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IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IBRD-78510)

ON A

LOAN

IN THE AMOUNT OF US\$280 MILLION

TO THE

ARAB REPUBLIC OF EGYPT

FOR THE

CAIRO AIRPORT DEVELOPMENT PROJECT-TB2

May 2017

Transport and ICT Global Practice
Middle East and North Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective November 30, 2016)

Currency Unit = Egyptian Pound (EGP)

US\$1.00 = EGP 17.77

FISCAL YEAR

July 1 – June 30

ABBREVIATIONS AND ACRONYMS

ADP	Airports Development Project
ACI	Airports Council International
APEX	Airport Excellence
ATC	Air Traffic Control
ATM	Air Traffic Management
BOQ	Bill of Quantities
CAC	Cairo Airport Company
CADP	Cairo Airport Development Project-TB2
CAI	Cairo International Airport
CAS	Country Assistance Strategy
CD	Country Director
CNS	Communications, Navigation, and Surveillance
CPF	Country Partnership Framework
DC	Design Consultant
DB	Dispute Board
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
EHCAAN	Egyptian Holding Company for Airports and Air Navigation
ESIA	Environmental and Social Impact Assessment
FDI	Foreign Direct Investment
FIRR	Financial Internal Rate of Return
FM	Financial Management
GDP	Gross Domestic Product
GoE	Government of Egypt
HSE	Health, Safety, and Environment
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICR	Implementation Completion and Results Report
IPC	Interim Payment Certificate
IRR	Internal Rate of Return
ISR	Implementation Status and Results Report
ITS	Information Technology System
JV	Joint Venture
LoS	Level of Service

M&E	Monitoring and Evaluation
MIRR	Modified Internal Rate of Return
mppa	Million Passengers Per Annum
MoCA	Ministry of Civil Aviation
NPV	Net Present Value
MTR	Midterm Review
O&M	Operation and Maintenance
ORAT	Operational Readiness and Airport Transfer
PAD	Project Appraisal Document
PDO	Project Development Objective
PM	Project Manager
PMU	Project Management Unit
TA	Technical Assistance
TB1	Terminal Building 1
TB2	Terminal Building 2
TB3	Terminal Building 3
TTL	Task Team Leader

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Note: This ICR is a test of an "Agile ICR" as part of the World Bank Agility Pilot. It follows the latest template and guidelines for the revised ICR provided to the team.

**ARAB REPUBLIC OF EGYPT
CAIRO AIRPORT DEVELOPMENT PROJECT-TB2**

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DATA SHEET

A. Basic Information

Project Name	Project ID	Lending Instrument	ICR Date
Cairo Airport Development Project-TB2	P101201	Specific Investment Loan	May 2017

Country	Borrower	Implementing Agency	L/C/TF Number(s)
Arab Republic of Egypt	Government of Egypt	EHCAAN	IBRD-78510

Financing Source	Original Amount (US\$, millions)	Revised Amount (US\$, millions)	Actual at Closing Amount (US\$, millions)
WORLD BANK			
Total	280.00		212.90
IBRD	280.00		212.90
IDA			
TF			
OTHER			
Total	156.00		199.80
Government	156.00		199.80
Co-financing (development partners)			
TOTAL	436.00		412.70

Original Project Development Objectives	To assist the Government of Egypt (GoE) to (i) enhance the quality of airport services through an increase in capacity of Cairo International Airport; and (ii) strengthen air transport in Egypt.
Revised Project Development Objectives (if applicable)	To assist the Government of Egypt (GoE) to (i) enhance the capacity and the quality of services of Cairo International Airport and (ii) improve the capacity of key stakeholders (MoCA and EHCAAN) in the strategic planning of the air transport sector.

Original Environmental Assessment Category	Category B
Revised Environmental Assessment Category	n.a.

B. Key Dates

Approval	Effectiveness	Mid-Term Review	Original Closing	Actual Closing
02/23/2010	08/12/2010	06/10/2013	11/30/2015	11/30/2016

C. Restructuring		
Restructuring Date (s)	Amount Disbursed at Restructuring (US\$)	Key Revisions Made
06/10/2014	62.03	Revision of PDO, Results Framework, Disbursement Estimates
10/25/2015	181.19	Extension of Closing Date
07/06/2016	231.93	Extension of Closing Date

D. Key Ratings		
Outcome	Bank Performance	M&E Quality
Satisfactory	Moderately Satisfactory	Substantial

E. Ratings of Project Performance in ISRs				
No.	Date ISR Archived	DO	IP	Actual Disbursements (US\$, millions)
1	06/25/2010	Satisfactory	Satisfactory	0.00
2	01/11/2011	Satisfactory	Satisfactory	0.00
3	06/08/2011	Satisfactory	Highly Satisfactory	0.33
4	12/17/2011	Satisfactory	Satisfactory	0.98
5	04/14/2012	Satisfactory	Satisfactory	21.69
6	12/23/2012	Satisfactory	Satisfactory	22.04
7	06/20/2013	Satisfactory	Satisfactory	27.23
8	12/25/2013	Satisfactory	Moderately Satisfactory	46.05
9	04/26/2014	Satisfactory	Moderately Satisfactory	55.77
10	09/28/2014	Satisfactory	Moderately Satisfactory	107.05
11	03/24/2015	Satisfactory	Moderately Satisfactory	123.33
12	10/01/2015	Satisfactory	Moderately Satisfactory	166.13
13	01/12/2016	Satisfactory	Moderately Satisfactory	188.27
14	05/23/2016	Satisfactory	Satisfactory	213.52
15	11/29/2016	Satisfactory	Satisfactory	241.92

F. Sector and Theme Codes

	Original (at Appraisal)
Practice Area (Lead)	Transport
Sector Code (as % of total Bank financing)	
Public administration - Transportation	1
Aviation	99
Theme Code (as % of total Bank financing)	
Infrastructure services for private sector development	50
Trade facilitation and market access	50

G. Bank Staff

Positions	At Approval	At ICR
Vice President	Shamshad Akhtar	Hafez M. H. Ghanem
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1. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

1.1 Context at Appraisal

Context

1. **At project appraisal, Cairo International Airport (CAI) was already the second-busiest airport in Africa, aided by its geographic position as the crossroad between Europe, Asia, and Africa.** The airport had a total capacity of 21 million passengers per annum (mppa), two runways, and three terminal buildings, which were used by 58 passenger airlines, 10 cargo operators, and charter operators. The air transport sector was a key driver of the Arab Republic of Egypt's economic growth and the country's integration in the region and with the rest of the world. The sector supports tourism, which accounted for 3.5 percent of Egypt's gross domestic product (GDP) at the time of project preparation. An estimated 2.5 million jobs directly and indirectly depended on tourism. Airports were the primary points of entry for international visitors. It was estimated that around 80 percent of tourist traffic came through Egypt's airports, and tourism accounted for half of all international passenger traffic at CAI.¹

2. **The existing capacity of CAI would be saturated by 2017 given the significant growth in traffic, according to forecasts undertaken during project preparation.** The Government of Egypt (GoE) identified a need to continue expanding airport infrastructure and improving airport services to meet the growing demand at CAI, the main gateway to Egypt. Passenger traffic at CAI had more than doubled from 7.1 million in 1998 to 14.4 million in 2008. Passenger traffic grew by about 7 percent per year in 2005 and 2006 and skyrocketed by 16.7 percent in 2007 and by 14.2 percent in 2008. Due to the global economic crisis, traffic had begun to stagnate at the end of 2008 and dropped by 5 percent in the first quarter of 2009. Traffic returned to equilibrium from April to August 2009 and forecasts indicated traffic would resume growing by mid-2010 in line with worldwide economic recovery, albeit at a slower pace than the previous four years.²

3. **The project was prepared under challenging circumstances following the onset of the global economic crisis.** The crisis that began in 2008 posed significant challenges to Egypt's growth trajectory. From 2005 to 2008, Egypt's economy grew at a yearly average of 7 percent, a record over the previous 20 years. By 2009, real GDP growth had dropped to 4.7 percent and unemployment had increased to 9.4 percent from 8.4 percent a year earlier. Declining export earnings had led to a current account deficit (2.3 percent of GDP) for the first time since 2001. Declining capital inflows, including foreign direct investment (FDI) (down by 39 percent), led to an overall balance of payment deficit of 1.8 percent of GDP compared to a surplus of 3.3 percent a year earlier. The post-crisis world was likely to present a tougher business climate and greater difficulty in attracting foreign investors.

4. **In response to the crisis, the GoE's primary focus was to improve living standards, promote investment, reduce unemployment, contain inflation, and improve the performance of administrative entities.** The GoE responded with a crisis response plan featuring fiscal, monetary, and direct support measures. Fiscal stimulus came in the form of additional spending of EGP 15 billion (US\$2.7 billion or 1.5 percent of GDP), which consisted of EGP 10.5 billion in infrastructure investment spending. The GoE intended to develop well-integrated and cost-effective transport systems. The project was expected to contribute to Egypt's stimulus package and recovery efforts from the global economic crisis.

¹ Project Appraisal Document (PAD), January 2010.

² PAD.

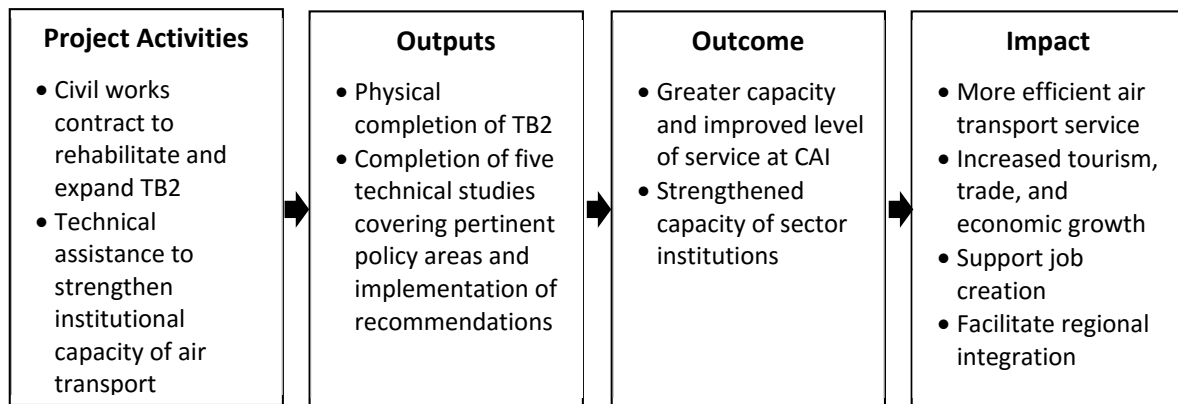
5. **The goal of the Egyptian Holding Company for Airports and Navigation (EHCAAN)³ was to continue expanding the capacity of the country’s main airports to meet growing demand.** Of CAI’s three terminal buildings, Terminal Building 2 (TB2) was proposed for rehabilitation and expansion as the existing facilities dated back to 1986. Terminal Building 1 (TB1), which began operations in 1963, had been fully renovated in 2003. Terminal Building 3 (TB3) had just been constructed as part of the US\$375 million World Bank-financed Airport Development Project (ADP) from 2004 to 2009. The project would more than double the capacity of TB2 from 3.5 mppa to 7.5 mppa, bringing overall CAI capacity to 25 mppa.

6. **The World Bank Group had established itself as a key partner in the development of air transport in Egypt.** The ADP was largely successful in improving airport services and strengthening operations through the construction of the new Terminal Building 3 (TB3) at CAI and a new terminal building at Sharm El-Sheikh Airport. In addition, a number of technical assistance (TA) activities were completed including the preparation of a national airport master plan and the development of a plan for the gradual liberalization of air transport. An important and additional contribution to the efficiency of the airport sector was the signing of management contracts with international airport operators for CAI and five regional airports from early 2005. In May 2009, during the final stages of implementation of the ADP, the World Bank received the official request from the GoE for a US\$280 million loan to finance the rehabilitation and expansion of TB2. The Cairo Airport Development Project-TB2 (CADP) was introduced therefore as a second phase of the ADP, which would allow future combined operations of TB2 and TB3.⁴

Theory of Change (Causal Chain)

7. As shown below, the underlying logic of the proposed project was clear.

Figure 1. Causal Chain



Project Development Objectives (PDOs)

8. The original PDO as stated in both the Project Appraisal Document (PAD) and the Loan Agreement was to assist the Government of Egypt (GoE) to (i) enhance the quality of airport services through an increase in capacity of Cairo International Airport; and (ii) strengthen air transport in Egypt.

³ EHCAAN was incorporated in 2001 as a state holding company in charge of public airports in Egypt. EHCAAN’s four subsidiaries include Aviation Information Technology, National Air Navigation Services Company, Egyptian Airports Company, and Cairo Airport Company (CAC). CAC is considered to be the employer for the construction contract on this project.

⁴ PAD.

Key Expected Outcomes and Outcomes Indicators

9. The original PDO was measured through five indicators for PDO (i) and two indicators for PDO (ii). Please refer to annex 1 (Results Framework) for more details on outcomes and indicators.

Components

10. **The project had two main components, and the first focused on the civil works and the second on TA activities, as summarized in table 1.** At approval, the total project cost was estimated at US\$436 million including contingencies, of which US\$280 million would be financed by IBRD and US\$156 million would be financed by EHCAAN. See annex 3 for detailed (estimated and actual) project costs by component. No components were revised during project implementation.

