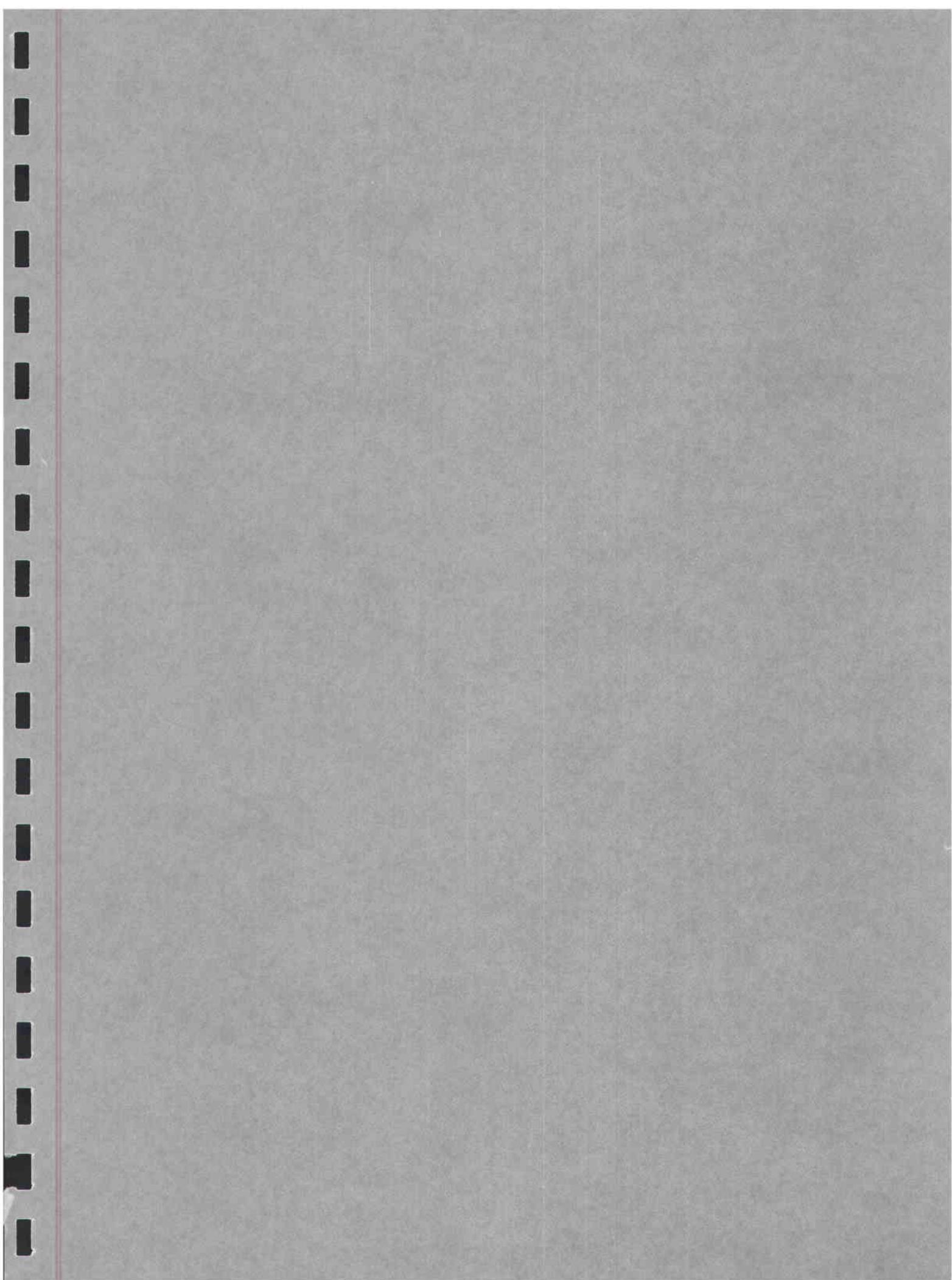




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Final Report

Technical Assistance for the Privatization of Moroccan Airports

According to the terms of the Final Report, following is the contact data for AAROTEC Infrastructure Group Inc., and consultants used during the course of the project. There were no local Moroccan consultants for this project and only staff members of AAROTEC were utilized on this project.

Should you require further information concerning becoming a potential US Concessionaires or potential US Suppliers for the project Technical Assistance for the Privatization of Moroccan Airports you may contact the AAROTEC office for this data:

Contact Information for AAROTEC

AAROTEC Infrastructure Group, Inc.,
Mr. Albert C. Young, Jr. P.E., Project Manager
P.O. Box 4007
Oakton, Virginia 22124
Phone: 703-255-3701
Fax: 703-255-3703
E-Mail address: aarotec@aarotec.com

or

AAROTEC Infrastructure Group, Inc. of WV
Mr. Levent Arikok, Project Architect
401 Ponderosa Trail
Bunker Hill, WV 25413
Phone: 304-821-1001
E-Mail address: aarotec@aarotec.com

or

AAROTEC/Caribe Engineering of PR
Ramon Cruz, Project Engineer
Condo El Centro II
500 Munoz Rivera Ave, Suite 1407
San Juan, (Hato Rey), Puerto Rico 00918
Phone: 787-773-0677
E-Mail address: aarotec@aarotec.com



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EXECUTIVE SUMMARY

Context

*The present **Pre-Feasibility Study** bearing on the **Preliminary Evaluation of the Perspectives for Privatization of Moroccan Airports** is situated in a context defined by the following factors:*

- (a) the national program of privatization of public enterprises undertaken by the Moroccan Government ten (10) years ago;*
- (b) the rapid evolution of the civil aviation sector in Morocco since the creation of the Office National des Aéroports (ONDA) and its predecessor, the Office des Aéroports de Casablanca (OAC);*
- (c) the Government strategy in the matter of the progressive liberalization of the airport infrastructure and service sectors;*
- (d) the adoption by the Government of a multi-sector priority strategy aimed at the objective of 10 million tourists per year in 2010, including the creation of a Strategic Steering Committee and the establishment of an Agreement of Application among the stakeholders.*

It was in this context that the Ministère de l'Économie, des Finances, de la Privatization et du Tourisme signed an agreement with the U.S. Trade and Development Agency (USTDA) for the realization of a technical assistance project aimed at the evaluation of the potential for the privatization of airports in Morocco.

Objectives of the Study and Mandate of the Consultant

The principal objective of the present study is to effect a preliminary evaluation of the perspectives for the participation of the private sector in the development and operation of the airports as defined in the Terms of Reference of the technical assistance project.

The global mandate of the consultant comprises the provision of technical assistance to the Ministère des Finances et de la Privatization, including following specific tasks:

- 1. Analysis of current traffic forecasts and present sectorial investment plans;*
- 2. Visits to at least six (6) airports chosen jointly by the consultant and the Moroccan authorities and which offer prima facie the best perspectives for future concessions;*

3. *On the basis of the visits to the airports, development of a summary report and elaboration of recommendations to the Ministry as to the three airports to be retained for further evaluation, including detailed justification;*
4. *Detailed evaluation of the three chosen airports, including:*
 - i. *Assets*
 - ii. *Present and forecast volumes of traffic*
 - iii. *Investment requirements necessary in the course of the next five years in order to be able to satisfy the demands of the forecast traffic*
 - iv. *Potential mechanisms for the financing of these investments*
 - v. *Potential arrangements for the operation and management of airports associated with these financing mechanisms*
5. *Preparation, on the basis of the results of the preceding analysis, of a model tender call document for “BOT” (Build-Operate-Transfer) airport concessions;*
6. *Development of strategic recommendations to the Ministry to effect the privatization of airports;*
7. *Development of a complete tender call document for secondary airports which could be utilized by the Moroccan authorities, once the model tender call document is approved;*
8. *Preparation and submission of a final report to the Ministry describing the results of the project activities.*

Following the meetings to initiate the project which took place in Morocco in March 2002, the Moroccan Administration requested that the Consultant include the following task in the mandate:

9. *Proposal of different scenarios for the privatization of the management of the ensemble of the airports rather than only the most important airports.*

Scope and Organization of the Definitive Final Report

*The objective of the present **Final Report** is to provide the Moroccan authorities with the complete documentation of the project, It comprises of two volumes: **Volume I (Pre-Feasibility Study)** and **Volume II (Model Tender Call Documents)**.*

*The present document, which comprises **Volume I** of the **Final Report**, presents a **Pre-Feasibility Study** covering the following aspects:*

- *Analysis of the airports, including the context of the national airport network, an inventory of facilities and validation of the choice of the airports concerned;*
- *Analysis of the present institutional framework in the light of the eventual implementation of a strategy for the participation of the private sector in the airports;*
- *Analysis of air traffic at the airports concerned, including the volumes and characteristics of historical, present and forecast traffic;*
- *Investment requirements necessary in order to be able to satisfy the demands of the forecast traffic;*
- *Financial analysis of the feasibility of the development and operation of the airports concerned in the form of an eventual concession, including projections of costs and revenues, a financing plan and the calculation of the Net Present Value (NPV) and the Internal Rate of Return (IRR) for the sensitivity options;*
- *Evaluation of the potential arrangements for the operation and management of the airports associated with financing mechanisms.*

It should be noted that, following the mandate of the consultant as discussed in the preceding Chapter 1.3, the financial analysis considered the formula of a BOT type of concession for the three chosen airports. We note that other formulae exist for the participation of the private sector in the Moroccan airports, both in terms of the business model chosen as well as in terms of the number of airports included in the transaction, as discussed in Chapter 7 of the present Report. This being said, the financial analysis of these options did not form part of the Terms of Reference of the present pre-feasibility study.

Selected Airports

Morocco benefits from a well developed airport network covering the ensemble of the national territory, including the Southern Provinces. This network represents the fruit of an ambitious program of modernization and bringing up to international standards of 15 airports undertaken by ONDA and its predecessor, the OAC, inspired by the announcement by his Majesty Hassan II in 1981 establishing as a national priority the modernization of the aeronautical communications networks, and increase the number of airports and enhancement of the quality and prestige of airport services. Today ONDA manages a network of 28 airports belonging to the State, of which 16 are open to international traffic.

The program of development of the airport network, which continues today, comprises among others the installation of security and safety equipment; the extension, rehabilitation, resurfacing and construction of new runways; the implementation of telecommunications systems related to air traffic control services; the installation of air navigation aids; and the expansion, rehabilitation and construction of new terminals. In this context, the architectural quality of most of the new terminal facilities, which expresses the visual aspects of the local culture, deserves to be mentioned.

Our study included visits to the airports designated in the Terms of Reference (Casablanca, Marrakech, Agadir, Fès, Ouarzazate et Tanger) as well as the analysis of the airport plans and other documents placed at our disposal by the airport directors or by the administration of ONDA or available in our offices.

The three airports chosen for our evaluation represent by far the busiest in the country, therefore the most important in terms of traffic volumes and economic significance, i.e. Casablanca – Mohamed V, Marrakech – Menara, and Agadir – Al Massira. In order to evaluate the pertinence of and establish an order of priority for the participation of the private sector in airports, the following table presents the application of evaluation criteria to the airports under consideration.

Selection of Airports – Evaluation Matrix						
Criterion	Casablanca	Marrakech	Agadir	Fès	Ouarzazate	Tanger
Financial Profile	√	√	√	-	-	-
Handling Capacity	√	√*	√	√	√	-
Facility Requirements	√	√*	-	-	-	√
Socio-economic Importance	√	√	√	√	√	√
Volume and Growth of Traffic	√	√	√	-	-	-
Other –Specific Situations	-	√*	-	-	-	-

* Possibility of a public/private partnership for the recycling of the civilian land of the existing airport in exchange for the development of airport facilities at a new site.

The preceding table indicates that it is the airports of Casablanca, Marrakech and Agadir which offer the most interesting possibilities for privatization projects. In order of priority, we have established the following ranking:

- (1) Marrakech – because of the necessity of putting into place a solution to the problem of the constraints on the present site of civilian airport facilities;
- (2) Casablanca – because of the opportunities associated with the significant volume of traffic and the necessity of future investments;

(3) Agadir – because of the rate of traffic growth.

Institutional Framework

In the context of the present study consisting of a preliminary evaluation of the perspectives for the privatization of airports in Morocco, we analyzed the existing and planned institutional framework relative to civil aviation. The eventual participation of the private sector in the development and operation of the Moroccan airports will have an impact on the stakeholders concerned most directly by the administration and the execution of the airport activities at the present time and should take into account their respective mandates.

The existing institutional framework has served the development of the civil aviation sector well over the course of the last 15 years. In effect, the sector has seen significant expansion, as much at the level of traffic growth as at the level of airport development at a national scale during this period. The current framework has enabled the mobilization of the resources of the State in order to ensure the expansion of the capacity of the airports and the air navigation systems which are managed by ONDA. Moreover, the provision of services by ONDA (air navigation and management of airport facilities) is done generally according to international standards and at a high level of service.

This being said, the institutional framework in place will have to evolve in order to be able to respond to the requirements of air transportation in the course of the coming years, which will have consequences for the perspectives for the participation of the private sector in the management and the development of the airports. The Moroccan Government recognizes this situation and has taken measures to address it. It has established priorities for the reform of the air transport sector, including the institutional framework with respect to airports and has undertaken studies in this sense.

Concerning the eventual participation of the private sector in the airports, the current institutional framework raises the following issues:

- *Although the responsibility of ONDA comprises the management and maintenance of the airports, the State remains the owner of the title to the land and principal immovables of the airports. The fact that ONDA does not enjoy the right of property over these assets limits its financial autonomy. In effect, the current régime constitutes an obstacle to the participation of the private sector, by reason of its complexity, of the impossibility of using the airport assets to guarantee loans for the necessary investments and of the necessity to subordinate decisions on the use of airport assets and the development of the airports to administrative procedures. The transfer of the property of the airports to ONDA (either by virtue of a transfer of land or by virtue of a long term concession for purposes of public utility or by an*

emphyteutic lease) should facilitate the decision process concerning the development of the airports and the management of the assets.

- *A corollary of the preceding point is that the authority for the planning and the construction of airport infrastructure lies with the Direction des Bases Aériennes (DBA) of the Ministry responsible for transportation and not with ONDA. Although the two organizations enjoy good collaboration at present, we believe that this situation represents a structural weakness at the level of the institutional framework, especially in the perspective of the eventual participation of the private sector. In effect, it would be more logical to place the responsibility for investments and the management of questions associated with the real assets with the airport operator.*
- *A corollary of the preceding point is that the authority for the planning and the construction of airport infrastructure lies with the Direction des Bases Aériennes (DBA) of the Ministry responsible for transportation and not with ONDA. Although the two organizations enjoy good collaboration at present, we believe that this situation represents a structural weakness at the level of the institutional framework, especially in the perspective of the eventual participation of the private sector. In effect, it would be more logical to place the responsibility for investments and the management of questions associated with the real assets with the airport operator.*
- *The fact that ONDA is at the same time the operator of the airports and the provider of air navigation services at the level of the national network does not facilitate a clear separation between the functions of a public utility and an operator of commercial services. In the majority of non communist countries, these two responsibilities are assigned to two distinct organizations. The present situation limits the possibilities of participation of the private sector in the airports. Although the opening of the capital of an airport organization to commercial interests is entirely normal, air navigation constitutes a public service activity and the opening of its capital to commercial interests is not really conceivable.*

According to the system in place at present, the financing of the airports which are not economically viable is effected by means of internal cross subsidization at the level of ONDA. In the perspective of the eventual participation of the private sector, this situation risks being put into question by the eventual commercial partners. For the smaller airports which provide essential services to their regions but at which the traffic will not be able to generate sufficient revenues to cover the costs, other solutions will have to be considered. Models based on the notion of a public service obligation, subsidized by the State according to transparent rules, exist in the United States, Europe and Canada.

- *The rates of aeronautical fees are now decided by the Board of Directors of ONDA without any legal obligation to consult the users nor to obtain approvals on the part of a regulatory agency. In the context of the eventual participation of the private sector in the management, operation and development of the airports, this situation risks raising questions relative to the protection of the public interest and the regulation of fees according to the spirit and the letter of the Chicago Convention. The latter requires signatory States to ensure that aeronautical charges are based on the principle of recovery of the costs associated with the provision of the relevant services and facilities.*

Air Traffic

We have gathered and analyzed the data on the history of various measures of air traffic as recorded each year by ONDA. We have also analyzed the available forecasts of traffic for the airports of Casablanca, Marrakech, Agadir, Fès-Saïss, Ouarzazate et Tanger as prepared by other organizations, such as INFRAMED (Organisation de Coopération Euro-Méditerranéene), ONDA, Aéroports de Paris, IATA (International Air Transport Association), OACI (Organisation de l'Aviation Civile Internationale), FAA (Federal Aviation Administration), Airbus Industrie et Boeing.

In order to complete our analysis of air traffic at the designated airports, the following parameters were identified as being the principal factors having an impact on air traffic demand:

- *That tourism will become a priority of the national economy;*
- *That annual economic growth will reach 5%;*
- *That the government will maintain its commitment with respect to the agreement signed January 10, 2001 and designated as the “Framework Agreement 2002-2010”;*
- *That the government will implement its strategic tourism development plan;*
- *That the annual growth of tourist arrivals will reach 15% and that the volume of tourists will reach 10 million in 2010;*
- *That an investment plan aimed at the development of resort centers will be implemented;*
- *That the quality/price relationship of the Moroccan tourist product will be improved;*

- *That the politic of liberalization of air transportation will be implemented;*
- *That the government will implement a politic of “open skies” for the authorization of traffic rights for airlines.*

The following basic hypotheses were utilized in the elaboration of the forecasts:

- *Casablanca – Mohamed V Airport International will continue to benefit from its position as a connecting “hub” for air services as well as its status as economic and financial center of the Moroccan economy to attract air traffic.*
- *The objectives fixed by the government to develop tourism as well as the long term projections for the evolution of the international tourism market will have an impact on the growth in demand in terms of air traffic at the airports of Agadir and Marrakech. In these two cases, the international tourist sector constitutes the principal portion of air traffic and should benefit from the ambitious program of tourist development initiated by the government.*
- *The growth of peak hour traffic at the airports studied will evolve at a slower rate than that of annual traffic, due to the general tendency towards the reduction in the amplitude and the spreading of the peak periods in comparison to the annual volume which coincides with the growth of the latter.*

Forecasts of traffic volumes at the airports of Casablanca – Mohamed V, Marrakech – Menara and Agadir – Al Massira were undertaken for the horizons of 2005, 2010 and 2020 in order to quantify the indices of demand on airport facilities and the volumes of activity for the purpose of the financial analysis.

In order to take account of the possible variations at the level of the base assumptions and the dynamics of the evolution of the traffic, we prepared forecasts for each airport according to three different scenarios. The Base-line Scenario represents the most probable conditions in our opinion; the Low Scenario represents less optimistic conditions while the High Scenario represents more optimistic conditions.

The results of our projections indicate average annual rates of growth for passenger traffic (the determinant index of activity) at all three airports in the Base-line Scenario in the order of 8% to 9% during the period of the study. Although these figures may appear somewhat elevated, the models utilized for the forecasts were developed as a function of the basic assumptions drawn from the information on tourism and the economy which reflect the policies and engagements of the government.

The results of the forecasts are presented for each airport according to the categories of passengers, aircraft movements and air cargo and in terms of annual and peak hour volumes. These forecasts are presented in the form of the three scenarios identified for the growth of demand. The volumes of passengers are broken down by sector: international, domestic and connecting; aircraft movements and air cargo volumes are presented in the form of total traffic. For purposes of information, the following tables indicate the forecasts of annual passenger volumes for each of the airports:

Forecast of annual passengers: all sectors
Casablanca – Mohamed V International Airport

	Scenarios		
	Low	Base-line	High
2005	3,920,000	4,350,000	5,470,000
2010	4,930,000	6,650,000	7,430,000
Average annual growth rate	4.5%	9.9%	12.4%

Forecast of annual passengers: all sectors
Marrakech – Menara International Airport

	Scénarios		
	Bas	de base	Haut
2005	1,673,950	1,878,691	2,210,209
2010	2,106,085	2,484,819	3,000,000
Average annual growth rate	5.0%	8.7%	12.8%

Forecast of annual passengers: all sectors
Agadir – Al Massira International Airport

	Scénarios		
	Bas	de base	Haut
2005	1,401,270	1,541,490	1,813,505
2010	1,653,037	2,038,826	2,461,538
Average annual growth rate	5.6%	9.5%	13.8%

Investments

In order to constitute a data base for the analysis of the financial feasibility of the option of a BOT concession for the three airports identified in the study, we prepared a summary of the investments foreseen at the chosen sites, as stipulated in the Terms of Reference. In this exercise we took account of the existing investment plans and the future requirements at the airports in question. It should be noted that the investments presented in the following pages do not constitute a detailed estimation for budgetary purposes. They are only indicative of the requirements at these airports and are intended to serve as one of the references for the global evaluation of the feasibility of the BOT concession

option. In the framework of the preparation of this summary, we have taken account of the existing investment plans as well as the requirements for investment determined as a function of the forecast traffic.

A summary of the total investment requirements for these airports in the short, medium and long term is presented in the following tables. The short term corresponds to the period up to the year 2010, the medium term to that between 2010 and 2015 and the long term to that between 2015 and 2020. The program concerns the investments which will have to be planned to ensure the safety and security of the operations, the maintenance of the infrastructure and the capacity of the airports to accommodate the forecast traffic.

**Summary of Future Investment Requirements
Casablanca, Marrakech and Agadir Airports (MAD)**

	Short term (2010)	Medium term (2015)	Long term (2020)	Total
Casablanca – Mohamed V	797,570,000	387,620,000	615,740,000	1,800,930,000
Marrakech – Menara	409,600,000		378,635,000	788,235,000
Agadir – Al Massira			697,275,000	697,275,000
Total	1,207,170,000	387,620,000	1,691,650,000	3,286,440,000

According to these data, the three principal airports of Casablanca, Marrakech and Agadir will necessitate investments totaling some 3.3 billion MAD, or approximately 350 million USD, in the course of the period up to 2020. In the short term, i.e. up to 2010, these investment requirements will total some 1.2 billion MAD, or 106 million USD.

Analysis of these figures reveals that the total investments required at Casablanca represent 55%, Marrakech 24% and Agadir 21% of the global amount for the three airports, which reflects more or less the respective proportions of the traffic at these airports.

Concerning the nature of the investments required at these airports, the analysis indicates that terminal buildings constitute the principal projects identified by the consultants for the period in question:

Proportion of Terminals to Total Forecast Investments

Casablanca	1,560,000,000 out of a total of 1,800,930,000 MAD (87%)
Marrakech	494,000,000 out of a total of 788,235,000 MAD (63%)
Agadir	432,000,000 out of a total of 697,275,000 MAD (62%)
Total three airports	2,486,000,000 out of a total of 3,286,440,000 MAD (76%)

If one adds the projects related to the terminals such as the aircraft apron parking gates and the road works in the public areas, the percentage is even more significant:

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Proportion of Terminals and Related Works to Total Forecast Investments

Casablanca	1,677,870,000 out of a total of 1,800,930,000 MAD (93%)
Marrakech	617,150,000 out of a total of 788,235,000 MAD (78%)
Agadir	541,950,000 out of a total of 697,275,000 MAD (78%)
Total three airports	2,836,970,000 out of a total of 3,286,440,000 MAD (86%)

This comparison indicates that the investment requirements at the three main airports consist essentially of projects associated with the accommodation of passengers and related works. On the other hand, the investments associated with aviation safety and security (runways, navigational aids, fire fighting and crash rescue, etc.) as well as the support networks (drainage, electricity, sanitary sewers, etc.) represent only a relatively small percentage of the total. One can therefore conclude that the basic infrastructure does not constitute the principal investment burden at these three airports.

In the perspective of the analysis of the participation of the private sector in the operation and the development of the Moroccan airports, it must be noted that the investment program only covers the three principal airports of the country. In the context of the objectives of development of the tourist sector announced by the government, it is obvious that the investment requirements at the level of the global Moroccan airports network will greatly surpass these figures.

In the specific case of Marrakech, the future investment requirements as presented take into account the recent significant expansion of the terminal facilities which increased the total floor area of the passenger terminal building by a factor of 100%. We have determined that the civilian facilities at the existing site of the airport will be able to accommodate the forecast traffic during the study period; however beyond 2020, they will reach their threshold of saturation. The strategy to pursue for handling civil air traffic aérien after this date raises several fundamental questions: the incidence of noise on the surrounding populations, the impacts on the environment and the local road network, the cohabitation between military and civil operations, the availability of alternative airport sites, the possibility of “recycling” the land presently occupied by the civil facilities in order to contribute to the financing of the realization of an eventual new airport, the responsibility for the provision of basic infrastructure (roads, water supply lines, sewers, electricity, etc.) at an alternate location, etc.

Financial Analysis

The pre-feasibility study contains the financial analysis of the development and operation of the airports of Agadir, Casablanca and Marrakech in the form of a BOT-type concession between the government and a private entity. As explained, the BOT concession model for these three sites does not represent the only possibility; it constitutes only one option among several for the

participation of the private sector in the Moroccan airports, the choice of this model having been determined by the Terms of Reference of the present study.

The critical result of the financial analysis is the calculation of the Internal rate of return (IRR). Based on our experience with airport concessions in a number of developing countries, an IRR of 25 percent or better will be necessary in order to be able to attract qualified private investor/operators. A twenty-year period was selected for the cash flow analysis. In view of the level of investment required, a shorter concession period would probably not be feasible in terms of attaining an adequate rate of return for the concessionaire.

Our financial analysis also comprised the development of twelve cash flow models for each airport, demonstrating the sensitivity of a variety of circumstances on the financial performance. These financial models can be grouped into four families, characterized by the following distinctions:

- The first three of these sensitivity models demonstrate the effect of higher capital costs on the performance of the Airports.*
- The next three sensitivity models demonstrate the effect of lower aviation activity on the financial performance of the airports.*
- The next three sensitivity models demonstrate the effect of higher operation and maintenance expenses on the performance of the airports.*
- The final three sensitivity models demonstrate the effect of lower revenues on the performance of the airports.*

The conclusion of this analysis indicates that a private investor could expect IRRs of more than 25% following the eventual concession of the airports of Casablanca, Marrakech and d'Agadir, which would produce positive NPVs, on the basis of the investment program discussed preciously and a combined cost of capital of 16.18%. These conclusions hold for each airport studied as well as for the ensemble of the three. More specifically, the IRRs which were calculated for each airport according to the Base-line Operational Scenario and the Base-line Investment Scenario are summarized as follows:

Summary of Financial Results

Base-line Operational Scenario / Base-line Investment Scenario

Airport	Internal rate of return (IRR)	Net present value (NPV)
Casablanca – Mohamed V	29.4%	\$4,9716,000
Agadir – Al Massira	25.7%	\$11,615,000
Marrakech – Menara	27.2%	\$13,106,000

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Returns such as these indicate that the project of the eventual concession of these airports, individually or collectively, is feasible from the point of view of the financial return on the investment which the Concessionaire would have to make. The financial sensitivity analysis indicates moreover that the IRR exceeds the minimum threshold of 16,8% in all cases of the Base-line Operational Scenario: when combined with the Base-line Investment Scenario, the High Investment Scenario "1" and the High Investment Scenario "2".

Internal rate of return (IRR): Base-line Operational Scenario

	Investment Scenarios		
	Base-line Scenario	High Scenario "1"	High Scenario "2"
Casablanca	29.4%	28.8%	28.2%
Marrakech	27.2%	26.3%	25.3%
Agadir	25.7%	25.7%	25.6%

The financial sensitivity analysis also demonstrates that IRRs between 20% et 25% could be achieved for the airports studied in the case of the High Expenses Scenario and of the Reduced Revenues Scenario, which would produce positive NPVs, albeit more modest, on the basis of the same combined cost of capital of 16.18%.

Internal Rate of Return (IRR): High Expenses Scenario

	Investment Scenarios		
	Base-line Scenario	High Scenario "1"	High Scenario "2"
Casablanca	22.9%	22.4%	21.8%
Marrakech	25.1%	24.1%	23.1%
Agadir	23.4%	23.3%	23.1%

Internal Rate of Return (IRR): Reduced Revenues Scenario

	Investment Scenarios		
	Base-line Scenario	High Scenario "1"	High Scenario "2"
Casablanca	22.2%	21.6%	21.0%
Marrakech	21.4%	20.5%	19.4%
Agadir	21.0%	20.9%	20.7%

Finally, the financial sensitivity analysis demonstrates that it is only in the case of the Reduced Activity Scenario that the IRRs would not reach the minimum threshold of 16.18%, thus resulting in negative NPVs for all airports studied.

