

## 資料 - 5 討議議事録 (M/D)

**Minutes of Discussions  
on the Basic Design Study  
on the Project  
for Rehabilitation of the Public Transportation Capacity in Belgrade City  
in the Federal Republic of Yugoslavia**

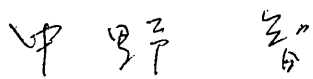
In response to a request from the Government of the Federal Republic of Yugoslavia (hereinafter referred to as "Yugoslavia"), the Government of Japan decided to conduct a Basic Design Study on the Project for Rehabilitation of the Public Transportation Capacity in Belgrade City (hereinafter referred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

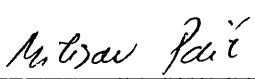
JICA dispatched to Yugoslavia the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Satoshi Nakano, Deputy Director of the Third Project Management Division, Grant Aid Management Department, JICA, and is scheduled to stay in the country from November 13 to November 21, 2001.

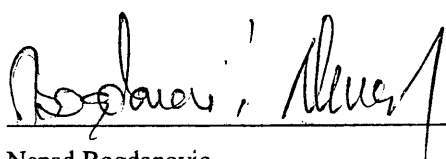
The Team held discussions with the officials concerned of the Government of Yugoslavia and conducted a field survey at the study area.

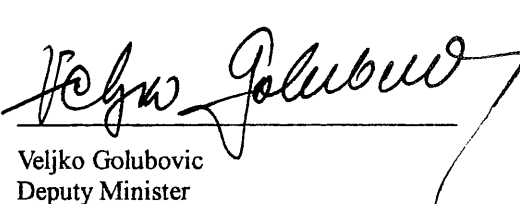
In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

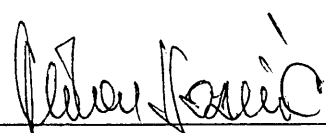
Belgrade, November 21, 2001


  
Satoshi NAKANO  
Leader  
Basic Design Study Team  
Japan International Cooperation Agency

  
Milisav Pajic  
Authorized Minister  
Ministry of Foreign Affairs  
Federal Republic of Yugoslavia

  
Nenad Bogdanovic  
President  
Executive Board  
City Assembly of Belgrade

  
Veljko Golubovic  
Deputy Minister  
Ministry of Finance  
Federal Republic of Yugoslavia

  
Milan Nozinic  
Director General  
Public Transport Company "Beograd"

  
Dobrosav Milovanovic  
Deputy Minister  
Ministry for International Economic Relations  
Republic of Serbia

## ATTACHMENT

### 1. Objective of the Project

The objective of the Project is to assist the rehabilitation of the public transportation capacity in Belgrade city through the procurement of buses and its maintenance equipment.

### 2. Project Sites

The Project sites are located in Belgrade City as shown in Annex-1.

### 3. Responsible and Implementing Organizations

The counterpart Ministry to the Government of Japan is the Ministry of Foreign Affairs of the Federal Republic of Yugoslavia.

The responsible organization is the City Assembly of Belgrade.

The implementing agency is the Public Transport Company "Beograd" (GSP Beograd).

The organization chart of the implementing agency is shown in Annex-2.

### 4. Items requested by the Government of Yugoslavia

After discussions with the Team, the items shown in Annex-3 were requested by the Yugoslavian 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

5-1. The Yugoslavian side understands the Japan's Grant Aid scheme explained by the Team, as described in Annex-4.

5-2. The Yugoslavian side will take the necessary measures, as described in Annex-5, for smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

### 6. Schedule of the Study

6-1. The consultants will proceed to further studies in Yugoslavia until December 13, 2001.

6-2. JICA will prepare the draft report in English and dispatch a mission to Yugoslavia in order to explain its contents around February, 2002.

6-3. In case that the contents of the report is accepted in principle by the Government of Yugoslavia, JICA will complete the final report and send it to the Government of Yugoslavia by April, 2002.

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## 7. Other Relevant Issues

7-1. The Yugoslavian side shall submit answers in English to the questionnaire which the Team handed to the Yugoslavian side by November 30, 2001.

7-2. The Yugoslavian side confirmed that the Public Transport Company "Beograd" will not be privatized in the foreseeable future.