Table 1. Project Components of the CADP at Appraisal

Category	Description	Amount of Loan Allocated
Component 1: Rehabilitation and Expansion of the Terminal Building 2 (TB2) at Cairo International Airport	Rehabilitation and expansion of the existing TB2 terminal including, among other things, a check-in hall, passenger waiting areas, gates, customs, baggage claim, information technology systems (ITS), a new pier with connecting bridges, and a new apron with parking contact stands and parking remote stands. After rehabilitation and expansion, the new terminal would reach a capacity of 7.5 mppa.	IBRD financing: US\$263 million EHCAAN financing: US\$148 million
Component 2: Technical Assistance and Studies	The original five subcomponents were as follows: (a) Subcomponent 2.1: Review of the Air Transport Policy of Egypt and Strategic Options (b) Subcomponent 2.2: Development Strategy of Air Traffic Control and Air Traffic Management (c) Subcomponent 2.3: Review of Civil Aviation Authority's Compliance with ICAO Standards and Recommended Practices Concerning Regulatory Oversight of Safety and Security ^a (d) Subcomponent 2.4: Analysis of the Fee and Tax Structure of the Air Transport Sector (e) Subcomponent 2.5: Spatial Planning of Cairo's Airport Area	IBRD financing: US\$2.8 million
Other	Physical and Financial Contingencies	IBRD financing: US\$14 million EHCAAN financing: US\$7.6 million
	Front-end fee	EHCAAN financing: US\$0.7 million

^a Note: This study was replaced with the Airport Excellence Review (APEX) in Safety implemented by Airports Council International (ACI).

1.2 Significant Changes during Implementation

Project Development Objectives (PDOs)

11. The PDO was amended through project restructuring in June 2014. The change did not affect the substance of the objectives; it merely clarified the PDO in two ways. First, it corrected an imprecise framing of PDO (i) implying that improved quality would result only from increased capacity. Second, it transformed PDO (ii) from a phrase not well linked with the project-supported activities to a more specific and concrete outcome.⁵ The PDO was revised to (i) enhance the capacity and the quality of services of Cairo International Airport and (ii) improve the capacity of key stakeholders (MoCA and EHCAAN) in the strategic planning of the air transport sector.

Key Expected Outcomes and Outcome Indicators

12. The 2014 restructuring revised the Results Framework to better link it to project activities. Five original outcome indicators were dropped, as they were deemed not directly attributable to project activities. To measure the capacity objective, the original indicator for ‘passenger traffic at CAI’ was restated as a core indicator for direct project beneficiaries, and a new indicator was added for ‘number of passengers that can be served through TB2 in one day’. The service quality objective was measured through the original indicators for ‘passenger processing time in the new TB2 (arriving/departing)’ and a new indicator, ‘TB2 reached the level B of IATA level of Service’. Component 2 on improving the capacity of stakeholders in the strategic planning of the air transport sector was measured through a new comprehensive indicator, ‘implementation of the strategic recommendations of the five studies by MoCA and EHCAAN’. The five new or revised outcome indicators were designed to more adequately capture the results. The intermediate outcome indicators remained unchanged. Details on the changes made are shown in annex 1 (Results Framework).

Other Changes

13. A Level 2 restructuring was approved in October 2015 to extend the closing date from November 30, 2015, to July 31, 2016, to allow for the full completion of all activities financed by the project and to ensure the achievement of the PDO.

14. A third and final restructuring was a Level 2 approved in July 2016 to extend the closing date from July 31, 2016, to November 30, 2016, for a cumulative 12-month extension. This was to allow the completion of the works and testing of the terminal before commissioning, as the contractor was unable to meet the completion date.

2. ASSESSMENT OF OUTCOMES

2.1 Relevance of PDOs

15. **At the time of approval, the project was highly relevant to and consistent with the objectives laid out in the prevailing Country Assistance Strategy (CAS) for Egypt.**⁶ The project aligned with the GoE’s strategic objective of achieving high and sustainable GDP growth and the World Bank’s objective of enhancing the provision of public services through improved efficiency of transport services. The CAS cited the close link between the expansion of airports and tourism development, as well as the challenge of attracting private foreign capital for large investments.⁷ Public financing was considered the best option given the difficulty in mobilizing private financing for strategic investments such as airport development

⁵ Project Restructuring Paper, May 2014.

⁶ The CAS FY06–09 (Report No. 32190-EG) covered the period FY06–11 when an Interim Strategy Note FY12–14 was prepared.

⁷ CAS FY06–09, page 54.

and the drop in FDI due to the economic and financial crisis.⁸ The World Bank Group brought vast policy and technical expertise in the air transport sector as well as lessons learned from the ADP. In addition, the World Bank's emphasis on institutional strengthening to complement infrastructure investments would help ensure the sustainability of the sector.

16. **Since the time the project was prepared, Egypt has undergone a period of transition following the unprecedented events of the Arab Spring.** The current World Bank Country Partnership Framework (CPF) FY15–19 reflects current priorities to renew the social contract by supporting private sector job creation, social inclusion, and improved governance. Regarding air transport, going forward the World Bank Group will seek to scale up measures to attract the private sector for investments in transport.⁹ It is recognized as an important enabler to achieving development goals. As stated in the CPF, “the air transport sector is directly connected to the tourism sector, itself a major source of job creation for the poor.”¹⁰ Enhancing the capacity and efficiency of key transport infrastructure and services is needed to remove bottlenecks, which remain as constraints to tourism, trade, regional mobility, job creation, and service delivery. This is in line with the theory of change underpinning the project, as mentioned in paragraph 7.

17. **The intervention is helping promote private sector involvement in the air transport sector through the signing of a management contract.** The sustainability of project investments is enhanced by the management contract for the terminal, which was strongly advocated by the World Bank and successfully put in place during implementation of the project.

18. **The focus on tourism's enabling environment continues to be highly relevant.** Enhancing the policy dialogue, institutional strengthening, and sectoral strategies is conducive to achieving the PDO and is aligned with the current CPF. The choice of lending instrument is still considered to be appropriate for a middle-income country.¹¹

19. **The project's objectives remain highly relevant to the GoE's development priorities. Tourism continues to be a major driver of the Egyptian economy and a key part of the GoE's development strategy.** It is a vital source of foreign currency reserves. As a catalytic investment, the project is expected to contribute to enhancing tourism competitiveness, a priority identified under the Economic Development and Culture pillars in the Sustainable Development Strategy: Egypt's Vision for the Year 2030.¹² The total contribution of the tourism and travel industry is estimated to be 7.2 percent of Egypt's total GDP (EGP 87.4 billion or US\$8.6 billion) in 2016 and is forecast to reach EGP 153.8 billion or US\$15.3 billion by 2027; it directly and indirectly supported 6.6 percent of total employment or 1,763,000 jobs in 2016.¹³

20. **Rating.** The overall relevance of the project is rated Substantial. Notwithstanding the prioritization of other sectors in current World Bank assistance to the GoE, air transport and tourism are identified as priority areas in the GoE's development plan and strategy.

⁸ PAD.

⁹ CPF FY15–19.

¹⁰ CPF FY15–19, page 33.

¹¹ IBRD Flexible Loan with a variable spread and level repayments. The loan has a 28-year maturity with a seven-year grace period and is denominated in U.S. dollars.

¹² Sustainable Development Strategy: Egypt's Vision for the Year 2030, May 2016.

¹³ World Travel and Tourism Council, Country Report for Egypt, 2017.

2.2 Achievement of PDOs (Efficacy)

21. Although the PDO was amended, a ‘split evaluation’ was deemed unnecessary, as the revision of the PDO statement was not substantive, did not change the key outcomes, and simply clarified the logic and specificity of the objectives. At the time of restructuring in 2014, US\$62 million had been disbursed (26 percent of the final disbursed loan amount of US\$241.92 million). The evaluation of efficacy is undertaken according to the revised PDO and Results Framework.

Revised PDO (i): Enhance the capacity and the quality of services of Cairo International Airport

22. **The project’s objective of expanding airport capacity was fully achieved.** The capacity of TB2 has more than doubled from 3.5 mppa to 7.5 mppa following the successful completion of the terminal works. Following the 2014 restructuring, a new indicator, ‘number of passengers that can be served through TB2 in one day’, was added to show the project’s impact on capacity levels, which was not reflected in the original Results Framework. The target of 20,000 passengers was calculated using the annual capacity of TB2 (7.5 million) divided by 365 days. Following the completion of the physical works, this objective was met.

23. **The revised target for ‘annual passenger traffic at CAI’ was fully achieved; however, passenger traffic was less than originally forecast.** During the 2014 restructuring, this same indicator was renamed as ‘direct project beneficiaries’ and a more conservative target of 15.3 mppa was set, following the Arab Spring and the resulting decline in passenger traffic (the original target was 19.47 mppa). The revised target was surpassed (108 percent) as traffic had recovered back to 2010 levels by 2016. ‘The percentage of female beneficiaries’ (passengers) was also added as an indicator according to World Bank Group corporate requirements but was not actively monitored during the project. The baseline and actual values were reported as a proxy of 50 percent as the project was not considered to be gender specific.

24. **The project aimed to improve the quality of airport services, in spite of the original incomplete attribution of enhanced quality to an increase in terminal capacity, which was removed during the 2014 restructuring.** The original causal link in the PDO between increasing capacity and improving service quality (“enhance the quality of services through an increase in capacity”) was removed during the 2014 restructuring, recognizing that space was only one driver of service quality. The indicators for ‘passenger processing time (arriving and departing)’ remained unchanged under the revised Results Framework. The indicator for ‘passenger processing time in the new TB2 (arriving)’ recorded 30 minutes for arriving passengers, just short of the target of 29 minutes, but was an improvement from the baseline of 37 minutes.¹⁴ The indicator for ‘passenger processing time in the new TB2 (departure)’ recorded 66 minutes for departing passengers, almost double the expected target of 36 minutes. Processing times are affected worldwide by the more stringent security measures in place as a result of the heightened threat of terrorism worldwide. In the current context, processing procedures have changed, and achieving the targets set at appraisal is no longer considered as relevant. Given that these measurements were also taken during the terminal’s early stages of operation and from a limited sampling, processing times are expected to improve once operations are streamlined. An additional indicator was added to measure service levels, ‘TB2 reached the level B of IATA level of service’.¹⁵ At the project’s closing, this

¹⁴ Processing times are a recognized indicator for service levels in the industry. Baseline numbers were taken from the old TB2. The reported processing times in the new TB2 were measured by CAC and the TB2 operator between February 5–16 and March 9–10, 2017.

¹⁵The LoS concept is an industry-recognized, aggregated guidance framework for the planning of terminal facilities. (Review of Preliminary Design Report, September 2009).

measurement had not yet been officially verified. However, TB2 is expected to fulfil the requirements for level B based on the terminal's design specifications. Level B implies a high level of service (LoS) with conditions of stable flow, very few delays, and high levels of comfort. At appraisal, the idea was that the LoS of the new TB2 would surpass TB3 (level C) by offering more space for each passenger.¹⁶

25. **A Passenger Satisfaction Survey for Terminal 2 carried out by the Cairo Airport Company (CAC) was not part of the project's Results Framework, but preliminary results are encouraging.**¹⁷ For example, in TB2, 92 percent of surveyed passengers rated 'Good to Excellent' for 'ease of finding your way through airport', 84 percent rated 'Excellent to Good' for 'comfortable waiting/gate area', and 97 percent rated 'Good to Excellent' for 'cleanliness of airport terminal'. A number of airlines and their passengers stand to benefit from the rehabilitated TB2. In full operations, 15 airlines comprising Skyteam, OneWorld, and Gulf airlines operate from TB2: Jazeera Airways, Kuwait Airways, Royal Jordanian Airlines, Saudi Airlines, Royal Air Maroc, British Airways, Air France, Oman Air, Etihad Airways, Qatar Airways, Emirates, KLM, Alitalia, Gulf Air, and Middle East Airlines. These airlines were operating from the aging TB1 during construction of TB2.

26. **Compared to the old terminal, which was inaugurated in 1986, the new TB2 offers a more modern and efficient design, with significant enhancements for the passenger experience.** The new terminal is 36 percent larger in surface area (228,000 m² from 168,000 m²) with an improved layout and passenger flow.¹⁸ The number and variety of commercial and retail options have increased as the terminal has expanded the space allocated for rental retail areas (27,000 m²) and is operating with three duty-free concessionaires.¹⁹ The new design also offers 38 new check-in counters, 11 moving walkways, 14 departure gates including 1 to accommodate the Airbus A380 (compared with the 7 gates the old terminal had), and a premium lounge.²⁰ An advanced baggage handling system with state-of-the-art baggage scanning and closed-circuit television (CCTV) has improved aviation security. The terminal also reflects advances in technology and evolving passenger needs through provision of electronic self-service kiosks, use of portable electronic devices, and Internet access. The new design also takes into account recommended practices for accessibility to better cater for passengers with restricted mobility.²¹

27. Considering these factors, the project is considered to have contributed to enhancing capacity to a high extent, and improving overall quality of service to a substantial extent, through the expanded and modernized terminal.

