No.

BASIC DESIGN STUDY REPORT
ON
THE PROJECT
FOR
REHABILITATION OF MOSTAR CITY TRANSPORTATION SYSTEM
IN
BOSNIA AND HERZEGOVINA

FEBRUARY, 2001

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

YACHIYO ENGINEERING CO., LTD.

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PREFACE

In response to a request from the Government of the Bosnia and Herzegovina (BH), the Government of Japan decided to conduct a basic desigin study on the Project for Rehabilitation of Mostar City Transportation System in the BH and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to BH a study team from September 4 to October 6, 2000.

The team held discussions with the officials concerned of the Government of BH, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to BH in order to discuss a draft basic design, and as this result, 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.

I wish to express my sincere appreciation to the officials concerned of the Government of Bosnia and Herzegovina for their close cooperation extended to the teams.

February, 2001

Kunihiko Saito
President
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

February, 2001

We are pleased to submit to you the basic design study report on the Project for Rehabilitation of Mostar City Transportation System in Bosnia and Herzegovina (BH).

This study was conducted by Yachiyo Engineering Co., Ltd., under a contract to JICA, during the period from September, 2000 to Februay, 2000. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of BH and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

上田正明

Masaaki Ueda
Project Manager,
Basic design study team on the
Project for Rehabilitation of Mostar
City Transportation System in
Bosinia and Herzegovina

Yachiyo Engineering Co., Ltd.

Location Map

ABBREVIATIONS

A/P : Authorization to Pay
B/A : Banking Arrangements
BH : Bosnia and Herzegovina
DM : Deutsche Mark
EBRD : European Bank for Reconstruction and Development
E/N : Exchange of Notes
ETRP : Emergency Transport Reconstruction Program
EU : European Union
FSI : Federation Statistics Institute
FY : Fiscal Year
GDP : Gross Domestic Product
GRAS : The Sarajevo Transportation Authority
IBRD : International Bank for Reconstruction and Development
JICA : Japan International Cooperation Agency
KM : Konvertible Mark
IMG : International Management Group
M/D : Minutes of Discussion
NBBH : National Bank of Bosnia and Herzegovina
OECD : Organization for Economic Cooperation and Development
OHR : Office of the High Representative
OSCE : Organization for Security and Cooperation in Europe
Pax : Passenger
PCTA : Public City Transportation Agency for City of Mostar
RRTF : Reconstruction and Return Task Force
RS : Republic Srpska
RSMTC : The Republic Srpska Ministry of Transport and Telecommunications
SFOR : Stabilization Forces
UN : United Nations
UNHCR : United Nations High Commission for Refugees
USAID : United States Agency for International Development

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CHAPTER 1

BACKGROUND OF THE PROJECT

CHAPTER 1
BACKGROUND OF THE PROJECT

1.1 Background of the Project

Bosnia and Herzegovina (hereinafter referred to as "BH") actually consists of two entities, i.e. the Federation of BH (hereinafter referred to as "the Federation") and the Republic of Serbia (hereinafter referred to as "the Republic.)

The urban transport function of practically all cities in the Federation and the Republic was destroyed by the war which raged for almost three years from 1992 to 1995. In particular, most buses which had played a central role in public transport were either destroyed or looted. Even those buses which managed to survive are mainly out of operation because of the difficult procurement of spare parts. As a result, the service level of public transport has conspicuously declined. Urban dwellers are facing great inconvenience and commuters and students are forced to travel in extremely congested conditions.

The city of Mostar, the target city of the Project, is the central city of Herzegovina in the Federation and had a high concentration of enterprises, educational institutions and cultural facilities before the outbreak of the civil war. As the city was ethnically divided (Bosnians and Croatians) by Neretva River, it was the scene of intensive fighting. The city suffered extensive damage, including the destruction of all bridges across Neretva River. In the case of the bus service which was the city's main mode of transportation, more than 90% of all buses and operation facilities were damaged.

The Dayton Accord in October, 1995 led to the provision of assistance, mainly by the EU, for the post-war rehabilitation of Mostar and the once destroyed bridges have gradually been reconstructed. The city's infrastructure (power, telecommunications, water supply, sewerage and other services), however, is still divided into the east and west. The absence of any unified systems in the city incurs a high economic loss and integration of the urban infrastructure and improvement of the urban functions are hoped for.

Under these circumstances, the Mostar Council made a decision in February, 2000 to integrate bus corporations separately operating in the east and west into the Public City Transport Agency (PCTA). Following this decision, the Government of BH made a request to the Government of Japan for the provision of grant aid for the procurement of 51 buses and spare parts to improve the transport situation in Mostar by securing a reliable means of transport for the citizens of Mostar.

1.2 Contents of the Request

The contents of the original request made by the Government of BH are summarised in Table 1-2-1.

Table 1-2-1 Contents of the Original Request by the Government of BH

Item	Unit	Quantity Originally Requested
Vehicles		
Standard Bus	No.	41
Midi Bus	No.	4
Elbow Bus (Articulated Bus)	No.	4
Midi Bus for the Disabled	No.	2
Total	No.	51
Spare Parts	Set	1
Spare (Repair) Parts	Set	1

CHAPTER 2

CONTENTS OF THE PROJECT

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CONTENTS OF THE PROJECT

2.1 Basic Concept of the Project

(1) Objective of the Project

The Government of BH is aiming to achieve urgent post-war rehabilitation by means of restoring the public transport capacity in major cities, which has declined due to the civil war and the deterioration of vehicles, to the pre-war level in order to revitalise urban life and economic activities. The objective of the Project is to procure buses for public transportation in urban as well as suburban areas, maintenance tools and spare parts for the PCTA in Mostar, the key city in southern BH, in order to operate of a sufficient number of buses as the main mode of public transportation in Mostar serving the citizens of Mostar, including returning refugees, and to improve the bus maintenance capability.

(2) Outline of the Project

In order to achieve the objective of the Project, 62 buses are required for operation of total 52 bus routes (*) consisting 26 existing routes and 27 new routes.

The planned bus routes for post-war rehabilitation in Mostar are shown in Table 2-1-1.

The plan is expected the following effects. The Requested Japanese Assistance is aiming at procurement of new buses for the Projected under the plan.

① Rehabilitation of Route Operating Since Pre-War Period

Route which has been in operation since the pre-war period and of which the rehabilitation will improve access to workplaces, schools and hospitals.

② Route Contributing to Reconciliation of Ethnic Groups

Route which provides access to the east (Bosnians) and west (Croats) of Neretva River and which is important from the viewpoint of facilitating the reconciliation of ethnic groups.

③ Route Contributing to Accelerated Return of Refugees

Route which assists the establishment of new villages by returning refugees or which terminates at a town to which different ethnic groups have already returned.

④ Increasing for Accessibility of citizens

Route of which the new operation is expected to increase a number of passengers, accessibility of a large number of citizens will be more conveniences.

⑤ Expansion of Influence of Mostar

Route which is necessary to improve the access of commuters and students to Mostar from a suburban village in order to achieve the objective of the Project.

Fig. 2-1-1 shows the area of influence of Mostar and the departure/destination points of bus routes.

* Of the 26 existing routes, Route No. 61 is omitted from the scope of the Study as it runs outside the Study Area.

Table 2-1-1 Rehabilitation Plan of PCTA

No.	Route No.	Bus Routes	Routes Exist.	Routes Plan	Length (Km)	No. of Bus	Exist. → Plan Trips (1/2)	Plan Total Trips	Exist. → Plan First bus start.	Exist. → Plan Last bus start.	Estimated Passengers	Remarks
1	5	MOSTAR KRUZNO	○		12.0	2	4 → 24	24	8:00 → 6:00	16:00 → 22:00	840	One way Kruzno
2	6	VELMOS - ZALIK	○		7.0	4	34 34	34+34	6:15	20:00 → 21:00	2,380	
3	7	ZALIK - VELMOS (M-17)		○	7.5	1	7	7+7	6:30	20:30	560	
4	10	MOSTAR - BLAGAJ	○		14.0	2	15 15	15+15	7:00 → 6:00	22:00	1,050	
5	11	MOSTAR - VRANJEVCII	○		17.5	1	6 6	6+6	5:25	21:10	420	
6	12	MOSTAR - MALO POLJE	○		17.5	1	5 5	5+5	6:15	16:30 → 21:15	350	
7	13	MOSTAR - DRACEVICE	○		11.0	1	6 6	6+6	6:00 → 5:30	19:30 → 21:00	630	
8	18	MOSTAR - VRBA		○	8.0	1	8	8+8	6:00	21:00	560	
9	15	MOSTAR - KOKORINA	○		21.5	1	2 2	2+2	5:15	16:45	140	
10	16	MOSTAR - PODVELEZJE	○		30.0	1	7 7	7+7	5:20	21:15	455	
11	17	MOSTAR - PIJESCI	○		36.0	1	7 7	7+7	5:15	21:30	490	
12	20	MOSTAR - PODGORANI	○		21.0	2	10 → 12	12+12	5:30	20:30 → 21:45	1,260	
13	21	MOSTAR - HUMI	○		15.0	2	11 → 16	16+16	5:30	21:30 → 22:00	1,575	
14	22	MOSTAR - RASOJE		○	8.0	1	6	6+6	6:15	20:30	420	
15	23	MOSTAR - KUTI	○		14.0	1	8 → 10	10+10	6:00	20:30	1,050	
16	24	MOSTAR - D.DREZNICA		○	25.0	1	3	3+3	6:00	16:45	210	
17	25	MOSTAR - RASTANI	○		22.0	1	2 3	3+3	8:30 → 6:15	18:30	140	
18	26	MOSTAR - G.DREZNICA	○		50.0	1	5 5	5+5	5:00	21:30	350	
19	46	MOSTAR - COMORI		○	19.0	1	2	2+2	5:45	14:15	66	
20	47	MOSTAR - G. KRUZANJ		○	28.0	1	2	2+2	5:45	15:45	73	
21	1	MOSTAR - ILICI	○		6.0	2	7 → 18	18+18	6:30 → 6:00	19:30 → 21:00	1,890	
22	19	DEKO - RODOC		○	6.0	2	21	21+21	6:00	20:00	2,205	
23	2	JASENICA - SKAKALA	○		9.0	2	8 → 15	15+15	6:30 → 6:00	22:00 → 22:30	1,575	
24	3	DUBROVACKA - CIM	○		5.0	1	5 → 8	8+8	6:45 → 6:30	19:00 → 21:00	560	
25	4	PANJEVINA KRUZNO		○	8.0	1	13	13	6:00	20:00	910	One way Kruzno
26	28	MOSTAR - BUNA	○		14.0	1	4 → 6	6+6	6:45 → 8:30	20:15 → 19:30	420	
27	29	MOSTAR - HODBINA		○	16.0	1	7	7+7	6:45	20:15	490	
28	14	MOSTAR - POLJE	○		12.0	1	4 → 6	6+6	5:45 → 6:00	19:30 → 20:30	420	
29	27	MOSTAR - BOGODOL	○		19.0	1	2 → 5	5+5	5:30 → 4:15	16:15 → 20:00	175	
30	8	MOSTAR - ULOG	○		7.0	1	3 3	3+3	7:15	16:30 → 17:30	105	
31	9	MOSTAR - RASTANI		○	7.0	1	5	5+5	5:45	19:30	140	
32	30	MOSTAR - BACEVICI		○	9.0	1	5	5+5	6:00	20:00	350	
33	31	MOSTAR - KRUSEVO		○	12.0	1	4	4+4	6:20	16:40	245	
34	32	MOSTAR - BUCICI		○	12.0	1	4	4+4	5:00	19:45	280	
35	33	MOSTAR - SLIPCICI		○	29.0	1	5	5+5	5:00	20:10	350	
36	34	HIT - BIJELI BRIJEG		○	8.0	1	10	10+10	6:00	17:30	700	
37	35	RONDO KRUZNO		○	8.0	1	15	15	6:00	20:00	525	One way Kruzno
38	36	MOSTAR - RASKA GORA		○	21.0	1	2	2+2	4:15	17:30	63	
39	37	MOSTAR - NEVESINJE		○	39.0	1	1	1+1	11:00	13:00	73	
40	38	MOSTAR-CAPLJINA-STOLAC		○	60.0	1	4	4+4	6:00	20:00	280	
41	39	MOSTAR-ROTIMLJA-STOLAC		○	37.0	1	6	6+6	6:00	20:00	420	
42	40	MOSTAR-DOMANOVICI		○	28.0	1	7	7+7	6:00	19:00	490	
43	41	MOSTAR - CAPLJINA		○	35.0	1	4	4+4	7:00	20:00	350	
44	42	MOSTAR - SIROKI BRIJEG	○		23.0	1	6 6	6+6	7:15	19:45	420	
45	45	MOSTAR - UZARICI	○		19.0	1	2 2	2+2	6:15	15:30	140	
46	48	MOSTAR - MEDJUGORJE	○		29.0	1	3 3	3+2	6:20	14:30	210	
47	43	MOSTAR - LJUBUSKI	○		42.0	1	1 → 2	2+2	6:20	15:30	63	
48	44	MOSTAR - RAKITNO		○	60.0	1	1	1+1	7:00	10:00	66	
49	51	MOSTAR - ORTIJES		○	8.0	1	15	15+15	6:00	20:30	1,050	
50	52	GIMNAZIJA -(M=17)- Kruzno		○	11.0	1	24	24+24	6:00	22:00	770	Two way Kruzno
51	53	ZALIK-BALINOVAC-Kruzno		○	10.0	1	23	23	6:15	21:15	840	One way Kruzno
52	54	BUDNIK-VELMOS-Kruzno		○	6.0	1	23	23+23	6:15	21:15	805	Two way Kruzno
	52	TOTAL	25	27	999.0	62	167 453	75 + 378+377			30,399	

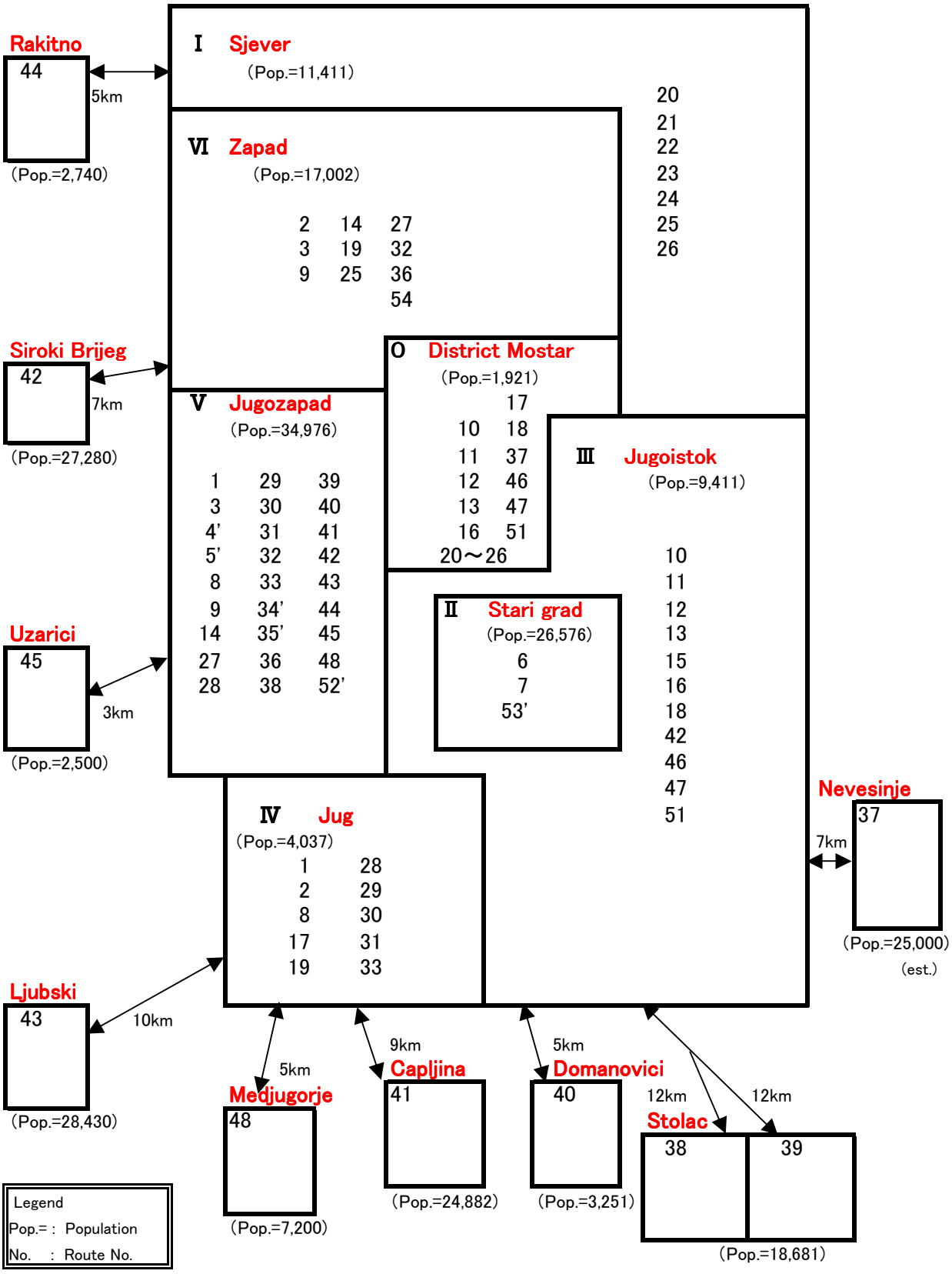


Fig. 2-1-1 Area of Influence of Mostar and Departure/Destination Points of Bus Routes

2.2 Basic Design of the Requested Japanese Assistance

2.2.1 Design Policy

(1) Basic Design

1) Scope of Requested Japanese Assistance

The Project aims at procuring the necessary vehicles, etc. which are required to substantially improve the level of the public transport capacity in Mostar, the capital of Neretva in the Federation. The specifications of the buses to be selected should meet European emission standards. The composition and quantities of buses have been finalised through consultations with the BH side based on the presupposition that as many suburban bus service routes around Mostar as is practically possible will be included in the Project while giving the highest priority to those service routes in the pre-war period from the viewpoint of the reconciliation of different ethnic groups. 52 bus routes under the Project is included 10 routes in suburban area of Mostar city, the towns and villages along these bus routes are closely linked with the city (i.e., Only Mostar city has more than middle schools and hospitals accommodated with beds). Therefore, these bus routes in suburban area will be also targeted as a scope of the Project.

2) Planning Approach

According to the PTCA's Profit and Loss Statement for the last three years, some three-quarters of the gross revenue comes from long distance and international services, leaving the inner city and suburban bus services to be operated by the new PCTA responsible for approximately one-quarter of the revenue. A similar breakdown between long distance and local services can be seen in the case of the expenditure. However, the revenue and expenditure balance is poor for inner city and suburban services, making some kind of financial input essential to compensate for the poor profitability of local services. In the case of the Project, while the Mostar Council is expected to cover the deficit, Mostar's fiscal base has not yet been fully established because of the short history of the revived city. An increase of the buses in possession will inevitably lead to a substantial increase of the personnel cost of drivers, fuel and other costs due to the longer service distances and depreciation cost. Accordingly, it will be difficult for the new PCTA to operate in a profitable manner.

Given the problems described above, the optimal size of the Project will be determined by examining the suitability of the Project in terms of both the business viability and the suitability of the bus route plan as well as the number of buses.

(2) Natural Conditions

1) Temperature and Relative Humidity

The mean annual temperature in the Project Area is 15.1°C while the maximum and minimum temperatures are approximately 41.6°C and -4°C respectively. The summer temperature in Mostar should be taken into consideration in the specifications for low floor buses which mainly run on circular routes in Mostar to serve hospitals and other public facilities.

2) Rainfall

Annual rainfall of 1,467 mm is recorded with maximum monthly rainfall of 330 mm in September. This level of rainfall does not pose any problem for the equipment design or road transportation. In winter, however, some caution is necessary in regard to road transportation as the severe cold suggests freezing conditions despite the fact that there is little snowfall.

3) Narrow Road Areas

Special attentions should be paid to the fast wearing of the clutch disc, etc. of the new buses to be procured under the Project, particularly when they are deployed for routes with narrow roads.

(3) Social Conditions

As Mostar is the centre of Neretva Province in terms of population, industrial activities and all other aspects of the socioeconomy, it also plays a crucial role in the lives of those people living in surrounding areas. For example, no secondary or higher schools exist other than those in Mostar, making it necessary to travel to Mostar for secondary or higher education. In the field of medical care, only clinics which provide first aid are available outside the city and all serious patients have to be treated in Mostar. In this aspect, Mostar is a lifeline for towns and villages in surrounding areas. At present, some 560 disabled people, including those injured during the civil war, and approximately 17,000 pensioners live in Mostar. As any public transport plan is expected to include measures which care for these disabled people, the plan (project) must consider their need to visit hospital in addition to the needs of commuters and students.

(4) Procurement Conditions or Special Characteristics

The Project intends the procurement of buses to restore the public transport capacity in post-war Mostar in response to the request by the Government of BH to secure a means of transport for the citizens of Mostar and also the procurement of maintenance equipment/tools and spare parts which are essential for the maintenance of the buses.

1) Procurement of Maintenance Equipment and Tools

Bus maintenance work can be largely classified into "inspection/maintenance work" and "repair work". The Project is included equipment and tools for repair work, leaving only inspection/maintenance equipment and tools to be excluded.

