

**PROJECT COMPLETION REPORT**

**ON THE**

**NATIONAL AIR NAVIGATION DEVELOPMENT PROJECT**  
**(Loan 1370-MON[SF])**

**IN**

**MONGOLIA**

**February 2001**

## CURRENCY EQUIVALENTS

		Currency Unit	–	Togrog (MNT)
		<b>At Appraisal</b> (June 1995)		<b>At Project Completion</b> (December 1999)
MNT1.00	=	\$0.0022		\$0.0010
\$1.00	=	MNT449		MNT1,000
SDR1.00	=	\$1.557		\$1.365

## ABBREVIATIONS

ADB	-	Asian Development Bank
CAA	-	Civil Aviation Authority
CAR	-	civil aviation regulation
EIRR	-	economic internal rate of return
FIRR	-	financial internal rate of return
ICAO	-	International Civil Aviation Organization
IDC	-	interest during construction
MIAT	-	Mongolian Airlines
TA	-	technical assistance

## NOTES

- (i) The fiscal year (FY) of the Government and the Civil Aviation Authority ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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## APPENDIXES

## BASIC DATA

### A. Loan Identification

1.	Country	Mongolia
2.	Loan Number	1370-MON(SF)
3.	Project Title	National Air Navigation Development Project
4.	Borrower	Mongolia
5.	Executing Agency	Civil Aviation Authority
6.	Amount of Loan	SDR15,410,000 <sup>1</sup>
7.	PCR Number	PCR:MON 613

### B. Loan Data

1.	Appraisal	
	- Date Started	29 May 1995
	- Date Completed	10 Jun 1995
2.	Loan Negotiations	
	- Date Started	24 Jul 1995
	- Date Completed	25 Jul 1995
3.	Date of Board Approval	05 Sep 1995
4.	Date of Loan Agreement	02 Nov 1995
5.	Date of Loan Effectiveness	
	- In Loan Agreement	90 days after date of Loan Agreement
	- Actual	14 Dec 1995
	- Number of Extensions	None
6.	Closing Date	
	- In Loan Agreement	31 Dec 1999
	- Actual	31 July 2000
	- Number of Extensions	One
7.	Terms of Loan	
	- Service Charge	1 percent per annum
	- Maturity	40 years
	- Grace Period	10 years
8.	Terms of Relending	
	- Interest Rate	6.5 percent per annum
	- Maturity	20 years
	- Grace Period	4 years
	- Second-Step Borrower	Civil Aviation Authority

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<sup>1</sup> Equivalent to \$24.0 million at appraisal.

## 9. Disbursements

## a. Dates

<b>Initial Disbursement</b> 11 Jan 1996	<b>Final Disbursement</b> 6 Nov 2000	<b>Time Interval</b> 4.8 years
<b>Effective Date</b> 14 Dec 1995	<b>Original Closing Date</b> 31 Dec 1999	<b>Time Interval</b> 4.5 years

## b. Amount

(\$ million equivalent as of 7 Nov 2000)

<b>Cat. No.</b>	<b>Project Component</b>	<b>Original Allocation</b>	<b>Last Revised Allocation</b>	<b>Net Amount Disbursed</b>	<b>Undisbursed Balance</b>
01	ATS Facilities and Navigational Aids	7,200,000	12,985,271	12,696,696	288,575
02	Telecommunications Facilities	3,100,000	0	0	0
03	Upgrading Choibalsan Airport	500,000	351,204	381,978	(30,774)
04	Ulaanbaatar Airport Safety and Security Improvement	150,000	0	0	0
05	Ground Equipment	5,000,000	4,042,701	4,043,852	(1,151)
06	Consulting Services	3,000,000	3,185,137	3,139,876	45,261
07	Service Charge	900,000	470,694	470,694	0
08	Unallocated	4,150,000	0	0	0
	<b>Total</b>	<b>24,000,000<sup>a</sup></b>	<b>21,035,007<sup>b</sup></b>	<b>20,733,096</b>	<b>301,911<sup>c</sup></b>

ATS = air traffic services

<sup>a</sup> Equivalent of SDR15,410,000 at appraisal.<sup>b</sup> The exchange rate depreciated during implementation from SDR1=\$1.557 at appraisal to SDR1=\$1.365 at loan closing.<sup>c</sup> Cancelled at loan closing.10. Local Costs (Asian Development Bank-financed)  
- Amount (\$)

None

## C. Project Data

## 1. Project Cost

(\$ million)

<b>Item</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
Foreign Exchange Cost	24.00	20.73
Local Currency Cost	8.50	8.47
<b>Total Cost</b>	<b>32.50</b>	<b>29.20</b>

## 2. Financing Plan

(\$ million)

Cost	Appraisal Estimate			Actual		
	Foreign	Local	Total	Foreign	Local	Total
<b>Implementation Costs</b>						
Borrower-Financed	0.00	3.47	3.47	0.00	4.91	4.91
ADB-Financed	23.10	0.00	23.10	20.26	0.00	20.26
Other External Financing	0.00	0.00	0.00	0.00	0.00	0.00
<b>Subtotal</b>	<b>23.10</b>	<b>3.47</b>	<b>26.57</b>	<b>20.26</b>	<b>4.91</b>	<b>25.17</b>
<b>IDC Costs</b>						
Borrower-Financed	0.00	5.03	5.03	0.00	3.56	3.56
ADB-Financed	0.90	0.00	0.90	0.47	0.00	0.47
Other External Financing	0.00	0.00	0.00	0.00	0.00	0.00
<b>Subtotal</b>	<b>0.90</b>	<b>5.03</b>	<b>5.93</b>	<b>0.47</b>	<b>3.56</b>	<b>4.03</b>
<b>Total</b>	<b>24.00</b>	<b>8.50</b>	<b>32.50</b>	<b>20.73</b>	<b>8.47</b>	<b>29.20</b>

ADB = Asian Development Bank, IDC = interest during construction

## 3. Cost Breakdown by Project Component

(\$ million)

Item	Appraisal Estimate			Actual		
	Foreign	Local	Total	Foreign	Local	Total
<b>A. Base Costs</b>						
Air Traffic Services Facilities and Navigation Equipment	7.20	0.20	7.40	12.70	1.28	13.98
Telecommunications Facilities	3.10	0.50	3.60	0.00	0.00	0.00 <sup>a</sup>
Choibalsan Airport Upgrading	0.50	2.00	2.50	0.38	1.31	1.69
Ulaanbaatar Airport Safety and Security Improvement	0.15	0.00	0.15	0.00	0.30	0.30
Ground Equipment	5.00	0.00	5.00	4.04	1.91	5.95
Consulting Services:						
- Human Resource and Systems Dev.	1.80	0.00	1.80	1.75	0.04	1.79
- Detailed Design and Implementation	1.20	0.00	1.20	1.36	0.02	1.38
- Y2K Adjustment Costs	0.00	0.00	0.00	0.03	0.05	0.08
<b>Subtotal (A)</b>	<b>18.95</b>	<b>2.70</b>	<b>21.65</b>	<b>20.26</b>	<b>4.91</b>	<b>25.17</b>
<b>B. Contingencies</b>						
Physical (Excluding Ground Equipment)	1.53	0.27	1.80	0.00	0.00	0.00
Price Escalation	2.62	0.50	3.12	0.00	0.00	0.00
<b>Subtotal (B)</b>	<b>4.15</b>	<b>0.77</b>	<b>4.92</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>C. Service Charges During Construction</b>						
	0.90	5.03	5.93	0.47	3.56	4.03
<b>Total</b>	<b>24.00</b>	<b>8.50</b>	<b>32.50</b>	<b>20.73</b>	<b>8.47</b>	<b>29.20</b>

Y2K = year 2000

<sup>a</sup> As anticipated at appraisal, the telecommunications facilities, the air traffic services, and the navigational aids were procured under one contract package entirely financed out of the air traffic services facilities and navigation equipment category after reallocation of loan proceeds.

## 4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants	01 Nov 1995	11 Dec 1995
Completion of Consulting Services	31 Mar 1996	01 Mar 1996
Equipment and Supplies:		
First Procurement	01 Aug 1996	06 Nov 1996
Last Procurement	01 Oct 1996	10 Jul 2000
Completion of Equipment Installation	31 Dec 1998	31 Dec 2000

## D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-days	Specialization of Members <sup>a</sup>
Fact-finding	27 Feb to 11 Mar 1995	4	52	b, e, f, g
Appraisal	30 May to 11 Jun 1995	5	65	a, b, c, e, j
Inception 1	10-21 Feb 1996	1	12	b
Special Loan Administration	5-8 May 1996	1	4	b
Inception 2	18-30 Oct 1996	2	26	a, b
Review 1	29 Aug to 9 Sep 1997	3	36	a, i
Review 2 <sup>b</sup>	24 Mar to 3 Apr 1998	1	11	a
Review 3 <sup>b</sup>	2-10 Jul 1998	1	9	a
Review 4 <sup>c</sup>	6-17 Apr 1999	1	12	a
Review 5 <sup>d</sup>	9-21 Nov 1999	1	13	a
Project Completion Review <sup>e</sup>	24 Oct – 3 Nov 2000	3	33	a, h, i

<sup>a</sup> a-engineer, b-financial analyst, c-counsel, d-economist, e-programs officer, f-staff consultant and air navigation expert, g-staff consultant and air traffic services, h-staff consultant and financial analyst, i-assistant project analyst, j-mission secretary.

<sup>b</sup> In conjunction with review of Loan 1256-MON(SF): *Ulaanbaatar Airport Project*, for SDR25.745 million, approved on 12 October 1993.

<sup>c</sup> In conjunction with review of Loan 1256-MON(SF) and Loan 1300-MON(SF): *Telecommunications Project*.

<sup>d</sup> In conjunction with review of Loan 1364-MON(SF): *Roads Development Project* and Loan 1300-MON(SF): *Telecommunications Project*.

<sup>e</sup> The Mission comprised Jean-Marie Lacombe, Project Engineer and Mission Leader, Mr. Christopher Webb, Staff Consultant and Financial Analyst; and Teresita Capati, Assistant Project Analyst.

## I. PROJECT DESCRIPTION

1. The Project was the second lending operation of the Asian Development Bank (ADB) in Mongolia's civil aviation sector.<sup>1</sup> In line with the development priorities of the Government, and ADB's country assistance plan and country operational strategy, the objectives of the Project were to (i) improve the safety and efficiency of air navigation in Mongolian airspace, (ii) contribute to the development of international air routes over Mongolia, (iii) upgrade civil aviation practices to internationally acceptable levels, and (iv) support institutional strengthening and human resource development. The Project was in response to major concerns expressed by international airlines, the International Civil Aviation Organization (ICAO), and the Government about the adequacy of the Mongolia's air traffic system. As a first step ADB provided technical assistance (TA) to, among other things, prepare a national air safety master plan and identify a program for upgrading the country's air traffic services.<sup>2</sup> The Project was designed based on the TA recommendations. Together with the loan, ADB provided an advisory TA to complement the institutional strengthening program initiated under TA 1963, and optimize the infrastructure improvements implemented under the Project.<sup>3</sup>

2. At appraisal the Project comprised the development of national air navigation and telecommunications networks, the provision of airfield lighting at Choibalsan Airport, and security and ground service equipment at Ulaanbaatar Airport,<sup>4</sup> and consulting services for human resources and systems development, and design and implementation supervision.

3. The Project was appraised from 30 May to 11 June 1995. On 5 September 1995, ADB approved a loan of SDR15.41 million (\$24 million equivalent) from its Special Funds resources, and a related TA grant of \$592,000 (footnote 3). The Loan Agreement was signed on 2 November 1995 and declared effective on 14 December 1995. The loan account was closed on 6 November 2000.<sup>5</sup> The list of major events in project implementation is in Appendix 1.

## II. EVALUATION OF IMPLEMENTATION

### A. Project Components

4. The project components were implemented as envisaged at appraisal. To meet the actual implementation requirements, some minor changes in scope were approved as follows: (i) reduction of the airfield lighting at Choibalsan Airport to that required for one-way approach as a two-way approach was not required, and installation of the second lighting set at Hovd Airport to improve airport operation; (ii) cancellation of a stand-alone computer system for immigration control at Ulaanbaatar Airport because such a system was not technically and

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<sup>1</sup> The first, Loan 1256-MON(SF): *Ulaanbaatar Airport Project*, for \$36.0 million equivalent, was approved on 12 October 1993 and completed in August 1997. The project completion report circulated to ADB's Board of Directors on 30 September 1999 rated the project as generally successful.

<sup>2</sup> TA 1963-MON: *Institutional Strengthening of the Civil Aviation Sector and National Air Safety Master Plan*, for \$850,000, approved on 12 October 1993.

<sup>3</sup> TA 2391-MON: *Institutional Strengthening of the Civil Aviation Sector, Phase II*, for \$592,000, approved on 5 September 1995.

<sup>4</sup> The ground service equipment was originally to be procured under Loan 1256-MON(SF): *Ulaanbaatar Airport Project*, but was added to the Project because of financing constraints and the need to reconsider the equipment requirements based on the findings of TA 1963-MON (PCR: MON 25306: *Ulaanbaatar Airport Project*, September 1999).