Revised PDO (ii): Improve the capacity of key stakeholders (MoCA and EHCAAN) in the strategic planning of the air transport sector

28. **The project contributed significantly to improving the capacity of key stakeholders in the air transport sector.** During the 2014 restructuring, the second part of the PDO was refined to clearly articulate institutional strengthening and the targeted stakeholders (EHCAAN and the Ministry of Civil Aviation [MoCA]). Five technical studies were financed by the project covering a range of topics: (a) air

¹⁶ PAD.

¹⁷ A Passenger Satisfaction Survey was carried out by CAC for the first quarter of 2017. It draws from a sample of 94 surveyed passengers for Terminal 2.

¹⁸ Project Management Unit (PMU) Annual Report, 2016.

¹⁹ For TB1 and TB3, there are only two duty-free concessionaires.

²⁰ Enhanced Design Review, November 2012.

²¹ Review of Preliminary Design Report, September 2009.

transport policy and strategic options, (b) development strategy of air traffic control (ATC) and management, (c) safety, (d) fee and tax structure, and (e) spatial planning of Cairo's airport area.

29. **At project closing, all the studies had been completed and the implementation of the recommendations had exceeded targets.** One comprehensive new indicator was added during restructuring: 'Implementation of the strategic recommendations of the five studies by MoCA and EHCAAN'. Overall implementation of the studies was assessed at 73 percent compared to the target of 60 percent. Evaluation of this indicator was based on an equal weighting for completion of the study and for the implementation of its recommendations. This was to ensure the recommendations were executed. For example, one of the studies, the Development Strategy of Air Traffic Control Infrastructure and Management, lays out a plan for 2011–2030 to optimize the Communications, Navigation, Surveillance (CNS) and Air Traffic Control (ATC) systems to provide adequate infrastructure to manage future growth in air traffic. The main recommendation was to upgrade CNS/ATC systems in seven airports across Egypt. At the time of project completion, two of the seven are being upgraded and will be completed in FY17 and the other five are in the procurement stage. The main outcomes of this study are a modernized, safer, and more efficient ATC system; easing of traffic congestion; and reducing costly delays, thus contributing to a reduction in fuel consumption and carbon emissions. See annex 1, **Error! Reference source not found. Error! Reference source not found. Error! Reference source not found. Error! Reference source not found. Error! Reference source not found.** table 1.2 for a thorough assessment of the implementation of the recommendations from each of the studies and the key associated outcomes.

30. Considering these factors, the project is considered to have contributed to a substantial extent to achieving PDO (ii) on improving the capacity of stakeholders in the strategic planning of the sector.

31. **Overall efficacy rating.** The achievement of the revised PDO is rated Substantial, based upon a high level of achievement of the terminal capacity outcome, substantial achievement of the service quality outcome, and substantial achievement of the institutional capacity outcome.

2.3 Efficiency

32. **The results of the ex post financial evaluation are similar to those calculated at appraisal.** The benefits accounted in the financial evaluation stem from cash revenues generated by additional passengers. Taking into account the actual project costs, which include investment costs and operation and maintenance (O&M) costs, the ex post financial internal rate of return (FIRR) of 14.5 percent and net present value (NPV) of EGP 660.2 million (equivalent to US\$110.4 million) at 11 percent discount rate²² compare favorably to the FIRR of 15.7 percent and NPV of EGP 1,600 million (equivalent to US\$283.1 million) estimated at a discount rate of 8 percent²³ at appraisal. Given that CAC's revenues are in U.S. dollars and their expenses are in Egyptian pounds, and taking into consideration the fluctuations of the Egyptian pound, high benefits were generated resulting in sound financial results in spite of implementation delays, increases in the financing cost of the project, and cost overruns. The financial

²² The effective rate of interest, as the best-estimated proxy of the financing costs of the project. This discount rate is different from the one used at appraisal (8 percent) to account for the significant increase in the financing costs of the project due to the devaluation of the EGP.

²³ The effective rate of interest as the best-estimated proxy of the financings costs of the project during appraisal.

performance of CAC remained sound during the implementation period, maintaining a current ratio²⁴ of no less than 1.0 and a debt service coverage ratio²⁵ of no less than 1.2, as recommended at appraisal.

33. **The economic efficiency of the project was less than estimated at appraisal but still remains sound according to new World Bank Group guidelines.** Based on the same methodology used at appraisal, four sources of benefits were considered for the economic analysis: (a) the net expenditure per additional tourist who is now able to visit Cairo, (b) the additional net expenditure by foreign visitors in airport shops, (c) the additional jobs created by construction and the increased activity at the airport, and (d) the time saving for passengers using CAI. The ex post economic evaluation yields an NPV of US\$116.4 million at a discount rate of 6 percent²⁶ and an economic internal rate of return (EIRR) of 8.5 percent, compared with an NPV at appraisal of US\$415 million at a discount rate of 12 percent and an EIRR of 20.3 percent. The ex post economic evaluation is less favorable than at appraisal mainly because of lower than expected passenger traffic due to the events following the Arab Spring. However, traffic is projected to rebound and grow at a more accelerated pace from now to the end of the evaluation period (2017–2035) than was estimated at appraisal. Other factors also contributed to the lower EIRRs and NPVs, namely the increase in project costs due to the need to enhance the terminal design and the implementation delays. Despite these factors, the project remains economically viable according to the latest World Bank Group guidelines for discounting costs and benefits²⁷ and yields positive NPVs and an acceptable EIRR. A detailed efficiency analysis is included in annex 4.

34. **Rating.** Considering these factors, the overall efficiency of the project is rated Substantial.

2.4 Outcome Rating and Underlying Justification

35. The overall outcome is rated Satisfactory. The project achieved substantial efficacy against the revised PDO. The project remained substantially relevant throughout its duration. Efficiency is rated Substantial given the viable results of the ex post economic and financial analysis.

2.5 Other Outcomes and Impacts (if any)

36. None.

3. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

3.1 Key Factors during Preparation

37. **The background analysis undertaken for the project was sound.** Traffic forecasts, which justified the need for capacity expansion, were reviewed by an independent expert hired by the World Bank. They confirmed that the existing capacity of CAI would be saturated by 2017. The impact of the Arab Spring,

²⁴ The current ratio is a financial ratio that measures whether or not a company has enough resources to pay its debts over the next 12 months. Here it is defined as (current assets) / (current liabilities).

²⁵ The debt service coverage ratio is a financial ratio that measures the ability of a company to produce enough cash to cover its debt payments. Here it is defined as (total cash flow available for debt service) / (total debt service).

²⁶ According to the new World Bank Group guidelines for discounting costs and benefits. Please see footnote 28.

²⁷ The newly recommended discount rates for projects in Egypt are between 4 percent and 8 percent. These new recommended discount rates take into account the economic growth of each country and thus are considered more accurate than the standard 12 percent discount rate.

which contributed to an unexpected decline in passenger traffic, was unforeseeable and outside the project's control (see section 3.2).

38. **Project preparation was swift and was facilitated by strong Government commitment and continuity of World Bank staff.** The official loan request from the GoE came in May 2009 during the final stages of the ADP. Approval by the Board followed 10 months later in February 2010, and the loan became effective in August 2010. At appraisal, the GoE committed counterpart financing equivalent of US\$156 million (36 percent of estimated project costs).²⁸ The rapid preparation time line is notable given the scale of the investment.

39. **The project benefited from a strong PMU and supportive management within the implementing agency.** The implementation arrangements under the ADP had proved to be effective and were retained for this project.²⁹ The PMU established under the ADP, with a majority of its original staff, remained in place, which ensured stability and strengthening of institutional knowledge.

40. **Some key lessons from the ADP were taken into account in the design of the project.** For example, under the ADP, two separate contracts were issued for the works and the ITS, which proved difficult to manage including coordination of works, the handover process, and identification of delays or dysfunctions.³⁰ Given the integrated nature of the facilities, the decision was taken on this project to procure all works, including the supply and installation of the ITS, in a single main contract. Overall, the project was designed to ensure compatibility in operations between TB3 and TB2.

41. **Despite the project's rapid preparation, overall quality at entry could have been improved through more thorough due diligence of the project site.** A joint venture (JV) of international and Egyptian engineering firms was hired by CAC to fulfill both the role of the Design Consultant (DC) and the Engineer for the project. The contract was funded by the GoE and was not financed under the World Bank loan. It was expected that having the same JV design the terminal, supervise the execution of the works, and manage the project would help ensure continuity, reduce implementation risks, and gain efficiencies. The preliminary design of the terminal was completed by the JV in August 2009, in the early stages of project preparation. The original design entailed only partial demolition of the old TB2. A review of the preliminary design was carried out by a World Bank-hired technical consultancy in September 2009; this highlighted the need for thorough site surveys to be undertaken and integrated into the final design and the significant risk for the project if they were not completed before the contract went to tender.³¹ The findings of the site surveys led to significant delays in the implementation of the project, as explained in section 3.2.

42. **In September 2011, the GoE opened a seasonal terminal to ease overall congestion at CAI.** The decision to open the terminal was not known to the World Bank team at appraisal and subsequently had an impact on the ex post economic evaluation of the project given the added capacity. See annex 4 for

²⁸ PAD.

²⁹ The Loan Agreement was signed with the GoE's Ministry of International Cooperation, EHCAAN was the legal implementing entity, and TB2 remained an asset of CAC, an entity of EHCAAN. CAC (the Employer) managed and procured the civil works contract. The PMU falls structurally under EHCAAN.

³⁰ Airport Development Project Implementation Completion Report (ADP ICR), December 2009. The selection method for the ITS supplier for TB3 was considered to be the main issue during implementation of the ADP. The main contractor was to install ITS through a subcontract with a supplier to be procured at a later stage (as ITS bidding documents were not ready in time for the main tender). However, attempts to harmonize the contracts proved difficult, and the decision was made to take it out of the main contract and directly procure the ITS supplier.

³¹ Review of Preliminary Design Report, September 2009.

the detailed economic analysis. Nonetheless, the facilities are basic and not comparable to the other terminals in terms of service quality and amenities. The terminal was opened specifically to handle pilgrimage (Hajj and Umrah) traffic and Egyptair's flights to/from Medina and Jeddah. It has an overall capacity of 3.3 mppa. The seasonal terminal operates as an extension of TB3, using its airside facilities and shuttling passengers to remote aircraft stands.

3.2 Key Factors during Implementation

43. **The Egyptian revolution, which began on January 25, 2011, created a challenging environment.** Considering the unprecedented conditions prevailing at the time, the fact that works continued without major disruptions and the project was fully completed with only a one-year delay is commendable. The perseverance of the PMU under challenging conditions of political and institutional turmoil is noteworthy. It also contributed to a high turnover in the project leadership. Over the course of the project, there were 9 different EHCAAN chairmen and 10 different CAC chairmen. This resulted in some delays in decision making, but overall support for the project remained strong.

44. **The scope of the project changed due to the need to fully demolish and reconstruct the terminal.** Contrary to the recommendations of the review of the preliminary design carried out in September 2009, the DC had proposed that the detailed surveys be carried out by the Contractor undertaking the civil works. The works contract was signed in November 2011 and Contractor mobilization began in January 2012. It was determined only after structural investigations undertaken in July 2012 that full demolition of TB2 would be required, rather than partial demolition, due to the poor quality of the old concrete structure, which did not meet current seismic codes. Construction of a completely new terminal building would be required, and, as a result, the terminal design had to be revised.³² This was the primary reason for the delay in implementing the project.

45. **The enhanced design was prepared by the Contractor with a ceiling set of around 25 percent of the original contract amount and a surface area increase of 35 percent compared to the original design.** Additional financing was not required to cover the cost increase, as there were sufficient uncommitted funds in the World Bank loan given that the Contractor's bid was below the project cost estimated at appraisal and foreign expenditures, which were covered by the World Bank, were less than estimated.³³ The contract was amended in May 2013 and the detailed design drawings were completed by February 2014. The revision provided an opportunity to improve the design for the building (that is, to an 'enhanced' design), and a number of design development workshops took place with various stakeholders. Overall capacity of the terminal did not increase, but improvements included more space for commercial areas and operational aspects such as enhanced passenger flow and baggage circulation. Attempts to introduce more 'green' elements to the design and improve the sustainability of the terminal did not gain much traction, in spite of the World Bank's continued efforts. The delays from redeveloping the design could not be recovered during construction despite efforts to accelerate the works.

46. **As a result, the project was slow disbursing.** For example, only US\$178.2 million, or 64 percent of the loan amount, had been disbursed after five years of implementation.

³² OPRC Case Recommendation and Review Report, 2016.

³³ According to the Loan Agreement, 100 percent of foreign expenditures for the works was eligible to be financed by the World Bank. Local expenditures would be covered by the borrower. As outlined in the PAD, at appraisal this breakdown was estimated to be 65 percent foreign and 35 percent local. The eventual contractor's bid was 55 percent foreign and 45 percent local; hence, the World Bank's costs were less than estimated at appraisal and the World Bank loan was not fully committed.

