

**Ministry of Transportation and Communication
Kyrgyz Republic**

PREPARATORY SURVEY REPORT

THE PROJECT

**FOR IMPROVEMENT OF THE EQUIPMENT FOR
ROAD MAINTENANCE**

IN OSH, JALAL-ABAD AND TALAS OBLASTS

IN

THE KYRGYZ REPUBLIC

January 2014

**JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)**

KATAHIRA & ENGINEERS INTERNATIONAL

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey on the Project for Improvement of the Equipment for Road Maintenance in Osh, Jalal-Abad and Talas Oblasts and entrust the survey to KATAHIRA & ENGINEERS INTERNATIONAL.

The survey team held a series of discussions with the officials concerned of the Government of Kyrgyz Republic, and conducted field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Kyrgyz Republic for their close cooperation extended to the survey team.

January, 2014

MIURA Kazunori
Director General,
Economic Infrastructure Department
Japan International Cooperation Agency

Summary

1. Background of the Project

The Kyrgyz Republic (hereinafter referred to as “Kyrgyzstan”) is a landlocked country with an area of about 198,500km² bordered by Kazakhstan, Uzbekistan, and Tajikistan and covered by a road network of about 34,000km. In the transport sector of landlocked Kyrgyzstan, about 95% of the transportation of people and goods relies on roads, which play a vital role in the lives of Kyrgyz people. In addition, about 40% of the international roads in Kyrgyzstan are part of the Asian Highway Network and the Central Asia Regional Economic Cooperation Corridor 3 (CAREC 3). CAREC 3 is an international transport corridor being constructed for the purpose of facilitating the distribution of goods and the economic development of the whole of Asia and plays a key function in connecting the countries in Central Asia and reaching out to Southwest Asia as well.

The Ministry of Transport and Communications (MOTC), the government agency responsible for the implementation of the Project for Improvement of the Equipment for Road Maintenance in Osh, Zhialalabad and Talas Oblast (hereinafter referred to as “the Project”), has jurisdiction over the international roads, national roads, and local roads, which extend 18,803km in total length and account for about 55% of the entire road network in Kyrgyzstan. The Road Maintenance Department (RMD), a subordinate organization under MOTC, is in charge of formulating maintenance plans of the roads governed by MOTC, as well as managing budget, procurement, etc. The actual road maintenance work is performed by 9 road maintenance bureaus (PLAUD/UAD), subordinate organizations of MOTC, and 57 road maintenance offices (DEP) situated throughout the country. DEP is a subordinate organization of PLUAD/UAD and in charge of road pavement and inspection/repair of roads/bridges and associated facilities while PLUAD/UAD takes charge of the formulation of maintenance plans and the management of budget for the roads administered by DEP.

Most of the roads in Kyrgyzstan were built during the former Soviet era, which ended in 1991. Since then, Russian engineers began withdrawing from Kyrgyzstan, ceasing the transfer of road maintenance techniques, and, consequently, the roads have been left without proper maintenance. Lack of budget due to economic turmoil and stagnation following the country’s independence also contributed to the delay in repair work and the deterioration of the roads. At present, it is estimated that about 200km of road is losing its functions every year. The deteriorated road conditions of Kyrgyzstan are hindering the transport of daily necessities and trade with neighboring countries, impeding the country’s economic development and vitalization.

Japan has been contributing to the capacity development and technical advancement of MOTC necessary for proper maintenance/administration of road pavement and winter roads through: (i) Project for Capacity Development for Road Maintenance (technical cooperation, 2008 – 2011), which aimed for MOTC to develop and retain skills required for road pavement maintenance and establish relevant standards and data systems, as well as (ii) Road Administration Advisor (technical cooperation, 2008 – 2011, 2011 - ongoing) to support policymaking and program planning for road maintenance and administration. In addition, (iii) Project for Capacity Development for Bridge/Tunnel Maintenance

(technical cooperation started in 2013) is currently being implemented to support MOTC in formulating bridge/tunnel inspection/repair plans. Further, JICA has implemented (iv) Project for the Improvement of the Equipment for Road Maintenance in Naryn Oblast (Grant Aid, 2006) and (v) Project for Improvement of the Equipment for Road Maintenance in Issyk-Kul and Chui Oblasts (Grant Aid, 2010) to provide road maintenance equipment to MOTC. MOTC has been endeavoring to utilize the fruits of these past cooperation projects by JICA, as well as those by other aid organizations in order to perform road maintenance works more efficiently and effectively, which, however, has been difficult especially in regions where necessary equipment is lacking or deteriorated. Under these circumstances, the Government of Kyrgyzstan requested the Government of Japan for a Grant Aid for procuring equipment necessary for the repair and post-disaster reconstruction of roads, as well as for clearing and melting snow, in Osh, Jalal-abad, and Talas Oblasts.

The National Development Strategies of Kyrgyzstan has established three mid-term objectives for the road/transportation sector, namely, (i) rehabilitation of International Transport Corridors, (ii) maintenance and improvement of domestic arterial road network, and (iii) gaining of independence in transportation network. Of these, this Project aims to contribute to the improvement and maintenance of the arterial road network in three of the seven Oblasts of Kyrgyzstan by providing equipment.

To achieve the above objectives, this Project intends to repair/replace road pavement, control overloaded vehicles, etc., toward which Japan will provide necessary road maintenance equipment.

2. Summary and Project contents

By the request of the Kyrgyz Republic, Japanese Government decided to conduct the preparatory survey on the Project for Improvement of the Equipment for Road Maintenance under responsibilities of MOTC. During the period from May 5 to July 9, 2013, JICA dispatched the survey team to held a series of discussions with the officials concerned of the Government of Kyrgyz Republic, and conducted field investigations of the target area. By further studies in Japan based on the results of site survey, Draft Preparatory Survey Report was prepared with outline design of the project contents. During the period from October 22 to October 31, 2013, JICA dispatched the survey team to explain the content of the Draft Preparatory Survey Report, and to discuss and confirm with the officials concerned of the Government of Kyrgyz Republic.

Based on the content of requested equipment and Minutes of Discussion sigend October 28 with MOTC as implementing agency, it was confirmed that this project will support to perform following road maintenance works.

- ① Road repair: patching of potholes, sealing of cracks, asphalt overlay and replacement, shaping of road shoulders and surfaces
- ② Snow clearing/melting: removal of snow and ice, spraying of snow-melting agent and sand
- ③ Post-disaster reconstruction: removal of fallen rocks and debris, restoration of collapsed roads
- ④ Support Operations: hauling of equipment, servicing and repair of equipment in workshops and on site, weighing of large vehicles (for controlling overload)

The specifications of the equipment determined by referring to those of the equipment procured by the two past Grant Aid projects (Project for the Improvement of the Equipment for Road Maintenance in Naryn Oblast and Project for Improvement of the Equipment for Road Maintenance in Issyk-Kul and Chui Oblasts), the operations of which are essentially the same as those of this Project, as well as the specifications of product models widely used in Kyrgyzstan, while making modifications and adjustments that were deemed necessary as a result of the Study.

List of Requested Equipment

No	Equipment	Specification	OSI UAD	PLUA D 6	PLUA D 5	BO UAD	Total
1	Asphalt Cutter	Cut depth: 150mm	14	14	10	16	54
2	Vibrating Compactor	Weight: 60kg	14	14	10	16	54
3	Hand Breaker	Weight: 7kg	14	14	10	16	54
4	Air Compressor	Displacement: 5.0 m ³ /min	7	7	5	8	27
5	Asphalt Sprayer	Tank capacity: 350 Lit	7	7	5	8	27
6	Hand Guide Roller	Weight: 600 kg	7	7	5	8	27
7	Asphalt Finisher	Paving width: 4.4 m	1	1	1	1	4
8	Road Roller	Weight: 9.5 t	1	1	1	1	4
9	Tire Roller	Weight: 12.5 t	1	1	1	1	4
10	Water Sprinkler	Tank capacity: 8,000 Lit	1	1	1	1	4
11	Motor Grader	Blade width: 3.7 m	2	1	1	2	6
12	Excavator	Bucket capacity: 0.8 m ³	1	1	1	1	4
13	Wheel Loader	Bucket capacity: 2.5 m ³	1	1	1	1	4
14	Dump Truck	Loading capacity: 14 t	3	3	3	3	12
15	Asphalt Plant	Production capacity: 35 t/h	1	1	1	1	4
16	Aggregate Plant	Production capacity: 35 t/h	1	1	1	1	4
17	Multi-Purpose Vehicle	4WD, with PTO for attachment	1	1	1	1	4
17-1	Snow Plough	Width: 3,000 mm	1	1	1	1	4
17-2	Rotary Snow Blower	Rotary diameter: 750 mm	1	1	1	1	4
17-3	Salt Spreader	Hopper capacity: 2.0 m ³	1	1	1	1	4
18	Truck with Crane	Loading capacity: 4.0 t with 2.8 t crane	7	7	5	8	27
19	Truck Trailer	Loading capacity: 25.0 t, flat low floor	1	1	1	1	4
20	Mobile Workshop Van	4WD, 8-ton class, aluminum van Installed with repair equipment/ tools and crane	1	1	1	1	4

No	Equipment	Specification	OSI UAD	PLUA D 6	PLUA D 5	BO UAD	Total
21	Repair Tools/Instruments	Portable gantry crane, Generator/Welder, Battery charger, Air Compressor, etc.	2	2	2	2	8
22	Portable Wheel Weigher	Weighing capacity: 10 t × 2 (20 t in total) Platform: 900 × 500 mm	Allocated to: WCTS				3
	Total		91	90	70	101	355

OSI UAD: Osh - Sarytash – Irkeshtam Main Roads Management Unit
 PLUAD 6: Obrast Level Roads Management Unit #6 (for Jalal-abad Oblast)
 PLUAD 5: Obrast Level Roads Management Unit #5 (for Talas Oblast)
 BO UAD: Bishkek – Osh Main Roads Management Unit
 WCTS: Weight Control and Tunnel Service Department

Aside from those made in the former Soviet Union, equipment products widely distributed in Kyrgyzstan come from Japan, China, and Europe. MOTC is not satisfied with the quality and performance of their current equipment items, except those made in Japan. MOTC has a high level of trust in the quality and performance of the Japanese-made equipment procured by the two past Grant Aid projects (Project for the Improvement of the Equipment for Road Maintenance in Naryn Oblast and Project for Improvement of the Equipment for Road Maintenance in Issyk-Kul and Chui Oblasts) and strongly desires to be provided with Japanese products through Grand Aid Project as well.

Therefore, in formulating an equipment procurement plan for this Project in accordance with the procurement rules for Grant Aid projects, it will be considered that sourcing the equipment mainly from Japan because of absence of comparable products made in Kyrgyzstan and in order to meet the aforementioned high expectations on Japanese products and provide continuity and compatibility with the equipment procured by the past Grant Aid project. Products, for which no or only a limited number of Japanese manufacturers exist, will be procured from manufactures of Europe or other third countries whose products are widely used in Kyrgyzstan and have comparable quality to that of Japanese products.

3. Project implementation schedule and project cost

If this Project should be implemented pursuant to the Grant Aid Scheme of the Government of Japan, project design period will be 4.5 months, and equipment supply period is 13 months. The Project will be implemented in accordance with the Japan's Grant Aid scheme and the cost will be determined before concluding the Exchange of Note (E/N) for the Project.

4. Project Evaluation

(1) Relevance

This project target area will cover about 7,500 km of road network. Currently PLUAD/UAD equipment, used for maintenance of these roads, are outdated and insufficient. Lack of technical potential for maintenance works is causing improper road maintenance.

MOTC is experiencing difficulties in the areas, where the equipment is obsolete and insufficient.

Nevertheless, MOTC is aiming to implement road maintenance effectively by using Japan Grand Aid and other donors help.

This project goal is “Implementing proper road maintenance in the project area”, by supplying equipment procured within Japan Grand Aid Scheme. It will support to achieve mid term goals of road development set in Kyrgyzstan National Development Strategy until 2017, as (1) improvement of international routes, (2) maintenance and improvement paved roads network, (3) independence of the transportation network. This project will contribute more for (1) and (2).

Especially, road maintenance is one of the emphasized area in Japanese Government Countries Assistance Program for Kyrgyz Republic, as to improve road infrastructure maintenance and intraregional differences. The project goals are also follows these cooperation principles.

From above, the project is recommended to implement under Japan Grand Aid Scheme.

(2) Effectiveness

1) Quantitative Effects

Quantitative Effects

Indicator	Baseline (2012)	Target (2018)
Pothole repair area (m ² /yr)	118,100* ¹	156,800* ²
Overlay length (km/yr)	10* ³	40* ⁴

※1 : Calculated based on the production volume of asphalt mixture for pothole patching in 2012 (OSI UAD: 32,000m², PLUAD 6: 33,000m², PLUAD 5: 17,100m², BO UAD: 36,000m²)

Calculation: Pothole area = Volume of asphalt mixture ÷ 2.35(mixture weigh) ÷ 0.06(pavement thickness) ÷ 1.1(loss rate)

※2 : The increase was derived from the estimated annual volume of asphalt for pothole patching produced by two newly constructed plants (PLUAD 6, OSI UAD): 3,000 t/yr x 2 plants = 6,000 t/yr (This does not include asphalt mixture to be produced by the other two new plants (OSI UAD, PLUAD 5), which will be replacing the existing ones.)

※3 : Actual road length overlaid directly by PLUAD/UAD (OSI UAD: 4.5 km, PLUAD 6: 3.5 km, BO UAD: 2.0 km).

※4 : Construction target distance for each PLUAD/UAD is 10km×4

2) Qualitative Effects

- ① A fleet of paving machines and asphalt mixture produced by the newly constructed plants will improve the quality of pothole patching and other road repair operations, leading to enhanced strength and durability of repaired sections.
- ② Improved efficiency in snow-clearing/melting and salt-spraying operations during winter will shorten the period of traffic shutdown.
- ③ Enhanced capacity for post-disaster road reconstruction will shorten the period of traffic shutdown.
- ④ Increased mobility of vehicle overload control operations will deter damage on roads.

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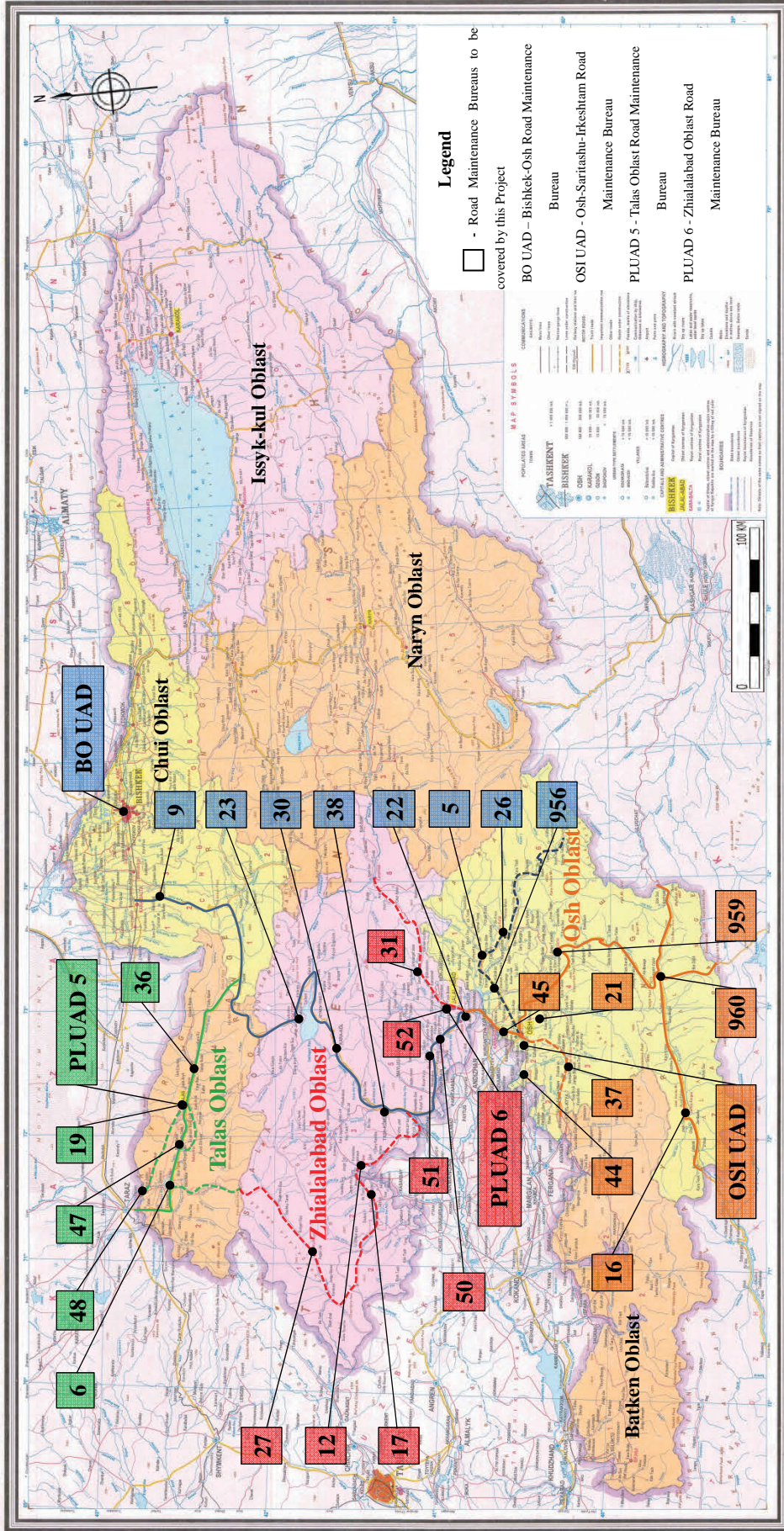
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KYRGYZ REPUBLIC