<sup>5</sup> On 22 December 1999, ADB approved extension of the loan closing date from 31 December 1999 to 31 July 2000.

administratively feasible; and (iii) procurement of additional navigational aids and telecommunications equipment financed by loan savings.<sup>6</sup>

## **B. Implementation Arrangements**

5. The project implementation arrangements were those envisaged at appraisal. The Civil Aviation Authority (CAA) was the Executing Agency and the project steering committee monitored and coordinated project activities throughout the implementation period. The steering committee met regularly and was instrumental in coordinating the project activities. The project implementation unit headed by a qualified project manager was suitably staffed with professionals. The performance of the implementation unit and the steering committee was satisfactory.

## **C. Project Costs**

6. The actual project cost was \$29.2 million compared with the appraisal estimate of \$32.5 million, and comprised \$20.7 million (71 percent) in foreign exchange cost and \$8.5 million equivalent (29 percent) in local currency (Appendix 2). The higher than anticipated cost of equipment and civil works (\$25.2 million) was financed from the contingency provision. The \$1.4 million contingency balance plus the \$1.9 million savings from the interest during construction (IDC) resulted in an overall project cost reduction of about \$3.3 million. The local currency cost remained as appraised at \$8.5 million equivalent because (i) the togrog depreciation did not affect the amount of taxes, in dollar terms, on imported goods and services, and (ii) the savings on the CAA-financed civil works at Choibalsan Airport were used by CAA to procure additional ground equipment.<sup>7</sup>

7. The financing plan at appraisal envisaged a \$24.0 million equivalent (SDR15.41 million) loan from ADB's Special Funds resources to cover 100 percent of the foreign exchange cost of the Project. The \$8.5 million local currency cost was to be funded by the Borrower. The actual foreign exchange cost of \$20.7 million, equivalent to SDR15.18 million, was financed in full by the loan. The local currency cost of \$8.5 million equivalent including \$3.6 million IDC on the subsidiary loan, was financed by the Borrower.<sup>8</sup> Of the total amount disbursed from the loan, \$20.2 million covered the foreign exchange cost for procurement and \$0.5 million was for service charges during construction (Appendix 2).

## **D. Project Schedule**

8. The implementation period envisaged at appraisal was about three and one-half years with completion of the physical works in mid-1999. The Project was substantially completed in December 1999. The six-month delay is attributed to delays in implementing upgrading works at Choibalsan Airport and procuring the ground service equipment for Ulaanbaatar Airport.<sup>9</sup> The appraised and actual implementation schedules are in Appendix 3.

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<sup>6</sup> ADB approved cancellation of the immigration control system at Ulaanbaatar Airport and minor change in scope for airfield lighting at Choibalsan Airport on 2 February and 28 October 1999, respectively. Procurement of additional navigational aids was approved by ADB on 4 January 2000.

<sup>7</sup> In the course of the Project, the togrog depreciated from MNT449/\$ to MNT1,000/\$.

<sup>8</sup> CAA paid IDC to the Government at a rate of 6.6 percent in accordance with the subsidiary loan agreement.

<sup>9</sup> Upgrading works at Choibalsan Airport were delayed due to protracted actions by the Government on the development of the airport. The ground service equipment had to be rebid due the failure of the first successful bidder to produce the performance security.

## **E. Engagement of Consultants, and Procurement of Goods and Services**

9. Consulting services for design and construction supervision, and human resources and systems development requiring about 210 person-months were financed entirely by the loan. The recruitment of consultants was conducted in accordance with ADB's *Guidelines on the Use of Consultants*. A \$3.1 million contract was signed in December 1995. The consultants were mobilized in January 1996 and the services substantially completed in October 1998.<sup>10</sup> The TA consulting services commenced in March 1997 and the final TA report was submitted in January 1998.

10. The Project was implemented under 14 contract packages including five through international competitive bidding, five through international shopping, and four through direct purchase procedures (Appendix 4). The procurement of goods was conducted in accordance with ADB's *Guidelines for Procurement*. Except for the ground service equipment, goods were procured without any major problems. Owing to the failure of the first successful bidder to submit the required performance security and in the absence of a second responsive bidder, the ground equipment was rebid.

## **F. Performance of Consultants, Contractors, and Suppliers**

11. The consultants' performance in assisting CAA by providing the required design and supervision services, and implementing the human resource and system development program was satisfactory. The performance of suppliers was also satisfactory, as the equipment was delivered in time, and installed and commissioned in accordance with the contractual terms and conditions.

## **G. Conditions and Covenants**

12. Most of the loan covenants were complied with (Appendix 5). Without affecting the project benefits, the areas of weak compliance related mainly to the reporting of CAA's accounts and the project benefit monitoring system. CAA agreed to (i) improve its accounting system to produce monthly reports; and (ii) prepare a database framework to monitor and evaluate project benefits, and ensure adequate development and investment planning.

13. Upon completion of the Ulaanbaatar Airport project (footnote 1) the loan covenants relating to the financial autonomy of Mongolian Airlines (MIAT) and CAA were partly complied with.<sup>11</sup> While the Government does not subsidize non-profitable domestic routes that need to be maintained by MIAT in the national interest, plans including reengineering of MIAT's business and privatization of non-aviation activities are being developed to achieve MIAT's self-financing. The financial autonomy of CAA is hindered by the transfer of part of the overflight revenues collected by CAA to the Ministry of Finance. The \$8.0 million and \$10.0 million appropriated by the Government in 1999 and 2000 respectively, have been allocated to the repayment of the two CAA subsidiary loans.<sup>12</sup> Of the \$10.0 million transferred in 2000, about \$5.3 million covered debt service in 2000 and the balance will be used to cover debt service for 2001. While it did not affect CAA's financial capacity, the advance collection of the debt service that was intended to provide budgetary support to the Government was decided without considering CAA's budget requirements. The appropriation of CAA's revenues by the Government for advance repayment of CAA's debt is acceptable in so far as the amounts collected are mutually agreed after

<sup>10</sup> The consulting services for implementation supervision covered the procurement, installation and commissioning of air traffic services and telecommunications facilities, and Ulaanbaatar Airport safety and security equipment, only.

<sup>11</sup> Loan Agreement for Loan No.1256-MON, Schedule 6, paras.4, 8 and 10.

<sup>12</sup> The proceeds of the two ADB Special Funds resources loans were lent by the Government to CAA under subsidiary loan agreements at a 6.6 percent interest rate.

provision is made for CAA's operation and maintenance cost, and investments in facilities and services to ensure compliance with ICAO standards. On the principle that overflight revenues should be primarily reinvested in the sector, these arrangements will continue to apply after full repayment of CAA's loans, to the transfer of CAA's surplus revenues to the Government. The Government provided assurance that the appropriation of overflight revenues, either for debt service or transfer of surplus revenues, will be made after due consideration of CAA's budget.

## **H. Disbursements**

14. From the \$21.0 million equivalent loan, \$20.7 million including \$0.5 million for IDC, was disbursed by the loan closing date of 6 November 2000 (Appendix 6).<sup>13</sup> The \$0.3 million undisbursed loan balance was canceled. CAA disbursed \$8.5 million equivalent to cover local currency costs. Of CAA's contribution, \$3.6 million was for IDC under the subsidiary loan (footnote 12).

## **I. Environmental and Social Impacts**

15. The Project was classified as belonging to environmental category C. Equipment procured under the project was installed in the existing Ulaanbaatar Airport facilities, most of which were constructed under the first airport project, and in small buildings at the provincial airports. No adverse environmental impact resulted from the Project. The Project did not require any acquisition of land, and did not affect the population. The Project was gender neutral. While retrenchments were required as a result of CAA's restructuring, the retrenchments were implemented in accordance with the government's laws and regulations. Currently, CAA employs about 1,200 persons of whom about 250 are women.

## **J. Performance of the Borrower and the Executing Agency**

16. The performance of the Borrower and CAA was satisfactory. Communications with ADB were timely, the implementation arrangements were well established and maintained, and conditions and covenants stipulated in the Loan Agreement were generally complied with. A seven-month extension of the loan closing date was required because of delayed actions by the Government in developing Choibalsan Airport, and the need to rebid the ground service equipment (footnote 9). Counterpart funds were adequate and released on schedule.

17. While reinforcing the reforms initiated under Loan 1256, the policy dialogue carried out under the Project was aimed at bringing many of the sector practices, institutions, laws, and regulations up to international standards, proceeding with commercialization, increasing self-financing, enhancing cost recovery practices, and supporting human resource development.

### **1. Sector Reform**

18. The following institutional development measures were implemented: (i) formal adoption of the National Air Safety Master Plan, prepared under TA 2391 (footnote 3); (ii) formal adoption of the global navigation satellite system within Mongolian airspace; (iii) implementation of the Civil Aviation Act; (iv) implementation of the civil aviation regulations (CARs) developed under the first airport project;<sup>14</sup> (v) organizational restructuring of CAA to achieve a closer matching of functional requirements in line with the CARs; (vi) human resource development and training; (vii)

<sup>13</sup> As a result of the depreciation of the SDR from \$1.557 to the dollar at appraisal to \$1.365 on the loan closing date, ADB financing for the Project decreased from \$24 million to \$21 million.

<sup>14</sup> These CARs covered flight operations, aviation security, air traffic control operations, aerodrome operations, search and rescue, licensing, and airworthiness.

preparation of an aeronautical information publication for Mongolia; (viii) implementation of improved immigration procedures; and (ix) medium- to long-term development of the sector through a capital budgeting process and the use of the National Air Safety Master Plan.

19. CAA is actively pursuing institutional and organizational development of the sector. As part of the Mongolian Capacity Building Program financed by the Australian Government, the Civil Aviation Act is being amended to separate CAA's regulatory functions from those of service provider, and the CARs are being further developed. ICAO provided assistance in preparing an airport emergency plan to enhance CAA's capability in dealing with emergency situations such as aircraft accidents, bomb threats, and hijacking.

## **2. Commercialization and Self-Financing**

20. CAA successfully commercialized the country's airspace. Starting in 1996, early in project implementation, CAA concluded commercial overflight agreements with international airlines.<sup>15</sup> These commercial overflight agreements provide for discounted air navigation charges against the payment by the airlines of a lump sum fee, which as specified in the agreements should be used to finance the development of Mongolian air navigation facilities. The \$15.0 million lump sum fees collected during 1996-1999 constitute a major source of benefit, which accrued from the commencement of the Project. In addition to the commercial overflight agreements, CAA has signed air navigation agreements with 32 airline companies.<sup>16</sup>

## **3. Cost Recovery**

21. In compliance with the Loan Agreement, CAA is carrying out an annual review of its tariffs and charges based on ICAO's recommendations. As a result of increased tariffs and charges, CAA's revenues exceeded costs by about \$8.0 million in 1997. After a loss in 1998 due to a downturn in revenues and increased operating costs following the commissioning of the project equipment, full cost recovery was achieved in 1999 again, and is expected in 2000 too.

## **4. Human Resource Development and Training**

22. The implementation of the human resource development program envisaged at appraisal was satisfactory. Aimed at improving human resource skills, practices, and procedures of the sector in compliance with ICAO's standards and recommended practices, the human resource development and training program was implemented under 10 modules: (i) air traffic service staff training, (ii) air traffic service support personnel training, (iii) MIAT flight safety audit, (iv) MIAT marketing and business plan, (v) MIAT ground handling operations, (vi) rescue and fire fighting services, (vii) aviation security, (viii) search and rescue, (ix) air safety regulations, and (x) CAA and MIAT management training. Despite the unfamiliarity of CAA and MIAT with international procedures and practices at the time of implementing the training modules, the training objectives were successfully achieved.

23. CAA is continuing with the institutional and organizational development of the sector with the assistance of ICAO and bilateral funding agencies. The Government of Sweden is providing a grant to finance a capacity building program to prepare the sector for technology changes.<sup>17</sup>

<sup>15</sup> Air France, Alitalia, Asiana Airlines, British Airways, Cathay Pacific, Korean Air, Lufthansa, and Virgin Atlantic. Given the high number of overflights, discounted overflight rates were agreed for the contract period, with a part of them paid upfront as a lump sum.

<sup>16</sup> Air navigation agreements allow country overflight against the payment of the full overflight rate.

<sup>17</sup> Within the next 10 years the current ground-based air navigation facilities will be replaced worldwide by a satellite-based system.

As part of the Australian-financed program (para.19), training in CARs is expected to be provided in 2001. A training program in air traffic control is being implemented at the Bangkok civil aviation training center with the assistance of the Civil Aviation Authority of Thailand.

## **K. Performance of the Asian Development Bank**

24. ADB followed established procedures and standards in preparing and implementing the Project, and its performance was satisfactory. The Project did not experience any major implementation-related issues. ADB staff, through frequent review missions and exchange of correspondence, developed and maintained a successful partnership, and provided the required monitoring and follow-up. The aide-memoire prepared at the end of each review mission highlighted issues requiring particular attention, and recorded the agreements reached with the Borrower and CAA on actions required to ensure successful implementation of the Project.