47. **The poor performance of the Engineer became a major point of concern.** The Engineer—who fulfilled the roles of engineer and DC—was selected by CAC in accordance with Egyptian procurement procedures. The World Bank raised concerns over the Engineer’s competencies early on, including during preparation and later during the bid evaluation for the procurement of the Contractor. The need for a competent and proactive Engineer became even more essential in light of the need to enhance the terminal design (for example, to reduce the risk of potential claims from the Contractor). Another point of concern was the minimal involvement of the foreign partner in the JV, who was not active in providing the necessary degree of governance and leadership to the local partner. It became apparent that the Engineer’s staff did not have the appropriate experience of working on major airport construction projects. Repeated warnings were conveyed to strengthen the Engineer’s team and reinforce its project management capabilities. They resulted in some staffing and organizational changes but did not significantly improve performance and eventually led EHCAAN to decide to hire a separate new Engineer.

48. **Supervision and monitoring of Health, Safety and Environment (HSE) on-site was inadequate.** During project implementation, the Contractor performed poorly on HSE aspects (for example, on-site health and safety, insufficient number of safety operators, lack of equipment such as water dispensers, latrines, and so on). One accident resulted in one fatality. HSE implementation was exacerbated by poor enforcement by the Engineer/DC despite several World Bank reminders during supervision mission.³⁴

49. **There were shortcomings in contract and risk management on the part of the Engineer/DC.** There were inconsistencies between documents prepared by the Engineer/DC such as the bill of quantities (BOQ), specifications, and drawings. For example, the order of precedence of the contract documents was changed so that the BOQ was placed at the top, assigning it a higher priority than the specifications or the drawings.³⁵ This gave way to opportunities for claims by the Contractor to be paid for missing BOQ items that were in the drawings/specifications. In addition, a number of Non-Conformance Reports were issued to the Contractor, rather than proactively supervising the site and preventing issues from arising.³⁶ The assessment of project risks and management of the risk register were also considered inadequate.

50. **In September 2014, a new Engineer was appointed, and the JV’s combined role of Engineer and DC was separated.** At that point, the project was estimated at 31 percent physical completion.³⁷ The original JV was retained as DC, carrying on its responsibilities for technical design issues and inspection, including HSE compliance, quality assurance, reviewing the Contractor’s design, and signing off on tests on completion. A newly appointed Engineer assumed responsibilities for overall project management, including management of the Contractor’s contract, ITS development, approval process among stakeholders, and project risks. Project management improved following the change of Engineer. However, there continued to be issues with the DC following the split in responsibilities, such as delays in review and approvals of the developed design, weak design coordination (for fit out of the commercial areas), and departure from the project site during the final stages of the project due to a disagreement with the Employer.³⁸

51. **An ongoing contractual dispute between CAC and the Contractor required substantial effort and time on the part of both the borrower and the World Bank.** This involved a disagreement between the Employer (CAC) and the Contractor on the correct application of the price adjustment formula in the

³⁴ The World Bank provided guidance on actionable steps to improve on-site HSE and meet international standards.

³⁵ Engineer’s Close-Out Report.

³⁶ Engineer’s Close-Out Report.

³⁷ Engineer’s Close-Out Report.

³⁸ The DC is obliged to stay on-site until the end of the defects notification period, September 2017.

General Conditions of Contract Sub-Clause 13.8.³⁹ As recorded in project documents, this issue had been discussed since the end of 2013, with ongoing guidance, including workshops, offered by the World Bank.⁴⁰ Given the failure to reach a resolution, the Contractor referred the issue to the project's Dispute Board (DB) in November 2016. The DB found that neither the Contractor's nor the Employer's application of the formula satisfied the intent of the clause to adjust the price as a result of the rise and fall in the cost of goods, labor, and other inputs to the works (the fluctuation formula). As part of the DB's decision in February 2017, it instructed the Employer to pay the Contractor US\$19.9 million plus €7.7 million for the amounts that were wrongly deducted from the Interim Payment Certificates (IPCs), plus the interest on the amount to be reimbursed. At the time of the Implementation Completion and Results Report (ICR), this issue remains unresolved with ongoing arbitration proceedings or pending an amicable solution. Given that the outcome of the proceedings may result in a further increase in project costs, which has not been factored into the ICR, the results of the ex post economic analysis could be affected.⁴¹

52. Complaints from subcontractors over late or non-payment added to concerns over the timely completion of the project. An amendment to the contract was signed on May 26, 2016, to release a part of the retention money to the Contractor against a bank guarantee, to ease the financial situation of the Contractor. The World Bank also recommended that the Employer increase the frequency of payment to the Contractor by issuing IPCs every two weeks instead of every month to ensure that the Contractor could pay the subcontractors on time, which was critical for the progress of the project. These disputes with subcontractors became particularly concerning during the final stages of works. Many of the same subcontractors were involved in the transition from works to facilities management.⁴² The World Bank team recommended that the Employer review the complaints and take necessary action to protect the interests of the subcontractors, when justified, as well as work directly with the Contractors' subcontractors to manage the facility until the issue was resolved.

53. A private management contract for TB2 was signed with a reputable international airport operator. The World Bank commended the GoE's selection and appointment of a terminal operator. Although the operator's scope of work was limited only to Terminal 2 and did not cover the whole airport, it was considered essential for the delivery of a successful Operational Readiness and Airport Transfer (ORAT)⁴³ for the terminal. The operator's team came on board in March 2016. The terminal began some operations in September 2016 and full operations in mid-February 2017.

³⁹ According to the clause, "In cases where the 'currency of index' is not the relevant currency of payment, each index shall be converted into the relevant currency of payment at the selling rate, established by the Central Bank of the Country, of this relevant currency on the above date for which the index is required to be applicable," the date mentioned being the date 49 days before the last day of the period to which the particular payment certificate relates.

⁴⁰ The World Bank prepared a 'Note on Use of Price Adjustment Provision in Civil Works (and Other) Contracts.'

⁴¹ The end of the disbursement grace period is May 31, 2017 (it was extended from March 31, 2017). Therefore, these costs may not be covered by the World Bank loan.

⁴² A one-year facilities management contract for the new TB2 was awarded to the Contractor at the same time as the award of the works. It was not financed by the World Bank loan. The contract was to cover completion of maintenance, housekeeping, repair services, and remedying defects for a year following handover. It was intended to start at completion of works/taking over of the terminal (September 2016) but was delayed due to a disagreement between the Employer and Contractor over its scope and amount following the enhanced design.

⁴³ ORAT is a comprehensive methodology and holistic approach to ensure the operational readiness of a new airport or terminal. It focuses on the construction completion stages up to transfer of expertise to ensure smooth and successful commencement of operations (ACI 2016).

4. BANK RATINGS, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

4.1 Quality of Monitoring and Evaluation (M&E)

54. **M&E design.** The M&E framework designed at appraisal had some shortcomings, which were addressed in the 2014 restructuring. These issues could have been addressed earlier, but they were overshadowed during the first four years of the project by the design, engineering, and construction problems explained in section 3. The original Results Framework consisted of seven outcome indicators,⁴⁴ which covered both components. There were six intermediate indicators, which remained unchanged during the project. Following the restructuring, the PDO was clarified and the second objective related to institutional strengthening was better defined. Four of the original PDO-level indicators were dropped, as they were not directly attributable to the project activities.⁴⁵ Four new indicators were added to better measure project outcomes on capacity and service levels.⁴⁶ A comprehensive indicator to measure the implementation of recommendations from the technical studies under Component 2 was beneficial particularly to measure progress on the Government's commitment to the policy agenda. 'Annual passenger traffic at CAI' was restated as 'direct project beneficiaries', and the target value was revised downward according to conservative forecasts following the Arab Spring. The revised indicators are more adequate and realistic to measure the project's achievements in a post-Arab Spring environment. Incorporation of Passenger Satisfaction Surveys could have provided useful qualitative insight into the project's impact on service levels. See annex 1 for a full description of the changes in the Results Framework.

55. **M&E implementation.** Data collection did not pose an undue burden, as many of the indicators were tracked by CAC on an ongoing, operational basis.⁴⁷ The PMU was diligent in data collection and reporting on performance data to the World Bank in the form of quarterly and annual reports. Achieving the targets for several outcome indicators depends on full operation of the terminal over a period beyond the project closing date (for example, passenger processing times). Processing times can also be influenced by other authorities such as for security screening (police) and immigration (border control). In addition, the implementation of the recommendations from Component 2 could carry on far beyond the closing date (for example, the spatial planning of CAI's area). This makes it challenging to fully assess the project's impact at the time of the ICR. The intention was to form a committee for the GoE to operationalize and implement the recommendations of the five studies, but at project completion, there was no evidence that the committee was functional. Greater effort could also have been made in measuring some indicators. For example, the indicator 'percentage of female beneficiaries' (which was added as a World Bank Group corporate requirement) was not surveyed. A proxy of 50 percent was used for reporting baseline and actual values as the project was expected to be gender neutral. Accurate reporting of this indicator could better inform operational decisions, including ensuring adequate security screening procedures for female passengers and so on. In addition, the indicator 'TB2 reached the level B of IATA level of service' was added during restructuring in June 2014 but did not reflect the International Air Transport Association (IATA)'s updated methodology in measuring service levels. IATA revised its LoS

⁴⁴ These were (a) passenger traffic at CAI, (b) connecting passenger traffic at CAI, (c) passenger processing time in the new TB2 (arriving), (d) passenger processing time in the new TB2 (departing), (e) commercial revenue per passenger, (f) number of enforced bilateral agreements, and (g) rate of compliance of Egypt's Civil Aviation in safety and security audits.

⁴⁵ These were (a) connecting passenger traffic at CAI, (b) commercial revenue per passenger, (c) number of enforced bilateral agreements, and (d) rate of compliance of Egypt's Civil Aviation in safety and security audits.

⁴⁶ These were (a) female beneficiaries; (b) number of passengers that can be served through TB2 in one day; (c) TB2 reached the level B of IATA level of service; and (d) implementation of the strategic recommendations of the five studies by MoCA and EHCAAN.

⁴⁷ Except for the indicator for female beneficiaries.

concept to four categories in March 2014, underprovided, suboptimum, optimum, and overdesign, to reflect both space and waiting time variables in the service concept (whereas the old LoS focused on the minimum amount of space required per passenger).⁴⁸

56. **M&E utilization.** Effective systems were put in place and indicators were systematically monitored by the PMU through a dedicated M&E Specialist who took ownership of data collection and quality control. The information collected was useful in assessing the progress on project implementation and in informing EHCAAN on strategic decisions and operations. In fact, indicators from the ADP continue to be monitored by CAC. The intention is to continue to monitor the project indicators following project closure. Outside the Results Framework, Passenger Satisfaction Surveys and data collected by other Government ministries (for example, customs forms for passenger data) could also provide useful insight for operational purposes.

57. **Rating for quality of M&E and underlying justification.** Considering (a) the moderate shortcomings in the original PDO and key indicators, which were corrected in time for the improvements to carry major weight; (b) the indicators of quality of airport services that were reasonable in ease and low cost of collection but could have been supplemented by additional indicators (for example, passenger surveys); (c) the generally good implementation of M&E; and (d) the generally effective utilization of M&E, the quality of M&E is rated Substantial.

4.2 Environmental Safeguard, Social Safeguard, and Fiduciary Compliance

58. **Environmental and social safeguards.** The project was classified as environment Category B and did not entail any land acquisition or resettlement. The only safeguard policy triggered by the project was OP 4.01 - Environmental Assessment. An Environmental and Social Impact Assessment (ESIA) was prepared by an Egyptian consulting firm hired by CAC and publicly disclosed. Public consultations were held for the project and efforts were made to encourage a balanced representation of stakeholders. The issues raised during the public consultations were primarily around the possible impact of the project on noise and air quality in the airport and surrounding communities. These concerns were addressed by the ESIA consultant. The project was able to reap the benefits of investing in capacity building during the ADP in the form of the environmental unit that was established within CAC, which monitored the implementation of the ESIA for the project. Monitoring systems were put in place to monitor noise and air quality. There were some concerns with safety on site and HSE compliance, as described in section 3.2, which was addressed through corrective actions and applying pressure on the Contractor.

59. **Financial management.** The project maintained sound financial management (FM) arrangements and complied with reporting and accounting requirements stated in the Loan Agreement. The PMU had knowledge and experience on fiduciary aspects from the ADP and brought a history of timely audit report submissions to the World Bank. FM was rated Satisfactory in the last Implementation Status and Results Report (ISR).

60. **Procurement.** There were no instances of misprocurement in the project and the Procurement Plan was kept up-to-date. The construction contract was amended four times.⁴⁹ The PMU was reasonably

⁴⁸ IATA New Airport Level of Service Concept Presentation, 2014.

⁴⁹ Contract amendment 1 on December 14, 2014, reflected major changes in enhancing the design of TB2 including a 35 percent increase in TB2's area and 25 percent capped increase in total contract cost. Contract amendment 2 on January 27, 2015, extended the construction completion date from January 28, 2015, to November 30, 2015. It had no impact on the total contract amount. Contract amendment 3 on May 18, 2016, was to release a part of the retention money to the Contractor

staffed to handle procurement issues and benefitted from experience on the ADP. Procurement was rated Satisfactory in the last ISR.