Internal Rate of Return (IRR): Reduced Activity Scenario

	Investment Scenarios		
	Base-line Scenario	High Scenario "1"	High Scenario "2"
Casablanca	10.4%	8.9%	7.4%
Marrakech	13.6%	12.3%	10.9%
Agadir	16.1%	15.9%	15.6%

We have identified several potential sources for the financing of the airport development program, as follows:

- a) public funds authorized by the government by means of programs of the Ministère du Transports et de la Marine Marchande (Direction des Bases Aériennes), which would represent contributions from the State;*
- b) internal funds of ONDA, generated by operational profits, which would represent an equity investment on the balance sheet of ONDA;*
- c) loans contracted by ONDA and guaranteed either by forecast operational profits or by the Moroccan State, which would represent long term debts on the balance sheet of ONDA;*
- d) capital contributions provided by an eventual partner/shareholder of ONDA (this option applies in the case where ONDA opens its capital or creates a subsidiary in which the partner invests its own resources), which would represent an equity investment on the balance sheet of the partnership;*
- e) direct investments made by an eventual concessionaire/operator in the framework of BOT-type contract (Build-Operate-Transfer), which would represent an equity investment on the balance sheet of the concessionaire/operator;*
- f) loans contracted by an eventual partner or concessionaire from financial institutions, which would represent long term debts on the balance sheet of the concessionaire/operator;*
- g) loans contracted by an eventual partnership or concessionaire from suppliers of imported elements, possibly supported by guarantees from financial institutions, which would represent des short term debts on the balance sheet of the partnership or concessionaire.*

The fact that most of the required investments consist of projects associated with the expansion of terminal buildings has implications for the choice of the eventual financing formulae. This type of airport investment is generally considered as an investment of commercial nature, especially in comparison with projects associated with aspects of safety and security (runways, taxiways, control towers, FFR facilities, perimeter fences, etc.) or with the maintenance of the airport property (garages, electrical equipment, sewers, drainage system, etc.....).

In this perspective, one can distinguish between public and private modes of financing. Investments intended to ensure safety and security are normally

financed by the granting of public funds as described in option (a) above. It is a question of the responsibility of the State by virtue of international treaties and Moroccan law, thus the financing of these investments is a matter for the concern of the public authorities. On the other hand, investments of a commercial nature, for example in the case of terminal buildings, can be considered as “discretionary” work in the sense that the sizing of these facilities and the level of service desired are subject to choices based on cost/benefit calculations, which is not the case for the aspects of safety and security.

In the specific context of the Moroccan airports, therefore, the financing of the greater part of the program of works envisaged would come from “commercial” sources, as described in options (d), (e), (f) and (g) above. In this context, the commercial sources of financing can be considered as being loans or capital contributions.

Private Sector Participation

According to traditional arrangements, the airports of most States belong to governments. This being said, this situation is in a state of evolution inasmuch as governments are abandoning the roles of owner and operator in favor of those of regulator and initiator of policies. Corporate entities, applying principles of commercial management, are assuming increased responsibilities for the operation, investment and management of airport activities.

Private sector participation in airports can take several forms, at the level of management and operation, investment and/or acquisition of equity. The options for the participation of the private sector comprise the full range from minimalist models such as contracting out of specific services, to global management contracts or airport operating concessions, up to models involving maximum responsibility in the form of the direct acquisition of the airport property and/or the purchase of shareholdings in an airport corporate entity.

In order of increasing degree of private sector participation, the following summary table presents a framework for the definition of generic options for the participation of the private sector in airport activities. The subsequent paragraphs describe these options in greater detail.

Range of Options for Private Sector Participation in Airport Activities

Options	A (maximum public sector / minimum private sector) >	B (reduced public sector / increased private sector) >>	C (reduced public sector / increased private sector) >>>	D (reduced public sector / increased private sector) >>>>	E (minimum public sector / maximum private sector) >>>>>
Ownership of assets	Public sector	Public sector	Public sector	Public sector	Private sector

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Investment	Public sector	Public sector	Public sector	Private sector	Private sector
Management and operation	Public sector	Private sector	Private sector	Private sector	Private sector
Typical modalities	Contracting out: specific services	Airport management contract	Airport operating concession	BOT ¹ concession, long term lease, etc.	BOO ² concession, asset purchase, etc.
Examples	Boston: Management contract for retail facilities; Ghana: Concession for ground handling and air cargo services	ASECNA: "Specific contracts" for management of airports in French-speaking African countries	<i>Airports du Cameroun</i> : Concession for the operation of the main airports	Toronto: Construction and operation of Terminal No. 3; New York (JFK): Construction and operation of Terminal One	British Airports Authority PLC ; Airports Company of South Africa ; Sydney (Australia) Airport Company

1. Build-Operate-Transfer
2. Build-Operate-Own

After analysis, the most relevant model for the eventual participation of the private sector in the Moroccan airports is that of the transfer of the airport property to ONDA and the opening of its capital to private investors. This option would permit the Government to realize its stated objectives, i.e.:

- *The mobilization of the capital necessary for the airport investments by tapping into non-governmental sources in order to respond in timely fashion to the demands of the industry and to reduce the financial burden on the Government;*
- *The introduction of approaches and methods of airport management based on commercial principles, in order to improve efficiency and maximize the generation of non-aeronautical revenues, with the objective of reducing the pressure to increase aeronautical charges, which constitute a critical element of the strategy of the Government aimed at reaching the target of 10 million tourists in 2010;*
- *The adaptation of the existing institutional framework to the requirements of the new régime of the liberalization of air transportation and integration with European airspace.*

We believe that the model of direct participation by the private sector in the shareholding of ONDA represents the best formula for mobilizing the investments necessary for the eventual renewal and expansion of the airport facilities and the pursuit of the required adaptations of the institutional framework for the management of the airports.

The other models (out-sourcing services contracts, airport management contracts, operating concessions, BOT concessions and their variants) do not offer the necessary tools to contribute in a real and sustainable way to the realization of the stated objectives of the Government.

In particular, the formulae involving contracts for specific services and airport management only constitute short term solutions aimed simply at improving the quality of these services and/or reducing costs, according to the case. The same applies to the formula of an operating concession. These formulae do not address in any way either the financing of the investments or the adaptation of the institutional framework.

The formula of a BOT concession presents other problems. Although this model comprises by definition the financing of specified airport investments, it poses the question of the non viable airports. In the context of a BOT concession, it is not likely that a potential concessionaire would be interested to take responsibility for investments for which the short term reimbursement can not be demonstrated reliably. This attitude is due on the one hand to the perception of risk on the part of the eventual partners and on the other to the fact that the concessionaire does not benefit from the long term value added, i.e. after the term of the concession contract.

In the light of the preceding observation, we believe that the eventual implementation of a BOT concession could put into question the integrity of the du Moroccan airports network and thus be in conflict with the objectives of the Government. When it is a question of a contractual obligation on the part of the concessionaire to realize financial investments, our experience indicates that the potential partners will only be interested in those airports which have already demonstrated their viability (in this case Casablanca, Marrakech and Agadir). In the framework of an eventual BOT-type concession contract, it is likely that the potential partners will only take charge of non profitable airports on the basis of simple management contracts, associated with a guarantee of reimbursement if investments would be required at these airports.

Obviously, such a scenario would create a financial imbalance at the level of ONDA since the organization practices a policy of cross subsidization whereby certain airports generate surpluses which are used to compensate for the deficits occasioned by others. An eventual BOT concession could therefore lead to a negative situation for ONDA if the concession fees collected do not compensate the loss of the surpluses associated with the operation of the profitable airports. But the negative repercussions of such a scenario could go beyond purely financial considerations. The establishment of two categories of airports, private and public, risks creating tensions at the level of the employees due to the eventual differences concerning working conditions and remuneration.

In this context, the formula of direct private sector participation in the shareholding of ONDA presents advantages in comparison to the other models, notably:

- The contribution of new capital as a direct investment in the enterprise;*
- The maintenance of the integrity of the airports network;*
- The creation of long term value added;*
- The transformation of ONDA into an organization managed according to commercial management approaches and methods, with the objectives of reducing the pressure on the increase of aeronautical charges and playing a key role in the strategy of the Government aimed at the target of 10 million tourists in 2010;*
- The revision of the present institutional framework as a corollary of the process of implementation of the opening of ONDA to private capital and the adaptation of the framework to the new requirements.*

It should be noted that the formula recommended, i.e. that of opening ONDA to direct participation by private capital, does not prevent in any way the possibility that the new ONDA itself might make use of other models in specific cases: out-sourcing of service contracts, management contracts, operating concessions, BOT concessions, etc.

Implementation Process

The process of implementation of the recommended model would require significant changes in the organization of the different stakeholders in the field of air transportation and the administration of civil aviation. The following paragraphs indicate the principal elements of this restructuring.

The keystone of the implementation of the recommended model consists of the change in the present status of ONDA: from an Enterprise Publique à Caractère Industriel et Commercial (EPIC) to a true Incorporated Company, i.e. from essentially a State enterprise to a veritable independent airport authority. In effect, this initiative should be undertaken at the same time as the separation of the present activities of ONDA between those associated with the management, maintenance and operation of airports and those associated with the provision of air navigation services.

This operation is necessary in order to permit the opening of the shareholding of ONDA to participation by the private sector. The transformation of ONDA could be accomplished in several steps. First, the change in status could be voted by resolution of the present Board of Directors and then ratified by Decree. Then, the airport property could be transferred by the State to the new ONDA “airports”. It should be noted that several mechanisms exist for the transfer of the property of the airport lands and immovables to the new airports ONDA, by means of either the granting of the titles to the lands, the granting of public utility concessions or very long term emphyteutic leases, etc.

Following this, the new ONDA “airports” could increase its liquidity and reinforce its technical and commercial competence by opening its capital to the private sector, including strategic investors, operators able to contribute know-how, employees and/or local organizations.

As a corollary of the preceding point, it will be necessary to effect changes at the level of the present composition of the Board of Directors of ONDA in order to reflect the new shareholding and the commercial orientation of the organization. More particularly, the representatives of the State coming from the ranks of the ministries should be replaced by essentially independent persons, selected on the basis of their competence in the relevant fields which concern the State property: air transportation, tourism, economy, urbanism, regional development, protection of the public and the environment, etc. At the same time, the airline Royal Air Maroc (RAM) should no longer be represented on the Board of Directors of the Board of Directors of the new ONDA and vice versa, in order to eliminate potential conflicts of interest.

The implementation of the formula of transformation of ONDA to an Incorporated Company and the opening of its capital to the private sector would require other

changes at the level of the responsibilities of other stakeholders. The responsibility for the planning and the realization of the principal airport investments, which now is the concern of the Direction des Bases Aériennes (DBA) of the Ministère du Transport et de la Marine Marchande, should be transferred to the new ONDA as a corollary to the previously mentioned transfer of property. Although good cooperation now exists between ONDA and the DBA, the proposed change in the status of the property airport would require the transfer of this responsibility to ONDA. This being said, the DBA should retain its present functions in the area of the elaboration of policies and national planning in regard to airports. We believe that in the new context, the DBA should continue to play the role of principal representative of the State for relations with the new ONDA.

The transformation of ONDA into an Incorporated Company would also require the reinforcement of the protection of the public interest and the transparency of economic regulation in the airports sector. According to the current régime, the Board of Directors of ONDA represents the only body which approves the airport charges; this situation does not suffice to ensure the protection of the public interest with regard to the level of airport charges. We therefore recommend that a Regulatory Authority be established which would have the responsibility of analyzing and approving airport aeronautical charges.

**PRELIMINARY EVALUATION OF THE PERSPECTIVES FOR PRIVATIZATION
OF MOROCCAN AIRPORTS**

FINAL REPORT – VOLUME I : PRE-FEASIBILITY STUDY

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1. INTRODUCTION

1.1 Context of the Study

The present study entitled **Preliminary Evaluation of the Perspectives for Privatization of Moroccan Airports** results from the following principal factors:

- (a) the national program of privatization of public enterprises undertaken by the Moroccan Government ten (10) years ago;
- (b) the rapid evolution of the civil aviation sector in Morocco since the creation of the *Office National des Aéroports* (ONDA) and its predecessor, the *Office des Aéroports de Casablanca* (OAC);
- (c) the Government strategy in the matter of the progressive liberalization of the airport infrastructure and service sectors;
- (d) the adoption by the Government of a multi-sector priority strategy aimed at the objective of 10 million tourists per year in 2010, including the creation of a Strategic Steering Committee and the establishment of an Agreement of Application.

National Program of Privatization of Public Enterprises

Since 1992, with the coming into force of the law on privatization, the Ministry of Finance and Privatization (previously the Ministry of Economy, Finance, Privatization and Tourism) became responsible for the implementation of the Government program aimed at augmenting the participation of the private sector in the national economy. Through the Privatization Directorate, the Ministry identified 114 public enterprises likely to be privatized in the course of the following years.

Within this framework, the Ministry decided to launch a process with the objective of exploring the potential for the participation of the private sector in the airports and airport services of the country as well as the various options to accomplish this.

Evolution of the Civil Aviation Sector

Morocco has been experiencing a high rate of growth in the air transport sector for several years and expects sustained annual increases of traffic in the course of the coming years according to the forecasts of the authorities. Major

investments are expected for airport expansion in order to be able to handle the traffic and improve the levels of service and the competitiveness of the country.

Progressive Liberalization of the Airports Sector

The Government is committed to a basic structural reform of the airports sector, including the provision of infrastructure and services. This reform is being pursued in the framework of a general program of structural adjustment of the transportation sector in the country and the intention to reinforce air transportation links with Europe.

Technical Assistance Funded by USTDA

It was in this context that the *Ministère de l'Économie, des Finances, de la Privatization et du Tourisme* signed an agreement with the U.S. Trade and Development Agency (USTDA) for the realization of a technical assistance project aimed at the evaluation of the potential for the privatization of airports in Morocco.

1.2 Objectives of the Study

As defined in the Terms of Reference of the technical assistance project, the principal objective of the present study is to effect a preliminary evaluation of the perspectives for the participation of the private sector in the development and operation of the airports. For the purposes of this exercise as defined by the Terms of Reference, the work of the consultant was oriented around the feasibility of privatization models in three specific cases: a large airport (Casablanca), and two others (Marrakech and Agadir).

1.3 Mandate of the Consultant

In the framework of the USTDA-funded project, the global mandate of the consultant as defined in the Terms of Reference comprises the provision of technical assistance to the *Ministère des Finances et de la Privatization*, including following specific tasks:

1. Analysis of current traffic forecasts and present sectorial investment plans;
2. Visits to at least six (6) airports chosen jointly by the consultant and the Moroccan authorities and which offer *prima facie* the best perspectives for future concessions;

3. On the basis of the visits to the airports, development of a summary report and elaboration of recommendations to the Ministry as to the three airports to be retained for further evaluation, including detailed justification;
4. Detailed evaluation of the three chosen airports, including:
 - i. Valuation of the assets
 - ii. Present and forecast volumes of traffic
 - iii. Investment requirements necessary in the course of the next five years in order to be able to satisfy the demands of the forecast traffic
 - iv. Potential mechanisms for the financing of these investments
 - v. Potential arrangements for the operation and management of airports associated with these financing mechanisms
5. Preparation, on the basis of the results of the preceding analysis, of a model tender call document for “BOT” (Build-Operate-Transfer) airport concessions;
6. Development of strategic recommendations to the Ministry to effect the privatization of airports;
7. Development of a complete tender call document for secondary airports which could be utilized by the Moroccan authorities, once the model tender call document is approved;
8. Preparation and submission of a final report to the Ministry describing the results of the project activities.

Following the meetings to initiate the project which took place in Morocco in March 2002, the Moroccan Administration requested that the Consultant include the following task in the mandate:

9. Proposal of different scenarios for the privatization of the management of the ensemble of the airports rather than only the most important airports.

1.4 Objectives, Scope and Organization of the Definitive Final Report

The objective of the present **Definitive Final Report** is to provide the Moroccan authorities with the complete documentation of the project. It comprises two volumes: **Volume I (Pre-Feasibility Study)** and **Volume II (Model Tender Call Documents)**.

The present document, which comprises **Volume I** of the **Definitive Final Report**, presents a **Pre-Feasibility Study** covering the following aspects:

- Analysis of the airports, including the context of the national airport network, an inventory of facilities and validation of the choice of the airports concerned;
- Analysis of the present institutional framework in the light of the eventual implementation of a strategy for the participation of the private sector in the airports;
- Analysis of air traffic at the airports concerned, including the volumes and characteristics of historical, present and forecast traffic;
- Investment requirements necessary in order to be able to satisfy the demands of the forecast traffic;
- Financial analysis of the feasibility of the development and operation of the airports concerned in the form of an eventual concession, including projections of costs and revenues, a financing plan and the calculation of the Net Present Value (NPV) and the Internal Rate of Return (IRR) for the sensitivity options;
- Evaluation of the potential arrangements for the operation and management of the airports associated with financing mechanisms.

The three airports chosen for this evaluation represent by far the busiest in the country, therefore the most important in terms of the volumes of traffic and economic weight, i.e. Casablanca – Mohamed V, Marrakech – Menara, and Agadir – Al Massira. The factors and reasons which led to the choice of these three airports are documented in Chapter 2.3 of the present Report.

It should be noted that, following the mandate of the consultant as discussed in the preceding Chapter 1.3, the financial analysis considered the formula of a BOT type of concession for the three chosen airports. We note that other formulae exist for the participation of the private sector in the Moroccan airports, both in terms of the business model chosen as well as in terms of the number of airports included in the transaction, as discussed in Chapter 7 of the present Report. This being said, the financial analysis of these options did not form part of the Terms de Reference of the present pre-feasibility study.

2. AIRPORTS

2.1 The Moroccan Airports Network

Morocco benefits from a well developed airport network covering the ensemble of the national territory, including the Southern Provinces. This network represents the fruit of an ambitious program of modernization and bringing up to international standards of 15 airports undertaken by ONDA and its predecessor, the OAC, inspired by the announcement by his Majesty Hassan II in 1981 establishing as a national priority the modernization of the aeronautical communications networks, an increase the number of airports and enhancement of the quality and prestige of airport services. The following Figure 2-1 indicates the locations of the principal airports managed by ONDA.

Figure 2-1 Locations of Principal Airports



The program of development of the airport network, which continues today, comprises among others the installation of security and safety equipment; the extension, rehabilitation, resurfacing and construction of new runways; the implementation of telecommunications systems related to air traffic control services; the installation of air navigation aids; and the expansion, rehabilitation and construction of new terminals. In this context, the architectural quality of most of the new terminal facilities, which expresses the visual aspects of the local culture, deserves to be mentioned.

Among the significant recent realizations of the ONDA program, the following projects can be mentioned, among others:

Casablanca

- Construction of a new parallel runway
- Extension of the international terminal by construction of a zone for European departures (500 million dirhams; in progress)
- Installation of an underground aircraft refueling system (in collaboration with the petroleum companies; 2000)

Fès

- Construction of a new passenger terminal sized to accommodate B747 aircraft (75 million dirhams; 2001)

Nador

- Construction of a new airport at the site of Jbel El Aroui (to be financed by the recycling and commercial development of the land of the former abandoned airport situated at Taouima within an urbanized zone (total cost of the new facilities 450 million dirhams; 1999); the effective development of the land of the former site requires modifications to the mortgage régime in force.

Marrakech

- Extension of the existing terminal

Today ONDA manages a network of 28 airports belonging to the State, of which 16 are open to international traffic. The following table presents the salient facts concerning the airports managed by ONDA.

Table 2-1 Moroccan Airports Network – Salient Facts

Airport	Status	Critical Aircraft Category	Major Renovations	Passenger Traffic 2001
Casablanca	International	Wide body	1992, 2003	3,515,000
Marrakech	International	Wide body	2002	1,393,000
Agadir	International	Wide body	1991	1,099,000
Tanger	International	Wide body	1995	284,000
Rabat	International	Wide body	1994	157,000
Fès	International	Wide body	2002	120,000
Oujda	Domestic	Wide body	1994	156,000
Nador	Domestic	Wide body	1998	83,000
Ouarzazate	International	Wide body	n.a.	74,000
Laayoune	Domestic	Wide body	n.a.	68,000
Dakhla	Domestic	n.a.	n.a.	n.a.
Al-Hoceima	Domestic	Medium range	n.a.	46,000
Tetouan	Domestic	Medium range	1994	3,700
Essaouira	Domestic	Medium range	1998	4,000
Errachidia	Domestic	Wide body	1993	1,600
Smara	Domestic	n.a.	n.a.	n.a.
Beni Mellal	Domestic	n.a.	n.a.	n.a.
Ifrane	Domestic	n.a.	n.a.	n.a.
Casa-Anfa	Domestic	n.a.	n.a.	n.a.
Tan-Tan	Domestic	Medium range	n.a.	n.a.

2.2 Inventory of Airport Facilities

Airports Studied

In order to establish the basis for the analysis of the perspectives for the participation of the private sector in the airports of Morocco, we prepared a summary of the airport facilities which we studied in the course of our mandate. This section of the report presents an inventory of the facilities at the six (6) airports designated in the Terms of Reference, in particular: Casablanca, Marrakech, Agadir, Fès, Ouarzazate and Tanger. The inventory comprises the dimensional aspects of the runways and aircraft maneuvering areas, technical equipment and buildings and other existing facilities.

Our study comprised visits to the airports designated in the Terms of Reference as well as the analysis of the airport plans and other documents made available

to us by the airports directors or by the ONDA administration or available in our offices. The inventory of the airports under study is presented in summary form in the tables which follow the texts for each airport (Tables 2-2 to 2-7).

The tables presented in this section are oriented around five (5) elements of the airside facilities: the dimensions, capacities, technical equipment, buildings and operations.

- The dimensions refer to the length and width of the runways, taxiways and aircraft maneuvering areas.
- The capacities concern the available handling capacity of each facility, e.g. the number of aircraft parking positions, the maximum rate of flow of the drainage system, the number and type of fire fighting and rescue (FFR) equipment available, the volume of the fuel tanks, etc.
- The technical equipment comprises the systems necessary for the functioning of aeronautical operations, such as aeronautical lighting and other visual navigational aids, control tower equipment, FFR vehicles and electronic air navigation aids.
- The buildings comprise all airside constructions associated with operations.
- The operations comprise the classification of aeronautical activities according to the standards of ICAO, e.g. the Airport Reference Code, the approach procedures, the categorization of FFR services and the management of the airspace from the control tower.

2.2.1 Casablanca – Mohammed V

Airside

The airside facilities of Casablanca airport conform to the standards of ICAO with respect to the critical dimensions and technical equipment. Table 2-2 presents a summary of the relevant information.

The airside facilities are in good general condition and well equipped to ensure safe and reliable aeronautical operations. This being said, two elements of concern were observed during our site visit: (1) the need for renovation of the surface of the runway, especially due to the numerous cracks in runway 35 and the accumulation of rubber from aircraft tires in the landing area of runway 17; (2) the need for a visual precision approach path indicator (PAPI) for runway 17.

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In addition to the facilities related strictly speaking to airport operations, an industrial and commercial zone (the “Technopole”) operates on the airport land.

Table 2-2 Inventory : Casablanca – Mohammed V Airport

Total area	1,484 ha
Airport reference code	4E
Category (aeronautical operations)	CAT II
Dimensions, existing runway	3,720 x 45 m
Dimensions, runway no. 2 (in construction)	3,720 x 45 m
Runway shoulders	2 x 7.5 m
Taxiway	3,380 x 23 m
Taxiway shoulders	2 x 3.5 m
Passenger aircraft parking apron	Area C – 9 attached gates Area E – 11 remote gates Area B – 12 remote gates
Cargo aircraft parking apron	2 posts
General aviation aircraft apron	Non
Drainage flow capacity	45,000 m ³
Runway lighting	Yes
Approach lighting	CAT II
Emergency generators	Yes
Pavement marking	Yes
Cargo building	Yes
General aviation building	No
Catering building	Yes
Airfield maintenance building	Yes
Control tower	
ATC operations	Airport Approach TMA
Height	28 m
Equipment	VHF Telephone Interphone AFTN Control of remote lighting system ILS verification Meteorological information Communications recording
FFR	
Category	9
Personnel	50 fire fighters
Capacity	24,500 l
Vehicle and equipment	2 10,000 l trucks 1 7,000 l truck 11 rapid intervention vehicles 2 10,000 l tanker trucks
Aircraft maintenance hangars	Regional Airlines

	RAM (Royal Air Maroc)	
	EADS	
	Marina Royal	
Fuel depot		
Fuel	Jet A-1	
Capacity	16,000 m ³	
Distribution	Hydrant system	
Navigational aids	<u>Year</u>	<u>Manufacturer</u>
VOR	1978	Sel 3000
DME	2000	Wilcox
NDB	1968	Tetherad
	1995	Sacom
ILS	CAT II	
Radar	No	
Rotating beacon	No	
Meteorological station	1995	Degreane
PAPI	1994	ADB

2.2.2 Marrakech – Menara

Airside

The airport of Marrakech – Menara is situated only 3.5 km from the downtown area of the city of Marrakech, which limits its handling capacity due to restrictions on operations and on the potential for expansion of its facilities. The location of the airport in the middle of a densely developed urban zone, including residential and tourist areas, leads to significant environmental concerns which limit the capacity and operations of the airport and prevent any possible extension of the airport facilities. In particular, it is a question of the noise impact of aeronautical operations and congestion of the airport ground access roads.

According to the available information, the airport accommodates between 86 and 90 operations per day, which corresponds to about 12 to 14 movements per hour during the heaviest peak period. It has been calculated that the theoretical capacity of the runway at Marrakech – Menara, taking into account the existing configuration of existing exit taxiways, should be approximately 25 mixed operations per hour under normal conditions; with a full parallel taxiway, the hourly capacity would be increased by 5 movements, which would give a total theoretical hourly capacity of 30 operations at the existing site. This being said, certain operational procedures can be noted which risk reducing the effective hourly capacity.

The runway presents other aspects which do not conform to ICAO standards. The ILS system is designated as CAT II for approach operations; however, the

runway lighting system is installed according to a CAT I configuration. In addition, the present system of visual approach indication consists of VASIS equipment for runway 28; this type of aeronautical equipment has been obsolete since 1999 and should be replaced by a PAPI system on the two runways in order to ensure conformity with ICAO standards.

Lack of space within the existing civilian airport property and environmental constraints effectively prevent the construction of the new facilities which will become necessary to handle the forecast traffic, such as expansion of the aircraft parking apron and a second runway.

Landside

A recent extension of the arrivals zone by some 8,000 m² has brought the total area of the terminal to approximately 16,000 m². The facilities for the handling of passengers are all arranged on the ground floor, with a small mezzanine for commercial concessions. The terminal facilities are in good condition and well maintained, having been renovated in the framework of the terminal expansion project. A building situated to the east of the main terminal building serves as a terminal for Hajj flights and other non-scheduled flights.

The capacity and level of service of the ground access roads are limited by the location of the airport in the middle of a relatively densely urbanized zone and the general congestion of urban vehicular traffic in the environs of the airport entrance.

Table 2-3 Inventory : Marrakech – Menara Airport

Total area	588 ha
Airport reference code	4E
Category (aeronautical operations)	CAT II
Runway dimensions	3,100 x 45 m
Runway shoulders	2 x 6 m
Taxiway	Nil
Taxiway shoulders	Nil
Passenger aircraft parking apron	13 "nose-in" gates
Cargo aircraft parking apron	No
General aviation aircraft apron	Yes
Drainage flow capacity	12,000 m ³
Runway lighting	Yes
Approach lighting	CAT I
Emergency generators	Yes
Pavement marking	Yes
Cargo building	Yes
General aviation building	Yes
Control tower	

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ATC operations	Airport		
	Approach		
	TMA		
Height	20 m		
Equipment	VHF		
	Telephone		
	Interphone		
	AFTN		
	Control of remote runway lighting system		
	ILS verification		
	Meteorological information		
	Communications recording		
FFR			
Category	7		
Vehicle and equipment	2 6,000 l trucks		
	1 6,000 l MAB		
	1 rapid intervention vehicle		
	1 8,000 l tanker		
Aircraft maintenance hangars	General aviation		
	Cargo		
Fuel depot			
Fuel	Jet A-1 and Avgas		
Capacity	12,000 m ³		
Distribution	Hydrant system		
Navigational aids	<u>Year</u>	<u>Manufacturer</u>	
VOR	1993	Sel 4000	
DME	1994	Thomson	
NDB	1999	Resa 50	
ILS	2000	Normac	CAT II
Radar	No		
Rotating beacon	Non		
Meteorological station	Oui		
PAPI	Non		VASIS

2.2.3 Agadir – Al-Massira

Airside

An inspection of the facilities and available documents indicates that the airport of Agadir – Al-Massira conforms to the standards of ICAO for airport design, construction, equipment and operation. The airside facilities are in good condition and are well equipped for safe and reliable aeronautical operations.

