion Date	Phase I: June, 2008 Phase II: November, 2010
Main Contractor	Phase I: Nishimatsu Construction Co., Ltd. Phase II: NIPPO Corporation
Main Consultant	Katahira & Engineers International
Basic Design	June, 2006
Related Projects	[JICA] <u>Technical Cooperation</u> Road Administration Advisor (2008 – 2014), The Project for Improvement of Road Maintenance (2013 –) <u>Grant Aid</u> The Project for Rehabilitation of Kurgan Tyube - Dusti Road (2008 – 2013), The Project for Improvement of Equipment for Road Maintenance in Khatlon Region and Districts of Republican Subordination (2013 –) [Other Donors] <u>Asian Development Bank (Loan)</u> Rehabilitation of 88km road sections between Dushanbe, Kurgan Tyube, Dangara and Kulyab (2001 – 2005)

² A bridge over Pyandzh River, running along the border between Tajikistan and Afghanistan. Its construction was supported by the United States of America and Norway to ensure stable logistics between these two countries.

³ No Grant Agreement was signed as the Ministry of Foreign Affairs was in charge of the supervision of the implementation of grant aid projects at that time.

	<u>United States of America and Norway (Grant)</u> Construction of a Cross-Border Bridge on the border with Afghanistan (2005 – 2007)
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2. Outline of the Evaluation Study

2.1 External Evaluator

Keisuke Nishikawa (Ernst & Young Sustainability Co., Ltd.)⁴

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: November 2012 – November 2013

Duration of the Field Study: March 24 – April 9, 2013

3. Results of the Evaluation (Overall Rating: C⁵)

3.1 Relevance (Rating: ③⁶)

3.1.1 Relevance with the Development Plan of Tajikistan

In Tajikistan, road investment for an improvement of transport linkages was listed in the ‘National Development Strategy’, formulated in August 2006, as one of the major activities conducive to economic growth. The target road section in this project comprised part of a major international highway that connected Dushanbe, capital of Tajikistan, and Kabul, capital of Afghanistan. This road was listed in the National Development Strategy as a road to be improved, and was also positioned as a regional highway in the Asian Highway Network initiative led by the United Nations. It was also a priority road in Tajikistan’s ‘Long-term Transportation Development Plan 2001 – 2005’ and the need and urgency of road development was also emphasised in the Ministry of Transport’s ‘Programme of National Investment and Technology for 2005 – 2007’.

In late 2011, the ‘National Target Development Strategy for the Transport Sector to the Year 2025’ was formulated, in which an expansion of road networks was the focus, in light of significant traffic on major national roads. During the ex-post evaluation, the development of major highways remained consistent⁷ with the UN’s Asian Highway initiative, and was also promoted as part of a Central Asia Regional Economic

⁴ Joined the evaluation team of Ernst & Young Sustainability as a team member from Japan Economic Research Institute Inc.

⁵ A: Highly satisfactory, B: High, C: Partially satisfactory, D: Unsatisfactory

⁶ ③: High, ②: Fair, ①: Low

⁷ Rehabilitation works of the Asian Highways (AH) in Tajikistan (AH7, AH65 and AH66) are currently being implemented, mainly with assistance from Japan, ADB, and China, leading to better domestic and international connectivity.

Cooperation (CAREC) programme, with cooperation from the Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), and World Bank (WB), etc.⁸

Based on the above, the importance of the project road has been consistently high from the planning period to ex-post evaluation, and this project can be considered highly relevant to the policy and the sector plan. In Central Asia, the importance of regional economic cooperation through better connectivity between countries is also being promoted by the CAREC programme in addition to the Asian Highway initiative. Therefore, this project is considered to be significant from not only Tajik but also regional perspectives.

3.1.2 Relevance with the Development Needs of Tajikistan

When this project was being planned, some difficulties were seen in Tajikistan in transporting basic daily commodities and trading with neighbouring countries due to the deterioration of major roads constructed during the former Soviet era. Regarding daily maintenance activities, small damages such as potholes were repaired even under budget constraints. However, despite increasing deterioration, comprehensive rehabilitation work such as overlaying were neither implemented nor planned due to a lack of equipment. Urgent rehabilitation of the road section to be covered under this project was also required to ensure its functions as a regional highway, particularly after a border bridge with Afghanistan was scheduled to be completed in 2007.

It became clear during the ex-post evaluation that the number of registered vehicles in Tajikistan was 297,272⁹ in 2010, substantially up from the 111,588 recorded in 2000. During the same period, domestic and international freight transportation volumes also increased (see 'Effectiveness' for details), backed by the growth of construction and manufacturing sectors, with much of the materials and goods being transported on roads. However, as stated in the National Target Development Strategy for the Transport Sector, while the demand for road was rising, a road density was still much lower than that in developed countries and paved road was lacking, becoming a serious socioeconomic issue.

Thus, the project road was a major highway connecting Tajikistan with Afghanistan and other neighbouring countries, playing an important role in meeting the increasing traffic volume. The need for freight transport continues to be high as seen in the

⁸ CAREC has four priority areas in transport, trade facilitation, energy, and trade policy. In the transportation area, six regional highways are to be developed. The project road corresponds to Corridor 5 and Corridor 6.