4.3 Bank Performance

Assessment of Ensuring Quality at Entry

61. The project's strategic relevance, environmental and social development issues, fiduciary aspects, implementation arrangements, M&E, and risks were satisfactorily addressed at entry, which was facilitated by the team's prior experience on the ADP. The project's preparation was overseen on the World Bank side by the same Task Team Leader (TTL) who had worked on the ADP, which helped promote efficient collaboration. The team successfully proposed and negotiated the scope for the institutional component for the project. Quality at entry was significantly weakened, however, by shortcomings on the technical aspects of the civil works during preparation. Given that CAC funded the design and supervision contract separately with their own funds, the World Bank had less leverage and technical influence in the early stages. During preparation, the JV of engineering firms hired by CAC did not complete detailed site surveys or integrate them into the terminal design. This meant that the design eventually had to be revised during implementation, which had significant cost and time implications, as explained earlier. The World Bank hired a consultant with extensive sector experience to review the preliminary design before project approval, and although conducting detailed site surveys was a key recommendation of this review, the World Bank did not preclude the construction contract financed by the loan from being tendered before sufficient due diligence was undertaken.

Assessment of Quality of Supervision

62. The World Bank team remained responsive to changes in circumstances during implementation. The team was strengthened by the inclusion of a technical consultant with vast expertise in the air transport sector. He had supported the design of the TA component and participated in every supervision mission as part of the World Bank team. On average, two full-fledged supervision missions were conducted per year. The project leveraged locally based World Bank staff to maintain engagement with stakeholders and foster communications. Interim supervision missions were conducted toward the latter stages of implementation to minimize further delay. Additional guidance was also provided during implementation, when needed, through the organization of workshops and the deployment of World Bank specialists (for example, procurement, FM, safeguards, and air transport). The World Bank was proactive in recognizing the need to improve the PDO and Results Framework, which led to restructuring in 2014, while also fostering capacity building and encouraging the PMU to take ownership (for example, M&E). Over the course of the project, the team was able to maintain a candid dialogue with the project team to address various issues (such as the possible partial opening of the terminal or the opportunity to proceed with a management contract). The World Bank's advocacy succeeded in bringing private sector experience in this project as EHCAAN contracted an international airport operator to assist during the opening and to manage the new TB2 for two years.⁵⁰

against a bank guarantee to ease the financial situation of the Contractor. It had no impact on the total contract amount. Contract amendment 4 on September 28, 2016, was to account for variation orders that were outside the scope of the enhanced design according to amendment 1. See annex 4 (Table 4.2) for associated costs.

⁵⁰ The signing of private management contract was not an official loan condition in this project.

63. **Rating for overall World Bank performance and underlying justification.** For the reasons outlined in the previous paragraphs, the overall rating for World Bank performance is Moderately Satisfactory.

4.4 Risk to Development Outcome

64. **At project completion, the risk to development outcome is considered to be Low.** Through the World Bank's engagement, the GoE has a greater awareness of the importance of ensuring the sustainability of investments through adequate operations and maintenance. A 24-month renewable management contract is currently in place for TB2 with a reputable international operator. The GoE has allocated resources as part of its business plan for maintenance of the facilities and service quality going forward.⁵¹ CAC's financial standing remains sound, as detailed in the financial evaluation (annex 4). Strong Government commitment is expected to continue advancing the policy agenda. Exogenous factors such as the volatile political and security climate remain the main risk to traffic demand and the country's attractiveness for tourism. The increasing threat of terrorism and current security restrictions could deter passengers from flying to Egypt.

5. LESSONS AND RECOMMENDATIONS

65. The following lessons learned and recommendations from the project are intended to inform future World Bank Group operations.

66. **There needs to be a greater emphasis placed on completing preparatory studies and site surveys during the early stages of a project.** It is recommended that site surveys be undertaken and integrated into the design development before the contract goes to tender or else considerable risk is added to the project in terms of costs and delays in construction. The DC needs to be cognizant of applicable construction codes and structural conditions while developing the design.⁵² Surveys should cover geotechnical, topographical, structural condition, demolition, and contamination aspects. These can help inform the Contractor on the scope of intended works and the suitability of existing facilities to be included in permanent works, improve calculation of quantities and costs, identify any hazards, and so on.⁵³ To the extent the World Bank is involved in the preliminary design stage, it should play an active role in advising on the scope of studies. It should also ensure a more rigorous review of the design and the contract before it is tendered. These considerations, rather than initial client preferences (for example, for a refurbishment rather than a rebuild), should drive investment decisions.

67. **Swift action must be taken in response to nonperformance of the Engineer to prevent the project from suffering.** If attempts at improvement fail, and the Engineer lacks the required expertise to carry out his/her role, it should be changed as quickly as possible to prevent setbacks on the project. The Engineer for this project was financed and selected by the GoE before the World Bank Group loan became effective. The World Bank subsequently played an important role in advising the GoE, and the Engineer was eventually replaced in September 2014, after a one-year selection process and four years into implementation.

68. **Separating the roles of the DC and the Engineer can be beneficial, particularly on large-scale projects. The responsibilities of each stakeholder need to be clearly defined from the beginning.** When

⁵¹ On average 18 percent of total operating expenses are assigned for maintenance in CAC's budget to 2035.

⁵² In fact, during the ADP, CAC had to redesign parts of the TB3 design that was developed in the mid-1990s due to, among other factors, the application of a new seismic code in Egypt (ADP ICR).

⁵³ Review of Preliminary Design Report, September 2009.

the responsibilities are combined, the boundaries between the two parties are often blurred, which can lead to gaps and disagreements (for example, on HSE compliance), particularly when responsibilities have not been clearly established at the outset. Generally, the separation of roles reduces the potential for conflict of interest and improves accountability. The DC and Engineer also draw on two different skill sets. The firm appointed by the client to undertake the design and quality assurance may not be suitable to manage the overall project. The separation of the roles on this project and the selection of a new Engineer brought better accountability, project control, and management. When the roles are kept separate, it is expected that the DC will be accountable to the Engineer, who is in charge of managing the project on behalf of the client. In cases such as this when the client has weak capacity, an Engineer can fulfill an important advisory role for the client.

69. **To ensure better compliance with HSE aspects, responsibilities and consequences of HSE violations need to be clearly defined in the tender and contract documents.** Part of the challenge on the project was to elevate Egyptian standards to internationally accepted, World Bank standards. The World Bank can help the client by advising on provisions for HSE breaches in contracts, particularly related to fines and penalties. These should correspond with the expected level of performance and risk associated with the implementation of the project. Underestimated fine provisions on HSE can result in weak performance by the contractor and passing on of responsibilities.⁵⁴ Other measures need to be properly enforced from the beginning, such as submission and approval of the qualifications of HSE staff and organization chart and ensuring that a sufficient number of HSE officers are on-site, to ensure a proactive rather than reactive approach to HSE compliance.

70. **Greater clarity needs to be provided on the application of the price adjustment formula.** In general, there appeared to be a lack of understanding across stakeholders over how to correctly apply the formula stipulated in Clause 13.8 on the Adjustments of Changes in Cost in the General Conditions of Contract in the standard bidding documents. In future projects, to reduce uncertainty and potential cost implications, it would be advisable to have an example of the application of the clause in the bidding documents. As good practice, bidders could also be requested to run sample scenarios based on existing indexes as part of the evaluation. It would also be beneficial to have examples or illustrative guides on the World Bank Group's website for potential bidders to access. The International Federation of Consulting Engineers (FIDIC) could also be approached to discuss potential ways it could facilitate in ensuring the correct application of the formula and in revising the bidding documents to show how the formula is actually applied, in particular the conversion of the currency of index to the relevant currency of payment.

71. **A more comprehensive evaluation of airport service levels requires consideration of both quantitative and qualitative indicators in the Results Framework.** As the saying goes, "you cannot manage it if you don't measure it." Insights into quality criteria such as comfort, convenience, and ambience are best measured through qualitative indicators to complement quantifiable indicators (for example, processing times). They can be particularly useful in assessing discretionary areas such as airline lounges, retail and food beverage stores, seating areas, and so on, which are progressively becoming an important source of non-aeronautical revenues for airports and can greatly shape passenger perceptions. Airports are increasingly using innovative tools to interact with passengers and generate real-time feedback, for example, social media applications, to complement passenger surveys, focus groups, comment cards, and benchmarking surveys with other airports.

⁵⁴ Engineer's Close-Out Report.

72. **The management and operations of airport terminals can be greatly enhanced through private participation in the form of a management contract. The World Bank's engagement can be instrumental in promoting such an approach and convincing the Government of the value added.** Although a management contract was not part of the loan condition for this project, the World Bank stressed the important role of the operator.⁵⁵ Management contracts can bring professionalism as well as enhance the operational and financial performance of the airport, while fostering transfer of know-how and technical expertise. Having an operator in place is particularly helpful to support the ORAT process. Since March 2016, a recognized international operator has been engaged to manage TB2 for 24 months (renewable). However, it is considered good practice to have the same operator manage the entire airport for seamless integration across terminals and to ensure that operational efficiencies are gained.⁵⁶ During the project, the understanding was the operator would remain in place until a concessionaire is appointed in the next few years to potentially operate all terminals. Concessions generally involve a greater degree of private sector involvement and influence, transfer of risk, and longer contract duration.⁵⁷ Although other private sector options were discussed early on, they did not materialize.⁵⁸ Given the challenging political and investment climate, the management contract can be considered a favorable outcome, particularly in a country with minimal history of private engagement in the sector.

73. **Policy and institutional elements tend to have a longer-term impact but are an important incentive for the borrower.** The World Bank should continue to push for strategic TA work under loans; this intervention was one of only a few projects in the country that was financing TA work under a loan. The World Bank's continued engagement in a sector can help bring progress in advancing the policy agenda (for example, liberalization of air services, sector planning). This project benefited from the foundations laid in the ADP and a broad-ranging TA component. The long-standing relationships with the implementing agency also created mutual trust and value of World Bank operations and expertise.

74. **The World Bank and implementing agencies should work together to address issues that may compromise the quality, safety and security, or the technical, fiduciary, social, or environmental soundness of an infrastructure investment.** A partial opening of the terminal to begin limited operations in April 2016 was considered. However, the World Bank worked with EHCAAN to assess the risks of this proposal, in that offering partial and incomplete services to customers could compromise safety and security as well as have potential cost implications and impacts on the quality of the remaining works, which could have further delayed the full opening.

75. **The project offers positive lessons for collaboration between the borrower and the World Bank during a period of political turmoil.** The project had the same TTL who prepared the ADP, leveraging established relationships with the client and PMU. The transition to the second TTL was seamless and the TTL remained in charge until the completion of the project. The co-TTL had worked on the project from the very early stages of preparation. The PMU team in large part remained the same, with only one change to the PMU Director. CAC's Project Manager also remained the same. These arrangements helped

⁵⁵ When the loan was signed, there was a management contract already in place. During implementation of the ADP, a recognized and reputable operator was engaged by CAC to manage the entire airport as well as manage the ORAT process for TB3. The nine-year management contract terminated on January 31, 2014. The operator was instrumental during the enhancement of the TB2 design in providing recommendations, including the need for expanded retail space and so on.

⁵⁶ The current management contract in place is only for TB2; CAC covers O&M responsibilities for TB1 and TB3.

⁵⁷ PPP in Airports, 2016.

⁵⁸ The IFC was involved in discussions to consider different private sector options and in preparation for tender. A concession agreement has not been procured; however, potential options could include a concession contract for one or several terminals without capital expenditure and a concession contract for one or several terminals with capital expenditure. Capital expenditure could involve the rehabilitation of the ageing TB1.

mitigate the rotation of leadership within EHCAAN and CAC and offset external instability to minimize disruption to implementation.

ANNEXES

Annex 1. Results Framework

The ICR team adopted a summary table instead of the system-generated Results Framework. The following modified Results Framework table was designed to convey changes in the Results Framework during the project.

Table 1.1. Summary of PDOs and Indicators

Original PDO		To assist the Government of Egypt (GOE) to (i) enhance the quality of airport services through an increase in the capacity of Cairo International Airport, and (ii) strengthen air transport in Egypt ⁵⁹						
Revised PDO		To assist the Government of Egypt (GOE) to (i) enhance the capacity and the quality of services of Cairo International Airport and (ii) improve the capacity of key stakeholders (MoCA and EHCAAN) in the strategic planning of the air transport sector						
PDO Indicators		Baseline	Original Target	Revised Target	Actual Values at Project Completion	Achievement	Comment	
1	<i>Original (dropped in 2014 restructuring)</i>	Passenger traffic at CAI (in millions)	14.21	19.47		16.14	Partially achieved (83%)	Dropped during the 2014 restructuring and restated as direct project beneficiaries (see the next indicator).
2	<i>Added (2014 restructuring)</i>	Direct project beneficiaries (in millions)	14.21	19.47	15.30	16.14	Achieved (105%)	Added/restated. The former indicator for total passenger traffic at CAI (indicator 1 above) was restated as a core indicator and target was revised downward based on traffic forecasts following political unrest.
3	<i>Added (2014 restructuring)</i>	Female beneficiaries (%)	50%	50%		50%	Not measured	Added as a core indicator during the 2014 restructuring. Baseline and reported actual figures were set at 50% as the project was considered to be gender neutral and was not measured by CAC.

⁵⁹ The PDO was revised during the 2014 restructuring to be clearly attributable to the project as designed.