Scale 1:1 000 000



Location Map of Study Area

Images of Equipment (1/2)



1.Asphalt Cutter



2.Vibrating Compactor



3.Hand Rock Breaker



4.Air Compressor



5.Asphalt Sprayer



6.Hand-Guided Roller



7.Asphalt Finisher



8.Road Roller



9.Tire Roller



10.Water Sprinkler



11.Motor Grader



12.Excavator



13.Wheel Loader



14.Dump Truck



15.Asphalt Plant



16.Aggregate Plant

Images of Equipment (2/2)



17. Multi-Purpose Vehicle



17-1. Snow Plough



17-2. Rotary Snow Blower



17-3. Salt Spreader



18. Truck with Crane



(Semi-trailer)
19. Truck Trailer



(Tractor)



(Tools inside)
20. Mobile Workshop Van



21. Repair Tools/Instruments



22. Portable Wheel Weigher

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Abbreviations

ADB	Asian Development Bank
B/A	Banking Arrangements
BNT	Bishkek - Naryn - Torugart
BO	Bishkek – Osh
CAREC	Central Asia Regional Economic Cooperation
DEP	Local Level Roads Management Unit
EIA	Environmental Impact Assessment
E/N	Exchange of Notes
G/A	Grant Agreement
GDP	Gross Domestic Product
GNI	Gross National Income
IMF	International Monetary Fund
IsDB	Islamic Development Bank
JICA	Japan International Cooperation Agency
M/D	Minutes of Discussions
MOTC	Ministry of Transport and Communications
OSI	Osh - Sarytash – Irkeshtam
PBM	Performance Based Maintenance
PLUAD	Obrast Level Roads Management Unit
PTO	Power Takeoff
RMD	Road Maintenance Department
UAD	Main Roads Management Unit
WCTS	Weight Control and Tunnel Service
4WD	4 Wheel Drive

CHAPTER 1. Background of the Project

1-1 Background of the Request and Summary

Japan has been contributing to the capacity development and technical advancement of MOTC necessary for proper maintenance/administration of road pavement and winter roads through: (i) Project for Capacity Development for Road Maintenance (technical cooperation, 2008 – 2011), which aimed for MOTC to develop and retain skills required for road pavement maintenance and establish relevant standards and data systems, as well as (ii) Road Administration Advisor (technical cooperation, 2008 – 2011, 2011 - ongoing) to support policymaking and program planning for road maintenance and administration. In addition, (iii) Project for Capacity Development for Bridge/Tunnel Maintenance (technical cooperation started in 2013) is currently being implemented to support MOTC in formulating bridge/tunnel inspection/repair plans. Further, JICA has implemented (iv) Project for the Improvement of the Equipment for Road Maintenance in Naryn Oblast (Grant Aid, 2006) and (v) Project for Improvement of the Equipment for Road Maintenance in Issyk-Kul and Chui Oblasts (Grant Aid, 2010) to provide road maintenance equipment to MOTC. MOTC has been endeavoring to utilize the fruits of these past cooperation projects by JICA, as well as those by other aid organizations in order to perform road maintenance works more efficiently and effectively, which, however, has been difficult especially in regions where necessary equipment is lacking or deteriorated. Under these circumstances, the Government of Kyrgyzstan requested the Government of Japan for a Grant Aid for procuring equipment necessary for the repair and post-disaster reconstruction of roads, as well as for clearing and melting snow, in Osh, Jalal-abad, and Talas Oblasts.

This Study was conducted to verify the necessity and validity of the request, draft a outline design appropriate for a Grant Aid project, and formulate a project plan (to set the quantities, specifications, etc. of equipment to be procured) and an equipment operations and maintenance (O&M) plan to estimate the approximate cost of the Project. The final list of requested equipment items is shown in Table 1-1 below.

Table 1-1 List of Requested Equipment

Equipment	Unit	Equipment Station				Total
		OSI UAD	PLUAD 6	PLUAD 5	BO UAD	
Asphalt Cutter	Unit	14	14	10	16	54
Vibrating Compactor	Unit	14	14	10	16	54
Hand Rock Breaker	Unit	14	14	10	16	54
Air Compressor	Unit	7	7	5	8	27
Asphalt Sprayer	Unit	7	7	5	8	27
Hand-Guided Roller	Unit	7	7	5	8	27
Asphalt Finisher	Unit	1	1	1	1	4
Road Roller	Unit	1	1	1	1	4
Tire Roller	Unit	1	1	1	1	4
Water Sprinkler	Unit	1	1	1	1	4
Motor Grader	Unit	3	3	3	3	12
Excavator	Unit	1	1	1	1	4
Wheel Loader	Unit	2	2	2	2	8

Equipment	Unit	Equipment Station				Total
		OSI UAD	PLUAD 6	PLUAD 5	BO UAD	
Dump Truck	Unit	6	6	6	6	24
Asphalt Plant	Unit	1	1	1	1	4
Aggregate Plant	Unit	1	1	1	1	4
Multi-Purpose Vehicle	Unit	1	1	1	1	4
Snow Plough	Unit	1	1	1	1	4
Rotary Snow Blower	Unit	1	1	1	1	4
Salt Spreader	Unit	1	1	1	1	4
Truck with Crane	Unit	7	7	5	8	27
Truck Trailer	Unit	1	1	1	1	4
Mobile Workshop Van	Unit	1	1	1	1	4
Repair Tools/Instruments	Unit	2	2	2	2	8
Spare Parts	Set	—	—	—	—	1
Total		96	96	76	106	374
Portable Wheel Weigher	Unit	WCTS				3

OSI UAD: Osh-Saritashu-Irkeshtam Road Maintenance Bureau

PLUAD 6: Zhialalabad Oblast Road Maintenance Bureau

PLUAD 5: Talas Oblast Road Maintenance Bureau

BO UAD: Bishkek-Osh Road Maintenance Bureau

WCTS: Weight Control and Tunnel Service Bureau

As a result of this Study, it was confirmed that the works to be performed utilizing the requested equipment correspond to the following road maintenance operations that are highly needed in the target regions:

- ① Road repair: patching of potholes, sealing of cracks, asphalt overlay and replacement, shaping of road shoulders and surfaces
- ② Snow clearing/melting: removal of snow and ice, spraying of snow-melting agent and sand
- ③ Post-disaster reconstruction: removal of fallen rocks and debris, restoration of collapsed roads
- ④ Support Operations: hauling of equipment, servicing and repair of equipment in workshops and on site, weighing of large vehicles (for controlling overload)

It will be determined that the model types, specifications, and quantities of the equipment items to be procured by this Project that are required to perform the above operations in the target regions while taking into account the usage statuses of equipment provided by similar past projects (e.g. Grant Aid Project for the Improvement of the Equipment for Road Maintenance in Naryn Oblast and the Project for Improvement of the Equipment for Road Maintenance in Issyk-Kul and Chui Oblasts).

1-2 Natural Conditions

Target area is 750 m – 3000 m above the sea level. The lowest temperature is -30°C (January) at the highest mountain area, and the highest temperature is 35°C at the south region Jala-abad and Osh oblasts. Amount of rainfall is about 400 mm. Rains occur mainly from March to May, but almost 300 days in a year are sunny.

In southern part, rains occur rarely, but in mountainous areas snowfalls reach up to 160 cm.

1-3 Environmental and Social Considerations

This Project, which plans to procure road maintenance equipment and perform maintenance work on existing roads using the procured equipment, falls under Category C under “JICA Guidelines for Environmental and Social Considerations” (issued by April, 2010). In other words, implementation of this Project will have no serious impact on the environment or society.

Currently, Kyrgyzstan is not practicing strict regulations on emission control for construction equipment and engine vehicles. But taking into account the quality of the fuel available in Kyrgyzstan, environmentally friendly emission standards will be proposed.

This Project includes the construction of asphalt plants and aggregate plants, for which the Kyrgyzstan side needs to conduct an Environmental Impact Assessment (EIA) as required by the laws and regulations of Kyrgyzstan as part of its responsibilities under this Project. MOTC, the executing agency of this Project, needs to contract a licensed consultant to prepare an EIA report and submit it to the State Agency on Environmental Protection and Forestry, the competent authority for EIA, to have it examined and receive an EIA certificate. This EIA procedure, which is essentially the same as that for the two past Grant Aid projects, in which no delay or other issues occurred during the EIA-related processes, is estimated to take one month for conducting EIA and about three weeks for the examination of report and issuance of EIA certificate. Since detailed data of the plant facilities (such as installation layout and specifications) will be needed for the preparation of an EIA report, the Consultant shall deliver such data to MOTC as soon as possible after the Equipment Supplier is selected by tender, and provide technical assistance as needed.

EIA procedural flow

- Confirming the conditions of the candidate location for plant installation, receiving information about surrounding nature, receiving design report (plant specification, layout plan, etc.)
- EIA report and submission (about 1 month)
- Impact components and contents, defining measures, impact volume calculations
- Verification of EIA report by Ministry of environment protection and forestry (about 2 weeks)
- Conformation by Ministry of environment protection and forestry (about 2 weeks) (issuing EIA certificate)
- Construction and installation works begin (leveling the installation site, providing utilities infrastructure)

CHAPTER 2. Contents of the Project

2-1 Basic Concept of the Project

The National Development Strategies of Kyrgyzstan has established three mid-term objectives for the road/transportation sector, namely, (i) rehabilitation of International Transport Corridors, (ii) maintenance and improvement of domestic arterial road network, and (iii) gaining of independence in transportation network. Of these, this Project aims to contribute to the improvement and maintenance of the arterial road network in three of the seven Oblasts of Kyrgyzstan by providing equipment.

To achieve the above objectives, this Project intends to repair/replace road pavement, control overloaded vehicles, etc., toward which Japan will provide necessary road maintenance equipment.

2-2 Outline Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Policy

MOTC, the executing agency of this Project, governs a variety of road maintenance services, of which the equipment to be procured by this Project covers the following operations that are particularly needed in the target regions.

- ① Road repair: patching of potholes, sealing of cracks, asphalt overlay and replacement, shaping of road shoulders and surfaces
- ② Snow clearing/melting: removal of snow and ice, spraying of snow-melting agent and sand
- ③ Post-disaster reconstruction: removal of fallen rocks and debris, restoration of collapsed roads
- ④ Support Operations: hauling of equipment, servicing and repair of equipment in workshops and on site, weighing of large vehicles (for controlling overload)

The specifications of the above equipment will be determined by referring to those of the equipment procured by the two past Grant Aid projects, the operations of which are essentially the same as those of this Project, as well as the specifications of product models widely used in Kyrgyzstan, while making modifications and adjustments that were deemed necessary as a result of the Study.

Considering that no DEP has adequate equipment to perform the required services and that their current equipment is severely deteriorated and will likely become inoperable within a few years; the quantity of each item will be determined on the assumption that road maintenance work teams will be organized based on the equipment to be provided by this Project.

(2) Policy Concerning the Climatic Conditions

Of the climatic conditions of the target regions, those relevant to the equipment plan are as follows:

- Temperature: -30°C – +35°C
- Elevation: 760 – 3,000 m
- Snowfall: 5 – 160 cm

(3) Policy Concerning the Environment

While Kyrgyzstan currently has no regulations on emissions from construction equipment or motor vehicles, Russian-produced fuels widely used in the country are designed to meet the Euro-3 standards.

Most construction equipment and vehicles imported from China and Europe are also Euro-2 or Euro-3 compliant.

However, some fuels sold in Kyrgyzstan contain water, lubricant, or other impurities and thus are of low quality. To counter this, a fuel filter or a water separator will be attached to each of the main equipment items to prevent failure of the engine system and mitigate air pollution by emissions.

By taking into account the qualities of fuels and the types of construction equipment and vehicles that are widely used in Kyrgyzstan, emission standards equivalent to Euro-2 and Euro-3 will be applied to the equipment to be procured by this Project. For engines of certain manufacturers not complied with Euro-2 or Euro-3, applicable standards will be determined individually.

(4) Policy Concerning Operations and Maintenance

Equipment to be procured by this Project will be operated and maintained by DEP and WCTS under the jurisdictions of their respective PLUAD/UAD. The estimated costs required for operating and maintaining the road maintenance equipment will be presented, as well as the costs of performing road maintenance operations using the equipment, and it was confirmed that the budget would be secured by MOTC.

There will be no need to employ new operators or drivers, as most of the items will be replacing the existing ones. Operators and drivers of road rollers, multi-purpose vehicles, mobile workshop vans, and other newly added equipment will be secured basically by re-assigning the current staff or assigning two or more duties to one person, and, if there still is shortage, recruiting new personnel. Since MOTC personnel already have experience in operating most of these machines, it will be sufficient to provide training on startup and operation only at the time of handover.

Each DEP can overhaul engines, transmissions, and running gear of equipment made in the former Soviet Union and possesses the basic ability to maintain and service construction machinery. They also have ample technical capacity to perform periodic inspections on Japanese-made equipment to be introduced by this Project. However, they may have difficulty overhauling or repairing such Japanese equipment, which has different structures and mechanisms from those of former Soviet-made equipment. To cope with this, it will be considered conducting technical training on overhauling, etc. using the equipment procured by the past two Grant Aid projects. In addition, it will be proposed that internal technical transfer from DEP operators/mechanics, who have experience in servicing Japanese equipment in the past two Grant Aid projects, to other operators/mechanics of MOTC organizations so that they will be able to develop and sustain their O & M capacities independently.

Since preventative maintenance and quick repair of broken equipment will be essential for keeping a high operation rate, procurement of simple repair tools/instruments will be considered, as well as mobile workshop vans that can repair broken equipment at construction sites.

Each equipment item will be provided with operation and maintenance manuals written in Russian easily understandable to the operators and mechanics.

(5) Policy Concerning the Grade of Equipment

The basic specifications of the equipment to be procured by this Project was determined by reference

to those of widely-used products in Kyrgyzstan, as well as those of the existing equipment, including that procured under the past two Grant Aid projects, with which MOTC staff are familiar, in view of the operation and maintenance. It was also taken into consideration if the output or capacity of each item was appropriate for the required work and if operating capacities of different items were balanced within each equipment configuration.

The Japanese-made products, which were procured by the past two projects and being used by MOTC staff, have been proven to be superior in quality and performance to those of equipment made elsewhere and thus would be useful for performing the required services efficiently. In addition, MOTC expressed a strong desire to be provided with the same types of equipment of comparable quality and performance. Therefore, the grade of each equipment item was set to match the performance and quality levels of a corresponding Japanese product.

(6) Policy Concerning Procurement Method and Schedule

The products to be procured are roughly divided into the four categories of: (i) construction equipment, (ii) vehicle-type equipment, (iii) plant equipment, and (iv) others. Since the scale of this Project is even larger than the past two Grant Aid projects, dividing the bid into lots will be considered, in which case, it will be arranged that the lots in such a way that each lot is comprised of products belonging to the same category and manufacturer as much as possible. Also, it will be considered that the estimated price of each lot will be within a similar range in order to motivate the bidders equally.

The production period of each equipment item ranges from three to seven months, which would create a 4-month time lag in their arrival at the project sites if the products were shipped as they were completed. To avoid this, the timing of shipment will be adjusted so that as many items as possible will be handed over at the same time.

(7) Matters Concerning Country of Origin

Aside from those made in the former Soviet Union, equipment products widely distributed in Kyrgyzstan come from Japan, China, and Europe. MOTC is not satisfied with the quality and performance of their current equipment items, except those made in Japan, as they have certain issues such as: (i) low work efficiency due to inadequate engine output, (ii) poor fuel performance, and (iii) frequent failure. MOTC has a high level of trust in the quality and performance of the Japanese-made equipment procured by the two past Grant Aid projects and strongly desires to be provided with Japanese products through this Project as well.

Therefore, in formulating an equipment procurement plan for this Project in accordance with the procurement rules for Grant Aid projects, it will be considered that sourcing the equipment mainly from Japan because of absence of comparable products made in Kyrgyzstan and in order to meet the aforementioned high expectations on Japanese products and provide continuity and compatibility with the equipment procured by the past Grant Aid project. Products, for which no or only a limited number of Japanese manufacturers exist, will be procured from manufactures of Europe or other third countries whose products are widely used in Kyrgyzstan and have comparable quality to that of Japanese products.

2-2-2 Basic Plan (Equipment Plan)

(1) Overall Plan

Of the road maintenance services provided by MOTC, this Project will cover the aforementioned four operations, for each of which the workflow and noting points are described below.

1) Road Repair

① Patching

- Cut the perimeter of the area to be patched → Break up and remove asphalt → Clean the hole → Apply primer coat → Pour asphalt mixture → Roll/compact

Points to note: Cleanly cut out the damaged area, clean the hole thoroughly after removing asphalt, and compact asphalt mixture to sufficient density.

② Crack Sealing

- Clean cracks → Apply straight asphalt → Cover with sand

Points to note: Thoroughly clean inside the cracks and completely fill them with straight asphalt.

③ Overlay and Replacement of Asphalt Pavement

Clean pavement surface (or compact the roadbed) → Apply primer coat

→ Spread asphalt mixture → Roll /compact

Points to note: Properly control the thickness of spread asphalt mixture, and roll/compact the mixture to sufficient density.

④ Shaping of Road Shoulders and Surfaces

- Cut off or fill uneven sections of shoulders/surfaces with motor grader.