Landside

The terminal, with a total area of 28,000 m², was constructed in 1991; it is very well planned and maintained. The arrangement of spaces and facilities for the

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handling of passengers and baggage (check-in counters, conveyer belts, carrousel, inspection counters, etc.) on the same level of the ground floor is organized so as to permit the greatest flexibility with respect to eventual changes which may occur in terms of the volumes and procedures for handling of the traffic.

The access curb and the ground vehicle parking area seem sufficient to accommodate the present and forecast traffic, especially in view of the high percentage of passengers who travel in tour groups and who use buses for ground transportation to/from the airport.

Table 2-4 Inventory : Agadir – Al Massira Airport

Total area	655 ha
Airport reference code	4E
Category (aeronautical operations)	CAT II
Runway dimensions	3,200 x 45 m
Runway shoulders	2 x 7.5 m
Taxiway	3,200 x 23 m
Taxiway shoulders	2 x 3.5 m
Passenger aircraft parking apron	Area C –10 “nose-in” gates Area E – 3 remote gates
Cargo aircraft parking apron	Nil
General aviation aircraft apron	Yes
Runway lighting	Yes
Approach lighting	CAT II
Emergency generators	Yes
Pavement marking	Yes
Cargo building	Yes
General aviation building	Yes
Control tower	
ATC operations	Airport Approach
Height	26 m
Equipment	VHF Telephone Interphone AFTN Control of remote runway lighting system ILS verification Meteorological information Communications recording
FFR	
Category	8
Vehicle and equipment	1 25,000 l VMA 28 vehicle 2 6,000 l VIM 2 ^a vehicles 1 6,000 l VMA 68 vehicle 3 ambulances
Aircraft maintenance hangars	General aviation



2 FFR

Fuel depot			
Fuel	Jet A-1		
Capacity	16,000 m ³		
Distribution	Hydrant system		
Navigational aids	<u>Year</u>	<u>Manufacturer</u>	
VOR	1991	Thomson	
DME	2000	Wilcox	
NDB	1991	Tetherad	
ILS	1991	Thomson	CAT II
Radar	No		
Rotating beacon	No		
Meteorological station	1991		
PAPI	1991		

2.2.4 Fès – Saïss

Airside

The airport is equipped with an obsolete CAT I ILS system for instrument flights on runway 28, leading to serious problems with respect to spare parts.

The other airside systems are also obsolete, worn out or in poor condition. The existing visual approach indication system consists of VASIS equipment for runway 10; this type of aeronautical equipment has been out of use since 1999 and should be replaced a PAPI system on both runways in order to conform to ICAO standards. In addition, the CAT I approach lighting system as installed on runway 28 in 1976 is in a degraded state, which poses a risk for instrument flight operations.

Finally, a hill situated only 1000 m from the threshold of runway 28 is considered as an obstacle to the safety of air navigation for approaches. The hill penetrates the aeronautical surface by 30 m.

Landside

The terminal building, with a total floor area of 7,000 m², was built recently in 2001. The layout of spaces and facilities for passenger and baggage handling (check-in counters, conveyors, carrousel, inspection counters, etc.) on a single floor at grade level is organized on both sides of a central public hall. The organization of the flows seems clear and logical and the handling capacities of the systems adequate for the present traffic. This being said, it appears that the

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layout of spaces intended for concessions, situated on the mezzanine, represents a breach of security.

The access curb and the parking lot for groundside vehicles seem sufficient to accommodate the present and forecast traffic in the medium term.

Table 2-5 Inventory : Fès – Saïss Airport

Total area	285 ha	
Airport reference code	4E	
Category (aeronautical operations)	CAT I	
Runway dimensions	3,200 x 45 m	
Runway shoulders	2 x 7.5 m	
Taxiway	Nil	
Taxiway shoulders	Nil	
Passenger aircraft parking apron	4 remote gates	
Cargo aircraft parking apron	Nil	
General aviation aircraft apron	Nil	
Runway lighting	Yes	
Approach lighting	CAT I	
Emergency generators	Yes	
Pavement marking	Yes	
Cargo building	No	
General aviation building	No	
Control tower		
ATC operations	Airport	
Height	18 m	
Equipment	VHF	
	Telephone	
	AFTN	
	Control of remote runway lighting system	
	Meteorological information	
FFR		
Category	7	
Vehicle and equipment	1 2,500 l VMA 28 vehicle	
	2 6,000 l VIMP vehicle	
	1 6,000 l VMA 68 vehicle	
	1 6.000 l VLIS vehicle	
	1 ambulance	
Aircraft maintenance hangars	Nil	
Fuel depot		
Fuel	Jet A-1 and Avgas	
Capacity	1,650 m ³ + 20 m ³	
Distribution	Tanker truck	
Navigational aids		
VOR/DME	Yes	
NDB	No	
ILS	Yes	CAT I
Radar	No	
Rotating beacon	No	

Meteorological station	Yes	
PAPI	No	VASIS

2.2.5 Ouarzazate

Airside

Although the airport is equipped with a CAT II ILS system, the runway lighting system does not conform to the requirements of ICAO for CAT II operations. For this type of operations, the runway should be equipped with an approach lighting system in a CAT II configuration, as well as runway center-line lights and landing zone lights. The airport was designed to accommodate all types of aircraft.

Landside

The terminal building, with a floor area of 5,000 m², is a simple but well planned structure. All the facilities for the handling of passengers and baggage are situated on the ground floor. The control tower is integrated into the terminal building. The facilities are well maintained and seem adequate for accommodating the current traffic.

Reinforcement of the security fence surrounding the civilian facilities of the airport should be considered.

Table 2-6 Inventory : Ouarzazate Airport

Total area	189 ha
Airport reference code	4E
Category (aeronautical operations)	CAT II
Runway dimensions	3,000 x 45 m
Runway shoulders	2 x 7.5 m
Taxiway	Nil
Taxiway shoulders	Nil
Passenger aircraft parking apron	3 remote gates
Cargo aircraft parking apron	Nil
General aviation aircraft apron	Nil
Runway lighting	Yes
Approach lighting	No
Emergency generators	Yes
Pavement marking	Yes
Cargo building	No
General aviation building	No
Control tower	
ATC operations	Airport Approach
Height	12 m

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Equipment	VHF Telephone AFTN Control of remote runway lighting system Meteorological information
FFR	
Category	6
Vehicle and equipment	1 6,000 l VMP vehicle 1 6,000 l VMA 68 vehicle 1 ambulance
Aircraft maintenance hangars	Nil
Fuel depot	
Fuel	Jet A-1 and Avgas
Capacity	500 m ³ + 20 m ³
Distribution	Tanker truck
Navigational aids	
VOR/DME	Yes
NDB	No
ILS	CAT II
Radar	No
Rotating beacon	No
Meteorological station	Yes
PAPI	No

2.2.6 Tanger – Ibn-Battouta

Airside

The airport is authorized to accept CAT 1 ILS operations; it is equipped in this regard with an ILS system for runway 28.

Although the airport handles type E aircraft according to the ICAO code, the FFR services are only equipped for Category 7 operations according to the system established by ICAO for fire fighting services.

Runway 28 is utilized for 90% of the operations despite serious constraints due to penetration of the aeronautical approach surface for runway 28 by obstacles only 1,000 m from the 28 threshold and the lack of a CAT I configuration approach lighting system.

Landside

The location of the terminal building with respect to the runway is atypical. The orientation of the terminal facilities is the opposite of the normal arrangement: the terminal building is situated between the access road and the aircraft parking apron, but the runway lies on the other side of the access road, thus

necessitating excessive taxiing distances for the aircraft, which must pass around the entire terminal complex in order to taxi between the apron and the runway.

The terminal building, with a floor area of 4,700 m², is well maintained, despite its age of more than 50 years. The control tower is integrated into the terminal building and dates from the 1960's.

Table 2-7 Inventory : Tanger – Ibn-Battouta Airport

Total area	291 ha
Airport reference code	4E
Category (aeronautical operations)	CAT I
Runway dimensions	3,500 x 45 m
Runway shoulders	2 x 7.5 m
Taxiway	3,500 x 23 m
Taxiway shoulders	2 x 10.5 m
Passenger aircraft parking apron	7 remote gates
Cargo aircraft parking apron	Nil
General aviation aircraft apron	Yes
Runway lighting	Yes
Approach lighting	No
Emergency generators	Yes
Pavement marking	Yes
Cargo building	Yes
General aviation building	Yes
Control tower	
ATC operations	Airport
Height	Approach
Equipment	23 m
	VHF
	Telephone
	AFTN
	Control of remote runway lighting system
	Meteorological information
FFR	
Category	7
Vehicle and equipment	1 2,500 l VMA 28 vehicle
	2 6,000 l VIMP vehicles
	1 6,000 l VMA 68 vehicle
	1 6,000 l VLIS vehicle
	3 ambulances
Aircraft maintenance hangars	General aviation
	Cargo
	FFR
Fuel depot	
Fuel	Jet A-1 and Avgas
Capacity	1,800 m ³ + 20 m ³
Distribution	Storage tank
Navigational aids	

VOR/DME	Yes	
NDB	No	
ILS	Yes	CAT I
Radar	No	
Rotating beacon	No	
Meteorological station	Yes	
PAPI	No	

2.3 Choice of Airports

2.3.1 Selection Criteria

The Terms of Reference specify that the analysis of the feasibility of the privatization of airport activities will bear essentially on three of the six airports identified for the study, to be chosen jointly by the Consultant and the Administration. This choice was made in relation to the selection criteria identified in the Terms of Reference and described in the following paragraphs.

Financial Profile

The financial profile of an airport constitutes a primary factor in the consideration of an eventual privatization strategy. Given the requirement on the part of the private sector to justify its participation by the demonstration of the possibility of an adequate return on investment, two aspects of the financial profile of an airport are pertinent: the global revenue and the potential for financially viable operations.

Given the costs associated with the implementation of an eventual privatization project, as much for the Administration as for the private operator, it is logical to give priority to those airports having the highest total revenue figures.

The absence of constraints on the operational viability of the airport constitutes the other determinant aspect of the financial profile. It should be noted that it is not obligatory that the current financial results of the airport in question be positive. This being said, it is essential for a privatization project that the financial situation of the airport not be subject to restrictions which place undue limits on the possibility of either reducing the costs of operation or increasing the revenues.

Handling Capacity and Existing Facilities

The handling capacity of the airport facilities constitutes a significant factor in the consideration of a privatization strategy. More specifically, it is the absence of

major constraints on the development of the handling capacity of the site in question which is the determining factor for the conditions of feasibility for an eventual privatization.

The limits imposed on the current capacities of the existing facilities can be associated with either environmental constraints (presence of obstacles to air navigation, noise impact on the surrounding territory, etc.) or the size of the airport boundary.

Facility Requirements

The privatization of airport activities represents an interesting means of providing for infrastructure requirements. The mobilization of private sector resources for the financing of the necessary capital investments can enable the efficient realization of projects and the use of public funds for other purposes.

From this point of view, the possibility and the desirability of the participation of the private sector in the satisfaction of the facility requirements constitutes a condition of justification for the privatization of airport activities. The relevance of this criterion thus depends on the existence of a well defined program of required facilities for which the participation of the private sector is sought.

Socio-economic Importance

The socio-economic importance of the airport constitutes a critical element in the evaluation of the feasibility of the privatization of airport activities. The more the airport is important for its tributary region, the more one can expect expressions of interest in participating in privatization on the part of local stakeholders. This demonstration of the commitment of local organizations will provide comfort and will facilitate the mobilization of the participation of serious foreign operators and investors.

Volume of traffic and Potential for Future Growth

Normally this criterion is reflected in the annual volume of traffic at the airport in question. As a general rule, when the volume of traffic reaches the threshold of one million passengers per year, the privatization of the airport should be feasible, because of the presence of a “critical mass” which justifies the mobilization of resources and generates sufficient basic revenues.

As a corollary of the criterion of traffic volume, the potential for the growth of traffic is critical for the feasibility of the eventual privatization of des airport

activities. This latter criterion is reflected in the forecasts of traffic at the airport in question, which are determined by factors such as demographic trends, perspectives for economic activities and tourism and the capacity of the airport tributary region.

Others

Finally, the existence of a specific situation at an individual airport may constitute a selection criterion justifying the privatization of activities. In certain cases when the development of an airport necessitates complex financial arrangements, the participation of the private sector may enable the implementation of transactions which public organizations are not well suited to effect.

In this sense, one can mention for example the recycling of land at a constrained airport site in exchange for the mobilization of the capital necessary for the development of airport facilities at a new and more appropriate site. The realization of such a program, in the case of Marrakech for example, could benefit from a formula of partnership between the public and private sectors.

2.3.2 Evaluation and Priorization of Airports

In order to evaluate the pertinence of and establish an order of priority for the participation of the private sector in airports, the following table presents the application of the preceding criteria to the airports under consideration.

Table 2-8 Selection of Airports – Evaluation Matrix						
Criterion	Casablanca	Marrakech	Agadir	Fès	Ouarzazate	Tanger
Financial Profile	√	√	√	-	-	-
Handling Capacity	√	√*	√	√	√	-
Facility Requirements	√	√*	-	-	-	√
Socio-economic Importance	√	√	√	√	√	√
Volume and Growth of Traffic	√	√	√	-	-	-
Other – Specific Situations	-	√*	-	-	-	-

* Possibility of a public/private partnership for the recycling of the civilian land of the existing airport in exchange for the development of airport facilities at a new site.

The preceding table indicates that it is the airports of Casablanca, Marrakech and Agadir which offer the most interesting possibilities for privatization projects. In order of priority, we have established the following ranking:

- (1) Marrakech – because of the necessity of putting into place a solution to the problem of the constraints on the present site of civilian airport facilities;
- (2) Casablanca – because of the opportunities associated with the significant volume of traffic and the necessity of future investments;
- (3) Agadir – because of the rate of traffic growth.

3. INSTITUTIONAL FRAMEWORK

In the context of the present study consisting of a preliminary evaluation of the perspectives for the privatization of airports in Morocco, we analyzed the existing and planned institutional framework relative to civil aviation. Our analysis focused on the identification of the implications of the institutional framework for the eventual participation of the private sector in the development and operation of the airports.

We consulted the official texts made available to us by the Moroccan authorities, in particular the *Direction des Bases Aériennes* of the *Ministère du Transport et de la Marine Marchande*, ONDA and the *Direction de la Privatization* of the *Ministère des Finances et de la Privatization*. We also held discussions with representatives of these same organizations in order to complement our analysis of these documents. It should be noted that a new Civil Aviation Code is in the process of being elaborated.

3.1 Legal Texts

The following official documents pertinent to the eventual privatization of airport activities were made available to the consultants during the missions to Morocco:

- *Dahir* no. 1-89-237 of 30.12.1989 concerning the promulgation of Law no. 14-89 transforming the *Office des Aéroports de Casablanca* (OAC) into the *Office National des Aéroports* (ONDA)
- Decree no. 2-89-480 of 30.12.1989 concerning the application of the Law no. 14-89 transforming the *Office des Aéroports de Casablanca* (OAC) into the *Office National des Aéroports* (ONDA)
- Law no. 14-89 transforming the *Office des Aéroports de Casablanca* (OAC) into the *Office National des Aéroports* (ONDA)
- *Dahir* no. 1-80-350 of 06.05.1982 concerning the promulgation of Law no. 25-79 creating the *Office des Aéroports de Casablanca* (OAC)
- Law no. 25-79 concerning the creation of the *Office des Aéroports de Casablanca* (OAC)
- Ministerial Order of the Minister of Transportation no. 1308-83 of 22.07.1983 fixing the attributions and the organization of the external services of the Ministry of Transportation

- Decree no. 2-82-36 of 04.04.1983 fixing the attributions and the organization of the Ministry of Transportation
- Draft Civil Aviation Code, version 6
 - *Titre IV – Les aérodromes [loi] : Articles L IV-1-1 à L IV-1-5, L IV-2-1 à L IV-2-4, L IV-3-1 à L IV-3-2*
 - *Titre XIV – Les aérodromes [réglementation] : Articles R XIV-1-1 à R XIV-1-6, R XIV-2-1 à R XIV-2-7, R XIV-3-1 à R XIV-3-4*
 - *Titre XXI – Redevances aéronautiques [réglementation] : Articles R XXI-1-1 à R XXI-1-2*
- Decree no 2-61-161 of 10 July 1962 concerning the regulation of civil aeronautics (*Titre III – Des aérodromes : Articles 40 to 59*)

3.2 Concerned Stakeholders

The eventual participation of the private sector in the development and the operation of the Moroccan airports will have an impact on the stakeholders concerned most directly by the administration and the operation of airport activities at present and their respective mandates, as follows.

Office National des Aéroports (ONDA)

The *Office National des Airports* (ONDA) is the stakeholder most directly concerned with the airports of Morocco. According to the legal texts in force, the Government has conceded to ONDA the mandate for the “arrangement, operation, maintenance and development” of the ensemble of the civilian airports of the State open to public air traffic. In this sense, ONDA assumes the role of exclusive concessionaire of the civilian airport properties belonging to the State: a situation of effective monopoly with respect to the management and control of the airports.

The mandate of ONDA also comprises air navigation services (as a delegation from the State) and the local control of air traffic at the civilian airports operated by ONDA, subject to the reservation of the competence of the military authorities for the control of local air navigation at the airports where this responsibility is confided to them by the regulations in force.

ONDA has the status of an “*Entreprise Publique à Caractère Industriel et Commercial*” (EPIC) created by decree of the Government and constituting a financially autonomous corporate entity. ONDA is subject to the trusteeship of the authority charged with transportation, in this instance the Ministry of Transportation and the Merchant Marine. It is also subject to the financial control of the State. The administration of ONDA develops and proposes its management procedures to the Ministries of trusteeship for approval and then ONDA applies them.

ONDA is administered by a Board of Directors comprising representatives of the Administration, including: the Ministry responsible for Transportation (Chairperson), the Ministry of Tourism, the Ministry of Finance, the Ministry of Public Works, etc. as well as a representative of the national airline Royal Air Maroc.

In order to ensure the provision of the services for which it is responsible, ONDA is authorized to utilize the necessary real property assets, i.e. the public airport property. ONDA enjoys, by delegation, the right of a public power to acquire by expropriation the property which is necessary for its purposes for cause of public utility.

ONDA has the right to borrow funds for the development of airports (subject to the approval of the Ministries of trusteeship); loans have already been concluded with the ADB (African Development Bank) among others, with the guarantee of the State. ONDA also enjoys the right to concede airport activities to third parties. ONDA is moreover subject to the Regulations of Public Contracts and other procedures established by the Ministry of Finance.

The airport assets (immovables – land, buildings, runways, etc.) are placed at the disposal of ONDA by the State; however, they remain the property of the State and not the property of ONDA. The improvements made by ONDA become the property of the State but nevertheless appear in the accounting of ONDA.

The coordination of safety and security is the responsibility of ONDA, although the direct responsibility remains with the organs of the State charged with safety and security; a Committee of coordination has been established.

With respect to the services of passenger and baggage handling, aircraft services, air cargo, the legal texts in force give ONDA the right to decide the organization and provision of these activities.

Direction des Bases Aériennes (DBA)

The *Direction des Bases Aériennes* (DBA) is a department of the Moroccan public administration and is part of the Ministry of Transportation and the Merchant Marine (MTMM), under the Air Administration. The DBA has as its mission “to study, realize and maintain the aeronautical infrastructure and to manage the civilian aeronautical property”.

As the agency of the public administration responsible for the exercise of the prerogatives of the State and of the control of the airport attributions conceded by the latter, the DBA intervenes in the following areas:

- Standards (establishment of airport standards and supervision of their respect; ensuring the conformity of aeronautical facilities with traffic requirements; establishment of airport operational documents; revision of legislative texts);
- Planning (elaboration and monitoring of planning documents: development plans, master plans, site plans);
- Protection of the airport environment (establishment of technical servitudes and noise impact plans);
- General and technical studies associated with airport infrastructure (analysis and presentation for ministerial approval of the projects of ONDA and monitoring of their realization);
- Management of the public airport property (maintenance of the public airport property registry; settlement of indemnities for the acquisition or occupation of property);
- Construction service for the Ministry (realization of the airport operations of the State – e.g. new airports; assistance for and ensuring of the delegated supervision of the organizations under the control of the State for investment projects);

In view of the above-mentioned missions, the role of the DBA vis-à-vis the Moroccan airports consists, at the same time, of that of a regulatory agency (standards, etc.), a bureau of control with respect to ONDA and, finally, a planning and construction office on behalf of the State. This situation reflects the

fact that the orders establishing the attributions of the DBA date from 1983, i.e. prior to the creation of ONDA.

Delegations régionales des transports

In order to ensure “the management, coordination and control of the ensemble of services” falling under the jurisdiction of the Ministry of Transportation in the regions, the Ministry has established by ministerial order Regional Directorates of Transportation. Coordination between airport activities and other activities falling under the jurisdiction of the Ministry in a given region is accomplished in the framework of the regional delegation in question. In certain cases, notably the region of Agadir, it is the Director of the airport who assumes the role of the Delegate of the Minister to the regional delegation.

Royal Air Maroc

The national airline Royal Air Maroc, in addition to being the principal air carrier at most of the airports of the country, presently enjoys a *de facto* monopoly for the provision of ground handling services at the international airports such as Casablanca, Agadir and Marrakech. According to ONDA, it is a question of a monopoly which is exercised *de facto*, but not *de jure*. These services comprise the handling of passengers, baggage, aircraft and air freight. The parties involved in the administration of the airports are now studying this situation in the context of the liberalization of the civil aviation sector.

Other Stakeholders

The control and protection of the perimeter of the airports is affected by the National Police; the facilities are supplied by ONDA. The safety and security of civil aviation (passenger screening) and the control of immigration are effected by personnel provided by the General Directorate of National Security; the equipment as well as the training is provided by ONDA. Customs control is ensured by the personnel of National Customs; the equipment is provided by ONDA.

3.3 Issues and Evolution

The existing institutional framework has served the development of the civil aviation sector well over the course of the last 15 years. In effect, the sector has seen significant expansion, as much at the level of traffic growth as at the level of airport development at a national scale during this period. The current framework has enabled the mobilization of the resources of the State in order to

ensure the expansion of the capacity of the airports and the air navigation systems which are managed by ONDA. Moreover, the provision of services by ONDA (air navigation and management of airport facilities) is done generally according to international standards and at a high level of service.

This being said, the institutional framework in place will have to evolve in order to be able to respond to the requirements of air transportation in the course of the coming years, which will have consequences for the perspectives for the participation of the private sector in the management and the development of the airports. The Moroccan Government recognizes this situation and has taken measures to address it. It has established priorities for the reform of the air transport sector, including the institutional framework with respect to airports and has undertaken studies in this sense, documented notably in the *Rapport de propositions pour une réforme du cadre légal et institutionnel des concessions au Morocco* (Price Waterhouse Coopers, janvier 2000) and the *Program d'ajustement structural des transports au Morocco – Secteur aérien* (Ecorys-NEI, August 2002).

Concerning the eventual participation of the private sector in the airports, the current institutional framework raises the following issues:

- Although the responsibility of ONDA comprises the management and maintenance of the airports, the State remains the owner of the title to the land and principal immovables of the airports. The fact that ONDA does not enjoy the right of property over these assets limits its financial autonomy. In effect, the current régime constitutes an obstacle to the participation of the private sector, by reason of its complexity, of the impossibility of using the airport assets to guarantee loans for the necessary investments and of the necessity of subordinate decisions on the use of airport assets and the development of the airports to administrative procedures. The transfer of the property of the airports to ONDA (either by virtue of a transfer of land or by virtue of a long term concession for purposes of public utility or by an emphyteutic lease) should facilitate the decision process concerning the development of the airports and the management of the assets.

- A corollary of the preceding point is that the authority for the planning and the construction of airport infrastructure lays with the *Direction des Bases Aériennes* (DBA) of the Ministry responsible for transportation and not with ONDA. Although the two organizations enjoy good collaboration at present, we believe that this situation represents a structural weakness at the level of the institutional framework, especially in the perspective of the eventual participation of the private sector. In effect, it would be more logical to place

the responsibility for investments and the management of questions associated with the real assets with the airport operator.

- The present make-up of the Board of Directors of ONDA poses certain problems in the context of the eventual participation of the private sector. First, the representation of RAM on the Board of Directors of ONDA and vice versa constitutes a conflict of interest, especially in view of the politics of liberalization of the air transport sector and the opening of the market to competition. Furthermore, the fact that the rest of the Board of Directors is composed of representatives of ministries of the State reflects a public service organization not suited to a commercial orientation.
- The fact that ONDA is at the same time the operator of the airports and the provider of air navigation services at the level of the national network does not facilitate a clear separation between the functions of a public utility and an operator of commercial services. In the majority of non communist countries, these two responsibilities are assigned to two distinct organizations. The present situation limits the possibilities of participation of the private sector in the airports. Although the opening of the capital of an airport organization to commercial interests is entirely normal, air navigation constitutes a public service activity and the opening of its capital to commercial interests is not really conceivable.
- According to the system in place at present, the financing of the airports which are not economically viable is affected by means of internal cross subsidization at the level of ONDA. In the perspective of the eventual participation of the private sector, this situation risks being put into question by the eventual commercial partners. For the smaller airports which provide essential services to their regions but at which the traffic will not be able to generate sufficient revenues to cover the costs, other solutions will have to be considered. Models based on the notion of a public service obligation, subsidized by the State according to transparent rules, exist in the United States, Europe and Canada.
- The rates of aeronautical fees are now decided by the Board of Directors of ONDA without any legal obligation to consult the users nor to obtain approvals on the part of a regulatory agency. In the context of the eventual participation of the private sector in the management, operation and development of the airports, this situation risks raising questions relative to the protection of the public interest and the regulation of fees according to the spirit and the letter of the Chicago Convention. The latter requires signatory States to ensure that aeronautical charges are based on the

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principle of recovery of the costs associated with the provision of the relevant services and facilities.

4. AIR TRAFFIC

4.1 Historical Trends

We have gathered and analyzed the data on the history of various measures of air traffic as recorded each year by ONDA as well as on current forecasts prepared by various organizations concerned. The following table's present summary extracts of the data which can be found in the annual reports of air traffic published by ONDA.