2) Procurement of Spare Parts

Essential spare parts will be provided for the proper maintenance of the buses

3) After-Services by Third Country

European car manufacturers have agents in neighbouring countries of BH and these agents dispatch mobile teams to BH to provide after-services. Many manufacturers have agents in BH and, therefore, no problems are anticipated in regard to after-services.

4) Local Procurement of Equipment

As the Project aims at providing equipment (buses) which does not involve any installation work, the local procurement of equipment will be unnecessary.

(5) Availability of Local Manufacturers

Eurobus-Soko in Mostar is engaged in the assembly of buses. This company was a state enterprise before the war, manufacturing aircraft parts, etc., and is fairly large.

Eurobus-Soko procures engines from an engine manufacturer and is capable of assembling 100 -150 buses a year. However, the factory does not have an assembly line and assembly work is conducted by moving from one bus unit to another which are placed side by side on the floor. There is, therefore, doubt in regard to the annual production volume of the buses is not assured. However, the company can be relied upon to manufacture a limited number of buses of specific types.

(6) Operation and Maintenance Capability of Implementation Organization

Even though the PCTA temporarily operated as the East and West Bus Companies during the civil war, its operation began before the civil war. At present, it maintains such major components as engines and transmissions, etc. of the existing fleet at an operational level and, therefore, has sufficient operation and maintenance capability.

With the delivery of the new buses, an increase of the number of drivers will be necessary. As many of the bus drivers who have been transferred to the long distance bus service company want, in fact, to return to the PCTA because of job security, no problems are anticipated in regard to securing the necessary number of drivers.

(7) Grade of Specifications of the Equipment

Bus fleet specifications are drafted on the basis of the above policy.

1) Buses

The Project intends the provision of the following types of buses based on analysis and examination of the business viability and desirable bus routes following the request made by the Government of BH. EURO2 is adopted as the applicable standards for emission, etc.

a. Standard Buses

This type of bus is popularly used for public transport and will be introduced for all routes planned under the Project. Given the relatively small urban area of Mostar with many citizens living in suburban areas, two types of large buses will be introduced, i.e. the standard type and the higher seating capacity type.

b. Low Floor Buses

The basic specifications for these buses will be the same as those for standard buses but the floor height will be low to provide easy accessibility for the disabled as well as ordinary passengers. As such, this type of bus will be introduced for those routes which pass a hospital and other facilities in view of additional convenience for the disabled. In view of the low body, these buses will only be used on those roads with good surface conditions. As these buses will mainly serve the city circular routes which are frequently used by old people and disabled people, they will be air-conditioned in view of the high summer temperature in Mostar.

c. Articulated Buses

The introduction of articulated buses is planned for those routes with a high number of daily passengers and a higher peak-time demand than the capacity of standard buses. The basic specifications will be the same as those for the standard-type standard buses.

d. Midi Buses

This type of bus will be introduced for those routes with narrow roads and a small curve radius such as those in mountain areas. They will have two doors to accommodate a relatively large number of seats.

2) Maintenance Equipment

The PCTA in Mostar currently has the East and West Workshops and is planning to allocate different maintenance functions to each of these workshops. The maintenance equipment and tools to be procured under the Project will be those which are essential and currently not possessed by the PCTA to conduct maintenance work while confirming the planned functions and roles of each workshop by the PCTA.

3) Spare Parts

Given the fact that the PCTA is not in a position to procure a sufficient quantity of spare parts because of its financial difficulties, spare parts will be procured and supplied under the Project to ensure the proper maintenance of the buses to be provided under the Project. The quantity of spare parts to be supplied will be equivalent to some two years requirement based on the monthly travelling distance (approximately 5,300 k m/month) of the existing fleeet of the PCTA.

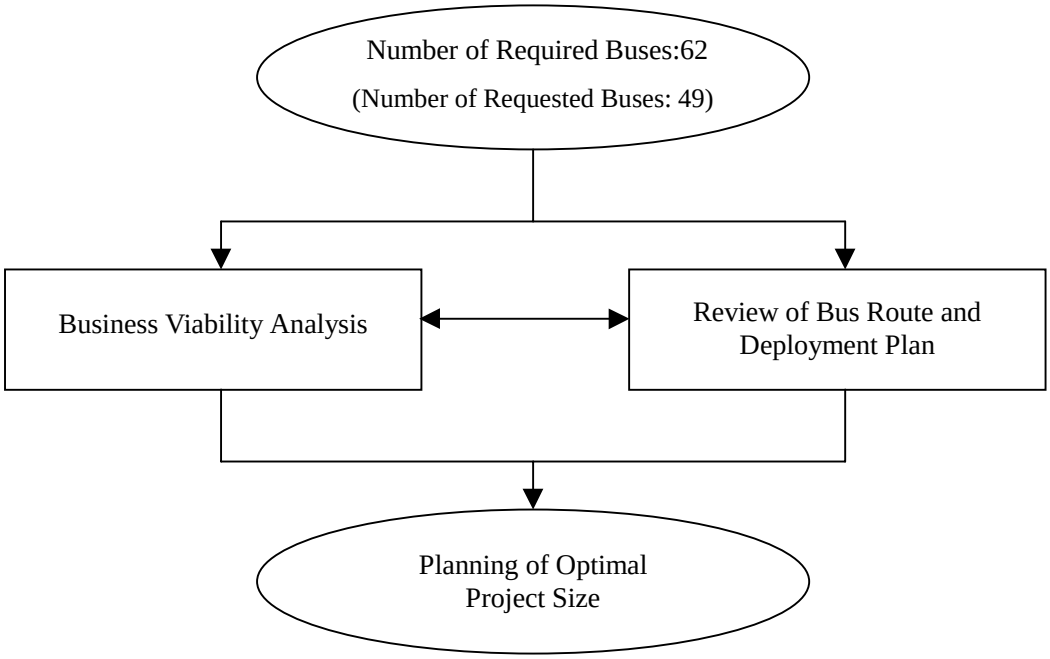
(8) Procurement Method and Period

Under the Japanese grand, the Project should be implemented within the period stipulated in the Exchange of Notes (E/N).

2.2.2 Basic Plan (Equipment Plan)

(1) Planning of Optimal Project Size

According to the "Basic Policy" in the previous section, firstly,the business viability of the PCTA was analysed based on the number of buses requested by the Government of BH becoming the possession of the PCTA. Based on the results of this business viability analysis, the bus route and deployment plan was reviewed to analyse whether or not the objective of the Project would be achieved.



(2) Business Analysis

The Project was examined from the viewpoints of its impacts on the business of the PCTA and sound business operation.

The outcome of business analysis is largely influenced by the revenue forecast. In the case of Mostar in particular, improvement of the fare collection rate will substantially affect the business viability of the PCTA given the fact that more than half of the current passengers do not pay the fare.

While aiming at achieving bus fare collection from two out of every three passengers in the future, the revenue and expenditure balance estimation was conducted based on the assumption that half of the passengers (50%) will pay the fare to make the business viable (this is the expected value equivalent to 170% of the currently fare-paying passengers).

As the predicted number of future passengers by the PCTA widely ranges from 30,399 to 41,258, the estimation was conducted for two cases involving the minimum and maximum number of passengers.

Table 2-2-1 Estimated Number of Passengers

	Current Number of Passengers	Future Case (Minimum)	Future Case (Maximum)
Estimated Number of Passengers[1)]	24,145	30,399	41,258
Continuation of Present Fare Collection Rate (37.1%)[2)]	8,961 (100%)	11,278 (126%)	15,306 (170%)
Improved Fare Collection Rate (50%) (one in two passengers)[2)]		15,199 (170%)	20,627 (230%)
Improved Fare Collection Rate (67%) (two in three passengers)[2)]		20,266 (226%)	27,505 (307%)

Notes 1) Based on the demand forecast by the PCTA.
2) Percentage figures in brackets show the ratio compared to the current number (8,961) of fare paying passengers.

The estimation results for the financial balance are shown in Table 2-2-3, indicating that a substantial deficit of –22.8% for the minimum number of passengers (+4.3% for the maximum number of passengers) will be incurred because of the increased expenditure when 49 new buses (creating a fleet of 62 buses) are added as requested by the Government of BH. As a result, the business of the PCTA will face financial difficulties. Because Mostar does not have a demand structure where an increase of the number of buses will be followed by an increase of the demand, reduction of the expenditure will have major implications in regard to profitability. To be more precise, the number of buses to be newly introduced should be reduced in order to reduce the depreciation cost, the influence of which on the business viability is substantial.

Table 2-2-2 Estimated Revenue and Expenditure

Assumtion : 62 Buses

	Item	2001(Sep.12000-Aug.31,2001) East	West	Total (A)	Min-Case 170%	Max-Case 230%
I	REVENUE			(KM)	(KM)	(KM)
1,1	Intra-city (Ordinal Pax)	396,864	308,448	705,312	1,654,678	2,245,755
1,2	Intra-city (Monthly Pax)	114,480	191,520	306,000	975,078	1,323,392
2.1	Suburban (Ordinal Pax)	737,856	167,616	905,472	1,462,502	1,984,931
2.2	Suburban (Monthly Pax)	1,421,472	0	1,421,472	3,249,430	4,410,177
3	Others	0	84,000	84,000	84,000	84,000
	TOTAL	2,670,672	751,584	3,422,256	7,425,688	10,048,255
II	EXPENDITURE					
1	Personnel			1,520,280	2,435,400	2,435,400
2	Fuel, Petroleum			944,010	2,341,145	2,341,145
3	Spare parts			130,000	352,400	352,400
4	Gums (Tire)			25,000	62,000	62,000
5	General Expenses			162,800	310,700	310,700
5.1	(Office expenses)			50,000	55,000	55,000
5.2	(Fund charge)			24,000	24,000	24,000
5.3	(Communications)			9,600	12,000	12,000
5.4	(Electricity)			19,200	21,600	21,600
5.5	(Insurance)			30,000	138,100	138,100
5.6	(Others)			30,000	60,000	60,000
6	Depreciation			153,186	2,633,839	2,633,839
7	Fixed Tax			437,101	982,813	1,297,521
	TOTAL			3,372,377	9,118,297	9,433,005
III	Corporate Tax			14,964	0	184,575
IV	Balance/Subsidy(I-II-III)			49,879	-1,692,608	430,675
V	Profit/Deficit (IV/I)			1.5%	-22.8%	4.3%

(3) Analysis of Bus Route and Deployment Plan (Review of the Plan)

The precondition for this re-examination is an increase of the number of passengers by integrating routes by means of the rerouting of nearby routes and slight extension instead of the complete abolition of certain routes so that the maximum number of potential passengers can benefit from bus services.

The concrete principles for this re-examination are described below.

a. The deployment plan should be formulated to serve as many passengers as possible while trying to retain as many planned routes as possible

b. In the case of those routes with a low passenger demand or low service frequency planned, nearby routes will be used as alternative routes if such routes exist.

c. In the case of passengers of an existing route(s) being able to use a new route, the existing route(s) will be integrated to the new route in order to reduce the number of routes.

The preconditions for route integration or abolition are described below.

i Passenger capacity of integrated route : 1,050 passengers/route-bus

ii Maximum rerouting distance of route : 10 km

iii Maximum extension distance of route : depends on service frequency

ix Maximum walking distance to nearest bus stop : 3 km

(The passenger capacity is based on the design capacity for Route Nos. 10, 23 and 51 adopted by the PCTA.)

The reasons for route integration or abolition and relief measures are given in Table 2-2-3. The largest number of passengers for a route to be integrated to another route is 560 persons/bus while the number of passengers for other routes earmarked for integration varies from 60 to 490 persons/day. This integration measure is designed to allow a bus route to absorb passengers of a nearby route(s) with a low demand so that the required number of buses can be reduced. Table 2-2-3 explains the reasons for bus reduction and the relief route (Route No.)

Even though people living along Route No. 22 are forced to walk a little further, all people in the Project Area can use one bus route or another, including suburban routes. As the relief measure involves rerouting for 4 – 5 km and/or extension of up to approximately 20 km for the affected routes, adjustment of the service diagramme up to a maximum of some 30 minutes will be required.

As shown in Table 2-2-4, the number of buses required for Route No. 6 and Route No. 10 is reduced by one as these routes share some sections with Route No. 52, Route No. 53 and others. Either integration or abolition is possible for another 14 routes. In the case of Route No. 7, however, the calculation result for the number of passengers for Route No. 53, to which Route No. 7 will be integrated, is 1,120 which is 7% higher than the daily passenger transportation capacity of 1,050 persons per bus. This means that the number of passengers may slightly exceed the capacity during peakhours but it is believed that this over-capacity can be solved by passengers in the Zalik-Velmos section also using buses running on Route No. 13, Route No. 18 and others.

Table 2-2-3 Reasons for Bus Reduction and Relief Measures

Route No.	Route	Relief Route(s)		Bus Reduction	Reason for Reduction	Relief Measure
		No.	Persons/day			
6	Velmos-Zalik		2,660	4 → 3: -1	Alternative routes are available.	886 passengers per bus (2,660 ÷ 3) is not large.
7	Zalik-Velmos (M-17)	52/53/6	560	-1	Alternative routes are available.	Current passengers can be covered by Route Nos. 6, 52 and 53.
10	Mostar-Blagaj		1,050	2 → 1 = -1	Requested number is reduced by 1.	1,052 passengers per bus is not large (Route Nos. 12 and 6 can be used).
22	Mostar-Rasoje	21	420	-1	An adjoining route is available.	Current passengers can be covered by Route Nos. 21 and 23 (extra walking distance of 1 – 3 km).
24	Mostar-D. Preznica	26	210	-1	Nearly the same route.	Re-routing of Route No. 26 (4 km); diagramme accommodating this change is feasible.
46	Mostar-Comori	11	66	-1	Both the number of passengers and service frequency are low.	Extension of Route No. 11 to supplement the two return trips/day service.
47	Mostar-G. Kruzanj	16	73	-1	As above	Re-routing of Route No. 16 (4 km)
29	Mostar-Hodbina	28	490	-1	Nearly the same route.	Extension of Route No. 28 (6 km).
14	Mostar-Polje	25	420	-1	As above	Extension of Route No. 25 for integration, resulting in nine (3 + 6) return trips/day.
8	Mostar-Ulog	2/19	105	-1	Both the number of passengers and service frequency are low.	Extension of both Route Nos. 2 and 19.
9	Mostar-Rastani	32	140	-1	Small number of passengers.	Integration to Route No. 32 (on the same route).
31	Mostar-Krusevo	33	245	-1	Nearly the same route.	Re-routing of Route No. 33 (5 km).
37	Mostar-Nevesinje	15	73	-1	Both the number of passengers and service frequency are low.	Extension of Route No. 15 to replace on return trip/day.
40	Mostar-Domanovici	17	490	-1	Nearly the same route.	Extension of Route No. 17 (13 km).
43	Mostar-Ljubuski	48	63	-1	Both the number of passengers and service frequency are low.	Route No. 43: three return trips/day; Route No. 48: four return trips/day; extension of Route No. 48.
44	Mostar-Rakitno	42	66	-1	As above	Extension of Route No. 42 to replace on return trip/day.
Total				-16		

Table 2-2-4 Bus Route and Deployment Plan

Route No.	Bus Routes	Zone	No. of Buses	Relocation Plan: Availability of Other Bus Route		Estimated Passengers	Planning routes: Exist. Routes	Planning routes: New Routes	No. of Reqired Buses: Number of Buses	No. of Reqired Buses: Exist.	No. of Reqired Buses: New	Artiu-lated	Low Floor	Midi
5	MOSTAR Kruzno	Ⅰ	2			840	○		2		○○		○○	
6	VELMOS - ZALIK	Ⅰ	4	-1		2,380	○		3	●	○○			
7	ZALIK - VELMOS (M-17)	Ⅰ	1	~	52/53	0								
10	MOSTAR - BLAGAJ	Ⅱ	2	-1	12	735	○		1		○			
11	MOSTAR - VRANJEVCII	Ⅱ	1			* 486	○		1		○			
12	MOSTAR - MALO POLJE	Ⅱ	1			* 665	○		1		○			
13	MOSTAR - DRACEVICE	Ⅱ	1			630	○		1		○			
18	MOSTAR - VRBA	Ⅰ	1			560		○	1		○			
15	MOSTAR - KOKORINA	Ⅲ	1			* 213	○		1		○			
16	MOSTAR - PODVELEZJE	Ⅲ	1			* 528	○		1		○			○
17	MOSTAR - PIJESCI	Ⅴ	1			* 980	○		1		○			
20	MOSTAR - PODGORANI	Ⅲ	2			1,260	○		2	●	○			
21	MOSTAR - HUMI	Ⅱ	2			* 1,995	○		2	●	○	○		
22	MOSTAR - RASOJE	Ⅰ	1	~	21	0								
23	MOSTAR - KUTI	Ⅱ	1			1,050	○		1		○			
24	MOSTAR - D.DREZNICA	Ⅲ	1	~	26	0								
25	MOSTAR - RASTANI	Ⅲ	1			* 560	○		1		○			
26	MOSTAR - G.DREZNICA	Ⅳ	1			* 560	○		1		○			○
46	MOSTAR - COMORI	Ⅱ	1	~	11	0								
47	MOSTAR - G. KRUZANJ	Ⅲ	1	~	16	0								
1	MOSTAR - ILICI	Ⅰ	2			1,890	○		2	●	○	●		
19	DEKO - RODOC	Ⅰ	2			* 2,226		○	2		○○	○		
2	JASENICA - SKAKALA	Ⅰ	2			* 1,659	○		2	●	○			
3	DUBROVACKA - CIM	Ⅰ	1			560	○		1		○			
4	PANJEVINA KRUZNO	Ⅰ	1			910		○	1		○			
28	MOSTAR - BUNA	Ⅱ	1			* 910	○		1		○			
29	MOSTAR - HODBINA	Ⅱ	1	~	28	0								
14	MOSTAR - POLJE	Ⅱ	1	~	25	0								
27	MOSTAR - BOGODOL	Ⅱ	1			175	○		1		○			○
8	MOSTAR - ULOG	Ⅰ	1	~	2	0								
9	MOSTAR - RASTANI	Ⅰ	1	~	32	0								
30	MOSTAR - BACEVICI	Ⅰ	1			350		○	1		○			
31	MOSTAR - KRUSEVO	Ⅱ	1	~	33	0								
32	MOSTAR - BUCICI	Ⅱ	1			* 420		○	1		○			
33	MOSTAR - SLIPCICI	Ⅲ	1			* 595		○	1		○			
34	HIT - BIJELI BRIJEG	Ⅰ	1			700		○	1		○			
35	RONDO KRUZNO	Ⅰ	1			525		○	1		○			
36	MOSTAR - RASKA GORA	Ⅲ	1			63		○	1	●				●
37	MOSTAR - NEVESINJE	Ⅳ	1	~	15	0								
38	MOSTAR-CAPLJINA-STOLAC	Ⅴ	1			280		○	1		○			
39	MOSTAR-ROTIMLJA-STOLAC	Ⅳ	1			420		○	1		○			
40	MOSTAR-DOMANOVICI	Ⅲ	1	~	17	0								
41	MOSTAR - CAPLJINA	Ⅳ	1			350		○	1		○			
42	MOSTAR - SIROKI BRIJEG	Ⅲ	1			* 486	○		1		○			
45	MOSTAR - UZARICI	Ⅱ	1			140	○		1		○			○
48	MOSTAR - MEDJUGORJE	Ⅲ	1			* 273	○		1		○			
43	MOSTAR - LJUBUSKI	Ⅳ	1	~	48	0								
44	MOSTAR - RAKITNO	Ⅴ	1	~	42	0								
51	MOSTAR - ORTIJES	Ⅰ	1			1,050		○	1		○			
52	GIMNAZIJA -(M=17)- Kruzno	Ⅱ	1			* 1,050		○	1		○		○	
53	ZALIK-BALINOVAC-Kruzno	Ⅰ	1			* 1,120		○	1		○		○	
54	BUDNIK-VELMOS-Kruzno	Ⅰ	1			805		○	1		○			
52	T o t a l		62	16	-	30,399	22	16	46	6	40	3	4	5

Zone

Ⅰ	Mostar ～ 10km
Ⅱ	Mostar ～ 20km
Ⅲ	Mostar ～ 30km
Ⅳ	Mostar ～ 50km
Ⅴ	Mostar ～ 60km

~ Cancel Terminal
* Total Passengers
● Existing bus
○ New bus

The relationship between the routes served by one bus and the number of passengers is shown in Table 2-2-5. Even though congestion is expected to occur during peak hours, the average number of passengers per route of approximately 700 is not particularly high. Given the special configuration of the routes in that the final destinations are far and widely scattered from central Mostar, a certain level of congestion cannot be avoided. The planned integration and abolition of bus routes is illustrated in Appendicrs.

Table 2-2-5 Number of Passengers and Number of Corresponding Routes

Number of Passengers per Day	Number of Routes
– 500	12
501 – 700	10
701 – 900	2
900 – 1,050	7
Total	31

The number of bus routes and buses after the above re-examination (review) are shown is Table 2-2-6. Although such measures as re-routing and diagramme alteration are necessary for the planned number of routes, all of the identified routes are still in place through integration. As described earlier, the number of buses can be reduced by 16.