Points to note: Properly adjust the blade angle to smooth uneven shoulders/surfaces into specified shapes. Blade width (approx. 3.5m) and power (engine output and weight) that can cover one lane are required.

2) Snow Cleaning/Melting

① Removal of Snow and Ice

- Remove early snow deposit → Remove compacted snow → Remove frozen snow on road surface
- Remove snowdrift and large snow deposits 50cm or deeper.

Points to note: Select snow-clearing methods and equipment suitable for the snowfalls of the target regions.

② Spraying of Snow-Melting Salt and Sand

- Spray snow-melting salt and sand.

Points to note: Adjust the mixture ratios of snow-melting salt and sand, as well as the spray rate, according to the temperature, snowfall level, and road conditions.

3) Post-Disaster Reconstruction

① Removal of fallen rocks and debris

- Remove and load fallen rocks and debris into truck → Haul away rocks and debris

Points to note: Debris need to be cleared, loaded, and hauled away swiftly.

② Restoration of collapsed roads

- Deliver earth and sand → Fill crevasses → Roll/compact → Pave road surface

Points to note: Deliver earth/sand and fill crevasses swiftly, and roll/compact the road surface sufficiently.

4) Support Operations

① Transport of equipment

- Load → Move → Unload

Points to note: Safely load and transport equipment by taking into account its weight and size.

② On-Site Repair

- Move to site → Repair → Move to another site

Points to note: The mobile workshop van should carry equipment and tools that can perform minor to medium repair on site, and have a driving performance (4WD, etc.) to swiftly move to the destinations via poor roads.

③ Inspection/Repair in Workshop

- Accept equipment → Inspect/service/repair → Deliver to work site

Points to note: Inspect, service, and repair equipment swiftly, and equip the workshop with tools that can repair aged equipment and fabricate needed parts. Considering the extremely poor content of existing equipment, it is planned to procure basic tool kits and install them in multiple DEPs.

④ Weighing of Large Vehicles

- Set up axle load scale → Measure axle load & handle violating drivers → Move to another weighing point

Points to note: A weighing point needs to be quickly moved around and set up in various locations to prevent overloaded vehicles from travelling long distances.

(2) Determining the Content of Equipment

Table 2-1 lists equipment items that correspond to the aforementioned operations.

Table 2-1 Equipment Configuration by Work Type

Operation	Work type	Equipment configuration
Road repair 1	Patching	Asphalt cutter, hand rock breaker, air compressor, asphalt sprayer, hand-guided roller, vibrating compactor, dump truck
	Crack sealing	Air compressor, asphalt sprayer
Road repair 2	Overlay and repaving Shaping of road shoulders and surfaces	Asphalt sprayer, asphalt finisher, road roller, tire roller, water sprinkler, excavator, wheel loader, motor grader, dump truck, asphalt plant, aggregate plant
Snow clearing & melting	Snow/ice clearing	Snow-clearing truck, snow plough, rotary snow blower, motor grader
	Salt/sand spraying	Salt spreader

Operation	Work type	Equipment configuration
Post-disaster reconstruction	Removal of fallen rocks and debris	Excavator, wheel loader, dump truck
	Restoration of collapsed road	Excavator, wheel loader, dump truck set of paving equipment (same as overlay equipment)
Support	Transport of equipment and workers, etc.	truck with crane, truck trailer
	On-site repair	Mobile workshop van
	Inspection/repair in workshop	Repair tools/instruments
	Weighing of large vehicles	Portable wheel weigher

(3) Determining the Basic Specifications of Each Equipment Item

The basic specification appropriate for each item, which is shown in Table 2-2, was determined according to the design policy of this Project and based on the standard specifications for pavement and civil works under the Cost Estimation Standards for Civil Engineering Works of the Ministry of Land, Infrastructure and Transport in consideration of the specifications of the existing equipment and those of products widely used in Kyrgyzstan, as well as the utilization status of the equipment provided by the past two similar projects.

For snow/ice-clearing operations, multi-purpose utility trucks will be procured, to which a snowplow, rotary snow blower, and salt spreader can be attached, so that they can be used both in winter and summer. These trucks can be used without the attachments during summer as hauling trucks and would be further utilized for cleaning and mowing by attaching brushes and blades, which MOTC can separately procure on its own.

Table 2-2 Basic Specifications of Equipment (draft)

Op.	Equipment	Function	Basic specification
		Reason/criteria for selection	
Road repair 1	Asphalt Cutter	Cuts asphalt.	Cut depth:150mm
		Thickness of existing asphalt: 50 – 100mm	
	Vibrating Compactor	Rolls road surface.	Weight: 60 kg
		Standard spec	
	Hand Breaker	Breaks asphalt.	Weight: 7 kg
		Standard spec	
	Air Compressor	Supplies compressed air (to hand breakers).	Displacement: 5.0 m ³
Air consumption of 2 hand breakers			
Asphalt Sprayer	Sprays tack coat & asphalt.	Tank capacity: 350 Lit	
	Standard spec		
Hand Guide Roller	Rolls road surface.	Weight: 600 kg	
	Standard spec		
Dump Truck	Transports gravel, crushed stones & asphalt mixture.	Loading capacity:14 t	
	Standard spec, aggregate plant capacity		

Op.	Equipment	Function	Basic specification
		Reason/criteria for selection	
Road repair 2	Asphalt Finisher	Levels asphalt mixture.	Paving width: 4.4 m
		Width of 1-lane road	
	Road Roller	Rolls road surface.	Weight: 9.5 t
		Standard spec	
	Tire Roller	Rolls road surface.	Weight: 12.5 t
		Standard spec	
	Water Sprinkler	Sprays road with water & supplies water to roller, etc.	Tank capacity: 8,000 Lit
		Standard spec, water supply volume to roller	
	Excavator	Collects & loads gravel.	Bucket capacity: 0.8 m ³
Popular model			
Wheel Loader	Transports gravel.	Bucket capacity: 2.5 m ³	
	Supply volume to plant		
Motor Grader	Shapes road shoulder, surface, and roadbed	Blade width: 3.7 m	
	Standard spec, width of 1 lane		
Asphalt Plant	Produces asphalt	Production capacity: 35 t/h	
	Minimum requirement: 34.5 t/h = 70 m/h × 3.5 m × 6 cm × 2.35 t/m ³		
Aggregate Plant	Produces aggregate	Production capacity: 35 t/h	
	Equivalent capacity to Asphalt Plant		
Snow Clearing/Melting	Snow Removing Truck (Multi-purpose Vehicle + Snow Plough)	Clears initial snow.	4WD. snow plough width: 3.0 m
		Can be attached with various snow-clearing devices	
	Rotary Snow Blower (Multi-purpose Vehicle + Rotary Snow Blower)	Clears deep snow.	Rotary diameter: 750 mm
		Attachable to utility truck	
Salt Spreader (Multi-purpose Vehicle + Salt Spreader)	Spreads salt and sand.	Hopper capacity: 2.0 m	
	Attachable to utility truck		
Motor Grader	Removes ice	Blade width: 3.7 m	
	Used also for road paving		
Post-Disaster Reconstruction	Excavator	Removes/loads fallen rocks and debris	Bucket capacity: 0.8 m ³
		Used also for road paving	
	Wheel Loader	Removes/loads fallen rocks and debris	Bucket capacity: 2.5 m ³
		Used also for road paving	
Dump Truck	Carries fallen rocks and debris	Loading capacity: 14 t	
	Used also for road paving		
Whole set of paving equipment	——Same as road repair equipment——		

Op.	Equipment	Function	Basic specification
		Reason/criteria for selection	
Support Operations	Truck with Crane	Carries small equipment (for patching)	Loading capacity: 4.0 t with 2.8 t crane
		Weight of patching equipment & supplies: approx. 3.5 t	
	Truck Trailer	Carries large equipment.	Loading capacity: 25.0 t, Extra low bed
		Weight of large equipment: approx. 21 t	
	Mobile Workshop Van	Repairs broken equipment on site.	4WD, 8-ton class, aluminum van Installed with repair equipment/tools and crane
		Installed with necessary tools for on-site repair	
	Repair Tool/Instrument Kit	Inspects/services equipment in workshops.	Gantry crane, Generator/welder, Air compressor, etc.
		Basic equipment set for inspection and servicing	
	Portable Wheel Weigher	Controls overloaded vehicles	Portable Type
		Weighing capacity: 20 t	

(4) Determining the Required Quantities

1) Road Repair Operations -1 (Patching, Crack Sealing)

The roads to be covered by this Project are administered by 27 DEPs under the jurisdictions of 4 PLUAD/UAD. Most of the DEPs are currently performing patching and sealing operations in two teams that rely mostly on manual work due to lack of equipment. In addition, some DEPs are using low-quality asphalt materials, leading to low durability of patched/sealed sections of roads.

The new road repairing machines will work as a group, and every two asphalt cutters and hand breakers will be sharing one air compressor to increase operational efficiency. As these small machines tend to wear quickly, they will work as a pair so that each can substitute for the other when it suddenly breaks in order to prevent the entire operation from halting.

This group of equipment will be installed in every DEP office in order to ensure the transfer of road repairing techniques, improve the durability of patched/sealed road sections, and produce other effects intended by the Project.

Table 2-3 Equipment Quantities Necessary for Road Repair Operations -1 (Patching & Sealing)

Equipment	Specification	Qty.			
		OSI UAD	PLUAD 6	PLUAD 5	BO UAD
Asphalt Cutter	Cut depth: 150mm	14	14	10	16
Vibrating Compactor	Weight: 60kg	14	14	10	16
Hand Breaker	Weight: 7kg	14	14	10	16
Air Compressor	Displacement: 5.0 m ³ /min	7	7	5	8
Asphalt Sprayer	Tank capacity: 350 Lit	7	7	5	8
Hand Guide Roller	Weight: 600 kg	7	7	5	8

2) Road Maintenance Operations – 2 (Overlay/Replacement of Pavement, Shaping of

Shoulders/Surfaces)

① Equipment Related to Asphalt Plant

The temperature of asphalt mixture needs to be 110°C or higher when it arrives at the paving site. Considering the atmospheric temperature during summer and other factors, the practical distance to transport asphalt mixture from the plant to the construction site would be around 100km (up to 150km) one way.

At present, each DEP is sourcing asphalt mixture from asphalt plants owned by MOTC, as well as from private manufacturers when MOTC's plants cannot produce needed amount or when the transport distance is too great. However, obtaining needed volume at needed timing from private asphalt plants is also often difficult, as they tend to ask for higher price and bulk orders and preferentially supply product to their own private projects.

In light of these circumstances, it is deemed appropriate that each PLUAD/UAD will be provided with one set of asphalt-plant-related equipment, along with one set of aggregate-plant-related equipment, as these two plants are usually set up side by side as a pair.

It is estimated that each PLUAD/UAD will be overlaying and replacing about 10km of asphalt pavement annually as part of small- to medium-scale repair operations. Assuming the road width of 3.5 m x 2 lanes = 7.0 m, average pavement thickness of 6 cm, annual repair distance of 10 km, plant loss rate of 10%, and asphalt mixture density of 2.35, the required production capacity of the asphalt plant can be derived as follows:

- Required annual production capacity: $7.0 \text{ m} \times 0.06 \text{ m} \times 10,000 \text{ m} \times 1.1 \times 2.35 = 10,857 \text{ t/yr}$

Assuming that the asphalt plant operates 5 hours per day and 90 days per year (15 days x 6 months), the required production capacity per hour will be as follows:

- Required production capacity (for repaving): $10,857 \text{ t/yr} \div (90 \text{ days} \times 5 \text{ h/day}) = 24.1 \text{ t/h}$

In addition, each PLUAD/UAD produces an average of 3,000 tons of asphalt mixture annually at the MOTC-owned asphalt plant for patching operations, which translates to the following required production capacity:

- Required production capacity (for patching): $3,000 \text{ t/yr} \div (90 \text{ days} \times 5 \text{ h/day}) = 6.7 \text{ t/h}$

Therefore, the required production capacity per hour of the asphalt plant becomes as follows:

- Required production capacity: $24.1 \text{ t/h} + 6.7 \text{ t/h} = 30.8 \text{ t/h}$

To meet the above requirement, we will select a standard-type 35t/h-class asphalt plant model.

The aggregate plant supplies materials to the adjacent asphalt plant and needs to have a capacity 1.5 times that of the asphalt plant so as not to cause material shortages. In this equipment plan, we set the operating hours of the aggregate plant 1.5 times longer than those of the asphalt plant (= 7.5 hours/day) and the production capacity at 35t/h to match that of the asphalt plant.

The number of dump trucks needed for delivering asphalt mixture to paving sites is derived as follows:

- Loading time of asphalt mixture: 20 minutes (including waiting time)
- Two-way travel time: approx. 60 minutes (= (average two-way travel distance 50 km \div average

- travel speed 50 km/h) x 60 minutes)
- Unloading (feeding) time: 15 minutes
- Total time from loading to unloading/feeding: 95 minutes
- Transport volume per dump truck per hour: $(60 \text{ min/h} \div 95 \text{ min}) \times 10 \text{ t/truck} = 6.3 \text{ t/ (h} \cdot \text{truck)}$
- Asphalt finisher productivity: 70 m/h
- $70 \text{ m/h} \times \text{paving thickness } 0.06 \text{ m} \times \text{paving width } 3.5 \text{ m} \times \text{asphalt density } 2.35 \text{ t/m}^3 = 34.5 \text{ t/h}$

Therefore, the required number of dump trucks is: $34.5 \text{ t/h} \div 6.3 \text{ t/ (h} \cdot \text{truck)} = 5.46 \approx 6$ trucks

In this equipment plan, it is decided to procure 3 (three) dump trucks for each plant, which can continue using the existing trucks as well, to keep the procurement quantity to minimum.

In addition, 1 (one) excavator and 1 (one) wheel loader are installed in each plant for excavating and carrying aggregate materials.

Locations of the plants are shown in the table below.

Table 2-4 Sites for Asphalt Plants and Aggregate Plants

PLUAD/UAD	Location	Site
OSI UAD	Osh Oblast Karatai Village	Remained site of relocated plant
PLUAD 6	Jalal-Abad Oblast Jergatal Village	New site
PLUAD 5	Taras Oblast Aksai Village	Remained site of relocated plant
BO UAD	Osh Oblast Kurshab Village	Site of former plant

② Asphalt Paving Equipment

One each of road roller, tire roller, and water sprinkler, which form a group of equipment required for asphalt overlay and replacement operations, will be installed in each PLUAD/UAD.

③ Motor Grader

In consideration of the Chinese-made motor graders that were procured using Turkish funds, as well as the required workload of each DEP (shaping of asphalt-paved road shoulders and unpaved road surfaces), motor graders will be procured for DEPs that were not covered by Turkish funds.

Table 2-5 Motor Grader Deployment Plan (1)

Division	DEP	Total road length (km)	Paved road (km)	Unpaved road (km)	Turkish Funds (Qty)	This Project (Qty)
OSI UAD	DEP 16	247	106	141	1	
	DEP 21	307	137	170		1
	DEP 37	435	190	245	1	
	DEP 44	232	138	94	1	
	DEP 45	299	169	130	1	
	DEP 959	305	144	161	1	
	DEP 960	222	128	94		1
PLUAD 6	DEP 12	348	153	195	1	
	DEP 17	360	173	187	1	
	DEP 27	193	20	173	1	
	DEP 31	193	20	173	1	
	DEP 50	279	98	181	1	
	DEP 51	263	90	173	1	
	DEP 52	203	81	122		1
PLUAD 5	DEP 6	407	174	233	1	
	DEP 19	306	71	235		1
	DEP 36	306	151	155	1	
	DEP 47	244	81	163	1	
	DEP 48	193	70	123	1	
BO UAD	DEP 5	276	167	109	1	
	DEP 9	414	216	198	1	
	DEP 22	339	262	77	1	
	DEP 23	353	115	238	1	
	DEP 26	255	63	192	1	
	DEP 30	180	138	42		1
	DEP 38	200	137	63		1
	DEP 956	154	87	67	1	
					21	6

Turkish Funds: no. of motor graders to be provided through Turkish Funds (to be delivered in 2013)

This Project: will provide the equipment preferentially to regions not covered by Turkish Funds

Based on the above, the following quantities of motor graders will be procured.

Table 2-6 Motor Grader Deployment Plan (2)

	OSI UAD	PLUAD 6	PLUAD 5	BO UAD	合計
Quantity	2 units	1 unit	1 unit	2 units	6 units

The motor graders will be used for replacing asphalt pavement and shaping road shoulders and surfaces during summer, and for clearing snow during winter.

Table 2-7 Equipment Quantities Necessary for Road Repair Operations – 2 (Overlay/Replacement of Pavement, Shaping of Shoulders/Surfaces)

Equipment	Specification	Qty.			
		OSI UAD	PLUAD 6	PLUAD 5	BO UAD
Asphalt Finisher	Paving width: 4.4 m	1	1	1	1
Road Roller	Weight: 9.5 t	1	1	1	1
Tire Roller	Weight: 12.5 t	1	1	1	1
Water Sprinkler	Tank capacity: 8,000 Lit	1	1	1	1
Motor Grader	Blade width: 3.7 m	2	1	1	2
Excavator (*)	Bucket capacity: 0.8 m ³	1	1	1	1
Wheel Loader (*)	Bucket capacity: 2.5 m ³	1	1	1	1
Dump Truck (*)	Loading capacity: 14 t	3	3	3	3
Asphalt Plant	Production capacity: 35 t/h	1	1	1	1
Aggregate Plant (*)	Production capacity: 35 t/h	1	1	1	1

(*) indicates equipment to support the operations of asphalt plant.