7-3. The Yugoslavian side requested to the Team that bidders who offer domestically manufactured buses should be allowed to participate in the tender on the Project from the viewpoint of the promotion of domestic industry. The Team understood the intention of the request and agreed to evaluate the technical viability from the viewpoint of its quality and production capacity, but also pointed out that the procurement from third countries might be needed in order to secure several bidders and the fairness and competitiveness of the tender.

7-4. The Yugoslavian side shall take all the necessary measures to exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes including Value Added Taxes, and other physical levies which may be imposed in Yugoslavia regarding the procurement of equipment and materials and services under the verified contracts.

7-5. The Yugoslavian side shall carry out the necessary repair work of the depots which would be used for the maintenance of the new buses to be procured under the Grant Aid, and also secure the parking space in the depots by disposing scrap buses prior to the handover of the new buses.

7-6. The Yugoslavian side shall implement the Environmental Impact Assessment on the Project according to the laws and regulations of Yugoslavia by its own expenses, if necessary.

7-7. The Yugoslavian side shall improve the essential facilities for the proper bus operation, such as terminal stations and bus stops, prior to the handover of the new buses, if necessary.

7-8. The Yugoslavian side shall ensure enough budget and personnel to operate and maintain the equipment after the completion of the Project.

7-9. For the sake of the technology transfer on sustainable operation and maintenance, the Yugoslavian side pointed out the need for technical training of counterpart personnel in Japan. They also understood that another official request on technical cooperation should be submitted through the Embassy of Japan in Yugoslavia.

7-10. In order to secure fairness and competitiveness of the tendering procedure on the Project, the Yugoslavian side confirmed that the technical details of the Project that were discussed with the Team should be confidential to third parties.

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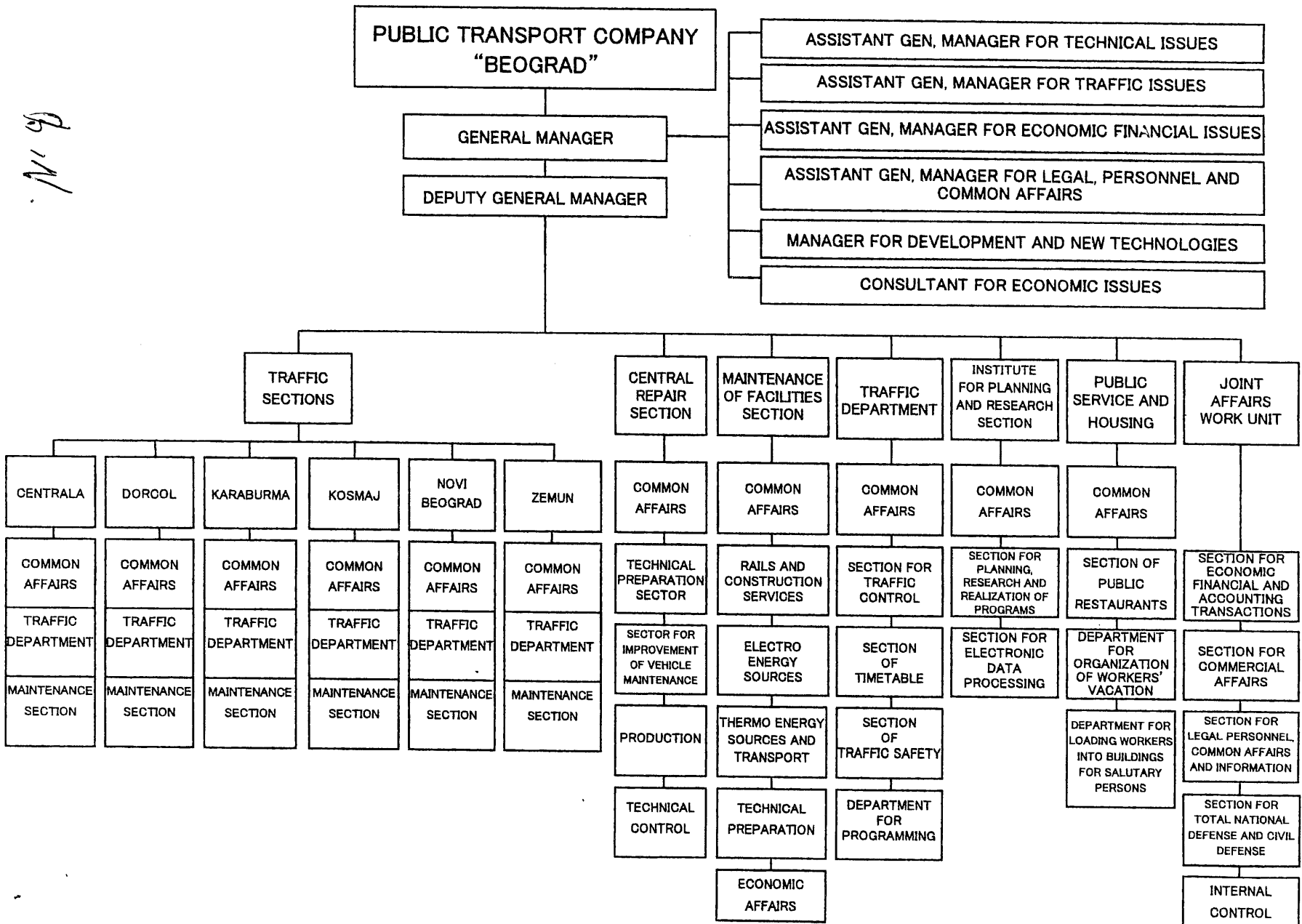
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(Annex-3)