Table 4-1 Annual Volume of Commercial Passengers (x 1000)

Airports	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992
Casablanca	3.396	3.449	3.515	3.571	3.421	3.162	2.777	2.577	2.242	2.184	2.096	1.987
Marrakech	1.368	1.349	1.393	1.426	1.292	1.081	875	753	676	805	793	654
Agadir	975	934	1.099	1.153	1.129	1.051	910	838	862	918	858	739
Fès-Saïss	129	113	120	124	122	117	81	62	66	71	90	83
Ouarzazate	69	67	74	86	79	73	59	45	44	44	52	37
Tanger	259	269										
Total	6.196	6.181										

Table 4-2 Annual Volume of Commercial Aircraft Movements

Airports	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992
Casablanca	47.383	46.640	48.280	49.580	47.415	44.702	37.896	32.072	29.840	29.466	29.312	28.806
Marrakech	13.843	13.078	13.115	13.958	12.942	12.019	10.237	8.370	7.849	9.267	10.255	9.109
Agadir	12.670	12.805	13.890	13.688	13.604	13.186	10.202	8.289	9.007	9.896	10.361	9.287
Fès-Saïss	2.571	1.706	1.944	2.274	2.336	3.363	1.751	1.180	1.530	1.508	2.163	2.291
Ouarzazate	1.128	998	1.212	1.436	1.460	1.455	1.212	.824	960	1.075	1.310	1.220
Tanger	7.422	7.361										
Total	85.017	82.588										

Table 4-3 Annual Volume of Air Freight (metric tons)

Airports	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992
Casablanca	43.728	43.042	41.142	43.490	44.255	41.948	40.637	38.475	40.591	39.635	39.798	39.938
Marrakech	2.093	2.198	2.469	2.354	2.006	1.670	1.764	1.816	2.293	2.019	1.752	1.580
Agadir	1.328	1.709	2.350	1.787	2.123	2.165	1.965	3.041	3.534	2.435	2.558	2.339
Fès-Saïss	463	426	468	569	658	563	499	405	296	332	393	341
Ouarzazate	35	47	39	127	122	44	44	39	23	29	20	10
Tanger	496	417										
Total	48.183	47.839										

4.1.1 Passengers

Annual Passengers

- The traffic at Casablanca represents around 50% of the total of passenger movements in Morocco, while the airports of Agadir and Marrakech handle 15.7% and 19.9% respectively. The traffic at the other three airports studied (Fès-Saïss, Ouarzazate et Tanger) represent no more than 7% of the total.
- All the airports displayed more or less constant traffic growth in the long term. During the period between 1992 and 2001, Casablanca registered a constant average annual growth of 5.6%, Agadir 3.3%, Marrakech 12.7%, Fès 4.2%, and Ouarzazate 28.1%.
- The absolute volume of annual commercial passenger traffic declined for the year 2001 in comparison to the year 2000 at all airports: at Casablanca by 1.6%, at Agadir by 4.7%, and at Marrakech by 2.3%. This decline is probably due to the global impact of the events of September 11, 2001, on world air traffic.
- Commercial air transport represents the quasi-totality of passenger traffic.
- During the year 2001, the mean distribution of passengers among arrivals, departures and transits was 47.0%, 48.3%, and 4.7%, respectively for the 6 airports included in this study. Although the proportion of arrivals to departures is very close for all airports, the proportion of transits varies considerably. At the three main airports of Casablanca, Agadir and Marrakech the proportion of transits is less than the average. In this sense, Casablanca handles a very low proportion of transits (1.6%) for an international airport which sees itself as a “hub” or connecting point. On the other hand, Agadir shows a proportion of transits of 4.6%, which seems high for an airport whose vocation is essentially origin-destination.

Monthly Passengers

- The monthly passenger traffic indicates two peak periods, situated between the months of March-April and July-August. In 2001 as in 2000, the month of August was the busiest. The first peak corresponds to the flow of tourists to leisure destinations in Morocco, while the July-August peak is characterized by the flow of expatriate Moroccans, returning to the country during the summer vacation period in Europe.
- The impact of the events of September 11, 2001 is clearly felt in terms of the number of air travelers recorded per month. From January to August 2001, air passenger traffic indicates a growth of 3.34% in comparison with the same

period in 2000. However, from the month of September 2001, air passenger traffic declined by 15% in comparison to the same four months of 2000.

- The differences between these variations in volumes of passengers and movements of aircraft are probably due to the fact that the number of passengers constitutes a factor directly sensitive to the ups and downs of the air travel market while scheduled aircraft operations constitute a variable more or less static, of which the sensitivity to changes in the market is more moderated than in the case of air passengers.

Load Factors

- We analyzed the load factors as a function of the available capacities of the principal aircraft in service at the 6 designated airports. Our analysis of the number of passengers carried on each type of aircraft revealed that the medium and long range airplanes (B737, A320, B757, MD80/82, B747, AB319, etc.), which represent more than 90% of the total number of operations, had an average factor of 58% at Casablanca, 59% at Agadir and Marrakech, 33% at Fès-Saïss and 34% at Ouarzazate. The range of load factors for each individual type of aircraft remained very close to the averages.
- Agadir registered the highest load factors, 97% for the A320, 71% for the B757 and 73% for the B737, because of the tourist character of the airport and the preponderant share of charter flights.

Charter Traffic

- Charter traffic at Casablanca represented 40,764 passengers in 2001, around 20% less than in 2000. In fact, charter passenger traffic has been in constant decline at Casablanca since 1994 at an annual rate of 5.3%. Charter passengers represent no more than 1.2% of the total air passenger traffic at Casablanca.
- On the other hand, Agadir registered charter traffic of 588,369 passengers in 2001, representing 53.5% of the total traffic. Charter traffic at Agadir shows an annual rate of growth of 4.2% since 1992.
- At Marrakech charter traffic represents 879,176 passengers, i.e. 63% of the total passenger traffic in 2001. Charter traffic at Marrakech shows an annual rate of growth of 11.1% since 1992.

- At Fès-Saïss and Ouarzazate, charter traffic represents around 15% of the total passenger traffic for each airport.
- Charter traffic originates mainly in France, which represents around 58% of the total international charter traffic. After visitors from France, the most significant are other Europeans (36%), especially those from Germany (9.5%) and Italy (6.1%). Other charter passengers originate essentially from the Middle East (4.5%).

4.1.2 Aircraft Movements

Annual Aircraft Movements

- For the period from 1992 to 2001, the annual rate of growth of total commercial aircraft movements in Morocco was 4.9%. During this period, the 6 airports studied registered different rates of growth.
- In this context, Casablanca registered an average annual rate of growth for commercial aircraft movements of 5.6% between 1984 and 2001 versus 4.6% at Agadir and 9.4% at Marrakech.
- Ouarzazate registered an average annual rate of growth for commercial aircraft movements of 21.3% during this period versus 5.9% at Fès-Saïss.
- The year 2001 saw a general decline in the number commercial aircraft movements throughout the national airports network, with the exception of Agadir where commercial aircraft movements grew by 1.5% compared to 2000.
- At Casablanca and Marrakech the number of commercial aircraft movements reached its maximum in 2000, with 49,580 and 13,958 operations, respectively.
- At Fès-Saïss, the number of commercial aircraft movements reached its maximum in 1998, with 3,363 operations; the number of commercial movements then declined by an annual rate of 16%. At Ouarzazate a maximum of 1,460 movements was reached in 1999 and the number has declined by 8.6% per year since this date.

Monthly Aircraft Movements

- The monthly variation in aircraft operations at the level of the total Moroccan airports network indicates a principal peak in the month of August, with 9,200 operations during the last two years.
- A secondary peak takes place in the month of March, with 8,560 aircraft movements in 2000 and 9,052 in 2001. This peak is explained by the tourist character of certain of the busiest airports, i.e. Agadir and Marrakech.
- The seasonal peaks of March and August reflect two types of traffic: tourists in March, principally Europeans, attracted by the excellent climate of Agadir and Marrakech; expatriate Moroccans in July-August, visiting family or for vacation.
- The effect of September 11, 2001 is clearly manifested in the statistics of aircraft movements at the level of the Moroccan airports network. Although the period between January and August 2001 indicates a slight increase of 0.45% in aircraft movements from 2000 to 2001, the period between September and December indicates a decline of 13.4% in 2001 compared to the same period in 2000.

Distribution of Commercial Aircraft Movements by Airport

- Commercial aircraft movement traffic at the ensemble of Moroccan airports in 2003 is divided as follows: Casablanca (56%), followed by Marrakech and Agadir (16% and 15% respectively); the three other airports studied (Fès-Saïss, Ouarzazate, and Tanger) contributed only 13% taken together.

Distribution of Non Commercial Aircraft Movements by Airport

- Non-commercial traffic is represented by military aircraft, official flights and general aviation, including flight schools and private aircraft. This category comprised 23% of the total aircraft movements in the national airports network in 2001.
- The share of this traffic in relation to commercial aircraft movements seems to have an inverse relation to the total volume of traffic.

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- The main airports indicate rather insignificant proportions for this category of traffic. At Casablanca, it represents 3.3% of the total traffic, at Agadir 10.5% and at Marrakech 2.3%.

The make-up of non-commercial aircraft movements by airport and by category is indicated in the following table:

Table 4-4 Distribution of Non-Commercial Aircraft Movements

Airports	General Aviation	Other	Military	Official Flights
Casablanca-Mohammed V	36.9%	36.3%	15.2%	11.6%
Agadir	72.1%	1.5%	16.9%	9.6%
Marrakech	78.8%	1.4%	5.8%	13.9%
Fès-Saïss	55.9%	6.5%	27.5%	10%
Ouarzazate	48.7%	0.4%	48.7%	2.2%

- Since 1992, non-commercial activities in the national airports network registered an insignificant average annual growth of 0.2%. This being said, variations exist among the different airports. Casablanca, Agadir, and Fès-Saïss registered constant declines in their non-commercial activities at annual rates of -1%, -7%, and -3%, respectively; Marrakech and Ouarzazate registered increases in their non-commercial activities at annual rates of 9.6% et 5.5%, respectively.
- In 2001, the volume of non-commercial aircraft movements was 1,649 at Casablanca, 1,636 at Agadir, 3,908 at Marrakech, 1,534 at Fès-Saïss and 1,453 at Ouarzazate.

Distribution of Aircraft Movements by Type of Aircraft

- According to the FAA system of categorization, the make-up of the aircraft fleet for each of the airports is presented in the following table:

Table 4-5 Composition of the Aircraft Fleet by Airport

Airports	FAA Code		
	D >300,000 lb	C 12,500 – 300,000 lb	A+B <12,500 lb
Casablanca-Mohammed V	6.4%	88.4%	5.2%
Agadir	6.2%	88.8%	5.0%
Marrakech	6.0%	92.6%	1.4%
Fès-Saïss	5.2%	89.3%	5.5%



- The total of 37,503 metric tons of international cargo at Casablanca in 2001 is composed of 21,334 metric tons (56%) of exports and 16,169 metric tons (43%) of imports.
- In terms of the principal origins and destinations of cargo, the majority of import and export activities pass through European countries, i.e. 68% of the total volume. France by itself represents 30% of the total air cargo activity. Other important exchanges take place with North America (3.4%), other Arab countries (2.2%) and other African countries (1.6%).

Air Mail

- Air mail represents no more than 2.7% of the total air cargo and is situated almost exclusively at Casablanca.
- This being said, air mail traffic declined by 5.1% per year since 1992 at Casablanca. This trend is still more marked at the other airports, the annual decline being more than 20%.
- In 2001, Casablanca recorded only 1,168 metric tons of mail, i.e. 31.6% less than in 2000.

4.2 Current Forecasts

We analyzed the available air traffic forecasts for the airports of Casablanca, Marrakech, Agadir, Fès-Saïss, Ouarzazate and Tanger as prepared by other organizations. The available studies of forecasts comprised those performed by both domestic Moroccan and foreign organizations, including the following:

- INFRAMED (Euro-Mediterranean Cooperation Organization) in 1997 and covers the period from 1997 to 2010;
- ONDA, published in 1998 and treating the period from 1998 to 2010;
- *Aéroports de Paris*, included in Report 3.2 of the **Schéma Directeur des Airports du Morocco et Plan Stratégique de ONDA**, published in 1999 and treating the period from 1999 to 2020;
- IATA (International Air Transport Association);
- ICAO (International Civil Aviation Organization);

- FAA (Federal Aviation Administration);
- Airbus Industries;
- Boeing.

We analyzed the forecasts prepared by these groups in terms of the volumes of air passengers, aircraft movements and volumes of air cargo. To the extent possible, we evaluated the underlying assumptions for each of these sources of data. Finally, we drew conclusions with respect to the relevance of the forecasts.

Our analysis presents the assumptions utilized in each study, as well as tables summarizing and comparing the different forecasts for passenger traffic (Table 4-7), aircraft movements (Table 4-8) and air cargo (Table 4-9). Concerning the latter, Table 4-9 indicates only the airport of Casablanca, since 85% of the cargo in the entire Moroccan airports network passes through this facility.

In certain cases the forecasts studied indicate only the total traffic for the Moroccan airports network as a whole, or for the geographic region comprising Morocco along with other countries. In these cases, we disaggregated these forecasts and assigned the traffic to individual airports according to the present proportion of each airport in the global Morocco airports network.

4.2.1 INFRAMED

This study was funded by the European Commission and performed through the Euro-Mediterranean Cooperation Commission in 1997. The forecast study covers from 1997 to 2010. The air traffic forecast performed by INFRAMED is based on socio-economic and air transport assumptions, such as:

- Moroccan economic growth above 5% annually.
- Positive evolution of the tourism industry.
- Main airports: Casablanca and Agadir.
- One airport hub based on Casablanca-Mohammed V for regular flights.
- The rest of the airports depend on the tourist offerings in their regions.
- The aircraft operations are related to the average number of passengers per flight.
 - From 1998 to 2005, the ratio passenger/flight is the same that the actual ratio.
 - From 2006 to 2010, the ratio increases by 1 passenger per flight annually.
- Strong increase of air cargo activity.

4.2.2 ONDA

This study was carried out by ONDA in 1998 covering only Casablanca – Mohammed V and covers the period from 1998 to 2010. The data made available to us did not include the forecasting assumptions.

4.2.3 Aéroports de Paris (ADP)

This study was carried out by a private consultant (*Aéroports de Paris – ADP*) at the request of ONDA within its National Airports System and Strategic Plan in 1999. The assumptions are as follows:

- Growth of air passengers based on the number of beds available in Moroccan hotels
- Low Scenario
 - 1,500 beds per year
- Base-line Scenario
 - Increase of 30,000 beds in 2003-2004
 - Expected 3.2 millions visitors in 2004
- High Scenario
 - Increase of length of stay of tourists
 - Increase of hotel occupancy rate
 - Development of Casablanca as an air transport hub

4.2.4 IATA

The forecasts of IATA are based on the “Delphi” methodology. At the request of IATA, international airlines prepare their own projections of air traffic by country. This methodology constitutes a qualitative approach based on the experience and knowledge of industry experts.

According to IATA, the growth of passenger traffic in Morocco is forecast to reach 3.3% per annum from 2001 to 2005. We applied the current proportions of traffic share among the airports studied to the total for the Moroccan airports network in order to calculate the volumes at each airport for passengers and aircraft movements.

4.2.5 Airbus Industries

Airbus Industry, as with all aircraft manufacturers, develops its own business forecast. That of Airbus is published under the name **Global Market Forecast (GMF)**. The latest GMF issued by the company dates from 2000 and presents a scenario of the development of aviation for each region of the world, in terms of

air passengers, aircraft deliveries and air cargo. The assumptions utilized comprise the following factors:

- The relationship between air transportation and GNP;
- The increase in the number of air carriers;
- The increase in the average capacity of aircrafts;
- Liberalization in the development of flight frequencies.

The application of the GMF to air traffic in Morocco was adjusted in order to take into account the political and geographical location of the country. Thus, due to the significant dependence of the Moroccan air traffic on the European air routes, we have utilized both Africa and Europe forecasts.

- Air passengers growth 2000 to 2010: 5.2%
- Air cargo growth 2000 to 2010: 6.1%
- Aircraft operations growth 2000 to 2010: 3.8%

4.2.6 Boeing

Boeing published its own forecast in the form of the **Current Market Outlook 2001**. The assumptions are based on worldwide GNP growth of 3% per annum with variations for different regions. We followed the same approach for the Boeing forecasts as we did for the application of the Airbus forecasts to the Moroccan traffic, which gave a growth rate of 4.8% per annum.

Table 4-7 Comparison of Forecast of Air Passengers Traffic

	Traffic Actual	INFRAMED		ONDA		ADP		IATA	Airbus	Boeing
		Tendance	Soutenue	Bases	Moyenne	Élevée				
Casablanca – Mohammed V	2001	3,516,786	3,624,100	3,728,633	4,613,377	3,362,000	3,618,000	4,003,000	3,781,225	3,771,030
	2005		4,400,000	4,707,314	6,812,325	4,192,000	4,965,000	6,026,000	4,612,173	4,550,334
	2010		5,500,000	6,300,000	10,009,541	5,090,000	6,491,000	8,131,000	4,000,000	5,912,171
Marrakech – Menara	2001	1,410,203	1,000,000	1,050,000	1,142,000	1,142,000	1,229,000	1,322,000	1,498,441	1,494,401
	2005		1,130,000	1,250,000	1,479,000	1,479,000	1,752,000	2,106,000	1,827,733	1,803,227
	2010		1,310,000	1,500,000	1,865,000	1,865,000	2,378,000	2,981,000	1,600,000	2,342,902
Agadir- Al Massira	2001	1,105,972	1,120,000	1,210,000	1,110,000	1,110,000	1,194,000	1,284,000	1,182,086	1,178,899
	2005		1,360,000	1,600,000	1,438,000	1,438,000	1,704,000	2,048,000	1,441,857	1,422,525
	2010		1,740,000	2,220,000	1,814,000	1,814,000	2,314,000	2,901,000	1,253,000	1,848,262
Fès-Saïss	2001				113,257	113,257	121,931	116,851	129,316	128,968
	2005				137,545	137,545	162,823	188,473	157,734	155,620
	2010				162,451	162,451	207,060	260,591	202,194	196,808
Ouarzazate	2001				78,010	78,010	83,984	80,485	79,687	79,472
	2005				94,739	94,739	112,150	129,817	97,198	95,895
	2010				111,894	111,894	142,620	179,491	89,000	124,595
Tanger – Ibn Battouta	2001	297,668	280,000	300,000	255,213	255,213	274,759	263,311	313,192	312,348
	2005		312,000	337,000	309,942	309,942	366,904	424,704	382,018	376,896
	2010		350,000	400,000	366,066	366,066	466,588	587,214	331,500	489,695

Table 4-8 Comparison of Forecasts of Commercial Aircraft Movements

	Traffic Actual	INFRAMED		ONDA		ADP		IATA	Airbus	Boeing
		Tendance	Soutenue	Bases	Moyenne	Élevée				
Casablanca – Mohammed V	2001	48,280	44,189	47,546	56,528	49,500	51,900	54,160	52,872	52,729
	2005		53,883	60,000	76,906	58,019	68,718	83,403	64,491	63,626
	2010		66,000	75,400	113,000	69,574	88,724	111,141	50,150	82,669
Marrakech – Menara	2001	13,115	9,500	12,126		13,500	14,140	14,800	14,362	14,324
	2005		10,180	14,274		16,149	19,129	22,995	17,519	17,284
	2010		12,100	13,800		20,111	25,642	32,145	14,300	22,456
Agadir- Al Massira	2001	13,890	10,584	10,000		14,860	15,500	16,230	15,211	15,170
	2005		11,900	10,900		17,664	20,931	25,156	18,554	18,305
	2010		15,700	20,500		22,006	28,071	35,192	15,700	23,783
Fès-Saïss	2001	1,944				3,650	3,830	4,000	2,129	2,123
	2005					3,889	4,604	5,329	3,150	2,597
	2010					4,559	5,811	7,313	3,150	3,329
Ouarzazate	2001	1,212				1,600	1,678	1,750	1,327	1,324
	2005					1,875	2,220	2,569	1,520	1,597
	2010					2,198	2,802	3,526	1,520	2,075
Tanger – Ibn Battouta	2001	8,459	4,361	4,600		6,340	6,644	6,900	12,184	12,151
	2005		4,628	5,000		6,480	7,671	8,880	11,500	14,861
	2010		5,400	6,200		7,559	9,534	12,125	11,500	19,050

Table 4-9 Comparison of Forecasts of Air Cargo (metric tons)

	Current traffic	INFRAMED		ONDA	ADP	Airbus	Boeing	
		Past trend	Sustained growth					
Casablanca – Mohammed V	2001	41,141.5	46,421	52,574	45,071	44,500	45,808	45,132
	2005		54,428	66,675	51,720	48,000	58,159	53,992
	2010		64,400	84,300	61,427	53,000	78,382	67,553

4.3 Base Data for Forecasts

In order to complete our analysis of air traffic at the designated airports, we identified several parameters related to the Moroccan economy and to the development of tourism which are relevant for our forecasting model. These parameters were obtained by means of interviews with key personnel of the *Ministère du Transport et de la Marine Marchande*, the *Ministère des Finances et de la Privatization* and ONDA.

The following parameters were identified as being the principal factors having an impact on air traffic demand:

- That tourism will become a priority of the national economy;
- That annual economic growth will reach 5%;
- That the government will maintain its commitment with respect to the agreement signed January 10, 2001 and designated as the “Framework Agreement 2002-2010”;
- That the government will implement its strategic tourism development plan;
- That the annual growth of tourist arrivals will reach 15% and that the volume of tourists will reach 10 million in 2010;
- That an investment plan aimed at the development of resort centers will be implemented;
- That the quality/price relationship of the Moroccan tourist product will be improved;
- That the politics of liberalization of air transportation will be implemented;

- That the government will implement a policy of “open skies” for the authorization of traffic rights for airlines.

4.4 Forecasts of traffic

4.4.1 Introduction

Forecasts of traffic volumes at the airports of Casablanca – Mohamed V, Marrakech – Menara and Agadir – Al Massira were undertaken for the horizons of 2005, 2010 and 2020 in order to quantify the indices of demand on airport facilities and the volumes of activity for the purpose of the financial analysis.

In order to take account of the possible variations at the level of the base assumptions and the dynamics of the evolution of the traffic, we prepared forecasts for each airport according to three different scenarios. The Base-line Scenario represents the most probable conditions in our opinion; the Low Scenario represents less optimistic conditions while the High Scenario represents more optimistic conditions.

The results of our projections indicate average annual rates of growth for passenger traffic (the determinant index of activity) at all three airports in the Base-line Scenario in the order of 8% to 9% during the period of the study. Although these figures may appear somewhat elevated, the models utilized for the forecasts were developed as a function of the basic assumptions drawn from the information on tourism and the economy which reflect the policies and engagements of the government.

4.4.2 Approach and Methodologies

Base Data

Historical Trends and Past Forecasts of Air Traffic

The particular methodologies used in this study are based on data which we have presented in the preceding sections 4.1 to 4.3. They include data on the historical trends, the make-up and assignment of air traffic to individual airports as well as on the current forecasts prepared by various concerned organizations which we have gathered and analyzed in the course of the first phase of the study.

Tourism – Air Traffic Relationship

Tourism has a very significant impact on forecasts of air traffic. The statistics for the year 2000 indicate a total of 4,293,240 visitors to the country, of which foreigners account for 57% or almost 2,500,000, Moroccans residing outside the country 36% or almost 1,600,000 and visitors on cruise ships 4.2%. We observed that this structure held for the recent past several years.

The statistics also indicate a constant distribution of the tourism parameters at each airport over time. On the basis of these observations, we developed a structure of the relationship between air traffic and tourist flows, as shown in Table 4-10.

Table 4-10 Structure of Air Traffic – Tourism Parameters

Airport	Percentage of foreign tourists at the airport versus total tourists in the country	Percentage of foreign tourists versus total air passengers at the airport
Casablanca – Mohamed V	13%	34%
Marrakech Menara	12%	80%
Agadir Al Massira	8%	65%

Determining Factors and Basic Assumptions

Several parameters relative to the development of the economy and tourism were identified as determining factors for our models for the forecast of traffic at the airports concerned. We obtained relevant information concerning these factors by means of interviews with officials of the ministries responsible for Transportation, Finance and Tourism, as well as with personnel of ONDA.

The following parameters were identified as the principal factors likely to influence the demand for air transportation:

Tourism

The government is committed to implement the Framework Agreement 2002-2010 signed on January 10, 2001 according to which tourism will constitute a national economic priority. The Agreement comprises:

- A strategic development plan for tourism;
- An annual growth of tourist arrivals of 15% and the achievement of a volume of 10 million tourists in 2010;

- A capital investment plan oriented around the development of resort centers;
- Improvement of the quality/price relationship of the Moroccan tourist product.

Economy

Annual economic growth is forecast to reach 5%.

Liberalization of Air Transportation

The government is engaged in a process of opening the air transport market, which comprises:

- An “open skies” policy concerning the granting of traffic rights and access to the Moroccan air market;
- Liberalization of ground handling services.

The objectives of tourist development and economic growth constitute the variables analyzed in the framework of the forecasts of traffic at the three airports studied.

The **base assumptions** utilized in the elaboration of the forecasts are the following:

- Casablanca – Mohamed V Airport International will continue to benefit from its position as a connecting “hub” for air services as well as its status as economic and financial center of the Moroccan economy to attract air traffic.
- The objectives fixed by the government to develop tourism as well as the long term projections for the evolution of the international tourism market will have an impact on the growth in demand in terms of air traffic at the airports of Agadir and Marrakech. In these two cases, the international tourist sector constitutes the principal portion of air traffic and should benefit from the ambitious program of tourist development initiated by the government.
- The growth of peak hour traffic at the airports studied will evolve at a slower rate than that of annual traffic, due to the general tendency towards the

reduction in the amplitude and the spreading of the peak periods in comparison to the annual volume which coincides with the growth of the latter.

4.4.3 Scenarios de development

On the basis of the assumptions discussed in the preceding section we established a series of hypotheses to define three development scenarios. The following matrix (Table 4-11) indicates the parameters associated with each development scenario.

Table 4-11 Traffic Forecasts: Parameters for Development Scenarios:			
Airport	Low Scenario	Base-line Scenario	High Scenario
Casablanca	<ul style="list-style-type: none"> • Econometric model • Annual GNP growth of 5% 	<ul style="list-style-type: none"> • Simple regression analysis • Annual GNP growth of 5% 	<ul style="list-style-type: none"> • Computation of tourism parameters • National objective of 10 million tourists achieved in 2010 • Foreign tourists at Casablanca airport: 13% of the total of tourists in the country • Foreign tourists: 35% of the air traffic at Casablanca airport
Marrakech	<ul style="list-style-type: none"> • Projection of past air traffic trends • Annual air traffic growth of 5.7% 	<ul style="list-style-type: none"> • Computation of tourism parameters • Annual tourism growth of 5.8% based on past trends • Foreign tourists at Marrakech airport: 12% of the total of tourists in the country • Foreign tourists: 80% of the air traffic at Marrakech airport 	<ul style="list-style-type: none"> • Computation of tourism parameters • National objective of 10 million tourists achieved in 2010 • Foreign tourists at Marrakech airport: 12% of the total of tourists in the country • Foreign tourists: 80% of the air traffic at Marrakech airport
Agadir	<ul style="list-style-type: none"> • Projection of past air traffic trends • Annual air traffic growth of 5.6% 	<ul style="list-style-type: none"> • Computation of tourism parameters • Annual tourism growth of 5.8% based on past trends • Foreign tourists at Agadir airport: 8% of the total of tourists in the country • Foreign tourists: 65% of the air traffic at Agadir airport 	<ul style="list-style-type: none"> • Computation of tourism parameters • National objective of 10 million tourists achieved in 2010 • Foreign tourists at Agadir airport: 8% of the total of tourists in the country • Foreign tourists: 65% of the air traffic at Agadir airport

4.4.4 Specific Forecast Methodologies

Several models were utilized for the forecast of air transportation according to the different development scenarios. Thus, the forecast of traffic in the individual scenarios corresponds, according to the case, to the utilization of one or another of the models described in the following paragraphs:

→ **Econometric Model**

Following interviews with key personnel of relevant Moroccan organizations, we chose the GNP as the principal variable to express the relation between external factors and the forecast indices of airport activities in certain cases. We found a significant correlation between the GNP and passenger volumes at the airport of Casablanca ($R^2=0.87$) but a less obvious correspondence for the airports of Marrakech and Agadir. We therefore used an econometric model to simulate the growth of passenger traffic at Casablanca airport, taking as a hypothesis a GNP growth rate of 5%, based on government forecasts for the evolution of the Moroccan economy. This technique was used more particularly to generate the traffic forecasts for the Low Development Scenario at Casablanca airport since the coefficient of determination is less than that of the simple regression used for the Base-line Scenario at Casablanca.

→ **Regression Analysis**

Although the regression analysis of air passengers at Casablanca revealed a correlation with GNP variable, we found that the aircraft movements correspond more directly to passenger volumes during the 14 years of observations.

→ **Industry Analysis**

Industry analysis (the “Delphi” method) applies to the identification of factors which have a determining impact on the evolution of air traffic. The objectives announced by the government and the implementation of a concerted program of development of the tourism sector will constitute determining factors for the evolution of air traffic at the airports studied.

→ **Time Series**

The projection of past traffic trends according to the adjustment of curves showing volumes of observed activities constitutes the methodology used

for the forecast of traffic indices for the Low Scenario in the case of the airports of Marakech and Agadir.

→ **Value Judgments**

Value judgments can be linked to the choice of methodologies and the hypotheses to be applied in the case of specific scenarios for each airport.

A detailed discussion of the application of these methodologies to the airports studied is found in Annex A2 to the present report.

4.5 Detailed Results

The results of the forecasts are presented in the following sections for each airport by the categories of passengers, aircraft movements and air cargo and in terms of annual and peak hour volumes. These forecasts are presented in the form of the three scenarios identified for the growth of demand. The volumes of passengers are broken down by sector: international, domestic and connecting; aircraft movements and air cargo volumes are presented in the form of total traffic.