3) Snow Clearing/Melting

Snow clearing during winter to ensure road traffic by operating 24 hours a day is the most important mission for all PLUAD/UAD, which are situated in snowfall zones with mountain passes. It is planned to procure one multi-purpose vehicle for each PLUAD/UAD, as it takes at least one day to travel from one PLUAD/UAD to another, which would not be realistic to do each time snow deposits on roads.

Table 2-8 Quantities of Equipment Required for Snow Clearing/Melting

Equipment	Specification	Qty.			
		OSI UAD	PLUAD 6	PLUAD 5	BO UAD
Multi-Purpose Vehicle	4WD, with PTO for attachment	1	1	1	1
Snow Plough	Width: 3,000 mm	1	1	1	1
Rotary Snow Blower	Rotary diameter: 750 mm	1	1	1	1
Salt Spreader	Hopper capacity: 2.0 m ³	1	1	1	1

4) Post-Disaster Reconstruction

Despite the fact that every PLUAD/UAD has areas where disasters frequently occur due to heavy snow, rainfall, fallen rocks, and so forth, the available quantity of equipment currently owned by their subordinate DEP is decreasing due to aging, resulting in delays in the restoration of affected roads. In this Project, it is planned to improve their capacity by procuring additional equipment to complement the existing equipment. While dump trucks, excavators, and wheel loaders will be basically stationed in asphalt plants, they will be used preferentially for performing emergency restoration work within each PLUAD/UAD.

5) Support Operations

① Truck with Crane

Each DEP will be installed with one truck with crane to carry small equipment, water, gravel, and other materials to support Road Repair Operations -1 (Patching, Crack Sealing).

② Truck Trailer

Paving equipment procured for each PLUAD/UAD will be covering the whole area under its jurisdiction. Each PLUAD/UAD will be provided with one truck trailer to haul the asphalt finisher, road roller and tire roller, which cannot travel long distances between construction sites by themselves. Truck trailers will be used also for transporting excavators and wheel loaders for snow-clearing and post-disaster reconstruction operations.

③ Mobile Workshop Van

Servicing tools owned by each DEP are not much more than simple hand tools, which can handle daily maintenance but cannot perform minor to major repairs, for which broken equipment needs to be brought back to DEP or taken to repair service dealers, etc. One mobile workshop van will be procured for each PLUAD/UAD so that the van can make rounds to each DEP within its jurisdiction to perform multiple tasks, including on-site maintenance and minor repair, as well as transport of broken components to the DEP in charge of repair.

Table 2-9 Quantities of Truck with Crane, Truck Trailer, and Mobile Workshop Van

Equipment	Specification	Quantity			
		OSI UAD	PLUAD 6	PLUAD 5	BO UAD
Truck with Crane	Loading capacity: 4.0 t with 2.8 t crane	7	7	5	8
Truck Trailer	Loading capacity: 25.0 t, flat low floor	1	1	1	1
Mobile Workshop Van	4WD, 8-ton class, aluminum van Installed with repair equipment/ tools and crane	1	1	1	1

④ Repair Tools/Instruments

As mentioned earlier, repair tools owned by each DEP are not much more than hand tools. A set of repair tools and instruments will be procured for each of the two DEPs that play central roles in equipment repair so that these DEPs can undertake repair work of surrounding DEPs in a concentrated manner. The deployment plan for each PLUAD/UAD is shown in Table 2-10.

Table 2-10 Descriptions/Specifications of Repair Tools/Instruments

	Equipment	Spec/Description
1	Portable gantry crane	Capacity: 3 t Suspension wire, nylon sling
2	Jack	Hydraulic garage jacks: 5 t, 10 t Portable jack: 10 t
3	Generator/Welder	30 - 280 A 380 V - 10 kVA

	Equipment	Spec/Description
4	Battery charger	Input: 1.4 KVA Output: 12/24 V, 35 A / 70 A
5	Air Compressor	5.5 kw 600 Lit/min, 0.95 Mpa
6	Mechanical tools	144-piece tool kit Open-end wrench Tire bead remover
7	Measuring instruments	Oil gauge set Tachometer Digital thermometer Caliper Digital circuit tester (AC/DC voltage, current, resistance) Torque wrench Duplex hammer
8	Power tools	Hand drill Portable grinder Bench grinder
9	Lubricating tools	Drum pump Grease pump Oil bucket pump Filter wrench
10	Work bench, cabinet	Movable work bench Vise Steel cabinet

Table 2-11 Repair Tools/Instruments Deployment Plan

	OSI UAD	PLUAD 6	PLUAD 5	BO UAD
Equipment station	•DEP 21 •DEP 959	•DEP 52 •DEP 12	•DEP 36 •DEP 6	•DEP 9 •DEP 956

⑤ Portable Wheel Weigher

Three portable wheel weighers will be procured for WCTS so that, in addition to the five existing weigh stations in the target regions, temporary inspection points can be quickly set up at road merges between weigh stations to control overloaded vehicles.

Table 2-12 Equipment Quantity Required for Weighing

	Specification	Qty.
Portable Wheel Weigher	Weighing capacity: 10 t × 2 (20 t in total) Platform: 900 × 500 mm Indicator: with built-in batteries and printer Interconnecting cable	3

6) Spare Parts

It is planned to procure a whole set of periodic replacement parts, expendables, and other items needed for periodic servicing of equipment during the initial operation phase of the first two years or

so, which translates to 3,000 hours of operation for construction equipment and 60,000 km of mileage for vehicles.

Table 2-13 List of Spare Parts (tentative)

Item		Quantity
Periodic replacement parts	Fuel filter	Quantity of each spare part, which differs for each product and manufacturer, will be determined after collecting data from the manufacturers. In terms of cost, it will be around 5 to 10% of the price of the equipment.
	Air filter	
	Engine oil filter	
	Hydraulic oil filter	
Expendables	Bucket tooth	
	Cutting edge	
	Brake shoe	
	V-belt	
Other	Head lamp	
	Brake lamp	
	Fuse	
	Hydraulic hose	
	Other spare parts recommended by manufacturers	

(5) Equipment to be procured

Equipment items selected as a result of the above considerations are listed in Table 2-14 below.

Table 2-14 List of Equipment to be Procured

No	Equipment	Specification	OSI UAD	PLUAD 6	PLUAD 5	BO UAD	Total
1	Asphalt Cutter	Cut depth:150 mm	14	14	10	16	54
2	Vibrating Compactor	Weight: 60 kg	14	14	10	16	54
3	Hand Breaker	Weight: 7 kg	14	14	10	16	54
4	Air Compressor	Displacement: 5.0 m ³ /min	7	7	5	8	27
5	Asphalt Sprayer	Tank capacity: 350 Lit	7	7	5	8	27
6	Hand Guide Roller	Weight: 600 kg	7	7	5	8	27
7	Asphalt Finisher	Paving width: 4.4 m	1	1	1	1	4
8	Road Roller	Weight: 9.5 t	1	1	1	1	4
9	Tire Roller	Weight: 12.5 t	1	1	1	1	4
10	Water Sprinkler	Tank capacity: 8000 Lit	1	1	1	1	4
11	Motor Grader	Blade width: 3.7 m	2	1	1	2	6
12	Excavator	Bucket capacity: 0.8 m ³	1	1	1	1	4
13	Wheel Loader	Bucket capacity: 2.5 m ³	1	1	1	1	4
14	Dump Truck	Loading capacity: 14 t	3	3	3	3	12
15	Asphalt Plant	Production capacity: 35 t/h	1	1	1	1	4
16	Aggregate Plant	Production capacity: 35 t/h	1	1	1	1	4
17	Multi-Purpose Vehicle	4WD, with PTO for attachment	1	1	1	1	4
17-1	Snow Plough	Blade width: 3.0 m	1	1	1	1	4
17-2	Rotary Snow Blower	Rotary diameter: 750 mm	1	1	1	1	4
17-3	Salt Spreader	Hopper capacity: 2.0 m ³	1	1	1	1	4
18	Truck with Crane	Loading capacity: 4.0 t with 2.8 t crane	7	7	5	8	27

No	Equipment	Specification	OSI UAD	PLUAD 6	PLUAD 5	BO UAD	Total
19	Truck Trailer	Loading capacity: 25.0 t, extra low bed	1	1	1	1	4
20	Mobile Workshop Van	4WD, 8-ton class, aluminum van Installed with repair equipment/ tools and crane	1	1	1	1	4
21	Repair Tools/Instruments	Gantry Crane, Generator/Welder, Battery Charger, Air Compressor	2	2	2	2	8
22	Portable Wheel Weigher	Capacity: 10 t × 2, Platform: 900 × 500 mm × 2	Equipment station: WCTS				3
	Total		91	90	70	101	355

2-2-3 Procurement Plan

2-2-3-1 Procurement Policy

(1) Project Implementing Bodies

Figure 2-1 shows the interrelations among the Japanese and Kyrgyz organizations, which will be engaged in the implementation of the Project if it is to be carried out using Grant Aid from the Government of Japan.

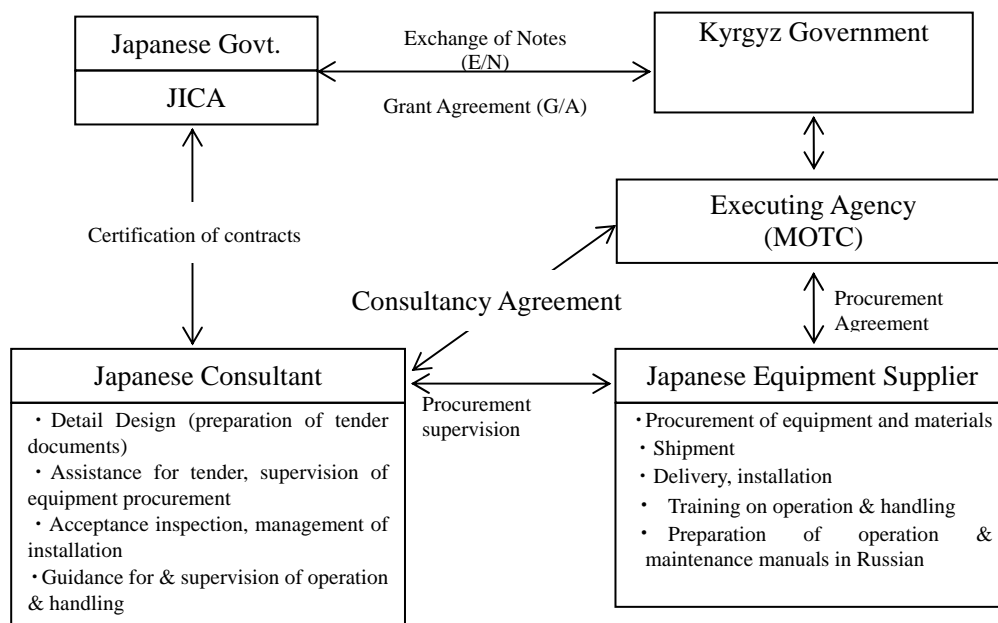


Figure 2-1 Interrelations Among Project Implementing Bodies

The executing agency on the Kyrgyz side of this Project will be the Ministry of Transportation and Communications (MOTC). Detailed design and procurement supervision will be undertaken by a Japanese consultant firm (the Consultant) under the Grant Aid Scheme of the Government of Japan. Equipment for this Project will be procured by a Japanese contractor (the Equipment Supplier), who will be the main signatory to Procurement Agreement.

(2) Consultant

Immediately after the signing of E/N and G/A, MOTC will conclude a Consultancy Agreement with the Japanese Consultant, which will, in accordance with the agreement, provide engineering services for the Project, including detail design, preparation of tender documents, assistance for tender execution, and supervision of procurement activities, and assume responsibility for these services until the handover of the equipment is complete.

(3) Equipment Supplier

The Equipment Supplier, who will be selected as a result of satisfying the required qualities and specifications and winning a tender open only to qualified bidders, will conclude a Procurement Agreement with MOTC with respect to the supply of equipment planned for this Project.

2-2-3-2 Implementation Conditions

The equipment to be procured for this Project will be shipped from Japan via ocean freight and transported via the Siberian Railway or Chinese Railway to undergo customs clearance in Bishkek, the capital of Kyrgyzstan. From there, the equipment will be transported by land and delivered to their respective destinations specified as follows.

- Equipment and spare parts, except for those related to plants, are to be delivered to DEP 39 near Bishkek.
- Plant-related items are to be delivered to the sites, where their respective plants will be constructed.

Upon delivery of equipment to the specified destinations, the Equipment Supplier will test-operate each equipment unit and hand it over to MOTC after confirming that it functions properly. Immediately after the handover, the Equipment Supplier will provide training to MOTC personnel on the operation, handling, inspection, and maintenance of the equipment.

As mentioned earlier, the equipment and spare parts, except for plant-related items, will be delivered to DEP39, from which point, MOTC will be responsible for forwarding and installing the equipment to and in 27 DEP and WCTS under 4 PLUAD/UAD as shown in Table 2-14, where the equipment will be stationed.

2-2-3-3 Scope of Works

The Japanese side will shoulder all expenses associated with the procurement of the equipment, including the costs of delivery to the specified destinations and unloading. The Kyrgyz side will be responsible for exempting the equipment from all import taxes and duties. The two countries' respective responsibilities are shown in Table 2-15.

Works associated with the construction of asphalt and aggregate plants are divided as follows:

- The Kyrgyz side will secure and prepare land for setting up the plants and provide primary power, water, and drainage services to the plants.
- The Japanese side will undertake installation, including foundation and retaining wall works.
- The Kyrgyz side will remove existing structures that will interfere with the installation of procured

equipment.

The Japanese side will present to the Kyrgyz side the following documents in advance:

- Floor plans of the plants
- Foundation plans of the plants
- Water/drainage system plans
- Electrical power requirements

Table 2-15 Responsibilities of the Two Governments

Work	Content	Responsible party		Remarks
		Japan	Kyrgyz	
Equipment procurement	Procurement of equipment	○		To custom house Incl. tax exemption From custom house
	Ocean/land transportation	○		
	Customs clearance		○	
	Inland transportation	○		
Operational guidance, etc.	Training on operation	○		
	Training on inspection & maintenance	○		
Plant construction	Land acquisition, site preparation		○	
	Foundation & retaining wall works	○		
	Equipment installation	○		
	Water service & drainage		○	
	Primary power supply		○	
Operations and maintenance	Forwarding of equipment		○	To equipment stations
	Securing of storage sites		○	
	Equipment maintenance		○	

2-2-3-4 Consultant Supervision

(1) Basic Policy

After the signing of E/N and G/A, the Japanese Consultant will conclude a Consultancy Agreement with the Government of Kyrgyzstan to undertake the supervision of the procurement work defined in the E/N according to the framework of the Grant Aid Scheme. It is important for the Consultant to perform its duties based on thorough understanding of the background of the Project, as well as the rationale and key points of the outline design.

(2) Work Content

The Consultant's supervisory work consists mainly of the following elements:

- Pre-launch consultation, verification of Project sites
- Review of equipment specifications
- Preparation of tender documents
- Briefing on tender documents, obtaining of approval
- Assistance for tender procedure (announcement, distribution of documents, execution of tender, evaluation of bids)
- Facilitation of contract signing (negotiation, witnessing, certification)
- Confirmation of issuance of purchase orders for equipment

- Factory/pre-shipment inspections
- Pre-loading survey (entrusted to a third party)
- Previous arrangements in Kyrgyzstan (to confirm delivery/installation schedule, tax exemption, and startup training procedure)
- Supervision of installation work
- Acceptance inspection, handover
- Witnessing of training on driving, operation, inspection, and servicing
- Preparation of a notice of completion

2-2-3-5 Quality Control Plan

In order to ensure that the procured equipment items satisfy the quality requirements and specifications stipulated in the agreement, the Consultant will conduct the following inspections in various stages of the procurement work.

- Checking of the contents of purchase orders issued by the Equipment Supplier
- Factory and pre-shipment inspections at the manufacturing plants of the equipment
- Pre-loading survey
- Inspection at the time of plant installation
- Inspection at the time of equipment handover

2-2-3-6 Procurement Plan

(1) Countries of Origin

Aside from those made in the former Soviet Union, equipment products widely distributed in Kyrgyzstan come from Japan, China, and Europe. MOTC appreciates highly of the easy operability and strong durability of the Japanese-made equipment procured by the two past Grant Aid projects and strongly desires to be provided with Japanese products by this Project as well. In addition, MOTC personnel have been properly operating/maintaining and are versed with such Japanese equipment.

In light of the above, while respecting the procurement rules for Grant Aid projects, it will be considered to source the equipment for this Project mainly from Japan because of absence of comparable products made in Kyrgyzstan and in order to meet the aforementioned high expectations on Japanese products and allow continuity and compatibility with the equipment procured by the past Grant Aid project. Products, for which no or only a limited number of Japanese manufacturers exist, will be procured from manufactures of Europe or other third countries whose products are widely used in Kyrgyzstan and have comparable quality to that of Japanese products. At present, there is a possibility that the following five items may be procured from Europe:

- ① Motor grader
- ② Multi-purpose vehicle
- ③ Snow plough (multi-purpose vehicle + attachment)
- ④ Rotary snow blower (multi-purpose vehicle + attachment)
- ⑤ Salt spreader (multi-purpose vehicle + attachment)

Thailand will be included among the possible source countries of motor graders (i), as major Japanese manufacturers have relocated their production bases to Thailand.