## **III. EVALUATION OF INITIAL PERFORMANCE AND BENEFITS**

### **A. Financial Performance**

#### **1. Traffic Reevaluation**

25. The traffic has been reevaluated based on the actual aircraft and passenger movements, and overflight traffic from 1995 to 2000 (Appendix 7). As a result of signing new air navigation agreements, overflight traffic from 1995 to 2000 grew at an average annual rate of 15 percent compared with 14 percent estimated at appraisal. The overflight traffic could further increase by about 25 percent in 2001 following the opening of new routes over Mongolia.<sup>18</sup> The opening of these routes is subject to successful negotiations between the People's Republic of China and the airlines, and installation of required navigation equipment by Canada and the Russian Federation. However, for the preparation of the project completion report, the annual overflight traffic growth has been forecast conservatively at 5 percent from 2001 to 2005 and 3 percent thereafter.

26. The international and domestic aircraft movements from 1996 to 2000 increased at an average annual rate of about 26 percent and 12 percent, respectively. International aircraft movements are anticipated to increase by 10 percent through 2001 and 2002, and 5 percent thereafter. Domestic aircraft movements are expected to stagnate until 2003 and to grow at an annual rate of 1 percent thereafter. Following an average annual growth of about 8 percent over the last five years, international passenger traffic is expected to increase at 8 percent per annum in 2001 and 2002, and 5 percent thereafter. Annual domestic passenger traffic is expected to stagnate at around 140,000 passengers until 2003 and to grow at an annual rate of 3 percent from 2004 onward.

#### **2. Financial Performance of CAA**

27. Detailed financial statements showing CAA's estimated and actual performance are in Appendix 8. CAA's revenues increased at an average annual rate of 24 percent, from \$8.3 million in 1995 to \$24.4 million in 2000. Overflight revenues increased at an average annual rate of 27 percent, from \$6.2 million in 1995 to \$18.7 million in 2000. From 2001, overflight revenues are expected to increase, as the air navigation charges will be billed based on actual fares<sup>19</sup>.

<sup>18</sup> Asia 1, and Polar 2 and 3 routes. Asia 1 will be opened to two-way traffic between London and Hong Kong, China. Polar 2 is a one-way traffic route linking North America and Asia, and Polar 3 a two-way traffic route linking Beijing and Hong Kong, China to North America.

<sup>19</sup> Most of the commercial overflight agreements expired by the end of 2000. They will be replaced by air navigation agreements requiring the payment of the full overflight rate.

Without the opening of new routes (footnote 18), overflight revenues are expected to increase at an annual rate of 5 percent from 2001 to 2005, and 3 percent thereafter. However, should the new routes be opened in the next two years, a significant increase of about 25 percent could occur in 2001 and 2002.

28. CAA's net operating income before tax increased at an average annual rate of 9.7 percent, from \$4.6 million in 1995 to \$7.3 million in 2000. The increase was achieved despite higher operation and maintenance costs due to the operation of the newly installed navigation equipment, losses at domestic airports, and the costs of development programs. Net operating income before tax is expected to increase in 2001 and 2002 by about 3 percent, and 1 percent thereafter. The net operating income resulting from the estimated growth will allow CAA to fully service its debt.

29. Except for MIAT's outstanding payments, financial performance indicators are in line with acceptable standards.<sup>20</sup> CAA is servicing its debt under the two subsidiary loan agreements and no repayment default is anticipated.

### **3. Financial Reevaluation**

30. At appraisal the financial rate of return (FIRR) of the Project was estimated based on CAA's total incremental revenues including the total overflight revenues. In reevaluating the FIRR, only 85 percent of the overflight fees and the lump sum fees paid under the overflight agreements (para. 20) have been considered as air navigation revenues.<sup>21</sup> The FIRR is estimated at 16.1 percent against 12.7 percent at appraisal (Appendix 9). The increase is attributed mainly to the up-front payment of lump sum fees, which were not anticipated and included in the estimated benefit stream at appraisal. Sensitivity analysis indicates that if the new routes are opened in the next two years (footnote 18), the FIRR will exceed 32 percent.

### **B. Economic Performance**

31. The economic reevaluation of the Project is based on the assumptions used at appraisal. The detailed calculation of the economic internal rate of return (EIRR) is in Appendix 10. The project EIRR, excluding as a benefit the lump sum fees under the commercial agreements, is reevaluated at 16.2 percent against 20.9 percent at appraisal.<sup>22</sup> Incremental user charges are the largest source of benefit. Sensitivity analysis indicates that the Project will remain economically viable even with a reduction in air navigation benefits of about 15 percent.

### **C. Attainment of Benefits**

32. While some rationalization measures identified at appraisal were not taken,<sup>23</sup> most of the benefits have been attained, with the major part deriving from the commercial overflight agreements (para. 20). The lump sum fees paid under these commercial agreements generated a total revenue of \$15 million during 1995-1999. In addition, improved infrastructure and air safety conditions resulted in a significant increase in overflight traffic.

<sup>20</sup> In November 2000, MIAT owed CAA about \$4.0 million of air navigation and airport charges. The repayment of the debt has been mutually rescheduled from 2001 to 2003.

<sup>21</sup> In line with the relevant ICAO standards, 15 percent of the overflight revenues are to be considered as airport revenues.

<sup>22</sup> The lump sum fees resulting from the commercial overflight agreements are treated as a financial benefit.

<sup>23</sup> Due to the Government's employment policy and for aviation safety reasons, the closure of air traffic control centers at Shand and Moron and the subsequent staff reduction anticipated at appraisal were not achieved.

#### IV. TECHNICAL ASSISTANCE

33. The primary objective of TA 2391 (footnote 3) was to assist with policy dialogue, especially in the area of human resources and systems development. More specifically, the TA supported (i) the preparation of regulations and policy papers, (ii) the restructuring of CAA, and (iii) the full development of the CAA commercial accounting system. The TA was implemented between March and August 1997. The consultant's final report was submitted in January 1998. The TA was generally successful as the objectives were met.

34. The TA supported the institutional and organizational development of the civil aviation sector. Policy papers and CARs were prepared to strengthen Mongolia's participation in international air traffic services, and ensure compliance with ICAO's standards and recommended practices. CAA's organization and staffing have also been improved. The TA helped design and develop a fully accrual-based commercial accounting system. The system is operational and produces the desired reports in accordance with international accounting standards. Policy and procedure manuals have been adopted to allow CAA's accounting department to operate in line with international accounting practices. The TA consultant recommended a set of measures for computerized immigration control, and prepared the required equipment specifications. However, the recommended computerized system for immigration control at Ulaanbaatar Airport was not implemented because the system was not technically and administratively feasible due to the absence of a nationwide management information system for immigration control.<sup>24</sup>

#### V. CONCLUSIONS AND RECOMMENDATIONS

##### A. Conclusions

35. The Project was physically completed in December 1999, with final payments to contractors and equipment suppliers made in October 2000. Despite the six-month implementation delay, the Project was completed successfully within the appraisal estimate. The performance of consultants, contractors, and suppliers was satisfactory. Improved air traffic safety and airspace management were instrumental in increasing the overflight traffic and ensuing revenues. The country's economy has benefited significantly from the Project. The Project will yield long-term financial and economic benefits.

36. The project objectives have been attained. The primary objective, i.e., improving the safety and efficiency of air navigation, has been fully met. While the overflight traffic significantly increased, no aircraft accident was recorded and only few incidents were reported. Air traffic management, human resource development, and sector regulations have been significantly improved. Sector practices are being further upgraded to comply with international standards and meet industry requirements. The Government has assured that CAA will be given the required autonomy to fulfill its regulator and service provider obligations in compliance with the Civil Aviation Act.

37. The performance of the Borrower and CAA was satisfactory. CAA achieved most of the project benefits before project completion. The benefits are sustainable and CAA is playing an increasingly important role in international civil aviation. Based on the overall assessment principles outlined in ADB's *Guidelines for the Preparation of Project Performance Audit Reports*, the Project is classified as highly successful (Appendix 11).

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<sup>24</sup> At the Borrower's request, ADB approved cancellation of the allocation for the immigration control system on 2 February 1999. The other security and safety equipment included at appraisal, i.e., the fuel testing equipment and voice recorder, was procured under CAA's own financing.

## **B. Lessons Learned**

38. The revenue from the commercial overflight agreements was a significant benefit, which was not expected at appraisal. Early attainment of the project objectives is attributable to CAA's active marketing policy and the positive response of the international airlines. While the Government and CAA through their high level of commitment and ownership played an instrumental role, the successful implementation of the Project is also attributable to the significant enhancement of competencies and capacity of CAA staff who benefited from the human resource development programs implemented with ADB assistance.

39. The positive impacts of the Project on the potential users of Mongolian airspace were underestimated at appraisal. While designed to meet international traffic standards and requirements, the profitability and sustainability of an air navigation development project that includes a capacity building component, depend greatly on the reaction of international airlines and the capacity of the infrastructure owner to market the airspace management system.

## **C. Recommendations**

### **1. Project Related**

40. To consolidate the project achievements and ensure their long-term sustainability, the Government should collect CAA's revenues only after allowing for CAA's operation and maintenance costs, and investments in facilities and services required to ensure compliance with ICAO standards. CAA should be given full financial autonomy to fulfill its obligations under the Civil Aviation Act. Compliance with these recommendations will be assessed through the review of CAA's annual reports to be submitted to ADB.

41. CAA should improve its overall business management, budgeting system, and financial management by preparing monthly accounting reports. Monthly accounting reports for the first quarter of 2001 are expected to be submitted to ADB along with the quarterly accounting report in April 2001.

42. To achieve compliance with the relevant loan covenant, CAA should develop a project benefit monitoring and evaluation system in accordance with ADB's *Guidelines on Benefit Monitoring and Evaluation*. The data recording framework and the evaluation system are expected to be submitted to ADB by 31 January 2001.

### **2. General**

43. To develop civil aviation as a key sector in the country's economy, CAA should (i) deepen sector reform to achieve clear separation of CAA's regulatory functions and service provider activities; (ii) continue the institutional and organizational development of the sector using its own resources and external assistance; (iii) implement training programs in financial and business management, and English business communications; and (iv) plan the development of provincial airports.

## APPENDIXES

Number	Title	Page	Cited On (page, para.)
1	Chronology of Major Events in Project Implementation	11	1, 3
2	Project Cost and Financing Plan	13	2, 6
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4	Contract Packages	15	3, 10
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6	Actual Loan Disbursements	21	4, 14
7	Traffic Analysis	22	6, 25
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## CHRONOLOGY OF MAJOR EVENTS IN PROJECT IMPLEMENTATION

27 Feb to 11 Mar 1995	Fact-Finding Mission.
25 May 1995	Management Review Meeting. Management approved advance action for the recruitment of the consultants for detailed design and implementation supervision.
29 May to 10 Jun 1995	Appraisal Mission.
20 Jul 1995	Staff Review Committee meeting.
24-25 Jul 1995	Loan negotiations.
5 Sep 1995	ADB approves loan of special drawing rights (SDR) 15.41 million, equivalent to \$24.0 million, and advisory technical assistance, for \$592,000 for the Institutional Strengthening of the Civil Aviation Sector.
2 Nov 1995	Loan and Project agreements signed.
21 Nov 1995	ADB approves the consultants' contract award for detailed design and implementation supervision, and human resource and systems development.
10-21 Feb 1996	Inception Mission 1.
5-8 May 1996	Special Loan Administration Mission.
18-30 Oct 1996	Inception Mission 2.
6 Nov 1996	ADB approves award of contracts for (i) rescue and fire fighting equipment through international competitive bidding (ICB), (ii) control tower cab through international shopping (IS), and (iii) aviation security equipment through IS.
17 Dec 1996	ADB approves award of the contract for procuring air traffic services (ATS) facilities, and navigation and telecommunications equipment through ICB.
29 Aug to 9 Sep 1997	Review Mission 1.
24 Mar to 3 Apr 1998	Review Mission 2.
2-10 Jul 1998	Review Mission 3.
13 Aug 1998	ADB approves award of the contract for procuring airfield lighting control through IS.

2 Feb 1999	ADB approves (i) cancellation of Part D – Ulaanbaatar Airport Safety and Security Improvement from project scope, and (ii) related reallocation of loan proceeds.
6-17 Apr 1999	Review Mission 4.
4 May 1999	ADB approves award of the contract for procuring ground service equipment through ICB.
28 Oct 1999	ADB approves minor change in project scope for financing (i) Hovd airport lighting and (ii) consulting services for the year 2000 (Y2K) issue.
9-21 Nov 1999	Review Mission 5.
11 Nov 1999	ADB approves award of the contract for procuring consulting services for Y2K.
23 Nov 1999	ADB approves award of the contract for procuring airfield lighting systems at Choibalsan and Hovd Airports through IS.
22 Dec 1999	ADB approves extension of loan closing date by seven months from 31 December 1999 to 31 July 2000.
4 Jan 2000	ADB approves (i) minor change in project scope and implementation arrangement to procure additional navigation aids and telecommunications equipment, and (ii) reallocation of loan proceeds from categories 03, 05, and 06 to category 01.
6 Jan 2000	ADB approves award of contracts for procuring (i) three VHF RCAG equipment, (ii) two solar power systems for the RCAG VHF stations, and (iii) electronic test equipment using direct purchase (DP).
29 Mar 2000	ADB approves award of the contract for procuring integrated ground station using DP.
31 Mar 2000	ADB receives the Borrower's project completion report.
17 May 2000	ADB approves award of the contract for procuring a flight inspection system using IS.
31 Aug 2000	ADB approves reallocation of unutilized loan proceeds from category 07 to category 01.
23-31 Oct 2000	Project Completion Review Mission.
6 Nov 2000	Loan account is closed and unutilized loan proceeds of SDR232,902.47, equivalent to \$297,961.45 are canceled.