4.5.1 Casablanca – Mohamed V

Passengers

Annual Passengers

According to the Base-line Development Scenario, total passenger traffic (all sectors) will see average annual growth of 9.9% during the study period, reaching 4,350,000 in 2005 and 6,650,000 in 2010.

According to the High Development Scenario, the average annual growth will be 12.4% during the study period, reaching 7,430,000 while the average annual growth of traffic for the Low Development Scenario will be 4.5%, reaching 4,930,000 in 2010. Table 4-12 shows a summary of these figures for the period up to the year 2010.

**Table 4-12 Annual Passenger Forecast: All Sectors
Casablanca – Mohamed V International Airport**

	Scenarios		
	Low	Base-line	High
2005	3,920,000	4,350,000	5,470,000



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2010	4,930,000	6,650,000	7,430,000
Average annual growth rate	4.5%	9.9%	12.4%

The desegregation of passenger traffic at Casablanca – Mohamed V International Airport into international, domestic and connecting sectors gives the following results, as indicated in Tables 4-13, 4-14 and 4-15 respectively for the sectors mentioned:

**Table 4-13 Annual Passenger Forecast: Domestic Sector
Casablanca – Mohamed V International Airport**

	Scenarios		
	Low	Base-line	High
2005	980,000	1,087,500	1,258,100
2010	1,133,900	1,529,500	1,708,900
Average annual growth rate	2.3%	6.6%	8.5%

**Table 4-14 Annual Passenger Forecast: International Sector
Casablanca – Mohamed V International Airport**

	Scenarios		
	Low	Base-line	High
2005	2,822,400	3,132,000	4,047,800
2010	3,648,200	4,921,000	5,498,200
Average annual growth rate	3.9%	8.8%	11.0%

**Table 4-15 Annual Passenger Forecast: Connecting Sector
Casablanca – Mohamed V International Airport**

	Scenarios		
	Low	Base-line	High
2005	23,520	26,100	32,820
2010	29,580	39,900	44,580
Average annual growth rate	3.1%	7.6%	9.7%

Peak Hour Passengers

The number of peak hour passengers will see a growth rate of 8% in the Base-line Scenario, reaching 2,175 passengers in 2005 and 3,325 in 2010. The annual growth rate of passenger volumes in the peak hour in the Low Scenario will be slower, at 3%, reaching 2,465 passengers in 2010; the High Scenario will see a growth rate of peak hour volumes of 10% which translates to 3,715 passengers in 2010. Table 4-16 shows a summary of these figures for the period up to the year 2010.



**Table 4-16 Peak Hour Passenger Forecast: All Sectors
Casablanca – Mohamed V International Airport**

	Scenarios		
	Low	Base-line	High
2005	1.960	2.175	2.735
2010	2.465	3.325	3.715
Average annual growth rate	3%	8%	10%

Aircraft Movements

Annual Aircraft Movements

For the Base-line Scenario, annual aircraft movements, all sectors combined, will see a growth rate of 8.9% reaching 57,000 commercial flight operations in 2005 and 87,000 in 2010. For the High Scenario, the corresponding rate will be 11.3%, reaching 71,700 movements in 2005 and 97,200 in 2010; for the Low Scenario, the rate will be 3.8% and the movements 51,500 in 2005 and 64,700 in 2010. Table 4-17 shows a summary of these figures for the period up to the year 2010.

**Table 4-17 Annual Commercial Aircraft Movements Forecast: All Sectors
Casablanca – Mohamed V International Airport:**

	Scenarios		
	Low	Base-line	High
2005	51.542	57.132	71.692
2010	64.672	87.032	97.172
Average annual growth rate	3,8%	8,9%	11,3%

Peak Hour Aircraft Movements

**Table 4-18 Peak Hour Commercial Aircraft Movements: All Sectors
Casablanca – Mohamed V International Airport**

	Scenarios		
	Low	Base-line	High
2005	25	27	34
2010	32	41	45
Average annual growth rate	8%	13%	15%

Air cargo

Annual Cargo Volume

**Table 4-19 Annual Aircraft Movements Forecast: All Sectors (metric tons)
Casablanca – Mohamed V International Airport**

	Scenarios		
	Low	Base-line	High
2005	43.775	46.573	49.535
2010	47.066	53.361	60.026
Average annual growth rate	1,6%	3,3%	5,1%

4.5.2 Marrakech – Menara

Passengers

Annual Passengers

According to the Base-line Development Scenario, the total passenger traffic (all sectors) will see an average annual growth of 8.7% during the study period, reaching 1,880,000 in 2005 and 2,480,000 in 2010.

According to the High Development Scenario, the average annual growth will be 12.8% during the study period, reaching 3,000,000 in 2010 while the average annual growth of traffic for the Low Development Scenario will be 5%, reaching 2,100,000 in 2010. Table 4-20 shows a summary of these figures for the period up to the year 2010.

**Table 4-20 Annual Passenger Forecast: All Sectors
Marrakech – Menara International Airport**

	Scenarios		
	Low	Base-line	High
2005	1,673,950	1,878,691	2,210,209
2010	2,106,085	2,484,819	3,000,000
Average annual growth rate	5.0%	8.7%	12.8%

The desegregation of passenger traffic at Marrakech – Menara International Airport into international, domestic and connecting sectors gives the following results, as indicated in Tables 4-21, 4-22 and 4-23 respectively for the sectors mentioned:

**Table 4-21 Annual Passenger Forecast: Domestic Sector
Marrakech – Menara International Airport**

	Scenarios		
	Low	Base-line	High
2005	401.748	450.886	530.450
2010	505.460	596.356	720.000
Average annual growth rate	4,6%	7,2%	10,8%

**Table 4-22 Annual Passenger Forecast: International Sector
Marrakech – Menara International Airport**

	Scenarios		
	Low	Base-line	High
2005	1.188.505	1.333.871	1.569.248
2010	1.495.320	1.764.221	2.130.000
Average annual growth rate	4,0%	6,6%	10,0%

**Table 4-23 Annual Passenger Forecast: Connecting Sector
Marrakech – Menara International Airport**

	Scenarios		
	Low	Base-line	High
2005	23.435	26.302	30.943
2010	29.485	34.787	42.000
Average annual growth rate	10,2%	13,9%	18,8%

Peak Hour Passengers

The number of peak hour passengers will see a growth rate of 6.5% in the Base-line Scenario, reaching 2,463 passengers in 2005 and 3,132 in 2010. The annual growth rate of peak hour passenger volume in the Low Scenario will be lower, at 4%, reaching 2,714 passengers in 2010; the High Scenario will see a growth rate of peak hour volumes of 10% which translates to 3,700 passengers in 2010. Table 4-24 shows a summary of these figures for the period up to the year 2010.

**Table 4-24 Peak Hour Passenger Forecast: All Sectors
Marrakech – Menara International Airport**

	Scenarios		
	Low	Base-line	High
2005	2.237	2.463	2.829
2010	2.714	3.132	3.700
Average annual growth rate	4%	6,5%	10%

Aircraft Movements

Annual Aircraft Movements

For the Base-line Scenario, annual aircraft movements, all sectors combined, will see a growth rate of 8.1%, a little less than the passenger growth rate, reaching 17,900 commercial flight operations in 2005 and 22,500 in 2010. For the High Scenario, the corresponding rate will be 11.6%, reaching 20,500 movements in 2005 and 26,800 in 2010; for the Low Scenario, the rate will be 5.6% and the movements 16,200 in 2005 and 19,700 in 2010. Table 4-25 shows a summary of these figures for the period up to the year 2010.

**Table 4-25 Annual Commercial Aircraft Movements Forecast: All Sectors
Marrakech – Menara International Airport**

	Scenarios		
	Low	Base-line	High
2005	16.223	17.861	20.513
2010	19.680	22.710	26.831
Average annual growth rate	5,6%	8,1%	11,6%

Peak Hour Aircraft Movements

**Table 4-26 Peak Hour Commercial Aircraft Movements: All Sectors
Marrakech – Menara International Airport**

	Scenarios		
	Low	Base-line	High
2005	13	14	16
2010	16	18	21
Average annual growth rate	4%	6%	9%

Air cargo

Annual Cargo Volume

According to our forecasts, the volume of air cargo at the airport of Marrakech – Menara will not be significant.

4.5.3 Agadir – Al Massira

Passengers

Annual Passengers

According to the Base-line Development Scenario, the total passenger traffic (all sectors) will see an average annual growth of 9.5% during the study period, reaching 1,540,000 in 2005 and 2,040,000 in 2010.

According to the High Development Scenario, the average annual growth will be 13.8% during the study period, reaching 2,460,000 in 2010 while the average annual growth of traffic for the Low Development Scenario will be 5.6%, reaching 3,650,000 in 2010. Table 4-27 shows a summary of these figures for the period up to the year 2010.

**Table 4-27 Annual Passenger Forecast: All Sectors
 Agadir – Al Massira International Airport**

	Scenarios		
	Low	Base-line	High
2005	1.401.270	1.541.490	1.813.505
2010	1.653.037	2.038.826	2.461.538
Average annual growth rate	5,6%	9,5%	13,8%

The desegregation of passenger traffic at Agadir – Al Massira International Airport into international, domestic and connecting sectors gives the following results, as indicated in Tables 4-28, 4-29 and 4-30 respectively for the sectors mentioned:

**Table 4-28 Annual Passenger Forecast: Domestic Sector
 Agadir – Al Massira International Airport**

	Scenarios		
	Low	Base-line	High
2005	392.355	431.617	507.781
2010	462.850	570.871	689.231
Average annual growth rate	4,6%	7,9%	11,7%

**Table 4-29 Annual Passenger Forecast: International Sector
 Agadir – Al Massira International Airport**

	Scenarios		
	Low	Base-line	High
2005	966.876	1.063.628	1.251.318
2010	1.140.596	1.406.790	1.698.462
Average annual growth rate	4,3%	7,7%	11,3%

**Table 4-30 Annual Passenger Forecast: Connecting Sector
 Agadir – Al Massira International Airport**

	Scenarios		
	Low	Base-line	High
2005	56.051	61.660	72.540
2010	66.121	81.553	98.462
Average annual growth rate	6,7%	10,6%	14,9%

Peak Hour Passengers

The number of peak hour passengers will see a growth rate of 9% in the Base-line Scenario, reaching 2,143 passengers in 2005 and 2,864 in 2010. The annual growth rate of peak hour passenger volume in the Low Scenario will be lower, at 5%, reaching 2,305 passengers in 2010; the High Scenario will see a growth rate of peak hour volumes of 12% which translates to 3,477 passengers in 2010. Table 4-31 shows a summary of these figures for the period up to the year 2010.

**Table 4-31 Peak Hour Passenger Forecast: All Sectors
 Agadir – Al Massira International Airport**

	Scenarios		
	Low	Base-line	High
2005	1.940	2.143	2.538
2010	2.305	2.864	3.477
Average annual growth rate	5%	9%	12%

Aircraft Movements

Annual Aircraft Movements

For the Base-line Scenario, annual aircraft movements, all sectors combined, will see a growth rate of 8.6%, a little less than the passenger growth rate, reaching 18,500 commercial flight operations in 2005 and 25,700 in 2010. For the High Scenario, the corresponding rate will be 12.9%, reaching 21,900 movements in 2005 and 30,000 in 2010; for the Low Scenario, the rate will be 4.8% and the movements 16,700 in 2005 and 19,900 in 2010. Table 4-32 shows a summary of these figures for the period up to the year 2010.



**Table 4-32 Annual Commercial Aircraft Movements Forecast: All Sectors
Agadir – Al Massira International Airport**

	Scenarios		
	Low	Base-line	High
2005	16,723	18,476	21,876
2010	19,870	24,692	29,976
Average annual growth rate	4.8%	8.6%	12.9%

Peak Hour Aircraft Movements

**Table 4-33 Peak Hour Commercial Aircraft Movements: All Sectors
Agadir – Al Massira International Airport**

	Scenarios		
	Low	Base-line	High
2005	13	15	18
2010	16	20	24
Average annual growth rate	4%	8%	12%

Air cargo

Annual Cargo Volume

According to our forecasts, the volume of air cargo at the airport of Agadir – Al Massira will not be significant.

5. INVESTMENTS

In order to constitute a data base for the analysis of the financial feasibility of the option of a BOT concession for the three airports identified in Chapter 2.3, we prepared a summary of the investments foreseen at the chosen sites, as stipulated in the Terms of Reference. In this exercise we took account of the existing investment plans and the future requirements at the airports in question. It should be noted that the investments presented in the following pages do not constitute a detailed estimation for budgetary purposes. They are only indicative of the requirements at these airports and are intended to serve as one of the references for the global evaluation of the feasibility of the BOT concession option. In the framework of the preparation of this summary, we have taken account of the existing investment plans as well as the requirements for investment determined as a function of the forecast traffic.

5.1 Existing Investment Plans

The **Five-Year Plan 2000-2004** (*Rapport de la Commission spécialisée « Transport »*) prepared by the *Ministère du Transport et de la Marine Marchande* constitutes a primary reference with respect to the investment plans at the airports concerned by the present study. This document describes the Integrated Investment Program of the Ministry in the domain of air transportation among others, including projects programmed by the Ministry and ONDA. Concerning more specifically the investments foreseen at the airports forming part of the present study, the Five-Year Plan mentions the following projects:

Table 5-1 Five-Year Plan 2000-2004 : Summary of Investment Requirements (Ministère du Transport et de la Marine Marchande)

Airport	Project	Total 2000-2004 (MAD x 1000)
Casablanca	Buildings	10.800
Casablanca	Infrastructure and service lines	14.000
Casablanca	Technical equipment	69.500
Marrakech	Buildings	18.616
Marrakech	Infrastructure and service lines	44.371
Marrakech	Technical equipment	16.500
Agadir	Purchase of land	135.000
Agadir	Technical equipment	2.488
Fès	Buildings	19.940
Fès	Infrastructures et networks	33.500
Fès	Technical equipment	48.300
Ouarzazate	Buildings	29.400
Ouarzazate	Infrastructure and service lines	4.000

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Ouarzazate	Technical equipment	15.590
Tanger	Buildings	106.000
Tanger	Infrastructure and service lines	30.862
Tanger	Technical equipment	13.640
Total		612.507

The total of these investments planned by the DBA amounts thus to almost 613 million dirhams to be invested by the State at the airports in question in the course of the current period. These capital investments do not form part of the future investment requirements.

5.2 Future Investment Requirements at Selected Airports

As a complement to the investments already planned, the future investment requirements at the selected airports constitute an important factor for the evaluation of the perspectives for the participation of the private sector in the airports of Morocco. It is a question of an appreciation of the level of funds which will have to be mobilized by the airport operator in the course of an eventual BOT concession.

We have prepared a summary of the investment requirements, based on data developed for the airports of Casablanca, Marrakech and Agadir by ADP Architects and Engineers and published in the series of documents forming part of the *Schéma directeur des aéroports du Maroc*, more specifically the *Volet 1.5 : Fonds documentaire, Étude de développement à long terme*. This study was commissioned recently by ONDA and, essentially, reflects hypotheses concerning the growth of traffic at the airports in question which are similar to those presented in Chapter 4 of the present report.

A summary of the total investment requirements for these airports in the short, medium and long term is presented in the following Table 5-2. The short term corresponds to the period up to the year 2010, the medium term to that between 2010 and 2015 and the long term to that between 2015 and 2020. The program concerns the investments which will have to be planned to ensure the safety and security of the operations, the maintenance of the infrastructure and the capacity of the airports to accommodate the forecast traffic. More detailed information is presented in Tables 5-5 (Casablanca), 5-6 (Marrakech) and 5-7 (Agadir) on the following pages.

**Table 5-2 Summary of Future Investment Requirements
Casablanca, Marrakech and Agadir Airports (MAD)**

	Short term (2010)	Medium term (2015)	Long term (2020)	Total
Casablanca – Mohamed V	797.570.000	387.620.000	615.740.000	1.800.930.000
Marrakech – Menara	409.600.000		378.635.000	788.235.000
Agadir – Al Massira			697.275.000	697.275.000
Total	1.207.170.000	387.620.000	1.691.650.000	3.286.440.000

According to these data, the three principal airports of Casablanca, Marrakech and Agadir will necessitate investments totaling some 3.3 billion MAD, or 350 million USD, in the course of the period up to 2020. In the short term, i.e. up to 2010, these investment requirements will total some 1.2 billion MAD, or 106 million USD.

Analysis of these figures reveals that the total investments required at Casablanca represent 55%, Marrakech 24% and Agadir 21% of the global amount for the three airports, which reflects more or less the respective proportions of the traffic at these airports. Concerning the nature of the investments required at these airports, terminals constitute the principal projects identified by the consultants for the period in question:

Table 5-3 Proportion of Terminals to Total Forecast Investments

Casablanca	1,560,000,000 out of a total of 1,800,930,000 MAD (87%)
Marrakech	494,000,000 out of a total of 788,235,000 MAD (63%)
Agadir	432,000,000 out of a total of 697,275,000 MAD (62%)
Total three airports	2,486,000,000 out of a total of 3,286,440,000 MAD (76%)

If one adds the projects related to the terminals such as the aircraft apron parking gates and the road works in the public areas, the percentage is even more significant:

Table 5-4 Proportion of Terminals and Related Works to Total Forecast Investments

Casablanca	1,677,870,000 out of a total of 1,800,930,000 MAD (93%)
Marrakech	617,150,000 out of a total of 788,235,000 MAD (78%)
Agadir	541,950,000 out of a total of 697,275,000 MAD (78%)
Total three airports	2,836,970,000 out of a total of 3,286,440,000 MAD (86%)

This comparison indicates that the investment requirements at the three main airports consist essentially of projects associated with the accommodation of passengers and related works. On the other hand, the investments associated with aviation safety and security (runways, navigational aids, fire fighting and

crash rescue, etc.) as well as the support networks (drainage, electricity, sanitary sewers, etc.) represent only a relatively small percentage of the total. One can therefore conclude that the basic infrastructure does not constitute the principal investment burden at these three airports.

In the perspective of the analysis of the participation of the private sector in the operation and the development of the Moroccan airports, it must be noted that the investment program only covers the three principal airports of the country. In the context of the objectives of development of the tourist sector announced by the government, it is obvious that the investment requirements at the level of the global Moroccan airports network will greatly surpass these figures.

It should also be noted that the costs of the investments as presented in this chapter are only approximate and are only intended to provide a theoretical base hypothesis for the analysis of the feasibility of an eventual BOT type concession for the three airports chosen. It is obvious that other investment programs could be defined either by the conveying authority, as a function of the priorities of the State, or by the eventual partner, as a function of its evaluation of the perspectives for the evolution of the air market at the airports in question. Finally, it must be underlined that we have included “elevated” and “reduced” variants for the investment program in the analysis of the sensitivity of the feasibility to external factors, in order to take account of the range of these divergences.

The details of the proposed investment program for each airport and for each phase (short, medium and long term) are found on the following pages, in the form of tables of Tables 5-5 (Casablanca – Mohamed V), 5-6 (Marrakech – Menara) and 5-7 (Agadir – Al Massira).

In the specific case of Marrakech, the future investment requirements as presented take into account the recent significant expansion of the terminal facilities which increased the total floor area of the passenger terminal building by a factor of 100%. We have determined that the civilian facilities at the existing site of the airport will be able to accommodate the forecast traffic during the study period; however beyond 2020, they will reach their threshold of saturation. The strategy to pursue to handle civil air traffic aérien after this date raises several fundamental questions: the incidence of noise on the surrounding populations, the impacts on the environment and the local road network, the cohabitation between military and civil operations, the availability of alternative airport sites, the possibility of “recycling” the land presently occupied by the civil facilities in order to contribute to the financing of the realization of an eventual new airport, the responsibility for the provision of basic infrastructure (roads, water supply

lines, sewers, electricity, etc.) at an alternate location, etc. These questions go well beyond the scope of the present pre-feasibility study and moreover are already treated in other studies commissioned by the administration, notably the *Étude de définition du transfert de l'aéroport de Marrakech Ménara* by the firme ECWS Engineering Consulting Works & Support in 2001.

5.2.1 Casablanca

Table 5-5 Future Investment Requirements (MAD)
Casablanca – Mohamed V International Airport

	Short term 2010	Medium term 2015	Long term 2020
Buildings			
Terminals	720,000,000	360,000,000	480,000,000
Control tower / technical building / eqt	-	-	-
FFR	-	-	15,000,000
Freight terminal	10,000,000	-	12,000,000
Main electrical substation: building	-	2,500,000	-
Main electrical substation: equipment	-	1,000,000	-
General works	2,500,000	-	-
Administration buildings	1,000,000	4,000,000	-
Shelters for remote gates	-	-	33,000,000
Lodgings	-	-	-
Runways and taxiways			
Pavement	-	-	-
Shoulders	-	-	-
Earthworks (cut)	-	-	-
Earthworks (fill)	-	-	-
Landing aids and airfield lighting			
Runway lighting Cat I	-	-	-
Approach lighting Cat I	-	-	-
Airfield electrical substation	-	-	-
Taxiway lighting + signage	-	-	-
ILS Cat I including DME (landing)	-	-	-
ILS Cat II	-	-	-
Complementary runway lighting Cat II	-	-	-
Approach lighting Cat II	-	-	-
Aircraft parking areas			
Rigid paving: aircraft gates	-	-	50,820,000
Flexible paving: taxiways	-	-	-
Area lighting	-	-	6,300,000
Storm drainage			
Aeronautical areas	-	5,000,000	5,000,000
Public roads and parking			
Public roads	10,100,000	-	-
Terminal parking	-	10,500,000	10,150,000
Overpasses	30,000,000	-	-
Public lighting			
Roadway lighting	750,000	-	-
Parking lighting	-	650,000	650,000
Airside roads			
Service roads	-	-	2,420,000
Perimeter roads	-	-	-

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Fences			
ICAO security solid fences	-	-	-
ICAO security storm fences	6,250,000	-	-
Landscaping			
Landscaping	-	3,000,000	-
Municipal services			
Water supply	250,000	250,000	-
Waste water	400,000	400,000	400,000
Electricity	320,000	320,000	-
Air navigation and meteorological			
VOR/DME	-	-	-
Sewage treatment plant	12,000,000	-	-
Total	797,570,000	387,620,000	615,740,000

5.2.2 Marrakech

**Table 5-6 Future Investment Requirements (MAD)
Marrakech – Menara International Airport**

	Short term 2010	Medium term 2015	Long term 2020
Buildings			
Terminals	194,000,000		300,000,000
Control tower / technical building / eqt	25,000,000		-
FFR	-		-
Freight terminal	4,000,000		-
Main electrical substation: building	-		-
Main electrical substation: equipment	-		-
General works	20,000,000		20,000,000
Administration buildings	-		-
Shelters for remote gates	-		-
Lodgings	-		-
Runways and taxiways			
Pavement	40,000,000		1,200,000
Shoulders	8,250,000		225,000
Earthworks (cut)	-		-
Earthworks (fill)	-		-
Landing aids and airfield lighting			
Runway lighting Cat I	-		-
Approach lighting Cat I	-		-
Airfield electrical substation	-		-
Taxiway lighting + signage	5,250,000		150,000
ILS Cat I including DME (landing)	-		-
Electrical supply to ILS	-		-
Displacement of glide path antenna	2,500,000		-
ILS Cat II	-		-
Aircraft parking areas			
Rigid paving: aircraft gates	30,000,000		27,000,000
Flexible paving: taxiways	10,000,000		6,600,000
Area lighting	4,200,000		4,200,000
Storm drainage			
Aeronautical areas	10,000,000		10,000,000
Public roads and parking			
Public roads	22,600,000		4,550,000
Terminal parking	10,500,000		3,500,000
Overpasses	-		-
Public lighting			
Roadway lighting	810,000		150,000
Parking lighting	750,000		250,000
Airside roads			
Service roads	3,740,000		550,000
Perimeter roads	-		-
Fences			
ICAO security solid fences	-		-
ICAO security storm fences	3,600,000		-
Landscaping			
Landscaping	-		-
Municipal services			
Water supply	400,000		100,000
Waste water	2,000,000		160,000

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Electricity	-	-
Air navigation and meteorological VOR/DME	-	-
Sewage treatment plant	12,000,000	-
Total	409,600,000	378,635,000



5.2.3 Agadir

**Table 5-7 Future Investment Requirements (MAD)
Agadir – Al Massira International Airport**

	Short term 2010	Medium term 2015	Long term 2020
Buildings			
Terminals			432,000,000
Control tower / technical building / eqt			-
FFR			-
Freight terminal			10,000,000
Main electrical substation: building			5,000,000
Main electrical substation: equipment			-
General works			-
Administration buildings			16,000,000
Shelters for remote gates			33,000,000
Lodgings			-
Runways and taxiways			
Pavement			48,000,000
Shoulders			675,000
Earthworks (cut)			-
Earthworks (fill)			-
Landing aids and airfield lighting			
Runway lighting Cat I			-
Approach lighting Cat I			-
Airfield electrical substation			-
Taxiway lighting + signage			6,750,000
ILS Cat I including DME (landing)			-
ILS Cat II			-
Complementary runway lighting Cat II			-
Approach lighting Cat II			-
Aircraft parking areas			
Rigid paving: aircraft gates			66,000,000
Flexible paving: taxiways			18,200,000
Area lighting			6,300,000
Storm drainage			
Aeronautical areas			10,000,000
Public roads and parking			
Public roads			13,850,000
Terminal parking			5,600,000
Overpasses			-
Public lighting			
Roadway lighting			900,000
Parking lighting			1,240,000
Airside roads			
Service roads			2,420,000
Perimeter roads			-
Fences			
ICAO security solid fences			-
ICAO security storm fences			7,000,000
Landscaping			
Landscaping			-
Municipal services			
Water supply			500,000
Waste water			1,200,000

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Electricity	640,000
Air navigation and meteorological VOR/DME	-
Sewage treatment plant	12,000,000
Total	697,275,000



6.0 FINANCIAL ANALYSIS

6.1 Introduction

This chapter contains the financial analysis of the feasibility of the development and operation of the airports at Agadir – Al Massira, Casablanca – Mohammed V and Marrakech – Menara under a concession arrangement between the government and a private entity. As explained in Chapter 1.4, the BOT concession model for these three sites represents only one option among several for the participation of the private sector in the Moroccan airports. The choice of this model was determined by the Terms of Reference of the present pre-feasibility study. The present chapter includes the following elements:

- a description of the existing and proposed financial structure of the airport;
- an analysis and projections of airport operating and maintenance costs;
- an analysis and projections of airport revenues;
- a discussion of a financing plan based on a concession for the development and operation of these airports;

The critical end process of the financial analysis is the calculation of the Internal rate of return (IRR). Based on experience with airport concessions in a number of developing countries, the Consultants believe that achieving an IRR of 25 percent or better will be necessary in order to attract qualified private investor/operators.

The values used in the financial analysis are stated in U.S. Dollars, using an average 2001 exchange rate of 11.6050 Moroccan Dirhams (MAD) to 1.00 US Dollar (US\$). According to the opinion of the Consultant, the financial structure and projections considered in this Chapter reflect the normal approach adopted by private operators for airport concessions. As is standard with this type of analysis, the projections do not incorporate any inflation over the time period of the project, consistent with the exclusion of inflation in the capital cost estimates.

A twenty-year period was selected for the cash flow analysis. It was apparent, in view of the amount of investment required at the airport, and based on the air traffic forecasts, that a shorter concession period was not likely to be feasible in terms of developing an adequate rate of return for the concessionaire. A longer period for the term of the concession would likely render the project more

attractive; therefore, the present analysis should be considered conservative from this standpoint.

Following standard practice for concession studies, the projections do not include estimates of the amounts or forms of payments from the successful concessionaire to the government in compensation for the concession of these airports over the twenty-year period. We have taken the assumption that these arrangements would be determined as part of the selection process and can not be predicted by the Consultant at this time.

The Consultant's financial analysis has been undertaken in several steps, which are described as follows:

Step 1 consisted of development of aviation activity forecasts for the Airports, each of which includes passengers, aircraft operations and cargo. These forecasts were developed and are presented in Chapter 4 of this Report; they are indicative of trends and only represent working hypotheses for the purposes of the present feasibility analysis.

Step 2 consists of the determination of the facility requirements for the airport, including capital cost estimates required to ensure the safety and security of operations, the maintenance of the infrastructure and the expansion and improvement of both airside and landside facilities. The estimates were developed and are presented in Chapter 5 of this Report; they are indicative of the requirements and only represent working hypotheses for the purposes of the present feasibility analysis.

