City Bus Authority
Phnom Penh Capital Administration
Cambodia

Preparatory Survey Report on the Project for Improvement of Transportation Capacity of Public Bus in Phnom Penh

September, 2016

Japan International Cooperation Agency (JICA)

ALMEC Corporation
Nippon Koei Co., Ltd.

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Exchange rate: Average rate for the 3 months from Jan. to Mar. 2016

1 United States dollars (USD) = 116.35 Japanese yen (JPY)

1 United States dollars (USD) = 4,000 Cambodian riel (KHR)

PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to the Joint Venture consist of ALMEC Corporation and Nippon Koei Co., Ltd.

The survey team held a series of discussions with the officials concerned of the Government of Cambodia, and conducted a 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 Cambodia for their close cooperation extended to the survey team.

September, 2016

Akira Nakamura

Director General

Infrastructure and Peacebuilding Department

Japan International Cooperation Agency

Summary

1. Outline of the Country

Cambodia is a constitutional monarchy nation located in Indochina Peninsula with its land surface area of approx. 181 thousand square meters and a population of approx. 15.83 million. The population of Phnom Penh Capital City has been increasing yearly from 2% to 4% in the past 5 consecutive years of 2010 to 2014 and is approaching 1.5 million according to the government's statistics in 2014. Cambodia enjoyed a high economic growth of more than 10% for 4 years from 2004 to 2007, but dropped to a rate of 0.1% in 2009 because of the global recession after the sub-prime loan case. However, it recovered to 6.1% in 2010 and continued to grow at 7% every year after 2011. According to Asian Development Bank (ADB), the Cambodian industry comprises of agriculture that is 30.5% of the GDP, industrial at 27.1%, and service industry that is slightly more than 40%. Given that the GDP per capita is USD1,140 while the nominal GDP is approx. USD17.7 billion (IMF, 2015 estimates), the country remains less developed compared to the surrounding nations such Myanmar and Laos.

2. Background and Outline of the Project

The number of car registrations has surged in the recent years and has especially increased by 25% compared to last year in 2015, due to the economic development since 2010. Although Phnom Penh is located in the important point of the Southern Economic Corridor connecting through the ASEAN economic zone, there had not been any public city bus service until 2014. The long absence of public transportation systems and the surge in number of vehicles because of economic development in recent years accelerate the occurrence of traffic congestion, traffic accidents, and air pollution.

The top national policy of Cambodia is called "Rectangular Strategy" of which its Third Phase (2013–2018) is ongoing. This strategy raises 4 issues that are eradication of corruption, reform of judicial institutions, reform of administration, and reform of security agencies, while setting the 4 priority areas of agriculture, private sector, infrastructures, and human resource development. This project corresponds to the priority area of infrastructures. The Rectangular Strategy highly regard the transportation infrastructures as a key measure for economic development and poverty reduction.

The Cambodian Government requested JICA to review the Urban Transport Master Plan of Phnom Penh, which Japan assisted in with its creation in 2001. Upon request, JICA implemented the Project for Comprehensive Urban Transport Planning in Phnom Penh from 2011 to 2014 and formulated the 2035 Urban Transport Master Plan. The Master Plan towards 2035 proposes planning of public transportation systems, road networks, and traffic controls. In the aspect of public

transportation system, the 2035 Master Plan aims to raise the modal share of public transportation by 30% followed by a 10% raise in 2020 through a proposition of 10 bus routes.

Phnom Penh Capital Administration (PPCA) currently operates 3 bus routes with 57 vehicles, however, the service levels such as the number of routes and headways are inadequate. Given the number of passengers of only 7,000 to 8,000 per day, the bus system has not reached the point where it contributes in the mitigation of traffic congestion. Therefore, JICA plans to improve the traffic environment of Phnom Penh Capital City through the grant of buses that enables to expand the routes and reinforce the bus transportation capacity.

3. Result of the Preparatory Survey and Project Outline

This preparatory survey aims to examine the relevance of the grant aid project in terms of effectiveness and technical-financial validity, as well as to conduct preliminarily design based on the necessary and appropriate size and contents to achieve the desired outcome. The survey requires an outline estimate based on the preliminary design, clarification of shared responsibilities with the partner country, creation of plan of operations, and suggestions for operation and maintenance.

JICA sent the Survey Team thrice from January 2016 to July 2016 for a range of discussions with concerned officers of Cambodian Government. Both parties met an agreement by co-signing the minutes of discussion on July 21, 2016. The Survey Team also surveyed the target sites and structure and finance of City Bus Authority (CBA), and created specifications of grant equipment and the outline estimate.

To achieve the enhancement of the transportation capacity of public bus service, the existing 57 second-hand vehicles would be sold and 80 new ones including maintenance equipment would be procured. This is also to meet the requirements for the expansion of routes to 5. Since CBA seems to take a substantial amount of time to employ and train drivers and crews, there will be two batches of delivery of the bus vehicles. The first delivery of 30 vehicles will replace the deteriorated vehicles among the existing 57 vehicles to ensure the service of the existing 3 routes. Upon delivery of the second batch of vehicles, the remaining second-hand vehicles will be replaced and the additional 2 routes will be opened. The Government of Cambodia strongly requested to procure buses manufactured in Japan due to high quality and credibility. However, no bus body building manufacturer in Japan can make left-hand drive buses for overseas at the moment. Therefore, Japanese-made bus chassis that is the most important component shall be seaborne and discharged at a third country near Cambodia where the bus body would be manufactured then combined with the chassis.

The CBA plans to construct bus depots with maintenance shops in 2 places in Phnom Penh including the areas of the formerly used Phnom Penh Port and waste treatment plant in Mean Chey. They also plan to employ and train 20 mechanics before the first delivery of buses. In parallel with the first delivery, maintenance equipment will be installed on the designated sites.

4. Project Implementation Schedule and Outline Estimate

According to the Procurement Guidelines for Japanese Grants, the duration of the detailed design phase is estimated to be 4 months. The delivery of buses will be divided into two depending on the degree of preparedness in the partner country. The estimated duration of procurement for the first batch of 30 bus units and maintenance equipment shall be delivered within 11 months and the second batch of 50 bus units shall be within 13 months.

The total project cost of Cambodia is estimated at about USD7,315,120 (= JPY851.1 million) including cost for constructions of depots and maintenance factories.

5. Project Evaluation

(1) Relevance

1) The target number of beneficiaries is 1.5 million citizens of Phnom Penh, which is roughly 10% of the total population of Cambodia. The project is especially beneficial for the poor.

2) The project aims to disseminate the use of public transportation. The purpose of this project also contributes to promote the right to select transportation, which is also known as the right for basic transportation for the mobility-impaired people. This conforms to human security, basic needs, and the creation of education and human resources.

3) The project does not require overly-sophisticated techniques. PPCA will be able to operate and maintain the equipment by its own human resources, techniques, and budget.

4) The project is subject to the development of transportation infrastructures for poverty reduction embedded in one pillar of the Rectangular Strategy Third Phase of the Government of Cambodia.

5) For the environment, the project contributes to the reduction of CO^2 and other air pollutants through the necessity of shifting from individual transportations.

6) The grant aid project is the relevant scheme, because the fare revenue is limited and expected profit is low since the project mainly targets the low-income and mobility-impaired people.

7) The Country Assistance Policy for Cambodia created in 2012 indicates “reinforcing the economic infrastructure” as one of the priority area. JICA also emphasized on the “reinforcement of economic infrastructure” in the JICA Country Analysis Paper of 2014, which found the improvement of the traffic situation of Phnom Penh as a critical issue. The project is consistent with those policies.

8) PPCA pushes forward with the preparations of both budget and recruitment of new personnel, therefore, makes it feasible for Japan to disburse the project through the grant

aid scheme.

(2) Effectiveness

1) Quantitative Effect

Indicator	Reference (2016)	Target (2021)
Number of bus routes	3	5
Operation rate (%)	67.5	100
Bus travel distance (vehicle–km/day)	4,386	8,830
Bus transportation capacity (10,000 pax–km/day)	21.9	40.3
Working rate of bus vehicle (%)	75	90
Ridership (pax–day)	8,133	40,000

Note: Operational rate = the actual number of services / the planned number of services (average)
Operational rate of vehicle = the number of operating vehicles / the number of vehicle possessed (average)

2) Qualitative Effect

i. Mitigation of traffic congestion on the bus routes.

ii. Raised awareness about public transportation among the citizens with the improved public bus service.

iii. CBA is able to provide an inexpensive and safe public transportation.

iv. Scope of activities of the mobility impaired poor and elderly by the availability of inexpensive and safe public transportation and expansion of service area.

Contents

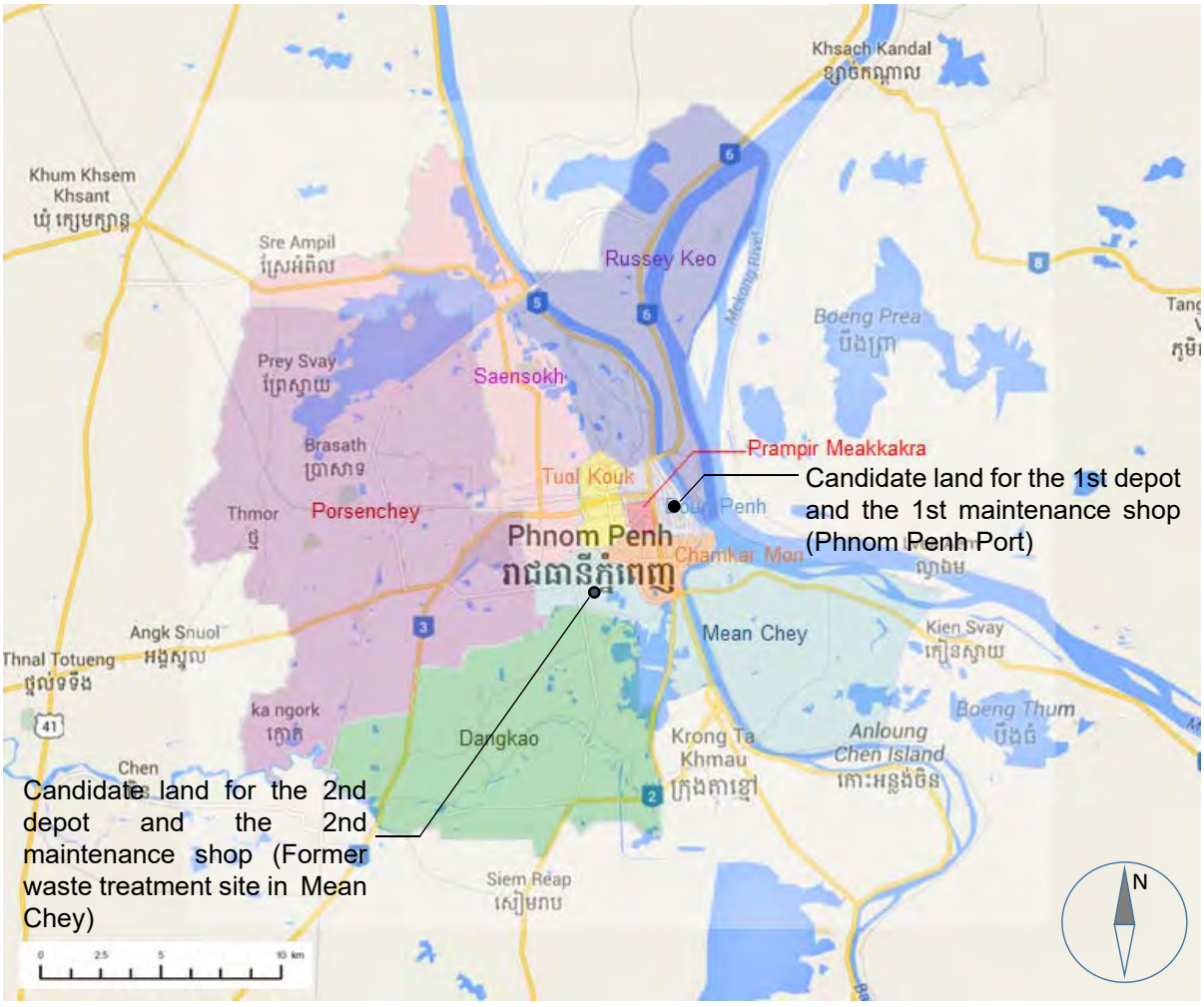
Appendices

Site Map

Kingdom of Cambodia

Source: UN Website
(http://www.un.org/Depts/Cartographic/map/profile/cambodia.pdf)

Phnom Penh Capital City



Picture

Traffic congestion in Phnom Penh (Feb. 2016)

Traffic volume of motorbike has dramatically increased in recent years. (Feb. 2016)

City Bus Authority (CBA) operates the inner city bus service in 3 routes with 57 Korean made vehicles. (Feb. 2016)

Inside the city bus (Feb. 2016)

City bus under repair. Bus vehicles get out of order daily, sometimes adding 20 minutes delay in the regular headway of every 20 minutes. (Feb. 2016)

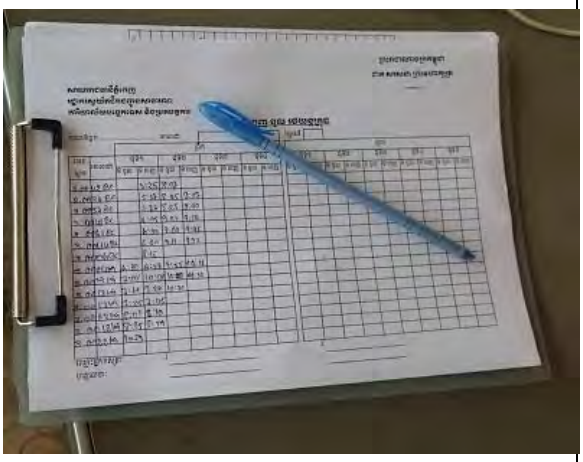
Buses frequently run behind schedule due to traffic jams or vehicle trouble, making more passengers wait. (Feb. 2016)

A bus under repair by a subcontractor. CBA outsources the overhaul and repair to private contractors. (Feb. 2016)

Overhaul of bus engines by a subcontractor (Feb. 2016)

The conductors deal with collecting fares inside the vehicle (Feb. 2016)

Most bus stops have only poles while several bus stops are equipped with shed and benches. (Feb. 2016)



Operation record is managed by CBA. (Feb. 2016)

City bus stopping at a bus stop. (Feb. 2016)

List of Tables and Figures

Abbreviations

ADB	Asian Development Bank
AFD	Agence Française de Développement
AGT	Automated Guideway Transit
A/P	Authorization to Pay
ASEAN	Association of Southeast Asian Nations
B/A	Banking Arrangements
CBA	City Bus Authority
CIF	Cost, Insurance and Freight
CNG	Compressed Natural Gas
CO_2	Carbon Dioxide
E/N	Exchange of Notes
DPWT	Department of Public Works and Transport of Phnom Penh
G/A	Grant Agreement
GDP	Gross Domestic Product
GPS	Global Positioning System
F/S	Feasibility Study
JICA	Japan International Cooperation Agency
IMF	International Monetary Fund
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LPG	Liquefied Petroleum Gas
MEF	Ministry of Economy and Finance
M/P	Master Plan
MPWT	Ministry of Public Works and Transport
NH	National Highway
PPCA	Phnom Penh Capital Administration
USD	United States Dollar
QRD	Quality, Reliability, Durability
VAT	Value Added Taxi
2035 MP	2035 Urban Transport Master Plan

Chapter 1 Background of the Project

1-1 Trends of the Concerned Sector and Issues

1-1-1 Trends and Issues

1-1-1-1 History of City Bus Service

While private cars, taxi, motorbike taxi known as "*motodop*," bicycle with a bucket seat named "*cyclo*", and the *tuk-tuk* are still widely used for the mobility of the citizens, Phnom Penh launched only recently a public transportation service.

The long absence of public transportation systems and the surge in number of vehicles because of economic development in recent years accelerate the occurrence of traffic congestion, traffic accidents, and air pollution. The capacity of the city's traffic control system is limited and education for drivers is inadequate. Furthermore, the lack of understanding of traffic laws and rules by both drivers and pedestrians increase the occurrence of traffic accidents.

(1) Launch of Bus Service in 1996

After the civil war in Phnom Penh, the first inner city bus service was launched in December 1996 with two (2) circular routes and five (5) radius routes operated by Malaysian company "Ho Wan Genting and Transport Co., Ltd." The service was similar with the old bus routes operated by Phnom Penh Capital Administration (PPCA) before the era of conflict. Subsequently, the bus service turned out be in the red and the company withdrew from the inner city bus service before their first anniversary and converting its business into an inter-city bus service.

(2) The First Social Experiment in 2001

Japan International Cooperation Agency (JICA) implemented the Project for Comprehensive Urban Transport Plan in Phnom Penh and created the 2035 Urban Transport Master Plan (2035 MP). JICA conducted the first social experiment of the inner city service for a month in 2001 as a component of the project. The experiment aimed to make the citizens understand the convenience of a city bus system and prove its efficiency and identify the problems in the city bus service planning and suggest strategic solutions.

The social experiment was conducted in two 8.5km-long routes of Monivong Boulevard and inner city circular road. There were 56 bus stops installed every 300m to 500m along the route, eight (8) of which were equipped with sheds. Parking of bicycles and motorbikes were prohibited in certain areas along the routes for smooth bus operation.

During the experiment, the ridership totaled to 103,239 comprising of 60,276 in the first route and 242,963 in the second. After JICA's experiment ended, although the Department of Public Work and Transport (DPWT) of Phnom Penh took over the operation with 17 buses at an initial flat rate of 500 riel then adjusted to 800 riel to ensure public continuity, the operation was terminated in a month after the end of the experiment because of budget shortage.

(3) The Second Social Experiment in 2014

The PPCA and JICA conducted another social experiment in February 2014 as one component of the Project for Comprehensive Urban Transport Plan in Phnom Penh in the belief that public transportation service is the most suitable way to solve traffic problems of Phnom Penh. This second social experiment aimed to: 1) Provide opportunity for citizens to enjoy comfortable and safe transportation service; 2) Accumulate know-hows on public bus operation and transfer for independent and sustainable operation; and 3) Verify the effectiveness of mitigation of congestions by the traffic lights control in the three crossings along the Monivong Boulevard.

This was conducted with 10 air-conditioned buses that served 7.5 km-long Monivong Boulevard as route 1. In order to ensure the efficiency, bus priority traffic light systems were installed in three (3) crossings and 36 bus stops were installed every 300 to 500 m. The ridership totaled 43,278 passengers that is 1,546 a day in average.

(4) Time after the Second Social Experiment

DPWT took over the second social experiment and expanded the operation. They extended route 1 from 7.5 km to 19 km before the launch of two other routes. They also increased their vehicles to 43 and developed guidance board and route maps in each bus stop. The fare was at flat rate of 1,500 riel.

The Phnom Penh City Bus Authority (CBA) that was temporarily established by PPCA then took over the bus operation. At the same time, PPCA developed bus stop equipment and restricted parking on the streets. These measures resulted to a gradual increase of ridership and reached 2,520 passengers per day. Passengers in route 1 was at 1,146, route 2 at 609, and route 3 at 763.

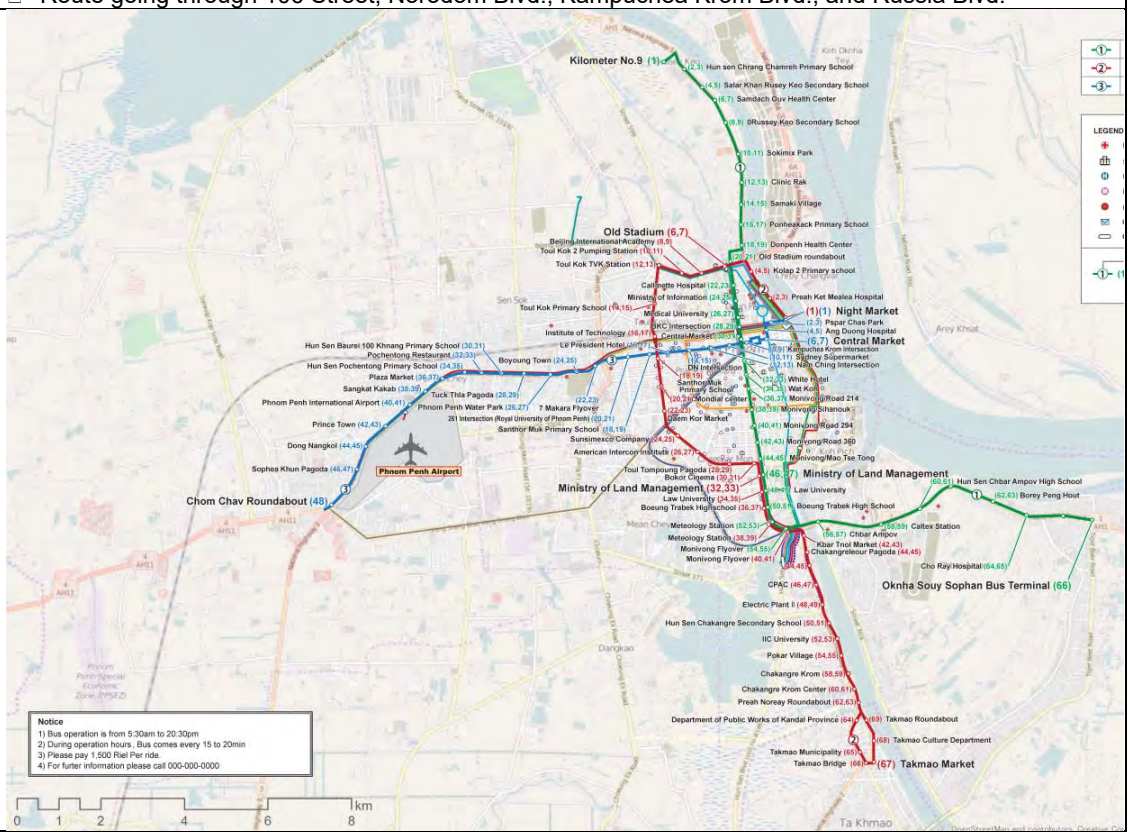
PPCA set a free fare for students, children shorter than 1 meter (m), elderly at 70 years old and above, monks, and persons with disabilities since October 2014 so as to make the bus service more prevalent. As a result, the ridership in October 2014 increased to 6,028 passengers per day. There were 2,025 passengers in route 1, 1,524 in route 2, and 2,479 in route 3.

1-1-1-2 Outline of Bus Operation

(1) Routes

CBA operates 3 routes as of August 2016 with 57 buses, of which 43 are in operation, as shown in Figure 1-1. Route 1 is running through the center of Phnom Penh from north to south on Monivong Boulevard, route 2 is operation from the city center to south passing through the eastern part of circular road (Mao Tse Toung Blvd.), and route 3 connects the night market in the town center and Phnom Penh International Airport.

Fare is at a flat rate of 1,500 riel, except for students and children that are 1 m or less in height. The operational hours is from 5:30 to 20:30 with 10 to 15 minutes headways.

	Route
Route 1	□ Route from Kilomet Lek Bram Boun bus stop to Boeung Chhouk bus stop □ The route entering NH5, Old Stadium Joint Road., Monivong Blvd., and NH1
Route 2	□ Route connecting the night market and Takmao Parking lot □ Route going through Sisovath Blvd., Old Stadium Joint Road, 70 Street, 273 Street, Toul Kork Road, Kim Ill Sung Blvd, Mao Tse Toung Blvd., Monivong Blvd, and NH2
Route 3	□ Route connecting the night market to Chaom Chao Round Out □ Route going through 106 Street, Norodom Blvd., Kampuchea Krom Blvd., and Russia Blvd.
Route Map	

Source: JICA Survey Team

Figure 1-1 Outline of the City Bus of 3 Routes

(2) Bus Ridership

The total bus ridership of the 3 routes are shown in Table 1-1. The ridership on February 23, 2016, Tuesday is a record high of 8,600 followed by 7,575 on February 24, Wednesday, and 7,063 on February 21, Sunday.

Passengers are categorized into charged and fare-free. The number of charged passengers on February 23, 2016 was 5,051 and on February 24, 2016 was 4,295, both totaling to almost 60% of the overall ridership. The fare-free passengers are the remaining 40%. Since students make up 30% of the total fare-free passengers, the deficit of CBA could not be overcome unless the current fare system would be reviewed and a student discount would be taken into consideration.

Having compared the data of ridership recorded by CBA with the result of the recent 3-day survey, the JICA Survey Team found that both data results were almost the same.

Table 1-1 Bus Ridership (Total of 3 Routes)

Date of the Survey	Paid Service Numbers	Free Service Passengers				Total
		Child under 1 m high	Students	Adult over 70 years old	Disabled	
February 21, 2016 (Sunday)	5,551	531	653	279	49	7,063
	78.6%	7.5%	9.2%	4.0%	0.7%	100.0%
February 23, 2016 (Tuesday)	5,051	407	2,711	353	78	8,600
	58.7%	4.7%	31.5%	4.1%	0.9%	100.0%
February 24, 2016 (Wednesday)	4,295	319	2,552	336	73	7,575
	56.7%	4.2%	33.7%	4.4%	1.0%	100.0%
Data from CBA, daily average ridership in December 2015						7,508

Source: JICA Survey Team

The ridership of bus by route is shown in Figure 1-2. Route 1 serves an average of 2,000 passengers a day, of which more than half are the charged passengers while the rest are fare-free. The most of the fare-free passenger are students remarkably in weekdays and much less in weekends. Number of charged passenger are not much difference between weekdays and weekends.

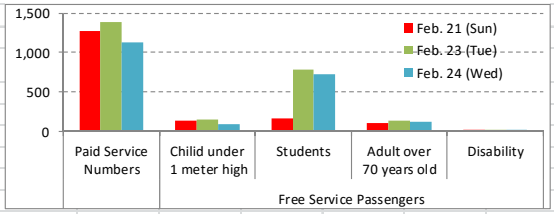
The ridership of route 2 is also an average of 2,000, yet slightly lesser than route 1 per weekday. The share of students in route 2 is slightly more than 20%, which is a little less than route 1 and, similar to route 1, the ridership of students sharply drops on Sundays.

The ridership of route 3 is the highest among the routes with more than 3,500 daily passengers. The charged ridership on Sundays is rather unusual as it outnumbers those on weekdays. Similar to routes 1 and 2, the ridership of students significantly drops on Sundays.

The most popular purpose of transportation is usually commute to workplace or school. The ridership significantly increases during weekdays, while declines on Sundays. However, the result of the survey turned out the ridership in Sundays tends to grow as high as weekdays or even higher. Although the JICA Survey Team did not include the purpose of transportation in the survey, charged passengers tend to use buses for other purposes than commuting to work or school. Thus, it will be essential to develop needs for an extensive range of purposes of transportation by outreaching the persons living far from the routes.

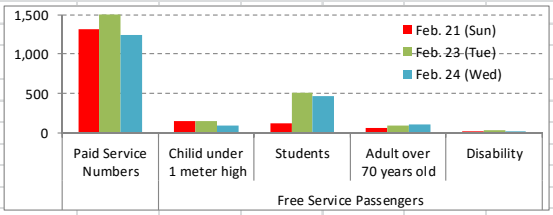
Numbers of Passengers on Route 1

		Free Service Passengers				
	Paid Service Numbers	Chilid under 1 meter high	Students	Adult over 70 years old	Disability	Total
Feb. 21 (Sun)	1,276	140	162	105	16	1,699
	75%	8%	10%	6%	1%	100%
Feb. 23 (Tue)	1,387	146	787	140	23	2,483
	56%	6%	32%	6%	1%	100%
Feb. 24 (Wed)	1,128	91	730	113	16	2,078
	54%	4%	35%	5%	1%	100%



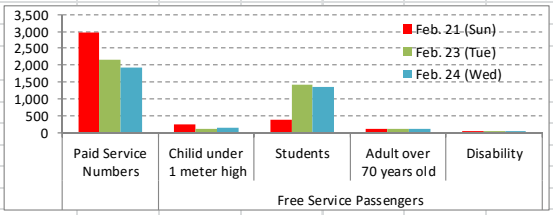
Numbers of Passengers on Route 2

		Free Service Passengers				
	Paid Service Numbers	Chilid under 1 meter high	Students	Adult over 70 years old	Disability	Total
Feb. 21 (Sun)	1,317	147	114	55	16	1,649
	80%	9%	7%	3%	1%	100%
Feb. 23 (Tue)	1,499	147	505	90	28	2,269
	66%	6%	22%	4%	1%	100%
Feb. 24 (Wed)	1,248	96	459	100	16	1,919
	65%	5%	24%	5%	1%	100%



Numbers of Passengers on Route 3

		Free Service Passengers				
	Paid Service Numbers	Chilid under 1 meter high	Students	Adult over 70 years old	Disability	Total
Feb. 21 (Sun)	2,958	244	377	119	17	3,715
	80%	7%	10%	3%	0%	100%
Feb. 23 (Tue)	2,165	114	1,419	123	27	3,848
	56%	3%	37%	3%	1%	100%
Feb. 24 (Wed)	1,919	132	1,363	123	41	3,578
	54%	4%	38%	3%	1%	100%



Source: JICA Survey Team

Figure 1-2 Bus Ridership by Route (Survey Result)

1-1-1-3 Trends and Issues of CBA

(1) Phnom Penh CBA

The Phnom Penh CBA was established under the umbrella of PPCA in July 1, 2014, while the legitimate authorization of the Cabinet Council was issued on May 21, 2014. On September 1, 2014, CBA launched the bus service with 3 routes and 57 vehicles. As of August 2016, 43 buses are in operation.

(2) Trends in Management of Bus Service

The fare is 1,500 riel (approx. USD0.36) for a single ride. The same fee applies in a route transfer and there is no incentive for transfer passengers. Students, children with

height of 1 m or less, disabled, elderly at 70 years old and above, and monks are fare-free.

The sales result in 2015 was merely 2 billion riel (approx. USD0.50 million). The annual sales in 2015 turned out a deficit of USD1.20 million or monthly more than 0.4 billion riel (approx. USD100,000). The substantial part of expenses was derived from the monthly maintenance cost of that range from USD25,000 to 30,000 and this is one of the major factors to fall in red. Since some buses become non-operational on a daily basis, the headways are often forced to stretch from 20 to 40 minutes and that affects the operation substantially.

All buses that CBA own were made in Korea in 2002 to 2005 and are second-hand. The procurement cost of each bus was USD19,000. The buses were originally powered by CNG (Compressed Natural Gas) then later converted to LPG (Liquid Petroleum Gas), so there are many breakdowns and problems on the vehicles. Moreover, the shop that can repair the modified buses is limited and charge at a higher cost.

(3) Trends of Management of Bus Service

Depots are installed in six (6) places in either sides of the 3 routes. There is no workshop, but only space for parking. Hence, daily maintenance has never been conducted by CBA. Should buses need repairs, CBA outsources maintenance to a private car repair factory. Likewise, maintenance manuals are not available in CBA. For the construction and maintenance work of facilities such as bus stops and road pavement, two civil engineers are assigned from DPWT to CBA.

In spite of having a control center, the staff in charge of vehicle allocation at each depot control the operations by contacting drivers through radio communications.

CBA recruits bus drivers who have heavy vehicles licenses and provide a few days practical training before going to the duty. There is no supervisor or manager for the education of drivers.

1-1-1-4 Laws and Regulations Related to Urban Transportation Service

There is no national policy or law related to public transportation because Phnom Penh started the 3-route bus service only in September 2014. The Ministry of Economy and Finance (MEF) plans to review the structure of CBA after 3 years through discussions with PPCA as to whether to construct the Special Purpose Company (SPC) by invitation of investors or establish a financially independent state enterprise like the Port Authority and Water Authority 3 years thereafter.

