

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR REHABILITATION OF
THE PUBLIC TRANSPORTATION CAPACITY IN BELGRADE CITY
IN
THE FEDERAL REPUBLIC OF YUGOSLAVIA

MARCH, 2002

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
YACHIYO ENGINEERING CO., LTD.

PREFACE

In response to a request from the Government of the Federal Republic of Yugoslavia, the Government of Japan decided to conduct a basic design study on the Project for Rehabilitation of the Public Transportation Capacity in Belgrade City and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Federal Republic of Yugoslavia a study team from November 12 to December 13, 2001.

The team held discussions with the officials concerned of the Government of Yugoslavia, 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 Federal Republic of Yugoslavia 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 the Federal Republic of Yugoslavia for their close cooperation extended to the teams.

March, 2002



Takao Kawakami
President
Japan International Cooperation Agency

March, 2002

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Rehabilitation of the Public Transportation Capacity in Belgrade City.

The study was conducted by Yachiyo Engineering Co., Ltd. under a contract to JICA, during the period from October, 2001 to March, 2002. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of the Federal Republic of Yugoslavia and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

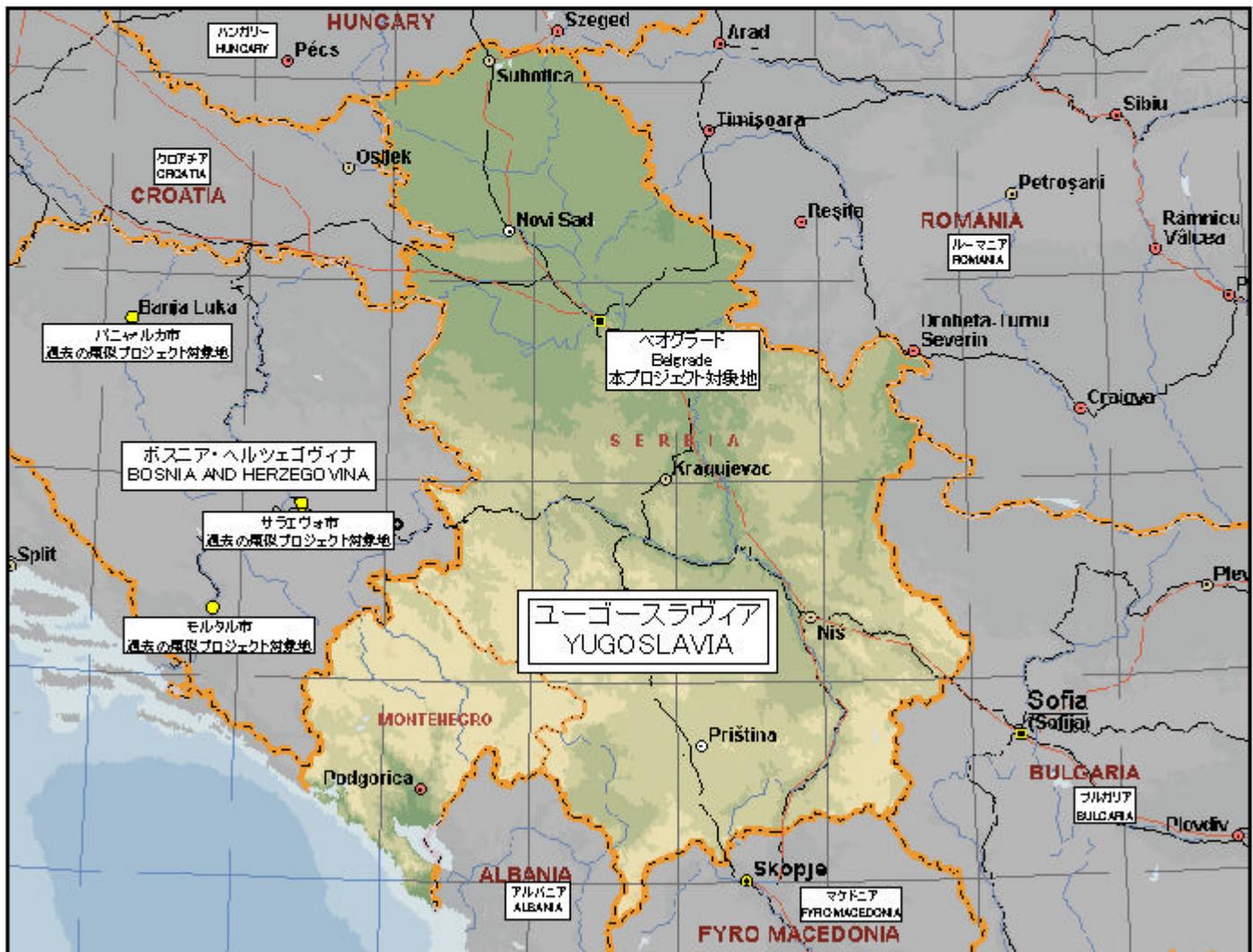
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



