

Ukraine

Ex-Post Evaluation of Japanese ODA Loan
“Boryspil State International Airport Development Project”

External Evaluator: Naomi Murayama, OPMAC Corporation

0. Summary

The project aimed to meet the increasing passenger demand in Boryspil State International Airport and then to improve services for airport users by constructing a passenger terminal building and other related facilities. The objective of this project was highly relevant to Ukraine’s development plan and development needs at the time of both the appraisal in 2004 and the ex-post evaluation, as well as to Japan’s ODA policy at the time of the appraisal; therefore its relevance is high. The project scope was expanded in response to external factors such as a drastic increase in the passenger demand and a change in the land to be used for the planned terminal building. This expansion of the scope, however, was appropriate for the emergence of the project effects. Considering the modifications in the scope, the project cost was almost within the plan, although the project period exceeded the plan. Therefore, the efficiency of the project is fair. The targeted operation and effective indicators of the project were broadly achieved and the project largely achieved its objectives; therefore, the effectiveness and impact of the project are high. While the conflicts in the eastern region, as of the time of the ex-post evaluation, seem to have had some limited negative impacts on project sustainability, no major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore the sustainability of the project effects is high.

In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description



Project Location



Boryspil Airport Terminal D Departure Lobby

1.1 Background

Kyiv, the capital city of Ukraine, is the political and economic center of the country with a population of 2.6 million. Boryspil State International Airport, located in Kyiv Oblast¹, is the country's largest international airport serving as a gateway for passengers flying to and from Ukraine. At the time of the appraisal, the number of passengers using the airport had been increasing at the rate of, on average, 24% per year, reflecting the eastward enlargement of the European Union (EU) as well as the brisk recovery of the Ukrainian economy. A demand forecast for the airport showed that the number of passengers would rise significantly to become nearly three times as high in 2015 as in 2003. An expansion of the international passenger terminal to increase its handling capacity was thus urgently called for in order to meet the growing demand.

1.2 Project Outline

The objective of this project was to meet the increasing passenger demand at Boryspil State International Airport and then to improve services for airport users by constructing an international passenger terminal building and other related facilities, thereby contributing to the promotion of economic activities through expansion of foreign direct investment and tourism resources utilization.

Loan Approved Amount/ Disbursed Amount	19,092 million yen / 19,092 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March, 2005 / March, 2005
Terms and Conditions	Interest rate: 1.5% Repayment period: 30 years (Grace period 10 years) Conditions for procurement: General untied
Borrower / Executing Agency	Cabinet of Ministers of Ukraine / State International Airport Boryspil
Final Disbursement Date	October, 2012
Main Contractor (Over 1 billion yen)	ALSIM ALARKO SAN TES. VE TIC AS (Turkey)/ YSD INSAAT SANAYI VE TICARET A.S. (Turkey)/ DOGUS INSAAT VE TICARET (Turkey) (JV)

¹ An oblast is a type of administrative division of the former Soviet bloc including Ukraine. The term is analogous of "state" or "province".

Main Consultant (Over 100 million yen)	Japan Airport Consultants, Inc. (Japan)
Feasibility Studies, etc.	<ol style="list-style-type: none"> 1. F/S: “Boryspil State International Airport Development Project” (March 1999) 2. JICA report: “JBIC Special Assistance for Project Formation (SAPROF) for Boryspil State International Airport Development Project” (June 2004)

2. Outline of the Evaluation Study

2.1 External Evaluator

Naomi Murayama, OPMAC Corporation

2.2 Duration of the Evaluation Study

This ex-post evaluation study was conducted according to the following schedule.

Duration of the Study: September, 2014 – September, 2015

Duration of the Field Study: November 16, 2014 – November 29, 2014

2.3 Constraints during the Evaluation Study

A lawsuit was filed during project implementation over the right to use the land for the planned passenger terminal building. Detailed information on the suit, however, has not been disclosed by the executing agency; therefore analysis on the possible impacts of the land issue on project implementation has been excluded from the scope of this study.

3. Results of the Evaluation (Overall Rating: A²)

3.1 Relevance (Rating: ③³)

3.1.1 Relevance to the Development Plan of Ukraine

In 2001 the government of Ukraine produced “The State Comprehensive Program for the Development of Air Transport in Ukraine up to 2010”. The program aimed to enable the air transport industry to recover from past stagnation; to ensure sufficient competitiveness of the industry in both the domestic and international transport markets; and to satisfy the growing demand for air transport in terms of both quantity and quality. Thus a hub airport development policy was being implemented to establish the most effective airport network possible. To execute this, it was necessary to attract foreign, as well as government investment, into airport-related facilities. “The State Program for the Development of the

² A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

³ ③: High, ② Fair, ① Low

Transport and Railway System of Ukraine between 2000 and 2004” stressed the development of Boryspil State International Airport as a top priority project and clearly stated that a Japanese ODA Loan was expected as a funding source.

It was also confirmed at the time of the ex-post evaluation that, in “The Concept of the State Programme for Boryspil International Airport Development for the period up to 2020” (in 2007), the strong necessity for airport terminal development to be funded by government budget and Japanese ODA Loan was mentioned against the backdrop of the following sectors:

- Air transport is one of the most important sectors in the national economy. Boryspil State International Airport in particular is becoming more important as a gateway to Ukraine;
- The International Civil Aviation Organization (ICAO) provides the analysis that the number of passengers in the airport is forecasted to increase at the rate of, on average, 4.5% per year, becoming 2.7 times greater than before by 2020;
- The insufficient handling capacity of the passenger terminal prevents increases in the number of passengers.