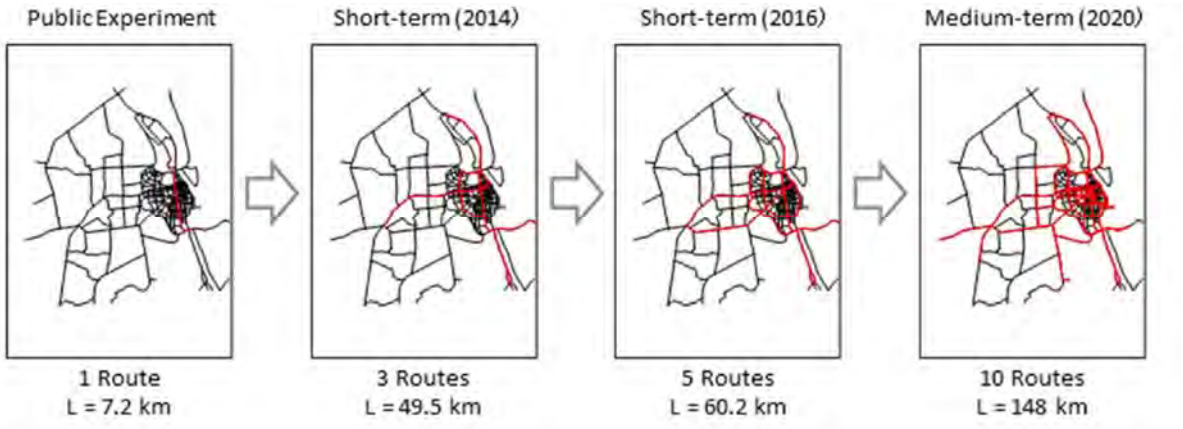
1-1-2 Development Plan

1-1-2-1 Project for Comprehensive Urban Transport Plan in Phnom Penh Capital City

JICA implemented the Project for Comprehensive Urban Transport Plan in Phnom Penh Capital City with three targets: 1) Creation of a comprehensive master plan (MP) of urban transportations targeted for 2035; 2) preparation of an action plan with priority projects followed by implementation of F/S; and 3) Transfer of techniques to concerned Cambodian Government officials and representatives. The project began in March 2012 and ended in December 2014—A duration of two (2) years and 10 months. In that project, JICA suggested some public transportation modes tailored to future demands based on the traffic demand forecast that presumed the modal share of public transportation of 30% in 2035. With that suggestion, the bus transportation would play a major role until a rail based public transportation system would be introduced. The project recommended to expand the 3 routes to 10 in 2020 (refer to Figure 1-3 and Figure 1-4).

Source: JICA, the Project for Comprehensive Urban Transport Plan in Phnom Penh

Figure 1-3 Ten Routes Specified in the Request for Grant Aid



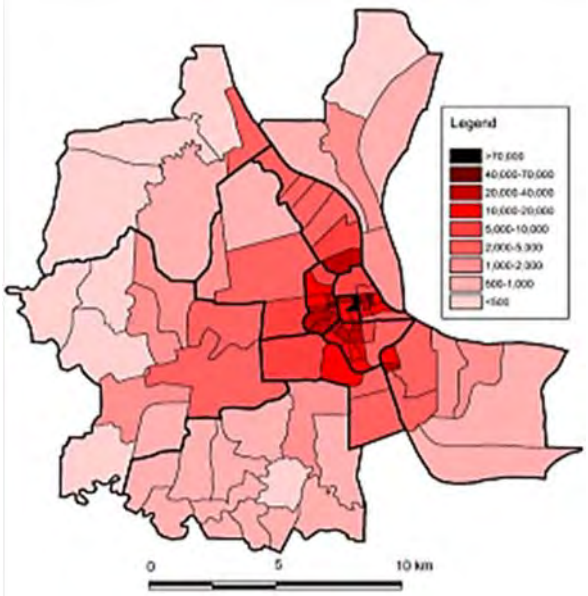
Source: JICA, the Project for Comprehensive Urban Transport Plan in Phnom Penh

Figure 1-4 Phase Plan of Bus Network

1-1-2-2 Issues of Project for Comprehensive Urban Transport Plan

The routes recommended by the Project for Comprehensive Urban Transport Plan have the following issues:

- Many of the suggested routes are long, which makes the alignment not compatible with the efficient bus service.
- The recommended routes stretch out to the distant suburbs in every direction, but the population is actually concentrated in the city center and the suburbs have lesser population. To run in long and less payable sections in exchange for hefty budget would lead to a constant deficit in bus business.
- The suburban routes are very long that more than 200 bus vehicles would be required to fulfill the service with 15-minute headway.

Bus Route Plan in the MP 2035	Population Distribution of 2014
	

Source: JICA Survey Team

Figure 1-5 Comparison of the Bus Routes Plan and Actual Population Distribution

1-1-2-3 Bus Network Plan of PPCA

PPCA has its own bus network plan, yet it goes farther than the route network in the 2014 master plan with an alignment passing over the Capital's boundary. Since the city bus service, in general, functions as a transportation for commuters concentrated on a city center, as opposed to the inter-city transportation serving for wider transportations. Hence, the Survey Team pursuits the discussions on the city bus service.

Source: PPCA

Figure 1-6 Bus Network Plan of PPCA

1-1-3 Socio Economical Trends

1-1-3-1 Economy of Cambodia

Cambodia enjoyed a high economic growth of more than 10% for 4 years from 2004 to 2007[1], but dropped to a rate of 0.1% in 2009 because of the global recession after the sub-prime loan case. However, it recovered to 6.1% in 2010 and continued to grow at 7% every year after 2011. Inflation rate remained at an average as low as 1.1% in 2015 because of low oil price and stable price of food. The current account and financial balances are, however, in constant deficit. IMF estimates the deficit of the current account balance to be -11.1% and financial balance to be 2.0%, both of which were compared to GDP. Cambodia is expected to continue the robust economic growth in light with the stable trends of exports of sewn products, constructions industry, service industry, and increase in foreign direct investment amount.

According to Asian Development Bank (ADB), the Cambodian industry comprises of agriculture that is 30.5% of the GDP, industrial at 27.1%, and service industry that is slightly more than 40%. Given that the GDP per capita is USD1,140 while the nominal GDP is approx. USD17.7 billion (IMF, 2015 estimates), the country remains less developed compared to the surrounding nations such Myanmar and Laos.

According to the material written by the General Department of Customs and Excise in 2014, the gross trade amount of import is up to USD10.7 billion and export is USD22.5 billion. The breakdown is as follows:

- Export: Fabrics (50.3%), printed goods (37%), footwear (3.9%), crops (2.1%),

[1] Ministry of Foreign Affairs of Japan, Country Data of Cambodia

rubber (1.3%)

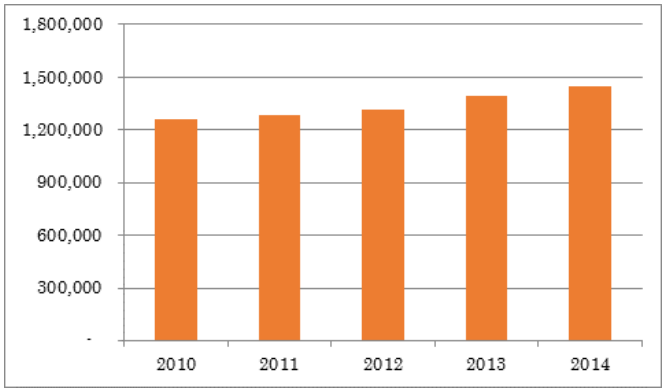
- Import: Textiles (35%), machines (9%), electrical instruments (5%), oil production (4%), vehicles (4%)

The major trading partners are as follows:

- Export: U.S.A. (23%), United Kingdom (9%), Germany (8%), Japan (7%), Canada (7%)
- Import: Thailand (28%), China (22%), Vietnam (16%), Hong Kong (6%), Singapore (6%), and Japan in 10th place (2%)

1-1-3-2 Population Trends in Phnom Penh Capital City

According to the statistics of the government of Cambodia as of 2014, the population has been increasing yearly from 2% to 4% in the past 5 consecutive years of 2010 to 2014 and is approaching 1.5 million, which accounts for 10% of the national population of 15.83 million (2016, UN Statistics Division).

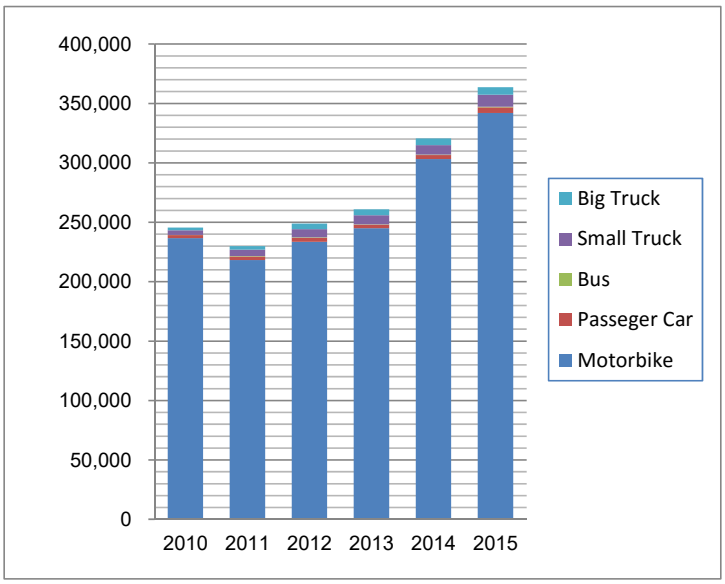


Source: PPCA, *Population in Phnom Penh*, 2010–2014

Figure 1-7 Population Trends in Phnom Penh Capital City

1-1-3-3 Trends in the Number of Registered Cars

The trend of number of car registrations is shown in the following figure. Car registrations have surged in the recent years and especially increased by 25% compared to last year in 2015. Accumulated number of registered vehicles totals to 2.28 million and 87% of the total registered is motorbike.



Source: Ministry of Public Works and Transport (MPWT)

Figure 1-8 Trends in the Number of Registered Cars

1-2 Background and Outline of Grant Aid

1-2-1 Background

The top national policy of Cambodia is called “Rectangular Strategy” of which its Third Phase (2013–2018) is ongoing. This strategy raises 4 issues that are eradication of corruption, reform of judicial institutions, reform of administration, and reform of security agencies, while setting the 4 priority areas of agriculture, private sector, infrastructures, and human resource development. This project corresponds to the priority area of infrastructures. The Rectangular Strategy highly regard the transportation infrastructures as a key measure for economic development and poverty reduction.

The Cambodian Government requested JICA to review the Urban Transport Master Plan of Phnom Penh, which Japan assisted in with its creation in 2001. Upon request, JICA implemented the Project for Comprehensive Urban Transport Planning in Phnom Penh from 2011 to 2014 and formulated the 2035 Urban Transport Master Plan. The Master Plan towards 2035 proposes planning of public transportation systems, road networks, and traffic controls. In the aspect of public transportation system, the 2035 Master Plan aims to raise the modal share of public transportation by 30% followed by a 10% raise in 2020 through a proposition of 10 bus routes.

In order to achieve the public transportation share of 30% in 2035, the master plan targets to introduce a rail-based public transportation system such as the Automated Guideway Transit (AGT). PPCA currently operates 3 bus routes with 57 vehicles, however, the service levels such as the number of routes and headways are inadequate.

Given the number of passengers of only 7,000 to 8,000 per day, the bus system has not reached the point where it contributes in the mitigation of traffic congestion.

This grant aid project aims to improve the traffic situation in Phnom Penh through enhancement of transportation capacity of public bus by expansion of routes and increase the number of bus vehicles.

1-2-2 Outline of the Preparatory Survey

This preparatory survey aims to examine the relevance of the grant aid project in terms of effectiveness and technical-financial validity, as well as to conduct preliminarily design based on the necessary and appropriate size and contents to achieve the desired outcome. The survey requires an outline estimate based on the preliminary design, clarification of shared responsibilities with the partner country, creation of plan of operations, and suggestion for operation and maintenance.

JICA sent the Survey Team thrice from January 2016 to July 2016 for a range of discussions with concerned officers of Cambodian Government. Both parties met an agreement by co-signing the minutes of discussion on July 21, 2016. The Survey Team also surveyed the target sites and structure and finance of CBA and created specifications of grant equipment and the outline estimate.

1-2-3 Outline of the Grant Aid Project

To achieve the enhancement of the transportation capacity of public bus service, the existing 57 second-hand vehicles would be sold and 80 new ones with maintenance equipment would be procured. This is also to meet the requirements for the expansion of routes to five (5) lines. Since CBA seems to take a substantial amount of time to employ and train drivers and conductors, there will be two batches of delivery of the bus vehicles. The first delivery of 30 vehicles will replace the deteriorated vehicles among the existing 57 vehicles to ensure the service of the existing 3 routes. Upon delivery of the second batch of vehicles, the remaining second-hand vehicles will be replaced and the additional 2 routes will be opened.

The CBA plans to construct bus depots with maintenance shops in 2 places in Phnom Penh including the former Phnom Penh port and waste treatment plant. They also plan to employ and train 20 mechanics before the first delivery of buses. In parallel with the first delivery of bus vehicles, maintenance equipment will be also installed on the designated sites.

1-3 Trends of Japan’s Aid

The proposed grant project depends on the objective of the priority area "Enhancement of Economic Infrastructure" in the Country Assistance Policy for Cambodia that is the

development of infrastructure. The objective states: To focus on development of axis of the land such as the Southern Economic Corridor to bear the promotion of economy and industry through stabilization and streamlining the logistics. The grant project aims to develop the public transportation of Phnom Penh Capital City, which is a strategically critical area on the Southern Economic Corridor. JICA implemented also other related projects under the same objective.

Table 1-2 Results of Related Japan's Assistance

Project Type	Period (FY)	Name of the Project	Project Outline
Grant Aid	2005–2016	The Project for Improvement of the National Road No.1 (Phase I–IV)	Aimed at the improvement of transportation efficiency and enhancement of transportation capacity through rehabilitation of roads and construction of bridge of NH1 (Phnom Penh–Neak Leung).
Technical Cooperation Project	2007–2010	The Project for Traffic Improvement in Phnom Penh City	Reinforcement of capacities in renovation of crossings, traffic regulations, and education of drivers
Technical Cooperation Project for Development Planning	2011–2014	Project for Comprehensive Urban Transport Plan in Phnom Penh Capital City	Creation of the 2035 Urban Transport Master Plan, implementation of the F/S for priority projects, training of transportation planning methods for DPWT
Grant Aid	2016–Present	The Project for Development of Traffic Management System in Phnom Penh	Development of area-wide traffic light control system in 100 major crossings in Phnom Penh Capital City

1-4 Trends of Other Development Partners

The trends of major developing partners in the transportation sector of Phnom Penh are shown in the table below. Aside from Japan, the assistance of China, ADB, and World Bank for road rehabilitation in and around Phnom Penh are also noteworthy.

In terms of the development of the city bus, there is no concrete foreign assistance plan other than that China plans to grant 100 buses yet specifications and schedule were not clearly announced. PPCA plans to tentatively replace the current deteriorated bus vehicles with those from China. Moreover, as soon as buses for city bus operation from the Japan grant arrive, the Chinese buses would be utilized for inter-city bus lines. The JICA Survey team confirmed this plan through the meeting with PPCA in July 2016.

Table 1-3 Result of Related Assistances by Other Development Partners

Development Partner	Period	Name of the Project	Project Outline
China	2012–2014	Rehabilitation of NH6	Rehabilitation of 36 km-long national road with 4 lanes (PP–TK)
	2008–2015	Rehabilitation of NH5	Rehabilitation of 30 km-long national road with 4 lanes (PP–PK). Dam was also constructed by China.
World Bank, ADB	2008–present	Road Asset Management Project (RAMP) I, II	Capacity development of MPWT in management of road rehabilitation and rehabilitations works of major roads in Phnom Penh
AFD	2005–2007	Phnom Penh Urban Master Plan 2020	AFD created Phnom Penh Urban Master Plan 2020 (2020 MP) in 2009. JICA's 2035 Transportation Master Plan is based on the land use plan of 2020 MP.

Source: JICA Survey Team

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Purpose

Cambodia's national development policy is called Rectangular Strategy of which its Phase III (2013–2018) is currently ongoing. The strategy prioritizes infrastructure, particularly, transportation infrastructure to serve for economic growth and poverty reduction. The Cambodian Government requested JICA to review the Urban Transport Master Plan of Phnom Penh, which Japan assisted in with its creation in 2001 to accelerate the Rectangular Strategy. Upon request, JICA implemented the Project for Comprehensive Urban Transport Planning in Phnom Penh from 2011 to 2014 and formulated the 2035 Urban Transport Master Plan.

The Master Plan towards 2035 aims in raising the modal share of public transportation by 30% then following a 10% raise in 2020 by proposing 10 bus routes. PPCA currently holds three operating bus routes with 57 vehicles, however, the service levels such as the number of routes and head ways are limited. Given the number of passengers of only 7,000 to 8,000 per day, the bus system has not reached the point where it contributes to mitigate traffic congestion.

This project aims to improve the traffic situation in Phnom Penh through the enhancement of the transportation capacity of public bus by expansion of routes and the increased number of bus vehicles. To achieve this goal, JICA would provide the necessary bus vehicles, spare parts, and equipment for maintenance.

2-1-2 Summary of the Project

In order to achieve the enhancement of the transportation capacity of public bus, there is a plan to sell the existing 57 second-hand vehicles and procure 80 vehicles and maintenance equipment. This is also to meet the requirement of the route plan in which 2 new routes would be added to the current 3 for a total of 5 routes. Since the City Bus Authority (CBA) takes a substantial time to employ and train the drivers or crews, there will be two batches of the delivery of bus vehicles. The first delivery of 30 vehicles will replace the deteriorated vehicles among the existing 57 vehicles to ensure the service of the existing 3 routes. Upon delivery of the second batch of vehicles, the remaining second-hand vehicles will be replaced and the additional 2 routes will be opened.

The CBA plans to construct bus depots with maintenance shops in 2 places in Phnom Penh including the areas of formerly used Phnom Penh Port and waste treatment plant in Mean Chey as well as employ and train 20 mechanics before the first delivery of buses. In parallel with the first delivery, maintenance equipment is also going to be

installed on the sites. The summary of the delivery is described in the Table 2-1.

Table 2-1 Summary of the Requested Japanese Assistance

Category	Contents	Delivery Unit
Procurement of bus vehicles and spare parts	Bus capable for 40 passengers (The first delivery)	30 vehicles
	Bus capable for 40 passengers (The second delivery)	50 vehicles
	Total	80 vehicles
Procurement of maintenance equipment	Maintenance equipment to improve the capacity of the CBA (Maintenance shop in 2 places)	Lamp Sam (2 sets)

Source: JICA Survey Team

2-2 Outline Design of the Requested Japanese Assistance

2-2-1 Design policy

2-2-1-1 General Policy

The grant aid is for the procurement of bus vehicles, maintenance equipment, and spare parts to realize the improvement plan for public bus suggested in JICA's project named "The Project for Comprehensive Urban Transport Planning in Phnom Penh."

The urgent issue of Phnom Penh is the expansion of the route network of the public bus service that's currently in operation in 3 routes with 57 vehicles. The service level has been lowered due to deterioration of the vehicles. Another issue is traffic congestion, which grows more serious with the increase of private vehicles such as cars and motorcycles. Moreover, CBA that was established only around a year ago, has limited capacity in operation and management and it would fall short of drivers and crews if bus routes were to be immediately expanded. Therefore, the general policy of the requested Japanese assistance is a strong coordination with a project aimed at the capacity development of CBA.

2-2-1-2 Policy for Natural Conditions

The natural conditions of Phnom Penh is summarized in Table 2-2

Table 2-2 Natural Condition

Temperature	23–33 degree Celsius
Elevation	Approx.250 m
Amount of rain	1,300–1,800 mm/year
Rainy season	May–Oct.

Source: JICA Survey Team

There are no remarkable issues with temperature and elevation, but water-proofing, rust prevention, and corrosion-proofing should be taken into consideration when it comes to chassis, roof, and outside plate, given the long rainy seasons, high humidity, and poor drainage conditions.

2-2-1-3 Policy for Social Economic Conditions

Cambodia succeeded in settling the political and economic situation after prolonged conflicts from the 1970s to 1980s and is now enjoying robust economic development. However, the GDP per capita of Cambodia still remains at the bottom of ASEAN nations with Myanmar. In light with those social economic conditions, public transportation plays an essential role in securing the mobility of the mass, given the fact that the fare has been retained low enough for the affordability of most citizens of the city including the poor. This results to inadequate fare revenue. The finance from the PPCA makes up for any loss. Given these conditions, Japan's assistance should take consider to make the financial burden on the maintenance cost as minimum as possible.

2-2-1-4 Policy for Operation and Maintenance

The CBA mandates the checkup and maintenance of vehicles to private enterprises for USD 800 per vehicle monthly, so the CBA is not able to check up and maintain the equipment on its own. If the number of bus vehicles increase, the cost would grow bigger. It would then be necessary for the CBA to take some part of the maintenance by themselves. Therefore, the Survey Team must make it a basic policy for the CBA to implement daily, regular checkups and light repairs on bus vehicles while its contractors take over the heavy repairs such as dismantling engines. When the bus vehicles arrive at the sites, JICA will send engineers from the manufacturer of the bus vehicles to train mechanics on maintenance of engines for around 2 weeks. Concurrently, JICA will foster mechanics through another technical assistance project.

2-2-1-5 Policy for Maintenance Equipment

The CBA currently outsources the maintenance of the existing bus vehicles initially loaded with CNG-fueled engines and later converted to LPG. This project would have the existing vehicles continuously outsourced for maintenance while maintenance equipment cut out for diesel-engine vehicles would be purchased and scheduled to be introduced from Japan.

2-2-1-6 Policy for Setting Grade of the Equipment

The specifications of the equipment to be procured through this project should be

appropriate for the road traffic conditions in Phnom Penh and formulated to secure the competitiveness of the bidding. The existing bus vehicles were converted to LPG from CNG-fueled. The bus vehicles to be introduced in this grant aid project must be diesel-fueled because those are easy to purchase in the local markets. Additionally, the diesel fuel available in Cambodia often contains contaminants due to low level of purification technique. The vehicles should meet the requirements of exhaust regulation equivalent to EURO-2.

2-2-1-7 Policy for Procurement of Spare Parts

Spare parts shall be procured by CBA, however, it will take time to establish a maintenance management system for the new bus vehicles. Therefore, the necessary spare parts will be procured by the grant aid project. The amount of spare parts should be enough for a 2-year operation (until establishment of appropriate maintenance management system). Assuming those parts are properly managed, JICA provides spare parts with its value equivalent to 10% of the vehicle price at maximum.

2-2-1-8 Policy for Procurement Measure and Schedule

The CBA requested to procure bus vehicles made mainly by Japanese manufacturers because of their performance and quality of products are superior compared to those made in other countries.

There are 3 major bus manufacturers in Japan, namely, Hino, Mitsubishi Fuso, and Isuzu. Generally, other manufacturers do bodyworks and interiors for the chassis and engines made by those major manufacturers, but this conventional production system is tailored only to Japanese market. There is no production line for vehicles with left-hand drive for export.

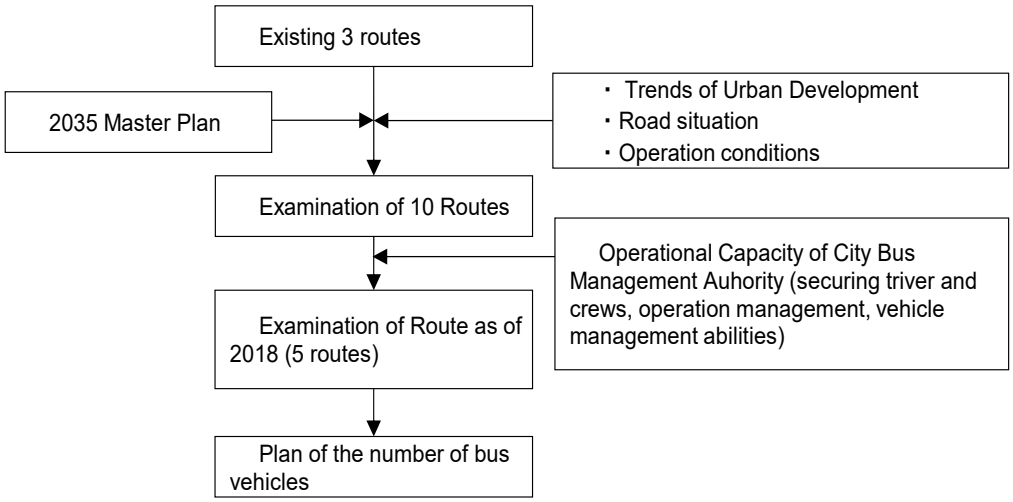
Cambodia does not have any bodywork manufacturer that meets the requirements of Japanese companies in the aspect of technique and production capacity. However, the JICA Survey Team identified some manufacturers in neighboring countries such as Vietnam, Thailand, and Philippines that are capable enough to deal with Japanese manufacturers. Hence, JICA set it as a policy to transfer chassis and engines made in Japan to the mentioned neighboring countries for bodyworks and assembly of interiors before delivery to Cambodia. Similar to procurement of bus vehicles, when purchasing maintenance equipment, JICA will prioritize Japanese products following the request from PPCA.

2-2-2 Basic Plan (Equipment Plan)

2-2-2-1 General Plan

(1) Basic Policy

The Survey Team came up with a number of buses having selected 5 routes to be introduced in 2018 out of 10 proposed routes in the 2035 MP as shown in Figure 2-1. The Survey Team believes an expansion of the service of up to 5 routes in 2018 is possible given the actual time to employ and train the drivers and mechanics. Eventually, number of buses and maintenance equipment are confirmed necessary for the proposed 5 routes.



Source: JICA Survey Team

Figure 2-1 Flow towards the Decision of the Number of Bus Vehicles

(2) Plan of Operation and Route

The CBA operates 3 routes as shown in Figure 1-1. Although its original operation plan ran 57 vehicles with 90 drivers in a two-shift labor system, the actual operational rate resulted in 60% of the originally planned services.

The Survey Team examined the 10 planned routes taking into consideration the problems with the current 3 routes, possible 10 routes suggested in the 2035 MP, and the other routes being examined by the PPCA.

- Lay out routes for bus services to cover the entire urban area in order to promote use of public transportation
- Minimize the effects of delays caused by traffic congestion by shortening the route length

- The number of services per hour is every 15 minutes in the urban area, every 30 minutes in the suburbs, and 60 minutes for airport commuters.

As a result, the gross length was at 143.3 km, while the required number of vehicles was 140 units as shown in Table 2-3 and Figure 2-2.

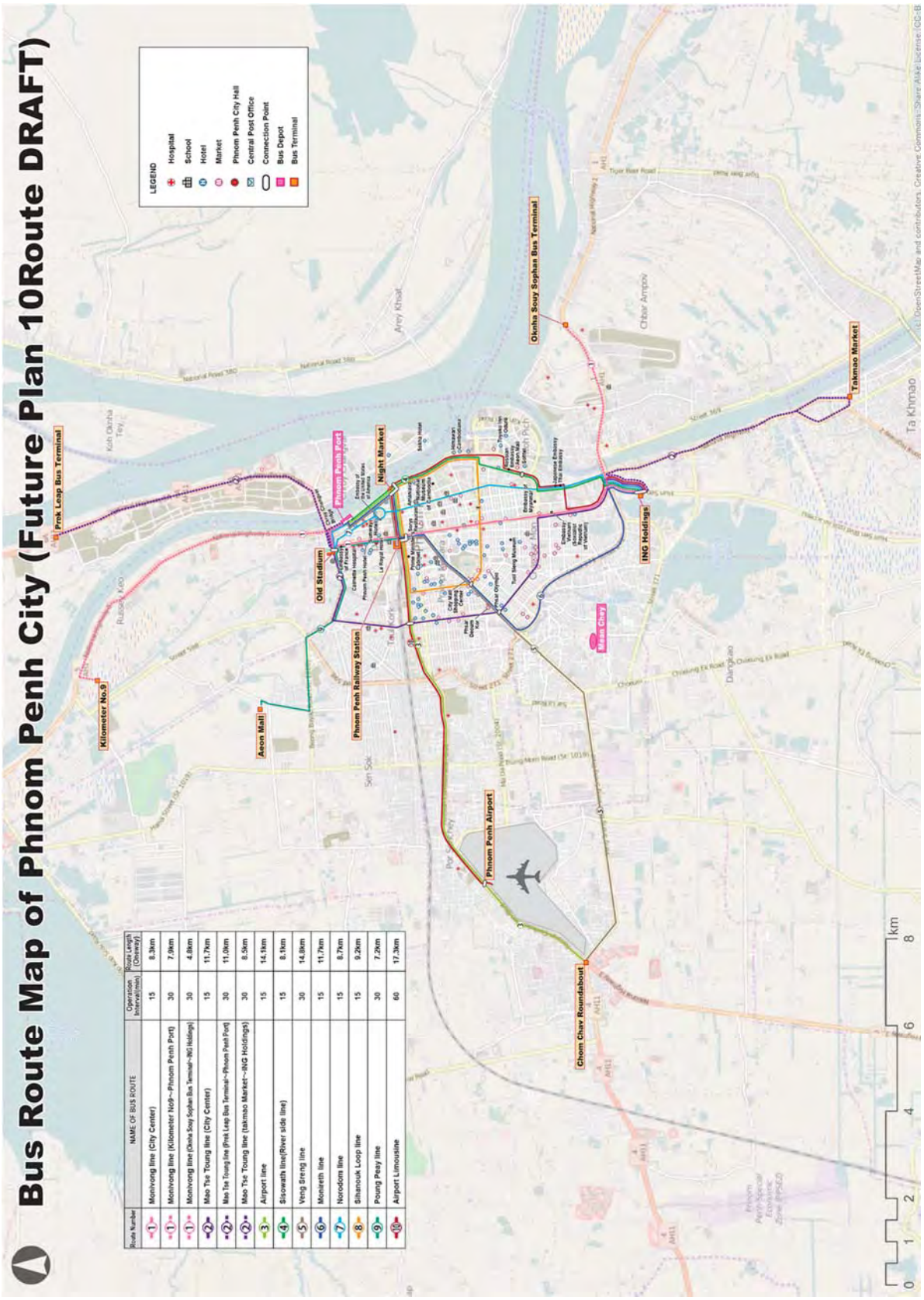
Table 2-3 Future Bus Route Network of Proposed 10 routes

Route	Route	Segment		Length (km)	No. of Vehicle	Operational hours		Headway (min.)
		Origin	Destination			Start	End	
1	Monivong Line	Phnom Penh Port	ING Holding	8.3	10	5:30	20:30	15
		KM9	Phnom Penh Port	7.9	5			30
		ING Holding	Oknha Sophan	4.8	3			30
2	Mao Tse Toung Line	Night Market	ING Holding	11.7	14			15
		Prek Leap Bus Terminal	Phnom Penh Port	11.0	3			30
		ING Holding	Takmao Markt	8.5	5			
3	Airport Line	Phnom Penh Port	Chom Chav Rab.	14.1	14			15
4	Sisowath Line	Phnom Penh port	ING Holding	8.1	10			15
5	Veng Sreng Line	Phnom Penh Port	Chom Chav Rab.	14.8	8			30
6	Monireth Line	Phnom Penh Port	ING Holding	11.7	12			15
7	Norodom Line	Phnom Penh Port	ING Holding	8.7	10			15
8	Sihanouk Loop	Phnom Penh Sta.	Phnom Penh Sta.	9.2	20	7:30	17:30	15
9	Poung Peay (AEON) Line	Phnom Penh Sta.	AEON Mall	7.2	8	5:30	20:30	30
10	Airport Limousine	Air Port	ING Holding	17.3	5			60
Total				143.3	127			
Reserved Vehicles					13			
Grand Total					140			

Source: JICA Survey Team

(3) Proposed Action Plan until 2020

The Schedule of the Action Plan until 2020 is shown in Figure 2-3. In order to expand to 10 routes for better bus service to the people, CBA has to prove the capability on the effective and efficient bus operation with the 80 bus vehicles provided by this grant aid project.