Table 2-2-6 Re-examination Results

	Original Plan	After Re-examination	Reduction
A. Number of Existing Routes	25 (*1)	22	-3
B. Number of New Routes	27	16	-11
C. Total Number of Routes (A + B)	52	38	-14
a. Required Number of Buses	62	46	-16
b. Number of Existing Buses	13 (*2)	6	7
c. Number of New Buses (a – b)	49 (*3)	40	-9

Notes 1) Thought discussion with the PCTA, number of the existing routes is 25 from 26 because Route No.61is omitted from the scope of Study area.

2) Availability of number of existing buses is 24 at the beginning of the Study, however, it is judged that only 13 buses are to be available in near future due to their quite old.

3) The government of BH requested 51 buses to the Government of Japan, however, number of new buses are 49 because midi buses for the disabled persons are omitted the Study through discussion with the PCTA.

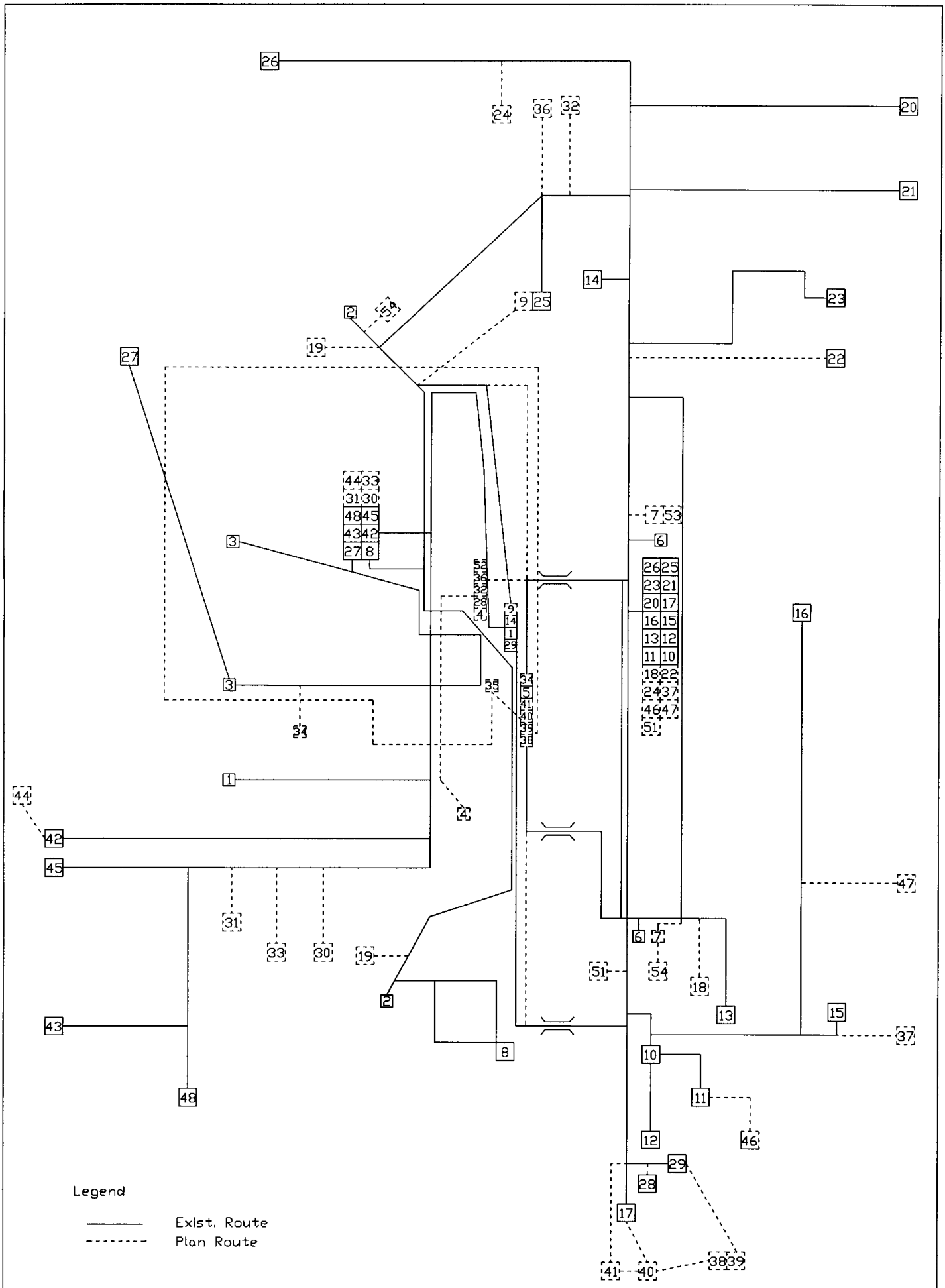


Fig. 2-2-1 Planned Bus Route Network of PCTA (Based on the Request)

(4) Selection of Bus Types and Deployment Plan

1) Criteria to Determine Bus Types

The deployment plan for articulated buses, low floor buses and midi buses for the planned routes has been decided based on the following criteria, taking the requests of the PCTA into consideration.

Table 2-2-7 Criteria for Deployment of Different Types of Buses

Articulated Bus	- Route with a demand of more than 1,050 passengers/day - Route with a peak demand of more than 100 passengers but short of the total transportation capacity of two buses - Route where the road has two or more lanes with the necessary shoulder width - Route where the departure and destination points have sufficient space for parking and turning round
Low Floor Bus	- Mainly routes in the city centre - Route circulating a wide area in Mostar - Route passing a large hospital(s); providing convenience for the disabled because of the use of a low floor bus - Well maintained road with a difference in the road surface level of less than 20 cm
Midi bus	- Narrow road in the mountainous area or a road with a curve(s) with a small radius, making its use by large buses difficult - Route with a small number of passengers

2) Criteria to Determine Number of Buses for Each Route

The bus service demand in Mostar is characterised by a relatively low demand for all routes, a high concentration of passengers early in the morning and predominantly radial service links between suburban areas and the city centre. Therefore, the PCTA plans a bus deployment unit of one bus per some 1,050 passengers for each route (Table 2-1-1).

The selection of either an articulated bus or two buses for those routes shown in Table 2-2-7 where the number of passengers exceeds 1,050 is determined using the flow shown in Fig. 2-2-2 based on the assumed instantaneous number of passengers during the early morning peak hours. The calculation results for articulated buses are shown in Table 2-2-8.

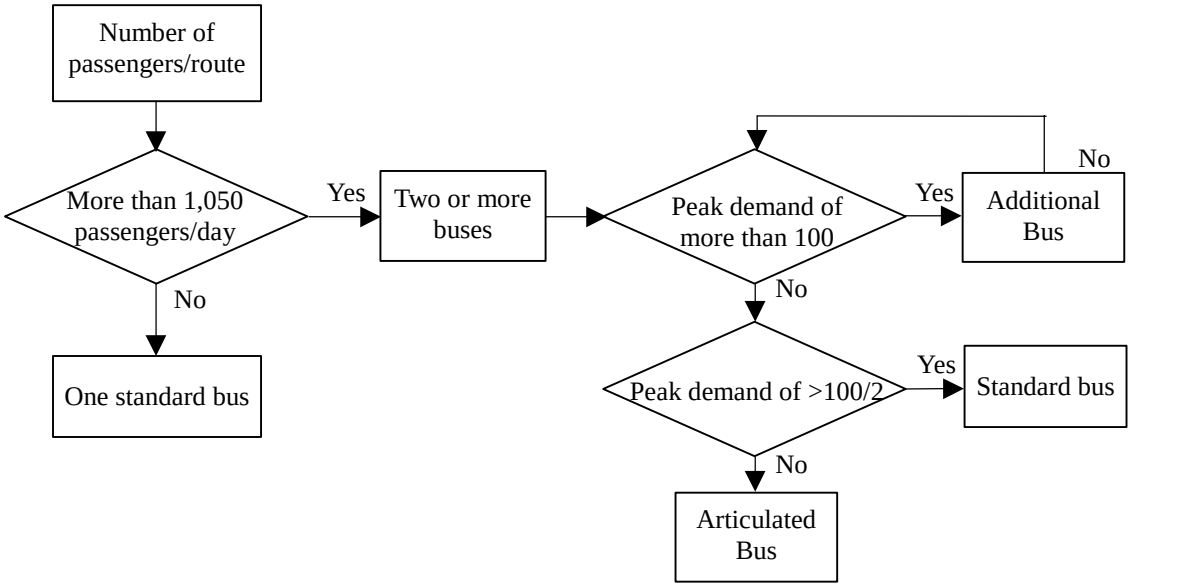


Fig. 2-2-2 Processes to Determine Bus Type

Table 2-2-8 Number of Articulated Buses

Route No.	Route	Existing Route	Number of Passengers/ Day	Planned Number of Buses	Peak Demand	Passenger Capacity	Number of Passengers Above 100	Articulated Buses
6	Velmos-Zalik	○	2,380	3	95	100	-5	-
20	Mostar-Podgorani	○	1,260	2	76	100	-24	-
21	Mostar-Humi	○	1,995	2	120	100	20	○
1	Mostar-Ilici	○	1,890	2	113	100	13	○
19	Deko-Rodoc		2,226	2	134	100	34	○
2	Jasemca-Skakala	○	1,659	2	100	100	0	-

Peak demand = number of passengers/day x direction factor (60%) x peak factor (20%) ÷ number of buses/direction

As shown by the deployment plan table, 40 new buses will be added to the 6 existing buses, resulting in a total of 46 buses serving 52 routes.

a) Based on the relevant criteria, three articulated buses will be required to serve three inner city routes with relatively frequent services, i.e. Mostar to Homi, Ilici and Rodoc.

b) Two low floor buses will be deployed for the circular route running through the city centre and one bus each will be deployed for the circular route on the M-17 from Gimnazija and the route between Hit and Bijeli Brijeg. The deployment of these low floor buses for these routes appears appropriate because of the

existence of hospitals, sports centres and other public facilities and shopping districts along these routes.

c) It has been decided to deploy midi buses for five routes between Mostar and Podvelezje, G. Dreznica, Bogodol, Raska-Gora and Uzarici because these routes pass through the mountainous region or have a relatively small number of users.

The number of newly required buses based on the above analysis results and taking the existing number of buses into consideration is shown in Table 2-2-9.

Table 2-2-9 Number of Bus Types

	Airticulated Bus	Low Floor Bus	Midi Bus	Standard Bus	Total
a. Required Number of Buses	3	4	5	34	46
b. Number of Existing Buses	1	0	1	4	6
c. Number of New Buses (a-b)	2	4	4	30	40

3) Bus Route and Deployment Plan

The number and type of buses operating on each route in the target year (2002) are shown in Table 2-2-10 and Fig. 2-2-3.

Table 2-2-10 Bus Deployment Plan

Route No.	Route	Zone	Number of Buses	Existing	New	Articulated	Low Floor	Midi	Transmission Type
5	MOSTAR Kruzno	I	2		○○		○○		Ax2
6	VELMOS - ZALIK	I	3	●	○○				Ax2
7	ZALIK - VELMOS (M-17)	I	Integrated to Route Nos.6, 52 and 53						
10	MOSTAR - BLAGAJ	II	1		○				A
11	MOSTAR - VRANJEVCII	II	1						A
12	MOSTAR - MALO POLJE	II	1		○				A
13	MOSTAR - DRACEVICE	II	1		○				A
18	MOSTAR - VRBA	I	1		○				A
15	MOSTAR - KOKORINA	III	1						M
16	MOSTAR - PODVELEZJE	III	1		○			○	M
17	MOSTAR - PIJESCI	V	1		○				M
20	MOSTAR - PODGORANI	III	2	●	○				M
21	MOSTAR - HUMI	II	2	●	○	○			A
22	MOSTAR - RASOJE	I	Integrated to Route Nos.21 and 23						
23	MOSTAR - KUTI	II	1		○				A
24	MOSTAR - D.DREZNICA	III	Integrated to Route No.26						
25	MOSTAR - RASTANI	III	1		○				M
26	MOSTAR - G.DREZNICA	IV	1		○			○	M
46	MOSTAR - COMORI	II	Integrated to Route No.11						
47	MOSTAR - G.KRUZANJ	III	Integrated to Route No.16						
1	MOSTAR - ILICI	I	2	●	○	●			A
19	DEKO - RODOC	I	2		○	○			Ax2
2	JASENICA - SKAKALA	I	2	●	○				A
3	DUBROVACKA - CIM	I	1		○				A
4	PANJEVINA KRUZNO	I	1		○				A
28	MOSTAR - BUNA	II	1		○				A
29	MOSTAR - HODBINA	II	Integrated to Route No.28						
14	MOSTAR - POLJE	II	Integrated to Route No.25						
27	MOSTAR - BOGODOL	II	1		○			○	M
8	MOSTAR - ULOG	I	Integrated to Route Nos.2 and 19						
9	MOSTAR - RASTANI	I	Integrated to Route No.32						
30	MOSTAR - BACEVICI	I	1		○				A
31	MOSTAR - KRUSEVO	II	Integrated to Route No.33						
32	MOSTAR - BUCICI	II	1		○				A
33	MOSTAR - SLIPCICI	III	1		○				M
34	HIT - BIJELI BRIJEG	I	1		○				A
35	RONDO KRUZNO	I	1		○				A
36	MOSTAR - RASKA GORA	III	1	●				●	
37	MOSTAR - NEVESINJE	IV	Integrated to Route No.15						
38	MOSTAR - CAPLJINA - STOLAC	V	1		○				M
39	MOSTAR - ROTIMLJA - STOLAC	IV	1		○				M
40	MOSTAR - DOMANOVICI	III	Integrated to Route No.17						
41	MOSTAR - CAPLJINA	IV	1		○				M
42	MOSTAR - SIROKI BRIJEG	III	1		○				M
45	MOSTAR - UZARICI	II	1		○			○	M
48	MOSTAR - MEDJUGORJE	III	1	●					M
43	MOSTAR - LJUBUSKI	IV	Integrated to Route No.48						
44	MOSTAR - RAKITNO	V	Integrated to Route No.42						
51	MOSTAR - ORTIJES	I	1		○		○		A
52	GIMNAZIJA - (M=17) - Kruzno	II	1		○		○		A
53	ZALIK - BALINOVAC - Kruzno	I	1		○				A
54	BUDNIK - VELMOS - Kruzno	I	1		○				A
52	Total		46	6	40	3	4	5	

A: Automatic gear type bus M: Manual gear type bus

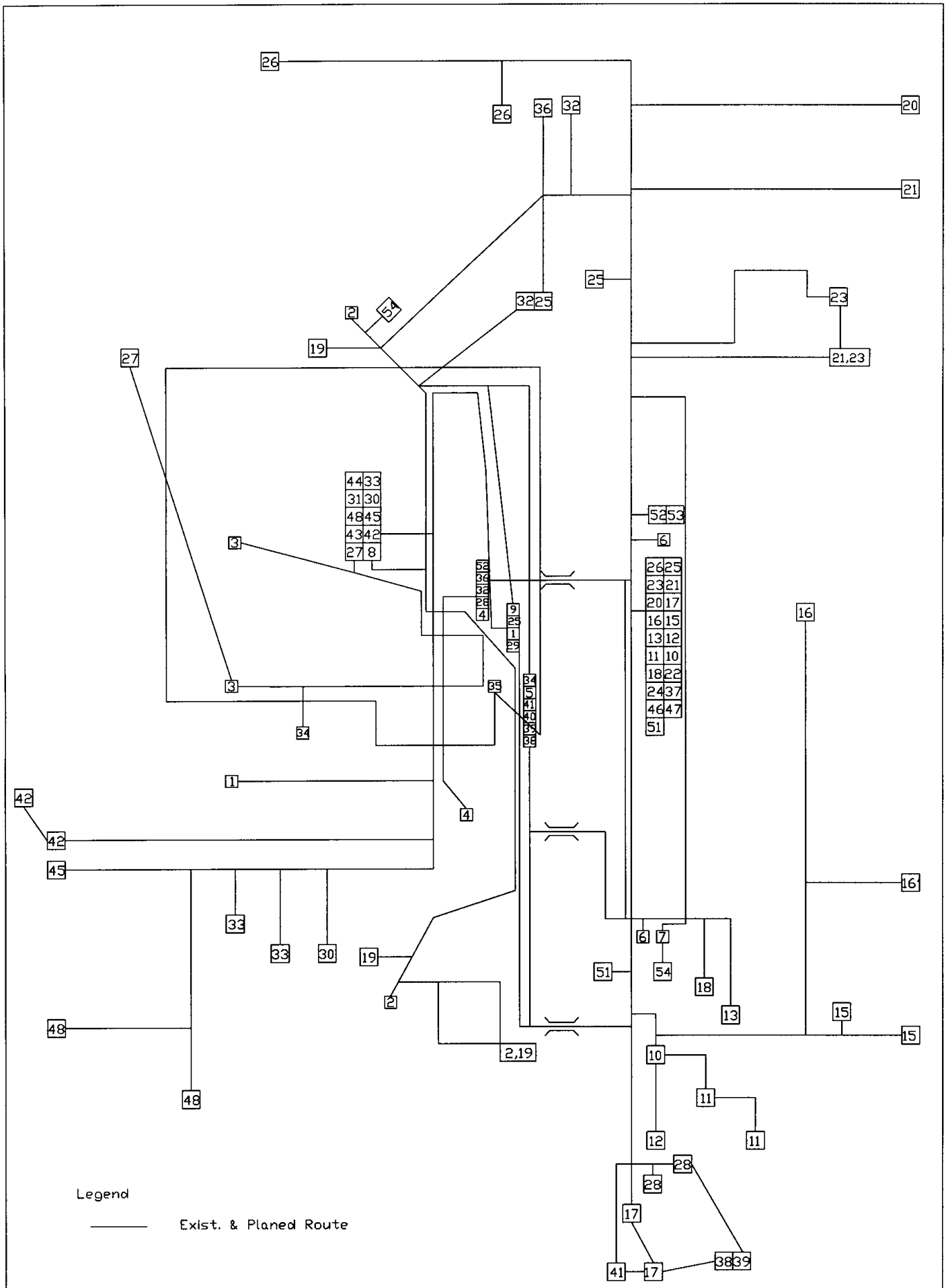


Fig. 2-2-3 Bus Route Map

(5) Equipment Specifications and Quantities

The specifications of the buses, maintenance equipment and spare parts under the Project are outlined in Tables 2-2-11, 2-2-12 and 2-2-13 respectively.

Table 2-2-11 Technical Specfication of Buses

No.	Description	Q'ty	Unit	Required specifications
1.	High Floored Standard bus			
	Dimensions			Width: Maximum 2.5 m
				External height: Maximum 3.2 m
				Length: 11.80 - 12.20 m
	Floor level from ground level			Maximum 750 mm
	First step height from ground level			Maximum 350 mm
	Step			Each step level not exceeding 200mm
	Capacity of engine			Minimum 220hp (at 2400 r.p.m.)
	Brake System			Disc brakes at front axle drum at rear
	(1) Type - A (Automatic gear type)	20	units	
	Type of gear box			Automatic
	Capacity of passenger			Up to 110 Passengers
	Number of seat			Approximate 40 Passengers
	Number of door			Two (2) or three (3) entrance and exit doors
	(2) Type-B(Large seat & Mechanical gear type)	10	units	
	Type of gear box			Mechanical
	Capacity of passenger			Approximate 80 Passengers
	Number of seat			Approximate 50 Passengers
	Number of door			Two (2) or three (3) entrance and exit doors
2.	Low floored Standard bus	4	units	
	Dimensions			Width: Maximum 2.5 m
				External height: Maximum 3.0 m + Air conditioner
				Length: 11.80 - 12.20 m
	Type of gear box			Automatic
	Floor level from ground level			Maximum 360 mm
	Capacity of engine			Minimum 220hp (at 2400 r.p.m.)
	Capacity of passenger			Up to 95-100 Passengers
	Number of seat			Approximate 30 Passengers
	Number of door			Two (2) or three (3) entrance and exit doors
	Air conditioner			One (1) roof air conditioner
	Solpe for entrnce and exit			Slope bridge of manual operation
	Kneeling device			For right hand side of Bus in conjunction with ECAS or equivalent

No.	Description	Q'ty	Unit	Required specifications
3.	Elobow bus	2	units	
	Dimensions			Width: Maximum 2.5 m
				External height: Maximum 3.2 m
				Length: 17.80 - 18.00 m
	Type of gear box			Automatic
	Floor level from ground level			Maximum 750 mm
	First step height from ground level			Maximum 350 mm
	Step			Each step level not exceeding 200mm
	Capacity of engine			Minimum 305hp (at 2000 r.p.m.)
	Capacity of passenger			Approximate 170 Passengers
	Number of seat			Approximate 50 Passengers
	Number of door			Three (3) or four (4) entrance and exit doors
4.	Midi bus	4	units	
	Dimensions			Width: Maximum 2.5 m
				External height: Maximum 3.2 m
				Length: Minimum 9.0 m
	Type of gear box			Classical mechanical gear box
	Floor level from ground level			Maximum 900 mm
	First step height from ground level			Maximum 350 mm
	Capacity of engine			Approximate 200 hp
	Capacity of passenger			Approximate 60 Passengers
	Number of seat			Approximate 30 Passengers
	Number of door			Two (2) entrance and exit doors
5.	Special tools and spare parts	1	lot	
	① Special tools			
	The following special tools shall be provided for maintenance work, but not be limited to:			
	(1) Following manual device for measuring compression gauge with adapter in diesel engine.			
	・Two(2) sets of high floored standard bus			
	・One(1) set of low floored standard bus			
	・One(1) set of elbow bus			
	・One(1) set of midi bus			
	(2) One(1) set of instrument for measuring of the oil pressure in the automatic gear box.			
	(3) Two(2) sets of special tools of each mechnical and electrical for bus.			
	② Spare parts			
	Manufacturer shall be provided spare parts based on attached "Spare parts list".			