“The Concept of the State Target Programme for Airports Development for the period up to 2023” (in 2013) further confirmed the consistent policy to modernize the airport into a hub airport satisfying international standards (modernization)⁴ and to improve efficiency in the operation of national assets.

The project aimed to meet the increasing passenger demand of the State International Airport and then to improve services for airport users by constructing an international passenger terminal building and other related facilities; thus the objective was consistently relevant to the development plan of Ukraine from the time of the appraisal to the time of the ex-post evaluation.

3.1.2 Relevance to the Development Needs of Ukraine

The actual number of passengers at Boryspil State International Airport, confirmed at the time of the appraisal, is shown in Table 1. Though rather stagnant from 1998 to 1999 due to the Russian financial crisis, the number, which includes domestic passengers, soared after 2000 reflecting the brisk recovery of the Ukrainian economy as well as rapid economic growth in neighboring countries through the eastward enlargement of the European Union (EU). Average growth rates of the number of passengers and volume of cargo from 1998 to 2004 were 15.7% and 15.0%, respectively. The total number of passengers in 2004 was 3,169 thousand (international passengers: 2,652 thousand, domestic passengers: 517 thousand, an increase of 34.2% from the previous year).

⁴ For instance, the security system was modernized by the project.

Table 1: The Number of Passengers at Boryspil State International Airport (at the appraisal)

Unit: thousand

Year	1998	1999	2000	2001	2002	2003	2004	Average growth rate
International passengers	1,313	1,268	1,346	1,478	1,703	2,105	2,652	12.9%
Domestic passengers	61	62	50	59	104	257	517	54.1%
Total	1,373	1,330	1,396	1,537	1,807	2,362	3,169	15.7%

Source: Documents provided by JICA

Table 2 shows the demand forecast of passengers at the time of the appraisal. The demand was forecasted to become 4,534 thousand (including 3,978 thousand international passengers) in 2010 and 6,483 thousand (including 5,667 thousand international passengers) in 2015. Therefore, an increase in the handling capacity by an expansion of the international passenger terminal was considered an urgent issue to be addressed.

Table 2: Demand Forecast of Passengers at Boryspil Airport (at the appraisal)

Unit: thousand

Year	2004 (actual)	2010	2015	2020
International	2,652	3,978	5,667	7,603
Domestic	517	557	816	1,080
Total	3,169	4,534	6,483	8,683

Source: Documents provided by JICA

The demand forecast had been revised several times since the appraisal work, which is summarized in Table 3. Special Assistance for Project Formation (SAPROF) in 2004 assumed an average passenger growth rate up to 2020 at 12% per year. However, State International Airport Boryspil (hereinafter referred to as “SIAB”) conducted a new demand forecast survey in 2007 because SIAB had found it impossible to use the land originally allocated for the planned terminal building and needed to draw up a revised project plan on a new site. The survey revealed the actual number of international passengers as 3,220 thousand in 2005 and 3,810 thousand in 2006 with a growth rate of 16% per year. A new demand forecast was made based on the information above, concluding that 3,500 passengers per hour were to be handled as peak hour passengers. Out of the 3,500, 2,000 of the peak hour passengers were to be accommodated by the existing terminal while the remaining 1,500 were to be accommodated by the new terminal building D to be constructed by this project.

Although Ukraine was confronted with a serious economic crisis at the end of 2008, the actual number of passengers in 2008 reached 5,490 thousand, exceeding the number

forecasted by the 2007 survey⁵. The forecast was further modified to 8,800 thousand per year in 2012 when the UEFA European Football Championship was held in Ukraine and to maintain more than 10,000 thousand per year between 2015 and 2020.

Table 3: Change in Demand Forecast of International Passengers at Boryspil Airport

Unit: thousand

Demand forecast year ⁶	PHP (Terminal D)	2010	2015	2020
Appraisal (2004)	1,000	3,978	5,667	7,603
March 2007	1,500	4,631	6,442	n.a.
February 2009	3,000	6,200	10,400	15,600
Ex-post evaluation (2014)	—	—	6,481	9,460

Source: Documents provided by JICA (for 2004, 2007 and 2009) and answers to the questionnaire (for 2014)

Note: PHP = Peak Hour Passengers

The number of passengers, however, has been decreasing due to the difficult social and security environment in Ukraine since the end of 2013. The number of tourists has declined mainly because the Crimean Peninsula, one of the major tourist destinations, was virtually annexed by the Russian Federation in March 2014. Further intensified conflicts in the eastern region of the country which includes the major industrial city of Donetsk, have caused a decrease in business visitors. Taking this situation into consideration, at the time of the ex-post evaluation, SIAB further modified the demand forecast for year 2015 downwards to the same level as that of 2007. Meanwhile, as stated later in “3.3.1 Quantitative Effects (Operation and Effect Indicators)”, the figure of international passengers for 2014 still exceeded the original target at the appraisal in spite of the recent drop. The executing agency expects the potential demand will return and that there will be a robust recovery in the number of passengers realized once the social situation in the eastern region is stabilized.