Source: JICA Survey Team

Figure 2-2 Future Route Map of Proposed 10 Bus Routes

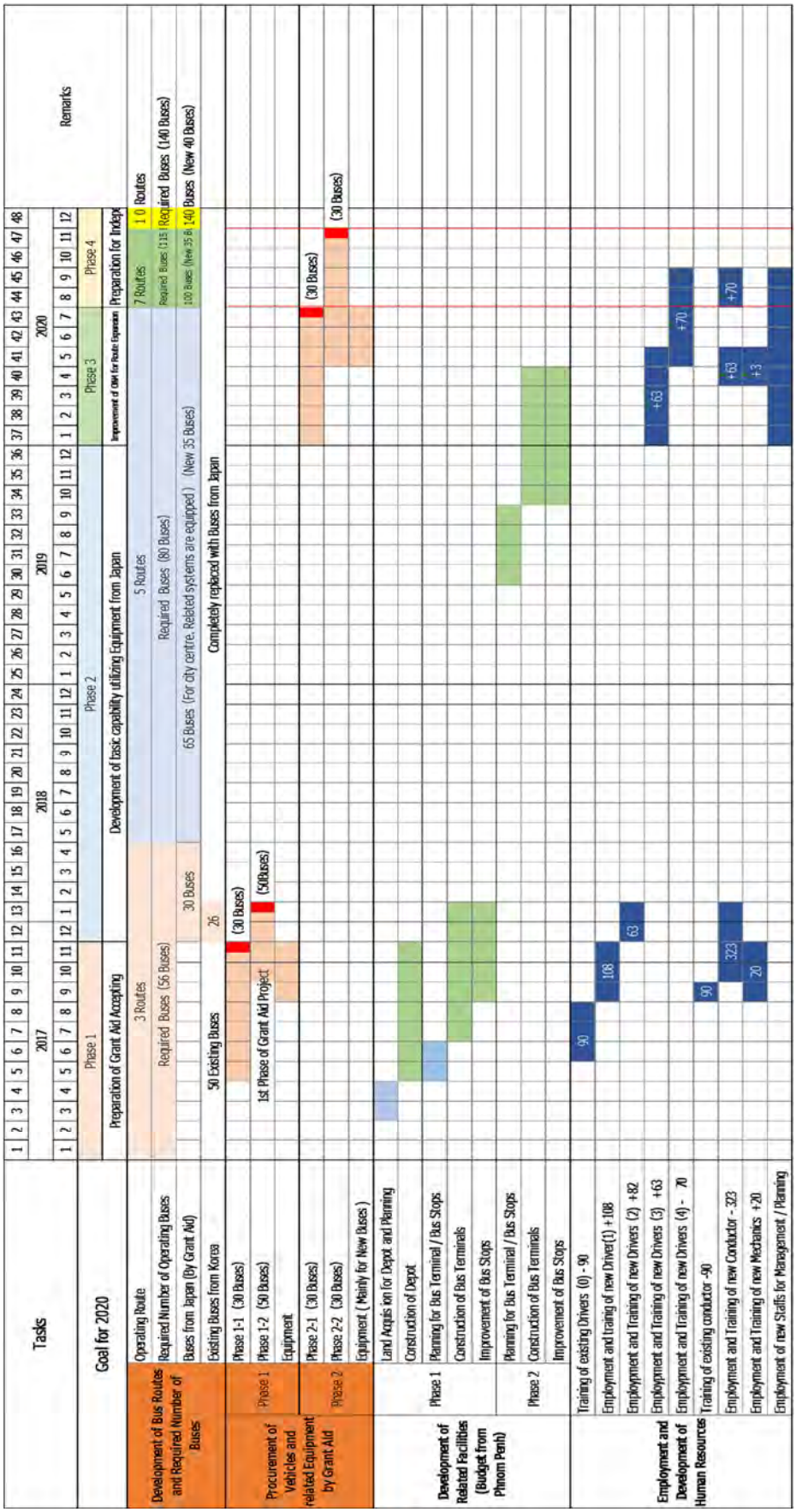


Figure 2-3 Proposed Schedule of the Action Plan Toward 2020

The required number of human resources and vehicles to operate on the planned bus routes is detailed in Table 2-4 below. An estimate of 330 new drivers would be recruited and trained to meet the requirements.

Table 2-4 Required Number of Drivers and Conductors

Phase	No. of Routes	Route No.	Driver	Conductor	Mechanic	Manager/ Planner
Status quo	3	1, 2, 3	90	90	-	20
Required No.	-	1, 2, 3	108	108	20	
	Adding 2 routes (5)	4, 6	82	82		13
	Adding 2 routes (7)	7、8	63	63	4	14
	Adding 3 routes (10)	5, 9, 10	70	70		
Total	10	10	413	413	24	47

Source: JICA Survey Team

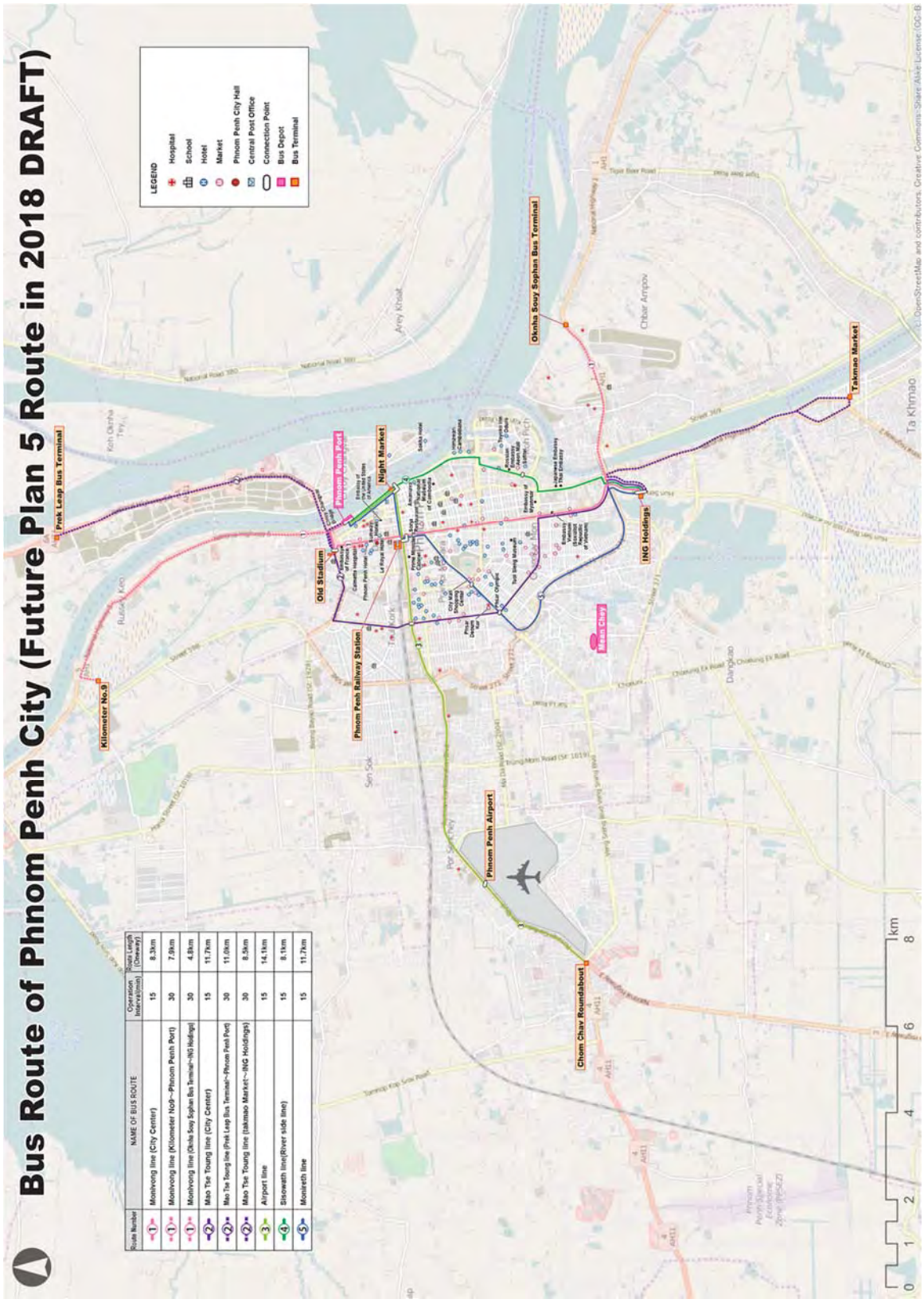
(4) Setting the Number of Vehicles to be introduced

On the application procedure phase, the PPCA requested 180 vehicles to serve in 10 routes. However, after examinations and discussions, the JICA Survey Team agreed with PPCA that the first phase of the project aim for approximately 5 routes. Consequently, the number of buses to be introduced turned out to be 80. The target 5 routes are described in Table 2-5.

Table 2-5 Five Bus Routes and Number of Vehicles Planned in the Project

Route	Route	Segment		Length (km)	No. of Vehicle	Operational hours		Headway (min.)
		Origin	Destination			Start	End	
1	Monivong Line	Phnom Penh Port	ING Holding	8.3	10	5:30	20:30	15
		KM9	Phnom Penh Port	7.9	5			30
		ING Holding	Oknha Sophan	4.8	3			30
2	Mao Tse Toung Line	Night Market	ING Holding	11.7	14			15
		Prek Leep	Phnom Penh Port	11.0	3			30
		ING Holding	Takmao Markt	8.5	5			30
3	Airport Line	Phnom Penh Port	Chom Chav Rab.	14.1	14			15
4	Sisowath Line	Phnom Penh port	ING Holding	8.1	10			15
6	Monireth Line	Phnom Penh Port	ING Holding	11.7	12			15
Total				86.1	76			
No. of Spared Vehicle					4			
Grand Total					80			

Source: JICA Survey Team



Source: JICA Survey Team

Figure 2-4 Route Map of Planned 5 Bus Routes

(5) Plan of Operation and Finance

Profit and loss as of 2018 when bus vehicles were provided is shown in Table 2-6.

Table 2-6 Estimate of Profit and Loss of the CBA in FY2018

Route	Name of Route		No. of Buses (unit)	Operation Length (km)	Bus▪ Annual Millage (Unit x Km)	Annual Ridership	Revenue (mil. Riel)	Revenue (USD)	Cost per km (USD)	Operation Cost (USD)	Profit (USD)
1	Monivong Line	City Center	10	8.3	400,040	507,000	468	117,035	1.51	604,060	-487,026
		KM9/Port	5	7.9	191,260	335,000	309	77,148	1.51	288,803	-211,654
		Ohnha Souy/ING	3	4.8	116,070	251,000	231	57,848	1.51	175,266	-117,418
2	Mao Tse Toung Line	City Center	14	11.7	563,560	1,153,000	1,063	265,818	1.51	850,976	-585,157
		Prek Leap /Port	3	11	204,400	196,000	181	45,239	1.51	308,644	-263,405
		Takmao /ING	5	8.5	131,400	194,000	179	44,791	1.51	198,414	-153,623
3	Airport Line		14	14.1	668,680	984,000	908	226,934	1.51	1,009,707	-782,773
4	Sisowath Line		10	8.1	391,280	237,000	219	54,731	1.51	590,833	-536,102
6	Monireth Line		12	11.7	556,260	857,000	791	197,719	1.51	839,953	-642,233
Total					3,222,950	4,714,000	4,349	1,087,262	1.51	4,866,655	-3,779,3

Note: Annual ridership is estimated from the ratio of the data of ridership obtained in Feb. 2016 to the population of area through which the route strands.
Revenue was calculated from the ration of charged passengers and its average fare.

Source: JICA Survey Team

Based upon previous conditions, the budget plan of the CBA for FY2018 when the bus vehicles would be granted to the Royal Government of Cambodia (RGC) was projected as shown in Table 2-7.

Table 2-7 Budget Plan of CBA at FY2018

Particulars			Budget Plan (USD)
A	Revenue		2,718,156
	1	Fare	1,087,262
	2	Non-fare	1,630,894
B	Expense		4,857,721
	1	Personnel	2,262,528
	2	Fuel	917,751
	3	Maintenance	463,200
	4	Depreciation	950,000
	5	Facility	78,160
	6	Others	186,082
C	Balance		-2,139,566
E	Profitability		-7871%

Source: JICA Survey Team

Consequently, the total revenue composed of fare and non-fare revenues will remain at USD2.7million, which is less than total annual expenditures. A total amount of deficit will reach USD2.1million due to the impact of depreciation expenses of bus vehicles. This deficit would be covered by the subsidies from PPCA.

On the other hand, it is an urgent issue for the revenue side that the fare is kept extremely low for political reason. Current bus fare for the general passenger is limited at 1,500 Riel and, moreover, passengers who are students, elders, and monks are free-of-charge. The Governor of PPCA announced that this fare setting should be reviewed to achieve a more sustainable operation.

The revenue plan was then revised based on the case if bus fare was increased to 3,000 Riel for general passengers and 500 Riel charge for the free-ride passengers without any change of ridership.

Table 2-8 Budget Plan of CBA at FY2018: Case for Fare Raised

Particulars		Budget Plan (USD)
A	Revenue	4,032,312
	1 Fare	2,401,418
	2 Non-fare	1,630,894
B	Expense	4,857,721
	1 Personnel	2,262,528
	2 Fuel	917,751
	3 Maintenance	463,200
	4 Depreciation	950,000
	5 Facility	78,160
	6 Others	186,082
C	Balance	-825,410
E	Profitability	-2047%

Source: JICA Survey Team

Results revealed that the amount of deficit will drastically reduce to USD825 thousand, evidently less than USD1million. If an increase in non-fare revenue by 1.5 times would be achieved through marketing efforts then the deficit would be fully reduced.

2-2-2-2 Plan of Procurement

Table 2-9 shows the major equipment, each of which costs above 1 million Japanese yen (FOB). For detailed specifications of each equipment, refer to Annex Table 6-1 in the breakdown of estimate of the grant project.

Table 2-9 Specification and Quantity of Equipment to be Purchased

Equipment	Purchasing country	Country of Origin	Major specifications or formulations	Qty.
Bus	Lower part of vehicle (Chassis and engine): Japan Upper part of vehicle (incl. chassis assembly): Vietnam, Thailand, Philippines and Japan Chassis assembly: Taiwan also available	Knockdown production by chassis and engine made in Japan	Chassis: Ladder type Engine: Diesel, water-cooling type, rear engine Steering: Left-hand drive Width: 2,200–2,500mm Length: 10,500–11,500 mm Height: 2,500–3,500 mm Seats: 40 passengers and 1 driver Accessory: spare parts	80
Equipment for the Bus	Japan or Third country	Japan or Third country	LED Destination Indicator: Language: Primary Khmer supplemented by English, indicating in parallel or in turn Bus stop guide in LCD display Drive Recorder inside and outside the vehicle Bus Location information GPS Accessory: Spare parts	80
Tire changer	Japan	Japan or Italy	14–23 inches or more	2
Automatic washing machine for bus	Japan	Japan	Compatible vehicle: Width: 2,500 mm Length: 12,000 mm Height: 3,800 mm	2
Hot water high pressure washer	Japan	Japan	900 liter/hour, diesel	2
Fork lift	Japan	Japan	More than 3 ton load capacity, diesel	2

Source: JICA Survey Team

(1) Specification of Bus Vehicle

The Government of Cambodia requested for buses each with a capacity of 45 passengers. Given that the number of seats of each currently used bus range from 25 to 37, the buses for procurement will secure 40 seats in each and have more capacity of up to 50 including standing passengers. There are no specific regulations for vehicle registration except for size in Cambodia.

Most of the entire roads of the bus routes are paved, but some parts are not and occasionally covered by water during rainy season. This is why a high-floor bus with

few steps has been selected despite barrier-free low floor buses that go mainstream in Japan.

Since the existing public bus service in Phnom Penh was launched in 2014, the CBA suffers from the lack of know-how. The CBA sometimes receives complaints from passengers for their inability to provide enough service. Particularly, the headways of the buses are irregular that both management and passengers are not sure of bus time arrival. This is why it is essential to control operation with a GPS location system.

Moreover, foreigners have no chance to figure out which bus to ride since the destination of each bus line is indicated only in Khmer. In order to rapidly increase the revenue of the CBA, the service must be user friendly even for passengers who already use the service. First, introduce the quality of services given in Japan such as putting a number on each line, distinguishing lines from one another using different colors, and indicating destination in both Khmer and English. This will lead to an increase of repeat passengers. Those measures also enable to use vehicles universally free from each line.

JICA is going to provide a first batch of 30 vehicles followed by a second batch of 50, which makes a total of 80 vehicles to serve in 5 routes in the Phnom Penh. Besides the provision of 80 buses, the project contains a component of the development of environment to educate crews and arrange management institutions that require recruitment of 200 crews each as drivers and conductors (Refer to Table 2-10).

Table 2-10 Specifications of Bus Vehicle

Item	Specification
1. General	
1-1 Size	
1) Width	2,200-2,500mm
2) Length	10,500-11,500mm
3) Height	2,500-3,500mm
1-2 Body shape	2-3 step (high floor)
1-3 Driving side	Left hand drive
1-4 No. of Seats	40 passengers, 1 driver
2. Engine	
2-1 Type	Diesel, water-cooling type
2-2 Exhaustion regulation	Compatible with the ratio of oil purification and maintenance technique in Cambodia.
3. Chassis	
3-1 Type	Ladder type frame
3-2 Location of engine	Rear
3-3 Transmission	Advance up to 5-6th gear, recede 1 gear
3-4 Steering	Power steering
3-5 Brake	Whole wheel air brake (Exhaustion brake)
4. Tire	
4-1 Tire	Radial Tire

5. Door	
5-1 Location	One each in front and central
5-2 Type	Combination use of air and electric
1) Front	Folding type
2) Central	Folding or sliding type Prevention feature of closing door, when sensing people on the door step
5-3 Safety Device	Accelerator inter locking
6. Emergency Exit	
6-1 Location	One place on the rear left side
7. Window	
7-1 Front	Below 4 layers
7-2 Flank	Upper: slide type, lower: fixed type
7-3 Rear	1 or 2 layers
7-4 Type	Smoke (Recommended: Sun Verre Green 50) Heat absorbing green in front, front door, side of driver's seat, reinforced windshield
7-5 Devices	Front window: wiper, wind washer
8. Floor	
8-1 Material	Non-slip type
9. Seat	
9-1 Specification	Front faced pair seat (left and right), single seat on the very front right, the rear 5 seats High-back type, PE
9-2 Color	Low visibility of stains (recommended by manufacturers)
10. Air conditioner	
10-1 Specification	Compatible with tropical zone
11. Design	
11-1 Design	Identified by PPCA
11-2 Color	Less than 3 colors
12. Fittings inside vehicle	
12-1 Devices	Odometer, alert light, buzzer, horn, etc.
12-2 Electrical component	
1) Headlight	Headlight: Discharge, LED or halogen type Fog light: Yellow Road verge light: White or yellow Reversing light: White
2) Room light	Passenger seats, steps, upper side of driver's seat: white LED
3) Pilot lamp	Door opening alert light (front-door, central-door) Alert light of sensing people on step at the central door Alighting buzzer signal light (with reset switch)
12-3 Announcement device	
1) Speaker	Inside and outside speakers
2) Microphone	1 for driver's seat, one each for front door, central door for conductor
12-4 Camera monitor	Rear camera monitor (installation near driver's seat)
12-5 Alert devices	Alert buzzer for controlling central door, receding buzzer (transmission coordinating type is recommended) Emergency door controlling alert device (alert buzzer when right or left turn)
12-6 Alighting buzzer	Installation at window frames and hand rails
12-7 Hanging strap	Triangle-shape, plastic
12-8 Hand railing	Both left and right side every 2 rows, 1 row on ceil With protection cushion, orange color

13. Fittings outside body		
13-1	Mirror	Rear view (side), under, side under
13-2	Camera	Rear view camera
13-3	Flag stand	One each for left and right on upper front part
13-4	Reflection device	Flank, rear
13-5	Advertisement frame	Frame for flank and rear
14. Interior fittings		
14-1	Fare box	Installed beside driver seat, fixed type, steel-type that is superior in safety. Fare box must be opened to take out fare (only paper currency) with key
14-2	Notice tool	Frame for route map, frame for advertisement, inspection certificate holder, etc.
14-3	Mirror	Interior mirror, door safety confirmation
14-4	Safety tool	Fire distinguisher, smoke candle, wheel holder, inspection hammer

Source: JICA Survey Team

Table 2-11 Other Equipment for Bus

Item	Specification	Purpose
1. LED destination indicator		
Specification	LED, more than 2 colors, coupled to each 4 sides (front, rear, left and right side)	・Indicator of destination for passengers ・Putting number in each route for easy identification of passenger ・Aimed to make vehicles for universal use among multiple routes and even for each headway between vehicles. ・Those measures make it unnecessary to have spare vehicles in each route, saving the number of reserve vehicles and making it easy to operate
Language	Primary Khmer supplemented by English, indicating in parallel or in turn	
Front display		
Size	1,640(W) x 320(H)mm	
Contents	Destination, transit stops, route number	
Color	Destination, transit stops: green, route number: red	
Right hand display		
Size	1,600(W) x 160(H)mm	
Contents	Destination, transit stops, route number	
Color	Destination, transit stops: green, route number: red	
Left side display		
Size	320(W) x 320(H)mm	
Contents	Route number	
Color	Red	
Rear display		
Size	640(W) x 320(H)mm	
Contents	Destination, transit stops, route number	
Color	Destination, transit stops: green, route number: red	
2. Bus stop guide in LCD display		
Monitor	22-27 inches	・Wipe out the anxiety of passenger about where they are by presenting information such as next stop, destination, route number, and others
Position	Front side inside the bus	
Language	Primary Khmer supplemented by English, indicating in parallel or	

	in turn	・Require proper manner inside buses by awareness raising-banning unnecessary movements while driving, no smoking, no eating and drinking, and other things to make the bus user-friendly.
Contents	Nest bus stop, transit, destination, route number, fare, service announcement and cautions	
3. Drive Recorder inside and outside the vehicle		
Camera	5 places	・Not only to relax passengers, but also monitor road condition as well as educate crews to drive safely and raise customer service level.
Location to install	Front of vehicle, left and right side of vehicle, 2 places inside vehicle	
4. Bus Location information GPS		
Specification	In-vehicle device and software	・Install GPS on each vehicle to control their location on the PCs at depots and related offices. ・Constant monitoring makes it possible to provide stable services by deploying vehicles correctly in case of congestion or emergency. ・Provide information to customers on the whereabouts or location of the bus they would be riding

Source: JICA Survey Team

(2) Equipment for Vehicle Maintenance

The CBA currently does not own any maintenance equipment as they have outsourced all of maintenance activities to external factories.

On the contrary, Phnom Penh enjoys holding Japan International Volunteer Center (JVC) Technical College that sends around 100 graduates every year with many who know mechanical techniques as much as second class mechanics license holders in Japan.

For that reason, in this grant project, the bus service offices that would be newly established basically would not conduct dismantling overhauls and bodyworks that require high techniques. They would only take on works that range from daily checkups to annual automobile inspections. The specifications of equipment for vehicles maintenance to be installed in each maintenance shop are shown in Table 2-12.

Table 2-12 Equipment for Vehicle Maintenance (for One Maintenance Shop)

Item	Qty.	Purpose
1. Equipment for Maintenance and Overhaul		
1 Pit lift, lifting capacity more than 10 tons	1	Used for checkups under body and around suspensions
2 Garage jack, capacity more than 10 tons	4	Used for manual jack ups to exchange tires
3 Garage lamp, bulb anpair capacity 10A	6	Check-up the dark side beneath the lower body
4 Wheel dolly Tire outer diameter: 509-1,160 mm	2	Exclusive use for exchange of bearings or hub bearings for an axle and removal of tires and brake drums at once to supply grease.

	Item	Qty.	Purpose
5	Drum pump, hand operated, revolutionary type	2	Hand operated pump to drain oil from a drum can
6	Oil drain, capacity 55 liters	1	Treatment of waist oil; receiving waste oil on the floor
7	Oil drain, capacity 70 liters	2	Treatment of waist oil; receiving waste oil in pit
8	Oil bucket pump, hand operated	2	Used for filling oil
9	Grease gun, capacity 400cc	6	Used for applying grease
10	Mechanic tool set for large vehicle (approx.100 items of hand tools)	3	Sets of conventional hand tools
11	Service creeper, more than 800(L) x 400 (W)mm	4	A board equipped with casters, on which a mechanic lie to check up bottom of a vehicle
12	Rigid rack, more than 10 tons	8	Sustaining the body while jacking up
13	Mobile work step, approx. 900(H)mm, Top plate 400(L) x 600(W)mm	4	Step for repair works for upper body such as lamps and windows
2.	**Equipment to Repair Wheels and Tire Brakes (Working desk)**		
1	Brake lining riveter Air pressure 5 ton at 1.0 MPa	1	Fixing brake lining or fixing brake and brake shoes
2	Tire pressure gauge with inflator capacity 1.1 MPa	4	Measuring tire air pressure
3	Tire changer Rim clamping: 14-23 inch or more Tire dia.: more than 1,400mm Tire width: more than 500mm	1	Removal or mount of a wheel to exchange tires.
4	Tire bead remover, more than 1,500 mm length	2	Applied when exchanging a tire manually
5	Tire lever for truck and bus, more than 500 mm length	2	Applied when exchanging a tire manually
3.	**Desk for maintenance of engines and transmissions**		
1	Work bench, approx. 1,800(L) x 800(W) x 740(H)mm, top plate, wood	1	For assembly and dismantling works for small components
2	Mobile work bench (with caster), approx. 1,200(L) x 800(W) x 740(H)mm, top plate, wood	1	For assembly and dismantling works for small components. Able to move to parts to be repaired
4.	**Vehicle Washing Equipment**		
1	Automatic Washing machine for bus Compatible vehicle: 12,000(L) x 2,500(W) x 3,800(H)mm	1	Washing the body of buses in its side by water
2	Hot water high pressure washer 900 liters/hr, diesel	1	High pressure washing machine compatible with warm water to wash engine unit, polluted body and other parts
3	Water tank for hot water high pressure washer, capacity 2 cu.m	1	Used for the high pressure washing machine
4	Mobile washing step, approx. 1,400(H)mm, upper plate 2,000(L) x 600(W)mm	2	Applied for works at high places with the high pressure washing machine
5.	**Power Tool**		
1	Air impact wrench, 1/2” sq. drive	1	Air-driven small impact wrench
2	Air impact wrench, 3/4” sq. drive	1	Air-driven medium-sized impact wrench
3	Air impact wrench, 1” sq. drive	1	Air-driven large impact wrench to remove tire.
4	Socket for impact wrench, 1/2” sq. drive (Socket dia.: 8, 10, 13, 17, 19, 21, 22, 24, 27, 30, 32 mm)	2	Socket set for small size impact wrench
5	Socket for impact wrench, 3/4” sq. drive (Socket dia,: 19, 22, 24, 27, 30, 32, 36, 41 mm)	2	Socket set for medium size impact wrench
6	Socket for impact wrench, 1” sq. drive	2	Socket set for large size impact wrench

	Item	Qty.	Purpose
	(Socket dia.: 32, 36, 41, 46, 50 mm)		
7	Combination socket for impact wrench, 1” sq. (Socket dia,: 35 x 17, 38 x 20, 41 x 19, 41 x 21 mm)	1	Socket set for large size impact wrench
8	Universal joint for impact wrench, 1/2” sq. drive	1	Universal joint for small size impact wrench
9	Universal joint for impact wrench, 3/4” sq. drive	1	Universal joint for medium size impact wrench
10	Universal joint for impact wrench, 1” sq. drive	1	Universal joint for large size impact wrench
11	Adapter for impact wrench, size 1/2” (F) x 3/4” (M)	1	Adopter to connect small size impact wrenches with medium size impact wrenches
12	Adapter for impact wrench, size 3/4” (F) x 1/2” (M)	1	Adopter to connect medium size impact wrenches with small size impact wrenches
13	Adapter for impact wrench, size 1” (F) x 3/4” (M)	1	Adopter to connect large size impact wrenches with medium size impact wrenches
14	Extension bar for impact wrench, 1/2” sq. x 75 mm length	1	Extension fitting for small size impact wrenches
15	Extension bar for impact wrench, 1/2” sq. x 125 mm length	1	Extension fitting for small size impact wrenches
16	Extension bar for impact wrench, 1/2” sq. x 250 mm length	1	Extension fitting for small size impact wrenches
17	Extension bar for impact wrench, 3/4” sq. x 175 mm length	1	Extension fitting for medium size impact wrenches
18	Extension bar for impact wrench, 3/4” sq. x 250 mm length	1	Extension fitting for medium size impact wrenches
19	Extension bar for impact wrench, 1” sq. x 175 mm length	1	Extension fitting for large size impact wrenches
20	Extension bar for impact wrench, 1” sq. x 250 mm length	1	Extension fitting for large size impact wrenches
21	Extension bar for impact wrench, 1” sq. x 330 mm length	1	Extension fitting for large size impact wrenches
22	Electric drill, up to 13 mm dia.	1	To make holes for maintenance
23	Straight shank twist drill set, 1.0–13.0 mm (at 0.5 mm interval)	2	Drill bits for making holes
24	Portable grinder, grindstone size dia. 125 mm	1	Cutting, scraping, and polishing of metal components
25	Hand grinder, grindstone size 32 mm dia.	1	Deflashing and finishing works on steel or other materials
26	Disc grinder, grindstone size outer dia. 100 mm x inner dia. 16mm	1	Cutting, scraping, and polishing of metal components
27	Electric cord reel, cord length 30m, receptacle 2 taps	2	Code reel for extension of electric tools
6.	**Hand Tool**		
1	Socket wrench set, 1/4” sq. drive, socket: dia. 5–12 mm, with accessories	1	Socket of general hand tool to be used for Electrical fittings
2	Socket wrench set, 3/8” sq. drive, socket: dia. 6–21 mm, with accessories	1	Socket of general hand tool to be used for Electrical fittings
3	Socket wrench set, 1/2” sq. drive, socket: dia. 10–32 mm, with accessories	1	Socket of general hand tool (frequently used)
4	Socket wrench set, 1” sq. drive, socket: dia. 32–80 mm, with accessories	1	Socket of general hand tool (frequently used)
5	Solder-less terminal kit for automobile plug, socket, sleeve, connector, plier, etc.	2	Exchanging solderless terminals for electrical fittings and wiring

	Item	Qty.	Purpose
6	Screw plate set (M3, 4, 5, 6, 8, 10, 12, 13, 14, 16, 18, 20, with accessories)	1	For nail standing works
7	Booster cable, capacity: 200 A	2	Connection with discharged batteries and recharged batteries
8	Lever block capacity 3/4 ton, lift height: 1,500mm	1	To fix components when welding, to extend bent components
9	Lubrication service tool set, oil measure 2 and 4 liters	2	For daily works of lubrication
10	Air blow gun, Bent type, approx. 100 mm length	10	Removing stains and dust emerged during works
7.	**Measuring Tool and Device**		
1	Torque wrench, 3/8" sq., Torque adjustment range: 10–50 N.m	1	Tool to tighten bolts and nuts of precision instrument such as engines and transmissions
2	Torque wrench, 1/2" sq., Torque adjustment range: 40–200 N.m	1	Tool to tighten bolts and nuts of precision instrument such as engines and transmissions
3	Torque wrench, 3/4" sq., Torque adjustment range: 100–750 N.m	1	Tool to tighten bolts and nuts of precision instrument such as engines and transmissions
4	Vernier caliper, range: 0-300 mm length	2	Measure lengths
5	Standard thickness gauge, range: 0.03–1.00 mm thickness	2	Measure gaps
6	Digital multi tester AC/DC ampere, AC/DC voltage resistance	2	Applied for various electrical equipment with digital electricity tester
7	Steel tool cabinet, approx. 800(L) x 400(W) x 1,700(H)mm, 4 shelves	4	Storage for tools
8.	**Repair Tool for Battery**		
1	Battery and coolant tester, Optical type	4	Measurement of ratio of batteries and ratio of contents of coolant
2	Battery tester, Application: 18-160AH	2	Test by burdening
3	Quick battery charger Output: 12-24V/100A	2	Large size battery charger compatible with starting engine by direct connection with 100 A at maximum
4	Battery filler, capacity: 4 liters	2	For refilling battery liquid
5	Battery syringe, capacity: 100 g	2	For draining battery liquid
6	Booster cable, 200 A capacity, 3 m length	4	To connect discharged batteries and recharged batteries
7	Hand truck, 4 wheels, Load capacity approx. 300kg	1	To transport batteries
9.	**Air Compressor**		
1	Air Compressor Motor output: more than 5.5 kW, 0.95 MPa, Receiver tank capacity: more than 180 liters	1	To produce the compressed air used in the factory
2	Air receiver, capacity: 400 liters	1	Tank for compressed air
3	Air transformer, pressure: 1.0 MPa	3	Adjustment of air pressure
4	Air hose reel, 8 mm dia. x 10 m length, pressure: 1.0 MPa	6	To supply compressed air
10.	**Fabrication, welding and painting of bus vehicles**		
1	Air spray gun, Suction type, capacity approx. 1,000cc	2	Painting operations
2	Air hose, 10m length, pressure: 1.0 MPa	10	Supplying compressed air for painting operations
11.	**Fork Lift**		
1	Fork Lift Lifting capacity: more than 3,000 kg Lift elevation: more than 3,000 mm Turning radius: within 2,500 mm	1	To lift up heavy materials such as tires since the project site does not own the hanging devises like cranes.