4	<i>Original (dropped in 2014 restructuring)</i>	Connecting passenger traffic at CAI (in millions)	0.67	3.95		0.63	Not achieved (16%)	Dropped during the 2014 restructuring as not directly attributable to the project activities.
5	<i>Original</i>	Passenger processing time in the new TB2 (departing) (in minutes)	45	36		66	Not achieved	—
6	<i>Original</i>	Passenger processing time in the new TB2 (arriving) (in minutes)	37	29		30	Mostly achieved (97%)	—
7	<i>Original (dropped in 2014 restructuring)</i>	Commercial revenue per passenger at CAI (US\$)	4.3	7.1		5.9	Partially achieved (84%)	Dropped during the 2014 restructuring as not directly attributable to the project activities.
8	<i>Original (dropped in 2014 restructuring)</i>	Number of enforced bilateral agreements	47	67		77	Achieved (115%)	Dropped during the 2014 restructuring as not directly attributable to the project activities.
9	<i>Original (dropped in 2014 restructuring)</i>	Rate of compliance of Egypt's Civil Aviation in safety and security audits	N/A ⁶⁰	75		83.4	Achieved (111%)	Dropped during the 2014 restructuring as not directly attributable to the project activities.
10	<i>Added (2014 restructuring)</i>	Number of passengers that can be served through TB2 in one day	9,590 ⁶¹	20,000 ⁶²		20,000	Achieved (100%)	Added as an indicator during the 2014 restructuring to better capture the impact of the project on capacity levels, which was absent from the original M&E framework.
11	<i>Added (2014 restructuring)</i>	TB2 reached the level B of IATA level of service (Yes/No)	No	Yes		No	Not yet verified at the time of ICR	Added as an indicator during the 2014 restructuring to better measure the impact of the project activities on service levels.

⁶⁰ No baseline was available for comparison as the International Civil Aviation Organization (ICAO) had recently changed the method of measuring compliance.

⁶¹ Maximum capacity of the old TB2.

⁶² Target was calculated by the annual capacity of TB2 (7.5 million) divided by 365 days.

12	<i>Added (2014 restructuring)</i>	Implementation of the strategic recommendations of the five studies by MoCA and EHCAAN (%) ⁶³	0	60		73	Achieved (122%)	Added as an indicator during the 2014 restructuring to comprehensively measure the impact of the project activities in Component 2.
Intermediate Results Indicators⁶⁴			Baseline	Original Target	Revised Target	Actual Values at Project Completion	Achievement	
Component 1: Rehabilitation and Expansion of the Terminal Building 2 (TB2) at Cairo International Airport								
1	<i>Original</i>	Percentage of physical completion of the new TB2	0	100		100	Achieved (100%)	
Component 2: Technical Assistance and Studies								
2	<i>Original</i>	2.1 Approved report on the air transport policy of Egypt and strategic options (Yes/No)	No	Yes		Yes	Achieved (100%)	
3	<i>Original</i>	2.2 Approved report on the development of air traffic control and air traffic management (Yes/No)	No	Yes		Yes	Achieved (100%)	
4	<i>Original</i>	2.3 Approved report on Civil Aviation Authority's compliance with ICAO Standards and Recommended Practices concerning regulatory oversight of safety and security (Yes/No)	No	Yes		Yes	Achieved (100%)	
5	<i>Original</i>	2.4 Approved report on fee and tax structure of the air transport sector (Yes/No)	No	Yes		Yes	Achieved (100%)	
6	<i>Original</i>	2.5 Approved report on spatial planning of Cairo airport's area (Yes/No)	No	Yes		Yes	Achieved (100%)	

⁶³ Evaluation is based on a weighting of 50 percent for completion of study and 50 percent for implementation of the study's recommendations. See table 1.2 for more details.

⁶⁴ The Intermediate Results Indicators did not change over the course of the project.

Table 1.2. Summary of Component 2 Activities

Study Name	Key Recommendations from Study	Implementation Status of Recommendations	Score	Outcomes
2.1 Review of Air Transport Policy of Egypt and Strategic Options	<p>The following four strategic action plans were identified for the Egyptian Civil Aviation Authority to develop a progressive and balanced liberalization process:</p> <ul style="list-style-type: none"> • Position and consolidate Egypt as a scheduled destination with Europe as the main touristic market • Reinforce and improve air services to the Middle East, the main Visiting Friends and Relatives (VFR) market • Develop the Central and East African market, encouraging hub operations at CAI • Reinforce the Origin/Destination (O/D) markets, contributing to developing CAI as a hub 	<ul style="list-style-type: none"> • Egypt has embarked on gradual liberalization of air services on a bilateral basis with several countries in the Middle East, Africa, and Europe. • Three multilateral agreements serving these regions are important: the Arab League Open-Skies Agreement, the Yamoussoukro Decision, and an open skies agreement with the European Union. 	<p>Completion Status: Completed on June 4, 2013 50/50</p> <hr/> <p>Implementation Status: 17/50</p> <hr/> <p>Overall Score: 67/100</p>	<ul style="list-style-type: none"> • Promote passenger traffic growth by removing barriers to entry • Promote competition • Decrease fares • Stimulation of demand
2.2 Development Strategy of Air Traffic Control and Air Traffic Management	<ul style="list-style-type: none"> • The study developed a plan of €223 million for 2011–2030 to optimize the CNS and ATC systems to provide adequate infrastructure to manage the future air traffic. • It recommended the upgrade of air traffic management (ATM) and ATC systems in seven airports in Egypt. 	<ul style="list-style-type: none"> • Two systems are being upgraded through the European Investment Bank and the <i>Agence Francaise de Developpement</i> and will be completed during FY17. • The remaining five airports are going to be upgraded through coordination between the Civil Aviation and the Air Force (undergoing final procurement stages). 	<p>Completion Status: Completed on August 3, 2011 50/50</p> <hr/> <p>Implementation Status: 23/50</p> <hr/> <p>Overall Score: 73/100</p>	<ul style="list-style-type: none"> • Modernized, safer, and more efficient ATM/ATC • Ease traffic congestion • Reduce costly ATC delays contributing to a reduction in fuel consumption and carbon emissions
2.3 Airport Excellence Review in Safety (APEX) by Airports Council	<ul style="list-style-type: none"> • Under the APEX in safety program, ACI organizes and dispatches a team of experts to the airport to improve level of safety in specific areas of interest. • A safety peer review of CAI was carried out by ACI from May 3–7, 2015, and the final report was issued in October 2015. 	<ul style="list-style-type: none"> • A workshop was held in November 2015 to discuss the report’s recommendations and findings. • As of August 2016, CAC had completed full implementation of the action plan (160 recommendations). 	<p>Completion Status: Completed on October 25, 2015 50/50</p> <hr/> <p>Implementation Status:</p>	<ul style="list-style-type: none"> • Improved operational safety, capacity, and training

International (ACI)	<ul style="list-style-type: none"> 160 recommendations were provided covering operations, procedures, and training on safety-related topics. 		50/50	
			Overall Score: 100/100	
2.4 Analysis of the Fee and Tax Structure of the Air Transport Sector	<ul style="list-style-type: none"> Benchmarking of fees according to ICAO recommendations and the region One of the main recommendations is to increase charges and fees to ensure the financial sustainability of the Egyptian airport and air navigation sector. 	<ul style="list-style-type: none"> Departure fees per passenger increased by US\$5 for international and charter traffic and by US\$1 for domestic traffic. This measure became effective on May 1, 2013, for all airports, except Sharm El-Sheikh and Hurghada. 	Completion Status: Completed on October 24, 2011 50/50 Implementation Status: 25/50 Overall Score: 75/100	<ul style="list-style-type: none"> Enhance financial sustainability of aviation sector Align fees, charges, and taxes with regional benchmarks
2.5 Spatial Planning of Cairo's Airport Area	<ul style="list-style-type: none"> The study produced a Conceptual Master Plan as a part of conceptual design of the Cairo Aerotropolis. The market assessment covers residential, office, retail, hotel, healthcare, education, and industrial development. It included traffic, environmental, geo-topographical, and marketing assessment of 10 million m² around the premises of the Cairo Airport. Implementation plan is divided into three phases over a project time line of 25 years (2015–2040 inclusive). 	<ul style="list-style-type: none"> A concession contract was signed for 39 years to a private investor for entertainment and commercial purposes, covering approximately 200 thousand m²; If implementation evaluation is based on total area covered by the study, then percentage implemented is 2%. EHCAAN is preparing with Lufthansa Consulting the detailed feasibility study to implement the first priority mentioned in the study related to logistics area and the cargo activities. 	Completion Status: Completed on October 24, 2011 50/50 Implementation Status: 2/50 Overall Score: 52/100	<ul style="list-style-type: none"> Optimal long-term planning of land use surrounding the airport Foster sustainable tourism and urban development
Total implementation			(367/500) 73%	Improve the capacity of key stakeholders in the strategic planning of the air transport sector

Note: For each study, an equal weighting was assigned for the completion of the study (50 percent) and for the implementation of its recommendations (50 percent) for a combined total assessment (100 percent).

Annex 2. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team Members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Ahmedou Hamed	Consultant	n.a.	n.a.
Akram El-Shorbagi	Senior Financial Management Specialist	MNAFM	Financial Management
Armando Araujo	Consultant	n.a.	Procurement
Armin Morz	Consultant	n.a.	Team Member
Charles Schlumberger	Lead Air Transport Specialist	GTI08	Air Transport
Fatiha Amar	Operations Analyst	GSP05	Operations
Ibrahim Saadi Shaqora	Consultant	n.a.	n.a.
Knut Opsal	Lead Social Development Specialist	GSU07	Safeguards
Maged Ahmed Mahmoud Hamed	Regional Safeguards Advisor	OPSPF	Safeguards
Michel Bellier	Task Team Leader	GTI08	TTL (ADM)
Philippe Jacobe De Naurois	Consultant - Financial	GEE06	Financial Evaluation
Robin Carruthers	Consultant - Transport Economist	GTCTC	Economic Evaluation
Sara Gonzalez Flavell	Special Assistant	IEGDG	Legal
Vickram Cuttaree	Program Leader	EACPF	Team Member
Vincent Vesin	Senior Transport Specialist	GTI08	Transport
Wael Elshabrawy	Financial Management Specialist	GG023	Financial Management
Zeyad Abu-Hassanein	Senior Environmental Specialist	GEN05	Safeguards
Supervision/ICR			
Afaf Mkami	Consultant	GTI08	ICR Team Member
Ahmad Ibrahim Omar	Customer Service Representative	GSDTF	Translation
Alan Carroll	Consultant	GTIDR	ICR Team Member
Amal Nabil Faltas Bastorous	Senior Social Development Specialist	GSU05	Safeguards
Amer Abdulwahab Ali Al-Ghorbany	Environmental Specialist	GEN05	Safeguards
Charles E. Schlumberger	Lead Air Transport Specialist	GTI08	Air Transport
Clara Alvarez Rodriguez	Team Member	n.a.	Team Member
Dhari Aljutaili	Team Member	n.a.	Team Member
Dina Elabd	Research Assistant	GTI05	Team Member
Ehab Mohamed Shaalan	Senior Environmental Specialist	GEN05	Safeguards
Henri Charles Malecot	Consultant	GTI05	Team Member
Howaida Kamel	Research Assistant	GTI05	Team Member
Luis R. Prada Villalobos	Senior Procurement Specialist	GGO05	Procurement
Michel Audige	Consultant	GTI05	Team Member
Michel Bellier	TTL/Consultant	GTI05	TTL (ADM), Team Member
Monica Sawyer	Operations Officer	GTISO	PMSO
Nargis Ryskulova	Transport Specialist	GTI03	Team Member
Olivier P. Le Ber	Task Team Leader	GTI05	TTL (ADM)
Robin Carruthers	Consultant	GTCTC	ICR Team Member
Ross Pavis	Senior Operations Officer	GTISO	PMSO

Names	Title	Unit	Responsibility/ Specialty
Sami Ali	Senior Operations Officer	GTI05	Transport
Shruti Vijayakumar	Transport Analyst	GTI08	ICR Team Leader
Vincent Vesin	Co-Task Team Leader	GTI08	Co-TTL
Wael Ahmed Elshabrawy	Financial Management Analyst	GGO23	Financial Management
Zeyad Abu-Hassanein	Senior Environmental Specialist	GEN05	Safeguards

(b) Staff Time and Cost

CADP (P101201)		
Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of Staff Weeks	US\$ (Including Travel and Consultant Costs)
Lending		
FY09	0.35	7,718
FY10	43.68	322,069
Total:	44.03	329,787
Supervision/ICR		
FY10	1.45	10,504
FY11	26.78	158,216
FY12	26.15	153,623
FY13	21.08	197,203
FY14	26.39	273,470
FY15	28.52	202,310
FY16	41.16	218,808
FY17	26.02	106,298
Total:	197.55	1,320,433

Annex 3. Project Costs

(a) Project Cost by Component

CADP (P101201)							
Components	Appraisal Estimate (US\$, millions)			Actual (US\$, millions)			Percentage of Appraisal
	IBRD	Borrower	Total	IBRD	Borrower	Total	
Component 1							
1.1 Demolition and Construction Works	263.20	142.70	405.90	211.14	186.13	397.27	98
1.2 Supervision of Works	0.00	5.00	5.00	0.00	8.44	8.44	169
1.3 Other (furniture, artwork, x-ray)	0.00	0.00	0.00	0.00	4.22	4.22	
Subtotal	263.20	147.70	410.90	211.14	198.79	409.93	100
Component 2							
2.1 Air Transport Policy	0.56	0.00	0.56	0.15	0.03	0.18	32
2.2 ATC and ATM Study	0.56	0.00	0.56	0.34	0.06	0.40	71
2.3 Fees and Taxes Study	0.56	0.00	0.56	0.29	0.05	0.34	61
2.4 APEX Review	0.56	0.00	0.56	0.02	0.00	0.02	4
2.5 Spatial Study	0.56	0.00	0.56	0.96	0.17	1.13	202
Subtotal	2.80	0.00	2.80	1.76	0.31	2.07	74
Others							
Contingencies	14.00	7.60	21.60	0.00	0.00	0.00	0
Front-end fee	0.00	0.70	0.70	0.00	0.70	0.70	100
Subtotal	14.00	8.30	22.30	0.00	0.70	0.70	3
Total Project Costs	280.00	156.00	436.00	212.90	199.80	412.70	95

Note: The difference between project costs and the total disbursement amount is due to the Designated Account. The disbursement period of the World Bank loan has been extended to May 31, 2017.