⁹ 80% were passenger cars, 14% for trucks, and buses accounted for 6% of the total vehicles.

particularly high proportion of truck transport. The number of registered vehicles continues to increase, and road development has had an essential position in terms of regional development.

3.1.3 Relevance with Japan's ODA Policy

At the time of project planning, Japan had prioritised its ODA to focus on human security, the institutional development of market economy, economic development, and the promotion of regional cooperation in Central Asia, where road development was listed as one of the concrete measures. During the second foreign minister meeting of the Central Asia plus Japan Dialogue, held in June 2006, the implementation of this project was specified in the Action Plan to promote intra-regional cooperation among the Central Asian countries.

In this way, this project was seen as a project valuable in promoting regional cooperation in Central Asia, as well as nation-building based on sustainable development and market economy; therefore, the project was highly consistent with Japan's ODA policy.

This project has been highly relevant to Tajikistan's development plan and development needs, as well as to Japan's ODA policy; therefore its relevance is high.

3.2 Effectiveness¹⁰ (Rating:③)

3.2.1 Quantitative Effects

3.2.1.1 Reduction in Travel Time

An approximately 23.7km road section between Dusty and Nijiny Pyandzh was scheduled to be rehabilitated in this project, out of which a 12.1km residential section between 0+000km and 12+100km points and the remaining desert section of 11.6km between 12+100km and 23+700km points were both expected to shorten the travel time.

Base values prior to project implementation, target values upon project completion, and actual values recorded in the ex-post evaluation study are shown in the table below for comparison.

¹⁰ Sub-rating for Effectiveness is to be put with consideration of Impact.

Table 1: Reduction in Travel Time

	Base value (2006)	Target value upon completion (Target year: 2008)	Ex-post evaluation (2013)	
			Measured value	Value answered by the Executing Agency
Travel time in the residential section (12.1km)	29 minutes (Approx. 25km/h)	18 minutes (Approx. 40km/h)	14 minutes (Approx. 52km/h)	14 minutes (Approx. 52km/h)
Travel time in the desert section (11.6km)	20 minutes (Approx. 35km/h)	12 minutes (Approx. 60km/h)	12 minutes (Approx. 60km/h)	12 minutes (Approx. 60km/h)
Travel time of the entire section	49 minutes	30 minutes	26 minutes	26 minutes

Source: Basic Design Report, Answers to the Questionnaire by the Executing Agency, Actual site survey by the evaluation team

Travel time for the project road section was 49 minutes in total at the time of planning; 29 minutes for the first 12.1km section, and another 20 minutes for the remaining section. It was reduced to a total of 26 minutes (14 minutes and 12 minutes, respectively) based on the time measured during the ex-post evaluation study. The total travel time had been expected to be shortened to 30 minutes after project completion, but it was actually reduced further. A major factor in the travel time becoming much shorter than the target was the realisation of an average speed of 52km/h, as the first 12.1km section had two sub-sections where the speed limit was 40km/h and 60km/h. Also, the average travel time obtained in a beneficiary survey¹¹ was 28 minutes after project implementation, which is less than half of the 58 minutes answered as the time required before the project, thereby being mostly consistent with the measured value and the value answered by the Executing Agency.

Based on the above, this project has enabled vehicles to travel at upper speed limits throughout the project road section, achieving the target of travel time decreased to 30 minutes.

3.2.1.2 Fewer Flooding Days

Along the project road, there was a six-kilometre section with irrigation canals, where leakages and spill-over flows were causing road flooding approximately 40 days a year (an average of five hours a day), becoming a contributing factor to road damages. While the repairs of canals were outside of the project scope, some parts of this section were levelled higher and ditches were placed on the roadside to reduce the incidence of flooding.

Although no data on flooding days and duration were available, the

¹¹ An interview survey with 100 residents in Dusty and Nijiny Pyandzh was conducted. The main questions concerned travel time, traffic flow, road safety, flooding, satisfaction with road conditions, environmental and social impacts, maintenance conditions, etc.

flood-preventing measures taken in this project substantially reduced the incidence of flooding to one or two days a year, according to the Executing Agency. In the beneficiary survey, 90% of the respondents felt reductions in flooding, showing an improvement. As a consequence, smooth traffic is always possible without canal water covering the road during irrigation season.

Table 2: Changes in Road Flooding

	Base value (2006)	Target value at project completion (Target year: 2008)	Ex-post evaluation (2013)	
			Beneficiary survey results	Response from the Executing Agency
Reduction in the number of days and duration of time for road flooding	Approx. 40 days a year (5 hours a day, when vehicles cannot pass)	Reduced	More than 90% replied 'Reduced'	One to two days a year

Source: Basic Design Report, Answers to the Questionnaire by the Executing Agency, Beneficiary Survey Results

3.2.1.3 Traffic and Freight Volumes

In the ex-post evaluation survey, data on basic quantitative indicators such as traffic and freight volumes were collected, in addition to the above indicators expected at the time of planning.