**PROJECT COST AND FINANCING PLAN**  
(\$ million)

Item	Appraisal					Actual				
	Estimated Cost			Financing Plan		Actual Costs			Financing Plan	
	Foreign Exchange	Local Currency	Total	ADB	Gov.	Foreign Exchange	Local Currency	Total	ADB	Gov.
				Foreign Exchange	Local Currency				Foreign Exchange	Local Currency
<b>A. Base Cost</b>										
1. Air Traffic Services Facilities and Navigation Equipment	7.20	0.20	7.40	7.20	0.20	12.70	1.28	13.98 <sup>a</sup>	12.70	1.28
2. Telecommunications Facilities	3.10	0.50	3.60	3.10	0.50	0.00	0.00	0.00 <sup>b</sup>	0.00	0.00
3. Upgrading Choibalsan Airport	0.50	2.00	2.50	0.50	2.00	0.38	1.31	1.69	0.38	1.31
4. Ulaanbaatar Airport Safety and Security Equipment	0.15	0.00	0.15	0.15	0.00	0.00	0.30	0.30 <sup>c</sup>	0.00	0.30
5. Ground Equipment	5.00	0.00	5.00	5.00	0.00	4.04	1.91	5.95 <sup>d</sup>	4.04	1.91
6. Consulting Services	3.00	0.00	3.00	3.00	0.00	3.14	0.11	3.25	3.14	0.11
<b>Subtotal (A)</b>	<b>18.95</b>	<b>2.70</b>	<b>21.65</b>	<b>18.95</b>	<b>2.70</b>	<b>20.26</b>	<b>4.91</b>	<b>25.17</b>	<b>20.26</b>	<b>4.91</b>
<b>B. Contingencies</b>										
1. Physical	1.53	0.27	1.80	1.53	0.27	0.00	0.00	0.00	0.00	0.00
2. Price	2.62	0.50	3.12	2.62	0.50	0.00	0.00	0.00	0.00	0.00
<b>Subtotal (B)</b>	<b>4.15</b>	<b>0.77</b>	<b>4.92</b>	<b>4.15</b>	<b>0.77</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>C. Services Charges During Construction and other charges</b>	0.90	5.03	5.93	0.90	5.03	0.47	3.56	4.03	0.47	3.56
<b>Total Project Cost</b>	<b>24.00</b>	<b>8.50</b>	<b>32.50</b>	<b>24.00</b>	<b>8.50</b>	<b>20.73</b>	<b>8.47</b>	<b>29.20</b>	<b>20.73</b>	<b>8.47</b>
<b>Overall Financing Percentage</b>				<b>74%</b>	<b>26%</b>				<b>71%</b>	<b>29%</b>

a. Including the cost of the five additional packages for additional navigational aids and communications equipment as approved by the Asian Development Bank (ADB) on 3 January 2000.

b. Since the air traffic services facilities, navigational aids and telecommunications equipment were procured under one international competitive bidding contract as envisaged at

c. appraisal, ADB approved reallocation of loan proceeds from category 2 to Category 1 to facilitate loan disbursement procedures.

d. ADB approved the Borrower's proposed cancellation of the computer system for immigration control at Ulaanbaatar on 1 February 1999. The other airport safety equipment were procured by the Civil Aviation Authority with its own resources.

Including (i) the ground equipment cost and (ii) the cost (\$1.91 million) for a snow removal vehicle and friction tester equipment procured by CAA with its own resources.

Source: Civil Aviation Authority, ADB staff.



## CONTRACT PACKAGES

Cat.	PCSS Number	Proc. Mode	ADB Approval	Description	Winning Bidder	Country	Contract Amount (\$)	Contract Signing	% of ADB Financing
<b>Part A &amp; B: Air Traffic Services Facilities, Navigation Equipment, and Telecommunications Facilities</b>									
01	0002	ICB	17 Dec.1996	Air Traffic Service Facilities	Raytheon Company	USA	11,848,506.00	28 Feb.1997	100
	0011	IS	17 May 2000	Flight Inspection System	Radiola Corporation Ltd	New Zealand	341,816.00	18 May 2000	100
	0012	DP	29 Mar 2000	Integrated Ground Station	Arinc Inc.	USA	58,500.00	27 Apr. 2000	100
	0013	DP	6 Jan. 2000	Three VHF RCAG Equipment	Park Air Electronics,Ltd	UK	279,374.30	10 Jul.2000	100
	0014	DP	6 Jan. 2000	Two Solar Power Systems for the RCAG VHF Stations	Photovoltaic Division	Mongolia	123,880.00	10 Jul.2000	100
	0015	DP	6 Jan. 2000	Electronic Test Equipment	Codan Pty, Ltd	Australia	44,620.00	10 Jul.2000	100
<b>Subtotal</b>							<b>12,696,696.30</b>		
<b>Part C: Upgrading Choibalsan Airport</b>									
03	0010	IS	23 Nov. 1999	Airfield Lighting System at Choibalsan and Hovd Airports	Siemens AG	Germany	<b>381,977.76</b>	7 Feb. 2000	100
<b>Part E: Ground Equipment</b>									
05	0003	ICB	6 Nov. 1996	Rescue Fire Fighting Services Equipment	Oshkosh Truck Corp.	USA	862,747.20	25 Feb.1997	100
	0004	IS	6 Nov. 1996	Control Tower Cab	Berliner Anlagen-und Nachricht	Germany	369,400.00	5 Feb. 1997	100
	0005	IS	6 Nov. 1996	Aviation Security Equipment	Asia-Pacific Scan Pte. Ltd.	Singapore	307,414.00	18 Feb.1997	100
	0007	IS	13 Aug. 1998	Airfield Lighting Control	BAN GMBH	Germany	204,292.00	19 Dec. 1998	100
	0008	ICB	4 May 1999	Ground Services Equipment	DEVTEC Co. Ltd	Hong Kong, China	2,299,999.00	18 May 1999	100
<b>Subtotal</b>							<b>4,043,852.20</b>		
<b>Part F: Consulting Services</b>									
06	0001	DN	21 Nov.1995	HRD and Detailed Design Supervision	Michael Kellaway Int.	Australia	3,332,500.00	11 Dec. 1995	100
	0009	DN	11 Nov.1999	Y2K	CRO Engineering	Canada	30,000.00	15 Oct. 1999	100
<b>Subtotal</b>							<b>3,362,500.00</b>		
<b>Total</b>							<b>20,485,026.26</b>	<sup>a</sup>	

ADB = Asian Development Bank DN = direct negotiation, DP = direct purchase, HRD = human resources development, ICB = international competitive bidding, IS = international shopping, RCAG = remote controlled air-ground, UK = United Kingdom, USA = United States, VHF = very high frequency, Y2K = year 2000.

a. As a result of the \$0.223 million savings under the consulting services contract, out of the total contract amount of \$20.485 million, only \$20.262 million were disbursed. Source: ADB staff.

### COMPLIANCE WITH LOAN COVENANTS

Covenants	Reference to Loan Documents	Status of Compliance
<b>A. Project Execution</b>		
1. The Civil Aviation Authority (CAA) will be the Executing Agency and shall be responsible for planning, implementing, managing, supervising and coordinating the Project.	Loan Agreement (LA), Sch. 6, para. 1	Complied with.
2. The project steering committee will be maintained throughout project implementation and will meet at least twice a year to oversee progress under the Project.	LA, Sch. 6, para. 2	Complied with.
3. CAA will ensure that the project implementation unit remains adequately staffed throughout project implementation, and is headed by the project manager who must have qualifications and experience of at least a managerial rank and otherwise be acceptable to Asian Development Bank (ADB).	LA, Sch. 6, para. 3	Complied with.
<b>B. Legislation</b>		
4. The Borrower and CAA will carry out by 30 June 1996 all actions that will support the approval of a Government Order to amend the charter of the Ministry of Infrastructure (MOI) to clarify the implementation and operation of the Airspace Law of Mongolia.	LA, Sch. 6, para. 4	Complied with. A first amended Airspace Law was approved by Parliament on 22 Jan. 99. The Airspace Law, renamed the Civil Aviation Act, is being amended under a technical assistance program financed by the Australian Government (AusAID) and expected to be approved by the end of 2001.
5. Within the context of the existing arrangements for the operation of the Airspace Law of Mongolia 1992, CAA will introduce the following civil aviation regulations (CARs) that comply with the standards and recommended practices (SARPs) of the International Civil Aviation Organization (ICAO): (i) by 31 December 1995, flight operations, aviation security, air traffic control operations, and aerodrome operations; and (ii) by 30 June 1996, search and rescue, licensing, and airworthiness.	LA, Sch. 6, para. 5	Being complied with. CARs are being developed further under a technical assistance program financed by AusAID.

Covenants	Reference to Loan Documents	Status of Compliance
6. Within three months of the approval of the proposed Government Order to modify the charter of MID, as referred to in para. 4, the CARs will be suitably amended and/or expanded to reflect the new administrative arrangements.	LA, Sch. 6, para. 6.	Complied with.
<b>C. Aeronautical Information Publication</b>		
7. Prior to 1 September 1996, CAA will implement an aeronautical information publication for the Mongolia Flight Information Region that complies with the relevant sections of ICAO's SARPS.	LA, Sch. 6, para. 7	Complied with. First publication in English was issued in June 1998. Updated version was published in September 2000
<b>D. Tariffs and Charges</b>		
8. The Borrower will ensure that CAA has adequate authority to set its tariffs and charges and to source their required inputs on the basis of market principles.	LA, Sch. 6, para. 8	Being complied with. CAA sets its tariffs and charges based on ICAO recommendations. They are to be submitted to the Ministry of Infrastructure for approval.
9. The Borrower will ensure that CAA retains its ongoing responsibility for charging and collecting all tariffs and charges (including airport, air traffic services, overflight, license, and inspection fees) relating to the use of Mongolia's civil aviation infrastructure and airspace.	LA, Sch. 6, para. 9	Being complied with. CAA has full responsibility for setting its own tariffs and charges. They are subject to review and concurrence by MOI prior to implementation.
10. CAA will carry out an annual review of its tariffs and charges and submit to ADB the results of such review.	LA, Sch. 6, para. 10	Being complied with. The last review of CAA's tariffs and charges was in October 1999.
11. By 30 June 1996, implement a system of landing charges, aircraft parking charges, air navigation charges, and airport passenger service charges, for domestic operations in line with ICAO-recommended standards where appropriate, for all airport facilities in Mongolia.	LA, Sch. 6, para. 11	Complied with. A system has been in place since 1 January 1995.

Covenants	Reference to Loan Documents	Status of Compliance
<b>E. Accounts</b>		
12. By 31 December 1997, CAA will introduce, and operate thereafter, a full accrual-based commercial accounting system.	LA, Sch. 6, para. 12	Complied with. A full accrual-based accounting system is operational. However reporting needs to be improved.
13. Submit to ADB, not later than nine months after close of each fiscal year, audited project accounts and financial statements, all in English.	Project Agreement, (PA), Section 2.09(a)	Complied with. Audited project accounts and financial statements were submitted on time.
<b>F. Financial</b>		
14. Prior to 31 December 1999, CAA will not commit to, or enter into agreement to commit to, any form of loan, public or private bond issue, or any other debt with a repayment obligation of greater than 18 months in duration without the prior agreement of ADB.	LA, Sch. 6, 13	Complied with.
<b>G. Organizational Restructuring</b>		
15. Prior to 30 June 1996, CAA will carry out a general restructuring of its activities taking into account the recommendations of the consultants under TA 1963-MON.	LA, Sch. 6, para. 14	Complied with.
16. Prior to 1 January 1998, CAA will progressively adjust its staffing complement to a level and skills mix appropriate to the technology to be introduced under the Project and the proposed CARs.	LA, Sch. 6, para. 15	Being complied with. CAA staffing has been adjusted to the industry requirements. However significant staff reduction could not be implemented owing to the limitations imposed by the Mongolian labor laws.