Koichi Tsuzuki
Chief Consultant
Basic design study team on the
Project for Rehabilitation of the Public
Transportation Capacity in the Belgrade City

Yachiyo Engineering Co., Ltd.



ユーゴスラヴィア国全図
MAP OF YUGOSLAVIA

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Abbreviations

A/P	: Authorization to Pay
B/A	: Banking Arrangement
CO	: Carbon Monoxide
EBRD	: European Bank for Reconstruction and Development
E/N	: Exchange of Notes
EU	: European Union
GDP	: Gross Domestic Product
GSP	: Public Transport Company “Beograd”
HC	: Hydrocarbon
IEC	: International Electrotechnical Commission
ISO	: International Organization for Standard
JEC	: Japanese Electrotechnical Committee
JEM	: Standards of Japan Electrical Manufacturer’s Association
JICA	: Japan International Cooperation Agency
JIS	: Japanese Industrial Standard
M/D	: Minutes of Discussion
Nox	: Nitrogen Oxide
OECD	: Organization for Economic Cooperation and Development
PM	: Particulate Matter
UNHCR	: United Nations High Commissioner for Refugees

SUMMARY

SUMMARY

The Federal Republic of Yugoslavia (hereinafter referred to as Yugoslavia) was formed by Serbia and Montenegro in April, 1992 after the disembodiment of the former Republic of Yugoslavia due to ethnic conflict. During the period of dictatorship under former President Milosevic which lasted for some 10 years, social and economic activities in Yugoslavia were severely restricted and damaged by economic sanctions imposed by the UN and others to the extent that the average monthly income of the people was more than halved from DM 250 in 1991 to DM 120 in 1995. In 1999, Yugoslavia was subject to aerial bombing by NATO because of its refusal to accept the draft peace accord to solve the Kosovo conflict. Following the emergence of the new Kostunica administration in October, 2000, the international community decided to provide assistance for Yugoslavia's efforts to achieve democratisation and its return to the international community. At the international conference to assist the reborn Yugoslavia held in Brussels in June, 2001, the Government of Japan pledged grant aid of US\$ 50 million.

The City of Belgrade (hereinafter referred to as Belgrade), which is the capital as well as the political, economic and cultural centre of Yugoslavia, has been experiencing serious problems of a high unemployment rate and an increase of the number of poor people due to the sluggish performance of the national economy for a long period of time and the massive inflow of refugees from Croatia, Bosnia-Herzegovina and Kosovo as well as those displaced internally.

Public transportation serving Belgrade consists of bus, street car and trolley bus services, all of which are run by the Public Transportation Company "Belgrade" (GSP Belgrade). Although GSP Belgrade did not suffer any direct damage due to the bombing campaign, it is finding it difficult to carry out the necessary maintenance of its fleet because of long-standing financial problems since the commencement of economic sanctions. As a result, all services are experiencing major operational difficulties, resulting in failure to perform their public service function.

The total length of public transportation services in Belgrade is 1,379 km of which the bus service accounts for approximately 87% (1,201 km) with 98 bus routes serving all parts of the city. By number of passengers, bus transportation accounts for approximately 75%. As the service area of street cars and trolley buses is quite limited, bus transportation is an essential mode of transportation for the citizens of Belgrade. While GSP Belgrade smoothly operated the bus service prior to the beginning of economic sanctions in 1991 with 913 buses, the number of operable buses has declined to 417 in 2001. Moreover, the existing buses are considerably aged. Although GSP Belgrade receives a substantial subsidy from the City

Assembly of Belgrade, its revenue significantly falls short of the required level because of low fares in consideration of refugees and other people with low income, resulting in difficulty to secure sufficient budget for the proper procurement of new buses and spare parts, etc. Because of the continual decline of the number of operable buses, GSP is already finding it difficult to operate and maintain the buses on the 98 municipal routes even though the demand for inexpensive public transportation has been increasing due to the stagnant economy and increase of the number of poor people. The buses during peak hours are so crammed that passengers can hardly move and long queues of passengers waiting for buses chronically form at bus stops. The long time required to get on and off of buses results in a longer travelling time for passengers, illustrating the severe shortfall of the transportation capacity of the bus service to provide adequate public transportation.