Table 2-2-12 Workshop tools

NO.	Check item	Required tool	Existing tool				New tool				Total	Remark
			East		West		East		West			
			Present	No.	Present	No.	Provide	No.	Provide	No.		
1	Genral tools											
	(1) Air compressor-A (including piping,valve, gauge & tube)				○	1 set	○	1 set			1 set	
	(2) Crocodile hydro jack(Hydraulic garage jack)						○	1 pc	○	1 pc	2 pc	
	(3) Mobile hydro jack (Air hydraulic garage jack)						○	1 pc	○	3 pc	4 pc	
	(4) Pit jack		○	1 pc	○	1 pc						
	(5) Socket wrench								○	1 set	1 set	
	(6) Mechanical tool set (A)		△	1 set			○	1 set	○	2 set	3 set	Agency has part of tools
	(7) Mechanical tool set (B)				△	1 set	○	1 set	○	2 set	3 set	Agency has part of tools
	(8) Electrical tool set						○	1 set	○	1 set	2 set	
2	Daily checking											
	(1) Safety inspection											
	Head light	Visual check										
	Signal light	Visual check										
	Back light	Visual check										
	Stop light	Visual check										
	Oil check	Visual check										
	Filter check	Visual check										
	Check under the body	Grarage lamp					○	5 pc	○	5 pc	10 pc	
		service creeper					○	5 pc	○	5 pc	10 pc	
	(2) Cleaning											
	Cleaning(Inside)	Steam cleaner										
	Cleaning(Body)	Gantry type car washer	△	1 set								Agency will repair
	Cleaning(under the body)	High pressure car washer	○	1 set					○	1 set	1 set	
3	Body repair											
	(1) Grease filling system	Grease filling pump					○	1 pc			1 pc	
		hose and nozzzle					○	1 set			1 set	
		Hand grease pump with nozzle					○	3 pc	○	1 pc	4 pc	
	(2) Lub. Oil filling system	Lub. Oil filling pump					○	1 pc			1 pc	
		hose and nozzzle					○	1 set			1 set	
		Oil filter wrench					○	3 pc	○	1 pc	4 pc	
		Drain plug wrench set					○	3 set	○	1 set	4 set	
		Drain tank					○	1 pc			1 pc	
	(3) Fuel filling system	Fuel tank	○	2 pc								
		Fuel filling machine	○	2 set								
	(4) Tire check	Tire pressure gauge					○	2 pc	○	2 pc	4 pc	
		Air compressure-B					○	1 pc			1 pc	
		Tube set (9mm, 12mm)					○	2 set			2 set	
		Automatic air inflator					○	2 pc			2 pc	
	(5) Cleaning for engine etc	Steam cleaner					○	1 set	○	1 set	2 set	
4	Easy repair											
	(1) Body											
	Body (easy repair)	Body & fender tool set					○	2 set			2 set	
		Body puller set					○	2 pc			2 pc	
		Hand revetter set					○	2 set			2 set	
		High speed cutter					○	2 pc			2 pc	
		Disc grainder and orbital sander					○	2 pc			2 pc	
		Welding tool (electrical & gas)			○	2 set						
	Painting	Gun for painting with container					○	2 set			2 set	
	(2) Engine											
	Belt tension check	Tension tester					○	2 pc			2 pc	
	Revolution check	Diesel tacho tester					○	1 pc			1 pc	

NO.	Check item	Required tool	Existing tool				New tool				Total	Remark
			East		West		East		West			
			Present	No.	Present	No.	Provide	No.	Provide	No.		
5	Medium repair											
	(1) Tire change	Air hydraulic garage jack										Use item 1 (3)
		Rigid rack							○	4 set	4 set	
		Wheel dolley							○	2 pc	2 pc	
		Tire changer							○	1 pc	1 pc	
		Air impact wrench							○	2 set	2 set	
		Torque wrench							○	1 set	1 set	
	(2) Balance check	Wheel balancer							○	1 pc	1 pc	
		Balance wight set							○	2 set	2 set	
	(3) Tube vulcanizer	Tube vulcanizer set							○	2 set	2 set	
		Tube test tank							○	1 pc	1 pc	
	(4) Brake check	Hydraulic-four pillar jack							○	1 set	1 set	
		Brake adjusting tool set							○	1 set	1 set	
		Brake lining revetter							○	2 pc	2 pc	
		Brake drum gauge							○	1 set	1 set	
		Universal wheel hub puller							○	2 pc	2 pc	
	(5) Parts change	Hydraulic-four pillar jack										Use item 5 (4)
		Puller set							○	1 set	1 set	
		Hydraulic press							○	1 set	1 set	
		Cleaning pan							○	10 pc	10 pc	
		Part cleanetr							○	2 set	2 set	
		Air gun for compressor							○	2 pc	2 pc	
	(6) Electrical check											
	Bayttery	Battery tester							○	2 set	2 set	
		Battery service tool							○	2 set	2 set	
		Booster cable					○	2 set	○	2 set	4 set	
		Battery caddy							○	2 pc	2 pc	
		Battery chager					○	1 pc	○	1 pc	2 pc	
	Light	Headlight tester							○	1 set	1 set	
	Instrument system	System checker							○	2 set	2 set	Special tool
		Diesel circuit tester							○	2 set	2 set	
		AVO meter							○	2 pc	2 pc	
		Regulator tester							○	2 set	2 set	
6	Heavy repair											
	(1) Engine	Hydraulic-four pillar jack										Use item 5 (4)
		Mobile engine lifter							○	1 pc	1 pc	
		Mobile floor crane with with sling set							○	1 pc	1 pc	
		Engine support stand							○	2 pc	2 pc	
		Compression gauge for engine(Standard bus)							○	2 set	2 set	Special tool
		Compression gauge for engine(Low floored bus)							○	1 set	1 set	Special tool
		Compression gauge for engine(Midibus)							○	1 set	1 set	Special tool
		Gauge for mesuring of fuel							○	1 set	1 set	
		Device for testing fuel pipe							○	1 set	1 set	
		Torque wrench										Use item 5 (1)
	(2) Transmission gear	Hydraulic-four pillar jack										Use item 5 (4)
		Instrument for Pressure of automatic gear box							○	1 set	1 set	Special tool
		Transmission jack							○	1 pc	1 pc	
		Transmission support stand							○	2 pc	2 pc	
		Torque wrench										Use item 5 (1)
	(3) Differential gear	Hydraulic-four pillar jack										Use item 5 (4)
		Differential gear jack							○	1 pc	1 pc	
		Differential gear] support stand							○	2 pc	2 pc	
		Torque wrench										Use item 5 (1)

Table 2-2-13 Spare parts list

No.	Part name	Q'ty	Part name	Q'ty	Part name	Q'ty	Part name	Q'ty
	A: High Floored Standard Bus		**B: Low Floored Standard Bus**		**C: Elbow Bus**		**D: Midi Bus**	
1	POLYMIDE TUBE	1 pc	FLASHER LEFT/RIGHT	2 pc	HOSE PIPE	2 pc	TAPER ROLL BEARING	3 pc
2	TAPER ROLL. BEARING	1 pc	BULB	20 pc	SHAFT SEAL	2 pc	HOSE LINE	3 pc
3	HOSE LINE	1 pc	CLEARANCE LAMP RED	2 pc	V-BELT	3 pc	SHAFT SEAL	5 pc
4	SHAFT SEAL	2 pc	STALK SEITCH	2 pc	OIL FILTER ELEMENT	1 pc	V-BELT	2 pc
5	V-BELT	1 pc	SIDE MARKER LIGHT	2 pc	FILTER ELEMENT-A	1 pc	FILTER ELEMENT	3 pc
6	FILTER ELEMENT	2 pc	TAIL LAMP LEFT/RIGHT	2 pc	FOG TAIL LAMP	1 pc	METAL HOSE	2 pc
7	METAL HOSE	1 pc	HEAD LAMPS LEFT/RIGHT	2 pc	CLEARANCE RIGHT	1 pc	AIR CYLINDER	2 pc
8	AIR CYLINDER	1 pc	CLEARANCE LAMP LEFT/RIGHT	2 pc	CLEARANCE LEFT	1 pc	CLEARANCE LAMP	4 pc
9	CLEARANCE RIGHT	1 pc	WIPER BLADE	4 pc	CLEARANCE	1 pc	AUTOMATIC FUSE	4 pc
10	CLEARANCE LEFT	1 pc	WHEEL MOUNTING BOLT	6 pc	FLASHER	1 pc	SWITCH	8 pc
11	CLEARANCE LAMP	1 pc	BRAKE DISK	2 pc	LOCK FUSE	2 pc	TUBULAR LAMP	20 pc
12	AUTOMATIC FUSE	1 pc	TAPER ROLLER BEARING	4 pc	LUMINOUS KEY	1 pc	BULB	10 pc
13	LUMINOUS KEY	1 pc	AIR BELLOWS	2 pc	TUBULAR LAMP-A	5 pc	AIR BELLOWS	2 pc
14	FOOT SWITCH	1 pc	AIR SPRING BASE	2 pc	TUBULAR LAMP-B	3 pc	BRAKE DRUM	5 pc
15	TOGGLE SWITCH	1 pc	SHOCK ABSORBER FOR FRONT AXLE	2 pc	LIMIT SENSOR	1 pc	BRAKE LINING	20 pc
16	WARNING FLASHER SWITCH	1 pc	DISTANCE SENSOR	1 pc	RELAY	1 pc	RIVET	250 pc
17	TOGGLE SWITCH	1 pc	RUBBER PAD	4 pc	SENSOR	1 pc	JOINT	4 pc
18	ISOLATOR	1 pc	OIL FILTER ELEMENT	6 pc	TEMPERATURE SENSOR	1 pc	BELLOW	2 pc
19	STALK SWITCH	1 pc	PRESSURE CONTROL VALVE	1 pc	PRESSURE SENSOR	1 pc	AIR ELEMENT	2 pc
20	TUBULAR LAMP	5 pc	HEATER CARTRIDGE	1 pc	AIR BELLOWS	2 pc	CARTRIDGE	2 pc
21	BULB	5 pc	VACUUM INDICATOR	1 pc	HORN BUTTON	1 pc	MIRROR	4 pc
22	FLUID LEVE PROBE	1 pc	HOSES	2 pc	BRAKE DRUM	2 pc	SHOCK ABSORBER	2 pc
23	AIR BELLOWS	2 pc	HOSE BEND	1 pc	BRAKE LINING	16 pc	SOLENOID VALVE	1 pc
24	HORN BUTTON	1 pc	FAN	1 pc	HOLLOW RIVET	250 pc	SAFETY VALVE	2 pc
25	BRAKE DRUM	2 pc	CHECK VALVE	1 pc	RUBBER TO METAL PAD	1 pc	FILTER MAT	2 pc

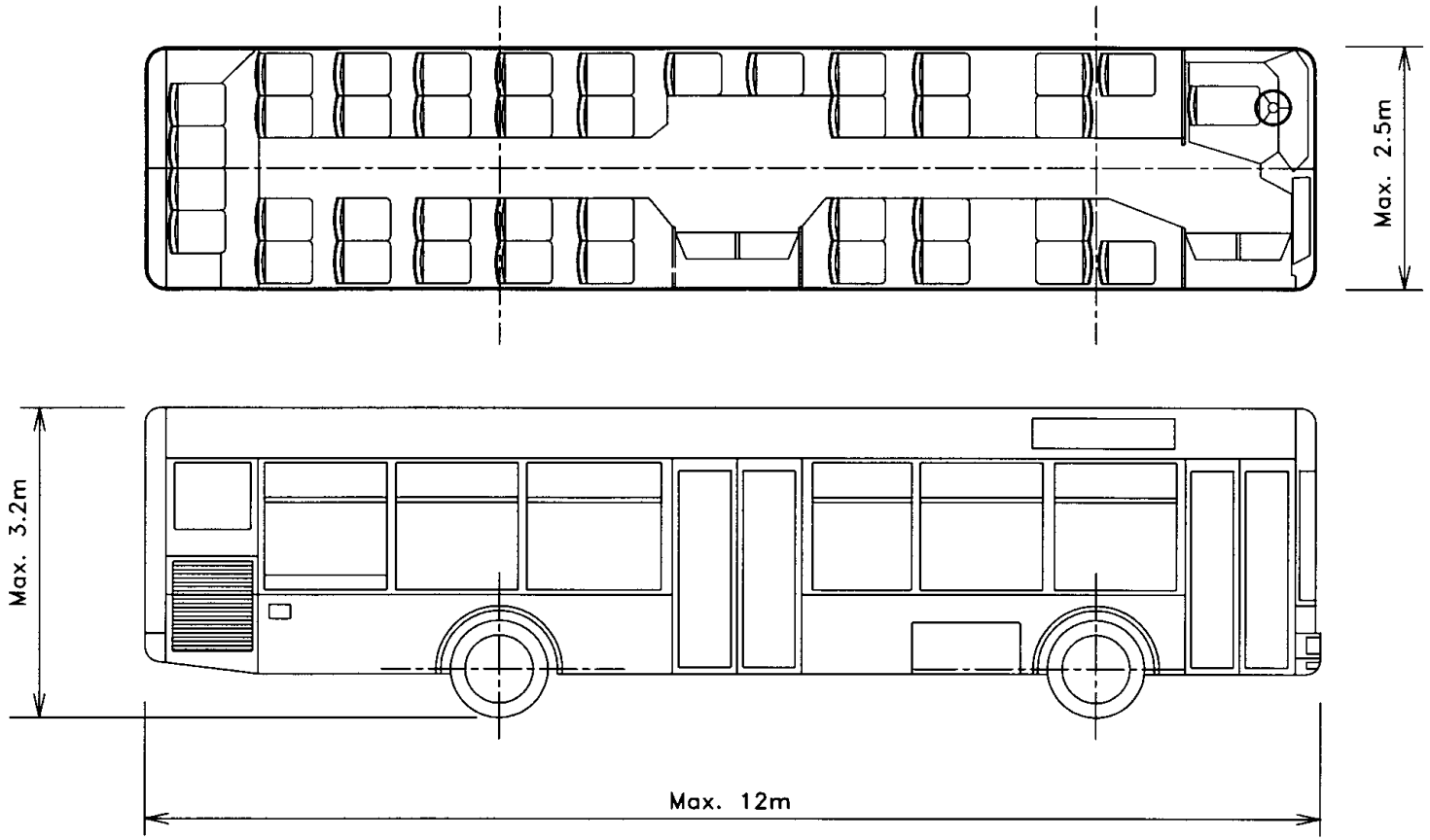
No.	Part name	Q'ty	Part name	Q'ty	Part name	Q'ty	Part name	Q'ty
26	BRAKE LINING	16 pc	WASHER	2 pc	SHAPED HOSE	1 pc	POTENTIOMETER	2 pc
27	HOLLOW RIVET	250 pc	PRESSURE SWITCH	1 pc	TENSION SPRING	4 pc	HOSE PIPE	1 pc
28	SPHERRICAL JOINT	2 pc	WIPER MOTOR	2 pc	FILTER ELEMENT-B	1 pc	NARROW V-BELT SET	2 pc
29	BELLOWS	1 pc	SPACER	2 pc	RADIATOR	1 pc	V-BELT	2 pc
30	AIR DRY ELEMENT	1 pc	WHETHER STRIP	3 pc	AIR DRY ER ELEMENT	1 pc	BEARING	10 pc
31	CARTRIDGE	1 pc	DISC BRAKE CALIPER	2 pc	LAMP	1 pc	SEAL	4 pc
32	FLUORSC. TUBE	2 pc	OIL SPRAYER NOZZLE	2 pc	PROXIMITRY SWITCH	1 pc	OIL SPRAYER NOZZLE	6 pc
33	INTERIOR MIRROR	2 pc	OIL PRESSURE VALVE	2 pc	BOOSTER	1 pc	PRESSURE VALVE	2 pc
34	OUTSIDE MIRROR	2 pc	OIL SEPARATOR	2 pc	MAGNETIC DULCH	1 pc	CONROD BEARING	8 pc
35	SHOCK ABSORBER	2 pc	NOZZLE	2 pc	MAIN BEARING	6 pc	GASKET	20 pc
36	SCIDING WINDOW	1 pc	KEY STONE RING	1 pc	THRUST BEARING	4 pc	EXHAUST VALVE	8 pc
37	FILTER DRIVER	1 pc	DRAIN PLUG	1 pc	SHAFT SEAL	2 pc	INTAKE VALVE	8 pc
38	SHUT-OFF VALVE	1 pc	CYLINDER HEAD GASKET	2 pc	OIL SEPARATOR	1 pc	OIL PRESSURE VALVE	8 pc
39	SOLENOID VALVE	1 pc	SET OF SEALS	4 pc	CONROD BEARING	6 pc	FILTER	15 pc
40	SAFETY VALVE	1 pc	EXHAUST VALVE	4 pc	REPAIR KIT PISTON RING	6 pc	THERMOSTAT	2 pc
41	FILTER MAT	1 pc	INTAKE VALVE	4 pc	VALVE GUIDE EXHAUST	6 pc	RING SEAL	4 pc
42	TEMERATURE PROBE	1 pc	EXPENDABLE FILTER	6 pc	VALVE GUIDE INTAKE	6 pc	CONTROL SWITCH	6 pc
43	POTENTIOMETER TEMP. COL.	1 pc	NARROW V-BELT SET	2 pc	SYLINDER HEAD GASKET	6 pc		
44	HOSE PIPE	1 pc	GASKET ASBESTOS-FREE	6 pc	GASKET CYLINDER HEAD REVER	6 pc		
45	NARROW V-BELT SET	1 pc	INJECTION NOZZLE	4 pc	INTAKE VALVE	6 pc		
46	V-BELT	1 pc	RIBBED V-BELT	2 pc	EXHAUST VALVE	6 pc		
47	MAIN BEARING	6 pc	RECTIFIER	2 pc	ROCKER BRACKET	6 pc		
48	THRUST BEARING	1 pc	ENGINE MOUNTING	2 pc	PUSH ROD	6 pc		
49	SHAFT SEAL	1 pc	AIR FILTER ELEMENT	6 pc	PRESSURE RELIEF VALVE	1 pc		
50	OIL SPRAYER NOZZLE	6 pc	COOLING WATER HOSE	4 pc	OIL FILTER ELEMENT ENGINE	2 pc		
51	PRESSURE REGULATING VALVE	1 pc			GASKET-A	1 pc		
52	GASKET TIMING COVER	1 pc			THERMOSTAT ELEMENT	2 pc		
53	GASKET	1 pc			O-RING SEAL	1 pc		
54	CONROD BEARING	6 pc			REPAIR KIT	1 pc		
55	CYLINDER HEAD COVER	1 pc			GASKET-B	12 pc		

No.	Part name	Q'ty	Part name	Q'ty	Part name	Q'ty	Part name	Q'ty
56	GASKET	6 pc			EXPEND FILTER	2 pc		
57	EXHAUST VALVE	6 pc			GASKET-C	1 pc		
58	INTAKE VALVE	6 pc			TORIC SEAL	24 pc		
59	OIL PRESSURE VALVE	6 pc			BAYONET CAP	1 pc		
60	EXPEND. FILTER	1 pc						
61	OIL DIPSTICH	1 pc						
62	THERMOSTAT	1 pc						
63	RING SEAL	2 pc						
64	GASKET	6 pc						
65	GASKET IN TAKE PIPE	6 pc						
66	EXPEND. FILTER	2 pc						
67	CONTROL SWITCH	2 pc						
68	STOP LAMP SWITCH	1 pc						

2.2.3 Basic Design Drawing

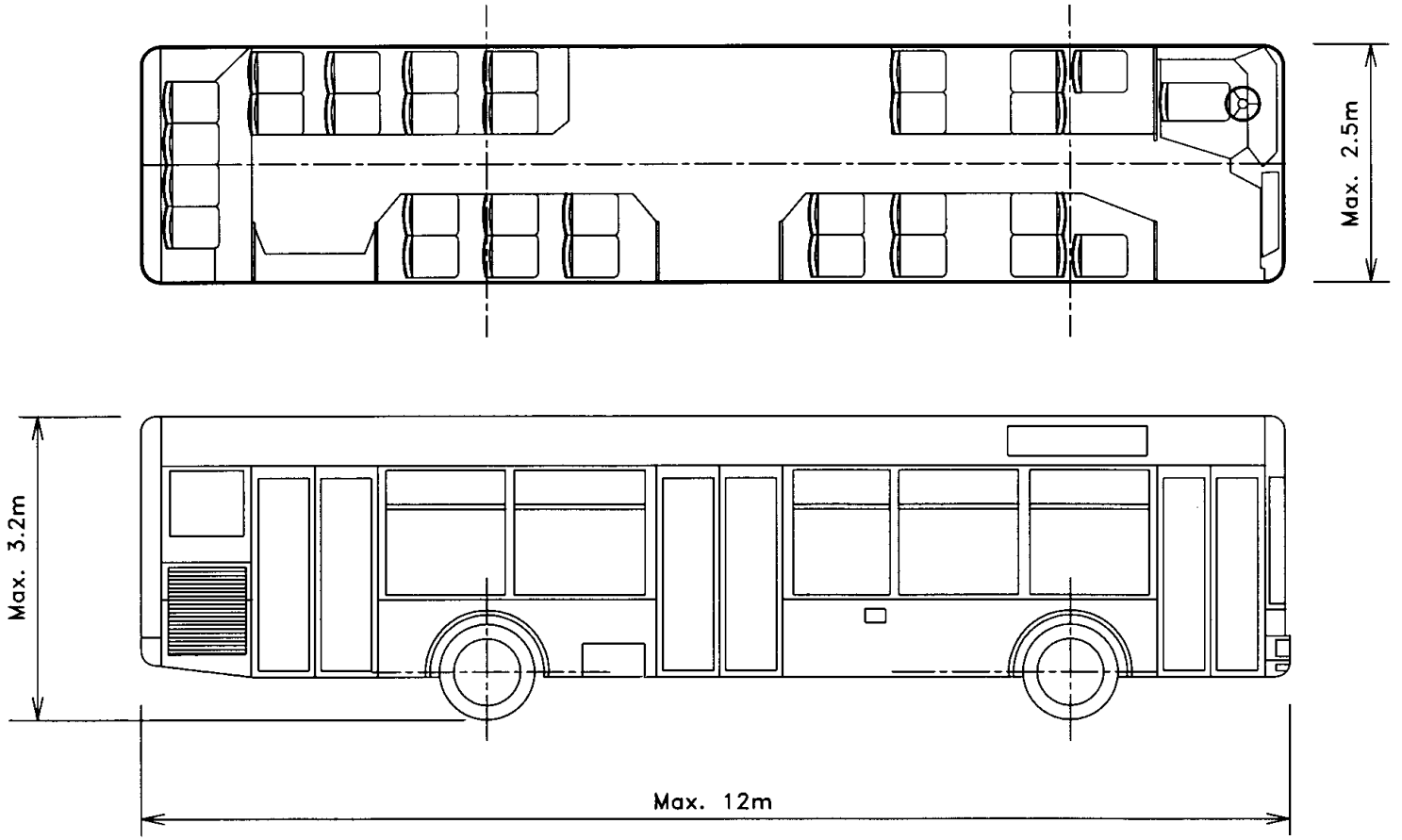
The main basic design drawings for the Project are those listed below.