Viewed in this light, the project was relevant to development needs of Ukraine both at the time of the appraisal and the ex-post evaluation.

3.1.3 Relevance to Japan’s ODA Policy

The Medium-Term Strategy of Overseas Economic Cooperation Operations at the time of the appraisal gave priority to economic infrastructure and environment projects in its support for Middle and Eastern European countries. The project is considered to have contributed to economic infrastructure development in Ukraine; therefore, it was relevant to Japan’s ODA policy.

⁵ The number of passengers in 2008 was estimated with a high-case of 5,465 thousand in the 2007 survey conducted by SIAB. The figures shown in Table 3 were utilized by JICA in considering the relevance of the scope modification. The figures are more realistic than the SIAB ones.

⁶ Figures at the time of appraisal shown in this table are ones which were conclusively calculated by JICA based on the SAPROF study. The figures for 2007 and 2009 were those which were conclusively adopted by JICA based on the SIAB surveys. The 2014 data was from SIAB.

In light of the above, this project has been highly relevant to the country's development plan and development needs, as well as to Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The project aimed to construct an international passenger terminal and other related facilities to meet the growing passenger demand. Major construction works, equipment and consulting services (output) are shown in Table 4.

Table 4: Comparison of Outputs (planned and actual)

Item	Original scope	Actual	Remarks
Major Constructions Works and Equipment			
International passenger terminal building	1,000PHP*note, 3-story, total floor area of approx. 37,000m ²	3,000PHP, 3-story, total floor area of approx. 107,000m ²	Enlarged (about 3 times)
Equipment installation	1) baggage handling system 2) passenger boarding bridge 3) 100% baggage screening system etc.	1) baggage handling system 2) passenger boarding bridge 3) 100% baggage screening system etc.	Same as planned. But the quality of equipment and capacity increased to meet the enlarged terminal capacity.
Apron pavement	Approx. 117,000m ²	Approx. 183,000m ²	Increased (about 1.6 times)
Ground supply equipment (GSE) road & parking	Approx. 24,000m ²	Approx. 24,000m ²	Same as planned.
Gallery	Approx. 1,000m ²	Cancelled	Due to change of terminal location (original gallery not required).
Adjustment of Airport Surface Detection Equipment (ASDE)		Cancelled	Due to change of terminal location (adjustment not required).
Infrastructure for newly relocated Official Delegation Hall (ODH)	1) Apron: approx. 42,000m ² 2) Taxiway: approx. 12,000m ²	Cancelled	ODH was not relocated.
Fuel hydrant system	Pipe and pits	Pipe and pits	Same as planned
Utilities	1) Hot water line etc. 2) Sewerage treatment plant	1) Hot water line etc. 2) Cancelled	Sewage was discharged to an existing sewage treatment works near Boryspil city.
Road & car park (outside of the airport)	1) Road: two lanes in the general section and five lanes along the terminal curb side 2) Carpark: total area of approx. 100,000m ²	1) Road: two lanes in the general section and five lanes along the terminal curb side 2) Cancelled	A multi-story carpark is now being constructed under a separate contract using the funds of SIAB (it will be completed in June 2015).

Item	Original scope	Actual	Remarks
Consulting Services			
Engineering design	1) Professional A: 118MM 2) Professional B: 114MM Total: 232MM	1) Professional A: 103.7MM 2) Professional B: 333.0MM Total: 436.7MM	Design was changed in accordance with the revised demand forecasts. Construction supervision was extended due to expansion. the project scope.
Assistance in tendering	1) Professional A: 28MM 2) Professional B: 28MM Total: 56MM	1) Professional A: 15.88MM 2) Professional B: 0.81MM Total: 16.69MM	
Construction supervision	1) Professional A: 269MM 2) Professional B: 321MM Total: 590MM	1) Professional A: 328.54MM 2) Professional B: 377.93MM Total: 706.47MM	

Source: Documents provided by JICA (for original scope) and answers to questionnaires (for actual)

Note: PHP = Peak Hour Passengers

A major modification from the original project scope is the further expansion of the international passenger terminal. The background and appropriateness of this are explained as follows: (i) the revision of the international passenger demand forecast in 2007 arising from hosting the 2012 UEFA European Championship and from cancelling the construction of a planned private terminal building (handling capacity: 1,000 PHP⁷) to be owned by a civil aviation organization of Ukraine, Aerosvit; and (ii) the further revision of the demand forecast in 2009 because of the drastic increase in the number of passengers in 2008 despite the worldwide economic turmoil. In line with these revisions, the size of the international passenger terminal under this project expanded to three times as large as that of the original scope. In reality the number of airport passengers had rapidly risen as expected until the conflicts in the eastern region broke out at the end of 2013 (please refer to “3.3.1 Quantitative Effects (Operation and Effect Indicators)”). Furthermore, an analysis of the passenger handling capacity of 2014 shows that the number of passenger per hour at peak times, from 7 am to 8 am and from 8 pm to 9 pm, exceeded 3,000. These results lead to the conclusion that the further expansion of the terminal building floor and handling capacity is reasonably justified.

Besides the above, a lawsuit was filed against Aerosvit over the right to use the land for the planned terminal building. A decision in 2007 to construct the terminal building in another lot within the airport boundary resolved this issue.

