

## JBIC ODA Loan Project Mid-Term Review 2006

Evaluator: Yoichi Hara (Mitsubishi UFJ Research and Consulting)

Field Survey: September 2007

Project Title: The Republic of Bulgaria “Sofia Metro Extension Project” (L/A No. BG-P5)

### [Loan Outline]

Loan Amount / Contract Approved Amount / Disbursed Amount : 12,894 million yen / 10,188 million yen / 4,685 million yen (as of the end of September 2007)  
Loan Agreement : February 2002  
Loan Expiry Date : July 2009 (7 years following the effective date of L/A)  
Executing Agency : City of Sofia  
Operation and Maintenance Agency : City of Sofia  
Selection Criteria for Mid-Term Review : Coordination with JICA (dispatch of JICA experts) and other donors (EBRD, EU, etc.)  
Special theme (measures for the disabled people)

### [Project Objective]

The objective of this project is to further streamline the city’s transportation system by constructing a tunnel and stations from the seventh to the ninth station as part of Phase 2 (the segment covering about 11 km from the seventh to the sixteenth station) of the Subway Line Construction Plan (covering about 19 km in total extension, from the first to the sixteenth station) by using the shield tunneling method, which Bulgaria has no experience, and thereby contribute to the strengthening of urban functions and enhancing convenience for citizens in Sofia, the capital of Bulgaria.

Consultants: Pacific Consultants International Co., Ltd., PADECO Co., Ltd.

Contractor: Taisei Corporation

### [Mid-Term Review Result]

Item	Ex-ante Evaluation (February 2002)	Result of mid-term review and ex-post evaluation results as estimated at time of mid-term review
<b>Relevance</b>	(1) National policy level At the end of 1999, Bulgaria became a candidate for membership in the EU. Since then, the government has endeavored to carry out the steps required by the EU, including structural reform (privatization, trade liberalization, etc.) and development of laws, before Bulgaria can gain	(1) National policy level Bulgaria joined the EU in January 2007. In order to promote developments on the social, transportation and environment fronts that the EU requires of its member nations, the Council of Ministers, the government’s supreme decision-making body (which is equivalent to

membership.

For Bulgaria, which sets EU membership in 2007 as its top priority goal, developing the urban functions in Sofia, the capital, and supporting the development of the market economy are extremely significant to narrow the gap that exists between Bulgaria and Western European countries on the economic, institutional and infrastructure fronts.

The central government took up this project as a major project to be implemented in the Sofia area from a list of projects included in the National Plan for Regional Development (2000–2006), a part of the National Mid-term Plan.

(2) Policy level

The city of Sofia (population: about 1.2 million), situated in a basin, has a high population density. In addition to having very narrow roads, the city is beset by a host of problems, including increase in the number of vehicles (doubled over the past 10 years) and the deteriorating condition of all its mass transportation systems, including streetcars, trolley buses, buses and subways.

Viewing the reorganization of the city’s transportation system as its major policy challenge, Sofia has set three goals for modernizing its urban functions: (i) streamlining the management of the city’s transportation system, (ii) partial removal of streetcars and other existing routes and rationalization of routes by changing how they are routed, and (iii) alleviation of traffic congestion and reduction of commuting time by implementing (i) and (ii). The city is currently working out a plan to realign its transportation system centering on its subways.

the Cabinet Council in Japan, and chaired by the Prime Minister), regards the subway extension project in Sofia as one of its top priority items. The EU, for its side, fully supports the project, for it recognizes the importance of subway construction as an effective way to alleviate traffic congestion and protect the environment (that is, a measure to abate air pollution).

To gain membership to the EU, in 2004 Bulgaria began preparing the “Sector Operational Programme: Transport 2007–2013” and submitted it to the EU in 2006. The importance of subway projects is also pointed out in this guideline, which stipulates that Bulgaria will develop its transportation infrastructure in a manner that conforms to the EU’s transportation policy. Thus the high priority placed on this project from a national policy level, which was confirmed at the time of ex-ante evaluation, remains unchanged even today.