Annual traffic volumes on the project road (around the end point on the Nijiny Pyandzh side) became four times larger than that of the planning period in 2006. Table 3 shows that the traffic volume recorded a big surge particularly in 2011, soon after the completion of this project; increases were recorded for all passenger cars, buses and trucks. In terms of the number of vehicles, trucks account for 73% of the total, implying that this road is functioning as an arterial road supporting the distribution of goods to and from Afghanistan in particular.



Photo 1: Trucks waiting for clearance at the Cross-Border Bridge (Near the end point in Nijiny Pyandzh)

Table 3: Annual Traffic Volume on the Project Road

(Unit: Number of vehicle)

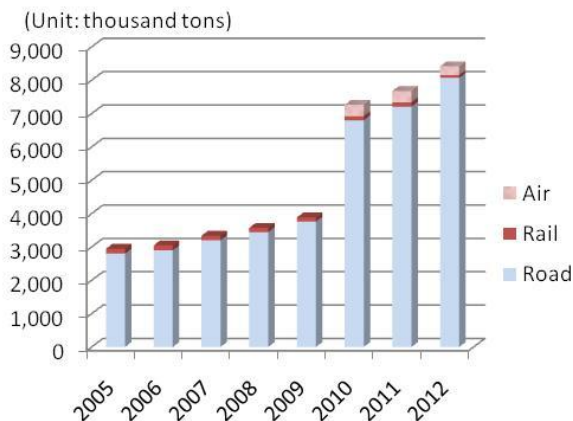
	2005	2006	2007	2008	2009	2010	2011	2012
Passenger car	2,165	2,625	3,003	3,570	4,466	5,609	9,030	10,673
Bus	201	245	284	337	421	526	847	1,001
Truck	6,514	7,895	9,032	10,750	13,458	16,921	27,342	32,320
Total	8,880	10,765	12,319	14,657	18,345	23,056	37,219	43,994

Surveyed at the end point in Nijiny Pyandzh

* Estimated value based on the actual values of 24-hour traffic counted several times. One-way traffic data

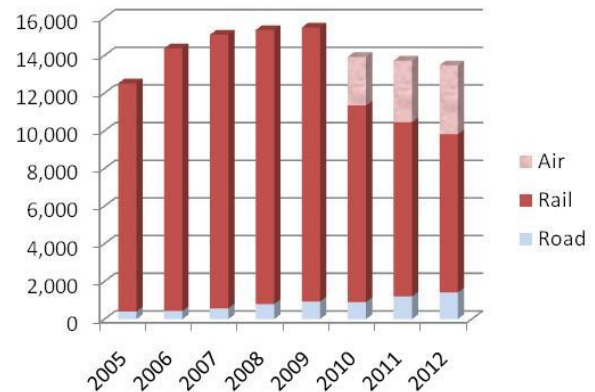
Source: Data provided by the Executing Agency

With respect to freight transportation, no data specific to the project road was available. However, national data for domestic and international freight volumes by transportation mode indicates, as shown in the figures below, that the proportion of domestic and international transport via road has been gradually increasing.



Note: No 'Air' data prior to 2010 available.
Source: Data provided by the Executing Agency

Figure 1: Freight Volume by Traffic Mode (Domestic)



Note: No 'Air' data prior to 2010 available.
Source: Data provided by the Executing Agency

Figure 2: Freight Volume by Traffic Mode (International)

3.2.2 Qualitative Effects

As a qualitative effect of this project, it was expected that as a regional highway, road widths would be expanded, enabling the roads to respond to increases in traffic volume, thereby making traffic safer and smoother. These effects were checked mainly during the site visit and by implementing a beneficiary survey.

All the respondents in the beneficiary survey felt substantial improvements in road surfaces as they could now travel smoothly. In terms of safety, 99% of them replied that the road became safer, 76% of whom also cited the removal of potholes and cracks on the road surface as the main reason. Rehabilitated road sections had standards

functional as a regional highway, with sufficient widths for large trucks to travel within specified speed limits without any problems. 13% of the respondents also commented that the road became safer as this project had expanded the effective width of the road. Despite these positive views, however, 9% of them expressed some concerns on the significantly increased speed of vehicles due to the sufficient road widths secured in the project.

As described above, it was observed that beneficiaries generally highly regarded the safety and smoothness of the road.

3.3 Impact

3.3.1 Intended Impacts

It became clear during the ex-post evaluation survey that the project road had played an important role as an arterial road to provide goods to Afghanistan and was functioning in recent years as a route for building materials to be transported from Afghanistan. The cross-border bridge between Tajikistan and Afghanistan constructed with assistance from the United States, etc., as well as the road



Photo 2: Traffic around the Dusty Market (along the project road)

section covered under this project has produced some effects by facilitating the smooth flow of trucks. According to the MOT's vehicle weight inspection station in Nijiny Pyandzh, an average of 60 large trailers (one-way) pass through the station every day.¹²

After completion of this project, a subsequent grant aid project 'The Project for Rehabilitation of Kurgan Tyube – Dusti Road' was implemented beginning in 2008. Once completed, Nijiny Pyandzh will be connected to Kurgan Tyube, a major city in Khatlon Province, with a high-standard road. As a section between Kurgan Tyube and Dushanbe was rehabilitated in the mid-2000s with assistance from ADB, it is hoped that access between the Afghan border areas and the capital will be immensely improved. Travel time between Kurgan Tyube and Nijiny Pyandzh was previously approximately three hours, but it was reduced to 1.5 hours or so, as measured during the site visit, although some sections were still being worked on.