Item	Qty.	Purpose
Engine: Water cooling diesel type Engine output: more than 35kW		
12. Storage of Parts		
1 Plastic pallet, approx.1,100mm(L) x 1,100(W) x 125 (H) mm, more than 1,000 kg at capacity	10	For lifting for fork lift
2 Part shelf, open type, approx.1,200mm(L) x600(W) x 1,800 (H)mm, 5 shelves incl. top plate	5	To storage spare parts
3 Part shelf, drawer type, approx.900mm(L) x450(W) x 1,800 (H) mm, 10 shelves for small size parts	2	Drawer for storage of small size spare parts
4 Parts carrier, plastic made, approx. 600 (L) x 400(W) x 200(H) mm	20	Case for temporary storages or transportations for spare parts

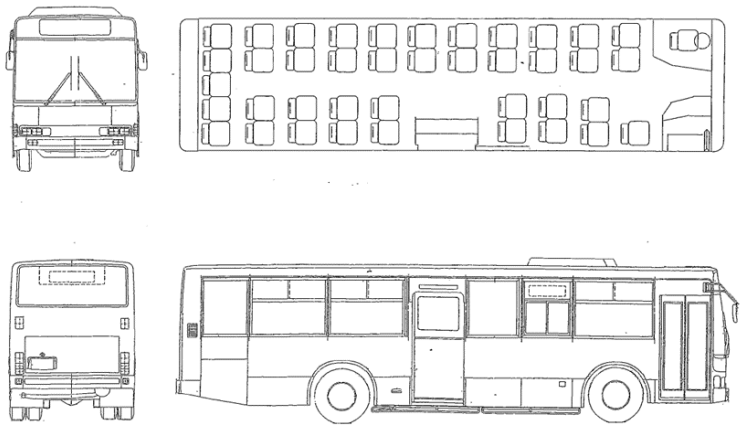
Source: JICA Survey Team

(3) Spare Parts

The Survey Team believes that the CBA should eventually procure spare parts on their own. However, JICA will purchase the necessary spare parts for proper maintenance of buses since it takes a certain length of time to set up the maintenance system for new equipment after the procurement and there is a risk that the initiative of the PPCA might not work. Proposition for procurement of spare parts is a span of a 2-year long operation. However, the maximum amount of procurement turned out to be 10% of the vehicle price since there is a variety of specifications and ideas about spare parts between the manufacturers that also makes it difficult to select one from the list.

2-2-3 Outline Design Drawing

Outline design of the bus to be introduced into the project is shown in Figure 2-5.



Source: JICA Survey Team

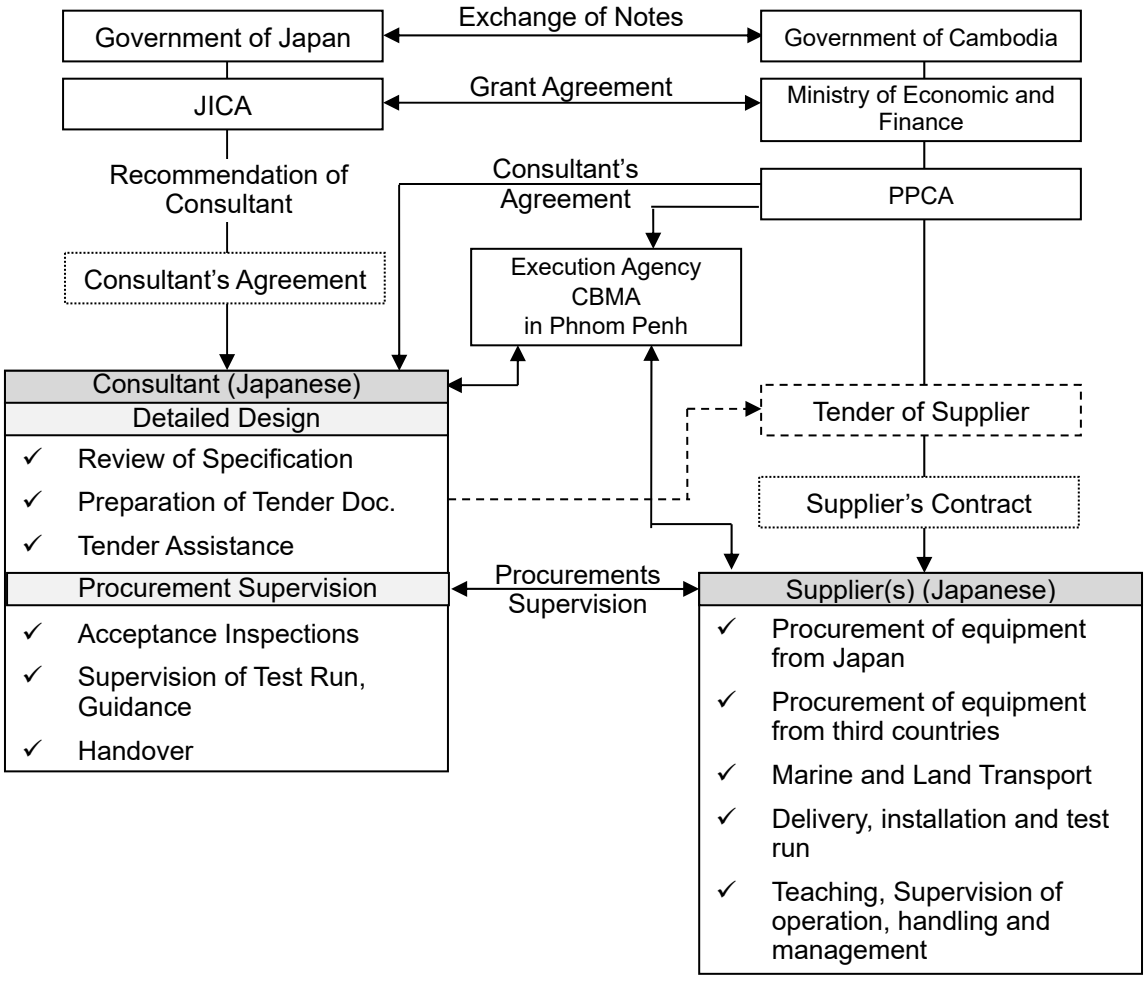
Figure 2-5 Image of Bus Vehicle

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

This project shall be done through the assistance of Japan's Grant Aid Scheme by the Government of Japan (GOJ). This will, therefore, commence after the approval of implementation by the GOJ and precede Exchange of Notes (E/N) by both the government and grant agreement (G/A) between JICA and Ministry of Economic and Finance.

The relationship between the concerned organizations in Japan and Cambodia are shown in a framework as follows.



Source: JICA Survey Team

Figure 2-6 Relationship of the Organization

2-2-4-2 Implementation Conditions

The Government of Cambodia strongly requested to procure buses manufactured in Japan due to high quality and credibility. However, no bus body building manufacturer in Japan can make left-hand drive buses for overseas at the moment. Therefore, Japanese-made bus chassis that is the most important component shall be seaborne and discharged at a third country near Cambodia where the bus body would be manufactured then combined with the chassis (combined engine, axles, etc.).

Since there are fears with the quality, reliability, and durability of the bus body, a tender condition has been made that the supplier shall nominate Japanese technical specialists who shall take care of bus design, technical inspection, and instructions on bus body manufacturing as listed in Table 2-13. Although it is likely that a Japanese company familiar with procurement and transportation of a variety of equipment becomes the procurement contractor to manage a body manufacturer in the third country, it is difficult for the procurement contractor to directly deal with technical matters of bus manufacturing.

Table 2-13 Technical Support for Bus Body Manufacturer in Third Country

Support Point	Description
After the Contract, review of the specification and bus design drawings	Confirmation of design drawings and adjustment connectability of chassis, engine and body parts, etc.
Under building of tentative frame structure of bus body	Technical instruction for combination of building for structural underframe of chassis and bus body skeleton structure as trial shop assembly
Technical support while bus body building	Support for technical skill for building bus body

Source: JICA Survey Team

2-2-4-3 Scope of Works

The Japanese side will assume the costs of procurement of equipment in Japan to the selected country near Cambodia and costs of inland and marine transportation to deliver to sites in Phnom Penh. The tax exemption of the import to Cambodia and customs clearance, however, will be the responsibility of Cambodia. The installation of the maintenance equipment for bus will also be undertaken by Cambodian side while supervised by supplier and engineer of the maintenance equipment manufacturer.

All obligations of both countries are presented in Table 2-14.

Table 2-14 Obligation for Japanese and Cambodian sides

Contents		Procurement		Installation	
		Japan	Cambodia	Japan	Cambodia
Procurement of Equipment	Procurement of equipment in Japan	✓			
	Marine transportation	✓			
	Customs clearance and inland transportation	✓			
	Procurement of equipment in third countries	✓			
	Land and marine transportation	✓			
	Tax exemption and customs clearance in Cambodia		✓		
	Inland transportation to the site	✓			
Operation and Maintenance	Construction of 2 bus depots		✓		
	Construction of 2 maintenance shops		✓		
	Installation of Bus terminal and bus stop		✓		
	Employment and develop human resources (driver and mechanic)		✓		
	Operation Manual (including some pages translated into Khmer language)	✓			
	Delivery of bus and installation of equipment	✓			
	Operation and maintenance for equipment	✓			✓
	Installation of maintenance equipment				✓
	Guidance for Initial operation and management for the bus	✓			
	Maintenance and management of buses		✓		

Source: JICA Survey Team

2-2-4-4 Consultant Supervision

After the conclusion of the E/N and the G/A, a Japanese Consultant recommended by JICA will sign the Consultant's Agreement on consulting services for detailed design and procurement supervision of the project. The consultant shall perform its duties based on the understanding of the background of the project as well as the procedure and contents of the determined on this preparatory survey

Detailed Design consists of the followings:

- Discussion, confirmation of the site condition and review of the plan
- Review of equipment specifications (bus, spare parts and maintenance equipment)
- Review of procurement plan, project cost by exchange rate
- Preparation of tender documents
- Explanation and approval by the Cambodia side on the tender documents
- Assistance for tendering such as public announcement, provision of document, execution of tender and evaluation
- Assistance for contract such as negotiation, witness of contract and arrangement for verification of contract

Procurement Supervision consists of the followings:

After the contract, the consultant checks design drawings of equipment submitted by

the procurement contractor followed by creation of equipment. The consultant then conducts inspections in accordance with the procurement and transportation plan of either bus vehicles procured in Japan and mounted in the third country, or maintenance equipment transported directly from Japan.

- Check of design drawing of equipment
- Confirmation of contents of equipment order sheets issued by the supplier
- Factory inspection while production, before delivery and assignment of pre-shipment inspection
- Procurement of equipment
- Inspection and handover of equipment
- Inspection before completion of the supplier' warranty period

2-2-4-5 Quality Control Plan

All procured equipment shall conform to the specifications and quality control plan on the tender documents. The following management items shall be regarded as quality control.

- Confirmation of the shop drawings and specifications submitted by the supplier
- Confirmation of the country of origin of chassis and engine
- Confirmation of material certificates of bus body frame, plate and steel
- Confirmation of the inspection format, record of inspection and other details in the inspection sheet prepared by the bus body builder
- Inspection at the factory and checking of inspection records
- Confirmation of packing and transportation methods, before delivery
- Witness for test run, initial operation, adjustment, before handover of the equipment

2-2-4-6 Procurement Plan

(1) Procurement Method of the Equipment

The PPCA asserted that the buses to run inside the Capital City should be made in Japan due to its high quality. Therefore, the bus body shall be required to be built in neighboring countries of Cambodia where there is enough capable bus body builders with technical strength and experience to mount on Japanese manufacturer's chassis. The three countries selected for bus body building are: (i) Vietnam, closest country to the Phnom Penh, has an advantage for a right-drive bus production country for internal use; (ii) Thailand, that is located at Western side of Cambodia, has technical skills to build a non-frame and low-floor buses although they are a left-hand driving country

same as Japan; and (iii) Philippines that has a subsidiary company of a Japanese vehicle manufacturer is also a right-driving country. In addition to these countries, Taiwan is selected for chassis assembly, having an affiliated company of a Japanese vehicle manufacturer with sufficient skill. This plan also includes the procurement of maintenance equipment from Japanese manufacturers as requested by Cambodian side. Table 2-15 shows the procurement condition of the equipment.

Table 2-15 Procurement Condition of the Equipment

Equipment	Quantity	Eligible Condition of the Equipment
Bus	80 units	➢ Bus for 40 passenger seats ➢ Chassis components (combined engine, axles, etc.) shall be made in Japan produced by Japanese bus vehicle manufacturer ➢ Bus bodies shall be built in Thailand, Vietnam, Philippines, or completely made in Japan ➢ Chassis can be built in Taiwan ➢ Air conditioner in bus shall be made in Japan or procured by a Japanese manufacturer based overseas ➢ Spare parts for bus shall be 10% of bus vehicles, which will be countervailed 2 years' requirement for maintenance ➢ LED destination indicator, bus stop guide in LCD display, drive recorder and bus location information GPS shall be installed in bus with spare parts as 10% of their price. ➢ First batch of 30 units of bus shall be handed over 11 months and the second batch of 50 units planned in a total of 13 months after commencing
Maintenance Equipment	1 Lot (2 set)	➢ Maintenance equipment shall be procured in Japan ➢ Equipment handed over to 2 maintenance shops. ➢ Equipment are (86 kinds in 12 categories); - Tire changer - Washing machine for bus - High pressure with hot water washer - Fork lift - Other maintenance equipment and tools ➢ All of equipment shall be handed over in 11 months

Source: JICA Survey Team

(2) Transportation Route of the Equipment

Vietnam was selected among the eligible countries being the closest country to the site after a study on transportation or delivery route of built bus.

The procured equipment of assembled chassis from Japan would be seaborne by vehicle carrier ship and discharged at Saigon Premier Container Terminal (SPCT) Port, 15km away from Ho Chi Minh City, Vietnam. The chassis would be delivered by vehicle-mounting trailer to a bus body building manufacturer in Ho Chi Minh City. The period of marine transportation from Japan to SPCT Port is 17 days once a month by direct shipping or twice a month transit to Singapore Hub Port in 25–30 days by scheduled shipping.

The distance of land transportation from Ho Chi Minh City to Phnom Penh is about 142 km and driving time is 7 hours. After completion of bus body building, around five buses will be loaded on trailers in convoy then transported to Phnom Penh City. The transit period is assumed to be about three weeks with the first batch and more than a month with the second batch including customs clearance.

Maintenance equipment will be transported by container ship directly from Japan to Sihanoukville Port in Cambodia.

2-2-4-7 Operational Guidance Plan

New crew such as bus drivers for the increase in bus routes and mechanics are needed and shall be employed by the CBA. Trainings for initial operation and maintenance are required, which are thus detailed.

(1) Initial Operational and Maintenance Guidance Plan

The technical staffers from the vehicle manufacturer and bus body building companies will train drivers primarily on the driving techniques and the daily check-ups mechanics and mechanics on the specifications of bus, the exchange of spare parts, daily maintenances, and mechanical skills.

Initial Operational Training

- Basic Operation Procedure
- Daily inspection before the inauguration of bus services
- Driving skill and technique training
- Bus body structure training
- Periodic inspection and maintenance training

Maintenance Training

- Management and procurement control of spare parts
- Particular passenger service and electrical equipment training
- Spare parts procurement list, replacement timing and supplying plan

- Trouble shooting procedure
- Fault finding and repair work
- Engine overhaul and mechanic training

(2) Operation Guidance Plan of Maintenance Equipment

Mechanics of CBA will unpack and sort out the maintenance equipment under the instructions of a technical staff from the maintenance equipment manufacturers. Mechanics of CBA will also install the bus washing machines under the instructions of an expert for special maintenance equipment.

- Structure and function of the equipment and tools
- Initial operation procedure of the equipment
- Heavy equipment (bus washing machine, compressor, etc.) operational Training

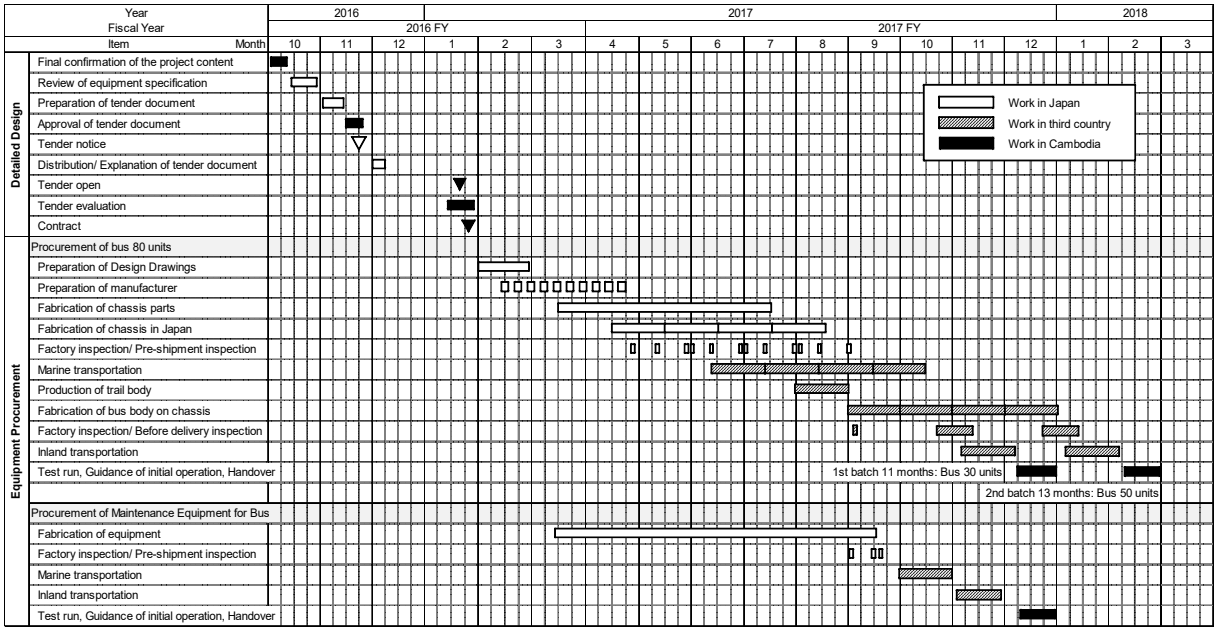
2-2-4-8 Soft Component (Technical Assistance) Plan

A technical assistance to the CBA in Phnom Penh is under planning for the smooth implementation of the operation of the bus, hence, no soft component will be implemented.

2-2-4-9 Implementation Schedule

The procurement will commence after signing of the Supplier's Contract. The estimated duration of procurement for the first batch of 30 bus units and maintenance equipment shall be delivered within 11 months and the second batch of 50 bus units shall be within 13 months. The tentative implementation schedule is shown Table 2-16.

Table 2-16 Project Implementation Schedule



Source: JICA Survey Team

2-3 Obligations of Recipient Country

The obligations and measures to be shared by the government of Cambodia is described in Table 2-17.

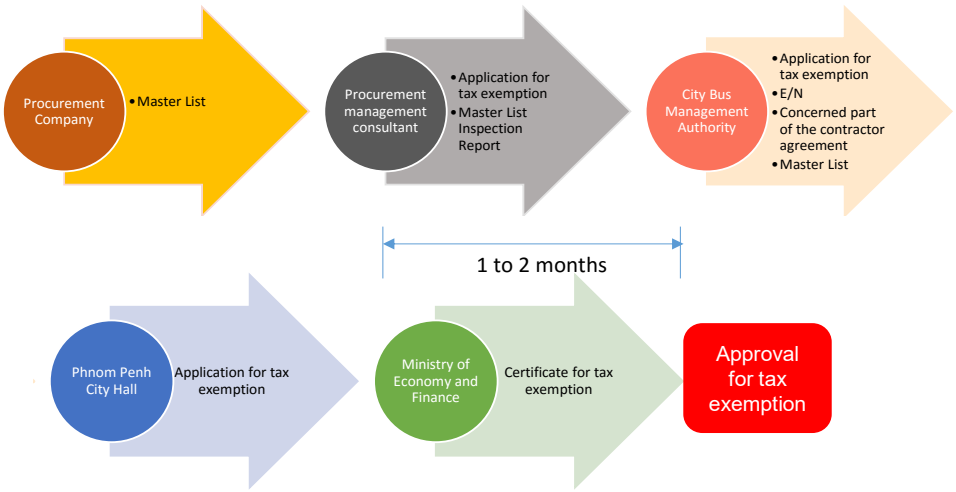
Table 2-17 Obligations of Cambodia

Phase	Obligation
Before bidding	• Opening a bank account (Bank Arrangements: B/A) • Acquisition of lands for depots and maintenance factories • Securing the budget for development of the related facilities, salaries and bank transaction fee
During procurement	• Procedures related to Banking Arrangement (BA) and Authorization to Pay (AP), its transaction fees • Ensure prompt uploading, custom clearance, and internal transportations. • Provide conveniences to Japanese citizens involved in the project • Bear custom duties, internal taxes, and other fiscal levies with respect to the project without using the grant. • Bear necessary expenses other than those to be borne by the grant aid • Retain the right of land use of two depots
Before the first delivery (First delivery: 30 buses, Maintenance equipment for two maintenance shops	• Construct 2 operation offices, 2 depots, 2 maintenance shops, 2 fuel stand, and 1 training facility for improving drivers' skills • Install main office of BMA • Provide facilities for distribution of electricity, gas, water supply, drainage, and other incidental facilities necessary for the equipment • Construction of the bus terminals facilities and bus stops (shed type and pole type). • The CBA recruits and educates fresh crews including 108 drivers, 108 conductors, and 20 mechanics • Carry out installation works of maintenance equipment including use of heavy vehicle, construction of utility systems such as water and electricity, and equipment foundation. • Cover other costs such as uniform for drivers and conductors, and vehicles for operation and maintenance • Repair facilities in the maintenance shops under the instruction of purchasing company in case of any deficit • Submit the monitoring result to JICA by using the monitoring form every 6 months as a part of Project Monitoring Report
Before the second delivery (the last delivery: 50 buses)	• Additional recruitment and education of new crews including 82 driver and 82 conductors by the CBA
After handing over	• Secure personnel and budget to operate the granted vehicles and maintenance equipment in an appropriate and effective manner.

Source: JICA Survey Team

Importing procured equipment in this grant scheme into Cambodia will be subject to tax exemption. Instead of the import procedure, a procurement company must submit the master list to the procurement management consultant for review and reporting. The

CBA as an executing agency will convey both the master list and report of consultant to the PPCA as a line agency as well as the subjective entity of the contract for this project. Then the PPCA will submit the application form to General Department of Customs and Excise (GDCE), Ministry of Economy and Finance. If approved, tax exemption would be conducted (Figure 2-7).



Source: JICA Survey Team

Figure 2-7 Tax Exemption Procedure

Importing tax comprises of import duty, which is basically an ad valorem tax at 12% in average of all goods while a rate of 35% in average is imposed for cars, special tax, which is imposed on cars and motorbikes, and VAT at 10%. Those tax prices are based on CIF transaction value, and all of them would be exempted.

It should be taken into consideration that adding goods to a master list requires a long time, so the consignee must take extra care in the preparation of the master list to prevent missing items.

The importer mandated by a procurement company usually takes over the procedure in Cambodia afterwards. The importer shows up at the GDCE to apply for a certificate of invoice value, which will be issued in a few days. The importer then crafts and submits the customs declaration filled with information of imported cargo with attached documents including approved invoice, packing list, Bill of Lading, and Certificate of Origin for each customhouse such as Sihanoukville Port or other dry ports. A form of application for transportation approved by General Department of Customs and Excise will be sent to the head of customhouse either in Sihanoukville Port or dry ports to be referred during the custom clearance.

Since more than 15 Japanese companies based in Cambodia are involved in import and export with expertise in application procedures, there is no problem in finding a

good custom broker.

Regarding the VAT imposed on domestic purchasing such as accommodation of the personnel involved in the project, vehicle rent, consumer goods, or wage for subcontractors for construction, the General Department of Taxation (GDT), Ministry of Economy and Finance will refund the VAT imposed on these items through the same procedure for the tax exemption.

2-4 Project Operation Plan

A proper management manual and set-up of the structure of maintenance and overhaul to prevent accidents and troubles in advance is essential in order to handle the granted equipment appropriately. The CBA does not have enough capacity to manage and maintain the vehicles since they outsourced the maintenance of existing vehicles to private contractors. Therefore, creating a manual for maintenance and management so as to develop capacities of fresh mechanics and making institutional arrangements through the upcoming technical assistance project before the delivery of bus vehicles would be essential.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

The Project cost required for fulfilling the undertakings to be borne by the Government of Cambodia is shown in the Table 2-18

Table 2-18 Project Cost by Cambodian Side

Items	Cost	
	USD (Thousand)	Equivalent JPY (Million)
Payment of bank service charges for banking arrangement (B/A) and authorization to pay (A/P)	25	2.9
Construction of office, bus depot, maintenance shop, fuel stand (2 places for each), and training center.	6,000	698.1
Construction of bus terminal	130	15.1
Construction of bus stops (Pole type)	17	2.0
Construction of bus stops (Shed type)	43	5.0
Main office of CBA	900	104.7
Installation work of maintenance equipment	50	5.8
Others (uniform for driver and conductor and maintenance vehicle cost)	150	17.5
Total	7,315	851.1

Source: JICA Survey Team

Conditions of cost estimate are as followings;

1. Estimate Time: Average rate of 3 months before the end of March, 2016
2. Exchange Rate: USD1 = 116.35 Japanese yen
3. Procurement Period: Implementation of design and procurement of equipment shown in the tentative implementation schedule
4. Remarks: The Project will be implemented under the Japan's Grant Aid scheme. The above project costs would be revised by the Japanese Government before issuing the E/N and G/A

2-5-2 Operation and Maintenance Cost

The following Table 2-19 shows overall operation and maintenance cost which includes; i) overall necessary cost for maintaining procured equipment through the Project, ii) overall salaries by the procurement of necessary number of staff, and iii) investment and maintenance costs of facilities such as bus stop and, etc., which will be paid at CMBA's own cost.

The table includes operation and maintenance cost for achieving the operation of 10 routes by FY2020, which is the aim of PPCA. The figures are tentative based on the assumption that 5 route operations with a grant of 80 bus vehicles through the project were successfully conducted.

Table 2-19 Operation and Management Cost

		Unit	Price (USD)	2016		2017		2018		2019		2020	
				Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Salary	Management	Person	510	19	125,970	19	132,269	19	138,882	19	145,826	19	153,117
	Admin at HQO	Person	280	19	69,160	19	72,618	19	76,249	38	160,123	38	168,129
	Car Controller	Person	320	9	37,440	9	39,312	9	41,278	9	43,341	10	50,565
	Admin at Site Office	Person	280	24	87,360	24	91,728	24	96,314	24	101,130	37	163,704
	Mechanics	Person	280	20	72,800	20	76,440	20	80,262	20	84,275	24	106,187
	Drivers	Person	300	90	351,000	198	810,810	280	1,203,930	280	1,264,127	413	1,957,816
	Ticket Sellers	Person	150	90	175,500	198	405,405	280	601,965	280	632,063	413	978,908
	Others (Cleaners)	Person	150	11	21,450	11	22,523	11	23,649	11	24,831	18	42,664
	Total			282	940,680	498	1,651,104	662	2,262,528	681	2,455,716	972	3,621,090
Fuel	LPG	US$/ℓ	0.625	2,144,010	893,338	222,153	925,480	531,051	221,271				
	Diesel	US$/ℓ	0.75			54,257	16,277	2,321,599	696,480	3,593,630	1,078,089	4,730,035	1,419,011
	Total				893,338		941,758		917,751		1,078,089		1,419,011
Maintenance	Korean Bus	Vehicle	800	57	547,200		522,400		83,200				
	Japanese Bus	Vehicle	500				15,000		380,000		480,000		790,000
	Total				547,200		537,400		463,200		480,000		790,000
Facilities	Depot and others*	Set	1	6,000,000	6,000,000								
	Terminal	US$/M^2	10	3000	30,000	5000	50,000	5000	50,000				
	Depreciation	US$/Vehicle				15000		15000	950,000	15000	1,506,250	15000	2,100,000
	Bus Stop (Pole t ype)	US$/Stop	250	0	0	37	9,250	33	8,250	54	13,500		0
	Bus Stop (Roof & Chair	US$/Stop	2500	0	0	9	22,500	8	20,000	13	32,500		0
	Office Building	US$/M 2	300	3000	900,000								
	Total				6,930,000		81,750		1,028,250		1,552,250		2,100,000
Others**		Set	5%		465,561		160,601		186,086		202,990		291,505
Grand Total					9,776,778		3,372,612		4,857,816		5,769,045		8,221,606

Note: Price escalation by inflation is not considered.

* Construction of office, bus depot, maintenance shop, fuel stand (all 2 sets), and training center.

* Installation costs of granted maitenance equipment (USD50,000), purchase of new uniforms (USD50,000), purchase of maintenance vehicles (USD100,000), and contingency

Source: JICA Survey Team

Chapter 3 Project Evaluation

3-1 Preconditions

Preconditions for the project implementation are as follows:

- Ensure lands for depots
- Budgetary measure to secure the personnel of CBA such as drivers
- Secure budget for the development of related facilities such as maintenance factory
- Preparation for the other obligations of the partner country

3-2 Necessary Inputs by Recipient Country

3-2-1 Obligations of Partner Country

The Government of Cambodia is highly required to consider self-help and sustainability efforts to ensure the effects of the grant project because that is the policy of Japan's grant aid. They should undertake the following.

3-2-1-1 Plan to Increase Personnel and Secure the Budget

Personnel such as drivers, conductors, and mechanics must be deployed, and budget for maintenance must be secured.

3-2-1-2 Improvement in Public Transportation Service

Not only the credibility of the operation, but also the development of bus terminal or bus stop facilities, provision of bus route map, and information on operations are important.

3-2-1-3 Implementation of Measures to Promote Use of Public Transportation

The project aims to improve the traffic environment of the Capital City through enhancement of the transportation capacity of public bus by expansion of routes and provision of additional bus vehicles. To achieve the target, besides reinforcement of the public transportation service, traffic policies such as traffic demand management should be implemented to promote modal shift from paratransit including motorbikes, private cars, and tuk-tuk.

3-2-1-4 Continuing the Financial Supplement of the PPCA.

The ridership of the ongoing 3 routes remained small due to the limited services since the establishment of the CBA. Moreover, since more than half of the overall number of passengers is made up of fare-free students, the revenue is too small to make ends meet. Even if the number of routes would be increased after the grant project, the

present fare system would not enable the business payable. Therefore, losses should be temporarily covered by the budget of PPCH to continue the bus service.

3-2-1-5 Development of Institution toward Self-Reliant Bus Service

Although the cost of the operation is supposed to be temporarily shouldered by the general finance of PPCH, efforts to achieve self-reliance on the bus business is still required. Structural reforms must be introduced such as new tax systems, like objective tax, to support the operation of public transportation besides fare system reforms and new business developments.

3-2-2 Coordination with Technical Cooperation Project

In parallel with the grant aid project, the technical assistance project for the improvement of the public bus service in Phnom Penh is scheduled. This technical assistance project aims to develop the capacity of traffic management measures including bus operation management, bus equipment maintenance, and operation management of CBA to reinforce smooth operations of bus service.

3-3 Important Assumptions

There are 2 assumptions to realize the effects of the grant project and make it sustainable. One is that CBA continues the provision of public bus service and the other is for them to secure the necessary budget.

3-4 Project Evaluation

3-4-1 Relevance

The relevance of the grant aid project is rated high in viewpoints of following indexes.