(b) Financing

CADP (P101201)				
Source of Funds	Type of Financing	Appraisal Estimate (US\$, millions)	Actual (US\$, millions)	Percentage of Appraisal
International Bank for Reconstruction and Development	Loan	280.00	212.90	76
Borrower	n.a.	156.00	199.80	128
Total	n.a.	436.00	412.70	95

Annex 4. Efficiency Analysis

Summary

1. An economic and financial analysis of the project over an evaluation period of 25 years, from 2010 to 2035, was conducted for the ICR. The financial evaluation resulted in an FIRR of 14.5 percent and an NPV of EGP 660.2 million (US\$110.4million equivalent) at a discount rate of 11 percent.⁶⁵ Given that CAC's revenues are in U.S. dollars and its expenses are in Egyptian pounds, and taking into consideration the fluctuations of the EGP, high benefits were generated resulting in sound financial results in spite of implementation delays, increases in the financing cost of the project, and cost overruns. The economic evaluation results were less positive resulting in an EIRR of 8.5 percent and a negative NPV of –US\$77.56 million at a discount rate of 12 percent. However, the project remains financially and economically viable with positive values of the economic NPV when using the newly recommended discount rates for projects in developing countries (between 4 percent and 8 percent for Egypt). The estimated NPV is US\$263.27 at a discount rate of 4 percent, US\$116.37 million at a discount rate of 6 percent, and US\$18.46 at a discount rate of 8 percent. The ex post economic evaluation is less favorable than at appraisal mainly because of lower than expected passenger traffic due to the events following the Arab Spring, increase in project costs due to the need to enhance the terminal design, and implementation delays. In light of the these factors, the overall efficiency of the project is rated Substantial.

Project Costs

2. Project costs included in the economic and financial analysis are actual costs for FY09–16 and projected costs for FY17. The project had cost overruns due to (a) the enhancement of the design of TB2, which resulted in a 26 percent increase of the works contract amount and (b) variation orders that were outside the scope of the enhanced design, which resulted in a 16 percent increase of the works contract amount, as detailed in table 4.1.

Table 4.1. Contract Amendments and Increases in Project Costs

Contract	Equivalent amount in EGP	Exchange rate (EGP/US\$)	Equivalent amount in US\$	%
Original contract	2,240,728,035.12	5.97	375,331,329	—
Amendment 1	572,932,008.78		95,968,511	26
Amendment 2	—		—	—
Amendment 3	—		—	—
Amendment 4	458,983,659.36		76,881,685	16
TOTAL	3,272,643,703.26		548,181,525	—

Source: OPRC Case Recommendation and Review Report, 2016.

3. In addition, due to the ongoing dispute between the Contractor and CAC regarding the application of the price adjustment formula, project costs may be subject to further increases depending on the final results of arbitration. The end of the disbursement grace period has also been extended from March 31, 2017, to May 31, 2017. Hence, costs used in this analysis for the ICR may not be the final project costs.

Ex Post Economic Evaluation

4. At appraisal, the economic analysis of the rehabilitation of TB2 was carried out using a conventional cost-benefit analysis for a period of 25 years starting from the year the civil works were estimated to start (2010). The project at appraisal had an estimated total initial investment of US\$413 million,⁶⁶ which yielded an NPV of US\$415 million and an EIRR of 20.3 percent.

Methodology

5. Since the model used at appraisal could not be found, a similar model was recreated following the same assumptions and yielding approximately the same EIRR and NPV.⁶⁷ The ex post economic evaluation followed the same basic approach as the ex ante evaluation by assessing the costs and benefits of the rehabilitation and expansion of the TB2 from 2010 to 2035, with no residual value considered.

6. The same four sources of benefits were accounted in this economic evaluation as in that for the PAD:

- (a) The net expenditure per additional tourist that is now able to visit Cairo
- (b) The additional net expenditure by foreign visitors in airport shops
- (c) The additional jobs created by construction works and the increased activity at the airport and
- (d) The time saving for passengers using CAI

7. The costs accounted for include

- (a) Investment costs and
- (b) O&M costs.

Passenger Air Traffic Conditions

8. Actual traffic volumes were used for the ex post analysis for 2009–2016. At appraisal, passenger traffic was assumed to remain at 0 percent growth in 2010 as a result of the economic crisis and grow at 5.4 percent over 2011–2016. However, 2010 recorded an all-time record of 16.1 million passengers with a growth rate of 12.2 percent, followed by a sharp collapse to 13.1 million passengers in 2011 (–19.3 percent) due to the decreased number of foreign tourism in the aftermath of the Arab Spring in 2011. In 2012, traffic volumes recovered and reached 14.7 million (+12.9 percent). The ongoing political unrest in 2013 resulted in another depression in traffic to 13.8 million passengers (–6.4 percent). Traffic rebounded

⁶⁶ These estimates were made based on the following assumptions: (a) costs include allowance for physical contingencies but not financial contingencies, as the economic analysis was undertaken at constant 2008 prices; (b) no allowance was made for taxes in converting financial to economic prices; and (c) no allowance was made for possible distortions in the exchange rate of the Egyptian pound against other currencies.

⁶⁷ The recreated model yields, using appraisal data, an NPV, at a discount rate of 12 percent, of US\$423.5 million, and an EIRR of 19.9 percent, to be compared with values obtained by the original model of an NPV, at a discount rate of 12 percent, of US\$415 million and an EIRR of 20.3 percent.

in 2014 to 14.7 million passengers and continued to grow from that time on, to reach a level of 15.8 million passengers in 2015 and 16.5 million passengers in 2016.

Table 4.2. Growth Rates Comparison for 2010–2016

	Growth Rates (%)		Number of Passengers (million)	
	Ex Ante	Ex Post	Ex Ante	Ex Post
2010	0.0	12.2	14.97	16.14
2011	5.4	-19.3	15.87	13.02
2012	5.4	12.9	16.82	14.71
2013	5.4	-6.4	17.83	13.76
2014	5.4	6.6	18.91	14.68
2015	5.4	7.8	20.06	15.83
2016	5.4	4.0	21.29	16.46

9. Traffic forecast for the period 2017–2035 was based on a study⁶⁸ conducted in 2011, which was also used as basis for CAC’s financial projections. Table 4.3 provides passengers traffic growth rates used in the analysis.

Table 4.3. Estimated Ex Post Growth Rates Compared to Appraisal Growth Rates, Authors and the 2011 Study for Average

			Growth Rates (%)			
			Ex Post			Ex Ante
			2017–2020	2020–2025	2025–2035	2017–2035
International	Business	National	9.40	5.70	4.30	2.50
		Foreign	9.40	5.70	4.30	2.50
	Leisure	National	9.40	6.38	4.82	3.50
		Foreign	9.40	5.70	4.30	3.70
Domestic	Business		5.10	3.30	2.70	3.20
	Leisure		5.61	3.63	2.97	4.40
Average			8.70	5.40	4.10	3.30

10. Although baseline traffic numbers are lower than expected at appraisal, projected traffic growth rates for 2017–2035 are significantly higher (average of 6 percent) than projections made at appraisal (average of 3.3 percent), reflecting Egypt’s transition from a period marked by political unrest to a period where traffic is expected to rebound and grow at a much accelerated pace.

Airport Terminal Capacities

11. Airport capacities over time were adjusted to reflect the opening of a new seasonal terminal in 2011, which was not foreseen at appraisal, and delay in the completion of the civil works.

12. The seasonal terminal with a capacity of 3.3 million began operations in September 2011 and raised the total capacity of CAI (TB1 + TB2 rehabilitated + TB3+ seasonal terminal) to 28.3 million passengers compared to a total capacity considered during appraisal of 25 million passengers. However, the seasonal terminal is designed to handle pilgrimage flights during a limited period of the year (Hajj and

⁶⁸ Analysis of the Fee and Tax Structure of the Air Transport Sector, Jacobs Consultancy, 2011.

Umrah). Its facilities are basic and not comparable to other terminals in terms of service quality and amenities. Thus, the opening of this seasonal terminal does not change the need of the additional capacity and the enhanced LoS provided by the rehabilitated TB2 to handle expected traffic growth for the period 2017-2035.

13. The start of the construction works of TB2 was delayed from 2010 to 2011 due to the need to enhance the design of TB2, leading to a one-year delay in completion of works and the full opening of the terminal. Nonetheless, it was demonstrated at appraisal, through sensitivity tests, that the optimum period for the start of construction of TB2 is between 2010 and 2012. Therefore, despite the delay, the actual start of construction remained within the optimal time period.

14. The economic reevaluation used the same assumptions that were used by CAC in their projections regarding the addition of future capacity through the opening of a new terminal TB4 in 2027/28. This analysis assumes that the additional capacity from TB4 will bring the total capacity of the airport to 35 million passengers, deferring the year by which the airport will reach its maximum capacity to 2030.

Estimating Economic Benefits

15. This analysis followed the same approach as the ex ante evaluation for estimating the economic benefits of the project, with slight changes to improve the methodology, as explained in the following paragraphs.

16. **Time savings to passengers.** Both the PAD and this ICR have assumed that (a) the cost per minute of delay for tourist passengers is based on their estimated willingness to pay to avoid the delay, while for business passengers it is based on the value of work that they would otherwise be able to do; (b) for both tourist and business passengers, the cost of each minute of delay to each passenger is proportional to that passenger's income; and (c) the length of delay to each passenger will increase exponentially as demand approaches capacity, consistent with queuing theory. However, unlike the ex ante evaluation, this analysis took into account the increase in the unit cost of congestion time as the passengers' income increases over time. Based on previous studies, a unit intertemporal income elasticity of the value of time of passengers was considered.

17. In the PAD, it was assumed that time-saving benefits will end when the combination of all three terminals are operating at 90 percent of their planned capacity and if additional airport capacity is not provided when needed. This analysis assumed that an additional terminal would be provided in 2027, bringing the total capacity of the airport to 35 million passengers. However, it was assumed that time savings will be accounted until the end of the evaluation period and will stop increasing when the airport is operating at 100 percent of its capacity.

18. **Tourist expenditure.** While tourist expenditure in Egypt was estimated based on the same assumptions made in the PAD, airport shops revenues were adjusted to take into account some recent estimates of tourists' expenditure at airports. Revenues from tourist expenditure come from two sources: (a) tourists who would use the airport even though TB2 were not built would spend 10 percent more if TB2 were available to them and (b) tourists who would not come if TB2 were not available, and the benefit from them is the whole of the net revenues from their airport expenditure. The net revenues were then estimated based on a recent study⁶⁹ on passengers spending at airports. It was assumed that the current

⁶⁹ F&B and Retail Survey, 2013, DKMA.

expenditure per foreign passenger at Cairo Airport is US\$25⁷⁰ and that due to the rehabilitation of TB2, it would increase by 10 percent until it reaches 50 percent of the benchmark value.

19. **Job creation.** No changes were made on the methodology of estimating job creation benefits used at appraisal. It was assumed that job creation benefits would stem from additional passengers at the airport at a rate of 2.4 additional jobs per 1,000 additional passengers⁷¹ and from the employment generated during construction of the airport at a rate of 50 jobs created per US\$1 million of expenditure.

Estimating Costs

20. Project costs include investments costs and O&M costs. Financial costs were converted to the economic costs by deducting 10 percent as an estimate of the taxes included in financial costs and taking into account fluctuations in the exchange rate as forecasted by CAC for its financial projections. The exchange rate is an important consideration as some of the costs and benefits are incurred in EGP and others in foreign currencies.

Results

21. The economic evaluation produced an overall project EIRR of 8.52 percent and a negative NPV of –US\$77.56 million using a 12 percent discount rate (which was the rate used at appraisal). This can be compared to an EIRR of 20.3 percent and an NPV of US\$415 million at appraisal with a 12 percent discount rate. However, when using the new World Bank Group-recommended approach for discounting costs and benefits in developing countries,⁷² taking into account the growth of economy overtime, the NPV is positive and therefore the project can still be considered economically viable. Table 4.4 presents the sensitivity analysis of NPV to discount rates.