Accessibility has also improved within the project area, making trips substantially

¹² A MOT inspection station near the end point in Nijiny Pyandzh checks the weight of all trucks heading for destinations in Tajikistan.

easier. A town in the centre of the project area is Dusty, where a market is located along a section of the project road. The implementation of this project enabled better access from Nojiny Pyandzh to the Dusty Market, and a subsequent project has also improved access from an area north of Dusty. While no particular induced economic effects have emerged as a consequence, many comments were heard in the beneficiary survey in Nijiny Pyandzh and settlements along the project road that access to the Dusty market had improved considerably.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

During the project planning, dust generated by vehicle passage was expected to decrease as a result of the rehabilitation of roads and road shoulders. No deforestation was planned as this project included only the rehabilitation of existing roads. Therefore, the project would not cause any impacts on the habitat conditions of animals and plants.

According to the Executing Agency, no issues in relation to the natural environment were identified by the time of ex-post evaluation, nor were any negative impacts during and after project implementation pointed out in the beneficiary survey.

3.3.2.2 Land Acquisition and Resettlement

In this project, land acquisition was anticipated for a total of 1.70km, including 950m for a new road section at the starting point and another 750m in the old railway section (2+350km – 3+100km section). However, it would not pose any issues as the sections were government-owned land. No additional land acquisition was planned as all other sections of the same route were 16m wide. In fact, as the road alignments were all as planned, land acquisition was also carried out as planned. In other words, only 1.70km of government-owned land was acquired.

As all these government-owned land sections were either dry fields or old railway sections. Since no privately-owned land was acquired, there was no resident resettlement under this project. Block walls that had been installed along the road area and needed to be removed prior to project implementation were actually removed by roadside residents. It was confirmed that there were no issues raised regarding land acquisition or resettlement in the beneficiary survey.

This project has largely achieved its objectives; therefore its effectiveness and impact is high.

3.4 Efficiency (Rating: ①)

3.4.1 Project Outputs

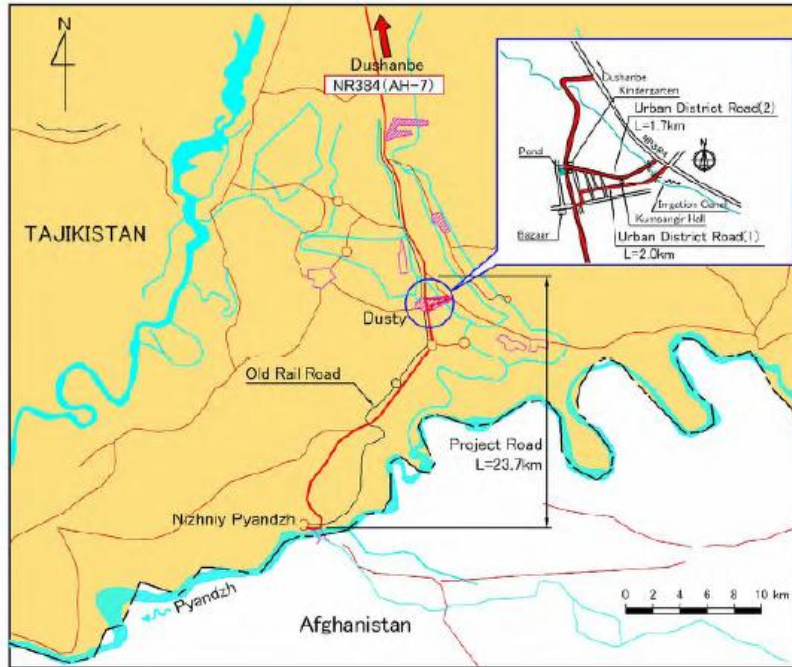


Figure 3: Project Location

In this project, a road section between Dusty and Nijiny Pyandzh (23.7km) and two urban district roads (approximately 3.7km in total) were rehabilitated. The entire period was divided into two phases.

Phase I: To rehabilitate both sides of the road totalling 8.3km between Dusty and Nijiny Pyandzh as well as a total of 3.7km district roads in Dusty town

Phase II: To rehabilitate the remaining section of the road between Dusty and Nijiny Pyandzh (15.3km)

A comparison of original and actual outputs are summarised as follows.

Table 4: Comparison of Original and Actual Outputs

Phase	Road Section	Original	Actual
Phase I	Dusty ~ Nijiny Pyandzh	8.34km	8.25km
	Urban District Road in Dusty Town	3.7km	3.61km
Phase II	Dusty ~ Nijiny Pyandzh	15.36km	15.36km

Road Specifications

Dusty ~ Nijiny Pyandzh: Width 12.0m, Asphalt concrete pavement for the entire section, 3 box culverts, 1.1km drainage facilities, etc.