Drawing No.	Title	Scale	Remarks
BM-BO1	Standard Bus	As indicated on the drawing	
BM-BO2	Low Floor Bus	As indicated on the drawing	
BM-BO3	Articulated Bus	As indicated on the drawing	
BM-BO4	Midi Bus	As indicated on the drawing	



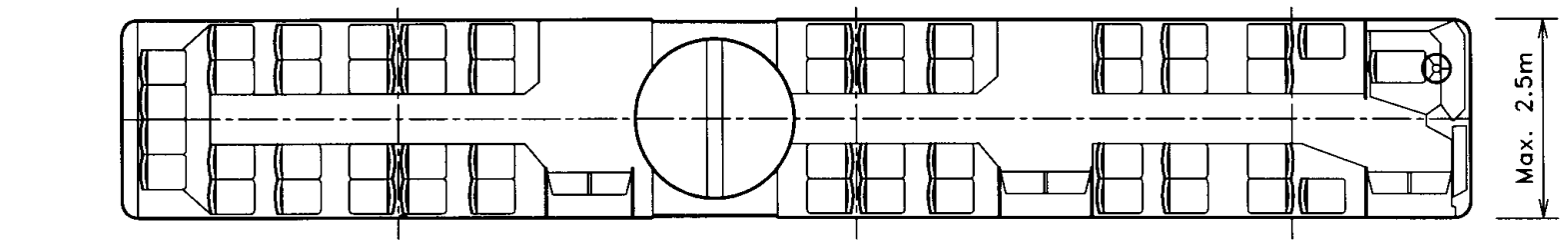
The Number of Seat : Type A&B About 40 seats
Type C About 50 seats

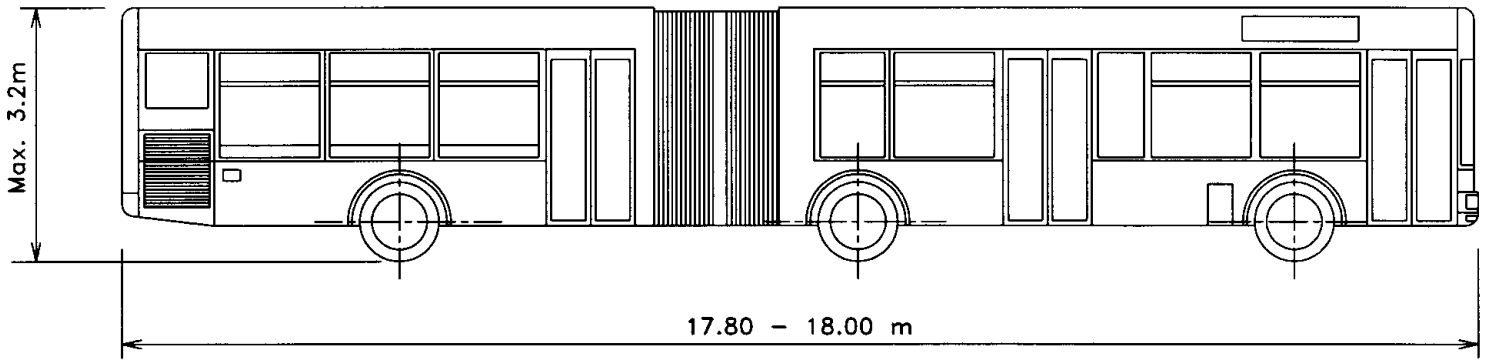
BM-B01 High Floored Standard Bus



The Number of Seat : About 30 Seats

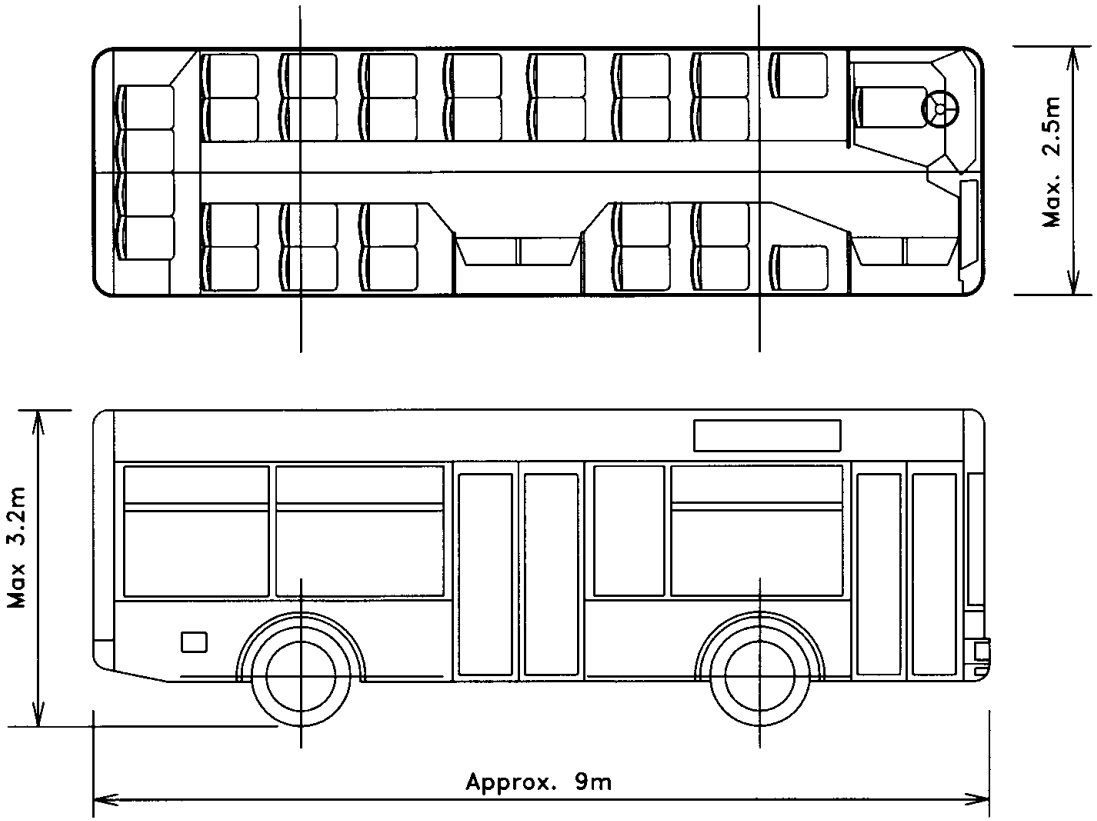
BM–B02 Low Floored Standard Bus





The Number of Seat : About 50 Seats

BM-B03 Elbow Bus (Articulate Bus)



The Number of Seat : About 30 seats

BM-B04 Midi Bus

2.2.4 Implementation Plan

2.2.4.1 Implementation Policy

(1) Precondition of Implementation

The Project will be implemented in accordance with the framework of Japan's grant aid system. Following approval by the Government of BH and the Government of Japan, the Exchange of Notes (E/N) regarding the detailed design will be signed to commence the actual implementation process of the Project. The basic issues and points to note regarding the implementation of the Project are described next.

(2) Necessity of Dispatching Engineer(s)

The PCTA, the implementation agency of the Project, is a public corporation born from the integration of two former bus companies and is capable of operating and maintaining the new buses to be provided under the Project. Because of the fact that the buses currently owned by the PCTA are mainly old models of 15 - 20 years of age, the staff members of the PCTA are somewhat unfamiliar with new models incorporating new technologies. This will make the dispatch of engineers by the Japanese side to Mostar necessary to conduct the transfer of new inspection and maintenance technologies and skills.

(3) Project Implementation Body

The PCTA will be responsible for the actual implementation of the Project and the organizational structure of the PCTA is described in Fig. 2-4-1. The PCTA will also be responsible for the operation and maintenance of the buses in the post-project period. For the smooth implementation of the Project, the PCTA will closely liaise and consult with the Japanese Consultant and Contractor and will need to appoint a person responsible for the Project.

This appointed person will be required to fully explain the contents of the Project regarding the buses and equipment/tools to be procured under the Project to the staff members of the PCTA as well as to the people concerned of the provincial government and other bodies in order to secure their cooperation for the Project based on a proper understanding of the Project.

2.2.4.2 Implementation Conditions

(1) Doors Layout Design for Tariff Collection System

Tariff collection rate is the most important factor to affect to business viability of the PCTA. The fleet design should be considered passengers' getting on/off in terms of its prevention. Number of bus doors is required to study both of passengers' convenience and tariff collection system.

(2) Number of Seats for Buses to be Used in Suburban Area

Operating time of bus in the city is no long, however, operating buses in suburban area take a long time rather than city buses. It is recommended that number of seats for suburban buses are more than the city buses.

(3) Manual Gear Box

Mountainous and hilliness area surrounding Mostar city, therefore manual gear box is preferable in terms of an easy operation.

2.2.4.3 Scope of Works

The buses and maintenance equipment/tools to be provided under the Project will be procured by the Japanese side while the installation of some of the maintenance equipment will be conducted by the BH side. The detailed scope of work for each side is shown in Table 2-2-14

Table 2-2-14 Scope of Work for Japanese and BH Sides

Item	Procurement of Buses, etc.		Installation Work		Remarks
	Japan	BH	Japan	BH	
1. Buses					
(1) Standard Buses	○				
(2) Low Floor Buses	○				
(3) Articulated Buses	○				
(4) Midi Buses	○				
(5) Special Tools	○				
(6) Spare Parts; Inspection and Maintenance Manuals	○			○ (to keep)	Spare parts: two years supply
(7) Pre-Delivery Inspection	○ (implementation)	○ (witnessing)			
2. Maintenance Equipment/Tools					
(1) Apparatus/Equipment	○			○	
(2) Tools	○				
(3) Testing Equipment	○				
3. Others					
(1) Bus Stops		○		○	

○ indicates the side responsible for the item concerned.

2.2.4.4 Consultation Supervision

In accordance with the grant aid scheme of the Government of Japan and based on the purport of the basic design, the Consultant will organize a project team which will consistently work through the detailed design and procurement supervision stages of the Project to ensure the smooth implementation of the Project.

Given the fact that the Project simply involves the procurement and supply of buses and maintenance equipment/tools, the Consultant will conduct the quality control for the buses, etc. to be procured by the Contractor at the procurement supervision stage. As some of the equipment will require installation, the Consultant will ensure the involvement of Japanese experts in the preparation of the test operation and re-adjustment manuals, on-site factory inspection and pre-delivery inspection to prevent in advance any possible problems with such equipment following its delivery to Mostar.

(1) Basic Principles for Procurement Supervision

The Consultant will supervise the progress at the manufacturing stage to ensure the completion of the Project within the pre-determined time limit and will also supervise and guide the Contractor in order to fully achieve the quality, quantity and delivery time stipulated in the agreement and to ensure the safe transportation of the buses, equipment and tools. The key points of this supervisory work are described below.

1) Schedule Control

The Consultant will compare the planned project implementation schedule submitted by the Contractor at the time of signing the agreement with the actual progress on a monthly basis. If the Consultant believes that a delay is likely to occur, he will issue a warning to the Contractor, requesting the submission of improvement measures so that the delivery of the buses, etc. can be completed on schedule. This comparison will mainly be made for the following matters.

a) Confirmation of the procured items (volume of completion at the manufacturing factories)
b) Confirmation of the delivered buses and equipment

2) Safety Control

The Consultant will consult and cooperate with the project manager of the Contractor to implement safety control which particularly features the following points in order

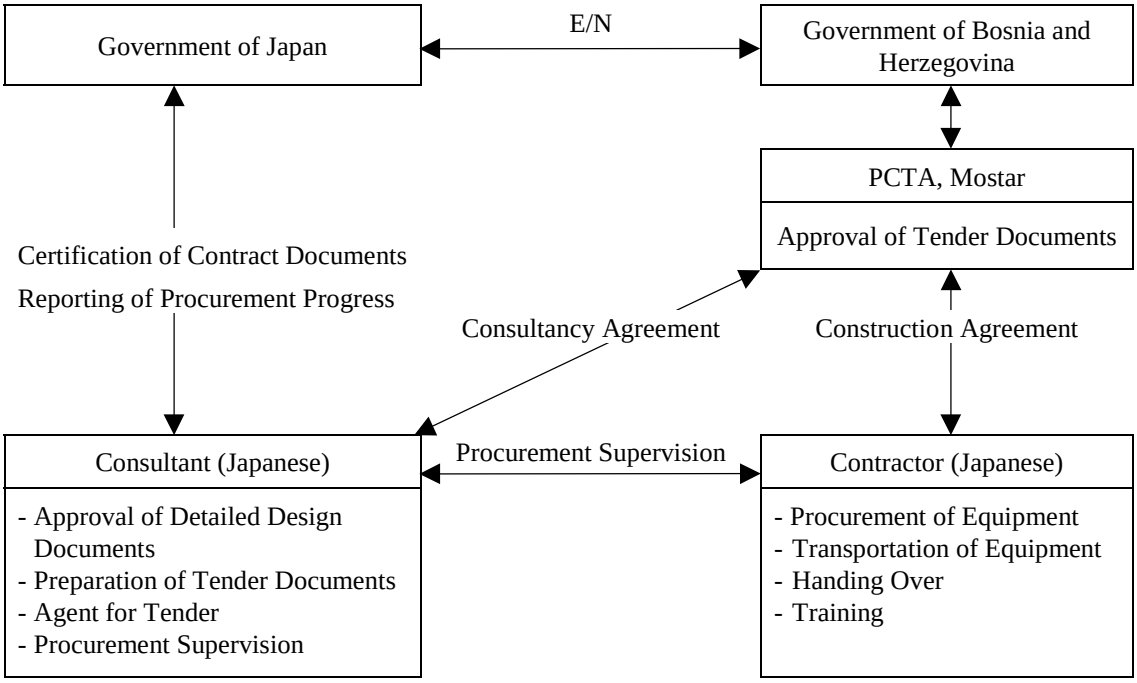
to prevent any disaster during the transportation stage and any accident involving a third party.

a) Establishment of safety control rules and appointment of a safety manager

b) Confirmation of the transportation route

(2) Project Implementation System

The project implementation system, incorporating all stages, including procurement supervision, and all parties of the Project, is shown in Fig. 2-2-4.



Note: Both the consultancy agreement and procurement agreement must be certified by the Government of Japan.

Fig. 2-2-4 Project Implementation System

1) Consultant

For the procurement of the planned buses and equipment under the Project, the Japanese Consultant will conclude a design and supervision agreement with the PCTA to conduct the detailed design for the facilities and work supervision. The Consultant will also prepare the tender documents and will conduct the tender on behalf of the PCTA as well as providing necessary advice regarding the tender for and the implementation of the Project for the PCTA.

2) Contractor

The Japanese Contractor selected through open tender by the BH in accordance with the framework of Japan's grant aid system will conduct the procurement of the buses, etc. planned under the Project. As the Contractor is expected to provide after-services, including the supply of spare parts and arrangement of repair work, etc., following the completion of the Project, it must carefully consider the post-Project liaison arrangements with the PCTA.

2.2.4.5 Procurement Plan

As the buses to be procured under the Project will be based on EURO2 standards, their procurement in Japan will be difficult. Procurement in the third country(Europe or Meddle East) is desirable in view of responding to the need for repair and securing after-services, including the procurement of spare parts. The supply sources should be decided taking these issues into consideration.

In the case of maintenance equipment and tools, these are available in Japan and, therefore, will be procured in Japan in the light of the Project being a grant aid project of the Government of Japan.

The supply sources for the buses and equipment to be procured under the Project are summarised below.

(1) Items to be Procured in the Third Country

1) Buses and Spare Parts

a) Standard buses : 30
b) Low floor buses : 4
c) Articulated buses : 2
d) Midi buses : 4

2) Special Tools

a) Engine compression pressure meter : two sets for standard buses and one set each for other types of buses
b) Automatic gear box oil pressure meter : one set
c) Special tools for mechanical work : two sets

d) Special tools for electrical work : two sets

(2) Items to be Procured in Japan

The equipment and tools for the inspection and maintenance of the buses will be procured in Japan. The packing method for the transportation of such equipment and tools from Japan will be strong enough to withstand the long maritime transportation, loading and unloading at ports and inland transportation to and storage at the workshops.

The likely port of landing for the equipment, etc. will be Port Koper in Slovenia. As this port has large landing facilities, no problems are anticipated in regard to the landing of the planned equipment, etc. The inland trunk roads from Port Koper to Mostar enjoy good paving conditions.

The Contractor must prepare the documents required for customs clearance in advance in order to shorten the time required for customs clearance in view of smooth customs clearance to maintain the project implementation schedule.

2.2.4.6 Quality Control Plan

The Consultant will conduct the following actions to check whether or not the Contractor is achieving the quality standards and specifications of the buses and equipment stipulated in the contract documents. If the Consultant believes that the required quality and specifications may be compromised, he will ask the Contractor to change, modify or alter the quality of the buses or equipment to meet the originally agreed standards, etc. However inspection for pre-shipment shall be done by the third party.

a) Checking of the shop drawings and equipment specifications

b) Checking of the equipment factory inspection results or attendance at the factory inspection

c) Checking of the packaging, transportation and temporary local storage methods

d) Checking of the test operation, re-adjustment, testing and inspection manuals of the buses and equipment and attendance at the inspection

2.2.4.7 Implementation Schedule

The project implementation schedule shown in Fig.2-2-5 has been decided based on the grant aid scheme of the Government of Japan.