(2) Policy level

In the city of Sofia, transportation conditions continue to deteriorate after the time of the ex-ante evaluation due to population growth and increase in the number of vehicles owned.

Population growth and increase in the number of vehicles in Sofia

	1994–1998	1999–2002	2003–2007
Population (estimate)	n.a	1.2 million (2001)	1.5 million (2007)
Number of registered vehicles	350,000 (1998)	509,000 (2002)	800,000 (2007)
Rate of increase	28%	31%	36%
Number of vehicle owners per 1,000 people	310 (1998)	435 (2002)	533 (2007)

Source: City of Sofia

	<p>(3) Planning level</p> <p>With respect to the Subway Line Construction Plan of the city of Sofia (covering about 19 km in total extension, from the first to the sixteenth station), construction of the segment from the first to the seventh station stretching about 8 km was completed in October 2001 (using the open cut method by self-secured funds). Commercial operations of the said segment have already started. However, the segment in operation only links the western residential area and part of the downtown area. In order to make subways serve as a core of the city's transportation system, it is necessary to extend the existing route through the downtown area to as far as the eastern residential area by constructing the Phase 2 portion of the</p>	<p>Given the above situation, as well as the significant impact the subway development will have on improving transportation efficiency, including enhancement of convenience for residents of Sofia and alleviation of traffic congestion, the relevance of the subway development project and its high priority remain unchanged from the time of the ex-ante evaluation.</p> <p>With regard to the development of a public means of transportation, the General Master Plan that the city of Sofia adopted in 2007 cites promotion of construction of a subway system by 2020 as a matter of top priority.</p> <p>At the time of appraisal, the European Bank for Reconstruction and Development (EBRD) was conducting a survey on reorganization of the city's transportation system in Sofia, and a reorganization plan did exist. However, there is no evidence that after the survey the plan was ever implemented. But regardless whether the reorganization plan was actually implemented or not, the high priority and relevance of the subway development project remain unchanged, as described in the aforementioned master plan.</p> <p>(3) Planning level</p> <p>Since the time of appraisal, neither change nor correction has occurred in the Subway Line Construction Plan of the city of Sofia itself. Nor has there been any change in the scope of this project. The needs and priority of this project remain very high to this day, and no change has occurred since the time of the ex-ante evaluation.</p> <p>This project is consistent with Bulgaria's national policies and measures, and since the strong need for subway development has been confirmed, it is judged that there is a strong need and relevance for this project.</p>
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	<p>subway (the segment covering about 11 km, from the seventh to the sixteenth station).</p> <p>In particular, with regard to construction of the aforesaid segment of the Phase 2 portion covering about 2 km, from the seventh to the ninth station, requires the use of the shield tunneling method, since Bulgaria lacks experience in this method, external technical support will be indispensable.</p> <p>At the same time, support is also being sought for management reforms of Metropolitan JSC (the city's wholly owned company) whose business objective is, among other things, to operate and maintain subways.</p>																																																				
<p><b>Effectiveness (Impact)</b></p>	<p>(1) Operation and effect indicators</p> <p>(i) Quantitative effects</p> <table border="1" data-bbox="443 655 1234 1388"> <thead> <tr> <th>Name of indicator</th> <th>At time of ex-ante evaluation (actual value in 2001)</th> <th>Target value (predicted value for 2008)</th> </tr> </thead> <tbody> <tr> <td colspan="3"><b>(a) Operation indicators</b></td> </tr> <tr> <td>Number of passengers (10,000/day) (0–10 stations)</td> <td>6.9</td> <td>11.8</td> </tr> <tr> <td>Metropolitan JSC's passenger revenue (million leva/year)</td> <td>8.6</td> <td>14.7</td> </tr> <tr> <td colspan="3"><b>(b) Effect indicator</b></td> </tr> <tr> <td>Metropolitan JSC's net earnings from its subway business (million leva/year)</td> <td>0.2</td> <td>3.7</td> </tr> <tr> <td colspan="3"><b>(c) Internal rate of return</b></td> </tr> <tr> <td>EIRR (Economic internal rate of return)</td> <td></td> <td>8.4%</td> </tr> <tr> <td>FIRR (Financial internal rate of