Other modifications in the project scope were broadly made according to the further expansion of the terminal and the change in the construction site mentioned above. These modifications, which were mainly related to changes in equipment including the cancellation of unnecessary equipment and the additional procurement of some equipment, are thus

⁷ PHP = Peak Hour Passengers

considered to have been appropriate in securing the effectiveness of the project.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost was 45,206 million yen (including 19,092 million yen funded by the ODA Loan), which substantially exceeded the planned cost of 25,457 million yen (including 19,092 million yen from the ODA Loan), at 178% against planned. The cost overrun resulted from the aforementioned scope change. In modifying the project scope in 2007 and in 2009, JICA confirmed the expansion of the terminal building and apron, as well as the increase in equipment such as check-in counters and the improvement in the quality of facilities. Considering the effects of these modifications, JICA concurred the increases in project costs of 15,963 million yen in 2007 and about 4,100 million yen in 2009. The costs, which were conclusively estimated at the time of scope revision in 2009, were used as base costs for comparison with the actual costs (as shown in Table 5). The table shows that the actual costs were 99–103% against the newly estimated costs though there are some differences in the estimations depending on the payment currency, foreign or domestic, for the civil works. Assuming the payment was made in foreign currency, the actual total cost would be mostly as planned.

Table 5: Comparison of Planned (as of scope revision) and Actual Total Project Cost

Unit: million yen

	Plan	Actual (against plan)
Total project cost (civil works payment in foreign currencies)	45,503	45,206 (99%)
Total project cost (civil works payment in local currency)	43,920	45,206 (103%)

Source: Documents provided by JICA (for plan) and answers to the questionnaire (for actual)

3.2.2.2 Project Period

The project period planned at the time of the appraisal was 70 months, from March 2005 to December 2010. The actual project period was 105 months, or from March 2005 to November 2013, which was longer than the planned project period: equivalent to 150% of the original plan. In the same way as for the project cost (Table 6), when the impact of scope modification on the project period was being considered, a revised planned completion date was set for May 2012 which, at the time of the scope modification in 2007 had been decided on as a new target, coinciding with Ukraine's hosting of the UEFA European Championship in May 2012. The official project completion date is defined in the Loan Agreement as the date of issuance of the taking-over certificates. Though the new terminal building physically started operating in May 2012, SIAB finally received all of the taking-over certificates in November 2013 and therefore the project was delayed by 18 months (121% against the planned period).

Table 6: Comparison of Planned (as of the scope revision) and Actual Project Period

	Plan	Actual (against plan)
Loan Agreement Signing Date	March 2005	March 2005
Completion Date	May 2012	November 2013
Project Period	87 months	105 months (121%)

Source: Answers to the questionnaire for the ex-post evaluation

The following factors may have impacted on the delay in the project implementation.

- 1) Time taken for the legal conflict with Aerosvit over the right to use the land for the terminal building to be resolved (resolution in March 2007).
- 2) Unexpected issues including the required government approval of the Basic Design of the terminal building. SAPROF had not fully recognized that more time than estimated would be needed to deal with this.
- 3) Two demand forecast revisions were conducted during implementation. In addition, the forecast revisions were made not by the project-recruited consultant team but by a different team which had initially prepared the master plan for the airport development. This split caused difficulty in communications between the two teams and finally led to the delay in implementation through an inefficient process of modifying the terminal design as required.
- 4) It was difficult for the contractor to execute the required works on schedule due to the design changes for the terminal building.

3.2.3 Results of Calculations of Internal Rates of Return (Reference only)

(1) Financial Internal Rate of Return (FIRR)

The result of the recalculation of FIRR for this project at the time of the ex-post evaluation was 26%, which was higher than the original FIRR of 5.4% at the time of the appraisal. The main reason for this was that the assumption for the calculation had changed. Although at the appraisal the new terminal building was originally planned to be used exclusively for international flights, the terminal was reasonably assumed to serve both international and domestic passengers since the domestic services provided at the other terminal moved to the terminal constructed under the project from November 24, 2014 in order that the airport might be more efficiently operated. The FIRR calculation at the appraisal was based upon the preconditions below:

<Preconditions of FIRR calculation at the appraisal>

- Cost: Project cost, operation and maintenance cost
- Revenue: Airport related revenues (landing fees, passenger service charges, parking charges etc.); non-airport related revenues (tenant fees etc.)
- Project life: 40 years

(2) Economic Internal Rate of Return (EIRR)

The EIRR for this project at the time of appraisal was 12.9%. Due to the fact that data needed for a quantitative analysis was not available, an analysis for EIRR was not possible. The EIRR calculation at the appraisal was based upon the preconditions below:

<Preconditions of EIRR calculation at the appraisal>

- Cost: Project cost, operation and maintenance cost
- Benefit: Additional tourism income through increases in foreign visitors, airport related revenues (landing fees, passenger service charges, parking charges etc.); non-airport related revenues (tenant fees etc.)
- Project life: 40 years

In light of the above, although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of the project is fair.