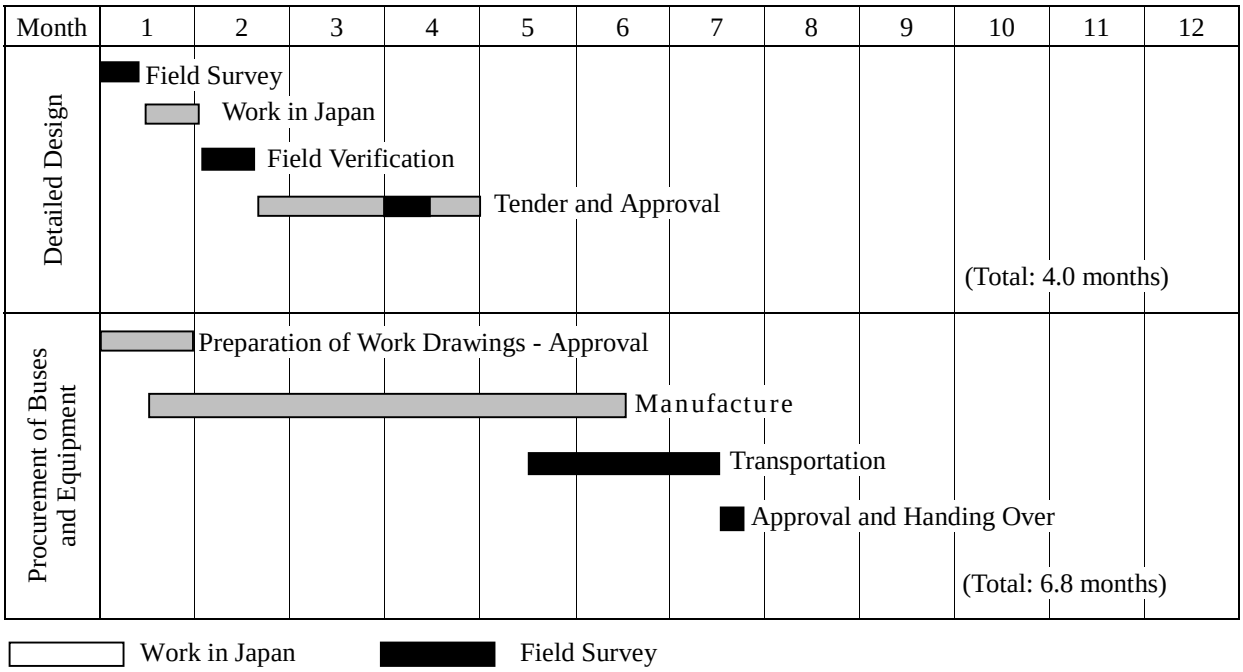


Fig. 2-2-5 Project Implementation Schedule

2.3 Obligations of Recipient Country

The BH side will responsible for conducting the following items described in ANNEX-5 of the Minutes of Discussions which were confirmed on September 13, 2000 and possibility of their implementation in the Project implementation process is as follows.

(1) Items Confirmed by Minutes of Discussion

1) Land

To secure land for implementation of the Project.

2) Banking Arrangement

Following the signing of the E/N, the Government of BH concludes the Banking Arrangements (B/A) with a foreign exchange bank in Japan in order to open an account and to bear the following commissions to a bank for advising of Authorization to Pay (A/P).

3) Customs Clearance and Tax Exemption

To ensure speedy unloading, customs clearance and tax exemption of the goods fro the Project at the port and/or airport of disembarkation and internal transportation in BH.

4) Stay and Entry Permission

To accord Japanese nationals whose services may be required in connection with the supply of products and services under the verified contracts such facilities as may be necessary for their entry into BH and stay therein for the performance of their work.

5) Internal Tax Exemption

To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in BH with respect to the supply of the products and services under the verified contracts

6) Appropriate Use and Maintenance of Equipment

To use and maintenance properly and effectively all equipment and materials provided with Japanese Grand aid.

7) All Other Expenses Except Grand Aid

To Bear All the Expenses other than those to be bone by the Grand aid necessary for the implementation of the Project.

(2) Other Items

According to Item “2-2-4-3 Scope of Works”, BH side shall undertake the following items.

1) Witness of Pre-Delivery Inspection

To assign engineers and technicians as full-time counterparts for the Project to witness the pre-delivery inspection of the buses and equipment, etc. and to receive the transfer of the operation and maintenance techniques/skills

2) Installation of Equipment

To install some equipment and materials (i.e., compressor and others are required) provided with Japanese Grant aid

3) Installation of Bus Stops

To install bus stops along the new routes for passengers’ convenience.

(3) Funding by BH Side

The required funding by the BH side is shown in Appendices.

2.4 Project Operation Plan

(1) Operation and Maintenance System

Proper maintenance (checks and maintenance) is essential to ensure the continuous and reliable operation of the buses and equipment procured under the Project. The implementation of appropriate preventive maintenance as well as regular maintenance work is, therefore, highly desirable to reduce the occurrence of bus and equipment breakdowns and to improve the reliability, safety and efficiency in view of maintaining the performance and functions of the buses and equipment procured under the Project to provide reliable public transport for users in the Project Area. The basic maintenance principles are shown in Fig. 2-4-1.

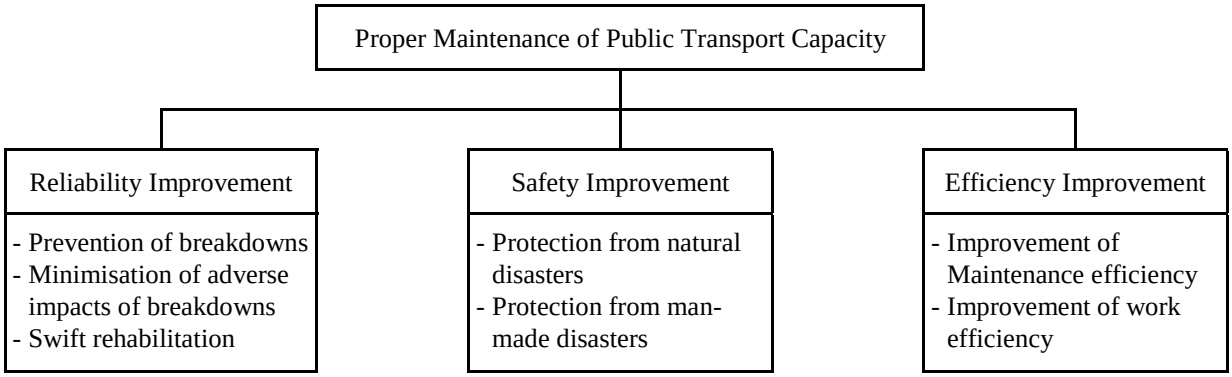


Fig. 2-4-1 Basic Concept of Operation and Maintenance System

Based on the basic concept of maintenance, the maintenance work for the buses and equipment to be procured under the Project should be conducted centering on the idea of preventive maintenance.

(2) Staff Training Plan

The dispatch of engineers by the manufacturers to provide OJT on operation and management is planned as part of the Project. Accordingly, it will be necessary for the PCTA to conduct its post-project maintenance work in accordance with the operation and maintenance techniques transferred by OJT while keeping the basic concept of maintenance described above in mind.

The PCTA will also be required to prepare maintenance manuals for the effective implementation of preventive maintenance.

(3) Operation and Maintenance Cost

The PCTA will be responsible for the actual operation and maintenance of the buses and equipment procured under the Project together with the existing buses. Assumption for operation and maintenance cost of total 46 buses is made as follows.

However, this estimation a bus fare collection rate of 50% (one in two passengers). If this collection rate is not achieved, the operation will produce much more deficit. This will be a heavy burden on the Mostar Council. It should be noted improvement of fare collection rate is the critical point of the Project.

Table 2-4-1 Estimated Revenue and Expenditure

	Item	(year of 2001) 2001(Sep.12000-Aug.31,2001) East	West	Total (A)	(year of 2003) Min-Case 170%	Max-Case 230%
I	REVENUE			(KM)	(KM)	(KM)
1,1	Intra-city (Ordinal Pax)	396,864	308,448	705,312	1,654,678	2,245,755
1,2	Intra-city (Monthly Pax)	114,480	191,520	306,000	975,078	1,323,392
2.1	Suburban (Ordinal Pax)	737,856	167,616	905,472	1,462,502	1,984,931
2.2	Suburban (Monthly Pax)	1,421,472	0	1,421,472	3,249,430	4,410,177
3	Others	0	84,000	84,000	84,000	84,000
	TOTAL	2,670,672	751,584	3,422,256	7,425,688	10,048,255
II	EXPENDITURE					
1	Personnel			1,520,280	2,062,115	2,062,115
2	Fuel, Petroleum			944,010	1,736,978	1,736,978
3	Spare parts			130,000	292,000	292,000
4	Gums (Tire)			25,000	46,000	46,000
5	General Expenses			162,800	279,800	279,800
5.1	(Office expenses)			50,000	55,000	55,000
5.2	(Fund charge)			24,000	24,000	24,000
5.3	(Communications)			9,600	12,000	12,000
5.4	(Electricity)			19,200	21,600	21,600
5.5	(Insurance)			30,000	107,200	107,200
5.6	(Others)			30,000	60,000	60,000
6	Depreciation			153,186	2,150,639	2,150,639
7	Fixed Tax			432,241	961,583	1,276,291
	TOTAL			3,367,517	7,529,115	7,843,823
III	Corporate Tax			16,422	0	661,330
IV	Balance/Subsidy(I-II-III)			54,739	-103,427	1,543,102
V	Profit/Deficit (IV/I)			1.6%	-1.4%	15.4%

2.5 Other Relevant Issues

It will be necessary to obtain the approval of the Ministry of Finance in BH for the tax exemption of the buses, etc. to be procured under the Project following the submission of the application documents for tax exemption by the Contractor to the PCTA. This process must be carefully considered by the BH side so that the implementation progress of the Project is not hindered by any delay in the process.

CHAPTER 3

PROJECT EVALUATION AND RECOMMENDATIONS

CHAPTER 3
PROJECT EVALUATION AND RECOMMENDATIONS

3.1 Project Effect

The following effects are expected to drive from the implementation of the Project.

Current Situation and Problems	・Remedial Measures Under the Project	Degree of Positive Effects/ Improvement
The PCTA has 31 buses for 301 departures a day for 26 routes consisting of 19 intra-city lines and 7 suburban lines. Most of the buses in use are quite old, 7 buses are not in operation and remaining 24 buses are needed to repair major maintenance soon.	・It is planned that number of bus route will be 36 from 26 for citizen's sake of the public transportation. ・It is necessary to operate 46 buses for providing services. The existing buses in operation are 6. Therefore 40 buses are newly required under the Project.	・To secure the public transportation system for 235,000 people by means of 36 bus routes. ・It is expected to promote reconciliation of different ethic groups (Bosnian and Croats). ・It will be able to support return of the refugees and displaced persons.
Introduction of articulated buses is more reasonable in case of route with a peak demand of more than 100 passengers but short of the total transportation capacity of two buses.	・Articulated buses will be introduced for relatively large number of passengers and frequent services in the city. ・Two is newly required.	・To secure convenience for commuting and schooling. ・To relief traffic congestion.
Bus with a small curve radius is effectively used for those routes with narrow roads in mountain area around Mostar city.	・Midi buses will be introduced. ・Four is newly introduced.	・To secure public transportation for inhabitants in mountain area. ・To promote an easy access to the city.
There are some 560 disabled parsons and same 17,000 pensioners in Mostar. Such socially weak people are able to travel by public transport.	・Low floor buses will be introduced. ・Four is newly introduced.	・To secure public transportation for socially weak people. ・To promote an easy access to public facility such as hospital.
Most of vehicles in BH are out of accord with gas exhaust standard in EU.	・Bus engine standards should be in accord with EURO2.	・This standard can be permitted by EU environment standard. ・To contribute to the citizens health.
The PCTA is planning to allocate different maintenance functions to the East and West workshops which are continuously used.	・Inspection and maintenance tools will be procured in conformity with maintenance work planned functions and roles of each workshop by the PCTA.	・To improve operation and maintenance system by the PCTA, it will be easy to repair the buses. ・It is expected that bus mileage life will be extended as a result.
Spare parts will be procure and supply under the Project to ensure the proper maintenance of the buses to be provided under the Project because of the PCTA' financial difficulties.	・The quantity of spare parts to be supplied will be equivalent to some two years requirement based on the monthly traveling distance (approx. 5,300km/month) of the existing fleet of the PCTA.	・To improve business viability of the PCTA. ・It is expected to provide stable bus services because of a prompt recovery of bus maintenance.

3.2 Recommendations

(1) Sound Business Prospects for PCTA

The business analysis under the study presupposes an increase of the fare collection rate to 50% (one in two passengers), the level where bus operation business by the PCTA is deemed to become financially viable. This 50% fare collection rate represents a 170% improvement of the present rate. If this target is not achieved, the Mostar Council will have to pay the deficit. Even though the Mostar Council has allocated the budget to cover the deficit of the PCTA in its FY 2001 budget, the tight financial situation of the Council means that the PCTA should introduce measures such as those listed below to improve the far collection system.

1) Establishment of a fair fare payment system for users

- Establishment of a uniform fare collection system for all types of buses
- Establishment of an easy system for the purchase of bus tickets
- Establishment of effective bus fare collection systems, such as coupon tickets and a discount system

2) Elimination of non-paying passengers

- Introduction of fare collectors (conductors)
- Establishment of a legal system to penalise non-paying passengers
- Introduction of random ticket checks and demand of a penalty for non-paying passengers

3) Intensive publicity

- Publicity using newspapers, posters and the mass media
- Education for young people, including students

4) Others

- Study of unified fare systems with other public transportation agencies
- Case study on bus fare (collection) systems

(2) Withdrawal of Traffic Regulations to Suit Bus Operation Plan for the City

Following the implementation of the Project, the number of buses in operation in Mostar will total 46, consisting of 33 new buses and 13 existing buses which are considered to be operable.

Even though the number of originally requested buses has been reduced, the number of bus services under the new regime will be some 2.5 times higher than the current service level.

Work to improve the bus terminal and its surrounding area will be required as many routes converge in the city centre. The road section approaching the bus terminal from the direction of Volmos in particular will accommodate some 20 routes, suggesting bus congestion at peak times in the morning and evening. This section should have multiple bus bays together with a sufficient road width to allow other vehicles to pass buses at bus stops.

The road in question should essentially allow traffic in two directions (north and south) to play an important role as part of the circular route, including the east-west route across Neretva River. It is, therefore, recommended that the Mostar Council formulate and implement a road expansion plan as well as a north-south traffic plan along this road.

(3) Consideration of Preventive Maintenance

The PTCA in Mostar currently possesses 6 buses which will be operable at the year of 2002. However, all of these buses are quite old and it will be no surprise for any one of them to break down at any time. This situation necessitate the PCTA's thorough enforcement of daily as well as regular checks to properly maintain the aged fleet by means of preventive maintenance to avoid breakdowns. In turn, this requirement makes it essential for the PCTA to accurately understand the conditions of each bus through daily checks.

The standard regular check items for the buses and equipment to be procured under the Project are described below.

1) Regular Checking of Buses

The regular checking of buses is classified into three types.

① Daily checking: checking of the external appearance, extraordinary heat and extraordinary sound, etc. using the five human senses

② Travelling distance-based regular checking: checking of the engine, gear box and other items (such as hydraulic pressure, air pressure and electrical parts, etc. which are not examined by the daily checking) in accordance with the pre-determined distance covered by the buses

③ Annual checking: annual checking of the engine, gearbox and other items as in the case of above

2) Regular Checking of Maintenance Equipment

① Daily checking: checking of extraordinary heat and extraordinary sound, etc. using the five human senses

② Regular checking: checking of the state of fastening of bolts, etc. of the equipment and the state of corruption or damage to the surface of insulation materials, etc. which are not examined by the daily checking

③ Detailed checking: functional checking of the interlocking mechanism, etc. and calibration of instruments

APPENDICES

1. Member List of the Study Team

(1) Members for Field Survey

Mr. Satoshi Umenaga	Leader	Deputy Director, Third Project Management Division, Grant Aid Management Department, JICA
Mr. Masaaki Ueda	Project Manager / Management Planner	Yachiyo Engineering Co., Ltd.
Mr. Masaaki Tsuda	Transportation / Operation Planner	Ditto
Mr. Takayuki Miyamoto	Cost Estimation / Procurement Planner	Ditto

(2) Members for Explanation of Draft Final Report

Mr. Satoshi Umenaga	Leader	Deputy Director, Third Project Management Division, Grant Aid Management Department, JICA
Mr. Masaaki Ueda	Project Manager / Management Planner	Yachiyo Engineering Co., Ltd.
Mr. Masaaki Tsuda	Transportation / Operation Planner	Ditto

2. Study Schedule

(1) Itinerary of the Field Survey

No	Date	Movement	Activities
1	Sep.4 (Mon)	Narita – Vienna	・Arrived at Vienna by NH285 (16:10)
2	Sep.5 (Tue)	Vienna- Sarajevo	・Call to Embassy of Japan and JICA Office ・Move to Sarajevo by OS831 (13:30) ・Courtesy call to Embassy of Japan
3	Sep.6 (Wed)	Sarajevo- Mostar	・Courtesy call to BH Ministry of Foreign Affairs and Transportation and Telecommunications ・Visit to GRAS Company ・Move to Mostar
4	Sep.7 (Thu)		・Courtesy call Public City Transportation Agency (PCTA) in Mostar City
5	Sep.8 (Fri)		・Explanation of Inception Report ・Submission of Questionnaire and discussion
6	Sep. 9 (Sat)		・Survey for bus operational routes and workshop
7	Sep.10 (Sun)		・Internal Meeting
8	Sep.11 (Mon)		・Discussion with PCTA ・Observation of Bus Operation Conditions
9	Sep.12 (Tue)		・Discussion on Minutes of Discussion (M/D)
10	Sep.13 (Wed)	Mostar- Sarajevo	・Signing of M/D ・Move to Sarajevo
11	Sep.14 (Thu)	Sarajevo- Vienna Sarajevo- Banja Luka	(Mr. S. Umenaga, Leader) ・Report to Embassy of Japan ・Leaving Sarajevo for Vienna by OS832 (Consultant Team) ・Discussion with GRAS ・Move to Banja Luka
12	Sep.15 (Fri)		・Call to RS Minstry of Transport and Communications and Autoprevoz of Banja Luka ・Survey for bus operational conditions in Banja Luka
13	Sep.16 (Sat)	Banja Luka- Sarajevo	・Survey for bus operational conditions in Banja Luka ・Move to Sarajevo
14	Sep.17 (Sun)	Sarajevo- Mostar	・Move to Mostar
15	Sep.18 (Mon)		・Discussion with PCTA
16	Sep.19 (Tue)		・Visit to SOKO Company
17	Sep.20 (Wed)		・Visit to OHR ・Discussion with PCTA
18	Sep.21 (Thu)		・Observation of East and West Workshops ・Visit to Cantonal Statistical Office
19	Sep.22 (Fri)		・Survey for bus operational routes in suburban
20	Sep.23 (Sat)		・Data analysis
21	Sep.24 (Sun)		・Data analysis
22	Sep.25 (Mon)	(Mostar- Sarajevo- Mostar)	・Mr. M.Ueda went to Sarajevo for collection of data
23	Sep.26 (Tue)		・Analysis of data and information
24	Sep.27 (Wed)		・Discussion with PCTA and Federal Ministry of Tranport and Communications ・Preparation of Field Report
25	Sep.28 (Thu)		・Preparation of Field Report

26	Sep.29 (Fri)		・ Preparation of Field Report and discussion with PTCA
27	Sep.30 (Sat)		・ Report revision
28	Oct.1 (Sun)		・ Report revision
29	Oct.2 (Mon)		・ Discussion with PTCA about Field Report
30	Oct.3 (Tue)	Mostar- Sarajevo	・ Move to Sarajevo ・ Report to the Embassy of Japan
31	Oct.4 (Wed)	Sarajevo- Vienna	・ Visit to UNCHR ・ Leaving for Vienna by OS 832 (15:30)
32	Oct.5 (Thu)	Vienna- Frankfurt	・ Report to the Embassy of Japan and JICA Office ・ Leaving for Tokyo via Frankfurt by LH 9239 (17:40)
33	Oct.6 (Fri)	Tokyo	・ Arriving at Tokyo by NH 210

(2) Itinerary of Explanation for the Draft Report

No	Date	Movement	Activities
1	Dec.4 (Mon)	Narita – Vienna	・ Arrived at Vienna by NH285 (16:10)
2	Dec.5 (Tue)	Vienna- Sarajevo	・ Call to Embassy of Japan and JICA Office ・ Move to Sarajevo by OS831 (13:30)
3	Dec.6 (Wed)	Sarajevo- Mostar	・ Courtesy call to Embassy of Japan, BH Ministry of Foreign Affairs and Transportation and Telecommunications ・ Move to Mostar
4	Dec.7 (Thu)		・ Visit to and discussion with Public City Transportation Agency (PCTA) in Mostar
5	Dec.8 (Fri)		・ Discussion with Mayer and Vice Mayer, and PCTA
6	Dec.9 (Sat)		・ Survey for bus operational routes and workshop
7	Dec.10 (Sun)		・ Discussion with PCTA
8	Dec.11 (Mon)		・ Discussion on Minutes of Discussions (M/D)
9	Dec.12 (Tsu)	Mostar- Sarajevo	・ Signing of M/D ・ Move to Sarajevo
10	Dec.13 (Wed)	Sarajevo- Vienna	・ Report to the Embassy of Japan ・ Leaving for Vienna by OS 832 (15:30)
11	Dec.14 (Thu)	Vienna- Frankfurt	・ Report to the Embassy of Japan and JICA Office ・ Leaving for Tokyo via Frankfurt by LH 9239 (17:40)
12	Dec.15 (Fri)	Tokyo	・ Arriving at Tokyo by NH 210

3. List of Parties Concerned in the Recipient Country

List of Parties Concerned in the Recipient Country

1. Ministry of Foreign Affairs
   Mr.Mihovil Malbasic, Assistant Minister, Department for Multilateral Relations
   Mr. Mithat Pasic
   Mr. Zeljko Jerkic Assistant Minister, Department for Multilateral Relations

2. Federal Ministry of Transport and Communications
   Mr. Besim Mehmedic, Minister
   Mr. Boban Puvo, Deputy Minister
   Mr. Smail Saric Assistant Minister
   Mr. Sci. Zaim Heco, Assistant Minister
   Ms. Amra Smailagic, Adviser

3. City of Mostar
   Mr. Safet Orucevic, Mayor
   Mr. Neven Tomic, Deputy Mayor
   Mr. Nuspahic Emir, Head, Traffic and Communications Department
   Mr. Vrlic Drazen, Deputy Head, Traffic and Communications Department

4. City of Mostar Public City Transportation Agency
   Mr.. Maric Damir, Director
   Mr. Dziho Omer, Deputy Directror
   Mr. Raljevic Artem, East Branch Office Manager
   Mr. Cvitkovic Franjo, West Chief of Department

5. Office of the High Representative (OHR)
   Mr. Javier Fernandez, Political Officer, Regional Office South

6. GRAS
   Mr. Todorovic Predrag, Technical Deputy Manager
   Mr. Bradarec Safet, Manager of Maintenance Department

7. RS Ministry of Transport and Communications
   Mr. Kisin Novo, Deputy Minister

8. Autoprevoz of Banja Luka
   Mr. Krecelj Ratko, Chief of Maintenance Department

9. EUROBUS-SOKO
   Mr. Zdravko Bevanda, Director

10. Federation Statistics, Mostar Office
    Ms. Sabina Vasic

11. International Management Group (IMG)
    Mr. Nenad Nikolic, Head of Transport Unit

4. MINUTES OF DISCUSSIONS

MINUTES OF DISCUSSIONS
On The Basic Design Study
On The Project for Rehabilitation of Mostar City Transportation System
In Bosnia and Herzegovina
(Explanation on Draft Report)

From September to October 2000, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Rehabilitation of Mostar City Transportation System (hereinafter referred to as "the Project") to Bosnia and Herzegovina (hereinafter referred to as "BH"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult the Government of BH on the components of the draft report, JICA sent to BH the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Satoshi Umenaga, Deputy Director, Third Project Management Division, Grant Aid Department, JICA, from December 5th to 13th, 2000.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

Mostar, December 12th, 2000.