return)</td> <td></td> <td>2.8%</td> </tr> </tbody> </table>	Name of indicator	At time of ex-ante evaluation (actual value in 2001)	Target value (predicted value for 2008)	<b>(a) Operation indicators</b>			Number of passengers (10,000/day) (0–10 stations)	6.9	11.8	Metropolitan JSC's passenger revenue (million leva/year)	8.6	14.7	<b>(b) Effect indicator</b>			Metropolitan JSC's net earnings from its subway business (million leva/year)	0.2	3.7	<b>(c) Internal rate of return</b>			EIRR (Economic internal rate of return)		8.4%	FIRR (Financial internal rate of return)		2.8%	<p>(1) Operation and effect indicators</p> <p>(i) Quantitative effects</p> <table border="1" data-bbox="1305 655 2074 1388"> <thead> <tr> <th>Name of indicator</th> <th>At time of ex-ante evaluation (actual value in 2001)</th> <th>At time of mid-term review (actual value in 2006)</th> <th>Target value (predicted value for 2010)</th> </tr> </thead> <tbody> <tr> <td colspan="4"><b>(a) Operation indicators</b></td> </tr> <tr> <td>Number of passengers (10,000/day) (0–10 stations)</td> <td>6.9</td> <td>8.0</td> <td>20.4</td> </tr> <tr> <td>Metropolitan JSC's passenger revenue (million leva/year)</td> <td>7.6</td> <td>12.4</td> <td>30</td> </tr> <tr> <td colspan="4"><b>(b) Effect indicator</b></td> </tr> <tr> <td>Metropolitan JSC's net earnings from its subway business (million leva/year)</td> <td>0.002</td> <td>1.663</td> <td>n.a</td> </tr> </tbody> </table>	Name of indicator	At time of ex-ante evaluation (actual value in 2001)	At time of mid-term review (actual value in 2006)	Target value (predicted value for 2010)	<b>(a) Operation indicators</b>				Number of passengers (10,000/day) (0–10 stations)	6.9	8.0	20.4	Metropolitan JSC's passenger revenue (million leva/year)	7.6	12.4	30	<b>(b) Effect indicator</b>				Metropolitan JSC's net earnings from its subway business (million leva/year)	0.002	1.663	n.a
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	<p>Note 1: As of 2001, only the first to the seventh station were completed and in operation. Target values are those set for after the segment from the seventh to the ninth station were completed.</p> <p>Note 2: Conversion rate: US\$1 = 123.94 yen = 2.15 leva (June 2001)</p> <p>(ii) Qualitative effects</p> <p>This project is expected to reduce the city's financial burden by making certain that improvements are made in the management of Metropolitan JSC (self-sustainability in terms of finance and organization), and thereby support the shift in the public works sector toward a market economy.</p>	<p>Source: City of Sofia</p> <p>Note 1: As of 2001 and 2006, only the first to the seventh stations were completed and in operation.</p> <p>Metropolitan JSC's figures on "passenger revenue" and "net earnings from its subway business" prepared at the time of the ex-ante evaluation (2001) reflect the changes that the executing agency had offered at the time the recent field study was conducted. According to the present Metropolitan JSC's duly audited financial statements, the correct figures are 7.6 million leva and 0.002 million leva, respectively.</p> <p>Meanwhile, due to delays in construction, it is assumed that 2010 (2 years after the work is completed) would be the target year (the year the ex-post evaluation is to be conducted). The premise on which the target value is set for 2010 is that the segment from the seventh to the ninth station being constructed under this project as well as the segment from the tenth to the thirteenth station currently being constructed with self-procured funds would be completed by that year. The reason the target values show such a large increase is as follows: since the area around the thirteenth station, the terminal station, is a residential area, if the subway route is extended this far, the number of passengers can be expected to increase sharply.</p> <p>(ii) Qualitative effects</p> <p>Improvement in the efficiency of transportation, improvement in convenience, positive impact on the environment (reduction in gas emission, vibration and noise caused by cars) can be expected as the effects of this project. (Ref.: It is estimated that by introducing the subway route currently in operation, gas emission, vibration and noise caused by automobiles have already been reduced by about 20%.)</p> <p>With regard to the task of improving the way Metropolitan JSC is managed, advice is being provided on rationalizing its financial status</p>