Urban district road in Dusty town: Rehabilitated width 7.6m, Simplified pavement for the entire section

As shown in the table above, the project output was achieved mostly as planned. The design standard was compliant with the standard of the Asian Highway Network.¹³ However, the load bearing capacity of the project road and its design were based on the results of our own survey, as the characteristics of each road such as traffic volume needed to be considered separately.

Changes from the basic design stage were limited to the following items during the second phase, and all other components remained the same.

- Road sign posts were increased from 83 to 102.
- Connecting sections between the main road and each house or other feeder roads were paved with asphalt, changed from a simplified pavement method.
- Lengths of the pavement of six locations connecting the main road and feeder roads were changed from 5m each to 20m each.

These small changes were implemented with instructions from the police or with proposals from the Executing Agency or contractors, and there no issues were identified. In addition to the above, the Tajikistan government was scheduled to undertake the following project components. These were all implemented and facilitated the generation of overall project outputs.

- To acquire government-owned land, removal of obstructing walls
- To obtain approvals for construction and environmental permissions
- To allocate a land section for construction and storage yards and a temporary office
- To relocate all structures such as electric poles and telephone lines in the project road
- To remove trees along the road, etc.

3.4.2 Project Inputs

3.4.2.1 Project Cost

A total cost of this project was planned to be 1,318 million yen, out of which 1,312 million yen would be borne by Japan and 6 million yen by Tajikistan. Construction work was divided into two phases, and the following table summarises a breakdown of the original and actual project costs contributed by the Japanese side.

¹³ Class II is one of four road design grades based on the road design standard in the Asian Highway initiative taken by the Economic and Social Commission for Asia and the Pacific (ESCAP), specified in Annex II of the Intergovernmental Agreement signed among the countries concerned.

Table 5: Comparison of Original and Actual Project Costs (Japanese Portion)

(Unit: million yen)

	Phase I		Phase II	
	Original	Actual	Original	Actual
Construction	548	537.5	669	1,197
Designing and Supervision	44	42.6	51	64.4
Total	592	580.1	720	1,261.4

Source: Basic Design Report and Completion Report

The actual cost for Phase I was within the planned amount despite the following factors during project implementation.

- (1) Market prices for construction materials increased.
- (2) Although the contractor for Phase I had a plan to procure bitumen and all cement from Uzbekistan, a conflict with the country prompted them to prohibit exports of their domestic products to Tajikistan. Bitumen then needed to be procured in bulk units by rail from Russia and cement needed to be transported on long-distance trucks from Pakistan through Afghanistan. Due to this conflict, all the foreign construction companies located in Tajikistan pulled out of the country, requiring the contractor to arrange for all of the construction equipment from other countries including Japan.

As for the Phase II section, the length of the project road was shortened by 2.3km to 13.06km from the original 15.36km in a detailed study undertaken by the consultant in response to the above changes. While a tender was floated in December 2007, procurement conditions for construction equipment and materials had deteriorated further compared to the detailed design period, and there were no bidders for this phase. Following this tender failure, it was judged that Phase II could not be completed under the period specified in the E/N, and this phase was once cancelled in July 2008 after monitoring the progress and completion (June, 2008) of Phase I.

In order to conclude Phase II, a review study was conducted to examine the project cost again by considering the findings on various risks obtained during Phase I on the construction method, period, and procurement of equipment and materials. The study was conducted from August 2008 and a new project cost was calculated at 1,324 million yen, up from the original amount of 720 million yen.¹⁴

While the cost borne by the Tajikistan side was not specified, it is presumed that the planned amount was disbursed, as all the components to be undertaken by the

¹⁴ Separately, 8.794 million yen was spent for design and supervision work during the initial tender process of Phase II.

Tajikistan government were implemented without delay.

Due to the tender failure caused by a price hike in construction materials, the actual cost was 1,841 million yen (140% of the plan), compared to the originally planned amount of 1,312 million yen.

Therefore, the project cost was higher than the planned amount.

3.4.2.2 Project Period

Planned and actual project periods from the signing of E/N for Phase I until project completion are shown respectively as follows.

Table 6: Comparison of Original and Actual Project Periods

Phase	Original	Actual
Phase I	Detailed Design ¹⁵ : 1.5 months Construction: 11.5 months	September, 2006 ~ June, 2008 (21 months)
Phase II	Detailed Design: 1.5 months Construction: 15.5 months	January, 2009 ~ November, 2010 (21.5 months)
Total	29.5 months	September, 2006 ~ November, 2010 (50.5 months)

Source: Basic Design Report and Completion Report

The project period for Phase I was lengthened by 2.5 months, caused by a delay in importing materials (bitumen, cement, etc.), a trade embargo of Uzbek bitumen due to a border closure between Tajikistan and Uzbekistan, and because more time was required to respond to the low quality bitumen brought in from other countries. The period was further delayed by 4.5 months due to the breakdown of an asphalt plant and a suspension of construction work due to heavy snow and extraordinarily low temperatures. Thus, the period for Phase I totalled 21 months.