3.3 Effectiveness⁸ (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

Operation and effect indicators were set as follows at the time of the appraisal for the project: (i) annual international passengers; (ii) peak-month international passengers; (iii) peak-day international passengers; (iv) annual international aircraft movement; (v) peak-month international aircraft movement; (vi) peak-day international aircraft movement; (vii) annual tourist arrivals; (viii) annual business visitors. Though the target year to achieve the indicators was five (5) years after project completion, the ex-post evaluation was carried out only one (1) year after completion; thus the evaluation also included comparisons of the estimated demand forecasts of SAPROF with actual figures. Moreover, indicators regarding tourists and business visitors should be handled as impact indicators because (i) the expansion of the terminal does not cause a rise in the number of these visitors and so should be evaluated by how efficiently it has accommodated the increasing number of passengers; and (ii) these indicators should be utilized to evaluate whether or not the economic activities of Ukraine are promoted through the expansion of foreign direct investment and tourism development. The indicators (i) through (vi) with their baseline values, targets, the SAPROF estimation, and actual figures are laid out in Table 7.

⁸ Sub-rating for Effectiveness is to be put with consideration of Impact.

Table 7: Comparison of Operation and Effect Indicators (planned and actual)

	Baseline	Target		SAPROF Estimation	Actual			
	2003	2015		2010	2013		2014	
	Baseline year	5-years after completion		Completion year	Completion year		1-year after completion	
Indicators	Total	Total	Terminal D	Total	Total	Terminal D	Total	Terminal D
International passengers								
Annual	2,105,000	5,366,000	1,850,000	3,978,000	7,174,203	5,646,778	6,340,547	5,511,269
Peak-month	253,800	649,300	233,900	464,400	853,921	796,065	725,570	622,045
Peak-day	9,070	23,120	7,970	17,150	31,117	23,354	26,477	21,702
International aircraft movement								
Annual	33,182	48,229	15,842	39,292	35,099	27,596	32,084	29,782
Peak-month	3,207	4,659	1,530	2,148	3,604	3,437	3,130	2,850
Peak-day	133	194	64	158	139	110	117	85

Source: Documents provided by JICA and answers to the ex-post evaluation questionnaire.

Note: "Peak-month" means the busiest month. "Peak-day" is the second busiest day in the average week in the busiest month.

The figures for international passengers both in the year of project completion and one year after exceeded those estimated by SAPROF as well as those targeted by the operation and effect indicators. The number of annual international passengers for all terminals had increased for 10 years to 3.4 times higher than that of 2003. The 2012 UEFA European Championship from June 8 to July 1 2012 co-hosted by Poland and Ukraine and articles on Ukraine's tourist destinations in international magazines attracted more foreign visitors to Ukraine. Besides this, the number of Ukrainians going abroad also increased as Ukraine's economy grew. Consequently, more international passengers than expected used the airport.

Actual international aircraft movements for the terminal building D met estimated and targeted figures but those for all terminals did not. Aircraft currently using Boryspil State International Airport are much larger than those expected in SAPROF because the terminal design changed during implementation to accommodate the double-decker Airbus A-380 and then to provide access to other such larger airplanes through the boarding bridge before the 2012 UEFA European Championship. Thus aircraft movements did not satisfy the target even though the number of passengers exceeded its target.

3.3.2 Qualitative Effects (Other Effects)

The ex-post evaluation conducted beneficiary satisfaction surveys with users of the airport facilities (airlines and passengers) in order to comprehend to what extent the project facilities had satisfied users and improved services and security.

(1) Improvement of services for users of airport facilities

The survey with the airlines (Table 8) showed that about half of the respondents evaluated current services in the new terminal positively to be “very good” or “good”. Only one airline company out of 13 judged the facility services as “bad”. Satisfactory points were: cleanliness, easy access to information (easy access to flight information screens, information desks etc.) and the short time required for check-in. Unsatisfactory aspects were: no availability of drug stores and limited numbers of available cafes.

Table 8: Evaluation of airport services by airlines

Answer	Respondents
Very good	2
Good	5
Neutral	5
Bad	1
Very bad	0
Don't know / no answer	0

Source: Beneficiary survey to airlines

The other beneficiary survey with passengers (Table 9) indicated that passengers rated the terminal facilities themselves as broadly satisfactory, but gave some negative assessments on the availability of shops and services (the aforementioned drug stores and cafes) and on passenger flow in departure and arrival (time-consuming procedures required for security checks and immigration)⁹.

Table 9: Passengers' satisfaction with airport facilities

	Very satisfied/ Very good	Satisfied/ good	fair	Unsatisfied/ Not good	Very unsatisfied/ Very bad	Don't know/ No comment
General impression of terminal D	4	22	8	6	5	0
Terminal's cleanliness	17	17	5	3	2	0
Reasonability of departure passenger flow	3	10	21	9	2	0
Ease of access to information	13	15	14	2	1	0
Availability of shops and services	2	15	20	6	2	0
Quality of shops and services	1	14	26	4	0	0
Availability of toilets	12	15	9	6	2	0
Elevators, escalators, moving sidewalks	9	22	8	4	1	0
Comfort of the boarding lounges	12	20	12	0	1	0
Facilities for the disabled and passengers who need special care	1	22	11	2	0	9
Availability of telephones, Wi-Fi internet	10	15	15	3	0	2
Reasonability of arrival passenger flow	1	16	14	11	2	0
Convenience of the baggage claim	5	21	16	2	0	1
Convenience of transport services	9	13	19	1	2	1

Source: Beneficiary survey to passengers

⁹ As SIAB has only limited involvement in security checks and immigration (where the Ukrainian military takes strict control) it may be difficult for SIAB to improve these two operations.