Items Requested by the Yugoslavian Side

Bus Line No.	Items	Priority
511	- 10 units of articulated buses	8
95	- 11 units of articulated buses	5
88	- 14 units of articulated buses	6
26	- 18 units of standard buses	7
23	- 7 units of articulated buses	4
18	- 11 units of articulated buses	3
17	- 9 units of articulated buses	2
16	- 13 units of articulated buses	1
Total	93 units	
Common	- Spare parts for the above-mentioned buses	-
Common	- Maintenance equipment and tools for the Novi Beograd Depot and the Karaburma Depot	-

Remarks:

1) Concerning maintenance equipment and tools for the Karaburma Depot, it is also proposed in the EBRD's loan project. It needs clear demarcation with the EBRD's loan project in order to avoid duplication.

2) Draft of detailed specifications of the buses and others will be prepared by the consultants in consultation with the Yugoslavian side.

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## JAPAN'S GRANT AID SCHEME

The Grant Aid scheme 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. The Grant Aid is not supplied through the donation of materials as such.

## 1. Grant Aid Procedures

Japan's Grant Aid scheme is executed through the following procedures.

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

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 the Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (the Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using Japanese consulting firms.

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid scheme, 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 (E/N) signed by the Governments of Japan and the recipient country.

Finally, for the smooth 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 (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter 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:

- Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid scheme from a technical, social and economic point of view.
- Confirmation of items agreed upon by both parties concerning the basic concept of the



Project.

- Preparation of a Basic Design of the Project.
- Estimation of cost 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 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 registered consulting firms. JICA selects firms based on proposals submitted by interested firms. The firms selected carry out a Basic Design Study and write a report, based upon terms of reference set by JICA.

The consulting firms used for the Study 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) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

2) "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 consulting firms and contractors and final payment to them must be completed.

However, in case of delays in delivery, installation or construction due to unforeseen factors such as natural disaster, 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.

3) 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.)

### 4) Necessity of "Verification"

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

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5) Undertakings required to 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:

- a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction,
- b) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
- c) To secure buildings prior to the procurement in case the installation of the equipment,
- d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
- e) 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 products and services under the verified Contracts,
- f) To accord Japanese nationals, whose services may be required in connection with supply of the products and services under the verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

6) "Proper Use"

The recipient country is required to operate and maintain the facilities constructed and 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.

7) "Re-export"

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

8) Banking Arrangement (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 (A/P) issued by the Government of recipient country or its designated authority.

9) Authorization to Pay (A/P)

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

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## Major Undertakings to be taken by Each Government

NO	Items	To be covered by Grant Aid	To be covered by Recipient side
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	a) Advising Commission of A/P		●
	b) Payment commission		●
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	a) Marine (Air) transportation of the products from Japan to the recipient country	●	
	b) Tax exemption and customs clearance of the products at the port of disembarkation		●
	c) Internal transportation from the port of disembarkation to the project site	●	
3	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		●
4	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		●
5	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
6	To bear all the expense, 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

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**Minutes of Discussions  
on the Basic Design Study  
on the Project  
for Rehabilitation of the Public Transportation Capacity in Belgrade City  
in the Federal Republic of Yugoslavia  
(Explanation on Draft Final Report)**

In November 2001, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Rehabilitation of the Public Transportation Capacity in Belgrade City (hereinafter referred to as "the Project") to the Federal Republic of Yugoslavia (hereinafter referred to as "Yugoslavia"), and through discussions, field survey, and technical examination of the results in Japan, JICA prepared a draft final report of the study.