Table 4.4: Sensitivity Analysis of NPV to the Discount Rate and MERR to the Reinvestment Rate

	Ex Post				Appraisal ⁷³			
Discount rate (%)	12	8	6	4	12	8	6	4
NPV (US\$, millions)	-77.6	18.5	116.4	263.2	423.5	1003.6	1501.1	2063.8
EIRR (%)	8.2				19.9			

22. The lower values of EIRR and NPV are mainly due to (a) slower than expected traffic growth, (b) cost overruns, and (c) delays in works completion and start of terminal operations.

⁷⁰ The benchmark value of US\$111.4 is the average of the passengers' expenditure in the world's largest 15 airports. And given that CAI is currently around 4.5 times smaller, it was assumed that the current average expenditure per international passenger is around 22.22 percent of the average expenditure at the world's largest airports. This yield an average expenditure at CAI per foreign passenger of US\$25. This value is more expansive than the CAC reported commercial revenue per passenger indicator (which was dropped during the 2014 restructuring) as the latter only captures CAC's non-aeronautical revenues (for example, parking, rentals) and does not include all expenditures of passengers at airport shops.

⁷¹ Managing Airports, 2003.

⁷² The new World Bank guidance on discounting costs and benefits is based on the prescriptive approach to evaluating the discount rate; if per capita growth is expected to be γ percent over the life of the project, the annual discount rate should be between γ percent and 2γ percent per year. In the case of Egypt, the projected real per capita growth over the life of the project is around 4 percent per year, which leads to a social discount rate between 4 percent and 8 percent.

⁷³ Results obtained with the recreated model, as the original model used at appraisal could not be found.

23. Furthermore, the project is expected to generate more than 50,000 direct and indirect jobs over its lifetime, and given the current Egyptian context and the high rates of unemployment, which reached an all-time high of 13.4 percent in 2013 and 12.6 percent in 2016,⁷⁴ the benefits of jobs creation are expected to be higher than what is assumed in this evaluation. The social value of a job created is significantly higher than the average income per job as accounted in the model of the economic evaluation. In addition, there are expected benefits related to time savings for aircrafts waiting for gates that were not taken into account in this evaluation but could raise the project's NPV and EIRR.

Sensitivity Analysis to Other Parameters

24. The estimate of TB2 rehabilitation and construction benefits is based on many assumptions that are subject to significant uncertainty. The sensitivity tests conducted in this section were designed to see the difference of results when testing less optimistic scenarios.

Table 4.5: Sensitivity Tests to Less Optimistic Scenarios

Assumption	EIRR	NPV (US\$, millions)			
		12%	8%	6%	4%
Basic assumptions	8.5%	-77.6	18.5	116.4	263.2
Decreasing growth rates by 25% for 2017–2020	6.2%	-120.6	-59.4	9.9	122.03
Decreasing the number of generated jobs by 50%	7.5%	-105.0	-19.8	69.9	208.06
Current expenditure at airport shops of US\$6.25 (75% less)	5.7%	-123.12	-71.37	-12.08	84.39
Exchange rate of 17 instead of 20 for 2018–2020	9%	-87.8	0.0	91.1	229.5
Increasing operation costs by 25%	7.7%	-94.9	-11.3	76.3	210.6

25. This set of sensitivity tests shows that the project's EIRR values remain acceptable even at less optimistic scenarios. In addition, the project NPV at a discount rate of 4 percent stayed positive for all the assumptions tested.

26. The computation of the EIRR is provided in table 4.6.

⁷⁴ Tradingeconomics.com

Table 4.6. Computation of the EIRR

Year	Costs (US\$, millions)		Benefits (US\$, millions)				Net Benefit (US\$, millions)
	Investments	Operating	Tourists	Congestion	Shops	Jobs	
2010	1.84	0	0.00	0.00	0.00	0.22	-1.62
2011	17.85	0	0.00	0.00	0.00	2.31	-15.54
2012	31.25	0	0.00	0.00	0.00	4.45	-26.80
2013	50.12	0	0.00	0.00	0.00	7.62	-42.50
2014	113.46	0	0.00	0.00	0.00	18.21	-95.25
2015	144.52	0	0.00	0.00	0.00	24.13	-120.38
2016	55.63	6.8	0.00	0.00	0.00	10.43	-52.01
2017	0.85	26.05	0.00	1.12	1.89	4.49	-19.41
2018	0.00	12.55	0.00	1.55	1.59	2.10	-7.31
2019		15.55	0.00	2.19	1.16	2.60	-9.61
2020		18.56	0.00	3.12	0.55	3.10	-11.78
2021		20.98	0.00	3.99	0.06	3.50	-13.43
2022		23.34	10.52	4.63	14.53	4.42	10.77
2023		26.19	35.62	6.08	24.26	6.15	45.92
2024		29.1	60.02	7.87	35.53	7.85	82.17
2025		30.57	67.25	7.87	39.39	8.46	92.40
2026		30.57	67.35	7.87	40.99	8.46	94.09
2027		30.57	54.54	26.65	34.55	7.82	92.99
2028		30.57	54.61	33.06	36.11	7.83	101.03
2029		30.57	54.69	41.19	37.81	7.83	110.95
2030		30.57	54.76	41.19	39.69	7.83	112.90
2031		30.57	54.83	41.19	41.75	7.84	115.04
2032		30.57	54.90	41.19	44.02	7.84	117.38
2033		30.57	54.97	41.19	46.51	7.85	119.94
2034		30.57	55.03	41.19	49.26	7.85	122.76
2035		30.57	55.09	41.19	52.27	7.85	125.84
						EIRR	8.5%

Ex Post Financial Analysis

27. This evaluation was based on the base scenario of the financial projections prepared by CAC for the period from 2005/06 to 2024/25. This scenario was developed based on the following assumptions:

- Departure fees were increased three times over the planning period in 2006/07 (starting January 1, 2007); in 2012/13 (starting January 5, 2013); and in 2014/15 (starting January 8, 2014) and then stay constant till the end of the plan. Table 4.7 presents the main assumptions related to the departure fees per passenger:

Table 4.7. Departure Fees Assumptions

Item	Actual 2006/2007 till 2012/2013 (US\$/Passenger)	Actual 2012/2013 till 2013/2014 (US\$/Passenger)	Actual 2014/2015 till the End of the Plan (US\$/Passenger)
International departure	15	20	25
Charter departure	15	20	25
Domestic departure	3	4	4

- Landing, parking, housing, and jet ways fees will start increasing in FY17 by the base case scenario percentage specified in the 2011 study⁷⁵ till the end of the plan (that is, +10 percent)
- The exchange rate of EGP to US\$ was computed as follows:

Table 4.8. Exchange Rate over the Evaluation Period, CAC (US\$ to EGP)

2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	Starting 2017/18
5.98	5.98	6	7	7	7	8.88	8.88	20

Note: The table presents the exchange rate changes as computed by CAC in its financial projections. The dramatic change in the exchange rate starting 2017/18 is due to the devaluation of the Egyptian pound.

- According to the growth rates provided by the base case scenario of the study, the total capacity of the airport (TB1 + rehabilitated TB2 + TB3 + seasonal terminal) will be reached in 2024/25. Hence, CAI will need to begin the construction of a new terminal by 2019/20. However, CAC cannot afford these costs in the near future. Thus, it is projected to start construction in 2023/24 and operation in 2027/28, one year before total capacity is reached, according to growth rates of the low base scenario of the study.

CAC's Financial Performance

28. The financial analysis of CAC's accounts and financial ratios show that CAC's financial situation has remained sound during the implementation period; the World Bank recommended during appraisal that CAC maintains a current ratio⁷⁶ of no less than 1, and a debt service coverage ratio⁷⁷ of no less than 1.2, and as table 4.9 shows that these figures were maintained.

Table 4.9: CAC's Financial Ratios during the Implementation Period

	FY 11	FY12	FY13	FY14	FY15	FY16
Debt service coverage ratio	2.6	2.8	1.6	3.9	3.6	3.3
Current ratio	1.1	1.2	1.2	1.1	1.2	1.7

⁷⁵ Jacobs study, *op cit*.

⁷⁶ The current ratio is a financial ratio that measures whether or not a company has enough resources to pay its debts over the next 12 months. Here it is defined as (current assets / current liabilities).

⁷⁷ The debt service coverage ratio is a financial ratio that measures the ability of a company to produce enough cash to cover its debt payments. Here it is defined as (total cash flow available for debt service) / (total debt service).

FIRR

29. The FIRR computation follows the same methodology used at appraisal. The life of the project has been estimated and computed until 2035. Incremental operating and maintenance costs correspond with those used in the analysis for computing the EIRR. The main inputs into the computation are (a) traffic forecasts and (b) CAC's financial statements.

30. The analysis compares the expenditure incurred in rehabilitating TB2 with the benefits received. The benefits stream includes the cash revenues generated by the additional number of passengers using TB2. It was assumed that the total capacity of TB2 would be gradually reached by 2024/25.

31. The result of the ex post financial evaluation is given in table 4.10. The FIRR is at 14.5 percent, which is slightly lower than the appraisal FIRR of 15.7 percent. The NPV calculated at a discount rate of 11 percent⁷⁸ is estimated at EGP 660.2 million (US\$110.4 million equivalent), compared with EGP 1,600 million (US\$283.1 million equivalent) at a discount rate of 8 percent⁷⁹ at appraisal. These lower values are mainly due to cost overruns, delays in implementation, and increases in the financing costs of the project due to the devaluation of the Egyptian pound. However, the project stayed financially viable; in fact, despite the fluctuations of the Egyptian pound, the operating revenues stayed significantly higher than costs, given that most of CAC's revenues are in the U.S. dollar while their expenses are in the Egyptian pound.

Table 4.10: Computation of the FIRR and the NPV

Year	Investments	Operating Cost	Total Cost	Traffic	New TB2 Traffic	Average revenue	Including Revenues	Net Benefits
	(EGP, millions)	(EGP, millions)	(EGP, millions)	(in million)	(in million)	(in EGP/Passenger)	(EGP, millions)	(EGP, millions)
2009/10	11.1	0.0	0.0	0.0		0.0	0.0	0.0
2010/11	2.2		2.2	14.4		91.9	0.0	-2.2
2011/12	235.0		235.0	14.1		91.9	0.0	-235.0
2012/13	181.6		181.6	15.3		91.9	0.0	-181.6
2013/14	598.0		598.0	13.6		168.3	0.0	-598.0
2014/15	1,167.0		1,167.0	15.4		168.3	0.0	-1,167.0
2015/16	1,081.1		1,081.1	16.1		168.3	0.0	-1,081.1
2016/17	16.8	201.4	218.2	17.2	1.9	168.3	315.6	97.4
2017/18		245.5	245.5	18.7	2.6	228.1	587.5	342.0
2018/19		312.2	312.2	20.4	3.3	228.1	747.2	434.9
2019/20		379.0	379.0	22.1	4.0	228.1	906.9	527.9
2020/21		445.7	445.7	23.3	4.7	228.1	1,066.6	620.9
2021/22		486.9	486.9	24.6	5.4	218.2	1,172.9	686.0

⁷⁸ The effective rate of interest as the best estimated proxy to the financing costs of the project taking into account the devaluation of the Egyptian pound.

⁷⁹ The effective rate of interest at appraisal, as the best-estimated proxy to the project financing costs.

Year	Investments	Operating Cost	Total Cost	Traffic	New TB2 Traffic	Average revenue	Including Revenues	Net Benefits
	(EGP, millions)	(EGP, millions)	(EGP, millions)	(in million)	(in million)	(in EGP/Passenger)	(EGP, millions)	(EGP, millions)
2022/23		550.3	550.3	25.9	6.1	218.2	1,325.7	775.3
2023/24		613.7	613.7	27.3	6.8	218.2	1,478.4	864.7
2024/25		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2025/26		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2026/27		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2027/28		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2028/29		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2029/2030		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2030/2031		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2031/2032		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2932/2033		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2033/2034		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
2034/2035		679.4	679.4	28.8	7.5	218.2	1,636.6	957.2
Total	2,457.8	2,613.5	5,071.2				25,603.6	11,613.4
							FIRR	14.5%
							NPV	660.2

32. Given the uncertainty of the assumptions related to the exchange rate and thus to the financing cost of the project, sensitivity analyses were conducted to test the viability of the project for different scenarios. In all cases, the NPV yields favorable results. Table 4.11 presents the main results found:

Table 4.11: Sensitivity Analysis to the Discount Rate

Discount rate (%)	12	11	8
NPV (EGP, millions)	421.95	660.20	1745.92

Annex 5. Borrower's Comments

As per the guidelines, the ICR was submitted to the Borrower for comments. They were given sufficient time to respond and provided the below response, which the team has taken into account.

Thanks a lot for your email, I'd like to extend my congratulations for such successful implementation of Cairo Airport Development Project -TB2 and on the efforts exerted by the Egyptian side and the WB team that established this important national project.

We appreciate the WB response to EHCAAN comments on the said project's ICR report, and we would like the bank to consider change the wording of the para 10 of the said report to be "...US \$156 would be financing by EHCAAN, instead of GoE and reflect it in table 1 below the said para as well, since EHCAAN financed out these amounts from its own resources.

Hoping for more fruitful cooperation with the WB.

Annex 6. Supporting Documents

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