Under these circumstances, the City Assembly of Belgrade has identified the restoration of the impoverished public transportation as its priority policy. As part of its efforts, the City of Belgrade formulated the Public Transportation Improvement Plan in March, 2001 to improve the public bus service in the city. This Plan aims at securing the service of 900 operable buses by the end of 2005. It also aims at securing 600 operable buses by the end of 2002 as a short-term target.

Having selected eight bus routes with a particularly heavy demand from among the city's 98 bus routes, the Government of Yugoslavia made a request to the Government of Japan for the provision of grant aid for "the Project for Rehabilitation of the Public Transport Capacity in the City of Belgrade" (hereinafter referred to as the Project) designed to procure new buses and maintenance equipment which will be required to secure a smooth bus service for the city. The requested project is considered to be the highest priority project to achieve the short-term target of the Public Transportation Improvement Plan.

In response to the request, the Government of Japan decided to conduct the Basic Design Study and the Japan International Cooperation Agency (JICA) dispatched the Basic Design Study Team to Yugoslavia for the period from 12th November to 13th December, 2001. During the visit, the Study Team discussed the contents of the request with GSP Belgrade, conducted a survey on the project-related sites and gathered the necessary information.

On its return to Japan, the Study Team analyzed the necessity, urgency and anticipated effects of the Project, examined the adequate scope of equipment and standards, including the scope of the grant aid, and roughly estimated the project cost. In addition, the Study Team formulated the appropriate basic design and project implementation plan. Based on this basic design and implementation plan, the JICA dispatched the same Study Team to Yugoslavia for

the period from 14th to 26th February, 2002 to explain and discuss the outline of the basic design with the Yugoslavian side.

The main purpose of the Project is to procure new buses and maintenance equipment to improve the capacity of bus transportation which plays a particularly important role in Belgrade's aging public transportation system and which is the everyday means of transportation for the citizens of Belgrade. The following basic design has been finalized to achieve the said purpose of the Project.

The basic principle for the selection of the target bus routes under the Project is that these bus routes are primarily decided based on the Yugoslavian request while taking the expected number of passengers, the current state of passenger congestion on buses, the importance of the routes and appropriate care for low income people, including refugees from abroad and internally displaced people, into full consideration. The number of buses to be procured under the Project has been decided by subtracting the number of existing buses as of the end of 2002 from the number of buses required to run peak-time services with a passenger rate of approximately 100% for each route. As a result of the examination, the eight routes and 93 buses (18 standard buses and 75 articulated buses) shown in Table 1 have been identified as the subject routes and the required number of new buses under the Project.

Table 1 Required Number of Buses and Subject Bus Route for Deployment

	Bus Route No.	No. of Buses Currently in Operation (A)	Required No. of Buses (B)	No. of Buses to be Procured Under the Project (B-A)	Type of Bus
1	16	14	28	14	Articulated bus
2	17	12	22	10	Articulated bus
3	18	10	22	12	Articulated bus
4	23	15	25	10	Articulated bus
5	26	9	27	18	Standard bus
6	88	12	21	9	Articulated bus
7	95	15	25	10	Articulated bus
8	511	21	31	10	Articulated bus
Total		108	201	Standard buses : 18 Articulated buses : 75 Total : 93	

In regard to the specifications of the new buses to be procured under the Project, it has been decided to employ local specifications as much as possible in order to ensure common maintenance requirements given the fact that many of the buses owned by GSP Belgrade were

manufactured in Yugoslavia and also to secure a minimum service life of 12 years. In regard to the engines, EURO-3 standards which have become the mainstream in Europe are adopted as an environmental measure to ensure cleaner emission.