Multi-purpose vehicles (ii) and attachments (iii, iv, and v), which are not produced in Japan, will probably be sourced from such European countries as Germany, France, and Italy.

(2) Procurement Route

Equipment items procured in Japan will probably be loaded and shipped from Yokohama and Kobe, and then transported via Siberian Railway and Chinese Railway. It is assumed that the latter will be used for transporting small construction equipment in containers, and the former will be used to carry the rest of the equipment to avoid robbery. The ocean freight is estimated to take 10 days, and land transportation about 50 days, totaling to approximately 60 days.

Cargos from Europe will be transported by rail or truck, which is estimated to take around 30 days.

2-2-3-7 Operation Guidance Plan

(1) Trial Operation and Adjustment

At the timing of delivery of the equipment, the Equipment Supplier will dispatch engineers to test-run and adjust the delivered equipment to ensure that all items operate properly. Though this Project intends to procure 25 types of equipment from many different manufacturers, it is planned to dispatch four engineers to take charge of multiple equipment types, including training on their startup and operation.

(2) Training on Startup and Operation

After handover of the equipment, drivers and mechanics will be given training on startup and operation. While the staff of each DEP have general knowledge and a certain degree of experience in handling the existing Russian and Chinese equipment, they are not familiar with the equipment to be newly introduced by this Project and may lack skills for overhauling and repair work. For this reason, training on startup and operation will be conducted in two increments as described below.

Each equipment item will be attached with operation and maintenance manuals written in Russian so that operators and mechanics can easily understand the content.

1) Training on Startup and Operation (Part 1)

This part of startup/operation training will teach how to operate and inspect the equipment on a daily basis. Since MOTC personnel have general knowledge, skills, and experience in using Japanese-made products, this training will focus on special maneuvers and inspections unique to each product model.

Training for the plants will be provided at four installation sites. As for other equipment, training will be provided at DEP 39 for all related PLUAD/UAD and subordinating DEPs.

Table 2-16 Duration of Training on Startup and Operation (Part 1)

No	Equipment	Qty.	No. of days	Engineer
1	Asphalt Cutter	54	1	A
2	Vibrating Compactor	54		
3	Hand Rock Breaker	54		
4	Air Compressor	27		
5	Asphalt Sprayer	27		
6	Hand-Guided Roller	27		
7	Asphalt Finisher	4	1	A
8	Road Roller	4	1	A
9	Tire Roller	4		
10	Water Sprinkler	4	0.5	A
11	Motor Grader	6	1	A
12	Excavator	4		
13	Wheel Loader	4		
14	Dump Truck	12	0.5	A
15	Asphalt Plant	4	8	B
16	Aggregate Plant	4	8	C
17	Multi-Purpose Vehicle	4	2	D
17-1	Snow Plough	4		
17-2	Rotary Snow Blower	4		
17-3	Salt Spreader	4		
18	Truck with Crane	27	1	A
19	Truck Trailer	4		
20	Mobile Workshop Van	4	1	A
21	Repair Tools/Instruments	8	1	A
22	Portable Wheel Weigher	3	0.5	A
	Total		26.5	

Note: Engineer A: for general purpose equipment, B: for Asphalt plant,
C: for Aggregate plant, D: for Multi-purpose vehicle

2) Training on Startup and Operation (Part 2)

Using the equipment procured by the past two Grant Aid projects as teaching materials, Japanese engineers will teach how to overhaul and repair the equipment and identify needed parts and components.

The teaching materials will be delivered to DEP39, where the equipment for this Project will be received and inspected. Training on plant operation will be given by Japanese-side engineers at the sites, where asphalt and aggregate plants will be set up. Part 2 of the training will follow immediately after the completion of Part 1.

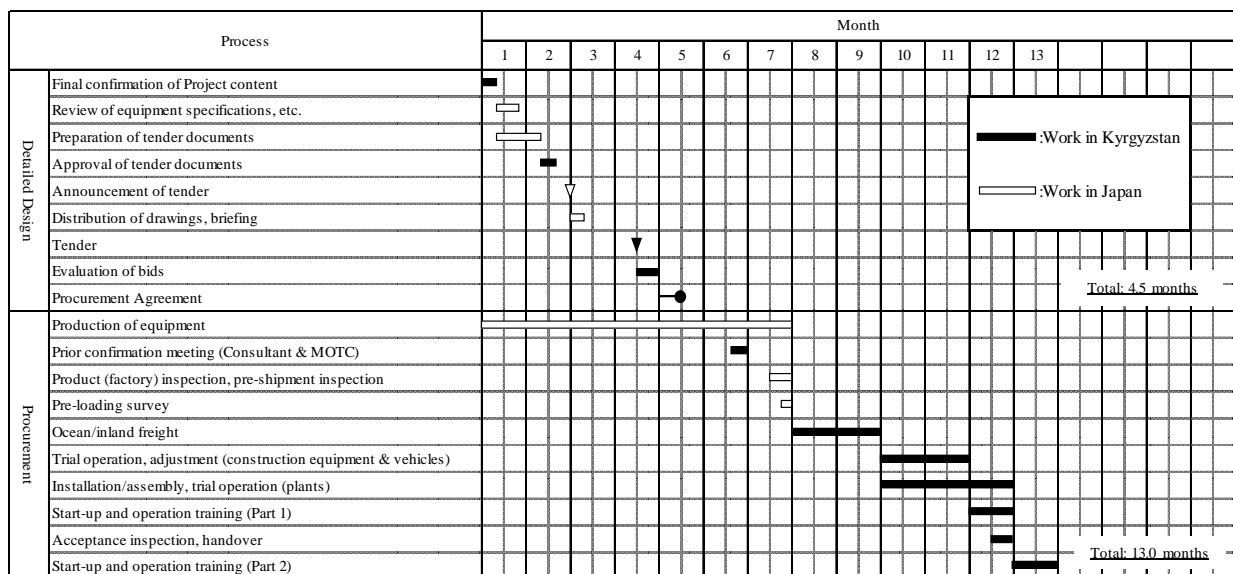
Table 2-17 Duration of Training on Startup and Operation (Part 2)

Category	Equipment	Qty. (reference)	No. of days
Small construction equipment	Asphalt cutter	25	3
	Vibrating compactor	28	
	Hand rock breaker	28	
	Air compressor	14	
	Asphalt sprayer	15	
	Hand-guided roller	14	
Road construction equipment	Asphalt finisher	3	3
	Road roller	3	
	Tire roller	3	
General construction equipment	Motor grader	3	4
	Excavator	3	
	Wheel loader	4	
Vehicle	Water sprinkler	3	5
	Dump truck	16	
	Truck with crane	14	
	Truck trailer	3	
Plant	Asphalt plant	3	6
	Aggregate plant	3	
Snow-clearing truck, etc.	Multi-Purpose Vehicle (incl. Attachments)	3	4
	Snow-clearing truck	4	
	Stabilizer	1	
	Mobile Workshop Van	3	
Total			25

2-2-3-8 Implementation Schedule

This Project will be implemented pursuant to the Grant Aid Scheme of the Government of Japan according the schedule shown in Table 2-18.

Table 2-18 Project Implementation Schedule



2-3 Obligations of Recipient Country

If this Project is to be implemented as a Grant Aid project of the Government of Japan, the undertakings of the Government of Kyrgyzstan will consist of the following:

- Payment of fees associated with Banking Arrangement (B/A) to a designated Japanese bank.
- Provision of facilities necessary for Japanese nationals engaged in this Project to enter and stay in Kyrgyzstan and visit Kyrgyz government agencies in order to carry out their duties.
- Exempting the Japanese citizens and corporations engaged in this Project from tariffs, duties, and all other internal taxes.
- Preparation of documents necessary for customs clearance and tax exemption of equipment to be procured as part of this Project.
- Assignment of personnel and provision of facilities necessary for training on startup, operation, inspection, and servicing.
- Acquisition and preparation of sites for constructing asphalt plants and installing ancillary works.
- Environmental Impact Assessment (EIA) procedure required for the construction of asphalt plants.
- Proper and effective use and maintenance of the procured equipment.
- Proper maintenance and administration of the target roads.
- Payment of all expenses other than those borne by the Government of Japan using Grant Aid.

The Kyrgyz side has assumed responsibilities similar to the above in the past two Grant Aid projects and thus is deemed capable of to implementing this Project without major problems.

2-4 Project Operation Plan

The operation and maintenance of the equipment to be procured by this Project, including servicing and repair, will be performed by DEP under each target PLUAD/UAD. The Kyrgyz side will draft a personnel deployment plan before the equipment is delivered to the specified destinations, and assign personnel to take training on startup and operation of each equipment item to be conducted by Japanese engineers so that they will acquire necessary knowledge and skills. As most of the equipment items will be replacing the existing ones, recruitment of new operators or drivers will not be necessary. Operators/drivers of road rollers, multi-purpose vehicles, mobile workshop vans, and other newly introduced items will be secured by reassigning the current staff or assigning multiple duties to one person, and, if there still is shortage, hiring new staff, the number of which is shown in Table 2-19.

Table 2-19 Required number of new staff

Equipment	Quantity			
	OSI UAD	PLUAD 6	PLUAD 5	BO UAD
Asphalt finisher	0	0	1	0
Road roller	0	0	1	0
Tire roller	0	0	1	0
Water sprinkler	0	0	1	0
Motor grader	1	1	1	1
Excavator	1	1	1	1
Wheel loader	1	1	1	1

Equipment	Quantity			
	OSI UAD	PLUAD 6	PLUAD 5	BO UAD
Asphalt plant	0	3	0	3
Aggregate plant	0	3	0	3
Multi-purpose vehicle	1	1	1	1
Trailer truck	1	1	1	1
Mobile workshop van	1	1	1	1
Total	6	12	10	12

In addition, the budget necessary for performing road maintenance work using the procured equipment needs to be appropriated to each road maintenance office as described in Section 2-5-2.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

The Project will be implemented in accordance with the Japan's Grant Aid scheme and the cost will be determined before concluding the Exchange of Note (E/N) for the Project.

(1) Cost to be borne by the Kyrgyz side

Item	Cost	
	10,000 KGS	10,000 JPY
Plant site acquisition and preparation	201.4	409.0
Incidental work	157.2	319.3
Banking arrangement fee	73.7	149.7
Total	432.3	878.0

(2) Estimation Parameters

- Timing: August 2013
- Exchange rate: 1.00 USD = 99.77 JPY
1KGS = 2.031JPY
- Procurement period: durations of the detailed design and equipment procurement processes are as shown in the implementation schedule.
- Other: this Project will be implemented under the framework of the Grant Aid Scheme of the Government of Japan.

2-5-2 Operation and Maintenance Cost

The annual cost of fuel and oil necessary for the operation of the equipment is estimated at 43.57 million som (approx. 88.42 million yen) as shown in Table 2-20, and the annual maintenance cost at 7.14 million som (approx. 14.5 million yen) as shown in Table 2-21. The annual labor cost of newly-recruited staff will be around 3.8 million som (approx. 7.72 million yen).

Based on the above, the O & M cost associated with the procured equipment to be borne by MOTC totals to 54.51 million som (approx. 110.64 million yen).

The estimated O & M cost of 54.51 million som will account for about 3.9% of MOTC's road

maintenance budget for 2013 (1385.65 million som), which has increased since 2011 at an average annual rate of 112%, indicating that it will be able to secure necessary budget for operating and maintaining the equipment to be procured by this Project.

Considering that MOTC has a track record of raising the O & M budget for the equipment procured by each of the past two Grant Aid projects in the same fiscal year when the equipment was procured and that MOTC has promised to allocate similar funding to this Project, it is deemed likely that adequate funds will be secured for operating and maintaining the planned equipment.

Table 2-20 Estimated Cost for Fuel and Oil (newly incurred cost)

No.	Equipment	Spec. (kw)	Qty.	Working hour (h/year)	Fuel consumption			
					(L/ kw·h·unit)	(L/h·unit)	(L/year·unit)	(L/year)
1	Asphalt Cutter	8.0	54	180	0.227	1.8	326.9	17,652
2	Vibrating Compactor	2.5	54	270	0.301	0.8	203.2	10,971
3	Hand Breaker	-	54	210	-	-	-	-
4	Air Compressor	35.0	27	240	0.189	6.6	1,587.6	42,865
5	Asphalt Sprayer	3.0	27	210	0.227	0.7	143.0	3,861
6	Hand Guide Roller	4.0	27	240	0.201	0.8	193.0	5,210
7	Asphalt Finisher	45.0	4	400	0.152	6.8	2,736.0	10,944
8	Road Roller	55.0	4	360	0.108	5.9	2,138.4	8,554
9	Tire Roller	65.0	4	380	0.100	6.5	2,470.0	9,880
10	Water Sprinkler	145.0	4	630	0.040	5.8	3,654.0	14,616
11	Motor Grader	100.0	6	380	0.108	10.8	4,104.0	24,624
12	Excavator	100.0	4	690	0.175	17.5	12,075.0	48,300
13	Wheel Loader	125.0	4	520	0.153	19.1	9,945.0	39,780
14	Dump Truck	250.0	12	830	0.050	12.5	10,375.0	124,500
15	Asphalt Plant	-	4	450	-	250.0	112,500.0	450,000
16	Aggregated Plant	230.0	4	675	0.170	39.1	26,392.5	105,570
17	Multi Purpose Vehicle	80.0	4	550	0.077	6.2	3,388.0	13,552
17-1	Snow Plough	-	4	190	-	-	-	-
17-2	Rotary Snow Blower	-	4	180	-	-	-	-
17-3	Salt Spreader	-	4	180	-	-	-	-
18	Truck with Crane	125.0	27	760	0.050	6.3	4,750.0	128,250
19	Truck Trailer	250.0	4	630	0.075	18.8	11,812.5	47,250
20	Mobile Workshop Van	145.0	4	760	0.050	7.3	5,510.0	22,040
21	Repair Tools/Instruments	-	8	-	-	-	-	-
22	Portable Wheel Weigher	-	3	-	-	-	-	-
	Total		355					1,128,419

Conditions in the cost estimate;

Fuel consumption is based on the "Depreciation Calculation Table for Construction Equipment, Etc."
(Japan Construction Mechanization Association)

Cost of diesel fuel: 38.2 som/Liter = 78.6 yen/Liter

Cost of oil: 1% of fuel cost

1KGS = 2.0310 yen (exchange rate as of July 23, 2013)

Fuel cost (annual)	$1,128,419 \text{L} \times 38.2 \text{KGS} / \text{L} = 43,105,605 \text{KGS}$	Approx. 875.5 million yen
Oil cost (annual)	$43,105,605 \times 1\% = 431,056 \text{KGS}$	Approx. 870,000 yen
Total	4,357万 KGS	Approx. 884.2 million yen

Table 2-21 Estimated Cost for Maintenance and Repair

No.	Equipment	Spec.	Qty.	Rate of maintenance (%)	Standard tenure of use in Japan (yr.)	Standard tenure of use in Kyrgyz (yr.)	Annual maintenance ratio (%)	Maintenance and repair cost/yr · unit (10,000 yen)	Maintenance and repair cost/yr (10,000 yen)
		(kw)							
1	Asphalt Cutter	8.0	54	7.0%	7.5	7.5	0.93%	0.3	16.8
2	Vibrating Compactor	2.5	54	7.0%	6.0	6.0	1.17%	0.1	7.4
3	Hand Breaker	-	54	7.0%	5.5	5.5	1.27%	0.1	5.2
4	Air Compressor	35.0	27	7.0%	13.5	13.5	0.52%	1.5	40.7
5	Asphalt Sprayer	3.0	27	7.0%	4.8	4.8	1.46%	5.0	133.8
6	Hand Guide Roller	4.0	27	7.0%	13.5	13.5	0.52%	0.5	13.6
7	Asphalt Finisher	45.0	4	9.0%	12.0	12.0	0.75%	16.9	67.5
8	Road Roller	55.0	4	9.0%	15.5	15.5	0.58%	6.1	24.4
9	Tire Roller	65.0	4	9.0%	15.0	15.0	0.60%	6.2	24.8
10	Water Sprinkler	145.0	4	9.0%	12.0	12.0	0.75%	5.2	20.9
11	Motor Grader	100.0	6	9.0%	15.5	15.5	0.58%	9.1	54.4
12	Excavator	100.0	4	9.0%	9.0	9.0	1.00%	12.9	51.7
13	Wheel Loader	125.0	4	9.0%	12.0	12.0	0.75%	11.0	44.2
14	Dump Truck	250.0	12	12.0%	11.0	11.0	1.09%	9.1	109.3
15	Asphalt Plant	-	4	9.0%	10.0	10.0	0.90%	72.7	290.8
16	Aggregated Plant	230.0	4	6.0%	10.7	10.7	0.56%	30.6	122.6
17	Multi Purpose Vehicle	80.0	4	9.0%	12.0	12.0	0.75%	16.1	64.5
17-1	Snow Plough	-	4	9.0%	13.5	12.0	0.75%	1.8	7.2
17-2	Rotary Snow Blower	-	4	9.0%	15.0	12.0	0.75%	3.7	14.7
17-3	Salt Spreader	-	4	7.0%	14.5	12.0	0.58%	2.0	7.8
18	Truck with Crane	125.0	27	12.0%	12.0	12.0	1.00%	6.0	161.6
19	Truck Trailer	250.0	4	12.0%	12.0	12.0	1.00%	17.6	70.5
20	Mobile Workshop Van	145.0	4	12.0%	12.0	12.0	1.00%	17.1	68.5
21	Repair Tools/Instruments	-	8	7.0%	15.0	15.0	0.47%	3.1	24.7
22	Portable Wheel Weigher	-	3	7.0%	12.5	12.5	0.56%	1.0	3.0
	Total		355						1,450.4
<p>Conditions in the cost estimate;</p> <p>Based on the "Depreciation Calculation Table for Construction Equipment, Etc." (Japan Construction Mechanization Association) 2013 edition</p> <p>Equipment price: body price or estimated price (CIF)</p> <p>Standard tenure of use in Kyrgyz (yr.) = Standard tenure of use in Japan (yr.)</p> <p>Annual maintenance ratio = maintenance ratio÷standard tenure of use in Kyrgyz</p> <p>Annual maintenance cost = equipment price x annual maintenance ratio</p> <p>1kGS= 2.0310 yen</p>									
Annual maintenance cost			71.4 million KGS			145.0 million yen			

CHAPTER 3. Project Evaluation

3-1 Preconditions

Preconditions for Project implementations cover issues such as Securing land space, Environmental and Social Considerations, constructions permissions, Obligations of Recipient Country and others described in Table 3-1.