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	<p>(2) Factors that may influence the effectiveness and impact</p> <p>(i) Environmental procedures</p> <p>Under the Environmental Protection Law of the Republic of Bulgaria, all railroad companies in Bulgaria are required to follow the two procedures of EIA. For this project, the first EIA report, which has to be approved before the project can be launched, was approved by the Ministry of Environment in December 2000.</p> <p>The second EIA is expected to be implemented as soon as the basic design of the project is completed, and ended prior to the bidding.</p> <p>(ii) Natural environment / social environment</p> <p>The area around the seventh station is a cultural heritage preserve. In this area, the location, shape, and other features of the remains of a walled city dating back to the Roman Empire have been nearly perfectly identified.</p> <p>The executing agency is required to obtain approval from the Cultural Affairs Agency before starting construction work that may influence ancient relics. In this project, the survey necessary to obtain the first EIA</p>	<p>and management as part of the consulting services offered under this project. Operating earnings of Metropolitan JSC have steadily improved. And in addition to the improvement in passenger convenience as a result of the consultants' recommendation and Metropolitan JSC's decision to promote the use of smart cards (prepaid cards) for paying the subway fare, this project has effectively increased the company's revenue from advertisements displayed on billboards in station buildings. In the coming years, the effects of this project are expected to be expressed in the reduction of the city's financial burden and in the support for the shift in the public works sector to a market economy.</p> <p>(2) Factors that may influence the effectiveness and impact</p> <p>(i) Environmental procedures</p> <p>The Ministry of Environment has carried out all of the EIA procedures; there were no negative influence on the effectiveness or impact of this project. Additionally, when the second EIA report was approved, the Ministry issued an advisory urging, among other things, the executing agency to conduct an archaeological survey at the eighth station, and if any relics are found, they should be stored in appropriate storage. (No relics were discovered either in the seventh or the eighth station.)</p> <p>(ii) Natural environment / social environment</p> <p>Since there were no relics newly found in the areas around the seventh and the eighth station, it became clear that there was no influence on the construction.</p> <p>The groundwater system has not been adversely affected after the construction started. Also, there is no impact of drainage during construction.</p> <p>With respect to other environmental consideration, in 2005, it became</p>
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	<p>approval has already been conducted, and based on the second EIA, the executing agency plans to file an application for permission to go ahead with the construction.</p> <p>Since construction within the preservation area entails digging seven meters or deeper underground using a shield machine, this project will be able to avoid adversely impacting relics and other artifacts of cultural heritage (all relics including its foundation are confirmed to be no deeper than four meters underground).</p> <p>Also, with regard to the impact on the underground water system and the impact of drainage during construction, no particular problem is envisaged, and a more detailed study is expected to be made in the second EIA.</p> <p>(iii) Resident relocation and land acquisition This project will not require resident relocation or land acquisition.</p> <p>(iv) Coordination with grant aid / technical cooperation Dispatch of JICA experts and utilization of skill-training programs are being considered as a way to coordinate with technical cooperation for improving the management of Metropolitan JSC.</p>	<p>necessary to cut down some trees in the park near the eighth station, but an NGO opposed this. In response, the city of Sofia presented a solution whereby it would transplant the trees to a different location and replant trees in their original locations when the construction work was completed. As a result, the issue has now been solved.</p> <p>No impact has appeared that was not anticipated at the time of the ex-ante evaluation.</p> <p>The monitoring of the EIA procedures and measures for protecting the environment are being implemented appropriately by the consultants in close cooperation with the contractor.</p> <p>(iii) Resident relocation and land acquisition This project has not required resident relocation or land acquisition.</p> <p>(iv) Coordination with grant aid / technical cooperation Efforts are being made to establish appropriate coordination with the JICA scheme. Three JICA experts were dispatched, and one from the Bulgarian side took part in the skill-training program JICA provides in Japan. The details are as follows:</p> <p>1) Dispatch of JICA experts Three technical personnel were dispatched to the city of Sofia as short-term JICA experts. One was dispatched as a transportation system advisor (for 3 months); the second, as a public sector finance advisor (for 6 months), and the third, as an advisor in promoting the streamlining and use of the transportation system (for 7 months).</p> <p>2) Utilization of JICA skill-training program One economist from Metropolitan JSC took part in the “railway management course” held in Tokyo between January to February 2007. The economist received training centering on subway management,</p>