Step 3, contained in this Chapter, consists of determination of the airport financial structure, including discussions of existing arrangements prior to the establishment of a concession and identification of alternative arrangements following the proposed concession of the airports. This information is presented in Section 6.2 of this Chapter.

Step 4, contained in this Chapter, consists of the development of a financing plan, including the investment and debt service requirements of the concessionaire for the airports. This information is presented in Section 6.3 of this Chapter.

Step 4, contained in this Chapter, consists of the development of a financing plan, including the investment and debt service requirements of the concessionaire. This information is presented in Section 6.3 of this Chapter.

Step 5, contained in this Chapter, consists of the analysis of existing operation and maintenance expenses and the development of projections for each of the airports. Background information for all of the airports is presented in Section 6.3 of this Chapter, while the projections for the individual airports are presented in Section 6.4 of this Chapter. The analysis also comprises comparisons between the operating and maintenance expenses at the airports of Casablanca, Agadir and Marrakech and those at other airports in the region, with the intent of verifying the validity of the projections for the airports concerned.

Step 6, contained in this Chapter, consists of the analysis of existing revenues and the development of revenue projections. Likewise, background information on the airports is presented in Section 6.3 of this Chapter, with the individual airport projections presented in Section 6.4 of this Chapter. The analysis also comprises comparisons between the operating maintenance expenses at the airports of Casablanca, Agadir and Marrakech and those at other airports in the region, with the intent of verifying the validity of the projections for the airports concerned.

Step 7, contained in this Chapter, consists of the development of twelve cash flow models for each airport, which demonstrate the sensitivity of a variety of circumstances on the financial performance. These financial models combine the inflow and outflow of funds into cash flow projections, and calculate the net present value (NPV) and internal rate of return (IRR) for each airport. These financial models, however, can be segregated into four groups, with the distinctions summarized below:

- The first three of these sensitivity models demonstrate the effect of higher capital costs on the performance of the Airports. Each model contains the operation and maintenance expense projections and revenue projections mentioned in Step 6 and Step 7 above (referred to as “Baseline Operational Scenario”). This Baseline Operational Scenario is combined with three different capital cost estimates, which are (a) the estimates presented in Chapter 5 of the present Report (referred to as “Baseline Capital Cost Scenario”), (b) 110 percent of such estimates (referred to as “Higher Capital Cost Scenario 1”) and (c) 120 percent of such estimates (referred to as “Higher Capital Cost Scenario 2”), corresponding to these three sensitivity models.
- The next three sensitivity models demonstrate the effect of lower aviation activity on the financial performance of the airports. Each model contains operation and maintenance expense projections and revenue projections that have been adjusted to reflect the low activity projections presented in

Chapter 4 (referred to as “Lower Activity Scenario”). This Lower Activity Scenario is combined with the three capital cost estimates outlined above, producing these three sensitivity models.

- The next three sensitivity models demonstrate the effect of higher operation and maintenance expenses on the performance of the airports. Each model contains operation and maintenance expense projections that have been increased by 25 percent (referred to as “Higher Operation and Maintenance Expense Scenario”), as well as the baseline revenue projections. This Higher Operation and Maintenance Scenario are combined with the three capital cost estimates outlined above, generating these three sensitivity models.

- The final three sensitivity models demonstrate the effect of lower revenues on the performance of the airports. Each model contains the baseline operation and maintenance expense projections, as well as revenue projections that have been reduced by 10 percent (referred to as “Lower Revenue Scenario”). This Lower Revenue Scenario has been combined with the three capital cost estimates outlined above, representing these three sensitivity scenarios.

Step 8 consists of a discussion of the alternatives and recommendations for the next step of the concession process. This critical information is presented in Chapter 8.

The various steps in the Consultant's approach are illustrated in Figure 6-1, Summary of Aviation Activity, Development Alternatives and Capital Costs.

6.2 Financial Structure

6.2.1 Existing Financial Structure

The airports are owned by the Government of Morocco. They are operated, maintained and developed by ONDA, an authority established for this purpose by the Government of Morocco. The specific roles and activities of ONDA and other stakeholders are detailed in Chapter 3, Institutional Framework, of the present Report and summarized below:

ONDA (Office National des Airports) – ONDA is responsible for the operation and maintenance of the airside and landside activities and facilities of all public Moroccan airports, including the three sites under study. In 2001, ONDA had 806, 182 and 101 employees assigned specifically to Casablanca, Agadir and

Marrakech Airports, respectively. ONDA collects all aeronautical (i.e., aircraft landing, security and parking fees) and non-aeronautical revenues (i.e., rentals, concession fees and miscellaneous charges) generated at these airports and pays all operating and maintenance expenses for the airside and landside activities and facilities at these airports. Also, ONDA is responsible for the development of both airside and landside facilities at these airports. At present, ONDA is also responsible for the provision of aeronautical communications and air navigation services for all Moroccan airports including Casablanca, Agadir et Marrakech. In exchange, ONDA collects “en-route” air navigation charges from the airlines that overfly Moroccan airspace and uses these revenues to pay its operation and maintenance expenses for the communications and air navigation equipment and services which it operates.

Airlines – The multinational airline Royal Air Maroc (RAM) operates the ground handling and aircraft support services at the airports studied, collecting revenues from other airline customers for these services and paying landing fees, lighting and aircraft parking charges, as well as rent to ONDA for the privilege of using of the airport facilities.

Private air carriers and service companies (general aviation) – These commercial businesses provide services to users of the Airports, receiving revenues from these users and paying landing, lighting and parking fees and rent to the airports for the privilege of using facilities at the airports.

Ministère du transport et de la marine marchande – The Ministry has the responsibility of general oversight of the airports and (jointly with the Ministry of Finance) the activities of ONDA, including the implementation of policies and procedures governing aeronautical safety and security. The Ministry is also responsible for the management of the airports development program on behalf of the State. Its activities are funded through the general budget of the Government of Morocco.

6.2.2 Proposed Financial Structure

The implementation of a concession régime for the airports studied would be associated with changes at the level of the roles of certain of the entities as described in the preceding paragraphs. The airport would remain the property of the Government of Morocco, but the concessionaire would become responsible for the operation and development of these airports with, as a consequence the changes in the roles of the various stakeholders as described in the following paragraphs:

ONDA – ONDA would convey its existing operating rights and development responsibilities to the concessionaire during the concession period. It is expected that some of the current ONDA personnel would then be hired by the concessionaire and that a certain number would be transferred to other positions in the organization which would remain responsible as the State regulatory agency to review and approve all development plans and tariffs and provide general oversight of the concession. These activities could be funded from the concession fee received from the concessionaire.

The activities of ONDA associated with the provision of en-route air navigation services would not be included in the concession of airport activities. In principle, ONDA would continue to be responsible for these activities and would share the landing fees at the airports concerned with the concessionaire, in proportion to the costs incurred by each party. This being said, according to the presentation of financial data by ONDA, the costs of the personnel assigned to the activities of airport traffic control are included in the accounts for each of the airports and could not be disaggregated. For the purposes of the present financial pre-feasibility analysis, therefore, we were obliged to include these costs as well as the revenues generated by the landing fees and the air navigation terminal taxes at the airports in question in the accounts of the concessionaire.

Concessionaire – The concessionaire would be responsible for the operation and maintenance, as well as the development of both landside and airside activities and facilities of the airports under a concession contract. The concessionaire would receive all of the revenues and pay all of the expenses formerly received and paid by ONDA for the operation, maintenance and development of these airports. The concessionaire would provide all financing for the development of the landside and airside facilities, including investing its own resources and borrowing from external sources as required. The concessionaire also would pay a fee to the Government for the privilege of operating the airports during the concession period. The exact composition of the proposed concessionaire, as well as the precise level of the concession fee, will be determined according to Government preference and project requirements. If entirely private, it is likely to consist of an entity involving several private parties (a construction contractor, a professional airport operator and possibly a financier); or it could involve some government ownership, which might help to keep the financing costs down in terms of guarantees.

Airlines – The airlines would continue to provide passenger, cargo and aircraft handling services at the airports, receiving revenues from customers for these services and paying rent and cargo fees to the airport operator (i.e. the concessionaire) for the use of these facilities. In addition, the ground handling

service providers (Royal Air Maroc and others) would pay royalties for the privilege of offering their services to third parties at the airports concerned.

Private air carriers and service companies (general aviation) – The various commercial enterprises would continue to provide services to users of the airports, receiving revenues for these services and paying rent to the airport operator (i.e. the concessionaire) for the facilities used for these activities and aeronautical fees to the provider of these services.

Ministère du transport et de la marine marchande – The Ministry would continue to be responsible for the regulation of civil aviation activities, including those taking place at airports. More particularly, the Ministry would be responsible for the establishment and the implementation of policies and procedures governing the safety and security of airport activities as well as management of the concession contract.

6.3 Financial Analysis

6.3.1 Financing Plan

The financing plan for the airport capital development program described in this subsection identifies the equity investment and debt repayment requirements for the airports, which represent outflows in the cash flow analysis (including the NPV and IRR calculations) presented later in this Chapter.

The financing plan described in this section also incorporates the four development Phases as presented in Chapter 5 of this Report, specifically:

Phase 1 : 2005-2006
Phase 2 : 2010-2011
Phase 3 : 2015-2016
Phase 4 : 2020-2021

The financing plan, including identification of the funding sources and the debt service requirements, for the individual airports is presented in Section 6.4.

For the purposes of the present analysis, the Consultant assumed that the financing of the development program would come from three sources, as follows:

- First, the concessionaire would invest its own resources, representing an equity investment on the balance sheet of the concessionaire.

- Second, it would borrow from financial institutions, representing long-term loans on the concessionaire's balance sheet.
- Third, it would borrow from suppliers of imported elements, possibly supported by guarantees of financial institutions, representing short-term loans on the concessionaire's balance sheet.

Our analysis assumes that the concessionaire would provide 30% of the funding requirement, with the 70% balance provided by borrowings from financial institutions and suppliers. Also, we have assumed that the borrowings from the financial institutions would correspond to the local requirements, while the borrowings from the suppliers would correspond to the imported requirements.

Our analysis also incorporates existing debt service requirements, which includes interest and principal requirements included in the trial balance, as well as depreciation, as provided by ONDA. The interest and principal reflect the debt service requirements recorded on the airports balance sheets for debt outstanding prior to 2001. The depreciation represents a proxy assumption to account for debt service requirements relative to investments at the airports made over the years by other government agencies. Also, it has been necessary to increase the level of depreciation, particularly in the case of Marrakech, reflecting depreciation applicable to recent capital improvements not reflected in the balance sheet and financial statements for 2001.

In general, the future and existing debt service requirements for the Airports generate exclusively outflows, while the airport operations generate both inflows and outflows. The inflows consist of the revenues realized by the airports while the outflows include the operation and maintenance expenses paid by the airports studied, as well as taxes on profits, which are assumed to be 35% of the operating profit (i.e., corresponding to the difference between revenues and operation and maintenance expenses).

When these inflows and outflows are combined, the outcomes represent either surpluses or deficits, but neither takes into consideration the time value of money, which the proposed concessionaire would need to determine in order to compare this investment opportunity with other available investment alternatives, with the key measures described below:

The **NPV** takes into consideration the time value of money, representing one measure of the relative worth of alternative investment options. It measures the worth of the investment in terms of its present monetary value over the 20-year

concession period. To do this, it uses the combined cost of capital (opportunity cost for the equity component plus interest rate for the debt components) required for the capital investment program as the discount factor (i = interest rate) and the 20-year concession period as the time factor (n = number of compound periods).

The IRR also takes into consideration the time value of money, representing another measure of the relative worth of alternative investment options. The IRR measures the worth of the investment in terms of its percentage yield over the 20-year concession period.

A positive NPV occurs when the IRR exceeds the combined cost of capital, meaning that the investor would experience a gain from undertaking the project. A negative NPV occurs, however, when the IRR is less than the combined cost of capital, with the investor experiencing a loss from the project. For this analysis, the combined cost of capital is 16.18% (a blending of 25% for equity, 14% for long-term debt and 12% for short-term debt), while the minimum target for the IRR is 25%, providing approximately a 9% cushion to cover the risk of unforeseen adverse circumstances.

6.3.2 Operations and Maintenance Expenses

This subsection presents the operation and maintenance expenses for the airports studied, identifying the categories of operating and maintenance expenses that would be associated with the proposed concession arrangement. The specific projections of these expenses over the proposed 20-year concession period are presented in Section 6.4.1 (Casablanca), Section 6.4.2 (Marrakech) and Section 6.4.3 (Agadir). The operation and maintenance expenses represent outflows in the cash flow analysis presented later in this Chapter.

The Consultant obtained historical data on operation and maintenance expenses from ONDA for the year 2001, including balance sheets for all of the individual accounts. These expenses were reclassified into 35 categories.

The projections of operation and maintenance expenses for the term of the 20-year concession (2002 through 2021) reflect the following key assumptions:

- First, that the airports would be operated in accordance with international aviation safety and security standards, with certain expenses established to satisfy these requirements.

- Second, that the airports would be expanded and improved, with certain expenses increasing as the result of the need to operate and maintain expanded facilities while other expenses would decrease as the result of a more efficient operation and more efficient facilities.
- Third, that the airport would be operated collectively as a business enterprise, with the concessionaire curtailing certain expenses in order to maximize profitability.

The operation and maintenance expenses for the airports studied having been compared with those for other airports in the region, we concluded that they are reasonable.

The categories of operation and maintenance expenses are described below, including identification of the elements for each category and the basis for the projections:

Personnel – This category includes the costs of salaries, insurance and benefits for the 1,085 employees of ONDA assigned to the airports studied. The projections reflect an increase in the number of employees by 25% each five years, commencing in 2006; this hypothesis was assumed in order to ensure a conservative analysis. The projections also reflect the takeover by the concessionaire of activities formerly assigned to other government organizations, but excluding police and security services that will continue to be provided by the organizations concerned.

Supplies and Purchases – This category includes the costs of purchasing maintenance supplies for the buildings, infrastructure, vehicles and equipment, as well as fuel and lubricants, water, gas and electricity utilities acquired for resale and/or internal use. Projections of maintenance supplies and electricity, gas and water utilities reflect the expansion of the infrastructure, buildings, vehicles and equipment, with increases occurring when the new facilities come on-line, which are identified in the later discussion for the individual airports. Projections of fuel reflect the increase in aircraft operations throughout the projection period.

Services – This category includes the costs of obtaining services such as insurance, telephone and training services from private entities and police services from government entities. Projections of police services reflect increases occurring when the new facilities come on-line, likewise as discussed in the later sections for each individual airport.

Taxes – This category includes the costs of local taxes, for which the airports are not exempt and we have assumed that this amount will remain constant throughout the period of the concession. The financial projections, however, assume that the concessionaire will be subject to income taxes on profits and this element is addressed in the cash flow analysis later in this section.

Others – This category includes miscellaneous costs, such as contributions and reserves. The projections assume that this cost will be constant throughout the projection period.

6.3.3 Revenues

This section represents a general discussion of the revenues for the airports studied; it identifies the types of revenues that would form part of the modalities of the proposed concession. The projections of these revenues over the proposed 20-year concession period are presented in Sections 6.4.1 (Casablanca), 6.4.2 (Marrakech) and 6.4.3 (Agadir). These revenues represent inflows in the cash flow analysis presented later in this chapter.

We analyzed the historical revenues for the airports concerned from the trial balance as provided by ONDA, including balances for all of the individual accounts. These revenues were reclassified into 28 elements that were used for projecting such revenues into the future, and further grouped into 4 categories that were used for comparing such revenues with those of other airports in the region.

The projections (2002 through 2021) of revenues reflect several key assumptions:

- First, that the airports will be expanded and improved, with certain existing revenues being increased, based on the expanded facilities and expanded passenger and cargo traffic;
- Second, that under a concession régime, the airports would be operated collectively as a business enterprise, and that certain rates and charges could be increased in order to enhance airport profitability and make the concession financially feasible.

The revenues for the Airports have been compared with those for other airports in the region, with the conclusion that they are reasonable and attainable.

The categories for the projections of revenues, including identification of the elements for each category and the basis for the projections, are described below:

Passenger and Cargo Charges – This category consists of fees paid by the airlines, based on departing passengers and covering the costs of developing, maintaining and operating the facilities used by these passengers. It also consists of fees paid by departing passengers, covering the cost of providing security services to such passengers. Finally, it also consists of fees paid by cargo operators, based on embarked and disembarked cargo handled by such operators. These fees are projected to increase by 25% at 5-year intervals over the 20-year concession period.

We assumed an increase in these tariffs by increments of 25% at intervals of 5 years during the 20-year period of the concession. We do not believe that this increase will have a significant impact on the growth of traffic, due to the small proportion which it represents in relation to the total door-to-door transportation cost. In any case, we have also prepared “elevated” and “reduced” variants for revenues in the analysis of the sensitivity of the feasibility to external factors.

Aeronautical Charges – This category includes landing fees, aircraft parking fees and fees for the use of boarding bridge paid by airlines, based on maximum take-off weight. It also includes lighting paid by the airlines, based on departures. We included these revenues in the accounts of the concessionaire since the financial data as provided by ONDA did not enable us to disaggregate the costs associated with these activities from the accounts for each of the individual airports.

We took the hypothesis of an increase in these fees by increments of 25% at 5-year intervals over the 20-year concession period. We do not believe that this increase will have a significant impact on the growth of traffic, due to the small proportion which it represents in relation to the total door-to-door transportation cost. In any case, we have also prepared “elevated” and “reduced” variants for revenues in the analysis of the sensitivity of the feasibility to external factors.

Concessions and Rentals – This category includes rents from terminal tenants, including airlines and concessions occupying space in the passenger terminal. The projections reflect an increase in rates from current levels to US\$300 per square meter in 2006, as well as an escalation of 25% at 5-year intervals over the 20-year concession period. The projections also reflect the expansion of revenue-producing terminal space at the Airports.

Other Revenues – This category includes a range of other revenue sources, such as interest income. It also includes recovery of 60% of the projected costs of electricity, gas and water charges, which in turn reflects the proportion of the terminal space that is rented.

6.4 Cash Flows – Specific Airports

The following sections of the present Report give a description of the specific hypotheses and the results of the analysis of the cash flows for each of the airports according to the different scenarios for the investments and the operational characteristics as described in Steps 6 and 7 of the methodology presented in Section 6.1 above. The tables which complete the present text are presented in the Annexes of the Report

6.4.1 Casablanca

Funding Sources - Casablanca

Based on the preceding assumptions and the facility requirements presented in Chapter 5, Table 6-1 presents the funding sources for the capital investment program associated with the development of Casablanca airport. During Phase 1, there would not be any investment or borrowing by the concessionaire. During Phase 2, the concessionaire would invest US\$25,482,000 and borrow US\$59,458,000. During Phase 3, it would invest US\$12,384,000, borrowing US\$29,896,000. During Phase 4, its equity investment would be US\$19,672,000, borrowing US\$45,903,000. Overall, the concessionaire would invest US\$57,538,000 and borrow US\$134,258,000, representing an overall debt to equity ratio of 70:30. As indicated above, the equity investment requirements represent outflows in the cash flow analysis presented later in this Chapter.

Debt Service Requirements - Casablanca

We have assumed that the concessionaire will be able to obtain long-term loans for the local construction requirements based on a maturity of 14 years (including interest only for 2 years) and an interest rate of 12%. The debt service schedule is based on the hypothesis that supplier credits would have a maturity period of 7 years (including interest only for 2 years) and an interest rate of 14 percent.

Based on these assumptions, we developed debt service schedules which are presented in Table 6-2. The new debt service requirements would extend from 2009 through 2021, ranging from a low of US\$7,373,000 in 2009 and 2021 to a high of US\$17,501,000 in 2019 through 2020. As indicated above, the debt

service requirements represent outflows in the cash flow analysis presented later in this Chapter.

Operations and Maintenance Expenses - Casablanca

Operation and maintenance expenses for Casablanca airport are presented in Table 6-3. As shown, actual operation and maintenance expenses were US\$19,726,000 in 2001 and are projected to increase to US\$58,344,000 in 2021 (the final year of the proposed concession period), representing an average annual growth rate of 5.57%. On a per enplanement basis, these expenses are projected to decrease from US\$5.61 in 2000 to US\$3.43 in 2021, representing an average annual rate of decline of minus 2.43%. This decline is based on the expense-containment measures that the Consultant expects would be implemented by the proposed concessionaire to improve the financial performance of the airports following the concession (i.e., centralized administration, common service contracts, etc.), in order to minimize the impact of activity growth on the generation of expenses at these airports. The expense components, as well as the basis for the projections, are described in Table 6.3.

Revenues - Casablanca

Revenues for Casablanca airport are presented in Table 6-4. As shown, actual revenues were US\$34,055,000 in 2001 and are projected to increase to US\$389,095,000 in 2021 (the final year of the proposed concession period), representing an average annual growth rate of 12.95%. On a per enplanement basis, these revenues are projected to increase from US\$9.69 in 2001 to US\$22.88 in 2021, representing an average annual growth rate of 4.39%. This growth rate is based on the revenue enhancement measures that the Consultant expects would be implemented by the proposed concessionaire to improve the financial performance of the airports following privatization (i.e., tariff rate increases, new revenue sources, etc.), enhancing the impact of activity growth on revenue generation. The revenue components, as well as the basis for the projections, are described in Table 6-4.

Baseline Case Cash Flows - Casablanca

This section contains three cash flow projections for the airport of Casablanca, demonstrating the financial performance of a 20-year concession in the form of results in terms of net present values (NPV) and internal rates of return (IRR). All three cash flow projections reflect the Base-line Operational Scenario: the first is based on the Base-line Investment Scenario; the second is based on the Elevated Investment Scenario "1"; and the third is based on the Elevated

Investment Scenario “2”. These three outcomes are presented in Tables 6-5 through 6-7, which form part of the Annexes to the present Report.

Sensitivity Cash Flow Analysis - Casablanca

This section contains nine cash flow projections for Casablanca airport, likewise demonstrating the financial performance of a 20-year concession for the airport and providing results in net present value and internal rate of return.

The first three cash flow projections reflect the impact of the Lower Activity Operational Scenario on the Base-line Investment Scenario, the Elevated Investment Scenario “1” and the Elevated Investment Scenario “2”, respectively.

The next three cash flow projections reflect the impact of the Higher Expense Operational Scenario on the Base-line Investment Scenario, the Elevated Investment Scenario “1” and the Elevated Investment Scenario “2”, respectively.

The final three cash flow projections reflect the impact of the Lower Revenue Operational Scenario on the Base-line cost scenario, the Elevated Investment Scenario “1” and the Elevated Investment Scenario “2”, respectively.

The results for these nine projections are presented in Tables 6-8 through 6-16, which form part of the Annexes to the present Report.

Comparison of Results - Casablanca

The twelve cash flow tables discussed above are summarized in Table 6-17, representing a matrix showing the gross cash flow, the NPV and the IRR for each of the twelve variations. As noted earlier, investors would reject any investment opportunity with a negative NPV, meaning that its average cost of capital exceeded its IRR. In effect, the financial cost of implementing such an investment opportunity would exceed the financial return.

Based on this reasoning and the target level of at least 25% previously established for the IRR, the proposed concessionaire would consider the Baseline Case to be feasible because IRRs are above the 25 percent threshold under each capital cost scenario.

The Higher Expense and Lower Revenue Scenarios would produce positive NPVs because their IRRs are above the 16.18% threshold (i.e., between 20% and 25 %). The Lower Activity Scenarios, however, would produce negative

NPVs because their IRRs are below the 16.18% threshold (i.e., between 7% and 10%).

6.4.2 Marrakech

Funding Sources – Marrakech

Based on the preceding assumptions and the facility requirements presented in Chapter 5, Table 6-18 presents the funding sources for the capital investment program associated with the development of Marrakech airport. During Phases 1 and 3, there would not be any investment or borrowing by the concessionaire. During Phase 2, the concessionaire would invest US\$ 13,086,000 and borrow US\$ 30,735,000. During Phase 4, the concessionaire would invest US\$ 12,097,000, borrowing US\$ 28,227,000. Overall, the concessionaire would invest US\$ 25,183,000 and borrow US\$ 58,962,000, representing an overall debt to equity ratio of 70:30. As indicated above, the equity investment requirements represent outflows in the cash flow analysis presented later in this Chapter.

Debt Service Requirements – Marrakech

We have assumed that the concessionaire will be able to obtain long-term loans for the local construction requirements based on a maturity of 14 years (including interest only for 2 years) and an interest rate of 12%. The debt service schedule is based on the hypothesis that supplier credits would have a maturity period of 7 years (including interest only for 2 years) and an interest rate of 14 percent.

Based on these assumptions, we developed debt service schedules which are presented in Table 6-19. The new debt service requirements would extend from 2001 through 2021, ranging from a low of US\$ 3,786,000 in 2009/2010 to a high of US\$ 7,689,000 in 2021. As indicated above, the debt service requirements represent outflows in the cash flow analysis presented later in this Chapter.

Operations and Maintenance Expenses – Marrakech

Operation and maintenance expenses for Marrakech airport are presented in Table 6-20. As shown, actual operation and maintenance expenses were US\$ 1,755,000 in 2001 and are projected to increase to US\$4,241,000 in 2021 (the final year of the proposed concession period), representing an average annual growth rate of 4.51%. On a per enplanement basis, these expenses are projected to decrease from US\$1.26 in 2000 to US\$1.24 in 2021, representing an average annual rate of decline of minus 0.08%. This decline is based on the expense-containment measures that the Consultant expects would be

implemented by the proposed concessionaire to improve the financial performance of the airports following the concession (i.e., centralized administration, common service contracts, etc.), in order to minimize the impact of activity growth on the generation of expenses at these airports. The expense components, as well as the basis for the projections, are described in Table 6.20.

Revenues – Marrakech

Revenues for Marrakech airport are presented in Table 6-21. As shown, actual revenues were US\$8,047,000 in 2001 and are projected to increase to US\$80,166,000 in 2021 (the final year of the proposed concession period), representing an average annual growth rate of 12.18%. On a per enplanement basis, these revenues are projected to increase from US\$5.78 in 2001 to US\$23.46 in 2021, representing an average annual growth rate of 7.26%. This growth rate is based on the revenue enhancement measures that the Consultant expects would be implemented by the proposed concessionaire to improve the financial performance of the airports following privatization (i.e., tariff rate increases, new revenue sources, etc.), enhancing the impact of activity growth on revenue generation. The revenue components, as well as the basis for the projections, are described in Table 6-21.

Baseline Case Cash Flows – Marrakech

This section contains three cash flow projections for the airport of Marrakech, demonstrating the financial performance of a 20-year concession of this airport, in the form of results in terms of net present values (NPV) and internal rates of return (IRR). All three cash flow projections reflect the Base-line Operational Scenario: the first is based on the Base-line Investment Scenario; the second is based on the Elevated Investment Scenario “1”; and the third is based on the Elevated Investment Scenario “2”. These three outcomes are presented in Tables 6-22 through 6-24, which form part of the Annexes to the present Report.

Sensitivity Cash Flow Analysis – Marrakech

This section contains nine cash flow projections for Marrakech airport, likewise demonstrating the financial performance of a 20-year concession for the airport and providing results in net present value (NPV) and internal rate of return (IRR).

The first three cash flow projections reflect the impact of the Lower Activity Operational Scenario on the Base-line Investment Scenario, the Elevated Investment Scenario “1” and the Elevated Investment Scenario “2”, respectively.

The next three cash flow projections reflect the impact of the Higher Expense Operational Scenario on the Base-line Investment Scenario, the Elevated Investment Scenario “1” and the Elevated Investment Scenario “2”, respectively.

The final three cash flow projections reflect the impact of the Lower Revenue Operational Scenario on the Base-line cost scenario, the Elevated Investment Scenario “1” and the Elevated Investment Scenario “2”, respectively.

The results for these nine projections are presented in Tables 6-25 through 6-33, which form part of the Annexes to the present Report.

Comparison of Results – Marrakech

The twelve cash flow tables discussed above are summarized in Table 6-34, representing a matrix showing the gross cash flow, the NPV and the IRR for each of the twelve variations. As noted earlier, investors would reject any investment opportunity with a negative NPV, meaning that its average cost of capital exceeded its IRR. In effect, the financial cost of implementing such an investment opportunity would exceed the financial return.

Based on this reasoning and the target level of at least 25% previously established for the IRR, the proposed concessionaire would consider the Baseline Case to be feasible because IRRs are above the 25 percent threshold under each capital cost scenario

The concessionaire could however consider the Higher Expense and Lower Revenue Scenarios as being marginal (IRR between 20% and 25 %) but would consider the Lower Activity Scenarios as being completely unacceptable (IRR between 11% and 14%).