74% (29 out of 39 respondents) of those passengers who had used the old passenger terminal responded to a terminal-building-comparison question that the new terminal building facilities were better than those of the old ones (Table 10).

Table 10: Comparison with the old international passenger terminal building

	Much better	Better	Unchanged	Worse	Much worse	No answer
Airport facilities	9	20	6	3	1	0

Source: Beneficiary survey to passengers

At the time of the ex-post evaluation (November 2014) several new duty-free shops were soon to be opened near gate lounges. SIAB explained that a drug store would soon also be located in the terminal as SIAB had applied to the State Property Fund for the necessary permission.

(2) Improvement of airport security

Responses from the airlines to a question about airport security and security systems are summarized in Table 11.

The responses showed that the airline companies gave positive ratings and no negative ones. The introduction of modern, good-quality equipment, in particular the luggage inspection system and the security gate system, was highly appreciated.

Table 11: Evaluation of airport security by airlines

Answers	Respondents
Very good	5
Good	6
Neutral	1
Bad	0
Very bad	0
Don't know / no answer	1

Source : Beneficiary survey to airlines

As seen before, the targeted operation and effective indicators were broadly achieved and the beneficiary satisfaction survey showed positive results; therefore, the effectiveness of the project is high.

3.4 Impacts

3.4.1 Intended Impacts

(1) Impacts on tourism

The number of Ukrainians going abroad and the number of foreigners visiting Ukraine both generally increased except for a drop in the period around year 2008 due to the financial crisis (Table 12). The number of foreign visitors rose to more than 24 million in 2013 from only 6 million in 2000. However, the impacts of the project on tourism cannot be evaluated since the rising number of tourists is due to multiple reasons and is not just as a result of the project. Even so, the international passenger terminal developed by this project sufficiently

accommodates the increasing number of tourists thanks to the expansion of the terminal; thus the project is considered to have bolstered Ukraine's economic activities through tourism development.

Table 12: Change in number of tourists

Unit: thousand

	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ukrainian citizens having travelled abroad	13,422	16,454	16,875	17,335	15,499	15,334	17,180	19,773	21,433	23,761
Foreigners having visited Ukraine	6,431	17,631	18,936	23,122	25,449	20,798	21,203	21,415	23,013	24,671

Source: Statistic Annual Journal of Ukraine, 2013. State Statistic Service of Ukraine

(2) Impacts on foreign direct investments and business visitors

Ukraine has steadily attracted foreign direct investments (FDI) since project commencement. However, the impacts of the project on FDI cannot be evaluated as the steady rise in FDI affects is not only as a result of the project but is due to multiple reasons.

Table 13: Cumulative Amount of FDI to Ukraine

Unit: million USD

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
6.79	9.05	16.89	21.61	29.54	35.72	40.05	44.81	50.33	55.30

Source: Statistic Annual Journal of Ukraine, 2013. State Statistic Service of Ukraine

Due to the fact that statistics on annual business visitors are not available, an analysis for the evaluation of the impact was not possible.

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

An Environment Impact Assessment (EIA) was prepared in the Basic Design and then approved by the Ministry of the Environment of Ukraine. An Environment Management and Monitoring Program was also prepared as a part of the Basic Design and then incorporated into the tender documents. The environmental monitoring system for this project is summarized as follows.

<Environment Monitoring System>

Air pollution: Monitoring once a year for the following items: particulate matter (PM), acetone, butyl acetate, xylol, toluol, ethyl acetate, and ethoxyethanol

Noise: No monitoring conducted as no housing areas are located near the airport

Waste and discharge water: Treated in the existing treatment facilities. The project did not include a water treatment facility in the scope.

The contractor had carried out an adequate Environment Management and Monitoring Program under the supervision of the consultants; thus no major issues are observed.

(2) Land Acquisition and Resettlement

The project site is located within the existing airport boundary and so no land acquisition and resettlement was required for the project. However, since a lawsuit with Aerosvit was filed over the right to use the land for the planned passenger terminal building, the terminal building could not be constructed at the planned lot but was constructed at another lot on the airport property.

This project has largely achieved its objectives. Therefore the effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

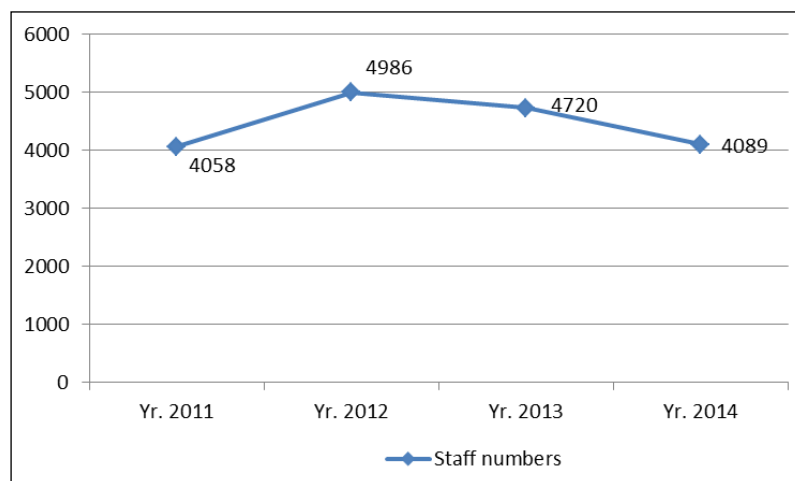
The operation and maintenance agency of the project is State International Airport Boryspil (SIAB). As of December 2014, there were 4,089 employees in total at SIAB, 2,007 of whom were in charge of the operation and maintenance of Terminal D. These belong to the Group for Building Operation and Maintenance Supervision Terminal D, comprising of a Chief Mechanic of the Airport Department, an IT Department, a Ground Handling Department, a Passenger Service Department, a VIP and Business Passenger Service Department and some others. These departments each take responsibility for assigned facilities and provide services appropriate to boarding class.