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	<p>(v) Coordination with other donors</p> <p>At the request of the city of Sofia, the EBRD is currently conducting a preliminary survey on the Sofia Transport Investment Program. This project aims to cooperate closely with the EBRD by striving to ensure consistency with the program.</p> <p>(vi) Measures for the disabled people</p> <p>It is planned to design station premises free of barriers. A discount ticket system for elderly and disabled persons will be introduced.</p> <p>(3) Factors influencing sustainability</p> <p>(i) Operation and maintenance system</p> <p>In Sofia, the transportation system is managed under a system whereby the city (i.e., the transportation bureau headed by the deputy mayor in charge of transportation) makes the relevant policy decisions. After that, in the case of the subway, Metropolitan JSC., and in the case of other</p>	<p>operation and maintenance.</p> <p>(v) Coordination with other donors</p> <p>With regard to the Sofia Transport Investment Program financed by funds provided by the EBRD, at the time of the ex-ante evaluation, the original plan called for the overhaul of the institutional and managerial aspects of the public transportation sector as a whole. However, in actuality, only the bus procurement, streetcar rehabilitation and new construction projects have been implemented. Thus, there has not been any direct coordination between JBIC and ERBD. As for coordination with EU, in this project, there is no track record of such coordination. However, at present, the city of Sofia is making preparations for constructing the segment from the fifth to the eleventh station on Line 2 by the funds provided by the EU. Consequently, in the future, it may be possible to generate a synergistic effect for enhancing transportation efficiency in conjunction with the project funded by Japanese ODA loans.</p> <p>(vi) Measures for the disabled people</p> <p>It is planned to install elevators especially designed for use by passengers in wheel chairs and facilities for sight-impaired passengers (handrails, bright colored guidance lines and signs, etc.) in station buildings. Discount tickets will be introduced for the elderly, the disabled, and children.</p> <p>(3) Factors influencing sustainability</p> <p>(i) Operation and maintenance system</p> <p>There are no changes in the management system of the city's transportation system and the operation and maintenance system of the subway business. Metropolitan JSC, which is in charge of operation and maintenance of subways, has a total of 620 employees. Of this number,</p>
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	<p>means of transportation such as buses and streetcars, the respective administrative authorities implement the policy decisions.</p> <p>The city of Sofia is the executing agency of this project, but Metropolitan JSC will be in charge of the business management, technical administration, and operation and maintenance of subways. Metropolitan JSC, the city's wholly owned company, is entrusted by the city to run the subway business exclusively.</p> <p>(ii) Technical capacity in operation and maintenance</p> <p>Since the city of Sofia and Metropolitan JSC have the experience of constructing and operating the segment from the first to the seventh station with self-procured funds, basically, there is no doubt that both are capable of implementing and operating this project. However, the construction technique they used in constructing the said segment was the open-cut method, not the shield tunneling method that this project was scheduled to use. Consequently, they lack experience using the shield tunneling method.</p> <p>Additionally, the management consultants hired for this project are scheduled to identify the managerial and financial problems besetting Metropolitan JSC, formulate remedial measures to be used in the future, and implement those measures for the purpose of consolidating a management structure that will reduce the financial burden that both the city of Sofia and the government bear.