Table 3-1 Preconditions for Project implementation

Issues	Description	Note
Securing land space	Asphalt Plant and Aggregate Plant require land spaces. Among 4 installation sites, 3 sites of OSI UAD, DEP 36 of PLUAD 5, DEP 956 of BO UAD are owned by themselves and no need for ownership transfer procedures. Ownership of the candidate site for PLUAD 6 will be transferred to DEP 12. From these, it is considered that there is no problem with securing land space for installation sites.	
Installation permissions and EIA	Candidate sites for OSI UAD and PLUAD 5 are located at the existing old plants' land. Candidate site for BO UAD is the land where the old plant was operating until 2007. At the candidate site for PLUAD 6, it was planned to install another plant in the past, and construction was held partially. After implementing EIA procedures, it is considered that there is no problem with acquiring permissions for installation.	See "1-3 Environmental and Social Considerations"
Obligations of Recipient Country	Among the obligations concerning equipment supply, securing land and acquiring permissions are described as above. For the administrative procedures, the counterpart MOTC has already several experiences with Grand Aid projects, and there were no problems with implementation. It is considered that there is no problem concerning with implementation aspects.	See "2-3 Obligations of Recipient Country"

3-2 Necessary Inputs by Recipient Country

For the effective application of the equipment, provided by the Project, necessary inputs and costs by Kyrgyz Republic are described in Table 3-2.

Table 3-2 Necessary Inputs (costs) by Recipient Country

No	Content	Note
1	Sufficient budget allocation to buy fuel and oil to run construction equipment.	
2	Sufficient budget allocation to repair and periodical inspection of the equipment	Procurement of spare parts, tools, etc.
3	Sufficient budget allocation to buy straight asphalt to perform pothole repair, overlay, surface cover renewal works etc.	

No	Content	Note
4	Employing operators and drivers to run and operate the equipment	Reassigning and new employment

3-3 Important Assumptions

Table 3-3 shows Important assumptions for realization and continuation of the project effects.

Table 3-3 Important Assumptions

Items	Description	Important Assumptions
Vision	Improved road conditions in the project area	
Project goals	Road maintenance is properly implemented in the project area	➤ Each DEP will continue to implement road maintenance works
Results	Road maintenance equipment is provided in the project area	<ul style="list-style-type: none"> ➤ Sufficient budget will be allocated ➤ Enough number of staff will be employed ➤ Operators and mechanics will continue to work in MOTC
Activities	<ul style="list-style-type: none"> ➤ Procure road maintenance equipment ➤ Start-up operation guidance ➤ Implementing road maintenance works 	

3-4 Project Evaluation

3-4-1 Relevance

This project target area will cover about 7500 km of road network. Currently PLUAD/UAD equipment, used for maintenance of these roads, are outdated and insufficient. Lack of technical potential for maintenance works is causing improper road maintenance.

MOTC is experiencing difficulties in the areas, where the equipment is obsolete and insufficient. Nevertheless, MOTC is aiming to implement road maintenance effectively by using Japan Grand Aid and other donors help.

This project goal is “Implementing proper road maintenance in the project area”, by supplying equipment procured within Japan Grand Aid Scheme. It will support to achieve mid term goals of road development set in Kyrgyzstan National Development Strategy until 2017, as (1) improvement of international routes, (2) maintenance and improvement paved roads network, (3) independence of the transportation network. This project will contribute more for (1) and (2).

Especially, road maintenance is one of the emphasized area in Japanese Government Countries Assistance Program for Kyrgyz Republic, as to improve road infrastructure maintenance and intraregional differences. The project goals are also follows these cooperation principles.

From above, the project is recommended to implement under Japan Grand Aid Scheme.

3-4-2 Effectiveness

(1) Quantitative Effects

Table 3-4 Quantitative Effects

Indicator	Baseline (2012)	Target (2018)
Pothole repair area (m ² /yr)	118,100* ¹	156,800* ²
Overlay length (km/yr)	10* ³	40* ⁴

※1 : Calculated based on the production volume of asphalt mixture for pothole patching in 2012 (OSI UAD: 32,000m², PLUAD 6: 33,000m², PLUAD 5: 17,100m², BO UAD: 36,000m²)

Calculation: Pothole area = Volume of asphalt mixture ÷ 2.35(mixture weigh) ÷ 0.06(pavement thickness) ÷ 1.1(loss rate)

※2 : The increase was derived from the estimated annual volume of asphalt for pothole patching produced by two newly constructed plants (PLUAD 6, OSI UAD): 3,000 t/yr x 2 plants = 6,000 t/yr (This does not include asphalt mixture to be produced by the other two new plants (OSI UAD, PLUAD 5), which will be replacing the existing ones.)

※3 : Actual road length overlaid directly by PLUAD/UAD (OSI UAD: 4.5 km, PLUAD 6: 3.5 km, BO UAD: 2.0 km).

※4 : Construction target distance for each PLUAD/UAD is 10km×4

(2) Qualitative Effects

This Project is expected to bring about the following qualitative effects:

- ① A fleet of paving machines and asphalt mixture produced by the newly constructed plants will improve the quality of pothole patching and other road repair operations, leading to enhanced strength and durability of repaired sections.
- ② Improved efficiency in snow-clearing/melting and salt-spraying operations during winter will shorten the period of traffic shutdown.
- ③ Enhanced capacity for post-disaster road reconstruction will shorten the period of traffic shutdown.
- ④ Increased mobility of vehicle overload control operations will deter damage on roads.

ATTACHMENTS

- 1 . Study Team Members
- 2 . Survey Itinerary
- 3 . List of Related Authorities (interviewees)
- 4 . Minutes of Discussions (M/D)
- 5 . Reference Materials

Attachment 1 Study Team Members

1 . Study Team Members

(1) Site Survey (May 21~December 20, 2013)

	Name	Responsibility	Organization
JICA staff	Mr. Tanaka Fusato	Team Leader	Manager, Transportation and ICT Division 3, Economic Infrastructure Development Department, JICA
	Ms. Shimada Aya	Project coordinator	Transportation and ICT Division 3, Economic Infrastructure Development Department, JICA
Consultants	Mr. Kobayashi Kiyohito	Chief Consultant/Road Planner	Katahira & Engineers International
	Mr. Baba Hideaki	Equipment Planner/ Operation and Maintenance Planner	Katahira & Engineers International
	Mr. Abdukadirov Rasulbek	Procurement Planner/Cost Estimator	Katahira & Engineers International
	Mr. Asano Tomu	Translator (Russian)	Katahira & Engineers International

(2) Survey for explanation and discussion of Draft Preparatory Survey Report
(October 22~October 31, 2013)

	Name	Responsibility	Organization
1	Mr. Oyama Takayuki	Team Leader	Head of JICA Office in Kyrgyz Republic
2	Mr. Kobayashi Kiyohito	Chief Consultant/Road Planner	Katahira & Engineers International
3	Mr. Baba Hideaki	Equipment Planner/ Operation and Maintenance Planner	Katahira & Engineers International
4	Mr. Abdukadirov Rasulbek	Procurement Planner/Cost Estimator	Katahira & Engineers International

Attachment 2 Survey Itinerary

2. Survey Itinerary

(1) Survey Itinerary

Number of days	Month	Day	Week day	JICA		Consultants				Stay
				Mr.Tanaka (Team leader)	Ms.Shimada (Project coordination)	Mr.Kobayashi (Chief consultant/ Road planning)	Mr.Baba (Equipment planning/ Maintenance and operation planning)	Mr.Rasul (Procurement condition / Cost estimation)	Mr.Asano (Russian translation)	
1	5	29	wed			Deaprt Narita Airport				in the plane
2	5	30	thu			Arrive Bishkek via Tashkent Meeting at JICA and MOTC				Bishkek
3	5	31	fri			MOTC: Presentation of Inception Report				Bishkek
4	6	1	sat			Meeting within the team, meeting with MOTC				Bishkek
5	6	2	sun			Meeting within the team				Bishkek
6	6	3	mon			Bishkek→Talas DEP36, 19				Talas
7	6	4	tue			Talas DEP47, 6, 48				Talas
8	6	5	wed			Djalalabad DEP27, 12, 17				Tashkomur
9	6	6	thu			Djalalabad DEP50, 51, 52				Djalalabad
10	6	7	fri			Djalalabad DEP31, 38 Osh DEP21				Osh
11	6	8	sat			Osh 45, 44, 37				Osh
12	6	9	sun			Material analysis and additional survey, etc.				Osh
13	6	10	mon			Osh DEP959, 960, 16				Osh
14	6	11	tue			Osh DEP956, 5, 26				Osh
15	6	12	wed			Osh→Djalalabad DEP22, 30				Karakol
16	6	13	thu			Djalalabad DEP23, Talas DEP9→Bishkek				Bishkek
17	6	14	fri			Material analysis and additional survey, etc.				Bishkek
18	6	15	sat			Material analysis and additional survey, etc.				Bishkek
19	6	16	sun			Material analysis and additional survey, etc.				Bishkek
20	6	17	mon			Material analysis and additional survey, etc.				Bishkek
21	6	18	tue			Material analysis and additional survey, etc.				Bishkek
22	6	19	wed			Material analysis and additional survey, etc.				Bishkek
23	6	20	thu			Material analysis and additional survey, etc.				Bishkek
24	6	21	fri			Material analysis and additional survey, etc.				Bishkek
25	6	22	sat			Material analysis and additional survey, etc.				Bishkek
26	6	23	sun			Material analysis and additional survey, etc.				Bishkek
27	6	24	mon			Material analysis and additional survey, etc.				Bishkek
28	6	25	tue			Material analysis and additional survey, etc.				Bishkek
29	6	26	wed			Material analysis and additional survey, etc.				Bishkek
30	6	27	thu			Material analysis and additional survey, etc.				Bishkek
31	6	28	fri			Material analysis and additional survey, etc.				Bishkek
32	6	29	sat			Material analysis and additional survey, etc.				Bishkek
33	6	30	sun			Material analysis and additional survey, etc.				Bishkek
34	7	1	mon		Meeting at JICA office	Official mission members survey				Bishkek
35	7	2	tue		Meeting at MOTC	Official mission members survey				Bishkek
36	7	3	wed		Site survey at Talas	Official mission members survey				Bishkek
37	7	4	thu	Minutes of Discussion		Official mission members survey				Bishkek
38	7	5	fri	Signing Minutes of Discussion		Official mission members survey				Bishkek
39	7	6	sat			Material analysis and additional survey, etc.				Bishkek
40	7	7	sun			Material analysis and additional survey, etc.				Bishkek
41	7	8	mon			Depart Bishkek, via Tashkent				in the plane
42	7	9	tue			Arrive Narita Airport, via Incheon				

(2) Survey for explanation and discussion of Draft Preparatory Survey Report

No of days	Month	Day	Week days	JICA	Consultants			Stay
				Mr. Oyama (Team Leader)	Mr. Kobayashi (Chief Consultant/ Road Planner)	Mr. Baba (Equipment Planner/ OM Planner)	Mr. Abdukadirov (Procurement Planner/ Cost Estimator)	
1	10	22	Tue		Depart Narita			in the plane
2	10	23	Wed	Meeting within the Team	Arrive Bishkek via Istanbul 14:00 Meeting at JICA Office			Bishkek
3	10	24	Thu	14:00 MOTC M/D Explanation and Discussion (Mr.Mamaev, RMD)				Bishkek
4	10	25	Fri		10:00 Discussion at Road Maintenance Department			Bishkek
5	10	26	Sat		Meeting within the Team, editing M/D			Bishkek
6	10	27	Sun		Meeting within the Team, editing M/D			Bishkek
7	10	28	Mon	11:00 MOTC M/D Signing (Mr.Mamaev, RMD)				Bishkek
8	10	29	Tue	Reporting to Japan Embassy				Bishkek
9	10	30	Wed		Depart Bishkek 11:20 via Istanbul			in the plane
10	10	31	Thu		Arrive Narita			

Attachment 3 List of Related Authorities

3. List of Related Authorities (interviewees)

(1) MOTC

Mr. IBRAEV Keldibek	Deputy Minister
Mr. MAMAEV Kubanychbek	Director of IPIG (Investment Project Implementation Group)
Mr. ALYPSATAROV Melis	Director of Department of Automobile Roads
Ms. MILOVATSKAYA Nina	Chief Specialist of Department of Automobile Roads
Mr. SOODONBAEV Jumash	Director of RMD (Road Maintenance Department)
Mr. EGEMBERDIEV Arstanbek	Chief Mechanic of RMD
Mr. JUMALIEV Kuban	Deputy of Chief Mechanic of RMD
Mr. KURMANBEKOV Ulukbek	Head of OSI UAD (Osh – Sary Tash – Irkeshtam Road Maintenance Bureau)
Mr. ESENKULOV Abdimetalik	Deputy Head of OSI UAD
Mr. ULAROV Muktor	Chief Mechanic of OSI UAD
Mr. MURZALIEV Azamat	Chief of Asphalt plant “Karatai” of OSI UAD
Mr. OROZBAEV Asilbek	Head of PLUAD (Oblast Level Road Management Bureau) No.6
Mr. ISMANOV Kamal	Chief Engineer of PLUAD No.6
Mr. OSMONALIEV Rustan	Head of PLUAD No.5
Mr. APYSHOV Urmat	Chief Engineer of PLUAD No.5
Mr. ALIYAZOV Janybek	First Deputy of General Director of BO UAD (Bishkek – OSH Road State Directorate)
Mr. SHALPYKOV Kaldar	Head of Production Control Division of BO UAD
Mr. KENETAEV Tabyldy	Chief Engineer of Asphalt Plant of GDRSU (State Road Repair and Construction Department)
Mr. MALENOV Nurzade	Chief Mechanic of Asphalt Plant of GDRSU
Mr. KURBANOV Akhmad	Head of JASU (Jalal-Abad Construction Department)
Mr. AIYLCHIEV Kylych	Director of Asphalt Plant of JASU (in Sokuluk)
Mr. KURMANALIEV Jekshenbek	Chief Mechanic of BNT UAD (Bishkek – Naryn – Torugart Road Maintenance Bureau)
Mr. SHARSHENOV Azamat	Leading Specialist of BNT UAD
Mr. AKIDEEV Ismail	Chief of Asphalt plant of BNT UAD (in Kochkor)
Mr. IMANAKUNOV Tynchtyk	Chief of Asphalt plant of PLUAD No.1 (in Tokmok)
Mr. ALDASHEV Junus	Head of DEP (Local Level Road Management Unit) No.5
Mr. SULTANOV Jumash	Chief Mechanic of DEP No.5
Mr. JUMALY UULU Korchubai	Head of DEP No.6
Mr. IMANALIEV Mirlan	Chief Engineer of DEP No.6
Mr. SYDYGALIEV Kerimkul	Chief Mechanic of DEP No.6
Mr. BALBAKOV Toktobek	Head of DEP No.9
Mr. ISMAILOV Shailoobek	Chief Engineer of DEP No.9
Mr. AKULUEV Shabyn	Head of DEP No.10
Mr. ALYBAEV Narynbek	Chief Engineer of DEP No.10
Mr. MURATBEKOV Almaz	Head of DEP No.12
Mr. AZINBAEV Adyl	Chief Engineer of DEP No.12
Mr. TILESHOV Kuttubek	Chief Mechanic of DEP No.12
Mr. KANKELDYEV Abdyrasul	Head of DEP No.16
Mr. TASHANOV Abdimutalip	Head of DEP No.17