Covenants	Reference to Loan Documents	Status of Compliance
<b>H. Bilateral Arrangements</b>		
<p>17. Prior to 1 January 1997, the Government and CAA will enter into negotiations to firm up acceptable and upgraded bilateral agreements with the aviation administration of the People's Republic of China (PRC), Kazakhstan, and the Russian Federation on:</p> <p>(i) the provision of search and rescue services; (ii) protocols covering the provision of communications to aircraft; and (iii) air traffic control and acceptance procedures, and coordination of flight plan modifications.</p>	LA, Sch. 6, para. 16	<p>Complied with. Bilateral agreements with the PRC and the Russian Federation have been established, and improvements on these agreements are being implemented. No agreement is needed with Kazakhstan as it is not in the immediate boundary of Mongolia.</p>
<b>I. Safety</b>		
<p>18. In conformity with the approved National Air Safety Master Plan, prior to the completion of the Project, CAA will decommission its existing approach and secondary surveillance radar facilities.</p>	LA, Sch. 6, para. 17	Complied with.
<b>J. Privatization of Airport Services</b>		
<p>19. During project implementation, CAA will, in consultation with ADB, progressively transfer selected airport services (e.g., cleaning services, catering services, concessionaires) to the private sector.</p>	LA, Sch. 6, para. 18	<p>Complied with. Operation of non-aviation services have transferred to the private sector.</p>
<b>K. CAA's Investment and Dividend Policy</b>		
<p>20. For CAA to invest in facilities that will facilitate minimum compliance with ICAO's SARPs, the Borrower and CAA have agreed that CAA will provide from its earnings and other sources of funds an amount that is sufficient to finance at least the five-year capital investment program that was approved by CAA's board of directors on 14 April 1995.</p>	LA, Sch. 6, para. 19	<p>Complied with. However, government's appropriation of CAA's revenues without due consideration to CAA's budget requirements hinder CAA's financial autonomy without affecting, so far, its investment capacity.</p>

<b>Covenants</b>	<b>Reference to Loan Documents</b>	<b>Status of Compliance</b>
<b>L. Benefit Monitoring and Evaluation</b>		
<p>21. CAA will continually monitor, assess, and report on the physical, financial, economic, and social aspects of implementation; these activities will be reviewed by ADB. The systems for recording the data and collecting the statistics for such monitoring will be established as part of project management. CAA will evaluate the benefits of the Project after completion in accordance with a schedule and terms of reference to be mutually agreed upon with the ADB.</p>	LA, Sch. 6, para. 20	Partly complied with. The Project Completion Review Mission provided the principles for a database framework to implement a benefit monitoring and evaluation system in early 2001. The base line data are available.
<b>M. Reviews</b>		
<p>22. The Borrower shall carry out, or cause to be carried out, the following reviews:</p> <ul style="list-style-type: none"> <li>(i) preliminary design review,</li> <li>(ii) detailed design review, and</li> <li>(iii) midterm review.</li> </ul>	LA, Sch. 6, para. 21	Complied with.

**ACTUAL LOAN DISBURSEMENTS**  
**(\$)**

Cat.	Contract Number	Winning Bidder	Country	Contract Amount (\$)	Disbursement					Total
					1996	1997	1998	1999	2000	
01	0002	Raytheon Company	USA	11,848,506.00		5,369,632.47	5,376,518.99	998,657.35	103,696.39	11,848,505.20
	0011	Radiola Corporation Ltd	New Zealand	341,816.00					341,816.00	341,816.00
	0012	Arinc Inc.	USA	58,500.00					58,500.00	58,500.00
	0013	Park Air Electronics,Ltd	UK	279,374.30					279,374.30	279,374.30
	0014	Photovoltaic Division	Mongolia	123,880.00					123,880.00	123,880.00
	0015	Codan Pty, Ltd	Australia	44,620.00					44,620.00	44,620.00
		<b>Subtotal</b>		<b>12,696,696.30</b>		5,369,632.47	5,376,518.99	998,657.35	951,886.69	<b>12,696,695.50</b>
03	0010	Siemens AG	Germany	<b>381,977.76</b>					381,977.76	<b>381,977.76</b>
05	0003	Oshkosh Truck Corp.	USA	862,747.20		776,472.48	86,274.72			862,747.20
	0004	Berliner Anlagen-und Nachricht	Germany	369,400.00		369,400.00				369,400.00
	0005	Asia-Pacific Scan Pte. Ltd.	Singapore	307,414.00		92,224.20	199,819.10	15,370.70		307,414.00
	0007	BAN GMBH	Germany	204,292.00				204,292.00		204,292.00
	0008	DEVTEC Co. Ltd	Hong Kong, China	2,299,999.00				1,309,569.24	990,429.76	2,299,999.00
		<b>Subtotal</b>		<b>4,043,852.20</b>		1,238,096.68	286,093.82	1,529,231.94	990,429.76	<b>4,043,852.20</b>
06	0001	Michael Kellaway Int.	Australia	3,332,500.00	1,836,118.82	844,127.66	334,938.23	47,185.00	47,921.82	3,110,291.53
	0009	CRO Engineering	Canada	30,000.00				10,000.00	19,584.64	29,584.64
		<b>Subtotal</b>		<b>3,362,500.00</b>	1,836,118.82	844,127.66	334,938.23	57,185.00	67,506.46	<b>3,139,876.17</b>
07		Service Charges During Construction		<b>470,693.85</b>	1,574.67	26,916.61	92,726.81	157,309.06	192,166.70	<b>470,693.85</b>
		<b>Total</b>		<b>20,955,720.11</b> <sup>a</sup>	1,837,693.49	7,478,773.42	6,090,277.85	2,742,383.35	2,583,967.37	<b>20,733,095.48</b>

UK = United Kingdom, USA = United States.

a. As a result of \$0.223 million savings under consulting services contracts, out of the total amount of \$20.956 million only \$20.733 million were disbursed.

Source: Asian Development Bank staff.

## TRAFFIC ANALYSIS

1. The traffic analysis considers the evolution of aircraft movements, passenger traffic, and overflights from 1995 to 2000. Traffic data are summarized in Table A7.

### A. Domestic and International Movements

2. From 1995 to 2000 international movements (landing and takeoffs) increased from 462 to 2,887 reflecting an average annual growth rate of 26 percent, which is comparable with the estimate at appraisal. International movements are expected to increase by 10 percent through 2001 and 2002, and 5 percent thereafter.

3. Domestic movements from 1995 to 2000 increased at an average annual rate of 11.9 percent, which is more than the 7.5 percent anticipated at appraisal. While domestic movements peaked at 12,642 in 1997, the 1998 downturn is attributed to the closure of domestic routes by Mongolian Airlines (MIAT) and the aging MIAT fleet. Due to these factors, domestic traffic is expected to stagnate until 2003, and to grow at an annual rate of 1 percent thereafter.

### B. Passengers

4. With about 79,000 passengers in 1995 to about 115,000 in 2000, international passenger traffic increased at an average annual rate of 7.9 percent, which is lower than the anticipated 10.1 percent at appraisal. Moreover, the actual number of international passengers is significantly below the estimated 303,383 passengers in 2000 owing to fewer international aircraft movements from European and Asian destinations, and a lower seating capacity of the aircraft serving Ulaanbaatar than anticipated at appraisal. Increased flight frequency from People's Republic of China, Republic of Korea, and Russian Federation should result in a growth of international passenger traffic of about 8 percent from 2001 to 2002 and 5 percent thereafter.

5. The number of domestic passengers decreased from about 147,000 in 1995 to about 140,000 in 2000. The actual annual growth rate is significantly less than the 7.6 percent anticipated at appraisal. Moreover, the actual number of domestic passengers is significantly below the estimate of 370,000 passengers in 2000 owing to the closure of six routes in 1998 and reduced services to other destinations. Passenger traffic is expected to stagnate until 2003, and grow at about 3 percent thereafter.

### C. Overflights

6. Overflight traffic from 1995 to 2000 grew at an average annual rate of 15.2 percent, which is comparable with the 14.5 percent at appraisal. The growth is directly attributed to the conclusion of commercial and air navigation agreements between CAA and the international airlines.<sup>1</sup> The analysis of overflights by country of origin reveals that about 49 percent of the traffic mix over Mongolia in 1997 resulted from new commercial agreements, while the overflight

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<sup>1</sup> The commercial agreements were valid for five years, and provided for a discounted overflight rate against the payment by the airliners of a lump sum fee, which according to the terms of the agreement was to be used by CAA to improve the navigation conditions over Mongolia. Of the eight commercial agreements, six expired by the end of 2000.

traffic growth from 1998 to 2000, was due mainly to the signing of nine additional overflight related agreements.

7. Overflight traffic could further increase by 50 percent in 2001 if the new international air routes Asia 1, Polar 2, and Polar 3 are opened to traffic.<sup>2</sup> However the opening is subject to successful negotiations with the People's Republic of China by the airlines (Asia 1), and procurement of navigation equipment by Canada and the Russian Federation (Polar 2 and 3).<sup>3</sup> Notwithstanding the latter, it is anticipated that overflights will grow by about 5 percent from 2001 to 2005, and about 3 percent thereafter.

8. The international air traffic increase at Ulaanbaatar Airport and over the country confirms the attainment of the project objectives.

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<sup>2</sup> Asia 1, Polar 2 and 3 routes. Asia 1 will be opened to two-way traffic between London and Hong Kong, China. Polar 2 is a one-way traffic route linking North America and Asia, and Polar 3 a two-way traffic route linking Beijing and Hong Kong, China to North America.

<sup>3</sup> The existing Asia 1 route runs from the People's Republic of China (PRC) to the Russian Federation through a 100 kms long PRC corridor between Mongolia and Kazakhstan. The opening of the new Asia 1 route over Mongolia is subject to the payment by the airlines of a royalty payment to the PRC.

Table A7: Traffic

Item	1994		1995		1996		1997		1998		1999		2000	
	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual
<b>International Movements</b>														
A300/B767	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B757	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TU-154	0	122	0	219	0	524	0	927	0	1,006	0	1,084	0	1,415
B737	0	128	0	231	0	294	0	681	0	739	0	796	0	1,039
Other	1,594	6	2,042	12	2,412	101	2,512	284	2,512	308	2,501	332	2,487	433
<b>Total International Movements</b>	<b>1,594</b>	<b>256</b>	<b>2,042</b>	<b>462</b>	<b>2,412</b>	<b>920</b>	<b>2,512</b>	<b>1,892</b>	<b>2,512</b>	<b>2,054</b>	<b>2,501</b>	<b>2,212</b>	<b>2,487</b>	<b>2,887</b>
<b>Domestic Movements</b>														
Bae 146 or equivalent														
AN24/Fokker 50	4,333	5,098	6,601	6,143	7,093	7,467	7,633	12,642	8,196	10,324	8,813	12,662	9,485	10,763
<b>Total Aircraft Domestic Movements</b>	<b>4,333</b>	<b>5,098</b>	<b>6,601</b>	<b>6,143</b>	<b>7,093</b>	<b>7,467</b>	<b>7,633</b>	<b>12,642</b>	<b>8,196</b>	<b>10,324</b>	<b>8,813</b>	<b>12,662</b>	<b>9,485</b>	<b>10,763</b>
<b>General Aviation Movements</b>														
Less than 5.5 tons	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.5 to 13.6 tons	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total General Aviation Movements</b>	<b>0</b>	<b>91</b>	<b>0</b>	<b>109</b>	<b>0</b>	<b>133</b>	<b>0</b>	<b>225</b>	<b>0</b>	<b>184</b>	<b>0</b>	<b>226</b>	<b>0</b>	<b>237</b>
<b>Overflights by Aircraft</b>														
A300/B767	3,720	1,229	4,103	1,639	4,526	1,823	4,992	1,666	5,506	1,848	6,073	2,574	6,700	2,538
DC10/MD11	1,125	636	1,590	848	1,895	970	2,176	1,165	2,508	1,289	2,850	1,580	3,257	1,558
B747	4,200	2,628	5,037	3,504	5,943	5,827	6,875	7,148	7,918	7,930	9,104	8,375	10,462	8,257
A340	-	104	-	139	-	570	-	1,365	-	1,514	-	3,722	-	3,670
IL76/86/96	-	2,497	-	3,329	-	3,956	-	5,888	-	6,533	-	6,001	-	5,917
Other	-	1,230	-	1,640	-	2,703	-	1,433	-	1,579	-	608	-	599
<b>Total Aircraft</b>	<b>9,045</b>	<b>8,324</b>	<b>10,730</b>	<b>11,099</b>	<b>12,364</b>	<b>15,850</b>	<b>14,043</b>	<b>18,664</b>	<b>15,932</b>	<b>20,694</b>	<b>18,027</b>	<b>22,860</b>	<b>20,419</b>	<b>22,539</b>
<b>Overflights by Country</b>														
People's Republic of China	-	-	-	-	-	-	-	2,556	-	3,029	-	3,121	-	3,077
Italy	-	-	-	-	-	-	-	206	-	294	-	311	-	307
United Kingdom	-	-	-	-	-	-	-	1,232	-	1,324	-	1,345	-	1,326
Russian Federation	-	-	-	-	-	-	-	1,825	-	1,471	-	1,436	-	1,416
Switzerland	-	-	-	-	-	-	-	917	-	859	-	852	-	840
Ukraine	-	-	-	-	-	-	-	250	-	269	-	269	-	265
Netherlands	-	-	-	-	-	-	-	663	-	694	-	700	-	690
France	-	-	-	-	-	-	-	734	-	1,236	-	1,332	-	1,313
Germany	-	-	-	-	-	-	-	1,791	-	2,046	-	2,095	-	2,066
Austria	-	-	-	-	-	-	-	398	-	553	-	584	-	576
Finland	-	-	-	-	-	-	-	221	-	333	-	356	-	351
Sweden	-	-	-	-	-	-	-	681	-	818	-	845	-	833
Republic of Korea	-	-	-	-	-	-	-	2,629	-	1,962	-	1,820	-	1,794
Hong Kong, China	-	-	-	-	-	-	-	410	-	539	-	562	-	554
Other	-	-	-	-	-	-	-	4,151	-	5,267	-	7,232	-	7,130
<b>Total Overflights by Country</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>18,664</b>	<b>-</b>	<b>20,694</b>	<b>-</b>	<b>22,860</b>	<b>-</b>	<b>22,539</b>
<b>Passengers</b>														
Domestic	169,000	156,976	257,000	146,518	277,000	166,176	298,000	191,975	320,000	173,393	344,000	190,800	370,000	140,000
International	146,060	71,251	186,900	78,632	224,280	83,781	251,194	92,086	271,290	95,187	287,567	98,309	303,383	115,133
<b>Total Passengers</b>	<b>315,060</b>	<b>228,227</b>	<b>443,900</b>	<b>225,150</b>	<b>501,280</b>	<b>249,957</b>	<b>549,194</b>	<b>284,061</b>	<b>591,290</b>	<b>268,580</b>	<b>631,567</b>	<b>289,109</b>	<b>673,383</b>	<b>255,133</b>