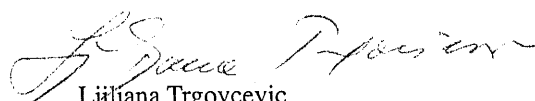
In order to explain and to consult the Government of Yugoslavia on the components of the draft report, JICA sent to Yugoslavia the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Satoshi Nakano, Deputy Director of the Third Project Management Division, the Grant Aid Management Department, JICA, from February 14 to 26, 2002.

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

Belgrade, February 22, 2002

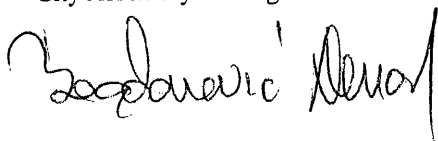


Satoshi Nakano  
Leader  
Basic Design Study Team  
Japan International Cooperation Agency

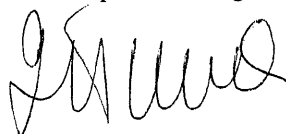


Ljiljana Trgovcevic  
Head of the Department of Bilateral Cooperation  
with Developed Countries  
Federal Ministry of International Economic Relations  
Federal Republic of Yugoslavia

Nenad Bogdanovic  
President  
Executive Board  
City Assembly of Belgrade



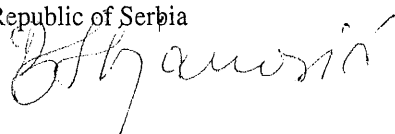
Dobrica Pantovic  
Head of the Customs System Sector  
Federal Ministry of Finance  
Federal Republic of Yugoslavia



Milan Nozinic  
Director General  
Public Transport Company "Beograd"



Blazenka Stojanovic  
Secretary General  
Ministry for International Economic Relations  
Republic of Serbia



## ATTACHMENT

### 1. Components of the Draft Final Report

The Government of Yugoslavia agreed and accepted the components of the draft final report explained by the Team. The Yugoslavian side also confirmed that there were no duplication with other Projects on the bus lines.

### 2. Japan's Grant Aid Scheme

The Yugoslavian side understands the Japan's Grant Aid scheme and the necessary measures to be taken by the Government of Yugoslavia as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both sides on November 21, 2001.

### 3. Schedule of the Study

JICA will complete the final report in accordance with the items confirmed by both sides and send it to the Government of Yugoslavia by May, 2002.

### 4. Other Relevant Issues

4-1. The Yugoslavian side confirmed that the counterpart Ministry on the Project to the Government of Japan had changed from the Federal Ministry of Foreign Affairs of the Federal Republic of Yugoslavia to the Federal Ministry of International Economic Relations of the Federal Republic of Yugoslavia.

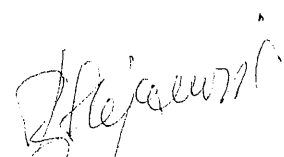
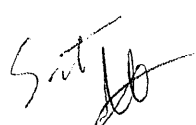
4-2. The Yugoslavian side shall undertake the works which were described in the articles 5 and 7 of the Minutes of Discussions signed by both sides on November 21, 2001.

4-3. The Yugoslavian side shall allocate necessary budget and personnel to carry out the Yugoslavian side's undertakings which are described in the chapter 3 of the draft final report of the Project.

4-4. Both sides agreed that, as eligible source countries for articulated and standard buses, OECD member countries in addition to Yugoslavia and Japan should be taken into consideration in order to maintain the competitiveness of the tendering and to ensure the delivery of the equipment within the limited period of the Project.

4-5. The Yugoslavian side shall improve the facilities at bus stops and terminals along the bus lines of the Project, such as timetable and information boards, windshields, benches, as proposed by the Team in order to improve the service for passengers.

4-6. Both sides agreed that the draft final report and the draft detailed specifications which were prepared by the Team should be confidential to third parties in order to secure the fairness of the tender of the Project.