The E/N for Phase II was signed in July 2007 and a consultant contract was signed in the following month. However, as mentioned above, this phase was cancelled in August 2008 due to the tender failure for construction work. After a review of the project cost, a revised E/N was signed again in January 2009. During the review study, another five months were added to the project period for preparation work and installation of safety equipment. Therefore, a new project period of 22 months was set and actual construction work was completed in 21.5 months, within the revised period.

Based on the above, the entire project period turned out to be 50.5 months between

¹⁵ A detailed design survey was undertaken together with the preparation of tender documents after a contract for consulting services on project implementation was signed. The majority of the design was substituted during the basic design stage.

September 2006 and November 2010 (171% of the plan), substantially longer than the planned period of 29.5 months.

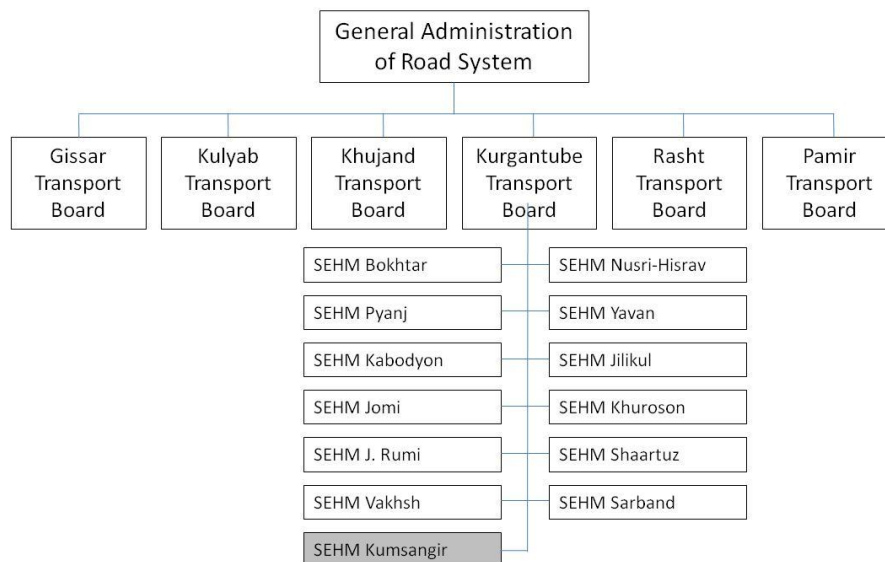
The project cost exceeded the plan, while the project period significantly exceeded the plan; therefore the efficiency of the project is low.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The Executing Agency of this project is the Ministry of Transport and the actual operation and maintenance work was undertaken as planned by the Kurgantube Transport Board (30 staff members),¹⁶ under the General Administration of Road System. The Kurgantube Transport Board supervises 13 State Enterprises Highway Maintenance (SEHM) offices, one of which is SEHM Kumsangir, in charge of the maintenance of the project road. The number of staff at SEHM Kumsangir is 38, slightly lower than 44 working during the planning period, but it was noted that there were no issues in the smooth implementation of maintenance activities. No maintenance work is outsourced and everything is managed directly by the office.

The SEHM Kumsangir controls a total of 255.8km of road: 65.8km of international highway, 8.4km of national highway, and 181.6 of provincial road.



*SEHM: State Enterprise Highway Maintenance

Source: Information provided by the Executing Agency

Figure 4: Organisational Structure of MOT's Road Management (Simplified for the Report)

¹⁶ The total number of staff in the Khatlon Province including those at 13 SEHM offices is 531 (as of 2013).

3.5.2 Technical Aspects of Operation and Maintenance

During project planning, while routine maintenance work such as pothole repair was undertaken by SEHM Kumsangir, a shortage of maintenance equipment was hindering major rehabilitation works such as overlaying, since specialised equipment would have been required. It was also deemed that they also did not have the experience needed to complete the task. At the time of ex-post evaluation, road surface conditions (damages) of the project road were assessed through frequent inspections by SEHM Kumsangir, and it was observed during the site visit that those inspections and cleaning of the road were implemented without problems. However, according to the Executing Agency, no systematic training programmes were provided to the maintenance personnel by MOT or SEHMs, and the means of acquiring advanced knowledge was only through domestic and international training programmes offered by donors including JICA (e.g. Training in Japan for engineers of the Kurgantube Transport Board). However, a technical cooperation project on operation and maintenance and a grant aid project providing equipment required for road maintenance have just started as part of Japanese assistance. It is therefore expected that the operation and maintenance capacities of the engineers / technicians will be enhanced.

During the ex-post evaluation survey, the Executing Agency commented that the technical level of the maintenance personnel was sufficient. However, even with some knowledge, the quality of the repaired road surface was insufficient, and further repair work was always required. The main factor in the poor quality of patching work is the difficulty in producing and/or obtaining good quality asphalt and a lack of equipment. During the site visit, repair work was being conducted for the second time on a spot that was already repaired once after the project.