6.4.3 Agadir

Funding Sources – Agadir

Based on the preceding assumptions and the facility requirements presented in Chapter 5, Table 6-35 presents the funding sources for the capital investment program associated with the development of Agadir airport. During Phases 1, 2 and 3, there would not be any investment or borrowing by the concessionaire. During Phase 4, the concessionaire would invest US\$22,277,000, borrowing US\$52,011,000. Overall, the concessionaire would invest US\$22,277,000 and borrow US\$52,011,000, representing an overall debt to equity ratio of 70:30. As

indicated above, the equity investment requirements represent outflows in the cash flow analysis presented later in this Chapter.

Debt Service Requirements – Agadir

We have assumed that the concessionaire will be able to obtain long-term loans for the local construction requirements based on a maturity of 14 years (including interest only for 2 years) and an interest rate of 12%. The debt service schedule is based on the hypothesis that supplier credits would have a maturity period of 7 years (including interest only for 2 years) and an interest rate of 14 percent.

Based on these assumptions, we developed debt service schedules which are presented in Table 6-36. The new debt service requirements would extend from 2019 through 2021, ranging from a low of US\$6,446,000 in 2009/2010 to a high of US\$11,314,000 in 2021. As indicated above, the debt service requirements represent outflows in the cash flow analysis presented later in this Chapter.

Operations and Maintenance Expenses – Agadir

Operation and maintenance expenses for Agadir airport are presented in Table 6-37. As shown, actual operation and maintenance expenses were US\$2,192,000 in 2001 and are projected to increase to US\$6,520,000 in 2021 (the final year of the proposed concession period), representing an average annual growth rate of 4.04%. On a per enplanement basis, these expenses are projected to decrease from US\$2.69 in 2000 to US\$1.30 in 2021, representing an average annual rate of decline of minus 3.55%. This decline is based on the expense-containment measures that the Consultant expects would be implemented by the proposed concessionaire to improve the financial performance of the airports following the concession (i.e., centralized administration, common service contracts, etc.), in order to minimize the impact of activity growth on the generation of expenses at these airports. The expense components, as well as the basis for the projections, are described in Table 6.37.

Revenues – Agadir

Revenues for Agadir airport are presented in Table 6-38. As shown, actual revenues were US\$7,146,000 in 2001 and are projected to increase to US\$92,121,000 in 2021 (the final year of the proposed concession period), representing an average annual growth rate of 13.64%. On a per enplanement basis, these revenues are projected to increase from US\$6.50 in 2001 to US\$18.42 in 2021, representing an average annual growth rate of 7.26%. This growth rate is based on the revenue enhancement measures that the Consultant

expects would be implemented by the proposed concessionaire to improve the financial performance of the airports following privatization (i.e., tariff rate increases, new revenue sources, etc.), enhancing the impact of activity growth on revenue generation. The revenue components, as well as the basis for the projections, are described in Table 6-38.

Baseline Case Cash Flows – Agadir

This section contains three cash flow projections for the airport of Agadir, demonstrating the financial performance of a 20-year concession of the airport of Agadir, in the form of results in terms of net present values (NPV) and internal rates of return (IRR). All three cash flow projections reflect the Base-line Operational Scenario: the first is based on the Base-line Investment Scenario; the second is based on the Elevated Investment Scenario “1”; and the third is based on the Elevated Investment Scenario “2”. These three outcomes are presented in Tables 6-39 through 6-41, which form part of the Annexes to the present Report.

Sensitivity Cash Flow Analysis - Agadir

This section contains nine cash flow projections for Casablanca airport, likewise demonstrating the financial performance of a 20-year concession for the airport and providing results in net present value and internal rate of return.

The first three cash flow projections reflect the impact of the Lower Activity Operational Scenario on the Base-line Investment Scenario, the Elevated Investment Scenario “1” and the Elevated Investment Scenario “2”, respectively.

The next three cash flow projections reflect the impact of the Higher Expense Operational Scenario on the Base-line Investment Scenario, the Elevated Investment Scenario “1” and the Elevated Investment Scenario “2”, respectively.

The final three cash flow projections reflect the impact of the Lower Revenue Operational Scenario on the Base-line cost scenario, the Elevated Investment Scenario “1” and the Elevated Investment Scenario “2”, respectively.

The results for these nine projections are presented in Tables 6-42 through 6-50, which form part of the Annexes to the present Report.

Comparison of Results – Agadir

The twelve cash flow tables discussed above are summarized in Table 6-51, representing a matrix showing the gross cash flow, the NPV and the IRR for the each of the twelve variations. As noted earlier, investors would reject any investment opportunity with a negative NPV, meaning that its average cost of capital exceeded its IRR. In effect, the financial cost of implementing such an investment opportunity would exceed the financial return.

Based on this reasoning and the target level of at least 25% previously established for the IRR, the proposed concessionaire would consider the Baseline Case to be feasible because IRRs are above the 25% threshold under each capital cost scenario

The concessionaire could however consider the Higher Expense and Lower Revenue Scenarios as being marginal (IRR between 20% and 25 %) but would consider the Lower Activity Scenarios as being completely unacceptable (IRR between 15% and 16%) for all Investment Scenarios.

7.0 PRIVATE SECTOR PARTICIPATION IN THE MANAGEMENT, OPERATION AND DEVELOPMENT OF AIRPORTS

The present chapter, which treats the different structures for the participation of the private sector in the management, operation and development of the Moroccan airports, comprises the following aspects:

- Identification of the pertinent models for the participation of the private sector in the management, operation and development of airports;
- Comparative analysis of the pertinent models for the participation of the private sector in the management, operation and development of airports;
- Recommendation of a strategy to be followed on the part of the government and ONDA for the participation of the private sector in the management, operation and development of airports.

7.1 General Context of Private Sector Participation in Airports

According to traditional arrangements, the airports of most States belong to governments. This being said, this situation is in a state of evolution inasmuch as governments are abandoning the roles of owner and operator in favor of those of regulator and initiator of policies. Corporate entities, applying principles of commercial management, are assuming increased responsibilities for the operation, investment and management of airport activities.

This trend reflects the need to attract investment capital from non-governmental sources in order to respond rapidly to the demands of the industry and reduce the financial burden on governments.

It also represents a recognition of the commercial nature of several airport activities and services and the necessity of introducing approaches and management methods oriented around business principles aimed at improving efficiency and maximizing revenue generation, especially on the non aeronautical side, in order to ensure the financial autonomy and viability of airports and reduce pressure on the increase of aeronautical charges.

In this sense, the introduction of private sector principles to airport management strategies has already demonstrated (British Airports Authority, *et al.*) that it can facilitate the implementation of efficient modes of management and the generation of higher nonaeronautical revenues, thus contributing to the long term

viability of airports and to their independence from governmental sources of funding.

7.2 Specific Context of the Moroccan Airports

The particular context of the Moroccan airports with respect to questions of private sector participation is characterized by the following factors:

Government Objectives and Policies

- the policy announced by the government, aimed at the rapid development of the tourist potential of the country and in particular reaching the target of 10 million tourists in 2010, which will have as a corollary an increased growth of air traffic at the Moroccan airports and the development of new tourism sites;
- the objective for air transportation as defined by the government: to reinforce the links with European countries, which has as a corollary the adaptation of the institutional structures with respect to the management of airports (see below);
- the liberalization of the régime of air transportation in the country.

Demand

- the strong growth of traffic at the principal airports recorded over the past decade and forecast for the next ten years;
- the requirements for expansion of the airports infrastructure, especially at the airports associated with the new sites identified for the development of tourism.

Characteristics of the Moroccan Airports Network

- the existence of a national airports network of good quality and with substantial handling capacity, thanks to the joint development programs of ONDA and the Ministry of Transport;
- the predominance of the three main airports of Casablanca, Marrakech and Agadir with respect to traffic volumes, revenues and the viability of the global airports network;

- the limited contribution of non aeronautical revenues in comparison to total airport revenues, especially outside Casablanca – Mohamed V;
- the existence of numerous secondary and tertiary airports with low traffic volumes in the national network managed by ONDA.

Institutional Framework

- the creation and expansion of the *Enterprise Publique à Caractère Industrielle et Commercial* ONDA as a professional organization responsible not only for “the planning, operation, maintenance and development” of the ensemble of the civil airports of the State open to public air traffic but also for air navigation in Morocco and the local control of air traffic at the civil airports operated by ONDA;
- the identification of adaptations to the institutional framework of airport administration which will be necessary in order to render it in accordance with the practices of the European Union and to the liberalized air transportation régime foreseen by the objectives and policies of the government, notably by the reduction of the role of the State, the separation between the services of the management of the airports and air traffic and the elimination of the representation of RAM and ONDA on each other’s Board of Directors.

7.3 Overview of Options: Private Sector Participation in Airports

Private sector participation in airports can take several forms, at the level of management and operation, investment and/or acquisition of equity. The options for the participation of the private sector comprise the full range from minimalist models such as contracting out of specific services, to global management contracts or airport operating concessions, up to models involving maximum responsibility in the form of the direct acquisition of the airport property and/or the purchase of shareholdings in an airport corporate entity.

In order of increasing degree of private sector participation, the following summary table presents a framework for the definition of generic options for the participation of the private sector in airport activities. The subsequent paragraphs describe these options in greater detail.

Table 7-1
Range of Options for Private Sector Participation in Airport Activities

Options	A (maximum public sector / minimum private sector) >	B (reduced public sector / increased private sector) >>	C (reduced public sector / increased private sector) >>>	D (reduced public sector / increased private sector) >>>>	E (minimum public sector / maximum private sector) >>>>>
Ownership of assets	Public sector	Public sector	Public sector	Public sector	Private sector
Investment	Public sector	Public sector	Public sector	Private sector	Private sector
Management and operation	Public sector	Private sector	Private sector	Private sector	Private sector
Typical modalities	Contracting out: specific services	Airport management contract	Airport operating concession	BOT ¹ concession, long term lease, etc.	BOO ² concession, asset purchase, etc.
Examples	Boston: Management contract for retail facilities; Ghana: Concession for ground handling and air cargo services	ASECNA: "Specific contracts" for management of airports in French-speaking African countries	<i>Airports du Cameroun</i> : Concession for the operation of the main airports	Toronto: Construction and operation of Terminal No. 3; New York (JFK): Construction and operation of Terminal One	British Airports Authority PLC ; Airports Company of South Africa ; Sydney (Australia) Airport Company

1. Build-Operate-Transfer
2. Build-Operate-Own

Option A – Contracting Out: Specific Services

In the model of contracting out for the provision of specific services, the owner of the airport (the government or airport authority) hires a contract operator who undertakes the management and/or the provision of specific services. According to this model, the responsibilities and the area of intervention of the operator are established by a contract and can include the management of a terminal building (Nairobi airport), the management of retail facilities (British Airports Authority for the airports of Boston and Newark, in the US) or the provision of ground handling and air cargo services (the company AFGO at the airport of Accra, in Ghana).

This type of arrangement enables the owner of an airport to hire a specialist in a specific field in order to be able to benefit from enhanced qualifications in that area without having to cede control of the entire airport to a third party. This is the concept of out-sourcing of services, which enables the airport administration

to concentrate on more fundamental questions relative to the management of assets. In the context of developing countries, an external contract can include an obligation on the part of the supplier of the contracted service to enact a program of transfer of technology and know-how to local personnel.

The nature of this type of contract can take several forms, including a service contract where the supplier is paid directly for its work, a concession for the contracted service where the concessionaire assumes the financial risk for its operations, going as far as a “BOT” type concession for the specific service in question where the concessionaire assumes not only the operational risk but also the responsibility for the realization of certain facilities. The out-sourcing of services can also comprise mixed forms of contract.

Option B – Airport Management Contract

In the airport management contract model, the owner of the airport (the government or the airport authority) hires a contract operator who undertakes the management of the entire airport on behalf of the owner in exchange for payment of expenses and fees. According to this model, the operator provides a service for which it is paid by the owner; thus, it does not take any risk. Normally, the operator becomes the employer of the airport personnel and the costs of salaries and benefits are included in its management contract. According to this model, the revenues which are generated by the airport are given over to the owner by the operator.

A variant of this model envisages incentive clauses which authorize the payment of bonuses to the operator if the latter surpasses fixed objectives with respect to operational surpluses, total revenues, volumes of traffic or other parameters.

Relevant examples of this model exist in the West African region: (1) the arrangement between the Government of Mauritania and the operator SAM (*Société des Aéroports de Mauritanie*) comprises two aspects – (a) a classic concession for the principal airports of Nouakchott and Nouadhibou, and (b) a contract for the management of the secondary airports; (2) the arrangements (“specific contracts”) between certain African States and the multinational agency ASECNA are essentially contracts for the management of the operation of specific airports.

Option C – Operating Concession

In the operating concession model, the conveying authority (the government or the airport authority) signs a contract which confides the management and

operation of the airport to a third party (the concessionaire) for a pre-determined period. According to this model, the concessionaire is responsible for all costs associated with the operation and maintenance of the airport and is entitled to all the revenues associated with these responsibilities. Normally, the concessionaire pays a fee to the owner of the airport for the privilege of operating the airport and having access to its revenues.

In an operating concession, the concessionaire operates the airport facilities in their existing state; it is not required to participate directly in their modernization and/or expansion, which remain the responsibility of the owner.

This being said, the fact of confiding the management of the airport to a well known professional concessionaire can facilitate access to financing for the required capital investments and enable the owner of the airport to benefit from more advantageous lending terms. The concessionaire can even assist in arranging the financing. Moreover, this model does not in any way exclude the possibility that the concessionaire may invest directly in the capital investments and/or arrange the necessary financing; however in these cases it does so at its own discretion and normally according to terms and credits which reflect the value of its contributions.

Option D – BOT Concession (Build-Operate-Transfer)

In the BOT concession model, the conveying authority (the government or the airport authority) signs a contract with a concessionaire for the management and operation of the airport as in the preceding case; however, in the specific case of a BOT-type concession, the mandate of the concessionaire also comprises the realization of an investment program aimed at the modernization and expansion of the facilities. As indicated by the name of this model, the immovables realized by the concessionaire are transferred to the owner at the end of the concession term.

As in the case of an operating concession, normally the BOT concessionaire pays the owner of the airport a fee for the privilege of operating and having access to its revenues, but the level of the concession fee takes into account the investments made by the concessionaire.

Normally, the scope and timetable for the realization of the investment program are determined and negotiated before the signature of the contract and constitute an integral part of the latter. In the case of a BOT concession, the duration of the contract reflects the period necessary for the amortization of the investments to be made by the concessionaire.

Option E – Transfer of Property

This option represents the maximum participation on the part of the private sector and the minimum on the part of the public sector. In the model of transfer of property, the title and the assets of the airport are transferred to an separate private enterprise.

Normally, the transfer of the airport property is conditional upon the acceptance by the purchaser of the obligation to continue to operate and maintain it as a certified airport according to the norms and standards in force, at least for a pre-determined period. Often, the transfer of property is associated with other conditions aimed at protecting the public interest, for example the imposition of limits on the eventual alienation of all or part of the property in favor of third parties. Moreover, the government may require the payment of a royalty on the part of the purchaser for the privilege to operate an airport at that site.

In this model, the purchaser of the airport decides, as owner, on the nature and the capacity of the necessary facilities and takes care, itself, of the modalities of realization and financing. In principle, the fact of being owner of the title to the land and facilities of the airport should facilitate the mobilization of the necessary financial resources.

The transfer of airport property can be accomplished according to two main formulae:

1. The property is transferred to a mixed corporation where the government is represented as a shareholder and which opens a portion of its shareholding to the private sector (example: Airports Corporation of South Africa);
2. The property is transferred directly to a private sector corporation (example: British Airports Authority).

7.4 Analysis and Recommendation of Options

In view of the situation and requirements relative to the specific case of the Moroccan airports network, the options for the participation of the private sector are oriented around the necessity of mobilizing the necessary investments for the eventual expansion of the facilities at the certain airports, effecting the necessary adaptations to the institutional framework of the management of the airports and increasing non aeronautical revenues.

In this perspective, our analysis is based on the following relevant observations concerning the specific models discussed above:

Contracting Out: Specific Services

In the present Moroccan context, this option offers the possibility of improving the situation with respect to increasing non aeronautical revenues by bringing in a group specialized in the management of retail concessions in the terminal buildings. Numerous experienced firms offer this type of service, for example Airports Group International (USA), British Airports Authority (UK), Weitnauer (Switzerland) and Vinci (France) among others. The eventual contract could take the form of a global concession for several airports or for an individual airport where the concessionaire signs contracts with sub-contractors which it chooses itself and pays a fee to the owner of the airport. The contract with the concessionaire could also include a minimum (floor) payment to the owner.

The advantages of such an arrangement are as follows:

- Access to a network of contacts and to the professional credibility of the operator, which should facilitate the optimization of the commercial potential of the sites and the possibility to attract prestigious tenants;
- Possibility of the transfer of know-how (according to the terms of the contract);
- Reduction in the personnel of ONDA;
- Speed and ease of execution (no changes necessary to the legal texts in force).

Although this formula offers the possibility of resolving the specific problem of insufficient non aeronautical revenues, it cannot by itself resolve the more fundamental issues of the mobilization of the investments necessary for the eventual expansion of airport facilities and the required adaptations to the institutional framework for the management of the airports.

Airport Management Contract

In the present Moroccan context, this option does not offer any particular advantages. With the specific exception of possible improvements at the level of the management of retail concessions in the air terminal buildings as mentioned

in the preceding section, ONDA manages the airports in its charge in a very professional manner.

Moreover, normally the formula of a management contract does not require the operator to make any investments nor to realize any capital works. According to this formula, the operator is only responsible for the daily management of the immovable, which remains the property of the State and for which the ultimate financial responsibility rests with ONDA. In a simple airport management contract, the operator does not assume any financial risk.

In addition, the granting of a global contract for the management of an individual airport or a group of airports does not represent an adaptation of the institutional framework in the sense required by the new context of the liberalization of air transportation and the necessity to ensure greater separation between airport and air navigation services.

Taking into account these observations, we have concluded that this option does not respond to the requirements of the Moroccan authorities; it would only introduce an additional level of administration without at the same time resolving any specific problem.

Operating Concession

In the present Moroccan context, the option of a simple operating concession, in the absence of an obligation to realize an investment and capital works program, does not represent a significant advantage in comparison to the preceding option, i.e. the formula of a simple management contract. The only difference is that the concessionaire accepts the financial responsibility for the operation for the airport.

Moreover, it is quite probable that the potential concessionaires would only be interested in those airports which are already viable, i.e. Casablanca, Marrakech and Agadir. In the case of the other airports which are not viable, the potential operators may only accept mandates based on the principle of a simple management contract. The implementation of such a scenario could create problems for ONDA, which would find itself deprived of its most viable airports. Unless the concession fees collected by ONDA compensate for the loss of the profits associated with the operation of the viable airports, this option could lead to a negative situation for the organization.

In this context, we have concluded that this option does not respond adequately to the objective of the Government concerning the obligation on the part of the

new operator to implement and arrange the financing for a specific program of modernization of the facilities. In effect, such an arrangement does not oblige the concessionaire to participate in any way in the program of modernization and expansion of the airports.

BOT Concession (Build-Operate-Transfer)

The option of a BOT concession responds well to the criterion of the mobilization of the investments necessary for the eventual expansion of facilities at certain airports. This being said, as in the case of the preceding option (the operating concession), it is even more likely that the potential concessionaires would only be interested in those airports which are already viable, i.e. Casablanca, Marrakech and Agadir, because of the great risk associated with the required investments.

In the case of the other airports which are not viable, the potential operators risk only accepting mandates based on the principle of a management contract with a guarantee of reimbursement in the case of investments required at these airports. The implementation of such a scenario could create problems for ONDA, which would find itself deprived of its most viable airports. Unless the concession fees collected by ONDA compensate for the loss of the profits associated with the operation of the viable airports, this option could lead to a negative situation for the organization.

Transfer of Property

The option of the transfer of property represents that which best responds to the three essential criteria, i.e.: (1) the adaptation of the institutional framework, (2) the mobilization of the investments necessary for the eventual expansion of the facilities at certain airports, and (3) the increase of non aeronautical revenues.

This being said, we consider that the direct transfer of the airport property to a private third party is not to be recommended for several reasons, among others:

- It poses a problem of protection of the public interest, since the government would no longer have direct control over airport operations.
- Once the property of the airport would be transferred, the government would no longer have control over either the scope or the timetable for the realization of the modernization and expansion of the facilities.

- It would be almost impossible to determine the true values of the airports in the case of a transaction involving the sale of the public asset to a third party.

In the light of these factors and the objectives and policies of the government, we have considered the possibility of the realization of this option by means of a change in the status of ONDA as manager and operator of the airports. The airport property could be transferred from the State to ONDA and the latter could be transformed from essentially a State enterprise to a veritable independent airport authority. This initiative should be accompanied by other measures intended to complete the adaptation of the institutional framework: the separation of the functions of management of the airports and air traffic within ONDA and the “cleaning up” of the respective Boards of Directors of ONDA and RAM in order to eliminate the representation of each on the other’s board and to reduce the direct representation of the State.

Finally, ONDA could open its capital to the private sector, either to operators able to bring know-how, strategic investors, employees or representatives of local organizations. This initiative would permit the “new” ONDA to increase its liquidity and to reinforce its technical and commercial competence.

7.5 Strategic Considerations and Issues for the Government and Stakeholders

The implementation of the recommended formula for private sector participation in the management of the airports of Morocco would have significant consequences with respect to the policies and strategies of the Government. The following paragraphs summarize these considerations and issues.

Relationship Between Airports and Tourism

The plans for the development of the airports network reflect the traffic projections (passengers, freight and aircraft movements) associated with the enhancement of the tourism potential of the country. At the same time, it is obvious that the forecast tourist activities will not be realized in the absence of the modernization and expansion of the airport facilities. The development of the airports and the tourism infrastructure constitute in effect two sides of the same coin: one depends on the other.

This situation – the close relationship between the modernization and expansion of the airports and the development of tourism – has important consequences for the implementation of private sector participation. In effect, the potential private

participants in airport development will want to have the assurance that the forecast development of tourism will in fact take place – and vice versa. It would therefore be logical to take steps to ensure that these two programs are pursued in parallel.

Moreover, experience in other countries indicates that normally the participation of the private sector in airports takes the form of a consortium grouping together among others the following elements:

- A firm with experience in airport management
- A firm with experience in the financing of infrastructure projects
- Stakeholders having a strategic and concrete interest in the development of the airport
- Groups based in the local community

In the case of the Moroccan airports, local and foreign stakeholders having investments in the tourism sector would have concrete interests in the modernization and expansion of the airports. In this context, the process of private sector participation in airports should be associated with incentive measures and commitments aimed at the simultaneous development of the tourism assets of the country.

The Regulatory Role of the Government

Given the *de facto* monopoly of airports with respect to the provision of access to air transport services for the community, the regulatory role of the government vis-à-vis a private airport operator becomes especially important: protection of the public interest, respect of civil aviation norms and standards, insurance of open and equal access to facilities and markets for airlines, protection of the property of the State, etc. In effect, the assignment of certain monopoly powers to a private sector operator means that the government must ensure that it possesses the necessary regulatory authority in the legal, technical and financial fields.

In this sense, it should be recognized that airports normally comprise two types of activity, with different consequences for the government regulatory authority, in particular:

- The **airside** comprises all the facilities and services necessary to accommodate the ground movement of aircraft (essentially the runway and taxiway system) and represents a “natural” monopoly for the airport operator. As such, the level of “aeronautical” tariffs established by the operator of the airport for the provision of airside facilities and services should reflect the principles of cost recovery and should not serve to generate excessive profits, according to the recommendations of ICAO.
- The **landside** comprises the passenger and freight terminals, parking lots and other ancillary and support facilities and services, typically including a wide range of participants. A commercial approach to the management of the airport would attempt to maximize the contribution of “non aeronautical” landside revenues, since these represent for the most part discretionary purchases, as a means of reducing pressures to increase aeronautical charges. Which should help to stimulate airport traffic and thus to generate higher total revenues, therefore facilitating the financial autonomy of the airport.

Transparency and Separation of Jurisdictions

The success of the process of private sector participation in airport management depends on the transparency of the arrangements put into place. These arrangements will be expressed in the eventual documents of the transaction, as well as in the laws and regulations underlying the transaction between the parties.

The eventual transaction documents should be completely explicit. For example, they should clearly establish the parameters of the transaction, the obligations of development and investment, the provisions for the distribution of revenues, the provisions for fees to be paid to the government and financial guarantees.

Also, the laws and regulations governing the transaction should be completely explicit. They should deal with the questions of convertibility of currency, exchange rates, repatriation of profits, as well as questions of income and other taxes, and should foresee measures for the adequate enforcement of these provisions.

Above all, the transaction should foresee measures for the fair and equitable resolution of disputes between the parties to the concession. This process should recognize that the parties will probably need to resolve the inevitable questions which will arise during operations. The procedures for the resolution of these questions should, in the first instance, be based on good-faith negotiations

between the affected parties, and then on irrevocable resolution according to the process of international arbitration.

Balancing Stakeholder Interests

Airport management typically comprises the participation of several operators and agencies, sometimes with diverging interests. The implementation of a formula for private sector participation in airport operation and development must take account of this fact and ensure an adequate balance between the interests of all stakeholders (e.g. public oversight of airport charges vs. the freedom of the operator to establish its own tariffs). In this sense, it is necessary to establish appropriate mechanisms (legal, regulatory, oversight, etc.) in order to recognize and protect the interests of all parties.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 Financial Feasibility of Investment Programs

As specified in the Terms of Reference of the present Pre-feasibility Study, we have prepared an analysis of the financial feasibility of the investment programs to be foreseen in the context of the option of an eventual BOT concession for the airports of Casablanca, Marrakech and Agadir. The parameters and hypotheses for this analysis are presented in Chapter 6, with the financial results for each of the airports. It should be noted that the option which was analyzed represented only one among several for the participation of the private sector in the Moroccan airports.

The conclusion of this analysis indicates that a private investor could expect IRRs of more than 25% following the eventual concession of the airports of Casablanca, Marrakech and d'Agadir, which would produce positive NPVs, on the basis of the investment program discussed in Chapter 5 and a combined cost of capital of 16.18%. These conclusions hold for each airport studied as well as for the ensemble of the three. More specifically, the IRRs which were calculated for each airport according to the Base-line Operational Scenario and the Base-line Investment Scenario are summarized as follows:

Table 8-1 Summary of Financial Results
Base-line Operational Scenario / Base-line Investment Scenario

Airport	Internal rate of return (IRR)	Net present value (NPV)
Casablanca – Mohamed V	29.4%	\$4,9716,000
Agadir – Al Massira	25.7%	\$11,615,000
Marrakech – Menara	27.2%	\$13,106,000

Returns such as these indicate that the project of the eventual concession of these airports, individually or collectively, is feasible from the point of view of the financial return on the investment which the Concessionaire would have to make.

In order ensure the relevance of this conclusion, the financial evaluation comprised a sensitivity analysis, which indicates that the IRR surpasses the minimum threshold of 16.8% in all cases of the Base-line Operational Scenario: when combined with the Base-line Investment Scenario, the High Investment Scenario “1” and the High Investment Scenario “2”.

Table 8-2 Internal rate of return (IRR): Base-line Operational Scenario
Investment Scenarios

Table 8-2 Internal rate of return (IRR): Base-line Operational Scenario

	Investment Scenarios		
	Base-line Scenario	High Scenario “1”	High Scenario “2”
Casablanca	29.4%	28.8%	28.2%
Marrakech	27.2%	26.3%	25.3%
Agadir	25.7%	25.7%	25.6%

The financial sensitivity analysis also demonstrates that IRRs between 20% et 25% could be achieved for the airports studied in the case of the High Expenses Scenario and of the Reduced Revenues Scenario, which would produce positive NPVs, albeit more modest, on the basis of the same combined cost of capital of 16.18%.