1) The target number of beneficiaries is 1.5 million citizens of Phnom Penh, which is roughly 10% of the total population of Cambodia. The project is especially beneficial for the poor. Cambodia is among the least developed countries in the ASEAN.

2) The project aims to disseminate the use of public transportation. The purpose of this project also contributes to promote the right to select transportation, which is also known as the right for basic transportation for the mobility-impaired people. This conforms to human security, basic needs, and the creation of education and human resources.

3) The project does not require overly-sophisticated techniques. PPCH will be able to operate and maintain the equipment by its own human resources, techniques, and budget.

4) The project is subject to the development of transportation infrastructures for poverty reduction embedded in one pillar of the Rectangular Strategy Third Phase of the Government of Cambodia.

5) For the environment, the project contributes to the reduction of CO_2 and other air pollutants through the necessity of shifting from individual transportations.

6) The grant aid project is the relevant scheme, because the fare revenue is limited and expected profit is low since the project mainly targets the low-income and mobility-impaired people.

7) The Country Assistance Policy for Cambodia created in 2012 indicates “reinforcing the economic infrastructure” as one of the priority area. JICA also emphasized on the “reinforcement of economic infrastructure” in the JICA Country Analysis Paper of 2014, which found the improvement of the traffic situation of Phnom Penh as a critical issue. The project is consistent with those policies.

8) PPCH pushes forward with the preparations of both budget and recruitment of new personnel, therefore, makes it feasible for Japan to disburse the project through the grant aid scheme.

3-4-2 Effectiveness

3-4-2-1 Quantitative Effect

The indicators specified in Table 3-1 are to evaluate extent of achievement of the project purpose. The proposition to set the indicators is CBA would operate the bus service in 5 routes that cover most of the city center of Phnom Penh with the granted vehicles in 2018.

Assumptions to set those indicators are as follows:

- Operation rate: CBA would pursue 100% operational rate by dealing with unexpected accidents, troubles, delays with spared vehicles.
- Bus travel distance: Total of revised routes of the 3 existing with the revised fare and additional 2 new routes, i.e. the total travel distance of all bus vehicles.
- Bus transportation: Same with the assumption for bus travel distance.
- Working rate of bus vehicle: CBA would reduce the rate of vehicle problems by replacement of old vehicles with new ones and maintenance restructure. However, an upper limit was set at 90% due to 10% allocation of vehicles for stand-by.
- Ridership: New routes would be created, population would increase due to

possible developments along the bus routes, and promotional measures.

Table 3-1 Evaluation Indicator

Indicator	Reference (2016)	Target (2021)
The number of bus routes	3	5
Operation rate (%)	67.5	100
Bus travel distance (vehicle–km/day)	4,386	8,830
Bus transportation capacity (10,000 pax–km/day)	21.9	40.3
Working rate of bus vehicle (%)	75	90
Ridership (pax–day)	8,133	40,000

Note: Operational rate = the actual number of services / the planned number of services (avg.)
Operational rate of vehicle = the number of operating vehicles / the number of vehicle possessed (avg.)

3-4-2-2 Qualitative Effect

The effectiveness can also be evaluated by the following qualitative indicators:

1) Mitigation of traffic congestion on the bus routes

2) Raised awareness about public transportation among the citizens with the improved public bus service.

3) CBA is able to provide an inexpensive and safe public transportation.

4) Scope of activities of the mobility-impaired poor and elderly by the availability of inexpensive and safe public transportation and expansion of service area.

Appendices

Appendix 1: Member List of the Survey Team

The First Field Survey Member (from Jan. 24 to Jan. 29, 2016, some consultants stayed till Feb. 18.)

Name	Title	Organization
Kenji Murata	Leader	Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, JICA
Shinichi Saito	Cooperation Plan	Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, JICA
Michimasa Takagi	Team Leader/ Public Transportation Plan	ALMEC Corporation
Koji Ohtsuka	Financial Analysis	Nippon Koei Co., Ltd.
Eijiro Ohtsuka	Equipment Plan/ Maintenance	ALMEC Corporation (Kanagawa Chuo Kotsu Co., Ltd.)
Etsuji Shiraishi	Bus Management Plan	Nippon Koei Co., Ltd.

The Second Field Survey Member (from Apr. 20 to Apr. 23, 2016, some consultants stayed from 15 at earliest and some until 18 at last)

Name	Title	Organization
Kenji Murata	Leader	Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, JICA
Shinichi Saito	Cooperation Plan	Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, JICA
Michimasa Takagi	Team Leader/ Public Transportation Plan	ALMEC Corporation
Eijiro Ohtsuka	Equipment Plan/ Maintenance	ALMEC Corporation (Kanagawa Chuo Kotsu Co., Ltd.)
Etsuji Shiraishi	Bus Management Plan	Nippon Koei Co., Ltd.
Hiroshi Fujisawa	Procurement Plan/ Cost Estimation (1)	Nippon Koei Co., Ltd.

The Third Field Survey Member (from Jul. 13 to Jul. 23, 2016)

Name	Title	Organization
Satoko Tanaka	Leader	Director, Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, JICA
Yusuke Taguchi	Cooperation Plan	Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, JICA
Michimasa Takagi	Team Leader/ Public Transportation Plan	ALMEC Corporation
Koji Ohtsuka	Financial Analysis	Nippon Koei Co., Ltd.
Eijiro Ohtsuka	Equipment Plan/ Maintenance	ALMEC Corporation (Kanagawa Chuo Kotsu Co., Ltd.)
Etsuji Shiraishi	Bus Management Plan	Nippon Koei Co., Ltd.

Appendix 2: Schedule of the First Field Survey

Date		Time	Activities	Cambodian Side Participant
Sat	January 23, 2016	AM		
		PM		
Sun	January 24, 2016	AM		
		PM		
Mon	January 25, 2016	AM	Meeting with JICA Cambodia Office	
		PM	Kick-off Mtg. at PPCA	PPCA, DPWT, CBA
Tue	January 26, 2016	AM	Explanation of the outline of the project in DPWT	DPWT, CBA
		PM	Site visit (Bus terminal and bus routes)	
Wed	January 27, 2016	AM	Discussion on the outline of the project in DPWT	DPWT, CBA
		PM	Interview with the City Bus Management Authority	
Thu	January 28, 2016	AM	Discussion on Minutes of Meeting (M/M)	DPWT, CBA
		PM	Site Visit (candidate land for depots in 2 places, JKI)	
			Meeting with MEF	MEF
Fri	January 29, 2016	AM	Meeting with JICA Cambodia Office	
		PM	Report to Embassy of Japan	
		PM	Signing M/M	PPCA, DPWT, CBA
Sat	January 30, 2016	AM		
		PM		
Sun	January 31, 2016	AM		
		PM		
Mon	February 1, 2016	AM	Sumitomo Electric Industries, Ltd.	
		PM	General Department of Transportation	
Tue	February 2, 2016	AM	CBA	
		PM	CBA	
Wed	February 3, 2016	AM	DPWT	
		PM	Interview with ING	
Thu	February 4, 2016	AM		
		PM	Meeting with CBA	
Fri	February 5, 2016	AM		
		PM	Hearing for license structure and road traffic laws	General Dpt. of Transportation
Sat	February 6, 2016	AM	Site visit (NH3, NH4)	
		PM		
Sun	February 7, 2016	AM		
		PM		
Mon	February 8, 2016	AM		
		PM	Report to Embassy of Japan	
Tue	February 9, 2016	AM	Specification of Bus	CBA
		PM		
Wed	February 10, 2016	AM		
		PM		
Thu	February 11, 2016	AM	Discussion with CBA	CBA
		PM		
Fri	February 12, 2016	AM	Discussion on the land for depots	Deputy Governor of Phnom Penh
		PM	JICA Cambodia Office, Mitsubishi Corporation	
Sat	February 13, 2016	AM	Site visit (NH3, NH4)	
		PM	Candidate site for 2nd shop of AEON	
Sun	February 14, 2016	AM		
		PM	Phnom Penh to Ho Chi Minh	
Mon	February 15, 2016	AM	Becamex Tokyu Bus (SAMCO)	
		PM		
Tue	February 16, 2016	AM	Move	CBA
		PM		
Wed	February 17, 2016	AM	Arrival in Japan	
		PM		

Date		Time	Activities	Location	JICA		Project Team			
					Murata	Saito	Takagi	E.Otsuka	Shiraishi	Fujisawa
Fri	2016/4/15	AM								
		PM							✓	
Sat	2016/4/16	AM							✓	
		PM					✓	✓	✓	
Sun	2016/4/17	AM					✓	✓	✓	
		PM					✓	✓	✓	
Mon	2016/4/18	8:30	Meeting with JICA Cambodia Office	JICA Cambodia			✓	✓	✓	
		9:30	Meeting with the City Bus Management Authority	CBMA						
		PM	Interview with the City Bus Management Authority				✓	✓	✓	
Tue	2016/4/19	AM	Interview with the PPCH (tentative)				✓	✓	✓	
		PM					✓	✓	✓	✓
Wed	2016/4/20	10:00	Meeting with AEON Mall	AEON			✓	✓	✓	✓
		PM	Interview with the City Bus Management Authority	CBMA	✓	✓	✓	✓	✓	✓
Thu	2016/4/21	AM	Discussion on Minutes of Meeting (M/M)	PPCH?	✓	✓	✓	✓	✓	✓
		PM			✓	✓	✓	✓	✓	✓
Fri	2016/4/22	AM	Signing M/M		✓	✓	✓	✓	✓	✓
		PM	Meeting with JICA Cambodia Office		✓	✓	✓	✓	✓	✓
		PM	Reporting to Embassy		✓	✓	✓	✓	✓	✓
Sat	2016/4/23	AM			✓	✓	✓	✓	✓	✓
		PM								✓
Sun	2016/4/24	AM								✓
		PM								✓
Mon	2016/4/25	AM								✓
		PM								✓
Tue	2016/4/26	AM								✓
		PM								✓
Wed	2016/4/27	AM								✓
		PM								✓
Thu	2016/4/28	AM								✓
		PM								✓
Fri	2016/4/29	AM								✓
		PM								

Appendix 4: Schedule of the Third Field Survey

Date	Activities
2016/7/17 Sun.	Arival in Phnom Penh
2016/7/18 Mon.	Discussion on DFR and M/D (w/PPCA)
2016/7/19 Tue	Discussion on DFR and M/D (w/PPCA)
2016/7/20 Wed	Discussion on DFR, M/D, and Technical Assistance (w/PPCA)
2016/7/21 Thu	Briefing from Deputy Governor to the Governor of PPCA Signing M/D
2016/7/22 Fri	Report to EoJ Report to JICA Cambodia Office Discussion with MEF

Phnom Penh Capital Administration (PPCA)

H.E Dr. IENG Aunny	Vice Governor of Phnom Penh
Mr. MEAN Chanyada	Director
Mr. HUOY Hay	Deputy Director
Mr. SO Phannara	Director of Administration Division
Mr. SIN Boramey	Director of Urbanization Division
Ms. PHAN Sopheaknita	Chief of Public Relations and International Cooperation
Ms. KHON Khema	Official of Public Relations and International Cooperation

City Bus Authority (CBA)

Mr. EAN Sokhim	Governor
Mr. NAK Tanavuth	Vice Governor
Mr. EA Phearith	Vice Governor
Mr. KHLY Norack	Administration
Mr. DANH Darith	Accounting
Mr. MEL Sarith	Technical/Service
Mr. LAY Sokraksmey	Inspection/Dispute

Department of Public Works and Transport (DPWT)

Mr. SAM piseh	Director

Ministry of Economy and Finance (MOEF)

Mr. REAM Utdom	Deputy Chief General Department of Budget
Mr. NGY Laymithuna	Technical Official, Department of Investment and Cooperation, Bilateral Cooperation Office

Minutes of Discussions
on the Preparatory Survey for the Project for
Improvement of Transportation Capacity of Public Bus in Phnom Penh

In response to the request from the Government of Kingdom of Cambodia (hereinafter referred to as "Cambodia"), the Government of Japan decided to conduct a Preparatory Survey for the Project for Improvement of Transportation Capacity of Public Bus in Phnom Penh (hereinafter referred to as "the Project"), and entrusted the Preparatory Survey to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") to Cambodia, headed by Mr. Kenji MURATA, Deputy Director, Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, and is scheduled to stay in the country from 24 January to 18 February, 2016.

The Team held a series of discussions with the officials concerned of the Government of Cambodia and conducted a field survey in the Project area. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Phnom Penh, 28 January, 2016

Kenji MURATA	H.E. PA Socheatevong
Leader	Governor
Preparatory Survey Team	Phnom Penh Capital Hall
Japan International Cooperation Agency	Cambodia
Japan	

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve traffic situation in Phnom Penh by/through enhancement of transportation capacity for public bus, thereby contributing to activate economic, social activities and environment in Phnom Penh.

2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for Improvement of Transportation Capacity of Public Bus in Phnom Penh".

3. Project Site

Both sides confirmed that the site of the Project is in Phnom Penh, which is shown in Annex 1.

4. Line Agency and Executing Agency

Both sides confirmed the line agency and executing agency as follows:

4-1. The line agency is Phnom Penh Capital Hall which would be the agency to supervise the executing agency.

4-2. The executing agency is City Bus Management Authority. The executing agency shall coordinate with all the relevant agencies to ensure smooth implementation of the Project and ensure that the undertakings are taken by relevant agencies properly and on time. The organization charts are shown in Annex 2.

5. Items requested by the Government of Cambodia

5-1. As a result of discussions, both sides confirmed that the items requested by the Government of Cambodia are as follows:

- 180 Bus fleets
- Maintenance Equipment and Spare parts for two years for bus fleet
- Training for Bus Operation/Management and Maintenance Engineering (Soft Component)

5-2. Both sides confirmed that appropriateness of the request will be examined in accordance with the further studies and analysis in Japan from the viewpoint of necessity, technical and financial viability and cost-effectiveness. The Cambodia

side understood that the quantities and specifications of requested items, therefore, may not be accepted as final components of the Project.

5-3. JICA will assess the appropriateness of the above requested items through the survey and will report findings to the Government of Japan. The final components of the Project would be decided by the Government of Japan.

6. Japanese Grant Scheme

6-1. The Cambodian side understands the Japanese Grant Scheme and its procedures as described in Annex 3, 4 and 5, and necessary measures to be taken by the Government of Cambodia.

6-2. The Cambodian side understands to take the necessary measures, as described in Annex 6 for smooth implementation of the Project, as a condition for the Japanese Grant to be implemented. The detailed contents of the Annex 6 will be worked out during the survey and shall be agreed no later than by the Explanation of the Draft Preparatory Survey Report.

The contents of Annex 6 will be used to determine the following:

(1) The scope of the Project.

(2) The timing of the Project implementation.

(3) Timing and possibility of budget allocation.

Contents of Annex 6 will be updated as the Preparatory Survey progresses, and will finally be the Attachment to the Grant Agreement.

7. Schedule of the Survey

7-1. The Team will proceed with further survey in Cambodia until 18 February 2016.

7-2. JICA will dispatch a mission to Cambodia in order to discuss and finalize the Operation and Maintenance Plan and the Five-year Action Plan in around April 2016.

7-3. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Cambodia in order to explain its contents in around July 2016.

7-4. If the contents of the draft Preparatory Survey Report is accepted in principle and the undertakings are fully agreed by the Cambodia side, JICA will complete the final report in English and send it to Cambodia in around September 2016.

7-5. The above schedule is tentative and subject to change.

8. Environmental and Social Considerations

8-1. The Cambodian side confirmed to give due environmental and social

considerations during implementation of the Project, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).

8-2. The Project is categorized as C because the sector, scale and other characteristics of the Project indicate that adverse impact on environment and/or society is minimal.

9. Other Relevant Issues

9-1. No duplication of use of the equipment from any sources including Chinese Government

Both sides confirmed that the buses to be procured by the Project will be used for inner-city transportation in Phnom Penh. The Cambodia side explained that 100 buses will be provided by the Chinese Government which may be temporarily used for inner-city transportation until the installation of the buses to be procured by the Project. After the installation of Japanese buses, the Chinese buses are expected to be used for inter-city lines.

The Cambodian side explained that at this moment City Bus Management Authority has set the plan to provide the services within the Phnom Penh Capital only. To operate inter-city bus service is the vision set for medium and long term plan. The Japanese side requested the Cambodian side to implement the above mentioned plan to avoid duplication of use of equipment.

The Cambodian side explained that the draft specification for buses from the Chinese government is under review by the government of Cambodia and the procurement schedule of buses has not been determined yet. The Cambodian side promised to inform the Japanese side of any progress of the Chinese bus project.

9-2. Securing budget and personnel

The Japanese side stressed that, in case buses are newly installed through the Project (and any other project including those to be procured by the Chinese government), additional staff, facilities and budget shall be arranged by the Cambodian side in an appropriate schedule. The Cambodia side agreed that Phnom Penh City Hall shall ensure that all necessary measures including securing enough budget and personnel will be taken to properly and effectively operate and maintain the equipment to be procured by the Project.

9-3. Continuity of City Bus Management Authority

The Japanese side expressed its concern on the continuity of City Bus

Management Authority. According to the letter from Ministry of Economy and Finance dated May 25, 2015, and the Article 31 of Statute of City bus, City Bus Management Authority may be transformed to the Public Enterprise in the form of state-company or multi-company at around 2018, or dissolved in case deficit continues for a certain period. The Japanese side pointed out that any transformation and/or dissolution of City Bus Management Authority shall affect the implementation of the Project.

The Cambodian side explained that Phnom Penh Capital Hall and the government of Cambodia have no plan to dissolve City Bus Management Authority. The Cambodian side also explained that even though City Bus Management Authority will be transformed to the Public Enterprise, new organization must follow Royal Decree No. CS/RKM/0696/03 dated 17 June 1996 on general status of Public Enterprise.

The Cambodian side has strong intention to upgrade the capacity and services of City Bus Management Authority in conformity with the urban transport master plan 2035.

9-4. Tax Exemption

The Cambodian side agreed that customs duties, internal taxes and other fiscal levies which may be imposed in Cambodia are exempted under mutual agreement of Exchange of Note (E/N). If any expenses stated above are caused by some reasons such as the delay of execution of tax exemption, the Cambodia side shall pay for it temporarily.

9-5. Undertakings of the Cambodian side

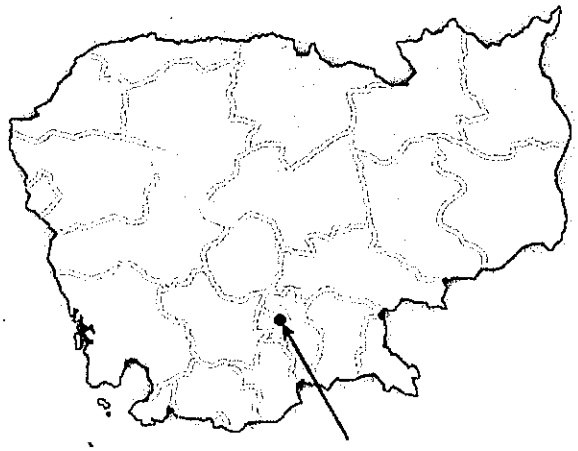
The Cambodian side shall, at its own expenses, provide the Team with the following items in cooperation with City Bus Management Authority and other organizations concerned.

(1) Security-related information as well as measures to ensure the safety of the Team;
(2) Information as well as support in obtaining medical service;
(3) Data and information related to the Preparatory Survey;
(4) Counterpart personnel;
(5) Suitable office space with necessary equipment and services;
(6) Credentials or identification cards;
(7) Entry permits necessary for the Team to conduct field surveys

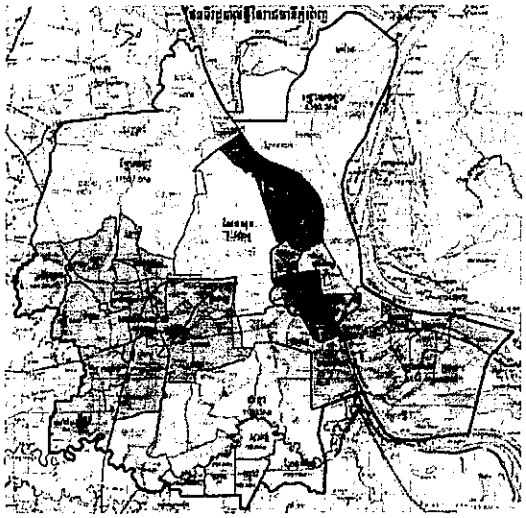
Annex 1 Project Site
Annex 2 Organization Chart
Annex 3 Japanese Grant
Annex 4 Flow Chart of Japanese Grant Procedures
Annex 5 Financial Flow of Japanese Grant
Annex 6 Major Undertakings to be taken by Each Government
Annex 7 Project Monitoring Report (template)

Annex 1

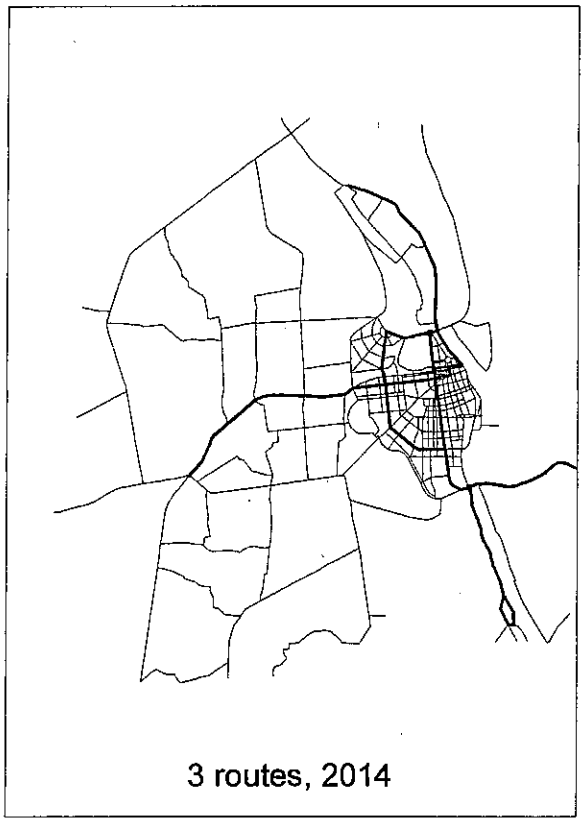
Kingdom of Cambodia

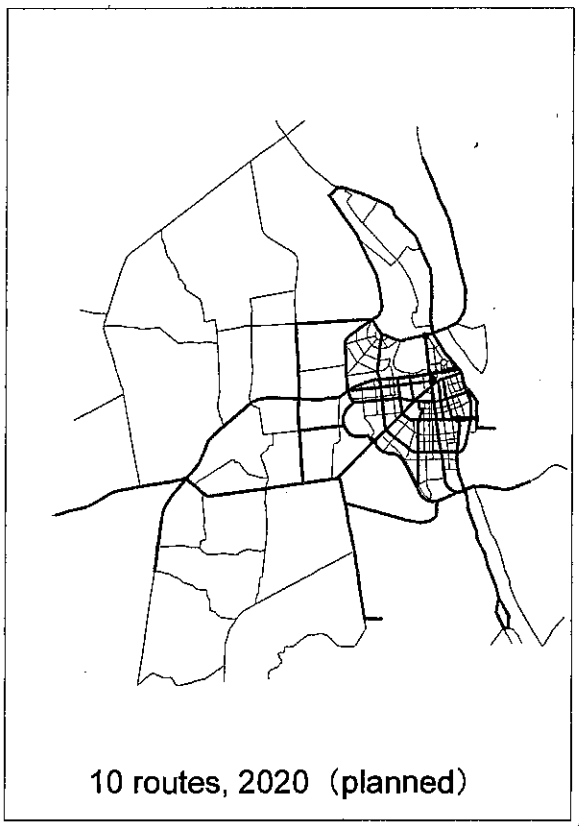


Phnom Penh Capital City



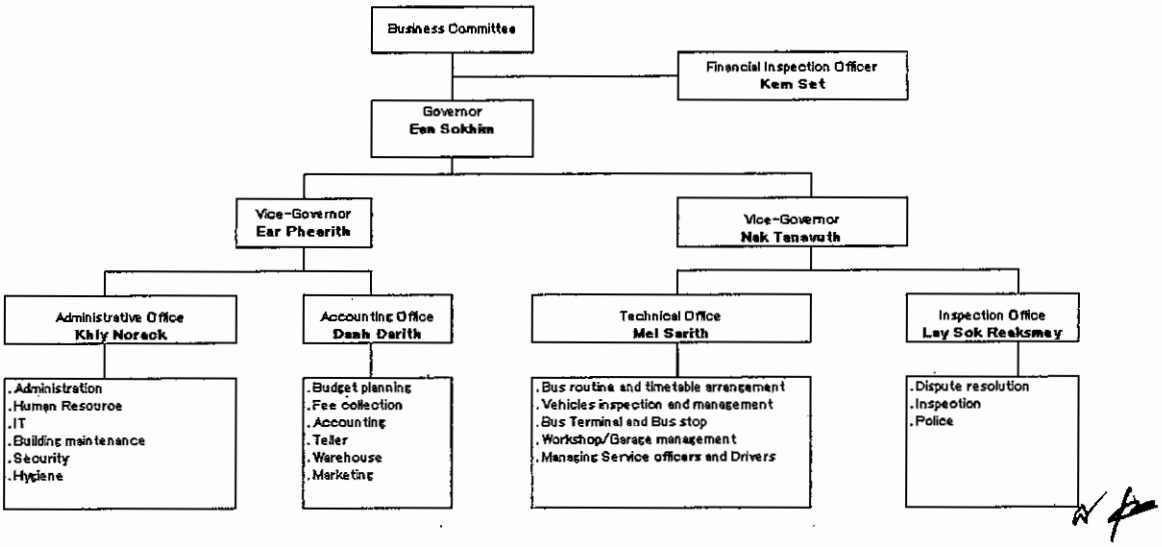
Tentative proposed Bus Route in Phnom Penh Metropolitan area





Annex 2

Organization Chart of City Bus Authority



Minutes of Discussions
on the Preparatory Survey for the Project for
Improvement of Transportation Capacity of Public Bus in Phnom Penh
(Second Field Survey)

The second field survey of the Preparatory Survey (hereinafter referred to as "the Survey") for the Project for Improvement of Transportation Capacity of Public Bus in Phnom Penh (hereinafter referred to as "the Project") was conducted by the the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team"), headed by Mr. Kenji MURATA, Deputy Director, Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, Japan International Cooperation Agency (hereinafter referred to as "JICA") from 15 to 29 April, 2016.

The Team held a series of discussions with the officials concerned of the Government of Cambodia (hereinafter referred to as "the Cambodian Side") and conducted a field survey in the Project area. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Phnom Penh, 22 April, 2016

Kenji MURATA	H.E. PA Socheatevong
Leader	Governor
Preparatory Survey Team	Phnom Penh Capital Hall
Japan International Cooperation Agency	Cambodia
Japan	

ATTACHMENT

to M/D Second Field Survey 22 April, 2016

1. Draft Action Plan

1-1. The Team explained to the Cambodian Side the contents of the Draft Action Plan (hereinafter referred to as "the Plan") including project framework (Annex 1), and 140 buses will be necessary to realize 10 routes bus traffic operation in Central Phnom Penh by 2020 as proposed in the Urban Transport Master Plan in 2014. The Plan includes Option A and Option B as shown in the "Proposed Schedule on the Action Plan" (Annex 2).

Option A:

- Phase 1:
  To operate 5 routes with 65 buses to be procured through proposed Japan's Grant Aid and 15 existing buses for 5 routes by around middle of 2018.
- Phase 2:
  To operate 10 routes with additional 75 buses to be procured through proposed Japan's Grant Aid (total 140 buses) and no existing bus by around the end of 2020.
- Technical Cooperation Project by JICA will be implemented from 2017 to 2020 to enhance the capacity of Phnom Penh City Bus Authority (hereinafter referred to as "CBA").

Option B:

- Phase 1:
  To operate 4 routes with 67 buses to be procured through proposed Japan's Grant Aid and no existing bus by around middle of 2018.
- Phase 2:
  To operate 10 routes with 73 additional buses to be procured through proposed Japan's Grant Aid (total 140 buses) and no existing bus by around the end of 2020.
- Technical Cooperation Project by JICA will be implemented from 2017 to 2020 to enhance the capacity of CBA.

1-2. The Team stressed that Japan's Grant Aid for Phase 2 of either Option would be decided by the Government of Japan after a Joint Evaluation mentioned below by the Japanese Side and the Cambodian Side. The evaluation would be expected to be held at the middle of 2018.

1-3. The Team further explained that the Joint Evaluation mentioned in 1-2 would be conducted based on the following items;

- The progress of construction works including Depots (Phnom Penh Port and Mean Chey), Maintenance Facilities, Bus Terminals and Bus Stops required for Phase 1 with Cambodian budget (as shown in Table 6 in the Plan)
- Employing necessary number of new staffs including Bus Drivers, Bus Conductors, Mechanics, and Operating and Planning Officers, required to operate the respective number of buses mentioned in Table 7 with Cambodian budget
- The progress and performance of proposed Technical Cooperation Project in Phase 1, for example bus operation record and bus maintenance record etc.,.

1-4. The Cambodian Side requested the Team to provide Option C, which is 90 buses for 6-7 routes in Phase 1 and 50 buses in Phase 2 for 10 routes by 2020 through Japanese Grant Aid, based on the Requirements Specification Note (2016) approved by Ministry of Economy and Finance. The Cambodian Side also requested 40 buses in Phase 3 after 2020. Additionally, the Cambodian Side explained that they intend to sell all existing buses after the installation of Japanese buses in order to reduce maintenance cost. The Team took noted the request and confirmed that the request would be reported to the Government of Japan. The result of discussion with the Government of Japan would be informed the Cambodian Side no later than the end of May 2016.

1-5. The Team pointed out that CBA operate 3 bus routes with 57 bus vehicles including the reserve buses and 90 drivers who work in a two shift system, however bus operation currently does not satisfy the planned service level where the operating time is between 5:30-20:30 and for 15 minute headways. For stable operation in 3 bus routes, 56 buses, 198 drivers and related facilities such as Depots and Bus Terminals would be required. The Team pointed out the increase of the number of drivers and buses is needed to improve operation stability.

1-6. The Team expressed concerns about difficulty in recruiting new staffs due to the current adverse working condition such as lower salary comparing with the one in the private sector. CBA agreed with the the Team's concerns. The Team confirmed the following actions;

A. CBA sent a letter dated 19 April 2016 to Phnom Penh Capital Hall requesting raise of total salary level of driver and is waiting for Governor's ap

approval.

B. CBA contacted private driving schools to enhance their students to apply CBA.

C. CBA advertised new recruitment for CBA drivers in newspaper.

The Cambodian Side agreed with the Team's concerns while the same is of the view that working conditions of drivers including salary shall be reviewed within the framework of comprehensive business plan of CBA for attracting more potential drivers to CBA.

1-7. The Team strongly requested the Cambodian Side to fulfill their undertakings mentioned in 1-3, such as construction works and employing new staffs in accordance with the Plan in Annex 1 and the schedule in Annex 2.
The Cambodian Side fully committed to complete those requirements in time.

1-8. The Team explained to the Cambodian side that JICA will provide Technical Cooperation Project for Phnom Penh Capital Hall and CBA toward realizing 10 bus routes in Phnom Penh City by 2020 as shown in Annex 3. The both sides agreed that it is required to solve the issues mentioned above in the Technical Cooperation Project.

1-9. The Team stressed that the number of buses to be procured and routes should be increased gradually taking account of the challenges of CBA, such as construction works of the facilities needed (i.e. depot and bus station), employing new staffs, and the current CBA operational capacity.
The Cambodian side agreed to it.

1-10. The both sides agreed that the Plan will be finalized at the time of the next mission around July 2016.

2. Validity of the Previous Minutes of Discussions

Both sides confirmed that all contents and agreements in the Minutes of Discussion of the preceding Preparatory Survey signed by both sides on 28 January 2016 should remain valid unless they are updated by this Minutes of Discussion.

3. Schedule of the Surveys

Both sides confirmed the schedule of the Survey as shown below. The Schedule may be subject to change during the course of the Survey.

3-1. The Team will proceed with further survey in Cambodia until 29 April 2016.

3-2. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Cambodia in order to explain its contents in around July 2016. The Report will include a whole design, implementing schedule, undertakings by Japanese and Cambodian Side and total estimated cost for the Project.