Photo 3: Subsequent repair work on a spot once repaired by SEHM (Phase II section)

3.5.3 Financial Aspects of Operation and Maintenance

MOT's maintenance budget was sourced from a road fund, comprising vehicle and fuel taxes until 1999, but it was abolished in 2000 and is now allocated from the general budget. The maintenance budget has consistently increased, and has been at a level of 4 ~ 5% of MOT's total budget.

Table 7: MOT's Maintenance Budget

	Budget (thousand Somoni ¹⁷)	% change from the previous year
FY 2003	4,950	—
FY 2004	12,000	142.4
FY 2005	18,100	50.8
FY 2006	21,540	19.0
FY 2007	22,173	2.9
FY 2008	25,150	13.4
FY 2009	30,300	20.5
FY 2010	34,000	12.2
FY 2011	39,000	14.7
FY 2012	46,800	20.0

Source: Data provided by the Executing Agency

Table 8: Maintenance Budget and Expenditure of SEHM Kumsangir

(Unit: thousand Somoni)

	Budget	Expenditure	Balance
FY 2003	35	41	-6
FY 2004	75	104	-29
FY 2005	180	280	-100
FY 2006	245	320	-75
FY 2007	234	380	-146
FY 2008	237	385	-148
FY 2009	374	410	-36
FY 2010	376	422	-46
FY 2011	376	422	-46
FY 2012	468	512	-44

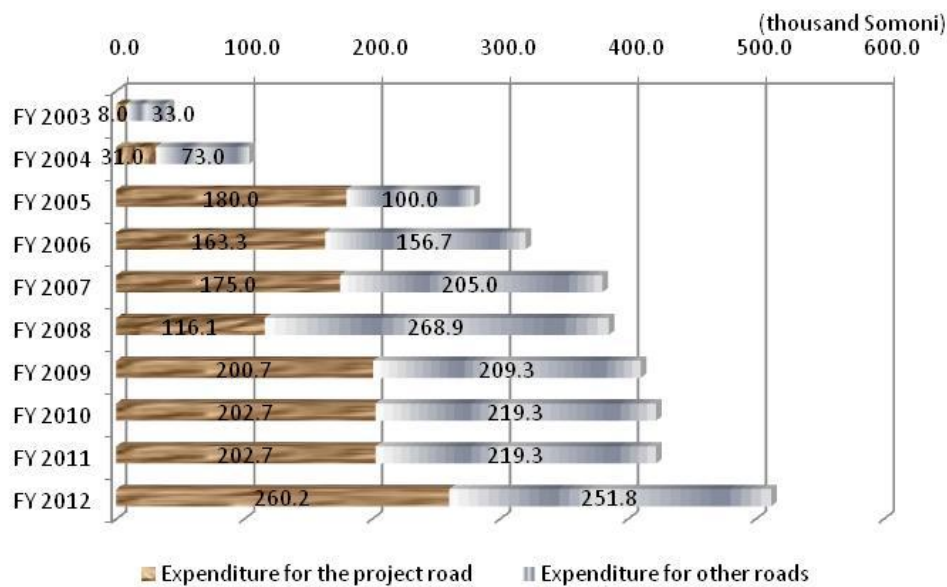
Source: Data provided by the Executing Agency

In parallel with the overall increase in maintenance budget for the MOT, the maintenance budget for SEHM Kumsangir is also generally increasing. However, with chronic budget shortcomings, they cannot purchase sufficient equipment and required materials.

The amount of expenditure for maintenance activities of SEHM Kumsangir is always in excess of the budgeted amount.¹⁸ One of the main reasons for this is that the amount of expenditure for the project road significantly exceeded the originally estimated amount. At the time of planning, maintenance work on the project road was expected to be manageable, as the annual maintenance cost necessary for the project road was estimated at 53,600 Somoni. The distance of the project road out of the total distance covered by SEHM Kumsangir was 37%, but 30% of the SEHM Kumsangir maintenance budget for 2005 was thought to be required after project completion. The actual expenditure for maintenance of the project road is, however, more than half of the total amount spent by SEHM Kumsangir (approximately 260 thousand Somoni in FY2012, 55% of the total), which is almost five times larger than the planned amount. Damages continue to occur even after project completion, and repairs are prioritised on the project road as it is an international highway.

¹⁷ 1 Somoni = Approx. 21 yen (as of July 2013)

¹⁸ In case the initial budget is used up halfway through the year, a request for additional allocation will be submitted. If granted, additional budget will be allocated during the last quarter of that financial year. This is why the amount of expenditure always exceeds initial budget figures.



Source: Data provided by the Executing Agency

Figure 5: Annual Expenditure by SEHM Kumsangir

As discussed above, the maintenance budget is chronically insufficient, making it difficult to purchase enough equipment and materials. Expenditures for maintenance of the project road have not been reduced even after project implementation, and SEHM Kumsangir receives additional budget to cover excess expenditure by submitting a request during that financial year. According to the Executing Agency, the required amount has never been met.

3.5.4 Current Status of Operation and Maintenance

Various damages started occurring soon after the completion of construction work on the project road, and a number of repairs have been made thus far. With this additional repair work, the one-year warranty inspection surveys normally conducted once after the completion of each phase were actually conducted twice.