</p> <p>(iii) Financial status in operation and maintenance</p> <p>It is assumed that Metropolitan JSC will cover the cost of operation and maintenance of this project with self-procured funds. The company recorded profit in its FY2000 earnings statement.</p> <p>However, Metropolitan JSC is not able to accurately ascertain the number of passengers it transports. (Commuter passes are sold by the</p>	<p>380 are engineers and technical experts engaged in the operation and maintenance work of subway lines. Metropolitan JSC has begun hiring new workers to be added to the staff that is engaged in the operation and maintenance of the segment of the subway currently being constructed with a Japanese ODA loan, and is operating the subway with plenty of leeway. Thus it can be said that those with the experience and technical expertise necessary for the scale of the business are being assigned to their respective posts in an appropriate manner.</p> <p>(ii) Technical capacity in operation and maintenance</p> <p>With regard to the shield tunneling method, at present, efforts are being made to transfer technology to ensure smooth implementation. (Until now, contrary to previous expectations, among other things, the local contractors showed little interest in the method, so the training had very little effect. Consequently, the contractor side endeavored to promote transfer of technology to local Bulgarian contractors by resorting to hiring engineers who had experience using the shield tunneling method in constructing subways in Bangkok or Singapore and assigning them to the construction site in Sofia.)</p> <p>Also, the management consultant hired for this project is advising Metropolitan JSC on the subject of management reform. (Contents of the advice being made include suggestions for analysis and improvement of the Metropolitan JSC's management, financial status and organizational structure.)</p> <p>(iii) Financial status in operation and maintenance</p> <p>As the changes in Metropolitan JSC's financial data presented below demonstrate, the company's operating earnings are steadily increasing.</p>
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	<p>municipal traffic corporation under a ticket system it shares with other modes of transportation such as buses and streetcars. The profit is distributed among the various administrative authorities.)</p> <p>(iv) External risk factors  External risk factors include: the possibility that the political and economic climate in Bulgaria and in the region surrounding this project's target area deteriorate; changes in the demographic scale/movement in the said region; electric power supply shortages triggered by the tight electric supply and demand; and natural disasters such as earthquakes and floods.</p>	<p style="text-align: right;">(Unit: 1,000 leva)</p> <table border="1" data-bbox="1301 213 2110 459"> <thead> <tr> <th></th> <th>2001</th> <th>2002</th> <th>2003</th> <th>2004</th> <th>2005</th> <th>2006</th> </tr> </thead> <tbody> <tr> <td>Operating earnings</td> <td>7,626</td> <td>7,962</td> <td>9,381</td> <td>9,844</td> <td>10,897</td> <td>12,412</td> </tr> <tr> <td>Operating cost</td> <td>7,624</td> <td>7,805</td> <td>8,850</td> <td>8,965</td> <td>9,810</td> <td>10,749</td> </tr> <tr> <td>Profit</td> <td>2</td> <td>157</td> <td>531</td> <td>879</td> <td>1,087</td> <td>1,663</td> </tr> </tbody> </table> <p>Source: Based on Metropolitan JSC's response to a questionnaire  Note: The above figures do not include the effect of the cost depreciation related to the property such as the station buildings whose control was transferred to Metropolitan JSC by the city of Sofia in 2003. (If the effect of this cost were taken into consideration, from 2003 to 2006, Metropolitan JSC's operating profit would be in the red.)</p> <p>Since it is now possible to count the number of passengers with automatic ticket gates, Metropolitan JSC is today able to accurately count the number of passengers it transports. So now profit can be accurately determined.</p> <p>Thus, while overhaul of the accounting standard may seem necessary, since the operating revenue is increasing, it can be concluded that there is no doubt about Metropolitan JSC's financial capability to operate and maintain the subways.</p> <p>(iv) External risk factor  External risk factors cited in the left column have not appeared, so they have not affected the effectiveness and impact of this project.</p>		2001	2002	2003	2004	2005	2006	Operating earnings	7,626	7,962	9,381	9,844	10,897	12,412	Operating cost	7,624	7,805	8,850	8,965	9,810	10,749	Profit	2	157	531	879	1,087	1,663