3-3. If the contents of the draft Preparatory Survey Report is accepted in principle and the undertakings are fully agreed by the Cambodia side, JICA will complete the final report in English and send it to Cambodia in around September 2016.

Annex 1 Draft Action Plan

Annex 2 Proposed Schedule on the Action Plan

Annex 3 Bus Route Map of Phnom Penh City (Future Plan Draft)

Annex 4 Minutes of Discussions signed on 28 January 2016

The Project for Improvement of Public Bus Transportation in Phnom Penh
Proposed Action Plan

1 Current Issues

Currently in Phnom Penh, there are 3 bus routes in operations. There are 6 issues that should be resolved with regards to the service level related to the operational headway and service area and the operational structure of the Phnom Penh Public Bus Company as well as the working environment for the bus drivers.

(1) Areas in the City with No Bus Service Presence

The existing service area for the 3 bus routes does not sufficiently cover the city and there are areas in the city with no service presence at all. Because of the areas with no service presence, passengers cannot get to their intended final destination by bus. This is especially apparent on the eastern side of Phnom Penh along the side of the river. If this area was covered with a new bus route, the bus service area would be greatly expanded and this new bus route is necessary for passengers to get to their final destinations by bus.

(2) Serious Traffic Congestion Causes the Average Travel Speed to Decrease

From traffic congestion during the morning and evening hours, the congestion hinders the stable operations of buses and causes the average travel speed of buses to differ by a lot (see Table 1). As a result, during the congested time periods, the number of buses that can be operated is greatly reduced and passengers waiting time increase and overcrowding inside the bus vehicles becomes more serious as well. Based on the results of the on the ground survey, during the peak evening hours, it can be confirmed that there are sections of road where the bus traveling speed drops to 5 km/h.

In order to secure the stable operations during the congested time periods, traffic signaling equipment, priority bus lanes as well as congestion countermeasures are necessary. It is desirable to secure a structure where reserve bus vehicles could be operated and where 15 minute headways can be guaranteed.

Table 1 Average Travel Speed from Route No. 3

		Up					Down				
	Plate ID	Departure	Arrival	Travel Time	Travel Speed (km/h)		Departure	Arrival	Travel Time	Travel Speed (km/h)	
AM	30033	5:47	6:24	0:37	22.7	16.7	7:10	8:30	1:20	10.5	15.8
	26	6:00	6:40	0:40	21.0		7:25	8:45	1:20	10.5	
	60	6:15	7:00	0:45	18.7		7:45	8:55	1:10	12.0	
	59	6:35	7:18	0:43	19.5		8:05	9:20	1:15	11.2	
	30062	6:50	7:40	0:50	16.8		5:40	6:08	0:28	30.0	
	54	7:05	8:05	1:00	14.0		5:55	6:30	0:35	24.0	
	3	7:25	8:22	0:57	14.7		6:10	7:00	0:50	16.8	
	8	7:45	8:43	0:58	14.5		6:25	7:11	0:46	18.3	
	5	8:05	9:08	1:03	13.3		6:40	7:45	1:05	12.9	
	8	8:25	9:35	1:10	12.0		6:55	8:09	1:14	11.4	
PM	30033	16:41	18:10	1:29	9.4	11.3	18:35	20:05	1:30	9.3	9.5
	26	15:57	17:25	1:28	9.5		18:00	19:10	1:10	12.0	
	60	15:15	16:35	1:20	10.5		17:35	-	-	-	
	25	15:40	16:50	1:10	12.0		17:20	18:20	1:00	14.0	
	54	17:13	18:40	1:27	9.7		15:45	17:00	1:15	11.2	
	3	17:40	19:05	1:25	9.9		15:15	17:19	2:04	6.8	
	48	18:35	19:30	0:55	15.3		15:30	18:15	2:45	5.1	
	45	19:00	20:00	1:00	14.0		16:55	18:40	1:45	8.0	

(3) Decrease in the Bus Service Levels Due to a Lack of Drivers and Bus Vehicles

Currently, for the 3 bus routes, there are 57 bus vehicles (including the reserve bus vehicles) and 90 drivers who work in a two shift system. However, for a bus service level where the operating time is between 5:30–20:30 and for 15 minute headways, some 198 drivers and 56 bus vehicles are necessary. Currently, due to breakdowns in the bus vehicle fleet and the lack of drivers, the operational performance turned out short to meet the standard, and the vehicles are not fully used in an effective manner. In order to secure stable services on bus routes, it is necessary to have the right numbers of bus vehicles for each bus route and to prepare a plan for staffing drivers.

Table 2 Operating Ratio from the Bus Operations Survey in February

	Bus Route No.1				Bus Route No.2				Bus Route No.3			
Date	From KM9	Operation Ratio	From Boeung	Operation Ratio	From Night Market	Operation Ratio	From Ta Kmao	Operation Ratio	From Night Market	Operation Ratio	From Chaom	Operation Ratio
2016/2/21	41	67.2%	42	68.9%	49	80.3%	49	80.3%	35	57.4%	35	57.4%
2016/2/23	44	72.1%	44	72.1%	51	83.6%	51	83.6%	34	55.7%	35	57.4%
2016/2/24	34	55.7%	34	55.7%	48	78.7%	47	77.0%	34	55.7%	34	55.7%

Note: As the ideal frequency, the bus is assumed to be operated every 15 minutes from 5:30 – 20:30 (61 times)

(4) Long Bus Routes

The long distance of the bus routes stretching out for 10 km from the city center of Phnom Penh to the suburban areas creates another problem. In such a long route, the buses tend to have long delays during the congestion time and it is impossible to secure the stable operating headway. As a result, there have been many complaints from passengers. Considering the usage of the bus routes, compared

to passenger usage in the city centre, there isn't much passenger usage in the suburban area. As a result, the service quality (operational headway) could be improved by adjusting the bus routes based on passenger demand. Therefore, in the suburban area as well as the city centre, areas for bus short turns (bus terminal) should be established so that management of the bus operations could be more effective and passengers could use the bus terminals to transfer to suburban bus services or vice versa.

(5) Insufficient Consideration for the Working Environment of Drivers

Currently, the bus drivers are working in two shifts and everyone comes to work and leaves work at the same time. However, the number of service varies everyday depending on degree of road congestion, number of drivers at work, and condition of the bus vehicles. Since there is no rule on management of the drivers' resting time and driving time, there are many cases of excessive driving time and insufficient resting time. In safe and stable bus operations, taking care of the drivers' work environment is important. Therefore, bus operations should be based on the bus Action Plan that takes into account the shift labor system.

(6) Insufficient Provision of Information to Passengers

The public bus company has just started operations recently and therefore common knowledge of these bus services among passengers is still insufficient. Especially, it is important to provide information of the bus routes, bus schedules, operating time period, and fares in the places like bus stops, inside the vehicles, and important transfer points in an easy-to-understand manner. In addition, in order to promote usage, regular distribution of advertisement flyers and provision of information on the Internet are necessary. Also, in the Phnom Penh, there are many foreign tourists, so it is also necessary to provide the information in multiple languages. OK A

2 Basic Policy

Based on the current operating issues, the proposed Action Plan has 6 basic policies as below.

(1) Development of Public Buses is an Urgent Issue

From rapid motorization, traffic congestion is becoming more and more serious and development of public buses is an urgent issue in Phnom Penh. Even in the "Phnom Penh Comprehensive Urban Transport Master Plan (hereafter 2014M/P)", the importance of public transport was recognized and the public investment in the public transport bus system is important.

(2) Aim for 10 Operating Bus Routes by 2020

Although there isn't a clear criteria for the phased expansion of bus routes, but from the experience of Japan's bus operators, there is a limit of 2~3 bus routes per 1 year. From this viewpoint, and based on Phnom Penh's request or according to the targets from the 2014M/P of having 10 bus routes by 2020, this is a reasonable plan.

Of course, to increase the public transport modal share of Phnom Penh, 10 bus routes will not be adequate and further development of public transport network will be required The target for 2020 would be for the bus operator in Phnom Penh to independently develop its own capabilities.

(3) Improving the Capacity of the Organization while Expanding the Bus Routes by Phases

Currently, the public bus company that is operating the 3 bus routes has only been established for a year and a half only and its capabilities of operating the bus, maintaining the bus vehicles and overall management are limited. If the bus routes were rapidly expanded, there would be hindrance in the effective operations of the buses and the profitability of the bus operations would get worse. Therefore, it is important to improve the capacity of the public bus organization while expanding the bus routes by phases.

(4) Examine the Phased Plan of Procuring Bus Vehicles

The procurement of bus vehicles will be based upon the examination of the Action Plan and taking into consideration the realistic schedule of the system of Japan's grant aid and related procedures. In particular, based upon the critical path of the bus vehicle procurement schedule, the bus procurement plan will be carefully examined.

(5) Clarify the Necessary Financial Sources for the Construction of New Facilities and for Securing

Human Resources

In accordance with the procurement plan for bus vehicles, budget for following items need to be examined: (i) employment and training of human resources such as drivers, conductors, mechanics, etc, (ii) construction of new bus facilities such as bus terminals, and (iii) bus operation.

(6) Improve the Capacity for Bus Operations by Implementing the Technical Cooperation Project

From the side of Japan, together with the quick implementation of the grant aid, improve the necessary capacity of bus operations, bus vehicle management, organizational management and training of human resources though implementation of the technical cooperation project.

3 Project Framework

3.1 Bus Vehicle Procurement Plan

For the operation of 10 bus routes by 2020, at the minimum, 140 bus vehicles will be necessary., In the cast of supplying 140 vehicles in one fiscal year by using Japan's grant aid, it would be necessary to employ and train around 410 drivers and conductors respectively. In addition, as stated in the basic policy section, if there should be a rapid expansion in the number of bus routes, there would be the risk that the effective operation of buses was hindered and profitability deteriorated. Therefore, the 140 bus vehicles would be supplied in 2 phases. Whether to implement the second supply will be examined based on the situations of the first supply and progress of the part shared by the counterpart. Considering the time it takes to train drivers, the supply of the bus vehicles will be expanded by another 2 phases. Therefore, expansion of the bus routes and employment of personnel will be based on the supply of 140 bus vehicles in 4 phases.

From this Japan grant aid project, upon the examination of the Action Plan to expand the number of bus routes in the first phase by 5 bus routes and to 10 by 2020, for each phase, the necessary numbers of bus vehicles is calculated (see Table 3 and 4). For the bus vehicles to be used in the city centre, there are preconditions to use Japanese made vehicles that will be supplied from the grant aid. However, until the final phase (Phase 4), there will be insufficient numbers vehicles for operations so there will be cases where there is no choice but to use the current existing Korean-made used buses. In this case, the plan is that for bus operations in the city center, Japanese-made buses will be used while in the suburban area, the existing buses will be used.

Based on calculated number of bus vehicles, a summary of the operations plan for 10 bus routes is shown in Table 5. For these 10 bus routes, (1) for the existing 3 bus routes, the service will be continued, (2) configure the bus routes to cover as much as the city as possible and (3) in order to realize the effective bus operations, set the length of bus routes to around 10 km. Based on these 3 basic conditions, the 10 bus routes were selected.

For the minimum operating requirements, the operating headway in the city center was set at 15 minutes while at the suburban area; it was set at 30 minutes. With regards to the traveling speed, based on the results of the current bus survey, the number of bus vehicles required for operations was calculated based on the travel speed of 10 km/h. Taking into consideration of the traffic congestion that comes with the increase in the future traffic demand, it will be required to revise the current Action Plan based on the conditions in the future. (Refer to the attached bus route map for the 5 bus routes and 10 bus routes)

Table 3 Procurement Policy 1 (Expansion with Utilization of Korean fleet)

Phase		No. of Routes		Required number of buses.	Provided by Japan (Cumulative)	Existing Buses	Target Year (yyyy/mm)
Grant Aid Project (1)	I	3	①、②、③	56	30 (+30)	26	2017/11
	II	5	①、②、③④、⑥	80	65 (+35)	15	2018/4
Grant Aid Project (2)	III	7	①、②、③④、⑥、⑦、⑧	115	100 (+35)	15	2020/7
	IV	10	①、②、③④、⑤、⑥ ⑦、⑧、⑨、⑩	140	140 (+40)	0	2020/11

Note) • Route Number is as shown in Route Map
• Existing Buses: Korean fleet which are currently operated

Table 4 Procurement Policy 2 (All Korean fleet will be sold)

Phase		No. of Routes		Required number of buses.	Provided by Japan (Cumulative)	Existing Buses	Target Year (yyyy/mm)
Grant Aid Project (1)	I	4	①、②、③④、	67	30 (+30)	37	2017/11
	II	4	①、②、③④、	67	67 (+37)	0	2018/4
Grant Aid Project (2)	III	7	①、②、③④、⑥、⑦、⑧	115	115 (+48)	0	2020/7
	IV	10	①、②、③④、⑤、⑥ ⑦、⑧、⑨、⑩	140	140 (+25)	0	2020/11

Note) • Route Number is as shown in Route Map
• Existing Buses: Korean fleet which are currently operated OK

Table 5 Outline of the Routes

Route ID	Name	Section		Route Length (km)	Number of Buses	Operating Hours		Frequency (min)
		Origin	Destination			From	to	
①	Monivong Line	Phnom Penh Port	ING Holding	8.3	10	5:30	20:30	15
		KM9	ING Holding	15.3	5			30
		Oknha Sophan	Old Studium	12.3	3			30
②	Mao Tse Toung Line	Phnom Penh Port	ING Holding	11.7	14			15
		ING Holding	Takmao Markt	19.5	5			30
③	Airport Line	Phnom Penh Port	Chom Chav Rab.	14.1	14			15
④	Sisowath Line	Phnom Penh port	ING Holding	8.1	10			15
⑤	Veng Sreng Line	Phnom Penh Port	Chom Chav Rab.	14.8	8			30
⑥	Monireth Line	Phnom Penh Port	ING Holding	11.7	12			15
⑦	Norodom Line	Phnom Penh Port	ING Holding	8.7	10			15
⑧	Sihanouk Loop	Phnom Penh Sta.	Phnom Penh Sta.	9.2	20	7:30	17:30	15
⑨	Poung Peay (AEON) Line	Phnom Penh Sta.	AEON Mall	7.2	8	5:30	20:30	30
⑩	Airport Limousine	Air Port	ING Holding	17.3	5			60
Subtotal					124			
Reserved					16			
Total					140			

3.2 Infrastructure Construction Plan

For the operations of public buses, not only are bus vehicles needed, but the construction of various related facilities are required as well. In table 6, the required various facilities are shown. The major infrastructure items required include depots, space for maintenance of bus vehicles, bus terminals, and bus stops, followed by peripherals such as resting and training facilities for staff. In addition to bus terminals at the starting and ending point of bus routes, up to 450 new bus stops are required. Basically the funding for this infrastructure is from the budget of Phnom Penh. The table below does not show but related facilities around the bus stops and bus terminals such as traffic management facilities and pedestrian space are important and it is important to secure the budget from the city of Phnom Penh for the construction of these facilities. For the planning of the various facilities, advice will be sought from Japanese experts from various fields.

For this Action Plan, with regards to the location for the establishment of the depot, there are 2 sites that are available: one in the port of Phnom Penh and a brownfield waste repository site in Mean Chey. Looking at the viewpoint of effective bus operations and also due to the fact that a lot of bus routes are

concentrated around the port of Phnom Penh, the port is the better location for the depot. On the other hand, the Mean Chey site is sufficiently wide and it is possible to build driver training facilities on the site. Further detailed examination is required including the problems of whether or not land acquisition is required or not.

Also, in the south, in the ING Holding terminal, as a transfer point between urban and suburban buses, this terminal plays an important role for effective bus operations and so it is expected that there should be resting facilities for bus drivers as well as facilities for comprehensive functions. Also, based on the planned cooperation between the new urban development nearby, it is expected that this will become an attractive transport hub.

In front of Phnom Penh station, in the future an intermodal transport hub for the future railway as well as the rail-based urban public transit system is required. However, for the time being, the space will need to be constructed as a transfer point for buses to help facilitate the convenience of using the bus.

Table 6 Bus Related Infrastructure

Facility	Place	Required Standard	Phase	Remark
Depot	Phnom Penh Port	- Accommodate about 120 buses - Area: about 2.5 to 3.0 ha - Because it will locate in city centre, necessity minimum is to be developed.	I	
	Mean Chey	- Advanced development assuming future expansion. - Accommodate about 300 buses (long term) - Required area: 4.0 to 5.0 ha	I	Required area includes training facilities
Maintenance Facility, Rest Area Training Facility	Mean Chey	- Possible to conduct advanced periodic inspection. - Car wash - Training facility	I	Equipment will be provided by Japan
	Phnom Penh Port	- Facilities mainly for daily inspection - Car wash	I	Equipment will be provided by Japan
	ING Holding	- Parking space with about 30 lots - Rest space for operator (driver / conductor)	I	Ensure the diagram efficiency
Bus Terminal	Phnom Penh Port	- Origin / Destination of 7 routes, intermodal facilities	I	
	Night Market	- Origin / Destination of 7 routes, intermodal facilities	I	
	PP Railway Station	- Origin / Destination of 8 routes (including planned railway) - Terminal in city centre (to be concerned about traffic management)	I	
	ING Holding	- Terminal in southern core (7 routes) - Coordination with urban development	I	
	Old Stadium	- Transfer among 4 routes	I	

	KM9	- Origin / Destination of 1 routes - P& R facility (to be discussed)	I	
	Takmao Market	- Origin / Destination of 1 routes - P& R facility (to be discussed)	I	
	Oknha Sophan	- Origin / Destination of 1 routes - P& R facility (to be discussed)	I	
	Chom Chav Rab	- Origin / Destination of 1 routes	I	
	Phnom Penh Airport	- Origin / Destination of 1 routes - Coordination with airport facility	II	
	AEON Mall	- Origin / Destination of 1 routes - Coordination with commercial facility	II	
Bus Stops	Route Id: ①②③	- 100 stops (excluding terminal) - Assumed average interval : 500 m	I	
	Route Id: ④⑥	- 130 stops (excluding terminal) - Assumed average interval : 500 m	I	
	Route Id: ⑦⑧	- 150 stops (excluding terminal) - Assumed average interval : 500 m	II	
	Route Id: ⑤⑨⑩	- 170 stops (excluding terminal) - Assumed average interval : 500 m	II	

3.3 Plan for the Employment and Training of Staff

After the procurement of vehicles and the construction of bus infrastructure, the next item necessary is the employment and training of staff for bus operations. In particular, it is necessary to secure sufficient numbers of drivers and for safe driving, issues are training of such drivers. Following the detailed calculations, for 10 bus routes, around 410 drivers and conductors are necessary. Also, at the same time, staff for bus maintenance and bus management is also needed. It is required for the capacity of the Phnom Penh public bus company to be strengthened in order to secure and train such staff.

Table 7 Required Human Resources for Bus Operation

Phase		No. of Routes	Required drivers	New hire	Conductor	Mechanic	Staffs for Operating Control / Planning
Existing		3	90	—	90	–	20
Required Human Resources	I~II	3	198	+108	198	20	4
		4	232	+34	232		
		5	280	+48	280		
	III	7	343	+63	343	4	7
	IV	10	413	+70	413		

Note) The number of driver/ conductor is based on the assumed shift as follows.

- Working hour is 9 hours with 1 hour of break hour, 20 min of morning check and 17 min of morning check.
- Considering the absences in 1 month, required staffs = (number of shift * 1.40)

3.4 Budget Plan

From 2016 to 2020, the required labor cost, fuel cost, infrastructure construction cost for the expansion of the bus routes was estimated and is shown in Table 8. The procurement requirements were adopted as preconditions for the calculations. (See Table 3 on which usage of the Korean-made bus vehicles and in the case of increasing the bus routes from 3 -> 5 -> 7 -> 10)

For 2016, the initial investment cost will be 40% of the total investment cost as it will include the construction of bus terminals as well as the bus depot. However, for the next fiscal year, fuel costs will make up 90% of the remaining investment cost.

For the cost estimation, the following conditions were set.

- General Labor Cost: 5% inflation rate
- Labor Cost for Drivers: The current basic salary for bus drivers is US$180, it will be much less than the one of the drivers working for private bus operators. Thus it is necessary to increase their salary up to the competitive level with the private bus operators. For the cost estimation, the salary assumed to be increased to US$260.

Table 8 Estimated Expenditure for Operation of Bus Company/Development of Related Facilities

		Unit	Unit Cost (USD)	2016		2017		2018		2019		2020	
				No.	Cost (USD)	No.	Cost (USD)	No.	Cost (USD)	No.	Cost (USD)	No.	Cost (USD)
Labor	Manager	Person	510	19	125,970	19	132,269	19	138,882	19	145,826	19	153,117
	Administrative	Person	280	19	69,160	19	72,618	19	76,249	38	160,123	38	168,129
	Operating Control/Planning	Person	320	9	37,440	9	39,312	9	41,278	9	43,341	10	50,565
	Administrative	Person	280	24	87,360	24	91,728	24	96,314	24	101,130	37	163,704
	Mechanic	Person	280	20	72,800	20	76,440	20	80,262	20	84,275	24	106,187
	Driver	Person	300	90	351,000	198	810,810	280	1,203,930	280	1,264,127	413	1,957,816
	Condutor	Person	150	90	175,500	198	405,405	280	601,965	280	632,063	413	978,908
	Others	Person	150	11	21,450	11	22,523	11	23,649	11	24,831	18	42,664
	Subtotal			282	940,680	498	1,651,104	662	2,262,528	681	2,455,716	972	3,621,090
Fuel Cost		km		2,093,640	872,350	2,093,640	858,010	2,670,880	824,208	3,550,560	1,034,583	4,686,965	1,406,090
Maintenance		–	500/ 800	57	547,200		534,400		451,200		480,000		790,000
Facility	Depot	M^2	150	40000	6,000,000								
	Terminal	M^2	10	3000	30,000	5,000	50,000	5,000	50,000				
	Depreciation	Unit				30,000		30,000	2,000,000	30000	3,012,500	30,000	4,200,000
	Bus Stop (Pole type)	Stop	250	0	0	37	9,160	33	8,160	54	13,500		0
	Bus Stop	Stop	2500	0	0	9	22,900	8	20,000	13	32,500		0
	Office	M^2	300	3,000	900,000								
	Subtotal						82,060		78,160		46,000		0
Overhead Cost		–	5%		464,512		156,279		180,805		200,815		290,859
Total					9,754,742		3,281,853		3,796,901		4,217,114		6,108,039

Note: Value in 2016 is the budget amount approved by PPCH

4 Proposed Schedule for the Action Plan

Based on the basic policy, the table for the Action Plan is attached. The basic policy for the creation of the Action Plan schedule is as follows.

- Based on the speedy approval of the grant aid from Japan and a smooth procurement process for the bus vehicles after the procurement process, the first batch of bus vehicles could be delivered by November 2017 and the completion of the first phase of the procurement of bus vehicles could be completed by April 2018. These were the assumptions that were set. Together with the procurement schedule of the bus vehicles, it is assumed that construction of related bus infrastructure in Phnom Penh will be completed. In this action plan, the target is set to operate 10 bus routes by 2020 by the possible second grant aid project from Japan.
- It is based on the premise that the evaluation of the second grant aid project from Japan to be finished in 2018 and the capacity of the Phnom Penh public bus company will be improved (completion of the all the required infrastructure facilities, employment and training of all necessary drivers, establishment of the public bus company taking ownership, etc.) and the next stage of the project will be prepared for.

Also, as per the basic policy, along with the grant aid project, for the improvement of the capacity of the public bus company, it is proposed for there to be a technical cooperation project.

- JICA and the city of Phnom Penh will start the technical cooperation project from January 2017 and the project will focus on the development of manuals for drivers and the training of instructors, change in the bus operations method, building the structure for the maintenance of bus vehicles, introduction of new vehicles and operations of new bus routes.
- The new operations management will start from December 2017 and through the dispatch of Japanese experts for the technical cooperation project, through actual operations management work, technical transfer is planned.
- Together with the progress of the grant aid project, for the technical cooperation project, the following objectives were set when examining the plan.

  Phase 1: January 2017–November 2017 – start preparations for the grant aid project
  Phase 2: December 2017–May 2019 – Utilize bus vehicles and equipment from Japan to improve the basic capabilities
  Phase 3: June 2019–December 2019 – Improve bus operations management for the expansion of the bus network
  Phase 4: January 2020–June 2020 – Preparation for the Phnom Penh bus company to be able to operate independently

5 Terms of Agreement to be confirmed by the City of Phnom Penh

a. Bus Route Plan
b. Bus Vehicle Procurement Plan
c. Bus Infrastructure Construction Plan
d. Staff Employment and Training Plan
e. Budget

6 Attached Documents

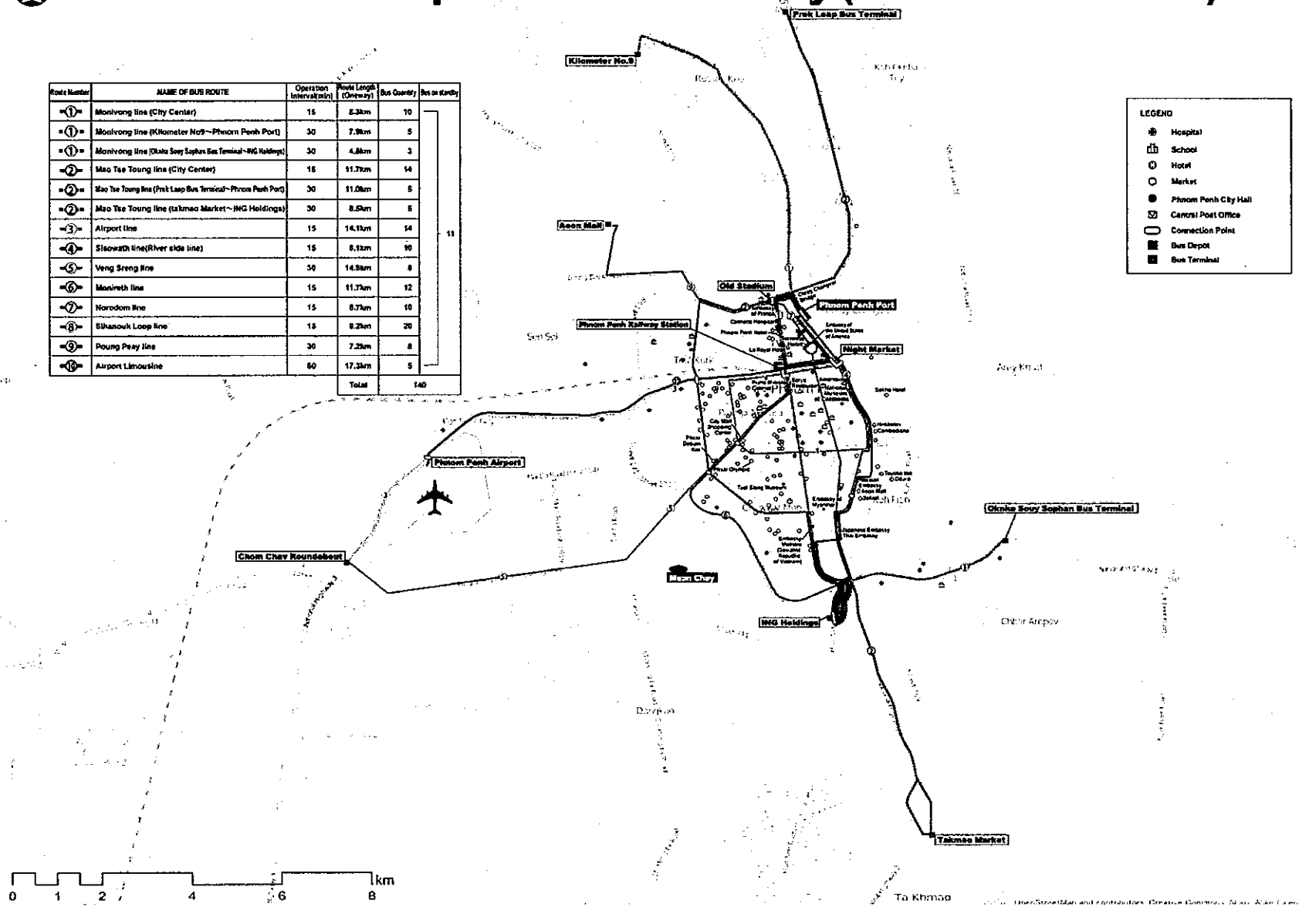
(1) Proposed Schedule for the Action Plan
(2) Current Bus Route Map and Future Bus Route Map (Proposal), 4 routes, 5 routes, 10 routes

ANNEX 2: Proposed Schedule of the Action Plan

			Tasks	2017	2018	2019	2020	Remarks
			Goal for 2020	Phase 1: Preparation of Grant Aid Accepting	Phase 2: Development of basic capability utilizing Equipment from Japan	Phase 3: Improvement of O&M for Route Expansion	Phase 4: Preparation for Independe	
A	Utilizing Existing Buses from Korea, The Bus Routes Will be Expanded in Phases as (3, 5, 7, and 10 routes(		Operating Route	3 Routes	5 Routes		7 Routes / 10 Routes	
			Required Number of Operating Buses	Required Buses (56 Buses)	Required Buses (80 Buses)		Required Buses (115 Buses) / Required Buses (140 Buses)	
			Buses from Japan (By Grant Aid)	30 Buses	65 Buses (For city centre, Related systems are ecuipped) (New 35 Buses)		140 Buses (New 25 Buses) / 140 Buses (New 40 Buses)	
			Existing Buses from Korea	50 Existing Buses	26 / 15		Completely replaced with Buses from Japan	
			Phase 1-1 (30 Buses)	(30 Buses)				
			Phase 1-2 (35 Buses)	1st Phase of Grant Aid Project	(35 Buses)			
			Equipment					
			Phase 2-1 (35 Buses)				(35 Buses)	
			Phase 2-2 (40 Buses)					(40 Buses)
			Equipment (Mainly for New Buses)					
B	All Exiting Buses from Korea will be Sold	Development of Bus Routes and Required Number of Buses	Operating Route	3 Routes	4 Routes		7 Routes / 10 Routes	
			Required Number of Operating Buses	Required Buses (56 Buses)	Required Buses (67 Buses)		Required Buses (115 Buses) / Required Buses (140 Buses)	
			Buses from Japan (By Grant Aid)	30 Buses	67 Buses (New 37 Buses)		115 Buses / 140 Buses (New 25 Buses)	
			Existing Buses from Korea	50 Existing Buses	37 / Completely replaced with Buses from Japan			
		Procurement of Vehicles and related Equipment by Grant Aid: Phase 1	Phase 1-1 (30 Buses)	(30 Buses)				
			Phase 1-2 (37 Buses)	1st Phase of Grant Aid Project	(37 Buses)			
			Equipment					
		Phase 2	Phase 2-1 (48 Buses)				(48 Buses)	
			Phase 2-2 (25 Buses)					(25 Buses)
			Equipment (Mainly for New Buses)					
	Development of Related Facilities (Budget from Phnom Penh)	Phase 1	Land Acquisition for Depot and Planning					
			Construction of Depot					
			Planning for Bus Terminal / Bus Stops					
			Construction of Bus Terminals					
			Improvement of Bus Stops					
		Phase 2	Planning for Bus Terminal / Bus Stops					
			Construction of Bus Terminals					
			Improvement of Bus Stops					
	Employment and Development of Human Resources		Training of existing Drivers (0) - 90	90				
			Employment and trainig of new Driver(1) +108	+108				
			Employment and Training of new Drivers (2) +172		+82			
			Employment and Training of new Drivers (3) +63			+63		
			Employment and Training of new Drivers (4) - 70				+70	
			Training of existing conductor +90	90				
			Employment and Training of new Conductor - 323	+108	+82	+63	+70	
			Employment and Training of new Mechanics +20	+20		+4		
			Employment of new Staffs for Management / Planning	+4		+7		
	Tasks in the Technical Cooperation Project(TCP) (Tentative)		1. Development of O&M Capacity					
			2. Development of Bus Managing Capacity					
			3. Review of Fare System and Development of Fare Collection					
			4. Development and Training of Drivers / Conductor					
			5. Capacity Development for Public Transport Policy, Facility Planning					
			5.1 Public Transport Planning					
			5.2 Traffic Management / Traffic Safety Planning					
			5.3 Related Facility Planning					
			6. System developed in TCP					
			(1) O&M System					
			(2) Commuter Pass System					
			(3) Traffic Safety System					
			(4) PTPS System					
			(5) Passenger Management System					
			(6) Bus Location System					
			(7) Provision of Information					
			(8) Call Center Management System					
	Preparation of the 2nd Phase of the Grant Aid Project		(Request for 2nd Phase of Grant Aid Project)					
			5.1 Joint Evaluation for the TCP					
			5.2 Preparation of the Preparatory Survey					
			5.3 Preparatory Survey including Evaluation					
			5.4 Appraisal and Approval, E/N and G/A					
			5.5 consultant Contract, DD, Tendering/Evaluation					
			5.6 Procurement					

Bus Route Map of Phnom Penh City (Future Plan DRAFT)

Route Number	NAME OF BUS ROUTE	Operation Interval(min)	Route Length (One-way)	Bus Quantity	Bus on standby
①-	Monivong line (City Center)	15	8.3km	10	11
①-	Monivong line (Kilometer No9~Phnom Penh Port)	30	7.9km	5	
①-	Monivong line (Okaka Souy Sophan Bus Terminal~ING Holdings)	30	4.8km	3	
②-	Mao Tse Toung line (City Center)	15	11.7km	14	
②-	Mao Tse Toung line (Prek Leap Bus Terminal~Phnom Penh Port)	30	11.0km	5	
②-	Mao Tse Toung line (takmao Market~ING Holdings)	30	8.5km	5	
③-	Airport line	15	14.1km	14	
④-	Sisowath line(River side line)	15	8.1km	10	
⑤-	Veng Sreng line	30	14.5km	8	
⑥-	Monireth line	15	11.7km	12	
⑦-	Norodom line	15	8.7km	10	
⑧-	Sihanouk Loop line	15	8.2km	20	
⑨-	Poung Peay line	30	7.2km	8	
⑩-	Airport Limousine	60	17.3km	5	
			Total	140	



Annex 4

Minutes of Discussions
on the Preparatory Survey for the Project for
Improvement of Transportation Capacity of Public Bus in Phnom Penh

In response to the request from the Government of Kingdom of Cambodia (hereinafter referred to as "Cambodia"), the Government of Japan decided to conduct a Preparatory Survey for the Project for Improvement of Transportation Capacity of Public Bus in Phnom Penh (hereinafter referred to as "the Project"), and entrusted the Preparatory Survey to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") to Cambodia, headed by Mr. Kenji MURATA, Deputy Director, Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, and is scheduled to stay in the country from 24 January to 18 February, 2016.