## 資料 - 6 事業事前評価表

## 事業事前評価表

1. 対象事業名	ユーゴスラヴィア連邦共和国 ベオグラード市公共輸送力復旧計画
2. 我が国が援助することの必要性・妥当性	<p>(1) 1990 年 7 月、世界の主要先進国 24 カ国で構成されている支援国会議で旧ユーゴスラヴィア連邦共和国（以下「ユ」国と称す）を支援対象国と決定したが、その後の旧「ユ」国内での紛争発生等の情勢の変化を受けて、1991 年 11 月、支援国諸国は経済協力の停止を決定した。我が国も主要先進 24 カ国に同調し、人道的援助や草の根無償資金協力を除き、1991 年 11 月から旧「ユ」国への援助を停止した。本プロジェクトは 2000 年 6 月に行われた新生「ユ」国支援会議において、我が国が表明した総額 50 百万ドルに対する無償資金協力案件のコンポーネントのひとつとして位置付けられている。</p> <p>(2) 本プロジェクトの実施機関であるベオグラード市公共輸送公社は、1999 年の NATO の空爆による直接の被害は無かったものの、1992 年から始まった経済制裁の影響で財政難に陥り、バス、スぺアパーツ、修理機材等の新規購入が極めて困難な状況にある。このため 1991 年には 913 台であった同公社の稼働可能なバス台数は 2001 年には半分以下の 417 台にまで落ち込んでいることに加え、現在稼働中のバスも老朽化が激しく、ベオグラード市の公共交通機関は危機的な状態にある。ベオグラード市の主な公共交通機関はバス、路面電車、トロリーバスであるが、バス交通の運行距離は上記公共交通機関総運行距離の 87%を占めている。また、公共交通機関の利用客から見ると全体の 75%を占めており、このことからバス交通はベオグラード市の最重要の公共交通機関であることが分かる。本プロジェクトは「ユ」国が、上記の状況を改善しベオグラード市の公共交通輸送力を復旧して安定した市民生活を回復するために、我が国に対して新規のバス購入の無償資金協力を要請したものである。バス運行台数が増加されることにより、市民（約 2.2 百万人）及びボスニア、コソヴォ等からの避難民（約 25～35 万人）の日常生活の足であるバス交通機関の運行状態が改善され、市民生活の安定、大気汚染の削減、及び時間短縮による経済の活性化等に大きく貢献することが期待される。</p>
3. 協力対象事業の目的（プロジェクト目標）	<p>本プロジェクト実施の目的は、「ユ」国の首都であるベオグラード市の公共輸送力の 87%を担うバス交通機関の輸送力の復旧を図るために、必要なバス及び修理機材等の増強を行うものである。</p>
4. 協力対象事業の内容	<p>(1) 対象地域</p> <p style="margin-left: 40px;">ユーゴスラヴィア連邦共和国 ベオグラード市</p> <p>(2) アウトプット</p> <p style="margin-left: 40px;">ベオグラード市の中心市街地を運行する 8 バス路線のバス稼働台数が増加する。各路線毎のバス台数（現況と調達後）と車両型式を以下に示す。</p>

路線番号	現在の運行台数	本件調達後の台数（増加分）	車両型式
16	14	28 (+14)	2 両連結バス
17	12	22 (+10)	2 両連結バス
18	10	22 (+12)	2 両連結バス
23	15	25 (+10)	2 両連結バス
26	9	27 (+18)	大型バス
88	12	21 (+ 9)	2 両連結バス
95	15	25 (+10)	2 両連結バス
511	21	31 (+10)	2 両連結バス
合 計	108	201 (+93)	

### (3) インプット

以下に示す稼働バス台数及び関連機材の調達

- 1) 2 両連結バス（定員 150 名）：75 台
- 2) 大型バス（定員 100 名）：18 台
- 3) バスの予備品：一式
- 4) バスの修理用機材：一式