Table 14: Staff and Departments for the Operation and Maintenance of Terminal D

Unit/Department	No. of Staff	
	Total	Number of Engineers
Group for Building Operation and Maintenance Supervision	3	2
Chief Mechanic of the Airport Department	243	36
Chief Power Engineer of the Airport Department	219	27
Economic Provision Department	332	2
IT Department	144	112
Ground Handling Department	484	3
Passenger Service Department	218	10
VIP and Business Passenger Service Department	104	0
Aerodrome Department	184	7
Radio and Lighting System Support Department	76	35
Ground total	2,007	234

Source: SIAB

SIAB explained that a sufficient number of staff members are deployed in each department with the adequate knowledge and skills required for operation and maintenance (Table 14). At the time of the appraisal, it was planned that an additional 800 workers would be recruited for the operation and maintenance of Terminal D. The further expansion of the terminal then meant about 900 new staff members with an additional 100 staff members to be actually employed in time for the opening of Terminal D in 2012. The decision in December 2014 to concentrate all flight services, including domestic ones, on Terminal D, however, meant that some employees were made redundant in personnel cuts (Figure 1). SIAB has no concerns about the negative impacts of the personnel reductions on the operation and the maintenance of the facilities developed under the project due to the fact that the facilities currently working in terminals other than Terminal D are rather limited.



Source: Answers to the questionnaire for the ex-post evaluation

Figure 1: Changes in staff numbers in SIAB

3.5.2 Technical Aspects of Operation and Maintenance

SIAB provides various kinds of staff training including that on operation and maintenance in line with an annual human development plan. In addition to this existing training, it was planned that particular training on the operation and maintenance of advanced facilities, such as the security system introduced by this project, would be given during implementation. The training was provided in accordance with the modifications of the project plan, and continued even after the completion of the project. In total, 86 employees have received training on the sophisticated equipment procured under the project since 2012. SIAB confirmed that training contributes not only to strengthening the capacity for operation and maintenance but also to reducing accidents, even slight ones, through staff skill development. All necessary manuals for each facility are made available.

No major problems have been observed in technical aspects of operation and maintenance and there are necessary manuals for each facility.

3.5.3 Financial Aspects of Operation and Maintenance

Table 15 shows the profit and loss statement for SIAB and the annual cost of operation and maintenance from 2010 to 2013. As the number of passengers grew, the net income from the sales of products and services increased accordingly. In 2013 SIAB suffered from deteriorating profits due to the bankruptcy of Aerosvit which had had the largest number of flights at the airport. Except for this isolated case, the underlying revenue structures (the net income from sales of products and services) and expenditure (the cost of products sold) are relatively stable and thus the revenue from Boryspil Airport is a major financial source for SIAB. The net profit to sales has also continued to be high at the 27% to 41% level. Administrative expenses are relatively low; thus it can be considered that SIAB runs the airport efficiently. Since repayment of the Japanese ODA Loan for the project and commercial bank loans has started, the financial costs have been increasing since 2012. During this time, SIAB still enjoyed a net profit in surplus; thus it seems unlikely that the repayments have put pressure on the operation. Although the operation and maintenance costs have been increasing since the commencement of the operation of Terminal D, they account for just a small portion of expenditure as a whole and SIAB have ensured the necessary operation and maintenance costs even in 2013 when revenues declined. Therefore, no major problems have been found in the financial aspects between 2010 and 2013.

Table 15: SIAB profit and loss statement and the annual cost of operation and maintenance (2010-2013)

Unit: million UAH

	2010	2011	2012	2013
Net income from sales of products and services	1,191,691	1,416,004	1,510,549	1,384,761
Cost of products sold	570,523	651,630	841,732	908,943
Gross profit/ loss	621,168	764,374	668,817	475,818
Administrative expenses	37,939	47,583	77,102	61,321
Other operating revenues	421,132	316,861	57,777	121,298
Other operating costs	396,326	284,779	43,188	89,370
Sales costs	1,472	1,732	2,123	3,399
Operating profit / loss	606,563	747,141	604,181	443,026
Financial costs	41,921	6,066	178,131	327,726
Other financial revenues	3,063	11,875	35,243	32,395
Other revenues (costs)	1,418	39,832	72,922	25,184
Profit before tax	569,123	792,782	534,215	172,879
Profit tax	195,381	206,401	131,739	46,346
Net profit (loss)	373,742	586,381	402,476	126,533
Expenditure for O&M	38.6	59.1	88.2	99.7
Of which, Terminal D	—	—	16.1	58.9
Net profit to sales (%)	31	41	27	9