The scope of procurement under the Project includes the minimum range and quantity of spare parts which will be required up to the time when GSP Belgrade establishes an adequate parts procurement and management system and repair equipment and tools which will be essential for the proper maintenance of the buses. The new buses and repair equipment, etc. will be deployed at the Novi Belgrade and Karaburma Depots where GSP Belgrade currently maintains its bus fleet, etc.

While the three bus manufacturers in Yugoslavia can be regarded as eligible suppliers of the new buses, third countries (OECD members) are included in the list of eligible procurement sources.

The procurement of 93 new buses under the Project will necessitate the recruitment of new drivers, conductors and administrative staff, etc. and GSP Belgrade has already formulated a plan to recruit some 770 people to operate the 93 new buses. In regard to operation control and maintenance, GSP Belgrade has built up the necessary expertise during its long history of 110 years and, therefore, no problems are anticipated in terms of the operation and maintenance of the buses in the post-project period.

The estimated revenue and expenditure balance of GSP Belgrade at the end of 2003 is expected to show a revenue shortfall of some 747 million dinars which will be met by the municipal subsidy. As the City Assembly of Belgrade has expressed its intention to continue to provide a subsidy to meet such revenue shortfall of GSP Belgrade, no problems are anticipated in regard to funding the operation and maintenance cost of GSP Belgrade.

In regard to the division of work between the Japanese side and the Yugoslavian side, the Japanese side will be responsible for the procurement of the buses and repair equipment/tools of which the procurement is planned under the Project. Some equipment, namely the screw compressor and brake drum lathe, etc., will require installation which will be conducted by the Yugoslavian side. Together with the procurement of 93 new buses under the Project, it will be necessary to improve various facilities at bus stops and this work will also be conducted by the Yugoslavian side.

In the case of the Project's implementation with grant aid of the Government of Japan, 10 months after the signing of the E/N will be required to complete the Project at an estimated cost of some DM 400,900 for the Yugoslavian side.

The implementation of the Project is expected to have the following direct effects.

- Increase of the transportation capacity

At present, the target eight routes are served by a total of 108 buses. The deployment of 93 new buses will substantially increase the transportation capacity of these routes.

- Shortening of the waiting time

At present, buses operate at an interval of some 10 minutes on the target eight routes. With the increased number of buses, the service interval will be shortened to some five minutes.

- Shortening of the travelling time

As a result of smoother passenger changes at bus stops, the peak-hour cycle time of buses will be reduced by some 20 – 50 minutes, thereby shortening the travelling time for passengers.

In addition to the above direct effects, the following indirect effects are also expected to take place.

- Reduction of air pollution

The existing highly deteriorated buses almost freely emit exhaust fumes while travelling. The gradual replacement of old buses by new buses with environment-friendly equipment is expected to reduce the level of air pollution.

- Vitalisation of local socioeconomic activities

The improvement convenience of using public transportation for commuting, travelling to school and shopping, etc. will contribute to the vitalisation of local socioeconomic activities.

- Reduction of the maintenance cost

The deployment of 93 new buses on eight routes will reduce the repair and other costs of the bus fleet for the next few years.

- Creation of employment opportunities

The implementation of the Project will create some 770 new jobs against the background of a high unemployment rate in Yugoslavia.

The increased number of operable buses in Belgrade due to the implementation of the Project will strengthen the city's public transportation city and will have considerable positive effects. The Project will also contribute to improving the BHN of Belgrade's citizens, confirming the suitability of the Project's implementation with grant aid provided by the Government of Japan.

There are, however, some problems relating to the implementation of the Project and the Project will be implemented much more smoothly, effectively and efficiently if these problems are solved.

- For the smooth, effective and efficient use of the new buses to be procured under the Project, it will be important for the City Assembly of Belgrade and GSP Belgrade to formulate and implement a transportation master plan which is designed to establish an efficient public transportation system.
- GSP Belgrade receives an annual subsidy from the City Assembly of Belgrade to cover its revenue shortfall which amounts to some 50 – 60% of the annual operation cost. While the low bus fares are the main reason for this substantial shortfall, the high rate of uncollected fares (approximately 20%) is another reason. In order to improve the situation, GSP Belgrade is considering the introduction of a pre-paid card system. It will be necessary for GSP Belgrade to try to increase the fare revenue by urgently improving the fare collection system, including the use of equipment which accepts pre-paid cards.

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