The Team held a series of discussions with the officials concerned of the Government of Cambodia and conducted a field survey in the Project area. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Phnom Penh, 28 January, 2016

村田 賢次

Kenji MURATA
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

H.E. PA Socheatevong
Governor
Phnom Penh Capital Hall
Cambodia

ATTACHMENT

1. Objective of the Project
   The objective of the Project is to improve traffic situation in Phnom Penh by/through enhancement of transportation capacity for public bus, thereby contributing to activate economic, social activities and environment in Phnom Penh.

2. Title of the Preparatory Survey
   Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for Improvement of Transportation Capacity of Public Bus in Phnom Penh".

3. Project Site
   Both sides confirmed that the site of the Project is in Phnom Penh, which is shown in Annex 1.

4. Line Agency and Executing Agency
   Both sides confirmed the line agency and executing agency as follows:

4-1. The line agency is Phnom Penh Capital Hall which would be the agency to supervise the executing agency.

4-2. The executing agency is City Bus Management Authority. The executing agency shall coordinate with all the relevant agencies to ensure smooth implementation of the Project and ensure that the undertakings are taken by relevant agencies properly and on time. The organization charts are shown in Annex 2.

5. Items requested by the Government of Cambodia

5-1. As a result of discussions, both sides confirmed that the items requested by the Government of Cambodia are as follows:

- 180 Bus fleets
- Maintenance Equipment and Spare parts for two years for bus fleet
- Training for Bus Operation/Management and Maintenance Engineering (Soft Component)

5-2. Both sides confirmed that appropriateness of the request will be examined in accordance with the further studies and analysis in Japan from the viewpoint of necessity, technical and financial viability and cost-effectiveness. The Cambodia

side understood that the quantities and specifications of requested items, therefore, may not be accepted as final components of the Project.

5-3. JICA will assess the appropriateness of the above requested items through the survey and will report findings to the Government of Japan. The final components of the Project would be decided by the Government of Japan.

6. Japanese Grant Scheme

6-1. The Cambodian side understands the Japanese Grant Scheme and its procedures as described in Annex 3, 4 and 5, and necessary measures to be taken by the Government of Cambodia.

6-2. The Cambodian side understands to take the necessary measures, as described in Annex 6 for smooth implementation of the Project, as a condition for the Japanese Grant to be implemented. The detailed contents of the Annex 6 will be worked out during the survey and shall be agreed no later than by the Explanation of the Draft Preparatory Survey Report.

The contents of Annex 6 will be used to determine the following:

(1) The scope of the Project.

(2) The timing of the Project implementation.

(3) Timing and possibility of budget allocation.

Contents of Annex 6 will be updated as the Preparatory Survey progresses, and will finally be the Attachment to the Grant Agreement.

7. Schedule of the Survey

7-1. The Team will proceed with further survey in Cambodia until 18 February 2016.

7-2. JICA will dispatch a mission to Cambodia in order to discuss and finalize the Operation and Maintenance Plan and the Five-year Action Plan in around April 2016.

7-3. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Cambodia in order to explain its contents in around July 2016.

7-4. If the contents of the draft Preparatory Survey Report is accepted in principle and the undertakings are fully agreed by the Cambodia side, JICA will complete the final report in English and send it to Cambodia in around September 2016.

7-5. The above schedule is tentative and subject to change.

8. Environmental and Social Considerations

8-1. The Cambodian side confirmed to give due environmental and social

Management Authority. According to the letter from Ministry of Economy and Finance dated May 25, 2015, and the Article 31 of Statute of City bus, City Bus Management Authority may be transformed to the Public Enterprise in the form of state-company or multi-company at around 2018, or dissolved in case deficit continues for a certain period. The Japanese side pointed out that any transformation and/or dissolution of City Bus Management Authority shall affect the implementation of the Project.

The Cambodian side explained that Phnom Penh Capital Hall and the government of Cambodia have no plan to dissolve City Bus Management Authority. The Cambodian side also explained that even though City Bus Management Authority will be transformed to the Public Enterprise, new organization must follow Royal Decree No. CS/RKM/0696/03 dated 17 June 1996 on general status of Public Enterprise.

The Cambodian side has strong intention to upgrade the capacity and services of City Bus Management Authority in conformity with the urban transport master plan 2035.

9-4. Tax Exemption

The Cambodian side agreed that customs duties, internal taxes and other fiscal levies which may be imposed in Cambodia are exempted under mutual agreement of Exchange of Note (E/N). If any expenses stated above are caused by some reasons such as the delay of execution of tax exemption, the Cambodia side shall pay for it temporarily.

9-5. Undertakings of the Cambodian side

The Cambodian side shall, at its own expenses, provide the Team with the following items in cooperation with City Bus Management Authority and other organizations concerned.

(1) Security-related information as well as measures to ensure the safety of the Team;
(2) Information as well as support in obtaining medical service;
(3) Data and information related to the Preparatory Survey;
(4) Counterpart personnel;
(5) Suitable office space with necessary equipment and services;
(6) Credentials or identification cards;
(7) Entry permits necessary for the Team to conduct field surveys

Annex 1 Project Site
Annex 2 Organization Chart
Annex 3 Japanese Grant
Annex 4 Flow Chart of Japanese Grant Procedures
Annex 5 Financial Flow of Japanese Grant
Annex 6 Major Undertakings to be taken by Each Government
Annex 7 Project Monitoring Report (template)

Minutes of Discussions
on the Preparatory Survey for the Project for
Improvement of Transportation Capacity of Public Bus in Phnom Penh
(Explanation on Draft Preparatory Survey Report)

On the basis of the discussions and field surveys in the Kingdom of Cambodia (hereinafter referred to as "Cambodia") in January and April 2016, and the technical examinations in Japan, the Japan International Cooperation Agency (hereinafter referred to as "JICA") prepared a draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") on the Project for Improvement of Transportation Capacity of Public Bus in Phnom Penh (hereinafter referred to as "the Project").

In order to explain the Draft Report and to consult with the concerned officials of the Government of Cambodia on its contents, JICA dispatched the Preparatory Survey Team (hereinafter referred to as "the Team"), headed by Ms. Satoko Tanaka, Director, Team 2, Transportation and ICT Group, Infrastructure and Peacebuilding Department, JICA, to Cambodia, and is scheduled to stay in the country from 13 July to 22 July 2016. The Team visited Phnom Penh Capital Admimistration and Phnom Penh City Bus Authority during their stay.

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

Phnom Penh, 21 July 2016

Satoko Tanaka
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Authority Name
Deputy Governor
Phnom Penh Capital Administration
Cambodia

ATTACHMENT

1. Objective of the Project

   The objective of the Project is to improve traffic situation in Phnom Penh by/through enhancement of transportation capacity for public bus, thereby contributing to activating economic, social activities and environment in Phnom Penh.

2. Project Sites

   Both sides confirmed that the Project site is Phnom Penh Capital City, which is shown in Annex 1.

3. Executing Agency and Implementing Agency

   Both sides confirmed the executing agency and the implementing agency as follows:

   3-1. The executing agency is Phnom Penh Capital Administration (hereinafter referred to as "PPCA"), which would be the agency to supervise the implementing agency and to coordinate with all the relevant agencies to ensure smooth implementation of the Project and ensure that the undertakings are taken by relevant agencies properly and on time.

   3-2. The implementing agency is Phnom Penh City Bus Authority (hereinafter referred to as "CBA"). CBA is the agency to operate public bus of the Project.

4. Contents of the Draft Report

   After the explanation of the contents of the Draft Report on the Project by the Team, the both sides agreed in principle to its contents.

5. Cost Estimation

   Both sides confirmed that the Project cost estimation described in Annex 2 was provisional and would be examined further by the Government of Japan for its final approval.

6. Confidentiality of the Cost Estimation and Specifications

   Both sides confirmed that the Project cost estimation and technical specifications in the Draft Report should never be duplicated or disclosed to any third parties until all the contracts of the Project are concluded.

7. Japanese Grant Scheme

The Cambodian side understood the Japanese Grant scheme, Japanese Grant procedures and financial flow of Japanese Grant Aid as described in Annex 3, Annex 4 and Annex 5.

8. Project Implementation Schedule

The Team explained to the Cambodian side that the expected implementation schedule is as attached in Annex 6.

9. Expected Outcomes and Indicators

Both sides agreed that key indicators for expected outcomes are as follows. The Cambodian side has responsibility to monitor the progress of the indicators and achieve the target in year 2021.

[Quantitative Effect]

Indicators	Baseline (in 2016)	Target (in 2021, 3 years after completion of the Project)
Number of bus routes	3	10
Bus service rate (%)	67.5	100
Running distance (km/day, total buses)	4,386	8,830
Volume of transportation (thousand persons-km/day)	219	329
Vehicle operating ratio (%)	75	90
Number of passengers (passenger/day)	8,133	40,000
Rate of traffic acccidents (Number of traffic acccidents/100,000km)	2.68	1.34.

*"Bus service rate" = "Actual number of running buses"/"Projected number of running buses"

*"Vehicle opeating ratio" = "Number of operating vehicles"/"Number of total buses"

*"Rate of traffic accidents" = "Number of traffic accidents"/"Running distance (per 100,000km)"

[Qualitative Effect]

a) Mitigation of traffic congestion on the bus routes
b) Enhancing citizens' preference for public transportation through improvement of public bus services
c) Providing inexpensive and safe public transportation by CBA
d) Broadening the scope of activities for the disadvantaged people in terms of movement

10. Undertakings Taken by Both Sides

Both sides confirmed the undertakings described in Annex 7. The main points of Annex 7 are written below.

- By the end of November 2016, the permission to use the land for Bus Maintenance Shops and Depots shall be obtained, and allocation of the necessary budget for construction of the related facilities, hiring staffs including drivers and conductors required for the Project, and payment of bank service charges shall be completed by the Cambodian side. The letter for the permission to use the land shall be submitted by PPCA to JICA as soon as possible (hopefully within one month) but not later than the end of November 2016.
- At the stage of the first delivery, construction of 2 Bus Maintenance Shops, including 1 drivers training center, and 2 Bus Depots, and hiring and training of the new staffs are the prerequisite for providing 30 buses and maintenance equipment.
- At the stage of the second delivery, hiring and training of additinal staffs are required for providing 50 buses.

In addition to Annex 7, the Cambodian side agreed on the following conditions.

- With respect to the permission to use the land, at least two locations shall be secured for construction of depots exclusively for the Project as soon as possible (hopefully within one month) but no later than the end of November 2016. One depot, the area of which is around 2.5 ha, should be located within 1 km from the port on the west side of Tonle Sap River. The other depot, the area of which is around 2.5 ha, should be located around on the proposed bus route No.6. The Cambodian side explained that it would seek for land for depots which do not require resettlement. Moreover, both sides agreed that the timing for tenders needs to be postponed in case the Project is categorized as Category A or B under 'JICA Guidelines for Environmental and Social Considerations

(April 2010)' due to requirement of resettlement or whatever reasons, because additional survey for social and environmental consideration and submission of environmental checklist as per Annex 10 are required.

- The right of land use of two depots shall be transferred from its owner to CBA after leveling of the lands for construction is completed by April 2017. The Japanese side stressed that the location of depots are closely linked to the bus operation plan and therefore the change of their location from the current plan may negatively affect an overall effectiveness of the Project. In response, the Cambodian side acknowledged the concern raised by the Japanese side and committed to pursue the permission to use the land for two depots including seeking permission from the Prime Minister's Office as per the proposed depot locations and handover schedule mentioned above.
- It was further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage. Contents of Annex 7 will be updated as the Detailed Design progresses.

11. Monitoring during the Implementation

The Project will be monitored every six month by the implementing agency and using the Project Monitoring Report (PMR) described in Annex 8.

12. Ex-Post Evaluation

JICA will conduct ex-post evaluation three years after the project completion with respect to five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, and Sustainability) of the Project. Results of the evaluation will be publicized. The Cambodian side is required to provide necessary support for ex-post evaluation by JICA.

13. Schedule of the Study

JICA will complete the Final Report of the Preparatory Survey in accordance with the items confirmed and send it to the Cambodian side around in September 2016.

14. Environmental and Social Considerations

The project is likely to have minimal adverse impact on the environment under the 'JICA Guidelines for Environmental and Social Considerations (April 2010)'. However, if the Project turns out to fall under Category A or B, the Cambodian side shall submit an enviromental checklist as soon as possible (ref. paragraph 8).

15. Other Relevant Issues

15-1 No duplication of use of the equipment from any sources including the Chinese Government

The Japanese side explained that it was informed in sudden during the mission by Ministry of Economy and Finance that 100 buses for Phnom Penh City provided by the Chinese Government would arrive in Cambodia in September 2016.

The Cambodian side explained that PPCA itself has not been aware of such update, although the following understanding as per Attachment 9-1 of the M/D of the First Field Survey, signed on 28 January, 2016, still remains valid:

"Both sides confirmed that the buses to be procured by the Project will be used for inner-city transportation in Phnom Penh. The Cambodian side explained that 100 buses that are expected to be provided by the Chinese Government may be temporarily used for inner-city transportation until the installation of the buses to be procured by the Project. After the installation of Japanese buses, the Chinese buses are expected to be used for inter-city lines."

The Cambodian side further explained that, upon the arrival of Chinese buses, (1) around half of 100 buses would replace the current buses and it would start hiring drivers and conductors for additional buses; and (2) two existing and two new depots, different from those to be secured for the Project mentioned in paragraph 10, are expected to accommodate these additional buses.

The Cambodian side reconfirmed that arrival of these buses will not affect the Cambodian side's undertakings for the Project including recruitment of new staff described in Annex 7, while acknowledging the explanation by the Japanese side that two new depots required for the Project would be able to accommodate 140 buses and related facilities only required for operating 10 bus routes by 2020. The Cambodia side requested the Japanese side to provide a brief idea on expected area of lands for depots for additional buses required for operating further bus routes as per the 2035 Master Plan. The Japanese side took note of it and expressed such additional depots can be located in suburb area of Phnom Penh.

15-2 Process for Phase 2

Japan's Grant Aid for Phase 2 would be decided by the Government of Japan after a Joint Evaluation by the Japanese Side and Cambodian Side. The evaluation would

be expected to be held at the middle of 2018 and conducted based on the following items.

- The progress of construction works including Depots, Maintenance Shops, Bus Terminals and Bus Stops required for Phase 1 with Cambodian budget.
- Employing necessary number of new staffs including Bus Drivers, Bus Conductors, Mechanics and Operating and Planning Officers, required to operate the respective number of buses with Cambodian budget.
- The progress and performance of proposed Technical Cooperation Project in Phase 1, for example, bus operation record and bus maintenance record etc.,.

This process for Phase 2 was agreed on attachment 1-2 and 1-3 of M/D of the Second Field Survey, signed on 22 April, 2016, and reconfirmed by the Cambodian side this time.

15-3 Operation and Maintenance of the Equipment

The Team explained the importance of operation and maintenance of the equipment provided by the Project considering that proper asset management impacts greatly on life-span of the facilities and its maintenance cost. The Cambodian side shall secure enough staff and budgets necessary for appropriate operation and maintenance of the equipment for the Project, in addition to staff and budget necessary for other new projects. The annual operation and maintenance costs are shown in Annex 9.

15-4 Safety Measures

To avoid accidents on site during the implementation of the Project, the Cambodian side agreed to take and cause the consultant and the contractor to take safety measures such as setting safety assurance to the site, providing information for security control to public, and deploying adequate security personnel, based on "The Guidance for the Management of Safety for Construction Works in Japanese ODA Projects" which has been published on JICA's URL below.

http://www.jica.go.jp/activities/schemes/oda_safety/ku57pq00001nz4eu-att/guidance_en.pdf

15-5 Misconduct

If JICA receives information related to suspected corrupt practice or fraudulent practices in the implementation of the Project, CBA and relevant organizations will provide JICA with such information as JICA may reasonably request, including information related to any concerned official of the government and/or public organizations of Cambodia.

CBA and relevant organizations will not, unfairly or unfavorably treat the person and/or company which provided the information related to suspected corrupt or fraudulent practices in the implementation of the Project.

15-6 Disclosure of Information

Both sides confirmed that the study results excluding the Project cost will be disclosed to the public after completion of the Preparatory Survey. All the study results including the project cost will be disclosed to the public after all the contracts for the Project are concluded.

Annex 1: Project Sites
Annex 2: Project Cost Estimation
Annex 3: Japanese Grant
Annex 4: Flow Chart of Japanese Grant Procedures
Annex 5: Financial Flow of Japanese Grant
Annex 6: Project Implementation Schedule
Annex 7: Major Undertakings to be taken by Each Government
Annex 8: Project Monitoring Report (PMR)
Annex 9: Operation and Maintenance Cost
Annex 10: Environmental Checklist

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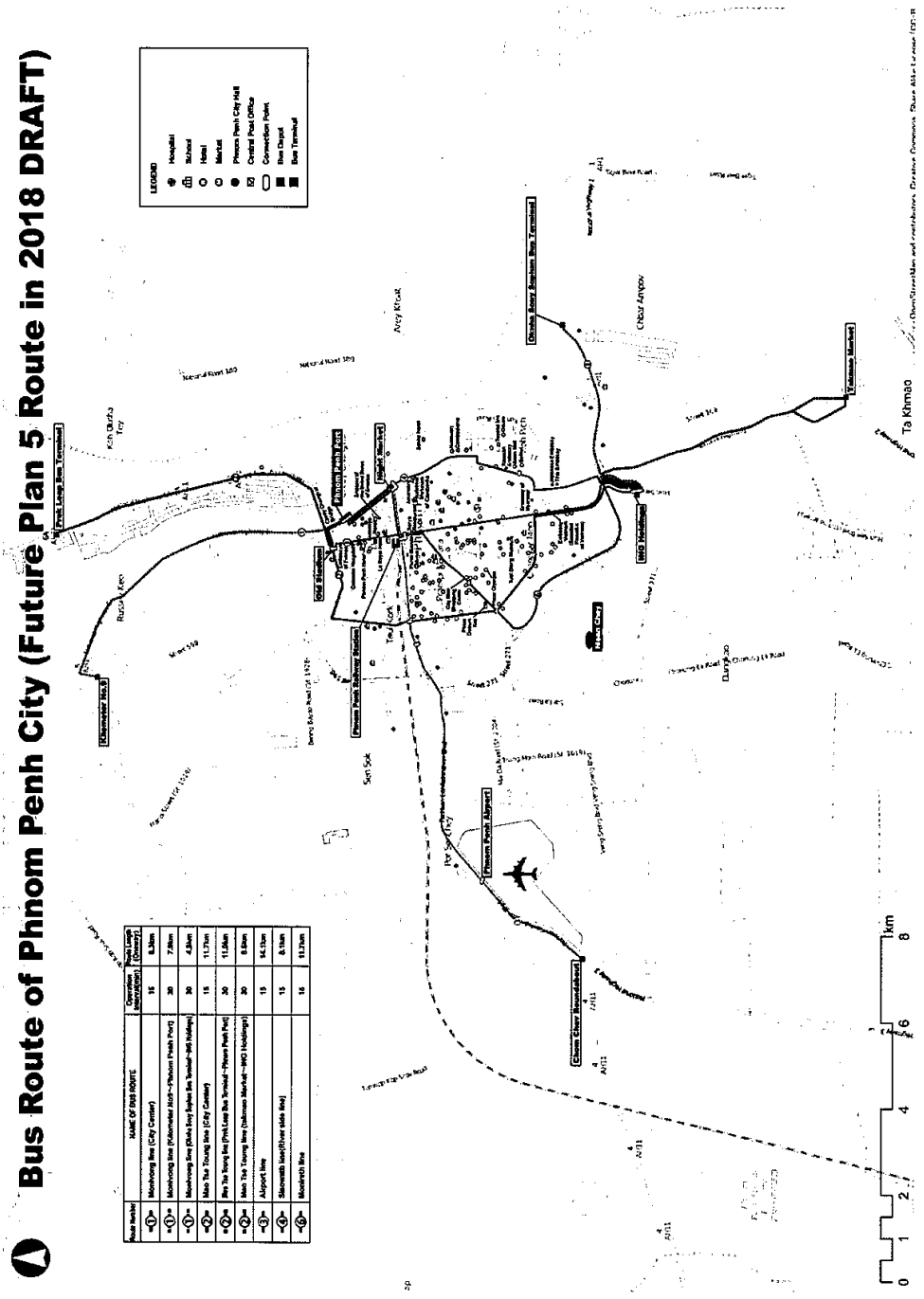
Annex 1

Bus Route of Phnom Penh City (Future Plan 5 Route in 2018 DRAFT)



Bus route	NAME OF BUS ROUTE	Operation interval(min)	Route Length (One-way)
①-	Monivong line (City Center)	15	5.3km
①+	Monivong line (Kilometer 6kM→Phnom Penh Port)	30	7.8km
①-	Monivong line (PNH Svay Sphea Bus Terminal→BIG Holdings)	30	4.8km
②-	Mao Tse Toung line (City Center)	15	11.7km
②+	Mao Tse Toung line (PNH Loop Bus Terminal→Phnom Penh Port)	30	11.8km
③+	Mao Tse Toung line (Veal Vong Market→BIG Holdings)	30	8.6km
③-	Airport line	15	14.1km
④-	Sisowath line(River side line)	15	8.1km
④+	Monivong line	15	11.2km

PROJECT SITES

CONFIDENTIAL

Annex 2

PROJECT COST ESTIMATION

This page is closed due to the confidentiality

2) Others

The project is implemented in accordance with the system of Japanese Grant. The above cost estimation does not assure the ceiling cost on the E/N and will be reviewed by the

Government of Japan before the conclusion of E/N between the two governments. Cost estimate borned by the Government of Cambodia mentioned above is provisional, and requires review for implementation.

Annex 3

JAPANESE GRANT

The Japanese Grant (hereinafter referred to as the "Grant") 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 is not supplied through the donation of materials as such.

Based on the JICA law which was entered into effect on October 1, 2008 and the decision of the GOJ, JICA has become the implementing agency of the Japanese Grant for Projects for construction of facilities, purchase of equipment, etc.

1. Grant Procedures

The Grant 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 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 an 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 project. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant 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) 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. Japanese Grant 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 singed 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, in accordance with the E/N, 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 Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. The Grant may be used for the purchase of the products or services of a third country, if necessary, taking into account the quality, competitiveness and economic rationality of products and services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals", in principle.

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals, in principle. 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 Project, the recipient country is required to undertake such necessary measures as Annex. The Japanese Government requests the Government of the recipient country to exempt all customs duties, internal taxes and other fiscal levies such as VAT, commercial tax, income tax, corporate tax, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract, since the Grant fund comes from the Japanese taxpayers.

(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, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant.

(7) "Export and Re-export"

The products purchased under the Grant 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"), in principle. JICA will execute the Grant 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) Environmental and Social Considerations

The Government of the recipient country must carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the recipient country and JICA Guidelines for Environmental and Social Consideration (April 2010) .

(11) Monitoring

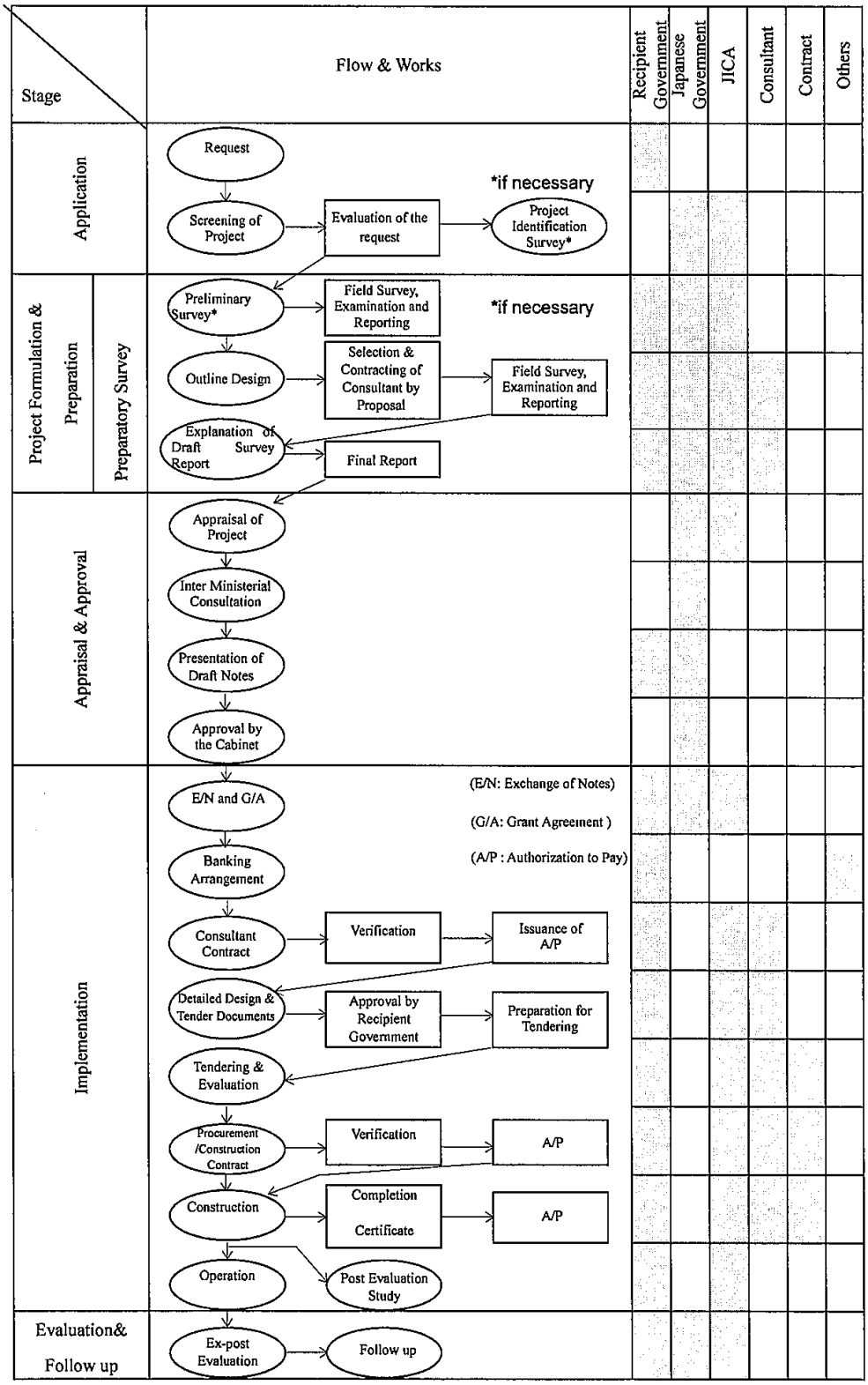
The Government of the recipient country must take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and must regularly report to JICA about its status by using the Project Monitoring Report (PMR).

(12) Safety Measures

The Government of the recipient country must ensure that the safety is highly observed during the implementation of the Project.