- = not available

## FINANCIAL PERFORMANCE

1. Financial statements of the Civil Aviation Authority of Mongolia (CAA) from 1995 to 2000 are shown in Tables A8.1, A8.2, and A8.3.
2. As a result of the increased demand for air services throughout Mongolian airspace, revenues and operating profit have increased significantly. From 1995 to 2000 revenues and gross operating profit have increased from \$8.3 million and \$4.6 million to \$24.2 million and \$14.7million, respectively, reflecting an average annual growth rate of 23.9 and 26.2 percent, respectively. Revenues in 2001 and 2002 are expected to increase slightly as the air navigation charges will be billed based on actual tariff and not on a lump-sum payment basis as provided for in the commercial agreements.<sup>1</sup>
3. The opening of new routes through Mongolian airspace (Appendix 7, footnote 2) would result in a 25 percent revenue increase.<sup>2</sup> Notwithstanding the latter, conservative estimates are that overflight revenues will increase by an annual rate of 5 percent from 2001 to 2005 due to additional air navigation agreements, and 3 percent thereafter as larger aircraft will reduced the number of flights. The forecasts make no allowance for traffic peaks caused by special events, such as the football World Cup in Japan and the Republic of Korea (2002).
4. Operation and maintenance costs have increased from 1999 owing to the operation of the navigation equipment installed under the Project, and depreciation on capital expenditure programs. Cost reductions envisaged at appraisal have not been achieved. The expected reduction in air traffic controllers at Shand and Moron airports was not implemented mainly because of safety reasons, the government's employment policy, and lack of fixed telecommunications link.<sup>3</sup>
5. Except for the outstanding payments by Mongolian airlines (MIAT), debtors, creditors and inventory are in line with acceptable international standards.<sup>4</sup> CAA is servicing the debt under the two subsidiary loan agreements and no repayment default is anticipated. The amounts appropriated by the Government in 1999 and 2000 to service CAA's debt were adequately reconciled.
6. Ulaanbaatar Airport generated a positive operating result of about \$1.2 million in 2000. Even though the operating result in 2000 was below that recorded in 1999 (about \$1.4 million), the airport's operating result is expected to grow at an annual rate of 2 percent. Airport operation and maintenance costs are expected to remain constant over 2001-2003. Maintenance costs will increase thereafter as equipment and facilities age.
7. Domestic airport operations result in a negative operating profit, however the losses are not growing at any significant rate. These losses are expected to stagnate from 2001 to 2003, and increase by about 3 percent from 2004. MIAT's financial situation will have a direct impact on the domestic airports, e.g., further reductions in domestic operations will adversely impact on the performance of domestic airports.

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<sup>1</sup> The commercial agreements were valid for five years, and provided for a discounted overflight rate against the payment by the airliners of a lump sum fee, which according to the terms of the agreement was to be used by CAA to improve the navigation conditions over Mongolia. Of the eight commercial agreements, six expired by the end of 2000.

<sup>2</sup> Asia 1, Polar 2 and 3 routes. Asia 1 will be opened to two-way traffic between London and Hong Kong, China. Polar 2 is a one-way traffic route linking North America and Asia, and Polar 3 a two-way traffic route linking Beijing and Hong Kong to North America.

<sup>3</sup> Government employment policy does not allow for the reduction of the workforce, simply a redistribution of that workforce.

<sup>4</sup> In November 2000, MIAT owed to CAA about \$4.0 million of air navigation and airport charges. The payment of the debt has been mutually scheduled from 2001 to 2003.

**Table A8.1 : Civil Aviation Authority of Mongolia - Financial Statements – Profit and Loss**  
(\$'000)

Item	1994		1995		1996		1997		1998		1999		2000	
	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Revision
<b>Traffic Statistics</b>														
Passengers – Domestic	169,000	156,976	257,000	146,518	277,000	166,176	298,000	191,975	320,000	173,393	344,000	190,800	370,000	140,000
Passengers – International	146,060	71,251	186,900	78,632	224,280	83,781	251,194	92,086	271,290	95,187	287,567	98,309	303,383	115,133
Aircraft Movements - Domestic	4,333	5,098	6,601	6,143	7,093	7,467	7,633	12,642	8,196	10,324	8,813	12,662	9,485	10,763
Aircraft Movements - International	1,594	256	2,042	462	2,412	920	2,512	1,892	2,512	2,054	2,501	2,212	2,487	2,887
Overflights	9,045	8,324	10,730	11,099	12,364	15,850	14,043	18,664	15,932	20,694	18,027	22,860	20,419	22,539
<b>Operating Revenues</b>	<b>5,654.0</b>	<b>4,492.1</b>	<b>6,434.2</b>	<b>8,298.8</b>	<b>7,517.4</b>	<b>16,600.9</b>	<b>8,589.8</b>	<b>24,696.7</b>	<b>10,270.5</b>	<b>19,874.8</b>	<b>12,427.0</b>	<b>25,213.7</b>	<b>13,910.8</b>	<b>24,367.5</b>
Landing Charges	187.4	26.8	199.5	34.7	243.6	216.0	264.3	396.3	280.1	1,184.3	296.1	1,283.1	312.7	1,063.4
Other ATC	61.9	0.0	86.8	0.0	93.9	0.0	99.8	0.0	104.3	0.0	111.5	0.0	117.8	0.0
Overflight Fees	4,570.5	2,782.2	5,294.1	6,202.5	6,069.3	12,374.6	6,919.9	18,486.3	8,346.9	13,965.1	10,195.9	18,127.0	11,564.6	18,658.3
Airport Departure Tax	717.9	541.8	734.2	1,361.9	967.5	604.2	1,083.6	745.5	1,170.3	779.0	1,240.5	974.0	1,308.7	802.5
Cargo Storage Charges	1.0	0.7	1.0	0.6	10.0	0.4	10.9	0.3	15.9	37.7	19.0	37.4	21.0	37.4
Concessions Rentals	15.0	0.0	18.0	0.0	25.0	135.2	95.0	200.0	155.0	390.1	265.0	561.9	285.0	769.5
Other Charges	100.3	1,061.4	100.6	574.4	108.1	1,057.4	116.3	236.6	198.0	35.5	299.0	90.8	301.0	95.2
Nonoperating Revenues	0.0	79.2	0.0	23.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Return of Sold Goods	0.0	0.0	0.0	0.0	0.0	-82.5	0.0	-481.0	0.0	-177.3	0.0	-91.8	0.0	-10.2
Airport Revenue - Other Charges	0.0	0.0	0.0	101.5	0.0	88.8	0.0	202.7	0.0	46.8	0.0	467.1	0.0	452.0
Commercial Agreements	0.0	0.0	0.0	0.0	0.0	2,206.7	0.0	4,910.0	0.0	3,613.5	0.0	3,764.3	0.0	2,499.3
Revenues Reclassified in PCR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Operating Expenses</b>	<b>288.9</b>	<b>2,848.1</b>	<b>817.8</b>	<b>3,711.4</b>	<b>1,368.6</b>	<b>4,077.4</b>	<b>2,551.9</b>	<b>4,658.1</b>	<b>5,451.0</b>	<b>8,969.9</b>	<b>5,655.4</b>	<b>15,769.5</b>	<b>7,002.9</b>	<b>13,397.2</b>
Salaries & Wages	130.0	715.0	221.5	629.0	376.6	625.6	641.9	582.2	884.0	904.7	965.1	999.7	1,061.6	1,209.9
Social Security	17.6	79.1	29.9	109.2	50.9	147.4	86.7	175.2	97.9	261.1	99.5	359.6	135.0	360.5
Staff Benefits	4.6	0.0	7.7	0.0	13.2	0.0	22.3	0.0	32.1	0.0	34.8	0.0	39.0	0.0
Staff Facilities	9.8	0.0	16.7	0.0	28.4	0.0	48.3	0.0	72.0	0.0	73.0	0.0	81.0	0.0
Travel & Related	1.8	212.7	1.9	281.9	2.0	294.7	2.0	392.1	2.0	418.5	2.1	467.9	2.2	427.0
Maintenance	5.5	0.0	169.4	0.0	275.4	320.8	307.6	195.2	307.6	347.6	307.6	329.0	307.6	817.9
Depreciation	94.1	715.0	344.1	828.6	594.1	622.6	1,413.8	1,721.8	4,024.6	1,756.7	4,141.0	4,535.9	5,342.5	5,013.9
Utilities	11.3	470.4	12.0	1,301.4	13.0	373.8	13.9	652.4	15.0	568.6	16.1	518.2	17.3	570.5
Other Administration Costs	14.2	656.0	14.6	561.2	15.0	549.5	15.4	939.2	15.8	3,145.3	16.2	633.8	16.7	830.9
General Expenses	0.0	0.0	0.0	0.0	0.0	1,073.5	0.0	0.0	0.0	1,116.2	0.0	1,344.1	0.0	1,403.5
Communications	0.0	0.0	0.0	0.0	0.0	69.5	0.0	0.0	0.0	236.2	0.0	336.1	0.0	322.0
Loan Interest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Government Payment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nonoperating Expenses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	214.8	0.0	6,245.1	0.0	2,441.2
<b>Net Operating Income</b>	<b>5,365.1</b>	<b>1,644.0</b>	<b>5,616.4</b>	<b>4,587.4</b>	<b>6,148.8</b>	<b>12,523.5</b>	<b>6,037.9</b>	<b>20,038.6</b>	<b>4,819.5</b>	<b>10,904.9</b>	<b>6,771.6</b>	<b>9,444.2</b>	<b>6,907.9</b>	<b>10,970.2</b>
Interest on Long-Term Debt	524.8	0.0	1,290.3	0.0	2,680.7	888.0	3,555.2	0.0	3,605.3	2,737.5	3,648.0	5,861.8	3,551.8	3,698.6
<b>Net Income Before Tax</b>	<b>4,840.3</b>	<b>1,644.0</b>	<b>4,326.1</b>	<b>4,587.4</b>	<b>3,468.1</b>	<b>11,635.6</b>	<b>2,482.7</b>	<b>20,038.6</b>	<b>1,214.2</b>	<b>8,167.4</b>	<b>3,123.6</b>	<b>3,582.4</b>	<b>3,356.1</b>	<b>7,271.7</b>
Income Tax	1,694.1	792.8	1,514.1	2,076.0	1,213.8	6,778.5	868.9	11,935.9	425.0	9,155.5	1,093.3	1,324.9	1,174.6	6,190.5
<b>Net Income After Tax</b>	<b>3,146.2</b>	<b>851.2</b>	<b>2,812.0</b>	<b>2,511.4</b>	<b>2,254.3</b>	<b>4,857.0</b>	<b>1,613.8</b>	<b>8,102.7</b>	<b>789.2</b>	<b>-988.1</b>	<b>2,030.3</b>	<b>2,257.5</b>	<b>2,181.5</b>	<b>1,081.2</b>
<b>Performance Indicators</b>														
Operating Ratio	5.1%	63.4%	12.7%	44.7%	18.2%	24.6%	29.7%	18.9%	53.1%	45.1%	45.5%	62.5%	50.3%	55.0%
Debt Service Ratio							1.85	0.00	1.95	0.00	1.97	0.00	1.87	0.00
Return on Net Fixed Assets in Service	43.9%	6.4%	34.2%	20.2%	24.1%	46.3%	19.9%	16.1%	21.3%	-2.2%	22.6%	3.9%	21.9%	2.0%

Source: Civil Aviation Authority, ADB staff.