### (4) 総事業費：

概算事業費約 18.73 億円（日本側 18.50 億円、「ユ」国側 0.23 億円）

### (5) スケジュール

詳細設計を含め 10 ヶ月の工期を予定

### (6) 実施体制

窓口官庁： 連邦国際経済関係省  
 実施機関： ベオグラード市公共輸送公社  
 監督機関： ベオグラード市政府

## 5. プロジェクトの成果

### (1) プロジェクトにて裨益をうける対象の範囲及び規模

裨益対象地域：ベオグラード市  
 裨 益 人 口：約 220 万人

### (2) 事業の目的（プロジェクトの目標）を示す成果指標

対象地域における市民の移動手段としての公共輸送力の向上

- 1) ピーク時における現状 10 分間隔程度のバス運行頻度が 5 分間隔程度に改善される。



- 2) 現行 80～120 分程度のサイクルタイム(各路線を1往復するのに要する時間)が次表に示すとおり 50 分～90 分程度に改善される。

路線番号	バスが往復に要する運行時間(サイクルタイム)(分)	
	2001 年 (実施前)	2003 年 (実施後)
16	80	51
17	96	62
18	112	59
23	128	81
26	88	54
88	110	68
95	124	79
511	108	88

## 6. 外部要因リスク

### (1) 機材の維持管理体制の改善

本プロジェクトの実施による調達機材が目的通り有効に利用されるためには、実施機関であるベオグラード市公共輸送公社は、調達されたバスの日常点検と定期点検を確実に実施すると共に、適切な維持管理に努める必要がある。また、維持管理を行うための予算措置が必要である。

### (2) 職員の増員

また、ベオグラード市公共輸送公社は、バスの運行と維持管理に必要な約 770 名の増員計画を立案しており、これを着実に実行する必要がある。

## 7. 今後の評価計画

### (1) 事後評価に用いる成果指標

- 1) ピーク時におけるバス運行頻度 (各路線の運行間隔)
- 2) バス路線の運行サイクルタイム (各路線を 1 往復するのに要する時間)

### (2) 評価のタイミング

事業終了から 1 年後をめどに事業評価を行う予定。

## 資料 - 7 参考資料/入手資料リスト

調査名： ユーゴスラヴィア国ベオグラード市公共輸送力復旧計画基本設計調査

番号	名 称	形 態 図書・ビデオ 地図・写真等	オリジナル・コピー	発 行 機 関	発 行 年
1	BELGRADE PUBLIC TRANSPORT PROJECT	Report	Original	NEA:EBRD Consultant	2001年
2	EBRD Loan: Tender Documents for Procurement of City Buses	Report	Copy	NEA:EBRD Consultant	2001年
3	NEA Company Profile	Brouchar	Original	NEA:EBRD Consultant	2001年
4	IKARBUS Company Profile	Brouchar	Original	IKARBUS	2000年
5	GSP Company Profile	Brouchar	Original	ベオグラード市公共輸送公社	2000年
6	City Map of Belgrade	Map	Original	Geo Center	1989年
7	Road Map of YUGOSLAVIA	Map	Original	Geo Karta	2000年
8	BEOGRAD New PLAN GRADA	Map	Original	Geo Karta	2001年
9	2001Beograd	Map	Original	Geo Karta	2001年
10	ベオグラード案内	Brouchar	Copy	在ベオグラード日本大使館	2001年
11	ユーゴスラヴィア連邦共和国事情	Brouchar	Copy	在ベオグラード日本大使館	2001年
12	EBRD Loan: Required Specification of Equipment and Tools	Report	Copy	ベオグラード市公共輸送公社	2001年

## 資料 - 8 上位計画の妥当性の検証

## 上位計画の妥当性の検証

### (1) 上位計画の概要

「べ」市は公共交通の輸送力を復旧して健全な市民生活の安定を図ることを目的とした「公共交通改善計画」を2001年に策定した。この計画の目標は2005年を計画目標年次と設定し、1991年時点での円滑に稼動していたバス運行レベルの状態まで復旧することであり、2005年に900台のバスを確保することである。また、2002年を中間年次（短期計画）と設定し、600台のバスを確保することである。

表4-1-1 ベオグラード市公共輸送公社のバス台数の推移

年次	登録バス台数 (台)	稼動可能バス台数 (台)	「べ」市の人口 (千人)	適用
1990	1,051	870	1,796	
1991	1,062	913	1,800	
1992	1,034	674	1,868	
1993	1,019	481	1,906	
1994	980	582	1,934	
1995	961	737	2,011	
1996	880	733	2,042	
1997	877	713	2,070	
1998	851	582	2,101	
1999	818	293	2,159	
2000	732	324	2,180	
2001	745	417	2,200	推定値