Mr. BEKBERDIEV Bainazar	Chief Engineer of DEP No.17
Mr. BAIKEEV Tillebai	Chief Mechanic of DEP No.17
Mr. DUISHENOV Kanatbek	Head of DEP No.19
Mr. KUDAKEEV Islam	Chief Engineer of DEP No.19
Mr. JOLDOSHEV Melis	Chief Mechanic of DEP No.19
Mr. TURDUKULOV Abdygany	Head of DEP No.21
Mr. MATKARIMOV Mamatimar	Chief Mechanic of DEP No.21
Mr. KURBANOV Rashid	Head of DEP No.22
Mr. SHAIDYLDAEV Sadyrbek	Chief Engineer of DEP No.22
Mr. ARTYKOV Karim	Chief of Asphalt Plant of DEP No.22 (in Bazar-Korgon)
Mr. CHOTUBAEV Anarbek	Chief Engineer of DEP No.23
Mr. BABANAZAROV Sadybakaz	Chief Mechanic of DEP No.23
Mr. KURBANBAEV Omurzak	Head of DEP No.26
Mr. NAKETAEV Juman	Head of DEP No.27
Mr. JOOSHEV Murat	Chief Engineer of DEP No.27
Mr. KOCHKOROV Abas	Chief Mechanic of DEP No.27
Mr. SEITALIEV Emil	Chief Engineer of DEP No.30
Mr. TEMIRKULOV Janyshbek	Chief Mechanic of DEP No.30
Mr. BAZARKULOV Jolboldu	Head of DEP No.31
Mr. KUBANYCHBEKOV Kanybek	Head of DEP No.36
Mr. ESHKOJOEV Bektursun	Chief Mechanic of DEP No.36
Mr. ALAPAEV Toktor	Chief of Asphalt Plant of DEP No.36 (in Aksai)
Mr. SAKTANOV Chirkesh	Head of DEP No.37
Mr. MAMATAIPOV Oljobai	Chief Engineer of DEP No.37
Mr. JUNUSOV Abiblla	Chief Mechanic of DEP No.37
Mr. SANSYZBAEV Sulaiman	Head of DEP No.38
Mr. SAMIDINOV Anarbek	Chief Engineer of DEP No.39
Mr. ALIBAEV Abdyrakhman	Head of DEP No.44
Mr. KAMILOV Adysh	Head of DEP No.45
Mr. SULTANKULOV Taalaipek	Head of DEP No.47
Mr. BOKUEV Dokturbek	Chief Engineer of DEP No.47
Mr. SADYRALIEV Meiman	Head of DEP No.48
Mr. TURDUNBEKOV Altynbek	Chief Engineer of DEP No.48
Mr. ABYLGAZIEV Aslanbek	Chief Mechanic of DEP No.48
Mr. KASYMBAEV Taalai	Head of DEP No.50
Mr. JOLDOSHOV Shadybek	Chief Engineer of DEP No.50
Mr. BAKIROV Abdylakim	Head of DEP No.51
Mr. SAGYNBAEV Musa	Head of DEP No.52
Mr. JANSEITOV Almaz	Chief Engineer of DEP No.52
Mr. SULAIMONOV Tanychbek	Chief Mechanic of DEP No.954
Mr. BERDIBEKOV Kanalbek	Head of DEP No.955
Mr. IRSALIEV Adylet	Chief Mechanic of DEP No.955
Mr. KADYRBAEV Tynubek	Head of DEP No.956
Mr. IBRAGIMOV Panyjan	Head of DEP No.959
Mr. OMOROV Osmonali	Chief Mechanic of DEP No.959

Mr. MATKASYMOV Mederbek Head of DEP No.960

Mr. KOJOBBERGENOV Sargybolot Head of WCTS (Department of Weight Control and Tunnel Service)

Mr. ARYKOV Nurlan Head of Division of Supervision of WCP (Weight Control Points) of WCTS

Mr. ABDRAEV Mars Senior Cashier-Operator of WCP No.3 “Sosnovka”

Mr. MAKALEEV Zamir Cashier-Operator of WCP No. 4 “Kara-Kul”

Mr. SHAIDYR UULU Shairbek Cashier-Operator of WCP No. 5 “Sary-Tash”

Mr. ULUKBEKOV Joomart Cashier-Operator of WCP No. 14 “Karatai”

(2) Local Government Authorities

Mr. KUTMANOV Altyn Deputy Head of Aksy Rayon Administration

Mr. SARYMSAKOV Mars Deputy Head of Jergatal Aiyl Administration

(3) ADB

Mr. SALLANMAA Raimo Individual Consultant for Performance Based Maintenance Contracting 0084/CS-IC-12, Director of “Destia Finnroad”

(4) Private Sector

Mr. NAZARALIEV Esen General Director of CJSC (Closed Joint Stock Company) “Jolchu”

Mr. MAZER Victor Deputy of General Director of CJSC “Jolchu”

Mr. DOSALIEV Munarbek Head of JSC (Joint Stock Company) “Jalal-Abad ABZ” (“ABZ” means “Asphalt Concrete Plant”)

Mr. MYRZAEV Abdulla Chief Engineer of JSC “Jalal-Abad ABZ”

Mr. TOKOSHOV Karybek Director of LLC (Limited Liability Company) “Tokoshev”

Mr. ABDUKAIMOV Ulan Head of LLC “Virage Service”

Mr. BORONBAEV Kalsbek Foreman of Asphalt Plant of “JBI 4” (“JBI” means “Reinforced Concrete Products”)

Mr. BEKBOLOTOV Boron Weight Controller of Asphalt Plant of “KBJ” (“KBJ” means “Karabalta Road Construction”)

Mr. NESTEROV Sergei Individual Entrepreneur (Workshop, Karabalta)

Mr. KONOVALOV Sergei Acting Director of Kyrrostransgroup (Nissan Autocenter, Bishkek)

Mr. VILENSKII Gennadii Director of MGATP-7 (International Transporter with Workshop, Bishkek)

Mr. OZYARDIMCI Hakki Kyrgyzstan Country Manager of Borusan Makina Kazakhstan (Caterpillar, Bishkek)

Mr. SABIROV Ibragim Manager of “U Dyadi Lyu” (Trader of Chinese Equipment, Bishkek)

Attachment 4 Minutes of Discussions (M/D)

4. Minutes of Discussions (M/D)

(1) Site Survey

**MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY
FOR THE PROJECT FOR IMPROVEMENT OF THE EQUIPMENT
FOR ROAD MAINTENANCE IN OSH, JALAL-ABAD AND TALAS OBLASTS
IN THE KYRGYZ REPUBLIC**

In response to a request from the Government of the Kyrgyz Republic (hereinafter referred to as "Kyrgyz"), Japan International Cooperation Agency (hereinafter referred to as "JICA") in consultation with the Government of Japan decided to conduct a Preparatory Survey (hereinafter referred to as "the Survey") on the Project for Improvement of the Equipment for Road Maintenance in Osh, Jalal-Abad and Talas Oblasts (hereinafter referred to as "the Project").

JICA sent the Preparatory Survey Team (hereinafter referred to as "the Team") to Kyrgyz, headed by Mr. Fusato TANAKA, Director, Transportation and ICT Division 3, Economic Infrastructure Department of JICA, and was scheduled to stay in the country from May 30th to July 5th, 2013.

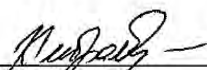
The Team held a series of discussions with officials concerned of the Government of Kyrgyz and conducted a field survey in the study area.

In the course of discussions and field survey, both sides confirmed the main items described in the attached sheets. The Team will prepare the Preparatory Survey Report.

Bishkek, July 5th, 2013



Fusato TANAKA
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan



Keldibek IBRAEV
Deputy Minister
Ministry of Transport and Communications
the Kyrgyz Republic

ATTACHMENT

1. Objective of the Project
The both sides confirmed that the objective of the Project is to improve the maintenance management of the roads under the jurisdiction of the Ministry of Transport and Communications (MOTC) in Osh, Jalal-Abad and Talas Oblasts by modernizing road maintenance equipment.
2. Project Site
The sites of the Project are shown in Annex-1.
3. Responsible and Implementing Organizations
 - 3-1. The responsible organization is MOTC.
 - 3-2. The implementing organizations are Osh-Sary Tash-Irkeshtam (OSI) Main Roads Management Unit (UAD), Oblast Level Roads Management Unit 6 (PLUAD 6) for Jalal-Abad Oblast, PLUAD 5 for Talas Oblast, Bishkek-Osh (BO) UAD and the Department of Weight Control and Tunnel Services (WCTS).
 - 3-3. The organization chart of MOTC is as shown in Annex-2.
 - 3-4. The organization charts of OSI UAD, PLUAD 6, PLUAD 5 and BO UAD are as shown in Annex-3.
4. Items Requested by the Government of Kyrgyz
 - 4-1. As a result of discussions, the both sides confirmed that the items finally requested by the Government of Kyrgyz are as follows:

(1) Road Maintenance Equipment and

Name of Equipment		OSI UAD	PLUAD 6	PLUAD 5	BO UAD	Total
Asphalt Cutter, 150mm	No.	14	14	10	16	54
Vibration Compactor, 60kg	No.	14	14	10	16	54
Hand Breaker, 7kg	No.	14	14	10	16	54
Air Compressor, 5m ³	No.	7	7	5	8	27
Asphalt Sprayer, 350 liter	No.	7	7	5	8	27
Hand Guide Roller, 600kg	No.	7	7	5	8	27
Asphalt Finisher, 4.4m	No.	1	1	1	1	4
Road Roller, 9t	No.	1	1	1	1	4
Tire Roller, 8-12t	No.	1	1	1	1	4
Water Tank Truck, 8,000 liter	No.	1	1	1	1	4
Motor Grader, 3.7m	No.	3	3	3	3	12
Excavator, 0.8m ³	No.	1	1	1	1	4
Wheel Loader, 2.5m ³	No.	2	2	2	2	8
Dump Truck, 14t	No.	6	6	6	6	24
Asphalt Plant, 35t/h*	No.	1	1	1	1	4
Aggregate Plant, 35t/h*	No.	1	1	1	1	4

Multi-Purpose Vehicle, 4*4	No.	1	1	1	1	4
Snow Plough Attachment	No.	1	1	1	1	4
Rotary Blower Attachment	No.	1	1	1	1	4
Salt Spreader Attachment	No.	1	1	1	1	4
Truck with Crane, 5t	No.	7	7	5	8	27
Truck Trailer, 25t	No.	1	1	1	1	4
Mobile Workshop, 4*4	No.	1	1	1	1	4
Maintenance Equipment	Set	2	2	2	2	8

Name of Equipment		WCIS				Total
Portable Vehicle Scale	No.	3				3

(*) Asphalt plants and aggregate plants will be installed at 1) Karatai, Osh Oblast for OSI UAD, 2) Jergatal, Jalal-Abad Oblast for PLUAD 6, 3) Aksai, Talas Oblast for PLUAD 5 and 4) Kurshab, Osh Oblast for BO UAD.

- (2) Spare Parts for the Road Maintenance Equipment mentioned in (1), if necessary.
- 4-2. JICA will assess the appropriateness of the request and will report the findings to the Government of Japan. The final specifications and quantities of the road maintenance equipment shall be decided by the Japanese side and be described in the draft Preparatory Survey Report, which will be prepared around October 2013, in consideration of necessity, technical viability, sustainability, cost-effectiveness, and budget availability. The Kyrgyz side understood that all the requested items, therefore, may not be accepted as final components of the Project.
5. Japan's Grant Aid Scheme
- 5-1. The Kyrgyz side understands the Japan's Grant Aid scheme explained by the Team, as described in Annex-4.
- 5-2. The Kyrgyz side will take the necessary measures, as described in Annex-5, to facilitate the smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented, according to the existing agreement between the Government of Japan and the Government of Kyrgyz.
6. Schedule of the Study
- 6-1. JICA will prepare the draft Preparatory Survey Report in English and explain its contents to the Kyrgyz side around October 2013.
- 6-2. When the contents of the draft Preparatory Survey Report are accepted in principle by the Government of Kyrgyz, JICA will complete the final report and send it to the Government of Kyrgyz around March 2014.
7. Other Relevant Issues
- 7-1. Road maintenance equipment mentioned in 4-1 is supposed to be installed at OSI UAD, PLUAD 6, PLUAD 5 and BO UAD. However, both sides agreed that the installation location shall be described in the draft Preparatory Survey Report after the study of the Team in Japan.
- 7-2. The Kyrgyz side shall secure enough budget and personnel necessary for operation and maintenance

of the equipment procured by the Project and for maintenance management of the roads in the Project site through effective utilization of the equipment procured by the Project after the completion of the Project. Necessary budget for operation and maintenance of the equipment procured by the Project and for maintenance management of the roads in the Project site is estimated as follows:

- annual budget for operation of the equipment (for procurement of fuel and oil) : 64 million som
- annual budget for maintenance of the equipment (for procurement of spare parts) : 30 million som
- annual budget for road maintenance management (for procurement of straight asphalt) : 110 million som

7-3. The Kyrgyz side shall provide security measures for all concerned Japanese nationals working for the Project, if deemed necessary.

7-4. The Kyrgyz side shall take all the necessary measures for the installation of asphalt plants and aggregate plants at each of the proposed sites described in 4-1.(1) as follows:

1) Karatai, Osh Oblast for OSI UAD

- removal of the existing plants
- clearing and levelling the site
- environmental impact assessment

2) Jergatal, Jalal-Abad Oblast for PLUAD 6

- securing the land for plants
- clearing and levelling the site
- securing electricity and water
- environmental impact assessment

3) Aksai, Talas Oblast for PLUAD 5

- removal of the existing plants
- clearing and levelling the site
- environmental impact assessment

4) Kurshab, Osh Oblast for BO UAD

- clearing and levelling the site
- securing electricity and water
- environmental impact assessment

7-5. All the equipment procured by the Project, except for asphalt plants and aggregate plants, will be handed over from the Japanese side to the Kyrgyz side one designated place, DEP 39 near Bishkek. The Kyrgyz side shall take the responsibilities for the transportation of the equipment to the designated places from DEP 39. As for asphalt plants and aggregate plants, the Japanese side will provide transportation to each of the proposed installation sites.

Annex-1: Project Sites

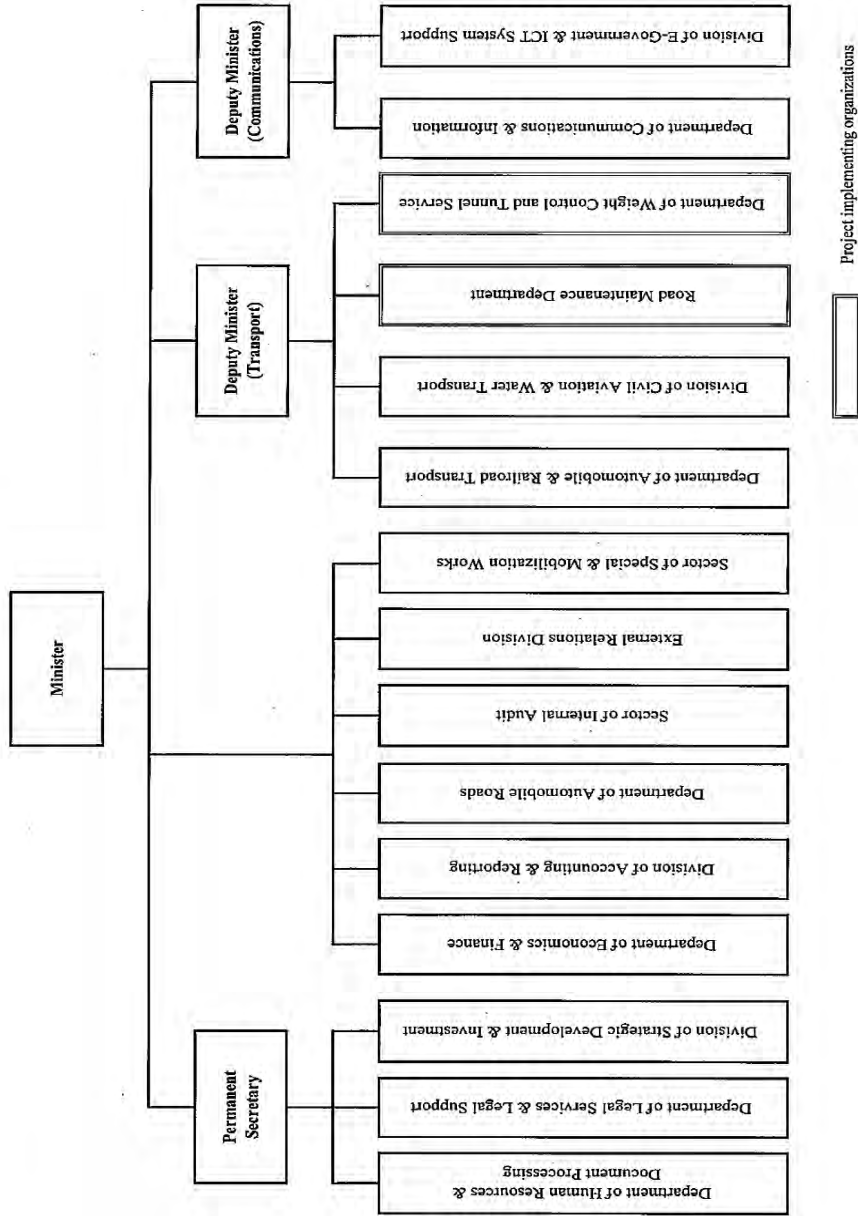
Annex-2: Organization Chart of MOTC

Annex-3: Organization Charts of OSI UAD, PLUAD 6, PLUAD 5 and BO UAD

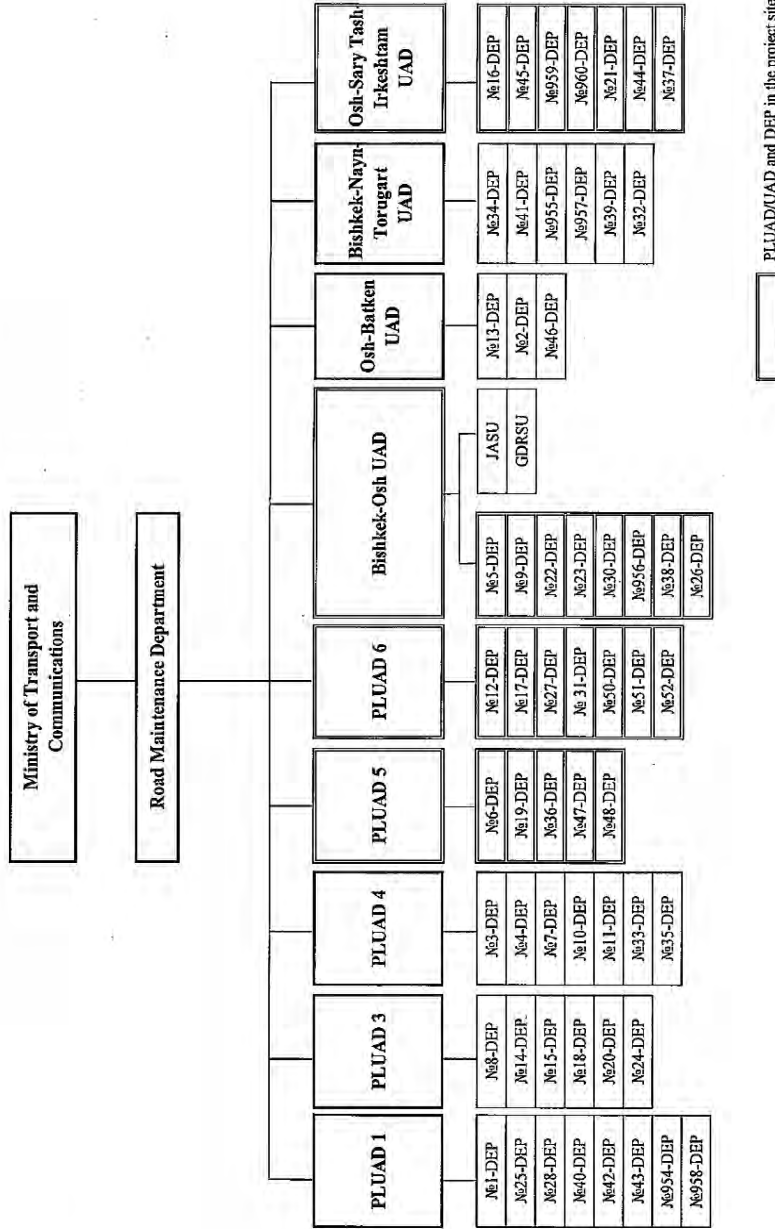
Annex-4: Japan's Grant Aid Scheme

Annex-5: Major Undertakings to be Taken by Each Government

ORGANIZATION CHARTS OF MOTC



ORGANIZATION CHARTS OF OSI UAD, PLUAD 6, PLUAD 5 & BO UAD



JAPAN'S GRANT AID SCHEME

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex 5.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