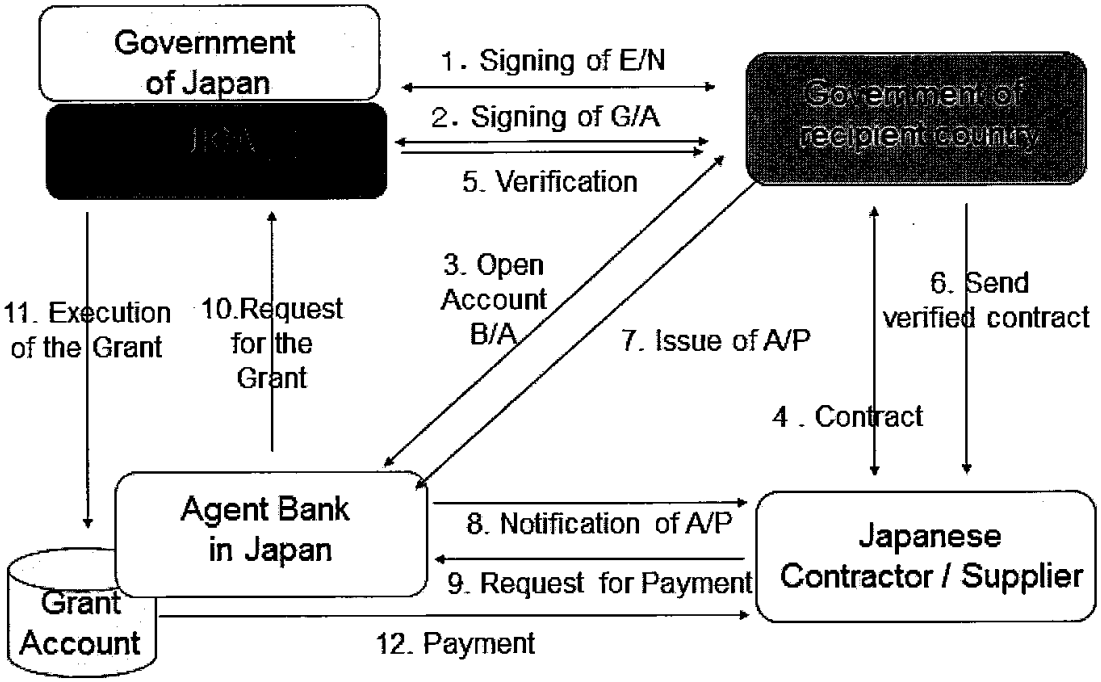
Annex 4

FLOW CHART OF JAPANESE GRANT PROCEDURES



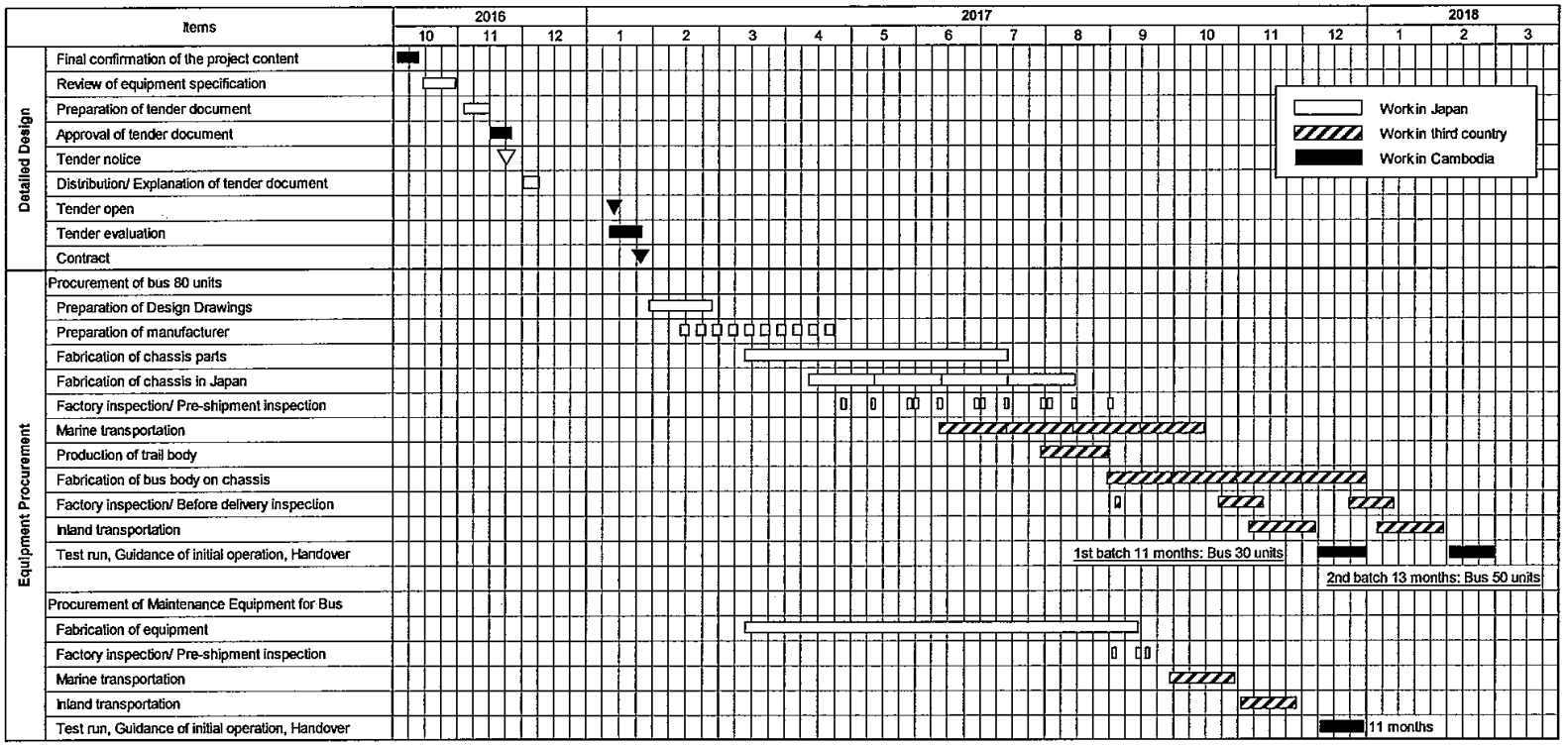
Annex 5

FINANCIAL FLOW OF JAPANESE GRANT AID (AUTHORIZATION TO PAY (A/P) TYPE)



Annex 6

PROJECT IMPLEMENTATION SCHEDULE



*The schedule above is as of 19 July, 2016, and subject to change depending on the progress of the Project.

Annex 7

MAJOR UNDERTAKINGS TO BE TAKEN BY EACH GOVERNMENT

Major Undertakings to be taken by Recipient Government

1. Before the Tender

No	Items	Deadline	In charge	Cost (Thousand USD)	Ref.
1	To open Bank Account (Banking Arrangement (B/A))	October 2016 (within 1 month after G/A)	MEF	---	
2	To obtain the permission to use the land for depots and maintenance shops	November 2016 (before notice of the tender document)	PPCA	---	
3	To secure the necessary budget for development of the related facilities, salaries and bank transaction fee	November 2016 (before notice of the tender document)	PPCA	---	

2. During Procurement

No	Items	Deadline	In charge	Cost (Thousand USD)	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		CBA	24	
	1) Advising commission of Authorization to Pay (A/P)	within 1 month after the signing of the contract	CBA	---	
	2) Payment commission for A/P	every payment	CBA	---	
2	To ensure prompt unloading, customs clearance and internal transportation in the recipient country	during the Project	PPCA	---	
3	To accord the 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 under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project	PPCA coordinate with relevant authorities	---	
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be borne by its designated authority without using the Grant. Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract.	during the Project	PPCA coordinate with relevant authorities	---	
5	To bear necessary expenses, other than those to be borne by the Grant Aid.	during the Project	PPCA	---	
6	The right of land use of two depots shall be transferred from its owner to CBA after leveling of the lands for construction is completed.	April 2017	PPCA	---	

3. Before the First Delivery (30 Buses and Maintenance equipment for two maintenance shops)

No	Items	Deadline	In charge	Cost (Thousand USD)	Ref.
1	To construct 2 operation offices, 2 depots, 2 maintenance shops, 2 fuel stands and 1 training facility for improving skills of drivers	December 2017 (Before provision of equipment)	CBA	6,000	
2	To install main office of Bus Management Authority	December 2017 (Before provision of equipment)	CBA	900	
3	To provide facilities for distribution of electricity, gas, water supply and drainage and other incidental facilities necessary for equipment and facilities	December 2017 (Before provision of equipment)	CBA	---	
4	To construct bus terminals and bus stops (pole type, with roof and chair type)	December 2017 (Before provision of equipment)	CBA	190	
5	To recruit and train fresh crews including 108 drivers, 108 conductors and 20 mechanics exclusively for the Project	December 2017 (Before provision of equipment)	CBA	54	
6	To carry out installation work for bus maintenance equipment, including use of heavy vehicle and construction of necessary water pipeline, electricity distribution line and equipment foundation	During provision of equipment	CBA	50	
7	To cover other cost such as uniform for drivers and conductors, and vehicles for operation and maintenance	During provision of equipment	CBA	150	
8	To repair facilities in the maintenance shops under the instruction of purchasing company, in case of any deficit	During provision of equipment	CBA	---	
9	To submit the monitoring results to JICA, by using the monitoring form, every six months as a part of Project Monitoring Report	During the Project	CBA	---	

4. Before the Second Delivery (50 Buses)

No	Items	Deadline	In charge	Cost (Thousand USD)	Ref.
1	To recruit and train fresh crews including 82 drivers and 82 conductors exclusively for the Project	February 2018 (Before provision of equipment)	CBA	37	

5. After Deliveries

No	Items	Deadline	In charge	Cost (Thousand USD)	Ref.
1	To secure personnel and budget to operate the granted buses and maintenance equipment in an appropriate and effective manner	After provision of equipment	CBA	---	

*The deadlines filled in the tables above are as of 19 July, 2016, and subject to change depending on the progress of the Project.

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Annex 8

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX
Month 20XX

Organization Information

Authority (Signer of the G/A)	Person in Charge _____ Division _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Implementing Agency	Person in Charge _____ Division _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	Person in Charge _____ Division _____ Contacts Address: _____ Phone/FAX: _____ Email: _____

Outline of Grant Agreement:

Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____
Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:

1: Project Description

1-1 Project Objective

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

1-3 Effectiveness and the indicators

- Effectiveness by the project

Quantitative Effect (Operation and Effect indicators)		
Indicators	Original (Yr)	Target (Yr)
Qualitative Effect		

2: Project Implementation

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	**Original:** *(M/D)* **Attachment(s):Map**	**Actual:** *(PMR)* **Attachment(s):Map**

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
(M/D) 'Soft component' shall be included in 'Items'.	*(M/D)*	*(PMR)* Please state not only the most updated schedule but also other past revisions chronologically. All change of design shall be recorded regardless of its degree.

2-1-2 Reason(s) for the modification if there have been any

(PMR)

2-2 Implementation Schedule
2-2-1 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
(M/D) 'Soft component' shall be stated in the column of 'Items'. Project Completion Date*	*(M/D)*		*(PMR)* As of (Date of Revision) Please state not only the most updated schedule but also other past revisions chronologically.

*Project Completion was defined as _____ at the time of G/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project

2-3 Undertakings by each Government
2-3-1 Major Undertakings
See Attachment 2.

2-3-2 Activities
See Attachment 3.

2-4 Project Cost
2-4-1 Project Cost

Table 2-4-1a Comparison of Original and Actual Cost by the Government of Japan
(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Procurement Equipment	'Soft component' shall be included in 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Consulting Services	- Detailed design -Procurement			

	Management -Construction Supervision			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

Table 2-4-1b Comparison of Original and Actual Cost by the Government of Cambodia

Items			Cost (Million USD)	
	Original	Actual	Original	Actual
				Please state not only the most updated schedule but also other past revisions chronologically.
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = (local currency)

2-4-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results

(PMR)

2-5 Organizations for Implementation

2-5-1 Implementing Agency:

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original: (M/D)
Actual, if changed: (PMR)

2-6 Environmental and Social Impacts

- The results of environmental monitoring as attached in Attachment 5 in accordance with Schedule 4 of the Grant Agreement.
- The results of social monitoring as attached in Attachment 5 in accordance with Schedule 4 of the Grant Agreement.

- Information on the disclosed results of environmental and social monitoring to local stakeholders, whenever applicable.

3: Operation and Maintenance (O&M)

3-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original: (M/D)
Actual: (PMR)

3-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original: (M/D)

4: Precautions (Risk Management)

- Risks and issues, if any, which may affect the project implementation, outcome, sustainability and planned countermeasures to be adapted are below.

Original Issues and Countermeasure(s): *(M/D)*	
Potential Project Risks	Assessment
1.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):

2.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
3.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(PMR)	

5: Evaluation at Project Completion and Monitoring Plan

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan for the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Undertakings to be taken by each Government
3. Monthly Report
4. Report on RD
5. Environmental Monitoring Form/Social Monitoring Form
6. Monitoring sheet on price of specified materials
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (Final Report Only)

Annex 9

ANNUAL INCREMENTAL OPERATION AND MAINTENANCE COSTS BY THE PROJECT

		Unit	Price (USD)	2016		2017		2018		2019		2020	
				Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Salary	Management	Person	510	19	125,070	19	132,260	19	138,882	19	145,826	19	153,117
	Admin at HQO	Person	280	19	69,160	19	72,618	19	76,249	38	160,123	38	168,129
	Car Controller	Person	320	9	37,440	9	39,312	9	41,278	9	43,341	10	50,560
	Admin at Site Office	Person	280	24	87,360	24	91,728	24	96,314	24	101,130	37	163,704
	Mechanics	Person	280	20	72,800	20	76,440	20	80,262	20	84,275	24	106,187
	Drivers	Person	300	90	351,000	198	510,610	260	1,203,930	280	1,264,127	413	1,957,810
	Conductors	Person	150	90	175,500	198	405,405	260	601,965	280	632,063	413	978,905
	Others (Cleaners)	Person	150	11	21,450	11	22,523	11	23,649	11	24,831	16	42,064
	Total			282	940,680	498	1,651,104	662	2,282,528	681	2,455,716	972	3,621,099
Fuel	LPG	US$/l	0.025	2,144,010	893,338	2,221,163	925,480	531,051	221,271				
	Diesel	US$/l	0.75			54,267	16,277	2,321,599	696,480	3,693,630	1,078,089	4,730,035	1,419,011
	Total				893,338		941,756		917,751		1,078,089		1,419,011
Maintenance	Koreen Bus	Vehicle	900	57	547,200		522,400		93,200				
	Japanese Bus	Vehicle	500				15,000		390,000		490,000		790,000
	Total				547,200		537,400		483,200		490,000		790,000
Facilities	Depot and others*	LS	1	6,000,000	6,000,000								
	Terminal	US$/M^2	10	3000	30,000	5000	50,000	5000	50,000				
	Depreciation	US$/Vehicle				15000		15000	950,000	15000	1,506,250	15000	2,100,000
	Bus Stops (Pole type)	US$/Stop	250	0	0	37	9160	33	8160	54	13500		0
	Bus Stops (Roof & Chair type)	US$/Stop	2500	0	0	9	22000	8	20000	13	32500		0
	Main Office Building	US$/M^2	300	3000	900,000								
	Total				6,930,000		82,060		1,028,160		1,552,250		2,100,000
Others**		Set	5%		465,501		160,610		193,062		202,980		291,600
Grand Total					9,778,778		3,372,038		4,657,721		5,789,045		8,221,600

Environmental Checklist: 19. Other Infrastructure Projects (1)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) (b) (c) (d)	(a) (b) (c) (d)
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) (b)	(a) (b)
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a)	(a)
2 Pollution Control	(1) Air Quality	(a) Do air pollutants, (such as sulfur oxides (SOx), nitrogen oxides (NOx), and soot and dust) emitted from the proposed infrastructure facilities and ancillary facilities comply with the country's emission standards and ambient air quality standards? Are any mitigating measures taken? (b) Are electric and heat source at accommodation used fuel which emission factor is low?	(a) (b)	(a) (b)
	(2) Water Quality	(a) Do effluents or leachates from various facilities, such as infrastructure facilities and the ancillary facilities comply with the country's effluent standards and ambient water quality standards?	(a)	(a)
	(3) Wastes	(a) Are wastes from the infrastructure facilities and ancillary facilities properly treated and disposed of in accordance with the country's regulations?	(a)	(a)
	(4) Soil Contamination	(a) Are adequate measures taken to prevent contamination of soil and groundwater by the effluents or leachates from the infrastructure facilities and the ancillary facilities?	(a)	(a)
	(5) Noise and Vibration	(a) Do noise and vibrations comply with the country's standards?	(a)	(a)
	(6) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a)	(a)
	(7) Odor	(a) Are there any odor sources? Are adequate odor control measures taken?	(a)	(a)

Annex 10

Environmental Checklist: 19. Other Infrastructure Projects (2)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
3 Natural Environment	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a)	(a)
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) Is there a possibility that changes in localized micro-meteorological conditions, such as solar radiation, temperature, and humidity due to a large-scale timber harvesting will affect the surrounding vegetation? (d) Is there a possibility that the amount of water (e.g., surface water, groundwater) used by the project will adversely affect aquatic environments, such as rivers? Are adequate measures taken to reduce the impacts on aquatic environments, such as aquatic organisms?	(a) (b) (c) (d)	(a) (b) (c) (d)
	(3) Hydrology	(a) Is there a possibility that hydrologic changes due to the project will adversely affect surface water and groundwater flows?	(a)	(a)
	(4) Topography and Geology	(a) Is there a possibility the project will cause large-scale alteration of the topographic features and geologic structures in the project site and surrounding areas?	(a)	(a)
4 Social Environment	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Is the compensations going to be paid prior to the resettlement? (e) Is the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the impacts of resettlement? (j) Is the grievance redress mechanism established?	(a) (b) (c) (d) (e) (f) (g) (h) (i) (j)	(a) (b) (c) (d) (e) (f) (g) (h) (i) (j)

Environmental Checklist: 19. Other Infrastructure Projects (3)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?	(a)	(a)
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a)	(a)
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken? (b) Is there a possibility that landscape is spoiled by construction of high-rise buildings such as huge hotels?	(a) (b)	(a) (b)
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) (b)	(a) (b)
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) (b) (c) (d)	(a) (b) (c) (d)

Environmental Checklist: 19. Other Infrastructure Projects (4)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) (b) (c)	(a) (b) (c)
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) (b) (c) (d)	(a) (b) (c) (d)
6 Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Roads, Railways and Bridges checklist should also be checked (e.g., projects including access roads to the infrastructure facilities). (b) For projects, such as installation of telecommunication cables, power line towers, and submarine cables, where necessary, pertinent items described in the Power Transmission and Distribution Lines checklists should also be checked.	(a) (b)	(a) (b)
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a)	(a)

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.
In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).
2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.

Annex 1
G/A NO.
PMR prepared on 04/09/2016

Project Monitoring Report on the Project for Improvement of Transportation Capacity of Public Bus in Phnom Penh Grant Agreement No. _____

Month, 2016

Organization Information

Authority (Signer of the G/A)	Person in Charge	Governor of Phnom Penh Capital Administration (PPCA)
	Contacts	Address: Phone/FAX: Email:
Executing Agency	Person in Charge	Governor of Phnom Penh Capital Administration (PPCA) (Division)
	Contacts	Address: Phone/FAX: Email:
Line Agency	Person in Charge	City Bus Authority (Division)
	Contacts	Address: Phone/FAX: Email:

Outline of Grant Agreement:

Source of Finance	Government of Japan: *Sealed as of Sep. 2016* Government of Cambodia: USD7,315 thousand, or JPY851.1 million
Project Title	Project for Improvement of Transportation Capacity of Public Bus in Phnom Penh
E/N	Signed date: Duration:
G/A	Signed date: Duration:

G/A NO.
PMR prepared on 04/09/2016

1: Project Description

1-1 Project Objective

Improve the traffic situation in Phnom Penh through the enhancement of the transportation capacity of public bus by expansion of routes and the increased number of bus vehicles

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

1) The targeted number of beneficiaries is 1.5 million of citizens of Phnom Penh, roughly accounting for 10% of the total population of Cambodia. The project is especially beneficial for the poor due to the nature of bus transportation even in Cambodia that is among the least developed countries in ASEAN.

2) The project aims to disseminate the usage of public transportation. This project purpose also contributes to enlarge the right to select the transportation, which is also known as the basic transportation right, for the mobility-impaired people, thus consistent with the human security, the basic human needs, and the creation of education and human resources.

3) The project does not require overly sophisticated technique. PPCA will be able to operate and maintain the equipment by its own human resources, technique, and PPCA's budget.

4) The project is subjected to the development of transportation infrastructures for poverty reduction embedded in one pillar of the Rectangular Strategy Third Phase of the government of Cambodia.

5) The project also contributes to reduction of CO2 and the air pollutions by urging shift from individual transportations in terms of the environment.

6) The grant aid project is the relevant scheme, because the fare revenue is limited and expected profit is low since the project mainly targets for the low income people and mobility-impaired people.

7) The Country Assistance Policy for Cambodia created in 2012 place "reinforcing the economic infrastructure" as one of the priority area. JICA also put emphasis on "reinforcement of economic infrastructure" in JICA Country Analysis Paper of 2014, analyzing the improvement of the traffic situation of Phnom Penh as a critical issue. The project is consistent with those policies.

8) PPCA is pushing forward the preparations of both budget and recruitment of fresh personnel, thus makes it feasible for Japan to disburse the project through the grant aid scheme.

1-3 Effectiveness and the indicators

- Effectiveness by the project

Quantitative Effect (Operation and Effect indicators)

G/A NO.
PMR prepared on 04/09/2016

Indicators	Original (Yr 2016)	Target (Yr 2021)
The number of bus routes	3	5
Operation rate (%)	67.5	100
Bus travel distance (vehicle–km/day)	4,386	8,830
Bus transportation capacity (10,000 pax–km/day)	21.9	40.3
Working rate of bus vehicle (%)	75	90
Ridership (pax–day)	8,133	40,000
Traffic accident ratio (case/vehicle–100,000 km traveled/year)	2.68	1.34
Qualitative Effect		
1) Mitigation of traffic congestions on the bus routes 2) Raised awareness about use of public bus service among the citizens by improved service 3) CBA turns out able to provide an inexpensive and safe public transportation measure 4) The spheres of activities of the mobility-impaired poor and elderly expand by an inexpensive and safe public transportation.		

2: Project Implementation

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	**Original: Phnom Penh** *(M/D)*  **Attachment(s):Map**	**Actual:** *(PMR)* **Attachment(s):Map**

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
1. Bus	80 units	Ditto
2. Maintenance Equipment	1 lot (2 set for each item) - Tire changer - Washing machine for bus - High pressure with hot water washer - Fork lift - Other maintenance equipment and tool	Ditto

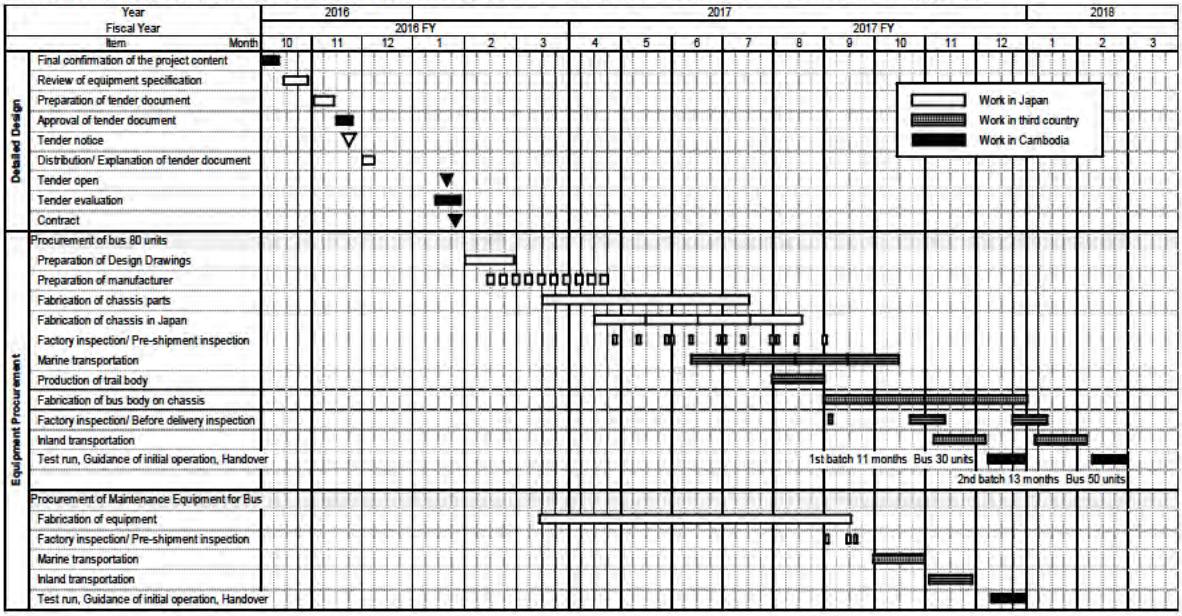
G/A NO.
PMR prepared on 04/09/2016

2-1-2 Reason(s) for the modification if there have been any.

(PMR)

2-2 Implementation Schedule

The procurement will commence after signing of the Supplier's Contract. The estimated duration of procurement for first batch of 30 bus units and maintenance equipment shall be delivered within 11 months and the second batch of 50 bus units shall be within 13 months.



2-2-1 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
Cabinet Approval	Sep.		
E/N			*(PMR)*
G/A			As of (Date of Revision)
Detailed Design	10/2016–01/2017		
Tender Notice	11/2016		
Tender	1/2017		Please state not only the most updated schedule but also other past revisions chronologically.
(Lot 1: Bus) Procurement	2/2017–1/2018		
(Lot 2: Maintenance Equipment) Procurement	3/2017–12/2017		
Project Completion Date	2/2018		

*Project Completion was defined as _____ at the time of G/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

G/A NO.
PMR prepared on 04/09/2016

2-3 Undertakings by each Government

2-3-1 Major Undertakings

See Attachment 2.

2-3-2 Activities

See Attachment 3.

2-4 Project Cost

2-4-1 Project Cost

Table 2-4-1a Comparison of Original and Actual Cost by the Government of Japan
(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
To procure buses, spare parts, and maintenance equipment	1) Manufacturing of the products 2) Transportation of the products			Please state not only the most updated schedule but also other past revisions chronologically.
To implement detailed design, tender support and construction supervision (Consultant				
Total				

Note: 1) Date of estimation: Apr. 2016
2) Exchange rate: 1 US dollar = 116.35 yen

Table 2-4-1b Comparison of Original and Actual Cost by the Government of Cambodia

Items			Cost (Thousand USD)	
	Original	Actual	Original	Actual
	Payment of bank service charges for banking arrangement (B/A) and authorization to pay (A/P)		25	Please state not only the most updated schedule but also other past revisions chronologically.
	Construction of office, bus depot, maintenance shop, fuel stand (2 places for each), and training center.		6,000	
	Construction of bus terminal		130	
	Construction of bus stops (Pole type)		17	

	Construction of bus stops (Shed type)		43	
	Main office of CBA		900	
	Installation work of maintenance equipment		50	
	Others (uniform for driver or conductor and maintenance vehicle cost)		150	
Total				

Note: 1) Date of estimation: Apr. 2016
2) Exchange rate: 1 US Dollar = 4,000 Cambodian riel

2-4-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

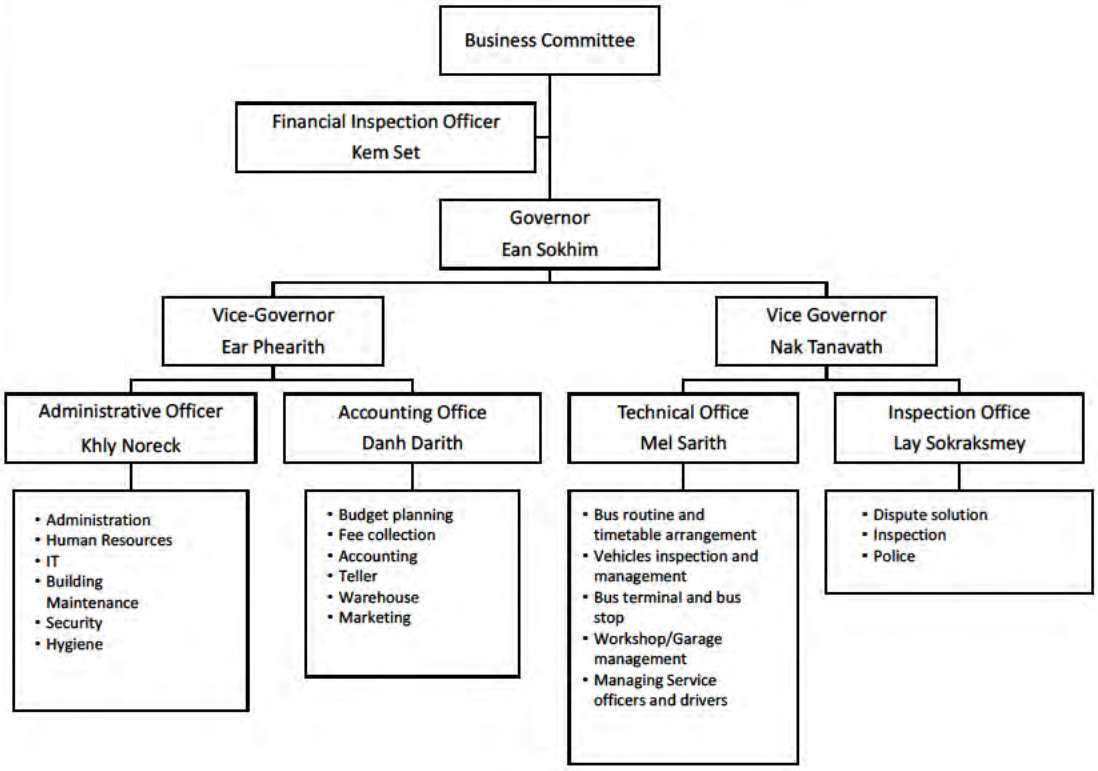
(PMR)

2-5 Organizations for Implementation
2-5-1 Executing Agency:

G/A NO.
PMR prepared on 04/09/2016

Original: *(M/D)*
The Phnom Penh CBA was established under the umbrella of PPCA in July 1, 2014, while the legitimate authorization of the Cabinet Council was issued on May 21, 2014. On September 1, 2014, CBA launched the bus service with 3 routes and 43 vehicles.

The sales result in 2015 was merely 2 billion riel (approx. USD1.83 million). The annual sales in 2015 turned out deficit of more than 0.4 billion riel (approx. USD100,000). The substantial part of expenses were derived from the monthly maintenance cost of somewhere in a range from USD25,000 to 30,000, and this is one of the major factors to fall in red. Since some buses become non-operational on a daily basis, the headways are often forced to stretch from 20 to 40 minutes and that affects the operation substantially.



Actual, if changed: *(PMR)*

2-6 Environmental and Social Impacts

- Nothing special

3: Operation and Maintenance (O&M)

3-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project

soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original: *(M/D)*
CBA does not have engineers for maintenance, but they borrow from DPWT 2 civil engineers with expertise in road, pavement construction and maintenance of bus stops. Hence, daily maintenance has never been conducted by CBA. Should buses need repairs, CBA outsources maintenance to a private car repair factory. Likewise, maintenance manuals are not available.

Actual: *(PMR)*

3-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original: *(M/D)*

		Unit	Price (USD)	2016		2017		2018		2019		2020	
				Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Salary	Management	Person	510	19	125,970	19	132,269	19	138,882	19	145,826	19	153,117
	Admin at HQO	Person	280	19	69,160	19	72,618	19	76,249	38	160,123	38	168,129
	Car Controller	Person	320	9	37,440	9	39,312	9	41,278	9	43,341	10	50,565
	Admin at Site Office	Person	280	24	87,360	24	91,728	24	96,314	24	101,130	37	163,704
	Mechanics	Person	280	20	72,800	20	76,440	20	80,262	20	84,275	24	106,187
	Drivers	Person	300	90	351,000	198	810,810	280	1,203,930	280	1,264,127	413	1,957,816
	Ticket Sellers	Person	150	90	175,500	198	405,405	280	601,965	280	632,063	413	978,908
	Others (Cleaners)	Person	150	11	21,450	11	22,523	11	23,649	11	24,831	18	42,664
	Total			282	940,680	498	1,651,104	662	2,262,528	681	2,455,716	972	3,621,090
Fuel	LPG	US$/ℓ	0.625	2,144,010	893,338	222,153	925,480	531,051	221,271				
	Diesel	US$/ℓ	0.75			54,257	16,277	2,321,599	696,480	3,593,630	1,078,089	4,730,035	1,419,011
	Total				893,338		941,758		917,751		1,078,089		1,419,011
Maintenance	Korean Bus	Vehicle	800	57	547,200		522,400		83,200				
	Japanese Bus	Vehicle	500				15,000		380,000		480,000		790,000
	Total				547,200		537,400		463,200		480,000		790,000
Facilities	Depot and others*	Set	1	6,000,000	6,000,000								
	Terminal	US$/M^2	10	3000	30,000	5000	50,000	5000	50,000				
	Depreciation	US$/Vehicle				15000		15000	950,000	15000	1,506,250	15000	2,100,000
	Bus Stop (Pole type)	US$/Stop	250	0	0	37	9,250	33	8,250	54	13,500		0
	Bus Stop (Roof & Chair	US$/Stop	2500	0	0	9	22,500	8	20,000	13	32,500		0
	Office Building	US$/M 2	300	3000	900,000								
	Total				6,930,000		81,750		1,028,250		1,552,250		2,100,000
Others**		Set	5%		465,561		160,601		186,086		202,990		291,505
Grand Total					9,776,778		3,372,612		4,857,816		5,769,045		8,221,606

Note: Price escalation by inflation is not considered.

* Construction of office, bus depot, maintenance shop, fuel stand (all 2 sets), and training center.

* Installation costs of granted OM equipment (USD50,000), purchase of new uniforms (USD50,000), purchase of maintenance vehicles (USD100,000), and contingency

4: Precautions (Risk Management)

- Risks and issues, if any, which may affect the project implementation, outcome, sustainability and planned countermeasures to be adapted are below.

Original Issues and Countermeasure(s): *(M/D)*	
Potential Project Risks	Assessment
1.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:

G/A NO.
PMR prepared on 04/09/2016

	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
2.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
3.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(PMR)	

5: Evaluation at Project Completion and Monitoring Plan

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan for the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

G/A NO.
PMR prepared on 04/09/2016

Attachment

1. Project Location Map
2. Undertakings to be taken by each Government
3. Monthly Report
4. Report on RD
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (Final Report Only)

Attachment 6

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
						Price (Decreased) E=C−D	Price (Increased) F=C+D
1	Item 1	●●t	●	●	●	●	●
2	Item 2	●●t	●	●	●		
3	Item 3						
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st ●month, 2015	2nd ●month, 2015	3rd ●month, 2015	4th	5th	6th
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

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Attachment 7

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	