**Table A8.2 : Civil Aviation Authority of Mongolia – Financial Statements – Balance Sheet**  
(\$'000)

Item	1994		1995		1996		1997		1998		1999		2000	
	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Revision
<b>Assets</b>	<b>13,365.6</b>	<b>28,416.5</b>	<b>32,342.6</b>	<b>37,659.0</b>	<b>56,033.6</b>	<b>59,948.9</b>	<b>70,990.1</b>	<b>72,059.0</b>	<b>73,092.9</b>	<b>67,715.1</b>	<b>73,134.0</b>	<b>75,907.6</b>	<b>73,103.3</b>	<b>84,539.1</b>
<b>Current Assets</b>	<b>4,019.7</b>	<b>7,307.6</b>	<b>4,691.9</b>	<b>5,974.3</b>	<b>3,621.5</b>	<b>11,691.7</b>	<b>4,714.0</b>	<b>11,216.2</b>	<b>6,432.7</b>	<b>10,887.0</b>	<b>8,614.8</b>	<b>16,132.8</b>	<b>11,026.6</b>	<b>25,029.7</b>
Petty Cash	175.0	0.0	175.0	0.0	175.0	0.0	175.0	0.0	175.0	0.0	175.0	0.0	175.0	0.0
Inventories	381.0	1,057.6	411.4	1,278.6	444.3	1,867.2	448.0	999.9	518.3	907.8	556.5	1,782.1	597.5	1,856.3
Accounts Receivable	350.0	2,006.1	615.6	587.6	664.8	5,663.5	691.0	8,453.1	775.4	8,799.2	827.0	12,618.7	1,065.0	17,640.5
Cash at Bank	1,857.8	720.8	1,389.9	1,308.5	320.4	3,930.2	44.0	1,676.8	351.8	958.8	760.4	1,416.1	1,400.4	5,197.8
Special Accounts	150.0	748.2	850.0	1,909.9	500.0	0.0	256.0	0.0	566.0	0.0	1,986.0	0.0	2,997.0	0.0
Goods in Transit	150.3	1,528.8	150.0	0.0	150.0	0.0	100.0	0.0	208.0	0.0	212.2	0.0	416.8	0.0
Other	955.6	1,246.1	1,100.0	889.7	1,367.0	230.7	3,000.0	86.4	3,838.2	221.2	4,097.7	315.9	4,374.9	335.2
<b>Fixed assets</b>	<b>9,345.9</b>	<b>21,108.9</b>	<b>27,650.7</b>	<b>31,684.7</b>	<b>52,412.1</b>	<b>48,257.2</b>	<b>66,276.1</b>	<b>60,842.8</b>	<b>66,660.2</b>	<b>56,828.1</b>	<b>64,519.2</b>	<b>59,774.8</b>	<b>62,076.7</b>	<b>59,509.4</b>
Plant, Equipment, Buildings	941.0	14,363.7	5,941.0	13,718.1	5,941.0	12,113.0	46,924.8	53,228.0	48,724.8	50,253.5	75,493.5	67,187.4	78,393.5	66,543.5
Less : Accum. Depreciation	456.7	1,047.5	800.8	1,271.2	1,394.9	1,616.7	2,808.7	2,846.2	6,833.3	4,771.6	10,974.3	8,722.7	16,316.8	12,085.9
Net Fixed Assets	484.3	13,316.2	5,140.2	12,446.8	4,546.1	10,496.3	44,116.1	50,381.8	41,891.5	45,481.9	64,519.2	58,464.6	62,076.7	54,457.6
Work in Progress	0.0	7,792.7	0.0	19,237.9	0.0	37,760.9	0.0	10,461.0	0.0	11,346.3	0.0	1,310.2	0.0	5,051.8
<b>Liabilities and Equity</b>	<b>13,365.6</b>	<b>28,416.5</b>	<b>32,342.6</b>	<b>37,659.0</b>	<b>56,033.6</b>	<b>59,948.9</b>	<b>70,990.1</b>	<b>72,059.0</b>	<b>73,092.9</b>	<b>67,715.1</b>	<b>73,134.0</b>	<b>75,907.6</b>	<b>73,103.3</b>	<b>84,539.1</b>
<b>Current Liabilities</b>	<b>527.4</b>	<b>1,631.1</b>	<b>498.9</b>	<b>532.8</b>	<b>749.9</b>	<b>8,643.5</b>	<b>826.7</b>	<b>4,631.8</b>	<b>918.5</b>	<b>4,572.7</b>	<b>1,049.9</b>	<b>231.6</b>	<b>1,099.9</b>	<b>3,610.1</b>
Accounts Payable	457.4	1,627.3	400.0	509.9	550.0	2,000.9	575.0	445.9	641.0	134.0	725.0	227.8	750.0	3,610.1
Deferred Charges	70.0	0.0	99.0	0.0	200.0	3,045.8	251.8	4,185.9	277.6	1,711.4	325.0	3.8	350.0	0.0
[Rounding Adjustment]	0.0	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0
<b>Long Term Liabilities</b>	<b>8,251.0</b>	<b>7,792.2</b>	<b>20,288.0</b>	<b>17,474.7</b>	<b>42,150.0</b>	<b>32,840.2</b>	<b>55,900.0</b>	<b>42,937.6</b>	<b>57,358.6</b>	<b>45,947.9</b>	<b>55,847.1</b>	<b>59,077.7</b>	<b>54,239.4</b>	<b>63,429.7</b>
Long-Term Debt	8,251.0	7,792.2	19,038.0	17,474.7	36,000.0	32,840.2	36,000.0	42,937.6	35,058.6	45,947.9	34,057.3	59,077.7	32,992.3	63,429.7
<b>Equity</b>	<b>4,587.2</b>	<b>18,993.2</b>	<b>11,555.7</b>	<b>19,651.5</b>	<b>13,133.7</b>	<b>18,465.2</b>	<b>14,263.4</b>	<b>24,489.6</b>	<b>14,815.8</b>	<b>17,194.6</b>	<b>16,237.0</b>	<b>16,598.3</b>	<b>17,764.0</b>	<b>17,499.3</b>
Capital	783.2	15,766.7	5,783.3	13,416.7	5,783.3	9,476.9	5,783.3	8,127.8	5,783.3	6,242.8	5,783.3	5,776.0	5,783.3	5,539.0
Reserves and Retained Earnings	3,804.0	3,226.5	5,772.4	6,234.8	7,350.4	8,988.3	8,480.1	16,361.7	9,032.5	10,951.8	10,453.7	10,822.3	11,980.7	11,960.3

Source: Civil Aviation Authority, ADB staff.

**Table A8.3 : Civil Aviation Authority of Mongolia - Financial Statements – Cash Flow**  
(\$'000)

Item	1994		1995		1996		1997		1998		1999		2000	
	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual	Appraisal	Actual
<b>Sources of Funds</b>	<b>6,965.3</b>	<b>20,980.6</b>	<b>20,314.9</b>	<b>11,495.3</b>	<b>27,643.0</b>	<b>22,808.3</b>	<b>19,040.7</b>	<b>12,783.3</b>	<b>9,500.0</b>	<b>4,183.3</b>	<b>8,177.2</b>	<b>16,188.8</b>	<b>9,354.0</b>	<b>12,171.9</b>
<b>Operations</b>	<b>3,214.3</b>	<b>-1,123.7</b>	<b>3,277.8</b>	<b>4,162.8</b>	<b>5,781.0</b>	<b>11,382.6</b>	<b>5,290.7</b>	<b>4,034.9</b>	<b>7,100.0</b>	<b>3,058.1</b>	<b>8,177.2</b>	<b>3,525.8</b>	<b>9,354.0</b>	<b>8,056.8</b>
Net Income after Tax	3,146.2	851.2	2,812.0	2,511.4	2,254.3	4,857.0	1,613.8	8,102.7	789.2	-988.1	2,030.3	2,257.5	2,181.5	1,081.2
Depreciation	94.1	715.0	344.1	828.6	594.1	622.6	1,413.8	1,721.8	4,024.6	1,756.7	4,141.0	4,535.9	5,342.5	5,013.9
Interest on Long-Term Debt	524.8	0.0	1,290.3	0.0	2,680.7	888.0	3,555.2	0.0	3,605.3	2,737.5	3,648.0	5,861.8	3,551.8	3,698.6
Net Change in Working Capital	550.8	2,689.9	1,168.6	-822.7	-251.9	-5,015.1	1,292.1	5,789.6	1,319.1	448.0	1,642.1	9,129.5	1,721.8	1,736.8
<b>Long term sources</b>	<b>3,751.0</b>	<b>22,104.3</b>	<b>17,037.1</b>	<b>7,332.5</b>	<b>21,862.0</b>	<b>11,425.7</b>	<b>13,750.0</b>	<b>8,748.4</b>	<b>2,400.0</b>	<b>1,125.1</b>	<b>0.0</b>	<b>12,663.1</b>	<b>0.0</b>	<b>4,115.0</b>
ADB Loan	3,751.0	7,792.2	12,037.0	9,682.5	21,862.0	15,365.5	13,750.0	10,097.5	2,400.0	3,010.2	0.0	13,129.8	0.0	4,352.0
Capital	0.0	14,312.1	5,000.1	-2,350.0	0.0	-3,939.8	0.0	-1,349.0	0.0	-1,885.1	0.0	-466.8	0.0	-237.0
<b>Uses of Funds</b>	<b>5,830.3</b>	<b>21,214.9</b>	<b>20,782.8</b>	<b>10,907.6</b>	<b>28,712.5</b>	<b>20,196.7</b>	<b>19,317.1</b>	<b>15,036.7</b>	<b>9,192.2</b>	<b>4,901.4</b>	<b>7,768.6</b>	<b>15,731.5</b>	<b>8,714.0</b>	<b>8,390.2</b>
Dividend to Government	943.9	0.0	843.6	0.0	676.3	0.0	484.1	1,221.6	236.8	1,000.0	609.1	1,000.0	654.5	1,000.0
Project Capital Works	4,361.6	21,214.9	13,648.9	10,799.6	25,355.5	16,918.0	15,277.8	13,815.1	2,608.7	-2,089.3	0.0	6,897.8	0.0	3,097.7
Other Capital Works	0.0	0.0	5,000.0	108.0	0.0	2,390.7	0.0	0.0	1,800.0	3,253.2	2,000.0	1,971.9	2,900.0	594.0
Debt Service	524.8	0.0	1,290.3	0.0	2,680.7	888.0	3,555.2	0.0	4,546.7	2,737.5	5,159.5	5,861.8	5,159.5	3,698.6
<b>Net Funds Flow</b>	<b>1,135.0</b>	<b>-234.3</b>	<b>-467.9</b>	<b>587.7</b>	<b>-1,069.5</b>	<b>2,611.6</b>	<b>-276.4</b>	<b>-2,253.4</b>	<b>307.8</b>	<b>-718.1</b>	<b>408.6</b>	<b>457.3</b>	<b>640.0</b>	<b>3,781.6</b>
Cash at Beginning of Year	722.8	955.1	1,857.8	720.8	1,389.9	1,308.5	320.4	3,930.2	44.0	1,676.8	351.8	958.8	760.4	1,416.1
<b>Cash at End of Year</b>	<b>1,857.8</b>	<b>720.8</b>	<b>1,389.9</b>	<b>1,308.5</b>	<b>320.4</b>	<b>3,920.2</b>	<b>44.0</b>	<b>1,676.8</b>	<b>351.8</b>	<b>958.8</b>	<b>760.4</b>	<b>1,416.1</b>	<b>1,400.4</b>	<b>5,197.8</b>

Source: Civil Aviation Authority, ADB staff.

## FINANCIAL REEVALUATION

1. The financial internal rate of return (FIRR) of the Project has been reevaluated using the with- and without-project and without-project comparison, as shown in Table A9. The major assumptions used in calculating the FIRR are as follows:

- (i) All components of the FIRR calculation are expressed in constant 2000 prices and covered 1995 to 2015.
- (ii) Capital costs reflect actual project costs incurred, excluding the ground equipment cost that was charged to the project financed by Loan 1256-MON.<sup>1</sup>
- (iii) The projected traffic growth for 2001 has been based on world and regional trends, and forecasts published by the International Civil Aviation Organization and the International Air Transportation Association.
- (iv) The projected traffic growth from the new air routes, Asia 1, Polar 2, and Polar 3 has not been taken into consideration, nor the special event in 2002.<sup>2</sup>
- (v) Only 85 percent of the actual and anticipated overflight revenues are considered under the Project, as 15 percent of the same was considered as airport revenue for the financial reevaluation of the project financed by Loan 1256.<sup>3</sup>
- (vi) The tariff and charges are those effective in October 2000.
- (vii) Incremental income taxes are computed on incremental revenues minus incremental operating costs, and an estimate for the depreciation of the project facilities.
- (viii) outstanding payment of airport and navigation charges by Mongolian airlines is assumed to be paid in full to the Civil Aviation Authority (CAA).
- (ix) The total amount of the lump fees collected by CAA since 1996 under the commercial agreements are considered as net revenue to the Project since these fees were aimed at modernizing the Mongolian air navigation facilities.

2. The Project FIRR is re-evaluated at 16.1 percent compared with 12.7 percent at appraisal. The higher than anticipated FIRR is attributed to the lump sum fees paid by the airlines to CAA under the commercial agreements. This benefit was not envisaged at appraisal.

<sup>1</sup> The ground equipment procured under the Project was originally to be procured under Loan 1256-MON(SF): *Ulaanbaatar Airport Project*, for SDR22.745 million, approved on 12 October 1993, but was rescheduled under the Project owing to financing constraints and the need to reconsider the equipment requirements based on the findings of TA 1963-MON (PCR:MON 25306 *Ulaanbaatar Airport Project*, September 1999).