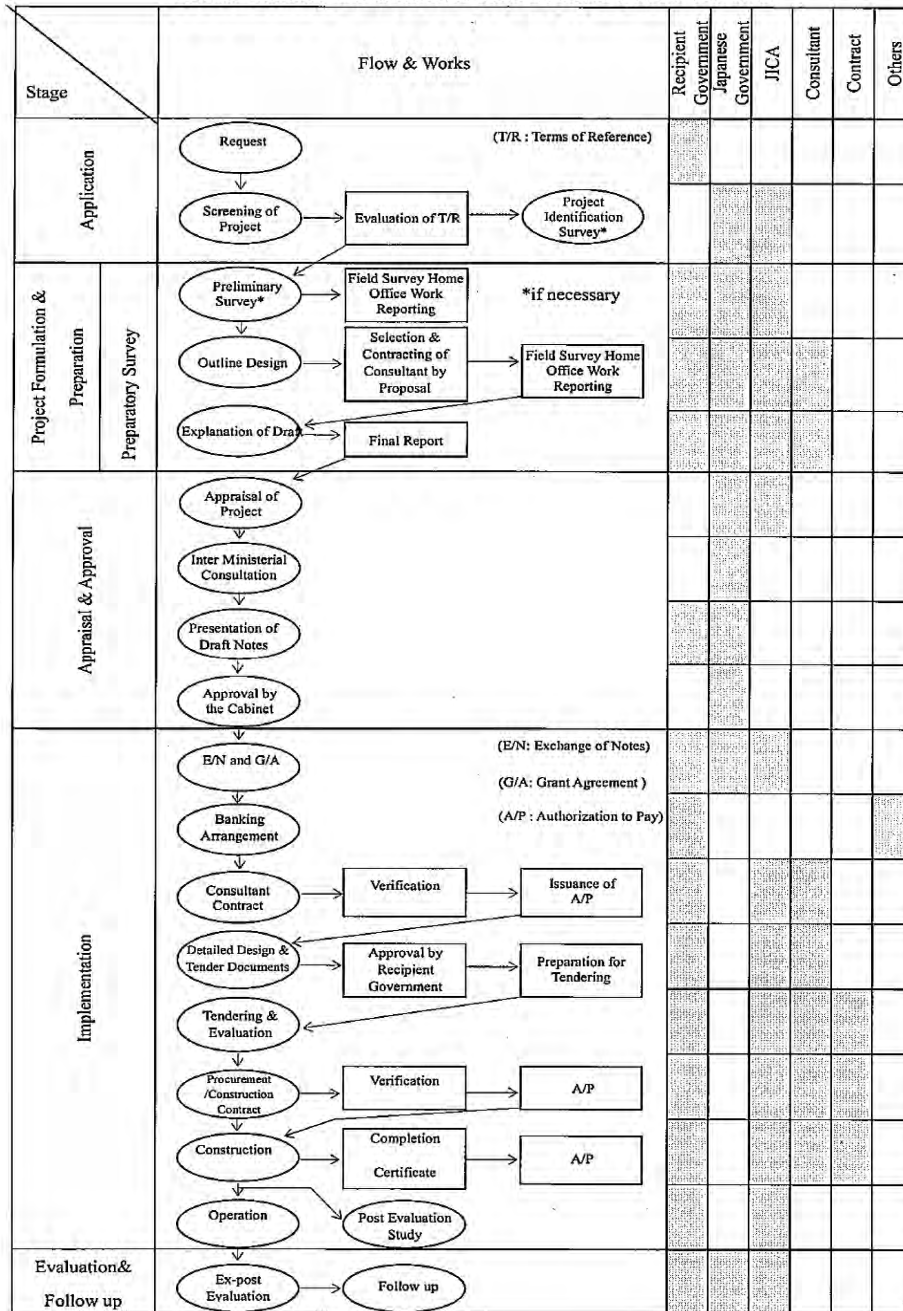
(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

FLOW CHART OF JAPAN'S GRANT AID PROCEDURES



					Annex-5
MAJOR UNDERTAKINGS TO BE TAKEN BY EACH GOVERNMENT					
No.	Items			To be covered by Grant Aid	To be covered by Recipient Side
1	To ensure prompt customs clearance of the products and to assist internal transportation of the products in the recipient country				
	1)	Marine (Air) transportation of the Products from Japan to the recipient country		●	
	2)	Internal transportation from the port of disembarkation to the project site		(●)	(●)
2	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted				●
3	To accord Japanese physical persons and / or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work				●
4	To ensure that the products be maintained and used properly and effectively for the implementation of the Project				●
5	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project				●
6	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A				
	1)	Advising commission of A/P			●
	2)	Payment commission			●
7	To give due environmental and social consideration in the implementation of the Project.				●
(B/A : Banking Arrangement, A/P : Authorization to pay)					

(2) Survey for explanation and discussion of Draft Preparatory Survey Report

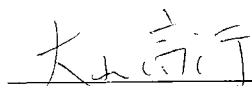
**MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY
FOR THE PROJECT FOR IMPROVEMENT OF THE EQUIPMENT
FOR ROAD MAINTENANCE IN OSH, JALAL-ABAD AND TALAS OBLASTS
IN THE KYRGYZ REPUBLIC
(EXPLANATION OF DRAFT REPORT)**

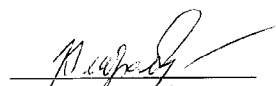
On the basis of the discussions and field survey in the Kyrgyz Republic (hereinafter referred to as "Kyrgyz") in May, June and July 2013, and the subsequent technical examination of the results in Japan, Japan International Cooperation Agency (hereinafter referred to as "JICA") prepared a draft Preparatory Survey Report on the Project for Improvement of the Equipment for Road Maintenance in Osh, Jalal-Abad and Talas Oblasts (hereinafter referred to as "the Project").

JICA sent the Preparatory Survey Team (hereinafter referred to as "the Team") to Kyrgyz, headed by Mr. Takayuki Oyama, Chief Representative, JICA Kyrgyz Republic Office, to explain to and consult with officials concerned of the Government of Kyrgyz on the contents of the draft Preparatory Survey Report from October 23rd to 28th, 2013.

As a result of discussions, both sides confirmed the main items described in the attached sheets.

Bishkek, October 28th, 2013


Takayuki Oyama
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan


Keldibek BRAEV
Deputy Minister
Ministry of Transport and Communications
the Kyrgyz Republic



ATTACHMENT

1. Components of the Draft Preparatory Survey Report
The Kyrgyz side agreed and accepted the contents of the draft Preparatory Survey Report including draft technical specifications of equipment explained by the Team. The list of equipment to be procured is indicated in Annex-1.
2. Confidentiality of the Cost Estimation
The both sides agreed that the Project Cost Estimation, as attached in Annex-2, and the specifications of equipment in the draft Preparatory Survey Report are confidential and should never be duplicated or disclosed to any third parties until all the contracts for the Project were concluded.
3. Validity of the Previous Minutes of Discussions
Both sides confirmed that all the agreements in the Minutes of Discussions of the preceding Preparatory Survey signed on July 5th, 2013 continue to be valid unless information is updated by the draft Preparatory Survey Report.
4. Japan's Grant Aid Scheme
The Kyrgyz side fully understood the scheme of the Japan's Grant Aid and the necessary measures to be undertaken by the Kyrgyz side as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed on July 5th, 2013.
5. Undertakings of the Kyrgyz Side
The Kyrgyz side shall undertake the following arrangements for the Project at its expense based on the contents of the draft Preparatory Survey Report.
 - 5-1. Administrative Arrangements
 - 1) Commission for Banking Arrangement (B/A) and Authorization to Pay (A/P)
 - 2) Tax exemption and custom clearance (at the time of equipment procurement)
 - 3) Securing land for the installation of an asphalt plant and an aggregate plant at Aksai, Talas Oblast for Oblast Level Roads Management Unit 5 (PLUAD 5) to be completed within 5 (five) months from the date of Contract with the Supplier for the Project
 - 4) Acquisition of permission and completion of necessary environmental impact assessment for the installation of an asphalt plant, an aggregate plant and a quarry in each of Karatai, Osh Oblast for Osh-Sary Tash-Irkeshtam Main Roads Management Unit (OSI UAD), Jergatal, Jalal-Abad Oblast for Oblast Level Roads Management Unit 6 (PLUAD 6), Aksai, Talas Oblast for PLUAD 5 and Kurshab, Osh Oblast for Bishkek-Osh Main Roads Management Unit (BO UAD) to be completed within 7 (seven) months from the date of Contract with the Supplier for the Project
 - 5) Transportation for all the equipment except for four (4) asphalt plants and four (4) aggregate plants from Local Level Roads Management Unit 39 (DEP 39) near Bishkek, which is the site for handover, to OSI UAD, PLUAD 6, PLUAD 5, BO UAD and the Department of Weight Control and Tunnel Services (WCTS), which are the installation sites.



5-2. Civil Works

- 1) Removal of the existing plants and bedding for the installation of an asphalt plant and an aggregate plant in each of Karatai, Osh Oblast for OSI UAD and Aksai, Talas Oblast for PLUAD 5 to be completed within 5 (five) months from the date of Contract with the Supplier for the Project
- 2) Clearing and leveling the installation sites for an asphalt plant and an aggregate plant in each of Karatai, Osh Oblast for OSI UAD, Jergatal, Jalal-Abad Oblast for PLUAD 6, Aksai, Talas Oblast for PLUAD 5 and Kurshab, Osh Oblast for BO UAD to be completed within 5 (five) months from the date of Contract with the Supplier for the Project
- 3) Securing electricity, water and drainage for an asphalt plant and an aggregate plant in each of Jergatal, Jalal-Abad Oblast for PLUAD 6 and Kurshab, Osh Oblast for BO UAD to be completed within 8 (eight) months from the date of Contract with the Supplier for the Project

6. Maintenance and Utilization of the Equipment

The Kyrgyz side shall secure enough budget and personnel necessary for operation and maintenance of the equipment, procured under the Project and for maintenance of the roads in the Project site through effective utilization of the equipment procured under the Project after the completion of the Project.

7. Schedule of the Study

JICA will complete the final Preparatory Survey Report in English, in accordance with the confirmed items and send it to the Government of Kyrgyz around February 2014.

Annex-1: List of Equipment to be Procured

Annex-2: Project Cost Estimation

Annex-3: Tentative Project Implementation Schedule



LIST OF EQUIPMENT TO BE PROCURED

The equipment to be procured by the Project will be handed over to and managed by 1) OSI UAD, 2) PLUAD 6 for Jalal-Abad Oblast, 3) PLUAD 5 for Talas Oblast, 4) BO UAD and 5) WCTS.

The number of each equipment procured for 1) OSI UAD, 2) PLUAD 6, 3) PLUAD 5, 4) BO UAD and 5) WCTS respectively is as follows;

Name of Equipment		OSI UAD	PLUAD 6	PLUAD 5	BO UAD	Total
Asphalt Cutter, 150mm	No.	14	14	10	16	54
Vibration Compactor, 60kg	No.	14	14	10	16	54
Hand Breaker, 7kg	No.	14	14	10	16	54
Air Compressor, 5m ³	No.	7	7	5	8	27
Asphalt Sprayer, 350 liter	No.	7	7	5	8	27
Hand Guide Roller, 600kg	No.	7	7	5	8	27
Asphalt Finisher, 4.4m	No.	1	1	1	1	4
Road Roller, 9t	No.	1	1	1	1	4
Tire Roller, 8-12t	No.	1	1	1	1	4
Water Tank Truck, 8,000 liter	No.	1	1	1	1	4
Motor Grader, 3.7m	No.	2	1	1	2	6
Excavator, 0.8m ³	No.	1	1	1	1	4
Wheel Loader, 2.5m ³	No.	1	1	1	1	4
Dump Truck, 14t	No.	3	3	3	3	12
Asphalt Plant, 35t/h ^(*)	No.	1	1	1	1	4
Aggregate Plant, 35t/h ^(*)	No.	1	1	1	1	4
Multi-Purpose Vehicle, 4*4	No.	1	1	1	1	4
Snow Plough Attachment	No.	1	1	1	1	4
Rotary Blower Attachment	No.	1	1	1	1	4
Salt Spreader Attachment	No.	1	1	1	1	4
Truck with Crane, 5t	No.	7	7	5	8	27
Truck Trailer, 25t	No.	1	1	1	1	4
Mobile Workshop, 4*4	No.	1	1	1	1	4
Maintenance Equipment	Set	2	2	2	2	8

Name of Equipment		WCTS	Total
Portable Vehicle Scale	No.	3	3

^(*) Asphalt plants and aggregate plants will be installed at 4 (four) sites as follows;

- 1) Karatai, Osh Oblast for OSI UAD,
- 2) Jergatal, Jalal-Abad Oblast for PLUAD 6,
- 3) Aksai, Talas Oblast for PLUAD 5 and
- 4) Kurshab, Osh Oblast for BO UAD

CONFIDENTIAL
PROJECT COST ESTIMATION

1. Cost Borne by the Government of Japan

CONFIDENTIAL

2. Cost Borne by the Government of Kyrgyz

Cost items	Sum	
	Thousand Som	Thousand Yen
Commission for Banking Arrangement (B/A)	736.9	1,496.6
Securing land for the installation of asphalt plants and aggregate plants at 1 (one) site	245.6	498.9
Removal of the existing plants and bedding for the installation of asphalt plants and aggregate plants at 2 (two) sites	1,179.0	2,394.5
Clearing and leveling the installation sites for asphalt plants and aggregate plants at 4 (four) sites	589.5	1,197.2
Securing electricity, water and drainage for asphalt plants and aggregate plants at 2 (two) sites	1,571.9	3,192.6
Total	4,322.9	8,779.8

3. Conditions of Cost Estimation




3-1. Estimated timing: July 2013

3-2. Exchange rates: US\$ 1.00 = Yen 99.77, Kyrgyz Som 1 = Yen 2.031

3-3. Others: The project is implemented in accordance with the system of Japan's Grant Aid. The above cost estimation does not assure the ceiling cost on the Exchange of Notes and shall be reviewed by the Government of Japan before signing of the Exchange of Notes between the two (2) Governments.

TENTATIVE PROJECT IMPLEMENTATION SCHEDULE

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th
OVERALL SCHEDULE	E/N & G/A ▲	Public Announcement △	Contract w/ Supplier △	Tender △					Equipment Manufacturing				Shipment				
													Foundation Work	Installation Work			
													Acceptance Inspection & Operation Guidance 1				
																	Operation Guidance 2
																	Handover
All Plants									Environmental Impact Assessment								
Plants: OSI UAD																	
Plants: PLUAD 6																	
Plants: PLUAD 5																	
Plants: BO UAD																	

 undertakings of the Japanese side in Japan or the third country
 undertakings of the Kyrgyz side in Kyrgyz
 undertakings of the Japanese side in Kyrgyz

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Attachment 5 Reference Materials

List of Reference Materials

No	Titles	Type	Original / Copy	Publisher	Publishing year
1	Road sector development strategy for 2011-13	Print	Copy	MOTC	2011
2	Medium term development program of the Kyrgyz republic for 2012-14	Print	Copy	IMF	2012
3	The Master Plan on Road and Transport Sector Development (2010-2025)	Print	Copy	ABD	2012