出典：ベオグラード市公共輸送公社

### (2) 2002年及び2005年時点での必要バス台数の推定

2002年及び2005年における必要バス台数の推定は「べ」市全域の98路線を対象としたバス台数とする。また、以下のような計算条件を設定する。

- ① バス利用者数の伸び率は年間1.5%を採用する。
- ② バス車両の乗客輸送容量は大型バス車両110人（乗車率100%）、2両連結バス車両160人（乗車率100%）とする。
- ③ 2001年時点でのバス利用者数（往復）はベオグラード市公共輸送公社の資料を使用する。

上記の計算条件を基に、2002年及び2005年における98路線に必要なバス台数を計算した結果、表-2に示すようにそれぞれ約800台（798台）及び約1,000台（984台）と計算された。

### (3) 2005 年計画の妥当性

#### 1) 妥当性

2005 年における計画目標での調達すべきバス台数は**900 台**と設定されている。一方、上記で計算された 2005 年時点での必要なバス台数は約 **1,000 台**である。計画目標バス台数は計算結果より **100 台**程度（計算値の **10%**）低めに設定されている。この **100 台**分に相当するバス利用者の輸送は平均乗車率を **100%**から **110%**程度に増加させることにより輸送可能である。従って、2005 年の計画目標は市及びベオグラード市公共輸送公社の財政事情を考慮した最低限の計画として妥当と判断される。

### (3) 2002 年計画の妥当性

#### 1) 妥当性

2002 年における計画目標で調達すべきバス台数は **600 台**と設定されている。一方、上記で計算された 2002 年時点での必要台数は約 **800 台**である。計画の目標バス台数は計算結果より約 **200 台**程度（計算値の **25%**）低めに設定されている。この **200 台**分に相当するバス利用者の輸送は平均乗車率を **100%**から **125%**程度に増加させることにより輸送可能であるが、現実的には非常に困難である。しかし、市及びベオグラード市公共輸送公社の財政難を考えれば、ここ **1~2 年**間で **400 台**（**800 台—417 台**）ものバスを補強することはきわめて困難である。従って、2002 年の計画目標は財政事情を考慮した実現的な最小限の計画として妥当であると判断できる。

表-2 2002年及び2005年における必要なバス台数

No.	バス路線名	車両形式	運行バス台数 (台)	サイクル タイム (分)	ピーク時需要 (人)			車両容量 (人)	必要台数 (台) 2002年	必要台数 (台) 2005年
					2001年	2002年	2005年			
1	15	A	9	62	2,694	2,734	2,858	160	13	16
2	16	A	14	82	4,600	4,669	4,881	160	29	36
3	17	A	12	96	3,100	3,147	3,289	160	23	28
4	18	A	10	112	2,700	2,741	2,865	160	23	29
5	20	S	2	78	279	283	296	110	2	3
6	23	A	15	128	2,600	2,639	2,759	160	25	32
7	24	S	2	56	459	466	487	110	3	4
8	25	S	8	100	1,286	1,305	1,364	110	14	18
9	26	S	9	88	2,800	2,842	2,971	110	27	34
10	27A	A	10	82	1,632	1,656	1,732	160	10	13
11	27B	A	5	62	302	307	320	160	2	2
12	31	A	7	66	2,485	2,522	2,637	160	13	16
13	32	S	3	54	762	773	808	110	5	6
14	32L	S	1	30	193	196	205	110	2	2
15	33	S	1	30	337	342	358	110	2	2
16	34	S	1	30	189	192	201	110	2	2
17	35	S	1	56	309	314	328	110	2	2
18	36	S	4	50	103	105	109	110	2	2
19	37	S	8	116	1,562	1,585	1,657	110	20	25
20	38	S	1	20	185	188	196	110	2	2
21	39	S	1	60	185	188	196	110	2	2
22	42	S	2	62	977	992	1,037	110	7	8
23	43	A	2	54	1,017	1,032	1,079	160	4	5
24	44	S	5	20	447	454	474	110	1	2
25	45	A	1	94	2,108	2,140	2,237	160	15	19
26	46	S	9	80	1,244	1,263	1,320	110	11	14
27	47	S	5	94	1,588	1,612	1,685	110	17	21
28	48	S	10	86	2,124	2,156	2,254	110	20	25
29	50	S	8	100	2,084	2,115	2,211	110	23	29
30	51	A	9	66	866	879	919	160	4	5
31	52	A	4	79	1,002	1,017	1,063	160	6	8
32	53	A	12	92	3,401	3,452	3,608	160	24	30
33	54	S	2	90	135	137	143	110	2	2
34	55	S	6	109	755	766	801	110	9	11
35	55A	S	1	30	211	214	224	110	2	2
36	55L	S	1	40	244	248	259	110	2	2
37	56E	A	12	92	4,700	4,771	4,987	160	33	41
38	58	S	6	110	1,269	1,288	1,346	110	15	19
39	59	S	6	104	608	617	645	110	7	9
40	60	S	1	40	162	164	172	110	2	2
41	65	A	10	86	1,887	1,915	2,002	160	12	15
42	67	S	3	40	1,105	1,122	1,172	110	5	6
43	71	A	4	68	1,377	1,398	1,461	160	7	9
44	73	A	9	126	3,900	3,959	4,138	160	37	47
45	75	A	10	60	3,800	3,857	4,032	160	17	22
46	76	S	2	45	125	127	133	110	2	2
47	82	A	2	70	545	553	578	160	3	4
48	83	A	7	96	2,306	2,341	2,447	160	17	21
49	84	A	5	64	1,448	1,470	1,536	160	7	9