Satoshi Umenaga
Leader,
Basic Design Study Team
JICA

Besim Mehmedic
Minister, Federal Ministry of
Transport and Communications,
Federation of Bosnia and Herzegovina

Safet Orucevic
Mayor,
City of Mostar

Neven Tomic
Deputy Mayor,
City of Mostar

Zeljko Jerkic
Assistant Minister,
Department for Multilateral
Relations,
Ministry of Foreign Affairs,
Bosnia and Herzegovina (Witness)

Maric Damir
Director,
Public City Transportation
Agency,
City of Mostar

Dzino Omer
Deputy Director,
Public City Transportation
Agency,
City of Mostar

ATTACHMENT

1. Components of the Draft Report

The BH side agreed and accepted in principle the components of the draft report explained by the Team. Main component of the Project is shown in ANNEX-1 and ANNEX-2 as a result of the discussion.

2. Japan's Grant Aid Scheme

The BH side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the BH side as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both parties on September 13, 2000.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the BH side by the end of March 2001.

4. Other Relevant Issues

(1) The BH side will ensure the sufficient financial support for the financial balance of Public City Transportation Agency, until the financial balance would reach to profitable.

(2) The BH side understands that increasing the collecting rate of fare is very important issue for the financial viability for the management. The BH side will take necessary measures, such as introduction of fare collector, establishment of penalty system, and implementation of the campaign etc.

(3) The BH side will ensure the tax exemption including VAT according to the procurement schedule presented by the Team.

(4) The BH side will allocate the budget for the preparation works of the machinery installation in conformity with the overall schedule, which was shown by the Team.

(5) The Team handed one copy of the draft detailed specification of the equipment to the Public City Transportation Agency. Both parties agreed that this draft specification is confidential and should not be duplicated or released to any outside party.

(6) The BH side strongly requested that the attendants at the tender opening should be more than other grant aid projects taking into consideration of the historical background of BH.

ANNEX-1

Main Component of the Project

1. Buses

No.	Type	Quantity	Remarks
1	Standard bus	30	
2	Midi bus	4	
3	Articulated bus	2	
4	Low floor bus	4	With air conditioning
	Total	40	

2. Workshop Equipment / Tool 1 set

3. Spare parts 1 set

SPECIFICATION OF BUSES

No.	Description	Q'ty	Unit	Specifications
1	High Floored Standard Bus	30	units	
	Dimensions			Width: Maximum 2.5 m
				External height: Maximum 3.2 m
				Length: 11.80 - 12.20 m
	Floor level from ground level			Maximum 750 mm
	First step height from ground level			Maximum 350 mm
	Step			Each step level not exceeding 200mm
	Capacity of engine			Minimum 220hp (at 2400 r.p.m.)
	Brake system			Disc brakes at front axle drum at rear
	-1 Type-A(Automatic gear type)	(20)	units	
	Type of gear box			Automatic
	Capacity of passenger			Up to 110 Passengers
	Number of seat			Approximate 40 Passengers
	Number of door			Two(2) or Three (3) entrance and exit doors
	-2 Type-B(Large seat & Mechanical gear type)	(10)	units	
	Type of gear box			Mechanical
	Capacity of passenger			Approximate 80 Passengers
	Number of seat			Approximate 50 Passengers
	Number of door			Two(2) or Three (3) entrance and exit doors
2	Low Floored Standard Bus	4	units	
	Dimensions			Width: Maximum 2.5 m
				External height: Maximum 3.0 m+A/C
				Length: 11.80-12.20 m
	Type of gear box			Automatic
	Floor level from ground level			Maximum 360mm
	Capacity of engine			Minimum 220hp (at 2400 r.p.m.)
	Capacity of passenger			Up to 95-100 passengers
	Number of seat			Approximate 30 Passengers
	Number of door			Three (3) entrance and exit doors
	Kneeling device			For right hand side of bus in conjunction with ECAS or equivalent
	Air conditioning			
	Platform at middle door			
3	Articulated Bus	2	units	
	Dimensions			Width: Maximum 2.5 m
				External height: Maximum 3.2m
				Length: 17.8 - 18.0 m
	Type of gear box			Automatic
	Floor level from ground level			Maximum 750mm
	First step height from ground level			Maximum 350 mm
	Capacity of engine			Minimum 305hp (at 2000 r.p.m.)
	Capacity of passenger			Approximate 170 Passengers
	Number of seat			Approximate 50 Passengers
	Number of door			Three (3) or four (4) entrance and exit doors
	Brake system			Disc brakes at front axle drum at rear

MINUTES OF DISCUSSIONS
On The Basic Design Study
On The Project for Rehabilitation of Mostar City Transportation System
In Bosnia and Herzegovina

In response to a request from the Government of Bosnia and Herzegovina (hereinafter referred to as "BH"), the Government of Japan decided to conduct a Basic Design Study on the Project for Rehabilitation of Mostar City Transportation System (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to BH the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Satoshi Umenaga, Deputy Director, Third Project Management Division, Grant Aid Department, JICA, and is scheduled to stay in the country from September 5th to October 4th, 2000.

The Team held discussions with the officials concerned of the Government of BH and conducted a field survey at the study areas.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Mostar, September 13th, 2000

Satoshi Umenaga
Leader,
Basic Design Study Team
JICA

Besim Mehmedic
Minister, Federal Ministry of
Transport and Communications,
Federation of Bosnia and Herzegovina

Safet Orucevic
Mayor,
City of Mostar

Neven Tomic
Deputy Mayor,
City of Mostar

Mihovil Malbasic
Assistant Minister,
Department for Multilateral
Relations,
Ministry of Foreign Affairs,
Bosnia and Herzegovina

Maric Damir
Director,
Public City Transportation
Agency,
City of Mostar

Dziho Omer
Deputy Director,
Public City Transportation
Agency,
City of Mostar

ATTACHMENT

1. Objective of the Project

The objective of the Project is to procure buses to recover public transportation in the City of Mostar, which contribute economic and social activities towards the reconstruction of the country.

2. Project Site and Bus Operation Area

The site of the Project is the City of Mostar. The map of bus operation area is shown in ANNEX-1.

3. Responsible and Implementing Agency

The Responsible Agency is Federal Ministry of Transport and Communications and Implementing Agency is Public City Transportation Agency, City of Mostar. Organization Chart of the Implementing Agency is shown in ANNEX-2.

4. Items Requested by the Government of BH

After discussions with the Team, the items described in ANNEX-3 were finally requested by BH side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

(1) BH side understands the Japan's Grant Aid Scheme explained by the Team as described in ANNEX-4.

(2) BH side will take the necessary measures, as described in ANNEX-5, for smooth implementation of the Project as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

(1) The consultants will proceed to further studies in BH until October 4th, 2000.

(2) JICA will prepare the draft report in English and dispatch a mission in order to explain its contents in December 2000.

(3) In case that the contents of the report are accepted in principle by the Government of BH, JICA will complete the final report and send it to the Government of BH by March 2001.

7. Other Relevant Issues

(1) BH side agreed that the highest priority for the transportation is in Zone I. The order of the priority is from Zone I to V.

(2) Concerning the examination of adequate number of buses, the following items are one of the factors under the consideration.

- Number of beneficiaries along the bus route
- Travel distance from the center of the city of Mostar to the destination
- Contribution to the reconciliation among people and return of refugees

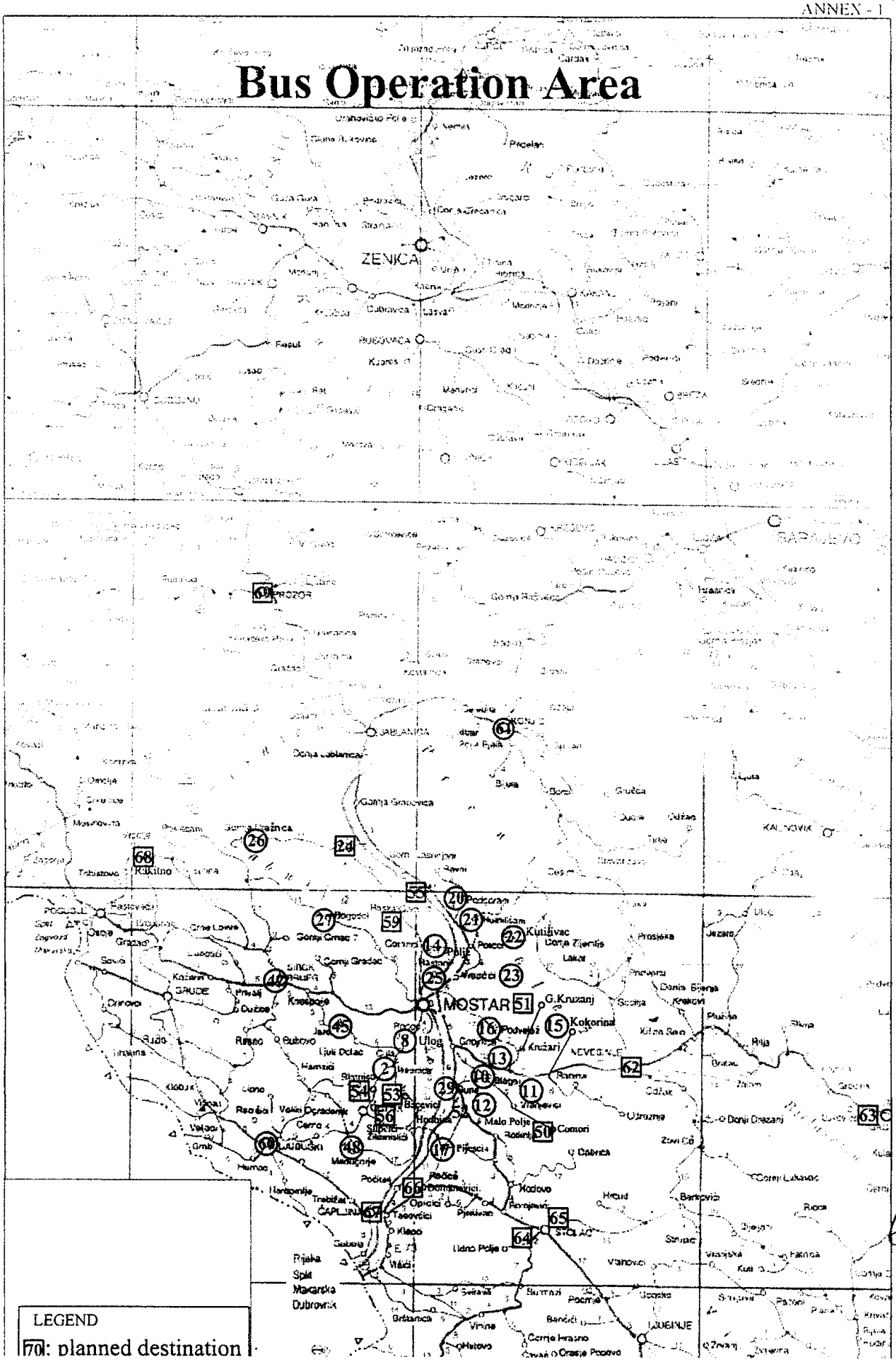
(3) BH side agreed that the request for the mini buses for disabled persons is cancelled. However, the low-floored bus(es) in standard type will be considered for disabled persons.

(4) BH side agreed that the chartered buses for commuters to factories should not be involved in the Project.

(5) BH side promised that the answers for the questionnaire requested by the Team and the functional demarcation of workshops in the east and west will be submitted to the Team by September 20th, 2000.

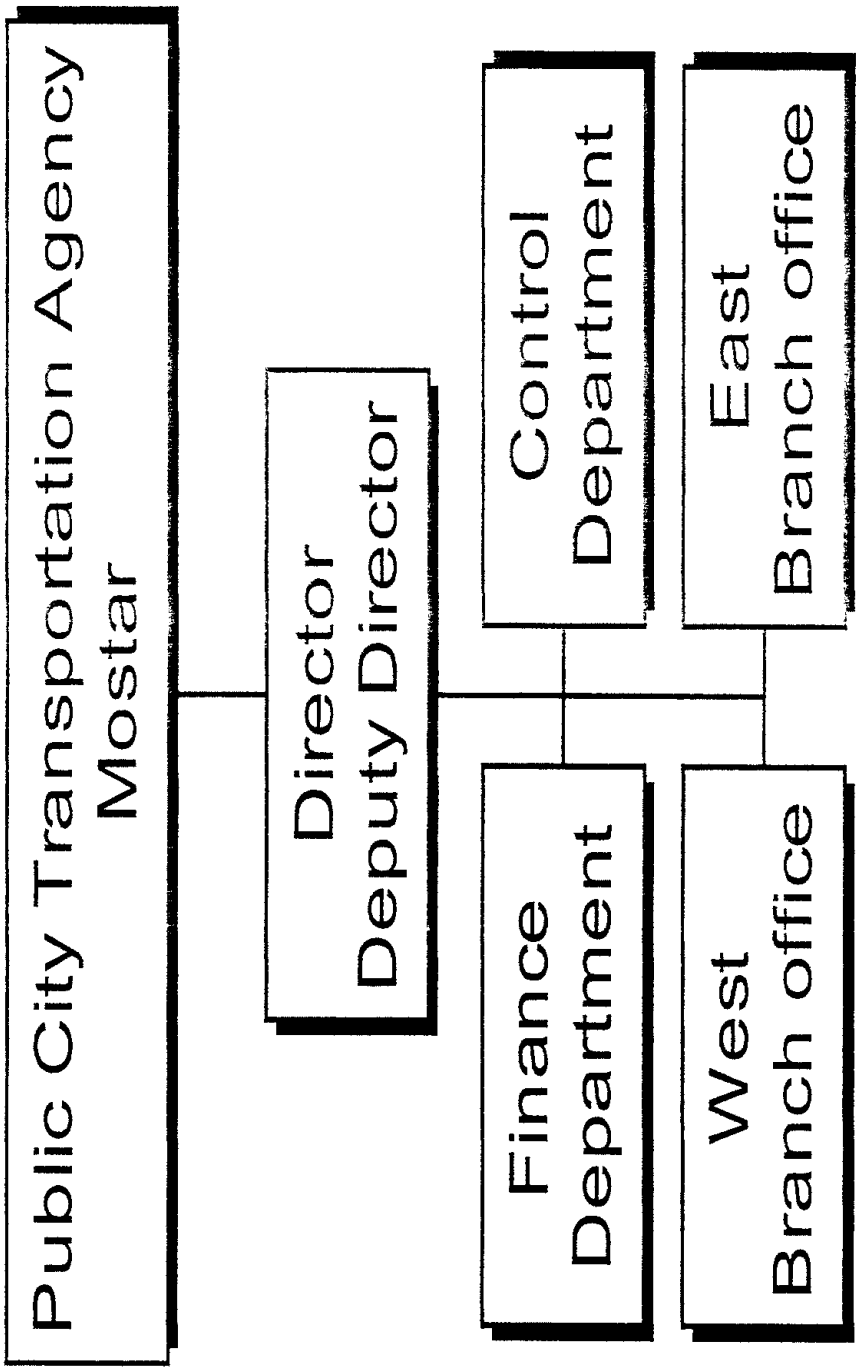
(6) For the sake of the technology transfer on sustainable operation and maintenance, BH side pointed out the need for training of counterpart personnel in Japan. BH side also understood that another official request on technical cooperation should be submitted to the Embassy of Japan through diplomatic channels.

Bus Operation Area



ANNEX-2

Organization Chart



ANNEX-3

Items Requested by the Government of BH

1. Buses

No.	Type	Quantity	Remarks
1	Standard bus	41	Including low-floored type
2	Midi bus	4	
3	Elbow bus (Articulated bus)	4	
	Total	49	

2. Spare parts 1 set

3. Workshop Equipment / Tool (See attached paper)

WORKSHOP EQUIPMENT/TOOL LIST

No.	Items	Q'ty	Units	Specification	Purpose	Priority	Category
1. Heavy tool							
(1)	Compressor	1	pcs	12 Bars, 500 litters	Comp. Air for tyre & etc.	A	Maintenance
(2)	Table of testing pump	1	pcs		Tester for injection pump	A	Maintenance
(3)	Lubricating pump	1	set		Filling the lubricating oil	A	Maintenance
(4)	Machine for assembling & dissembling of tires	1	pcs		Tyre replace tool	A	Maintenance
(5)	Hydraulic – four pillar jack	1	set		Jack up for tyre & brake	A	Maintenance
(6)	Air gun for the wheel screws	2	pcs		Fix the nut of tyre	A	Maintenance
(7)	Machine for tyre balancing	1	pcs		Adjusting tyre balance	A	Maintenance
(8)	Car washing machine (with brush)	1	pcs	Gantry type	Cleaning for external of bus	B	Cleaning tool
(9)	Car washing machine (with gun)	2	set	Hot water, high pressure	Cleaning of the spare parts and engine	B	Cleaning tool
(10)	Parts washing machine	1	pcs		Part washing tool	A	Maintenance
(11)	Device for tachograph testing	1	set		Check the tachometer	A	Maintenance
(12)	Gauge for measuring the received amount of fuel	1	pcs		Fuel flow meter for engine	A	Maintenance
(13)	Hydraulic press	1	pcs		Assembling & dissembling of pressed parts	A	Maintenance
2. Collective tool							
(1)	Mobil hydro-jack	4	pcs	10 tons	Jack up for tyre change	A	Maintenance
(2)	Crocodile hydro jack	2	pcs	10 tons	Jack up for heavy parts	A	Maintenance
(3)	Moment key	2	set		Torque wrench for fixing bolt	A	Maintenance
(4)	Mechanical tools in mobile boxes	6	set		General tools with moving tool box	A	Maintenance
(5)	Mechanical tools in the wall cabinet	4	set		General tools with wall mounted tool box	A	Maintenance
3. Measuring tool							
(1)	Manual device (with belt) for measuring compression in diesel engine	2	pcs		Check the tension of belt	A	Maintenance
(2)	AVO meter for buses	2	pcs		Check the electrical parts	A	Maintenance
(3)	Instrument for measuring pressure in air installation	1	set		Filling the air for tyre	A	Maintenance
(4)	Instrument for measuring for the oil pressure in the automatic gear box	1	pcs		Gauge for oil pressure	A	Maintenance
(5)	Device for testing fuel pipes	1	pcs		Check the fuel of engine	A	Maintenance
(6)	Instrument for measuring for the electrical parts	2	pcs		Check the electrical parts	A	Maintenance
(7)	Charger for the battery	1	pcs		Charge the DC power	A	Maintenance

A: First Priority B: Second Priority

JAPAN'S GRANT AID SCHEME

1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures.

- Application	(Request made by the recipient country)
- Study	(Basic Design Study conducted by JICA)
- Appraisal & Approval	(Appraisal by the Government of Japan and by the Approval Cabinet)
- Determination of Implementation	(The Note exchanged between the Governments Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study) using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

1) Contents of the study

The aim of the Basic Design Study (hereafter referred to as "the Study") conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

a) Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for

b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.

c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.

d) Preparation of a basic design of the Project.

e) Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure 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 in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The selected firm(s) carry(its) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA. The consultant firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

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

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two

conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However, the prime contractors, namely, consulting, constructing and procurement firms, are limited to "Japanese nationals." (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

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

6) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:

(1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.

(2) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.

(3) To secure buildings prior to the procurement in case the installation of the equipment.

(4) To ensure all the expenses and prompt excursion for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.