The following damages were mainly observed during the site visit.

- With regard to the major highway section, a number of repairs were made by the contractor around the warranty inspection period, especially in the Phase II section. While the level of damages was not so severe as to disturb smooth traffic flow, several damages to the road surface were spotted even after repairs were done during the warranty inspection. SEHM Kumsangir has been repairing such damages continuously.
- In the Phase I section, several undulating points were observed on the road surface

of the main highway on the Dusty town side.



Photo 4: Road surface repaired after damages (Phase I section: surfaces are undulating and the median line is winding.)



Photo 5: Road surface repaired again after damages (Phase II section: insufficient strength of asphalt)

- Urban district roads in Dusty town with double bitumen surface treatment (DBST) were more heavily damaged, with potholes and cracks.

As a response to overloaded vehicles, efforts have been made by checking the weight of all trucks arriving from the Afghanistan side at the weight inspection station in Nijiny Pyandzh as mentioned in ‘3.3 Impact’. Also in November 2011, a government order was issued to allow only vehicles with an axle load of 6 tons or less between 10 a.m. and 8 p.m. from 1 May to 31 August if the temperature is above 25 degrees Celsius. However, the station has only an old-style portable scale and cannot always measure exact weights of the trucks.

A maintenance plan is formulated and inspections are regularly conducted by SEHM Kumsangir, but it is difficult to implement repair work in accordance with the schedule due to insufficient budget allocations. With a lack of asphalt plants, road surface repairs are done with cold asphalt, which is less durable and coarser. As demonstrated, there are difficulties in procuring materials and road maintenance equipment such as compactors. It is therefore difficult to say that sufficient repair work has been conducted.

As stated above, in response to these issues, the equipment required for road maintenance will be provided to 13 SEHMs under the Kurgantube Transport Board through a grant aid project that started in March 2013. Moreover, a technical cooperation project on road management capacities is to be implemented from 2013, and it is hoped that this project will contribute to the enhancement of technical capacities on road maintenance as well as the skills on budget requests.

Some problems have been observed in terms of finance and maintenance conditions; therefore the sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project, in which major arterial roads were rehabilitated to ensure safe and stable traffic and transportation in the south-western part of the landlocked country of Tajikistan, was consistent with the development plan and needs of the country both during planning and ex-post evaluation. It was also relevant with the ODA policy of Japan during the planning stage. The effectiveness and impact of the project was high as this project achieved considerable reductions in travel time and flooding on the international highway. It also underpinned increased traffic and freight volumes and contributed to the improvement of access to a market and major cities. However, the efficiency of the project was low due to the excesses in project cost and periods compared to the plan, as the prices of construction materials escalated and more time was spent on countermeasures to the changes in procurement conditions. Also, some sections of the road began showing damage soon after the completion and some of the road surfaces still needed to be improved even during the ex-post evaluation. While the major causes are assumed to be an increased traffic volume and the passage of overloaded vehicles after project completion, shortages of budget and repair equipment of the executing agency have also resulted in insufficient repair works on the damaged sections. On the other hand, installations of vehicle weighing equipment and an establishment of management structure to crack down on overloaded transport vehicles were being explored. Also, concrete initiatives were taken for the appropriate procurement of maintenance equipment and materials, as well as for capacity building of the engineers concerned. Therefore, the sustainability of the project can be judged to be fair.

In light of the above, this project is evaluated to be partially satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

In the landlocked country of Tajikistan, proper maintenance of the roads has a high level of significance for the country's economy and society, as the proportion of transport over roads is high compared to other transport modes. Also, the country has several international highways such as the Asian Highway and CAREC corridors, part of which is a road section rehabilitated in this project. As such, it is essential to raise awareness within the government of the importance of road maintenance, as

opposed to merely constructing new roads. It is also important to secure a level of budget sufficient to improve and maintain road conditions, and establish a structure to develop the capacities of maintenance personnel. In addition, the need to strengthen institutional capacity in vehicle weight inspection to prevent the passage of overloaded trucks is also anticipated

4.2.2 Recommendations to JICA

Considering the short period of time that passed after project completion, damages to road surfaces of the project road were relatively severe. While the contractor repaired the damaged sections more than required in its warranty, further damages have kept occurring even after that. On the other hand, the surfaces improved in the subsequent project ‘The Project for Rehabilitation of Kurgan Tyube - Dusty Road’ have been far better than those of this project after the same period. With the increasing traffic volume, it is desirable that the conditions of the road surfaces covered in this project be monitored, and discussions with the Tajikistan government held as needed.

4.3 Lessons Learned

As this project was the first grant aid project in the road sector in Tajikistan, where weather conditions were severe, it seems to have been important to allocate more time for fact finding, to design the road more carefully by conducting a full-scale detailed design study, and to allow more leeway in terms of project period.

It is also thought that more involvement by the Executing Agency during the designing phase was necessary. Also, it was necessary to plan project details with a more in-depth examination of weather and local procurement conditions, which would have allowed the project to be implemented smoothly with high quality road construction.

(End)