Source: SIAB

Although the conflicts of 2014 possibly had some negative impacts on the number of passengers, the actual number for that year exceeded that forecasted in SAPROF. The number of passengers is now more than that of the demand forecast and therefore the current financial status is manageable in line with expectations. In addition, a close look at the breakdown of airport passengers (Table 16) makes it clear that there has been more of a negative influence on domestic passengers than on international ones as domestic flights to the Crimean Peninsula and the eastern region are currently not in operation. On the other hand, the ratio of international passengers to domestic passengers in 2012 was 7 to 1. As less passengers have used domestic flights, the impacts of the conflict on the financial status of SIAB are considered to have been rather limited. Furthermore, SIAB have made efforts towards greater management efficiency such as the concentration of all international and domestic flights on Terminal D in order to minimize the negative impact of a decrease in domestic passengers. Thus, at the time of the ex-post evaluation, SIAB seemed to have no major problems in the financial aspects.

Table 16: Breakdown of Boryspil Airport passengers

	2010	2011	2012	2013	2014
International	5,761	6,947	7,432	7,174	6,341
Domestic	931	1,082	1,037	742	548
Transit	2	18	9	11	2
Total	6,694	8,047	8,478	7,927	6,891

Unit: thousand

Source: Answers to the questionnaire for the ex-post evaluation

3.5.4 Current Status of Operation and Maintenance

As pointed out in the previous beneficiary satisfaction surveys, the airport terminal is kept clean and without damage. Equipment procured under the project is currently well functioning without any trouble.

No major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore the sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project aimed to meet the increasing passenger demand in Boryspil State International Airport and then to improve services for airport users by constructing a passenger terminal building and other related facilities. The objective of this project was highly relevant to the development plan and development needs of Ukraine at the time of both the appraisal in 2004 and the ex-post evaluation, as well as to Japan's ODA policy at the time of the appraisal; therefore its relevance is high. The project scope was expanded in response to external factors

such as the drastic increase in passenger demand and a change in the land to be used for the planned terminal building. This expansion of the scope, however, was appropriate for the emergence of the project effects. Considering the modifications in the scope, the project cost was almost within the plan, although the project period exceeded the plan. Therefore, the efficiency of the project is fair. The targeted operation and effective indicators of this project had been broadly achieved and thus the project has largely achieved its objectives; therefore, the effectiveness and impact of the project are high. Although the conflicts in the eastern region, as of the time of the ex-post evaluation, seem to have had limited negative impacts on project sustainability, no major problems were observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore the sustainability of the project effects is high.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

[Preparatory study in a country where a Japanese ODA project has been conducted for the first time]

This project was the first Japanese ODA project in Ukraine. Not only was the Executing Agency unfamiliar with JICA's ODA procedures, but JICA also was unfamiliar with Ukraine's laws and business practices. Nevertheless, the scope of the preparatory study for the Project was limited within general items such as the confirmation of development policies, development needs and technical matters. No study on procurement procedures and business practices nor a risk analysis were conducted. As a result, some issues such as the necessity for national approval of the basic design manifested themselves during project implementation and this delayed project progress, especially in the early stages of the project. In order to avoid this sort of problem, a more detailed study on laws and business practices including risk analysis than a preparation study for an ordinal project should be conducted at the preparatory stage in a country where a Japanese ODA project is being conducted for the first time.

[Scope of consulting services for construction supervision]

During project implementation, several changes in the design and the project scope were made which caused delay of the project. The changes were needed because 1) another parallel

project for terminal construction was aborted by a private company, 2) the candidate project site was changed, and 3) the number of passengers increased beyond the demand forecast of SAPROF. On the other hand, the Scope of Works for consulting services was limited to procurement support and construction supervision. The construction works actually began in 2008. As five years had already passed since the SAPROF study, the demand forecast was reviewed twice in this period. However, this review was carried out not by the consultant in charge of construction supervision under the project but by a third party consultant preparing for the development plan of the entire Boryspil Airport. Communication between these consultants was not smooth and this caused delays in the project. In order to avoid unnecessary delays, the Consultant should have reviewed the project scope in a timely way, while watching the progress of another parallel project. The design should then have been reviewed based on the proper demand forecasts and the usage of the other terminals in Boryspil Airport. For a future similar project, it is desirable that the whole development plan of Boryspil Airport and a review of the existing studies, including the demand forecast, should be included in the scope of the consulting services for construction supervision.

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs	Civil Works: <ul style="list-style-type: none"> • International passenger terminal building: 3-stories, approx. 37,000 m² • Road and apron • Other related equipment Consulting Service: Total: 878 M/M	Civil Works: <ul style="list-style-type: none"> • International passenger terminal building: 3-stories, approx. 107,000 m² • Road and apron • Other related equipment Consulting Service: Total: 1,159.86 M/M
2. Project Period	March 2005 – December 2010 (70 months)	March 2005 – November 2013 (105 months)
3. Project Cost		
Amount paid in Foreign currency	11,459 million yen	28,260 million yen
Amount paid in Local currency	13,998 million yen	26,946 million yen
	(683 million UAH)	(2,209 million UAH)
Total	25,457 million yen	45,206 million yen
Japanese ODA loan portion	19,092 million yen	19,092 million yen
Exchange rate	1UAH = 20.5 yen (As of June 2004)	1UAH = 12.2 yen (As of April 2013)