No.	バス路線名	車輛形式	運行バス台数 (台)	サイクル タイム (分)	ピーク時需要 (人)			車輛容量 (人)	必要台数 (台) 2002年	必要台数 (台) 2005年
					2001年	2002年	2005年			
50	88	A	12	110	2,600	2,639	2,759	160	22	27
51	91	S	2	90	132	134	140	110	2	2
52	92	S	1	60	215	218	228	110	2	2
53	95	A	15	124	2,700	2,741	2,865	160	26	32
54	96	A	4	72	935	949	992	160	5	6
55	101	A	7	80	1,447	1,469	1,535	160	9	11
56	102	S	1	50	131	133	139	110	2	2
57	104	S	4	60	593	602	629	110	4	5
58	105	S	3	75	317	322	336	110	3	3
59	106	S	3	110	213	216	226	110	3	3
60	107	S	1	60	126	128	134	110	2	2
61	108	S	3	60	380	386	403	110	3	3
62	109	S	1	80	92	93	98	110	2	2
63	110	S	1	30	118	120	125	110	2	2
64	202	S	3	80	219	222	232	110	2	2
65	302	S	7	120	698	708	741	110	9	12
66	302L	S	2	56	349	354	370	110	2	3
67	303	S	2	90	252	256	267	110	3	3
68	304	S	2	70	237	241	251	110	2	2
69	305	S	2	60	351	356	372	110	2	3
70	306	S	3	60	432	438	458	110	3	4
71	307	S	4	65	587	596	623	110	4	5
72	308	S	3	48	590	599	626	110	3	4
73	309	S	7	56	1,014	1,029	1,076	110	6	8
74	401	S	3	60	332	337	352	110	2	3
75	402	S	3	60	350	355	371	110	2	3
76	403	S	2	100	228	231	242	110	3	3
77	404	S	3	115	193	196	205	110	2	3
78	405	S	2	120	169	172	179	110	2	3
79	503	S	1	60	122	124	129	110	2	2
80	504	S	1	40	166	168	176	110	2	2
81	511	A	20	107	3,900	3,959	4,138	160	32	40
82	512	S	2	60	584	593	620	110	4	5
83	521	S	1	50	110	112	117	110	2	2
84	531	S	3	60	583	592	619	110	4	5
85	532	S	3	60	580	589	615	110	4	5
86	533	S	1	40	200	203	212	110	2	2
87	542	S	1	60	178	181	189	110	2	2
88	601	A	15	87	3,993	4,053	4,237	160	26	33
89	602	S	2	40	679	689	720	110	3	4
90	603	S	2	60	343	348	364	110	2	3
91	604	A	2	60	516	524	547	160	2	3
92	605	A	3	90	621	630	659	160	4	5
93	611	A	5	90	838	851	889	160	6	7
94	612	S	1	60	106	108	112	110	2	2
95	703	A	3	40	1,210	1,228	1,284	160	4	5
96	704E	A	7	76	2,223	2,256	2,359	160	13	16
97	705	S	1	40	92	93	98	110	2	2
98	706	A	8	90	1,504	1,527	1,596	160	10	13
	Total		466		104,745	106,316	111,134		797	984

注：A： 2両連結バス

S： 大型バス