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<p><b>Efficiency</b></p>	<p>(1) Outputs</p> <p>(a) Civil engineering work</p> <p>(i) Construction of a tunnel in the segment covering about 2.1 km, from the seventh to the ninth station</p> <p>(ii) Construction of station buildings of the eighth and the ninth station</p> <p>(iii) Construction of turn-back facilities</p> <p>(b) Consulting services (construction monitoring / supervision and management)</p> <p>(i) Engineering consultant</p> <ul style="list-style-type: none"> <li>• Review of bidding documents and bidding assistance</li> <li>• Design of shield tunneling method and monitoring and supervision of construction</li> <li>• Environmental measures (guidance and advice concerning impacts on the environment during construction)</li> </ul> <p>(ii) Management consultant</p> <ul style="list-style-type: none"> <li>• Establishment of a system for managing the revenue and cost of Metropolitan JSC</li> <li>• Support for the organizational reform of Metropolitan JSC</li> <li>• Training, etc. for the staff</li> </ul> <p>The total assumed consulting services M/M is 343 M/M (including foreign and local consultants).</p> <p>(2) Project period</p> <p>February 2002–September 2006 (56 months)</p>	<p>(1) Outputs</p> <p>(a) Civil engineering work</p> <p>There was no change in scope.</p> <p>(b) Consulting services</p> <p>There was no change in TOR.</p> <p>In December 2006, the number of man-hours required increased 212 M/M due to the additional construction work generated by the change in the location of the access shaft construction in the area around the seventh station.</p> <p>(2) Project period</p> <p>February 2002–December 2008 (83 months)</p> <p>The project period was extended due to delays in procurement and civil engineering work. In the case of civil engineering work, at this moment, only about half of the overall work has been completed. The main reasons include (i) the change in the location of construction at the seventh station; and (ii) the longer than expected time required to</p>
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		transfer technology (the shield tunneling method) to local Bulgarian contractors. In addition, since 34 of the 36 months of contract period that the executing agency has with the local contractors have already elapsed, the contract needs to be extended.
<b>Lessons Learned and Recommendations</b>	<p>[Lessons learned]</p> <ul style="list-style-type: none"> <li>Regarding coordination with the JICA scheme, one employee of Metropolitan JSC took advantage of the skill-training program that JICA offers in Japan. In this program, the employee absorbed advanced knowledge in the field of railway management. Since returning to Bulgaria, he has been contributing to the better management of Metropolitan JSC. It is believed that coordinating with the JICA scheme is useful for enhancing the effectiveness of similar projects in Bulgaria and elsewhere (those involving the transportation sector and management of public corporations).</li> </ul> <p>[Recommendations]</p> <ul style="list-style-type: none"> <li>The executing agency has suggested a change in operation and effect indicators. In the future, it is advisable that JBIC and the executing agency take the occasion of the completion of construction work to discuss new target values and reach an agreement.</li> <li>With regard to delays in construction, at this moment, December 2008 is the executing agency's target date for completion, but according to the evaluator's opinion, there is a strong possibility that the work would be further delayed. Thus it will be necessary to carefully monitor the progress of the construction work going forward.</li> <li>This subway project continues to be an important project that the citizens of Sofia long for. While delays may not be avoided, fast and sloppy implementation must not be allowed to undermine the safety of the project at any cost. Construction work should be executed in such a way that safety is never compromised.</li> </ul>	
<b>Indicators set for use at time of ex-post evaluation</b>	<p>Indicators set at the time of the ex-ante evaluation</p> <ol style="list-style-type: none"> <li>(1) Number of passengers (10,000/day)</li> <li>(2) Metropolitan JSC's passenger revenue (million leva/year)</li> <li>(3) Metropolitan JSC's net earnings from its subway business (million leva/year)</li> <li>(4) Internal rate of return (FIRR, EIRR) (%)</li> </ol>	<ul style="list-style-type: none"> <li>No changes were made in the items used as evaluation indicators at the time of the ex-ante evaluation, but a need arose to change the target year and target values.</li> <li>There are no problems with the evaluation system (indicator value measurement capacity) adopted by the executing agency.</li> </ul>