(5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the

7) "Proper Use"

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

8) "Rye-export"

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

9) Banking Arrangements (B/A)

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

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

ANNEX-5

Major Undertakings to be taken by Each Government

NO	Items	To be covered by Grant Aid	To be covered by BH side
1	To secure land		●
2	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
3	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine(Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		●
4	To accord Japanese nationals 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		●
5	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract		●
6	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
7	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities		●

(B/A: Banking Arrangement, A/P: Authorization to Pay)

5. COST ESTIMATION BORNE BY THE BH SIDE

Cost Estimation Borne by the BH Side

(1) Funding by BH Side

The required funding by the BH side is 67,000 DM (approximately ¥3.38 million), consisting of the following items.

① Maintenance equipment cost : 15,000 DM (approximately ¥0.75 million)

② Bus stop construction cost : 52,000 DM (approximately ¥2.63 million)

(2) Estimation Conditions

The required funding by the Japanese and BH sides described above is estimated based on the following conditions.

1) Time of estimation: January, 2001

2) Foreign exchange rates

a) 1 US$ = ¥108.71

b) 1 DM = ¥50.09

c) 1 Kr = ¥11.74

3) Procurement period: approximately one year after the signing of the E/N

4) The Project will be implemented in accordance with the rules of Japan's grant aid scheme.

6. Bus Routes Re-examination Plan (Study Results by Each Route)

Notes:

1. Figure-1 shows the targeted bus routes for re-examination.(⬭ means the targeted bus routes)

2. Figure-2(1) –2(4) show alternatives planned by PTCA and JICA Study Team for each bus route. The preconditions of re-examination are described in “2.3.1 Design Concept”.

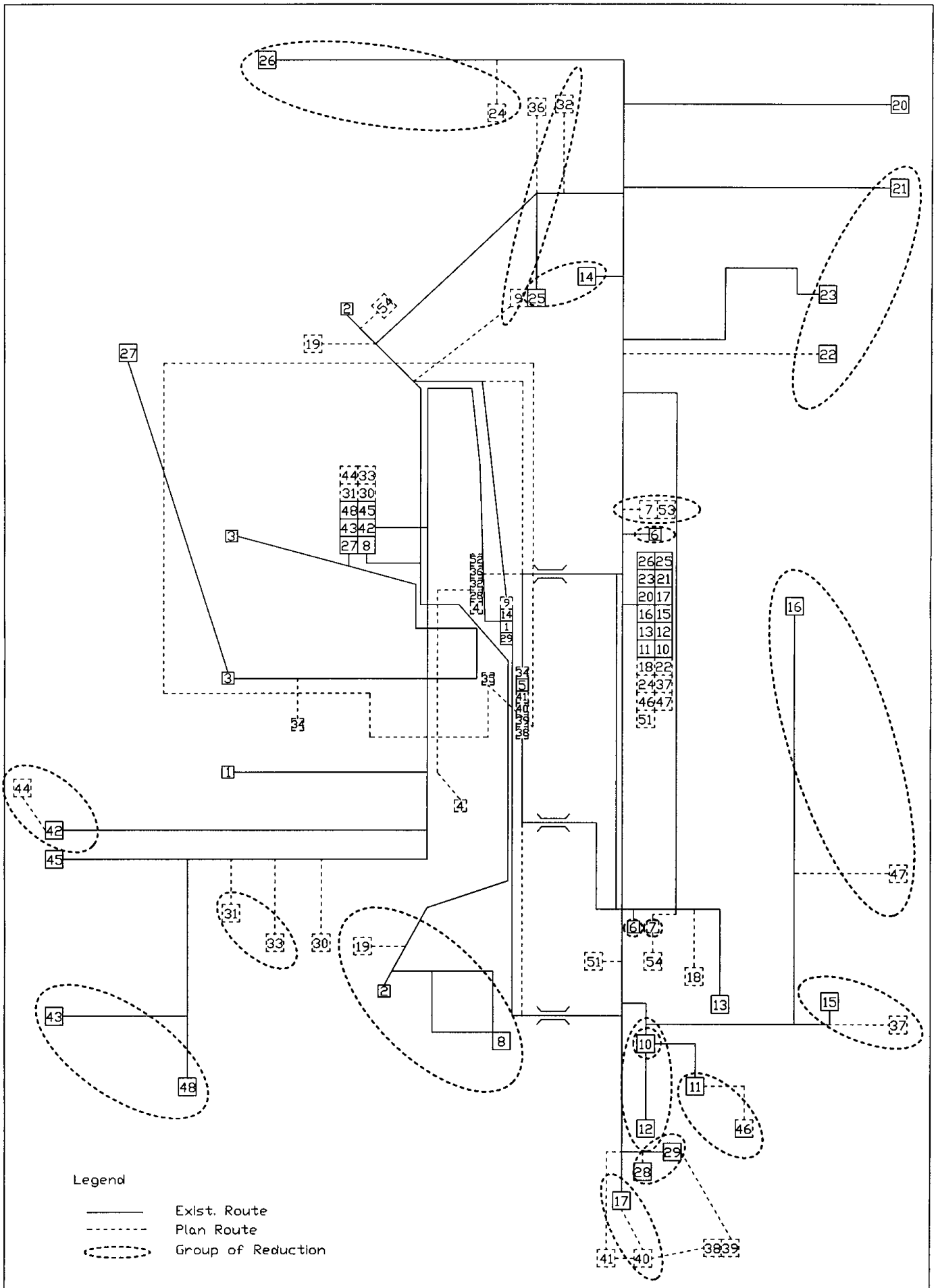


Figure-1 Bus Routes Re-examination

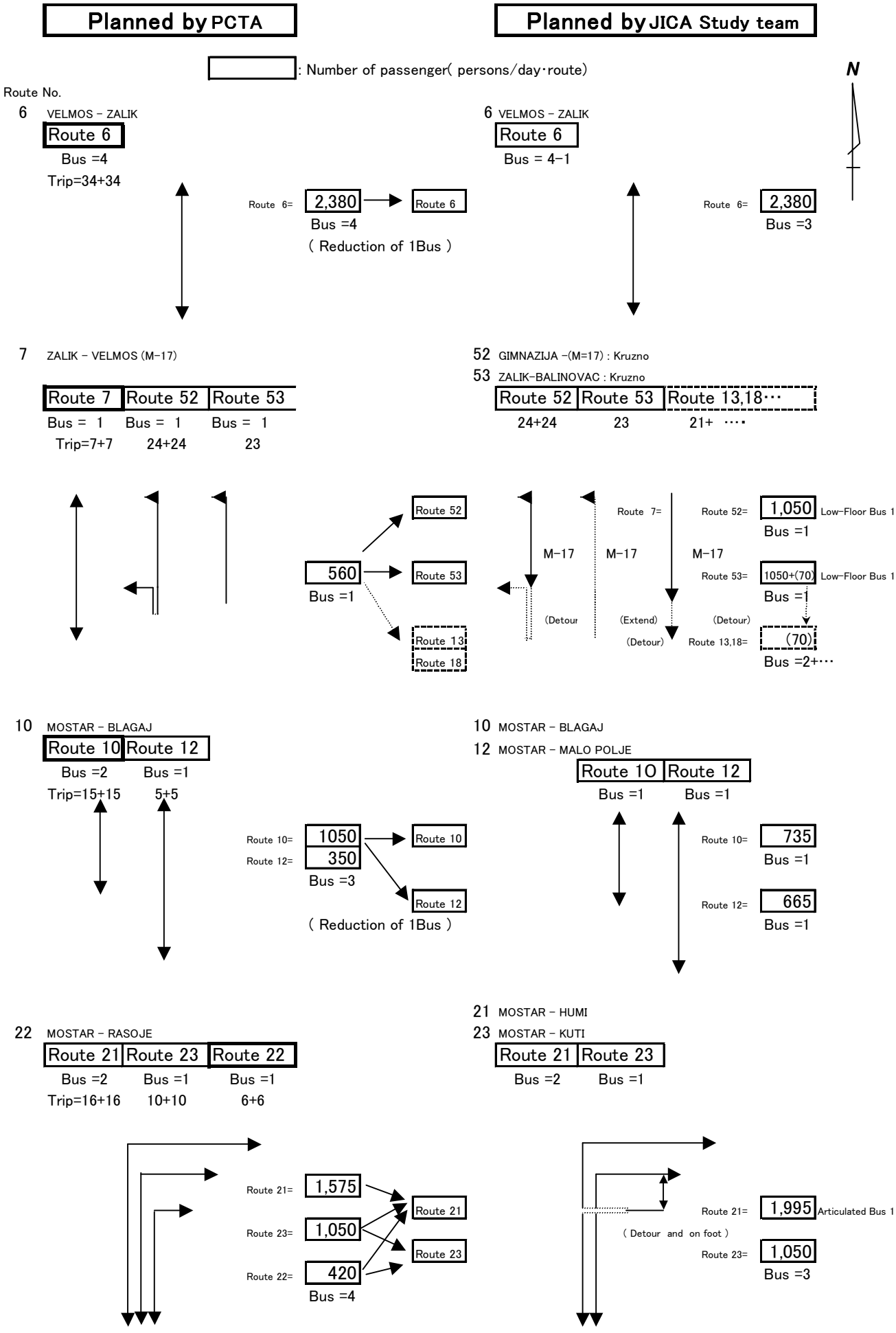


Figure-2(1) Alternative Plan for Each Route

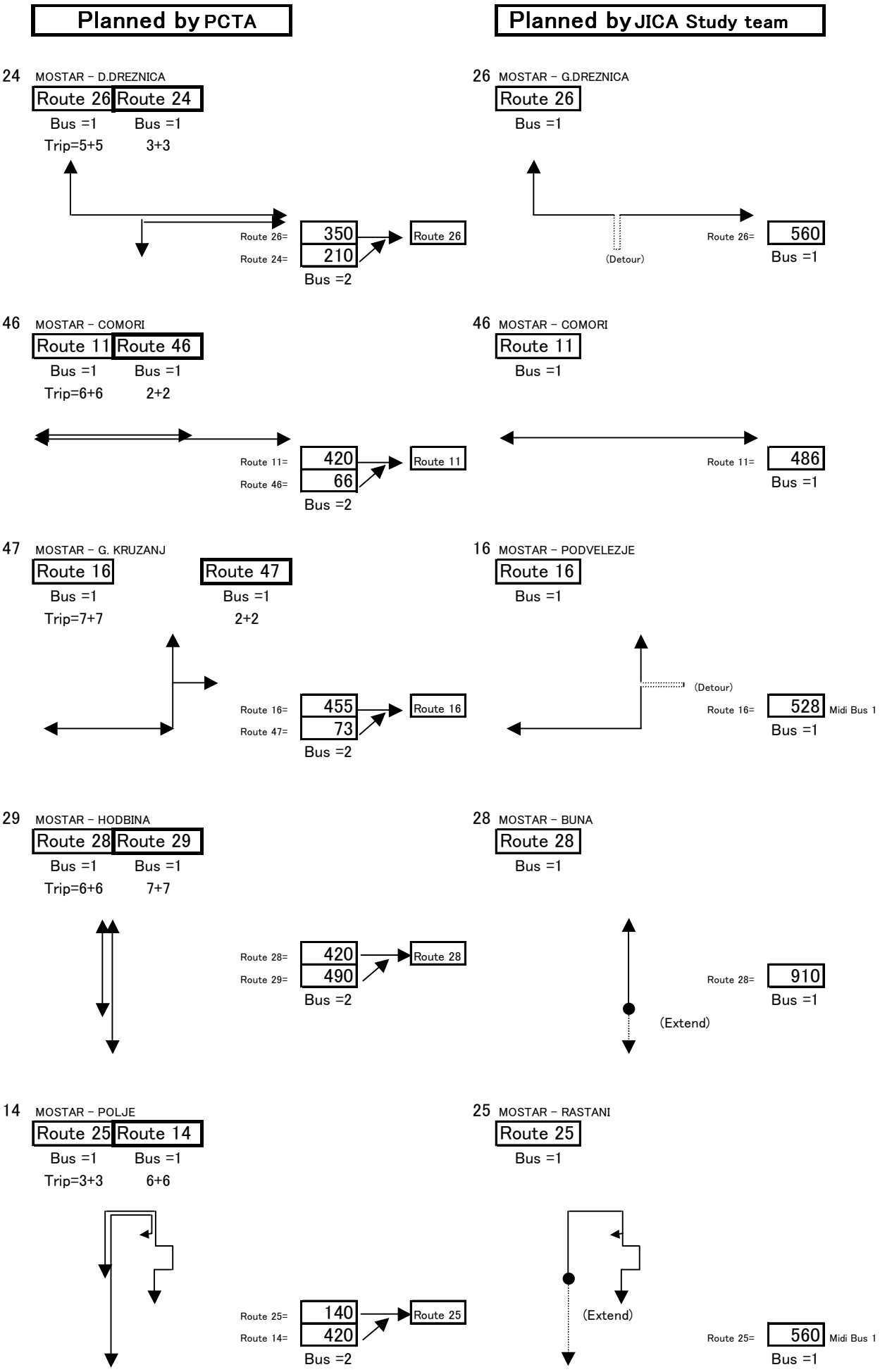


Figure-2(2) Alternative Plan for Each Route

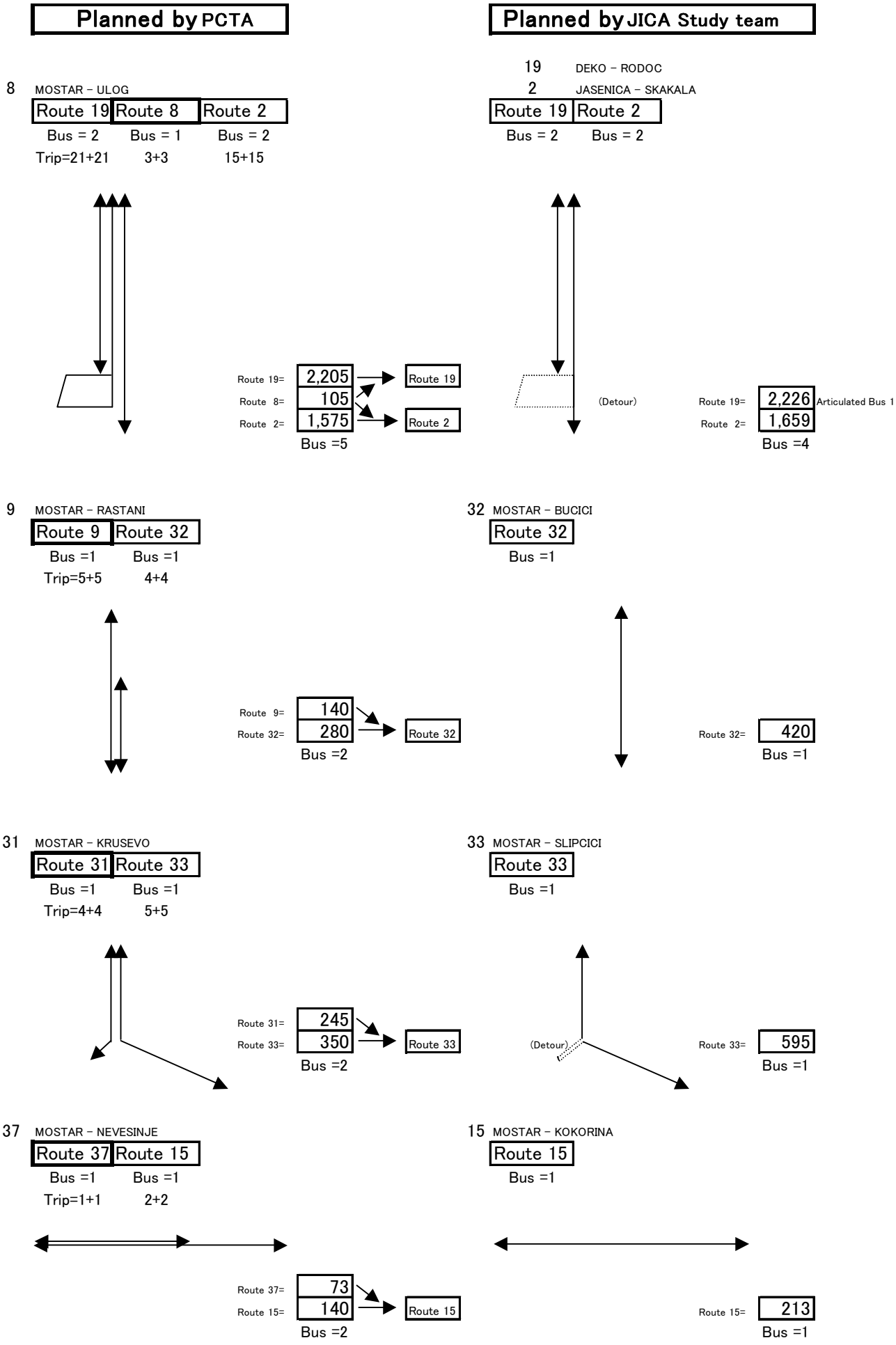


Figure-2(3) Alternative Plan for Each Route

Planned by PCTA

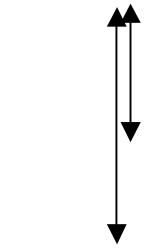
Planned by JICA Study team

40 MOSTAR-DOMANOVICI

Route 40 | Route 17

Bus =1 Bus =1

Trip=7+7 7+7



Route 40= 490

Route 17= 490

Route 17

Bus =2

17 MOSTAR – PIJESCI

Route 17

Bus =1

(Extend)

Route 17= 980

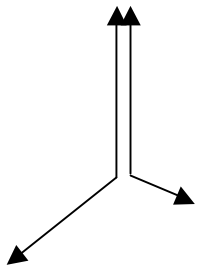
Bus =1

43 MOSTAR – LJUBUSKI

Route 43 | Route 48

Bus =1 Bus =1

Trip=2+2 3+2



Route 43= 63

Route 48= 210

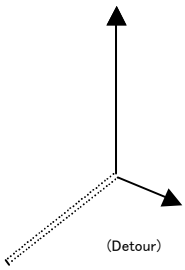
Route 48

Bus =2

48 MOSTAR – MEDJUGORJE

Route 48

Bus =1



(Detour)

Route 48= 273

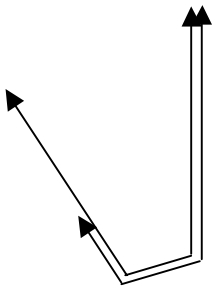
Bus =1

44 MOSTAR – RAKITNO

Route 44 | Route 42

Bus =1 Bus =1

Trip=1+1 6+6



Route 44= 66

Route 42= 420

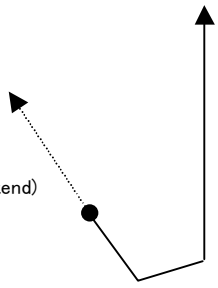
Route 42

Bus =2

42 MOSTAR – SIROKI BRIJEG

Route 42

Bus =1



(Extend)

Route 42= 486

Bus =1

Figure-2(4) Alternative Plan for Each Route

7. References

THE BASIC DESIGN STUDY ON THE PROJECT FOR REHABILITATION OF MOSTER CITY TRANSPORTATION SYSTEM IN BOSNIA AND HERZEGOVINA

N0.	Title	Type	Originalor Copy	Organization	Year
1	MOSTAR AND SURROUNDINGS	Brouchar	Original	"Turistkomerc",Zagreb	1985
2	TOURIST PLANN OF MOSTAR	Brouchar	Original	"Karttis"Mostar	-
3	BLAGAJ	Brouchar	Original	"Microbook"Mostar	1999
4	CENTRALBOSNIAN CANTON IN NUMBERS	Brouchar	Original	FEDERAL OFFICE OF STATISTICS	2000
5	HERCEGOVIAN-NERETVIAN CANTON INFIGURES	Brouchar	Original	FEDERAL OFFICE OF STATISTICS	2000
6	INTRODUCTION TO FEDERAL AUTHORITIES AND INSTITUTIONS	Brouchar	Original	Federal Institute for Programing of Development	1999
7	STATISTICS PACKAGE	Report	Original	UNHCR	2000
8	FEDERATION OF BOSNIA AND HERCEGOVINA IN FIGURES	Brouchar	Original	FEDERAL OFFICE OF STATISTICS	2000
9	STATISTICAL ECONOMIC INFORMATIONS BY CANTONS	Report	Original	FEDERAL OFFICE OF STATISTICS	2000
10	STATISTICAL ECONOMIC INFORMATIONS OF HERCEGOVIAN-NERETVIAN CANTON No.5	Report	Original	FEDERAL OFFICE OF STATISTICS	1998
11	STATISTICAL ECONOMIC INFORMATIONS OF HERCEGOVIAN-NERETVIAN CANTON No.8	Report	Original	FEDERAL OFFICE OF STATISTICS	1999
12	EMERGENCY TRANSPORT RECONSTRUCTION PROGRAM	Report	Original	INTERNATIONAL MANAGEMENT GROUP	2000
13	STATISTICAL DATA ON ECONOMIC AND OTHER TRENDS	Report	Original	FEDERAL OFFICE OF STATISTICS	2000
14	ROAD MAP	Map	Original	"freytag & berndt"Wien	-
15	CITY MAP AND BIG MAP OF MOSTAR REGION	Map	Original	"IC" Printing house,Mostar	-
16	PLAN OF THE TOWN SARAJEVO	Map	Original	TKP "SAHINPASIC"	1998/1999
17	MAP OF MOSTAR	Map	Original	JP.GEODETSKI ZAVOD	1998