<sup>2</sup> Asia 1, Polar 2 and 3 routes. Asia 1 will be opened to two-way traffic between London and Hong Kong, China. Polar 2 is a one-way traffic route linking North America and Asia, and Polar 3 a two-way traffic route linking Beijing and Hong Kong to North America.

<sup>3</sup> According to the ICAO standard, the air route of a twin engine aircraft is to be planned in such a way that the aircraft is always within 180 minutes single engine endurance from an international airport. As a result of the Ulaanbaatar Airport Project, Ulaanbaatar Airport can be used as a diversion airport by twin engine aircraft, and consequently 15 percent of the overflights derives from the application of the ICAO standard.

**Table A9: Financial Internal Rate of Return**  
(\$ million)

Year	Project Capital Costs <sup>a</sup>	Increment Operating Costs	Total Costs	Net Operating Savings <sup>b</sup>	Foreign Revenue Earnings <sup>c</sup>	Telecom Leasing Revenues	Commercial Agreement	Increment Financial Benefits	Increment Income Taxes	Net Financial Benefits	Net Increment Cashflow
1995											
1996	2.13	0.19	2.32				2.26	2.26	0.83	1.43	(0.88)
1997	7.53	0.02	7.55		0.60		5.15	5.75	2.29	3.46	(4.09)
1998	8.62	1.43	10.05	0.44	1.20		3.88	5.53	1.64	3.89	(6.16)
1999	3.23	2.76	5.98		1.54		4.14	5.68	1.17	4.51	(1.47)
2000	2.90	1.82	4.72	4.00	2.85		2.50	9.35	3.01	6.33	1.62
2001		1.82	1.82	2.50	4.28		0.30	7.08	2.11	4.98	3.16
2002		1.82	1.82		4.86		0.15	5.01	1.28	3.73	1.92
2003		1.82	1.82		5.46			5.46	1.46	4.00	2.19
2004		1.82	1.82		6.09			6.09	1.71	4.38	2.57
2005		1.82	1.82		6.49			6.49	1.87	4.62	2.81
2006		1.82	1.82		6.90			6.90	2.04	4.87	3.05
2007		1.82	1.82		7.33			7.33	2.20	5.12	3.31
2008		1.82	1.82		7.76			7.76	2.38	5.38	3.57
2009		1.82	1.82		8.21			8.21	2.56	5.65	3.84
2010		1.82	1.82		8.21			8.21	2.56	5.65	3.84
2011		1.82	1.82		8.21			8.21	2.56	5.65	3.84
2012		1.82	1.82		8.21			8.21	2.56	5.65	3.84
2013		1.82	1.82		8.21			8.21	2.56	5.65	3.84
2014		1.82	1.82		8.21			8.21	2.56	5.65	3.84
2015		1.82	1.82		8.21			8.21	2.56	5.65	3.84
<b>Financial internal rate of return (percent)</b>											<b>16.1</b>

<sup>a</sup> Project capital costs excluding ground equipment costs charged to Ulaanbaatar Airport Project (Loan 1256-MON). In line with the method used at appraisal, replacement cost or residual value is not considered.

<sup>b</sup> Avoided investment cost in existing systems, such as radar, which would have been required if the Project had not been implemented.

<sup>c</sup> Incremental overflight revenues.

Source: Civil Aviation Authority, ADB staff.

## ECONOMIC REEVALUATION

### A. General

1. The same methodology has been used for the economic reevaluation as at appraisal, comparing the with-project case to the without-project case. Without the Project, the capacity (and consequent perceived safety weaknesses) of the limited existing airspace management systems will constrain growth of air traffic volume in Mongolian airspace.<sup>1</sup> Overflight revenues are foreign currency earnings to the Mongolian economy. The reevaluation of the economic internal rate of return (EIRR) in Table A10.1 excludes 15 percent of the overflight traffic revenues, which have been considered as airport revenues in the economic reevaluation of the Ulaanbaatar Airport Project.<sup>2</sup> At appraisal all overflight revenues were included in the calculation of the economic benefits (except the lump sum payments, which are regarded as financial benefits).

### B. Costs

2. Project costs include procurement and installation of navigational aids and telecommunications equipment, and operation and maintenance. To calculate economic costs, local currency costs have been divided into tradable and nontradable groups. A standard conversion factor of 0.88 has been applied to the nontradable portion. Capital costs cover five years (with 84 percent incurred during the first three years), while at appraisal they covered four years (with 71 percent incurred in one year).

### C. Benefits

3. At appraisal the project benefits included net operating savings, avoided revenue losses, and avoided capital investment.<sup>3</sup> However, due to the government employment policy and aviation safety, the closure of the air traffic centers of Shand and Moron, and subsequent staff reduction were not achieved. The avoided investment costs for Mongolian rural telecommunications backbone were not realized in full, since only the excess capacity of the project telecommunications network could be used for commercial use and not its full capacity. At appraisal the benefit was a full avoided benefit and not an incremental benefit.

4. The project benefits are generated mainly by an increase in the international air traffic that materialized from the commencement of project implementation.<sup>4</sup> In addition, the project benefits include the decommissioning of radar equipment no longer required, which resulted in a saving of about \$0.2 million per annum, and the avoided revenue losses that a lack of flight safety would have generated. The improved air navigation facilities benefit to the airspace users by providing improved air safety and time saving.

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<sup>1</sup> Airspace management systems comprise air navigation equipment, communications, human resource skills, and air traffic management procedures

<sup>2</sup> According to the ICAO standard, the air route of a twin engine aircraft is to be planned in such a way that the aircraft is always within 180 minutes single engine endurance from an international airport. As a result of the Ulaanbaatar Airport Project, Ulaanbaatar Airport can be used as a diversion airport by twin engine aircraft, and consequently 15 percent of the overflights derives from the application of the ICAO standard.

<sup>3</sup> Net operating savings included the closure of existing ATC centers, staff reduction and associated costs, equipment maintenance, decommissioning existing telecommunication links, and avoided investment in existing systems. In the without-project scenario, the revenue losses were expected to result from decreased overflight traffic due to separation and safety reasons.

<sup>4</sup> The international airlines started flying over Mongolia on the understanding that the air navigation systems will be improved through the Project.

**D. Economic Internal Rate of Return**

5. The economic internal rate of return (EIRR) is estimated at 16.2 percent compared with 20.9 percent at appraisal, and the net present value (NPV) at 12 percent discount rate is \$4.5 million. Sensitivity analysis of the economic viability of the Project has been carried out for a reduction in benefits. The switching value indicates that the Project would remain economically viable even with reductions in air navigation benefits of 15 percent.

**Table A10 : Economic Internal Rate of Return**  
(\$ million)

Year	Project Capital Costs <sup>a</sup>	Increment Operating Costs	Total Costs	Net Operating Savings <sup>b</sup>	Foreign Revenue Earnings <sup>c</sup>	Avoided Telecom Investment	Commercial Agreement	Total Benefits	Net Benefits
1995									
1996	2.13	0.17	2.29		0.54			0.54	(1.75)
1997	7.24	0.02	7.26		0.37			0.37	(6.88)
1998	7.79	1.26	9.05	0.44	2.12			2.56	(6.49)
1999	3.23	2.43	5.65		2.32			2.32	(3.33)
2000	2.70	1.60	4.29	4.00	2.75			6.75	2.45
2001		1.60	1.60	2.50	3.27			5.77	4.17
2002		1.60	1.60		3.89			3.89	2.30
2003		1.60	1.60		4.65			4.65	3.06
2004		1.60	1.60		5.14			5.14	3.54
2005		1.60	1.60		5.68			5.68	4.08
2006		1.60	1.60		6.28			6.28	4.69
2007		1.60	1.60		6.96			6.96	5.36
2008		1.60	1.60		7.71			7.71	6.11
2009		1.60	1.60		7.71			7.71	6.11
2010		1.60	1.60		7.71			7.71	6.11
2011		1.60	1.60		7.71			7.71	6.11
2012		1.60	1.60		7.71			7.71	6.11
2013		1.60	1.60		7.71			7.71	6.11
2014		1.60	1.60		7.71			7.71	6.11
2015		1.60	1.60		7.71			7.71	6.11
<b>Economic internal rate of return (percent)</b>									<b>16.2</b>
<b>Net present value (12%)</b>									<b>4.55</b>

<sup>a</sup> Project capital costs excluding ground equipment costs charged to Ulaanbaatar Airport Project (Loan 1256-MON). In line with the method used at appraisal, replacement cost or residual value is not considered.

<sup>b</sup> Avoided investment cost in existing system, such as radar, which would have been required if the Project had not been implemented.

<sup>c</sup> Incremental overflight revenues.

Source: Civil Aviation Authority, ADB staff.

**ASSESSMENT OF PROJECT ACHIEVEMENTS IN MEETING SUBCRITERIA FOR PROJECT  
OUTCOMES ASSESSMENT, SUSTAINABILITY, INSTITUTIONAL, AND OTHER DEVELOPMENT  
IMPACTS**

**A. Relevance**

<b>Subcriterion</b>	<b>Loan 1370-MON National Air Navigation Development Project</b>
Relevance of project preparation to project output at the time of approval	Yes
Relevance of project output to achieve project goals and purposes at the time of approval	Yes
Priority in the context of the country's development strategy at the time of approval	Yes
Priority in the context of the development strategy of the Asian Development Bank (ADB) for the country at the time of approval	Yes
Priority in the context of the country's development strategy at the time of evaluation	Yes
Priority in the context of ADB's development strategy for the country at the time of evaluation	No
Priority in the context of one or more of ADB's strategic objectives at the time of evaluation	No
Appropriate changes made at midterm review/other reviews to make the Project more relevant	No
Percent of Subcriteria that Met Assessment	62.5 Most targets
Equivalent Rating	2

**B. Efficacy**

<b>Subcriterion</b>	<b>Loan 1370-MON National Air Navigation Development Project</b>
Achievement of most project physical outcomes	Yes
Achievement of most project intangible outcomes (e.g., technical assistance)	Yes
The likelihood of project outcomes leading to project goals	Yes
Percent of Subcriteria that Met Assessment	100
Equivalent Rating	Almost all targets 3

**C. Efficiency**

<b>Subcriterion</b>	<b>Loan 1370-MON National Air Navigation Development Project</b>
1. Efficiency of investments	
- EIRR > 12 percent (where recalculated at evaluation)	Yes
- FIRR > weighted average cost of capital (where recalculated at evaluation)	Yes
- Cost-effectiveness in generating the project outputs	
2. Efficiency of process	
- Manner of ADB's internal processing of the project	Yes
- Organization and management of executing and implementing agencies	Yes
- Effectiveness of project management	Yes
- Efficiency in recruiting consultants and other procurement	Yes
- Timely and adequate availability of counterpart funding	Yes
Percent of Subcriteria that Met Assessment	100
Equivalent Rating	Almost all targets 3

EIRR = economic internal rate of return, FIRR = financial internal rate of return.

**D. Sustainability**

<b>Subcriterion</b>	<b>Loan 1370-MON National Air Navigation Development Project</b>
- Availability of adequate and effective demand for project services or products	Yes
- Probable operating and financial performance of the operational entity and the ability to recover costs	Yes
- Probability of the existence of appropriate maintenance policy and procedures	Yes
- Probability of funds availability (cash flow) for continued operation, maintenance, and growth requirement	No
- Probable availability of skills to continue project	Yes
- Probable availability of appropriate technology and equipment to operate the project	Yes
- Probable availability of the enabling environment (subsidies, tariffs, price competitiveness, and political developments) in which the project is operating at the time of evaluation	No
- Government ownership and commitment to the project	Yes
- The extent to which the operation affects the environment and renewable or nonrenewable resources	
- The extent to which community participation and beneficiary incentives are adequate to maintain project benefits	
Percent of Subcriteria that Met Assessment	75
Equivalent Rating	Almost all targets 2

## E. Institutional Development and Other Impacts

<b>Subcriterion</b>	<b>Loan 1370-MON National Air Navigation Development Project</b>
1. Institutional development impacts	
- Country's formal laws, regulations, and procedures	+
- The people's informal norms and practices	+
- Institutional or organization strengthening	+
- Institutional skill levels and capacities	+
- Participatory attitudes of the society	
- Macroeconomic or sector policy framework	+
2. Other development impacts	
- Impacts on poverty	
- Impacts on the environment	
- Impacts on social organization	
- Impacts on political developments	
Percent of Subcriteria that Met Assessment	100
Equivalent Rating	Almost all targets 3

## F. Assessment of Overall Project Performance

Overall Rating of the National Air Navigation Development Project (Loan 1370-MON)

<b>Criterion</b>	<b>Assessment</b>	<b>Rating (0-3)</b>	<b>Weight (%)</b>	<b>Weighted Rating</b>
Relevance	Relevant	2	20	0.40
Efficacy	Highly Efficacious	3	25	0.75
Efficiency	Highly Efficient	3	20	0.60
Sustainability	Most Likely	2	20	0.40
Institutional Development and Other Impacts	Substantial	3	15	0.45
<b>Overall Rating</b>	<b>Highly Successful</b>		100	<b>2.60</b>