Table 8-3 Internal Rate of Return (IRR) : High Expenses Scenario

	Investment Scenarios		
	Base-line Scenario	High Scenario “1”	High Scenario “2”
Casablanca	22.9%	22.4%	21.8%
Marrakech	25.1%	24.1%	23.1%
Agadir	23.4%	23.3%	23.1%

Table 8-4 Internal Rate of Return (IRR) : Reduced Revenues Scenario

	Investment Scenarios		
	Base-line Scenario	High Scenario “1”	High Scenario “2”
Casablanca	22.2%	21.6%	21.0%
Marrakech	21.4%	20.5%	19.4%
Agadir	21.0%	20.9%	20.7%

Finally, the financial sensitivity analysis demonstrates that it is only in the case of the Reduced Activity Scenario that the IRRs would not reach the minimum threshold of 16.18%, thus resulting in negative NPVs for all airports studied.

Table 8-5 Internal Rate of Return (IRR) : Reduced Activity Scenario

	Investment Scenarios		
	Base-line Scenario	High Scenario “1”	High Scenario “2”
Casablanca	10.4%	8.9%	7.4%
Marrakech	13.6%	12.3%	10.9%
Agadir	16.1%	15.9%	15.6%

8.2 Potential Financing Mechanisms

The financing plan for the program of capital investments at the airports of Casablanca, Marrakech and Agadir is based on the identification of the

investment requirements as described in the preceding Chapter 5. The financing mechanisms are moreover intimately linked to the different models for the eventual participation of the private sector in the management, operation and development of the airports.

We have identified several potential sources for the financing of the airport development program, as follows:

- a) public funds authorized by the government by means of programs of the *Ministère du Transports et de la Marine Marchande (Direction des Bases Aériennes)*, which would represent contributions from the State;
- b) internal funds of ONDA, generated by operational profits, which would represent an equity investment on the balance sheet of ONDA;
- c) loans contracted by ONDA and guaranteed either by forecast operational profits or by the Moroccan State, which would represent long term debts on the balance sheet of ONDA;
- d) capital contributions provided by an eventual partner/shareholder of ONDA (this option applies in the case where ONDA opens its capital or creates a subsidiary in which the partner invests its own resources), which would represent an equity investment on the balance sheet of the partnership;
- e) direct investments made by an eventual concessionaire/operator in the framework of BOT-type contract (Build-Operate-Transfer), which would represent an equity investment on the balance sheet of the concessionaire/operator;
- f) loans contracted by an eventual partner or concessionaire from financial institutions, which would represent long term debts on the balance sheet of the concessionaire/operator;
- g) loans contracted by an eventual partnership or concessionaire from suppliers of imported elements, possibly supported by guarantees from financial institutions, which would represent des short term debts on the balance sheet of the partnership or concessionaire.

The fact that most of the required investments according to the program of capital works presented in Chapter 5 consist of projects associated with the expansion of terminal buildings has implications for the choice of the eventual financing formulae. This type of airport investment is generally considered as an

investment of commercial nature, especially in comparison with projects associated with aspects of safety and security (runways, taxiways, control towers, FFR facilities, perimeter fences, etc.) or with the maintenance of the airport property (garages, electrical equipment, sewers, drainage system, etc.....).

In this perspective, one can distinguish between public and private modes of financing. Investments intended to ensure safety and security are normally financed by the granting of public funds as described in option (a) above. It is a question of the responsibility of the State by virtue of international treaties and Moroccan law, thus the financing of these investments is a matter for the concern of the public authorities. On the other hand, investments of a commercial nature, for example in the case of terminal buildings, can be considered as “discretionary” work in the sense that the sizing of these facilities and the level of service desired are subject to choices based on cost/benefit calculations, which is not the case for the aspects of safety and security.

In the specific context of the Moroccan airports, therefore, the financing of the greater part of the program of works envisaged would come from “commercial” sources, as described in options (d), (e), (f) and (g) above. In this context, the commercial sources of financing can be considered as being loans or capital contributions.

8.3 Choice and Implementation of the Private Sector Participation Model

Choice of the Model

Taking into account the factors discussed in the preceding Chapter 7.4, the most relevant model for the eventual participation of the private sector in the Moroccan airports is that of the transfer of the airport property of ONDA and the opening of its capital to private investors. This option would permit the Government to realize its stated objectives, i.e.:

- The mobilization of the capital necessary for the airport investments by tapping into non-governmental sources in order to respond in timely fashion to the demands of the industry and to reduce the financial burden on the Government;
- The introduction of approaches and methods of airport management based on commercial principles, in order to improve efficiency and maximize the generation of non-aeronautical revenues, with the objective of reducing the pressure to increase aeronautical charges, which constitute a critical

element of the strategy of the Government aimed at reaching the target of 10 million tourists in 2010;

- The adaptation of the existing institutional framework to the requirements of the new régime of the liberalization of air transportation and integration with European airspace.

We believe that the model of direct participation by the private sector in the shareholding of ONDA represents the best formula for mobilizing the investments necessary for the eventual renewal and expansion of the airport facilities and the pursuit of the required adaptations of the institutional framework for the management of the airports.

The other models (out-sourcing services contracts, airport management contracts, operating concessions, BOT concessions and their variants) do not offer the necessary tools to contribute in a real and sustainable way to the realization of the stated objectives of the Government.

In particular, the formulae involving contracts for specific services and airport management only constitute short term solutions aimed simply at improving the quality of these services and/or reducing costs, according to the case. The same applies to the formula of an operating concession. These formulae do not address in any way either the financing of the investments or the adaptation of the institutional framework.

The formula of a BOT concession presents other problems. Although this model comprises by definition the financing of specified airport investments, it poses the question of the non viable airports. In the context of a BOT concession, it is not likely that a potential concessionaire would be interested to take responsibility for investments for which the short term reimbursement can not be demonstrated reliably. This attitude is due on the one hand to the perception of risk on the part of the eventual partners and on the other to the fact that the concessionaire does not benefit from the long term value added, i.e. after the term of the concession contract.

In the light of the preceding observation, we believe that the eventual implementation of a BOT concession could put into question the integrity of the du Moroccan airports network and thus be in conflict with the objectives of the Government. When it is a question of a contractual obligation on the part of the concessionaire to realize financial investments, our experience indicates that the potential partners will only be interested in those airports which have already demonstrated their viability (in this case Casablanca, Marrakech and Agadir). In

the framework of an eventual BOT-type concession contract, it is likely that the potential partners will only take charge of non profitable airports on the basis of simple management contracts, associated with a guarantee of reimbursement if investments would be required at these airports.

Obviously, such a scenario would create a financial imbalance at the level of ONDA since the organization practices a policy of cross subsidization whereby certain airports generate surpluses which are used to compensate for the deficits occasioned by others. An eventual BOT concession could therefore lead to a negative situation for ONDA if the concession fees collected do not compensate the loss of the surpluses associated with the operation of the profitable airports. But the negative repercussions of such a scenario could go beyond purely financial considerations. The establishment of two categories of airports, private and public, risks creating tensions at the level of the employees due to the eventual differences concerning working conditions and remuneration.

In this context, the formula of direct private sector participation in the shareholding of ONDA presents advantages in comparison to the other models, notably:

- The contribution of new capital as a direct investment in the enterprise;
- The maintenance of the integrity of the airports network;
- The creation of long term value added;
- The transformation of ONDA into an organization managed according to commercial management approaches and methods, with the objectives of reducing the pressure on the increase of aeronautical charges and playing a key role in the strategy of the Government aimed at the target of 10 million tourists in 2010;
- The revision of the present institutional framework as a corollary of the process of implementation of the opening of ONDA to private capital and the adaptation of the framework to the new requirements.

It should be noted that the formula recommended, i.e. that of opening ONDA to direct participation by private capital, does not prevent in any way the possibility that the new ONDA itself might make use of other models in specific cases: outsourcing of service contracts, management contracts, operating concessions, BOT concessions, etc.

Implementation Process

The process of implementation of the recommended model would require significant changes in the organization of the different stakeholders in the field of air transportation and the administration of civil aviation. The following paragraphs indicate the principal elements of this restructuring.

The keystone of the implementation of the recommended model consists of the change in the present status of ONDA: from an *Enterprise Publique à Caractère Industriel et Commercial* (EPIC) to a true Incorporated Company, i.e. from essentially a State enterprise to a veritable independent airport authority. In effect, this initiative should be undertaken at the same time as the separation of the present activities of ONDA between those associated with the management, maintenance and operation of airports and those associated with the provision of air navigation services.

This operation is necessary in order to permit the opening of the shareholding of ONDA to participation by the private sector. The transformation of ONDA could be accomplished in several steps. First, the change in status could be voted by resolution of the present Board of Directors and then ratified by Decree. Then, the airport property could be transferred by the State to the new ONDA “airports”. It should be noted that several mechanisms exist for the transfer of the property of the airport lands and immovables to the new ONDA, by means of either the granting of the titles to the lands, the granting of public utility concessions or very long term emphyteutic leases, etc.

Following this, the new ONDA “airports” could increase its liquidity and reinforce its technical and commercial competence by opening its capital to the private sector, including strategic investors, operators able to contribute know-how, employees and/or local organizations.

As a corollary of the preceding point, it will be necessary to effect changes at the level of the present composition of the Board of Directors of ONDA in order to reflect the new shareholding and the commercial orientation of the organization. More particularly, the representatives of the State coming from the ranks of the ministries should be replaced by essentially independent persons, selected on the basis of their competence in the relevant fields which concern the State property: air transportation, tourism, economy, urbanism, regional development, protection of the public and the environment, etc. At the same time, the airline Royal Air Maroc (RAM) should no longer be represented on the Board of Directors of the Board of Directors of the new ONDA and vice versa, in order to eliminate potential conflicts of interest.

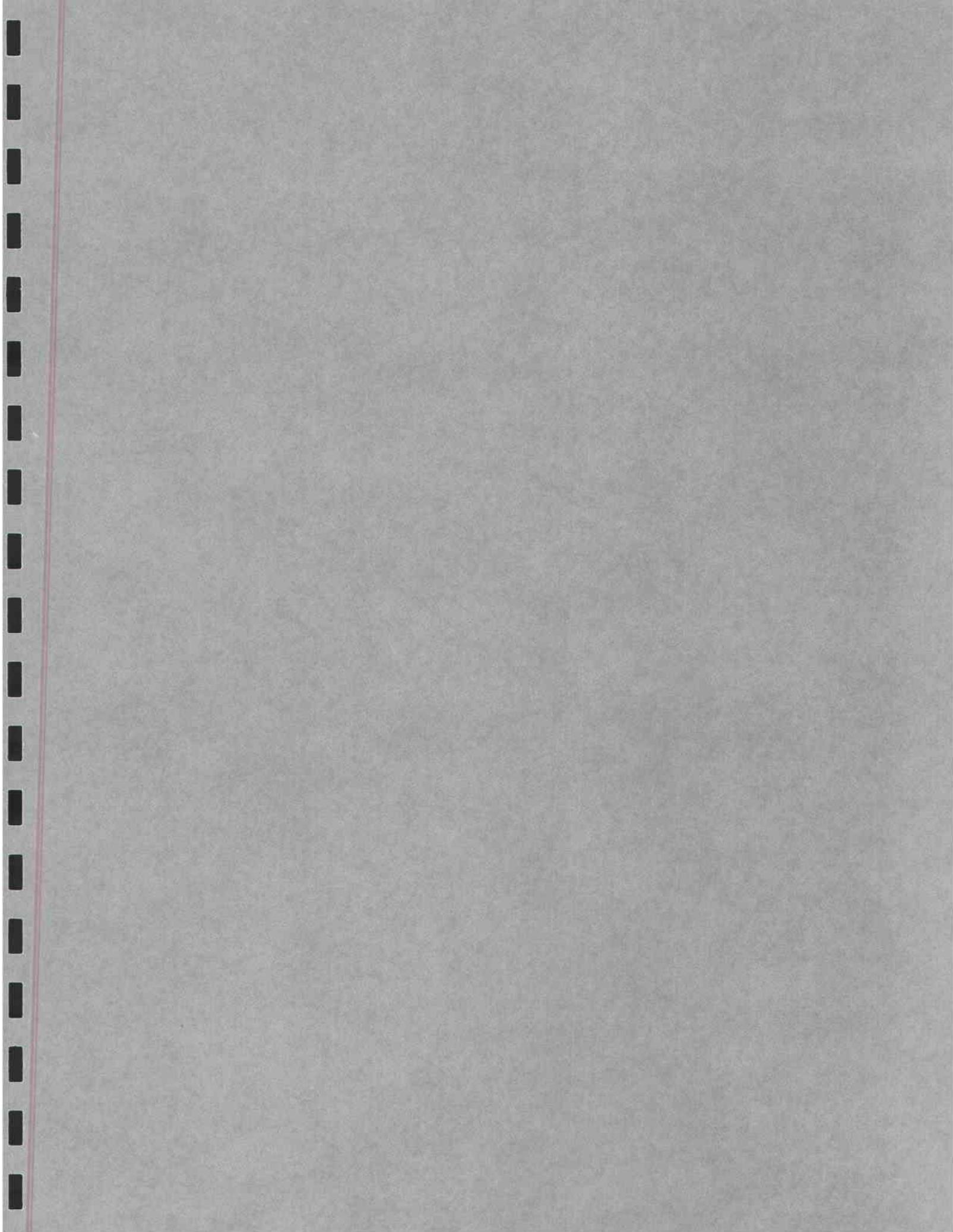
The implementation of the formula of transformation of ONDA to an Incorporated Company and the opening of its capital to the private sector would require other changes at the level of the responsibilities of other stakeholders. The responsibility for the planning and the realization of the principal airport investments, which now is the concern of the *Direction des Bases Aériennes* (DBA) of the *Ministère du Transport et de la Marine Marchande*, should be transferred to the new ONDA as a corollary to the previously mentioned transfer of property. Although good cooperation now exists between ONDA and the DBA, the proposed change in the status of the property airport would require the transfer of this responsibility to ONDA. This being said, the DBA should retain its present functions in the area of the elaboration of policies and national planning in regard to airports. We believe that in the new context, the DBA should continue to play the role of principal representative of the State for relations with the new ONDA.

The transformation of ONDA into an Incorporated Company would also require the reinforcement of the protection of the public interest and the transparency of economic regulation in the airports sector. According to the current régime, the Board of Directors of ONDA represents the only body which approves the airport charges; this situation does not suffice to ensure the protection of the public interest with regard to the level of airport charges. We therefore recommend that a Regulatory Authority be established which would have the responsibility of analyzing and approving airport aeronautical charges.

ANNEXES

- A1. REFERENCES**
- A2. TRAFFIC FORECAST METHODOLOGIES**
- A3. AIRPORT SITE VISITS**
- A4. POTENTIAL FOR REVENUE ENHANCEMENT**
- A5. LIST OF POTENTIAL U. S. SUPPLIERS OF EQUIPMENT**
- A6. LIST OF POTENTIAL U. S. CONCESSIONAIRES**





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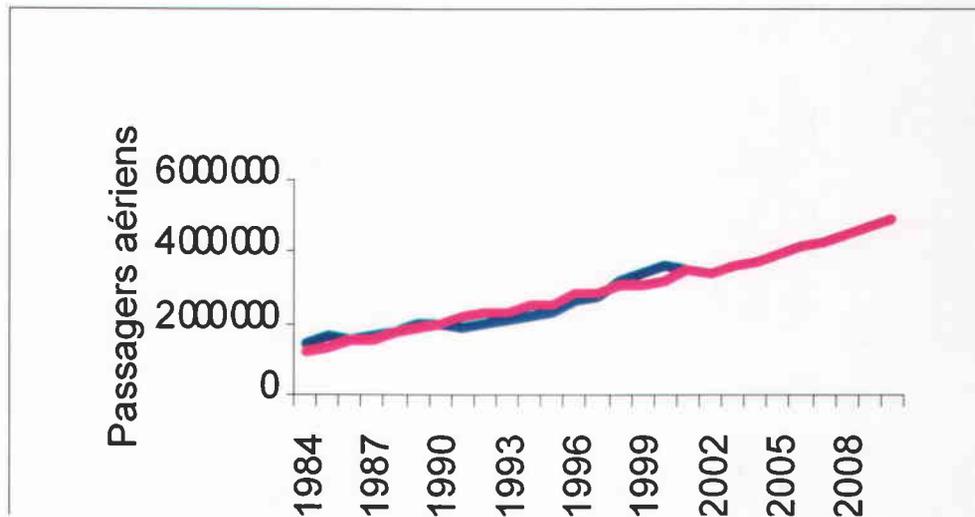
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A2. TRAFFIC FORECAST METHODOLOGIES

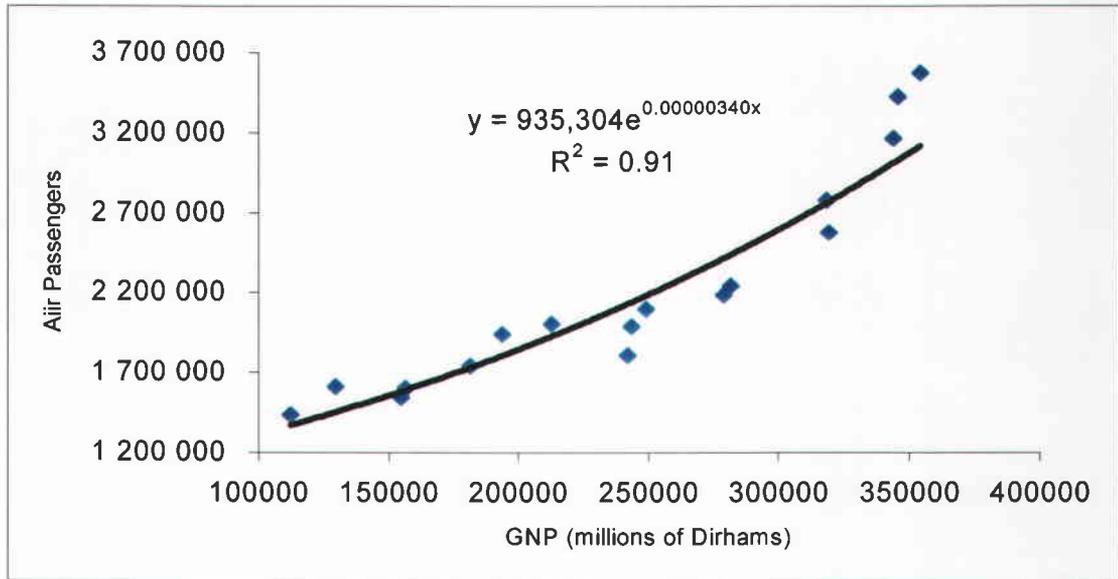
The econometric analysis between passenger air traffic at Casablanca – Mohamed V airport and the Moroccan GDP provided a linear relationship shown in Figure A2-1, with a R^2 of 0.87 as Passenger Air Traffic = $8 \times \text{GDP} + 279059$.

Figure A2-1.
Econometric Model: Air Passengers at Casablanca – Mohamed V airport



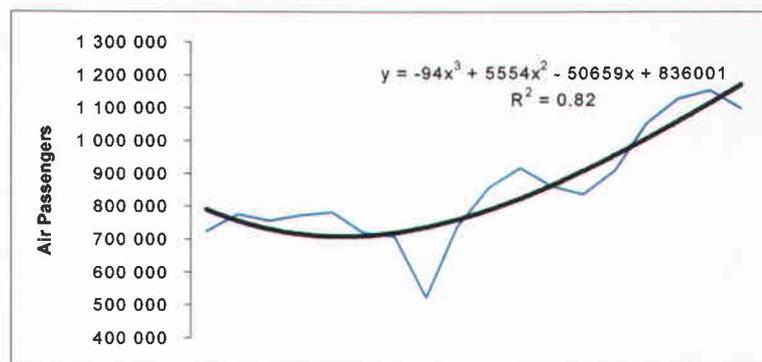
We observed a strong correlation between the variables with a coefficient of correlation of 0.91 fitting an exponential curve of the type: $y = 935,304 \times e^{0.00000340 \times \text{GDP}}$. This model corresponds to the Base-line Scenario of development. Figure A2-2 shows the graphic relationship between the two variables and the curve tied to them.

Figure A2-2
Simple Regression Analysis: Air Passengers-GDP at Casablanca – Mohamed V Airport



Concerning air passengers at Agadir, we have selected a time series trend technique as shown in Figure A2-3 to simulate the Low Scenario of development. A cubic curve fits the past passenger air traffic pattern with a $R^2=0.82$.

Figure A2-3 Analysis of Time Series Trends: Agadir



The distribution of domestic, international, and connecting air passengers at each airport has been computed from their share of the total air traffic of each airport. Following is a summary of the average allotment of domestic, international, and

connecting air passengers for Casablanca, Marrakech and Agadir from 1992 to 2000. We assume that the same arrangement will continue until 2010.

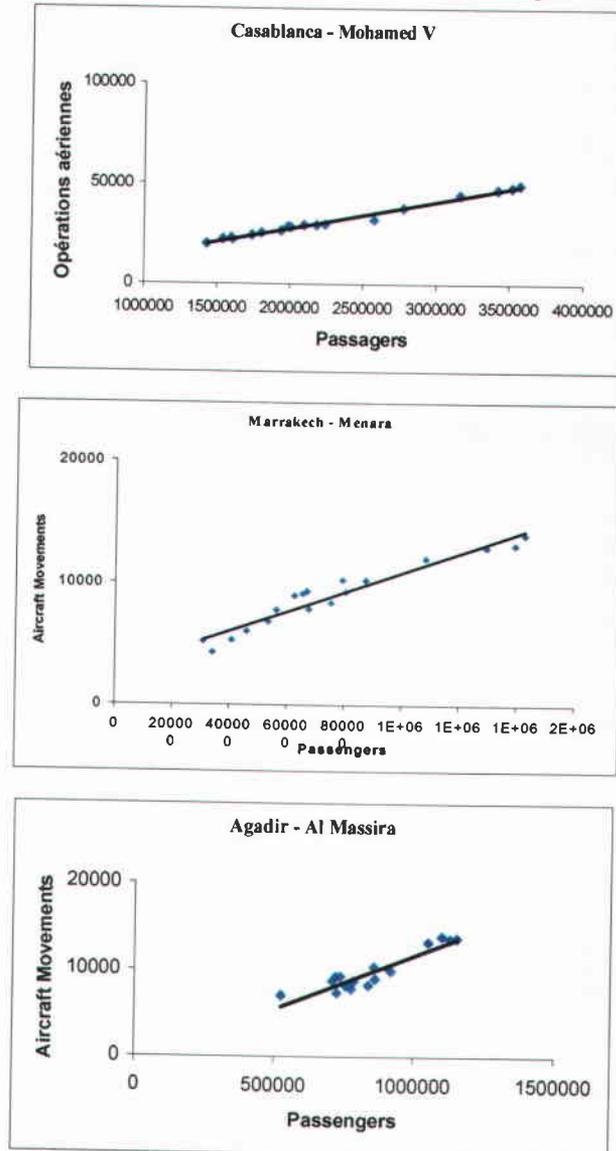
	Domestic	International	Connecting
Casablanca – Mohamed V	23%	74%	0,6%
Marrakech – Menara	24%	71%	1,4%
Agadir – Al Massira	28%	69%	4%

On the other hand, we have observed that aircraft operations and passenger air traffic over the past 16 years followed the same pattern of progressive development. The correlation analysis provided the following outcomes:

	Coefficient of Determination R²
Casablanca – Mohamed V	0.98
Marrakech – Menara	0.86
Agadir – Al Massira	0.93

In consequence, we assume that the pattern of aircraft operations will continue to perform on a similar basis for in the future, fitting a linear trend along with air passenger growth, as exhibited in Figure A2-4.

Figure A2-4
Aircraft Movements and Passenger Volumes: Simple Regression Analysis



The peak hour values at Casablanca Mohamed V have been obtained from the methodology of the Federal Aviation Administration (FAA) of the United States. Different ratios are applied to the annual values for each type of air activity to obtain the peak hour numbers. The FAA methodology establishes that passenger peak hour volumes represent around 0.05% of the annual passenger air traffic whereas peak hour aircraft operations are 0.47% of the annual movements.

For Agadir and Marrakech, due to their dependence on tourist traffic, we assumed that the same aircraft schedule which is determined by the constraints of the market will continue to be in place for the period of our forecasts. These assumptions lead to a factor of 0.08% of the annual value for aircraft movements during the peak hour. Regarding the passenger peak hour, we have considered the ratio between the actual passenger peak hour and peak hour aircraft movements at each airport, 175 for Marrakech and 145 for Agadir, assuming that they will be the same within the next 10 years.

Regarding air cargo, we have adopted a qualitative approach, based on a comparison of the results and arguments of other sources: ONDA, INFRAMED, ADP, Airbus and Boeing, as well as a quantitative approach based on an exponential rounding technique over the last 10 years. The above-mentioned sources agree in predicting an average annual growth rate of 5.1% since 1998-1999; however, real growth since this date has been 0.3% annually. On the other hand, the exponential rounding of historical air cargo volumes at Casablanca airport gives an annual growth rate of 1.6%. We have therefore taken the forecast of the above-mentioned sources (5.1%) as a basis for the High Traffic Scenario, the past trend (1.6%) as a basis for the Low Scenario and the average of the two as the basis for the Base-line Scenario.

In addition, it is convenient to point out that no air cargo forecast has been performed for Marrakech and Agadir due to their negligible contribution to the air cargo activity of the country.

A3. AIRPORT SITE VISITS

In accordance with the Terms of Reference, visits were made to the airports identified jointly by the *Direction de la privatization*, the *Direction générale de l'aviation civile* and ONDA during the first mission of the team to Morocco in the months of March and April 2002. These visits took place as follows:

A3.1 Casablanca – Mohammed V

Visits by the specialists of AAROTEC to the airport of Casablanca – Mohammed V took place on March 27 and 28, 2002.

A3.2 Marrakech – Menara

A visit by the specialists of AAROTEC to the airport of Marrakech – Menara took place on March 30, 2002.

A3.3 Agadir – Al-Massira

A visit by the specialists of AAROTEC to the airport of Agadir – Al Massira took place on March 29, 2002.

A3.4 Fès – Assaïs

A visit by the specialists of AAROTEC to the airport of Fès – Saïss took place on April 2, 2002.

A3.5 Ouarzazate

A visit by the specialists of AAROTEC to the airport of Ouarzazate took place on March 31, 2002.

A3.6 Tanger – Ibn-Batouta

A visit by the specialists of AAROTEC to the airport of Tanger – Ibn-Batouta took place on April 2, 2002.

A3.7 Tétouan

A visit by the specialists of AAROTEC to the airport of Tétouan took place on April 3, 2002.



A4. POTENTIAL FOR REVENUE ENHANCEMENT

In view of the marginal performance according to two of the sensitivity variants (the High Expenses Scenario and the Low Revenue Scenario) and the unacceptable results according to the variant of the Reduced Activity Scenario, it would be prudent to explore and to implement, if possible, revenue enhancement measures as discussed in the following paragraphs.

The implementation of measures likely to create the potential for the enhancement of revenues at the airports studied should form part of the strategies associated with the participation of the private sector in the management, operation and development of the airports. One possibility would be to implement increases in the passenger service charge, as well as other rates and charges, more rapidly, rather than spreading such increases over the 20-year concession period.

Obviously, our analysis of the financial performance of the option of the concession of the three main airports would have been more positive if the analysis had assumed implementation of these tariff revisions immediately when the concession would enter into force rather than doing so progressively. This approach would constitute a “pre-funding” of the investment requirements, and would almost certainly be vigorously opposed by the airlines operating at the airport, as well as by passengers and other stakeholders. The Consultants, therefore have not performed any additional analysis to evaluate the effect of this approach on the financial outcome.

On the other hand, we consider that some new sources of revenue could be developed in the context of private sector participation in the management of the airports, thanks to the experience and expertise of the partner. We mention some possibilities as follows:

- Fees for wrapping packages
- Fees for telecommunications and use of telephones
- Fees for rental and use of audio-visual equipment
- Charge for the treatment of waste water (airport tenants)
- Hotels on the airport property
- Charge for ground access permits (ground transportation providers)
- New concessions (internet access, video games, etc.)
- Development of the airport land

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This being said, we are not now in a position to evaluate either the validity of these new sources of revenue or their potential to contribute in a meaningful way to the cash flow projections and, therefore, we have not included them in our scenarios. This type of analysis would however form part of the reflections undertaken jointly by the potential partners and ONDA in the process of consultation.



APPENDIX: LIST OF POTENTIAL U.S. SUPPLIERS

1. Loading bridges

Jetway Systems, Inc.

1805 W. 2550 South,
Ogden, UT 84401
United States

Phone: 801-627-6600

Fax: 801-629-3474

Email: sales@jetwaysystems.com

Dewbridge Airport Systems

1350 College Ave
Canon City, Co 81212
United States

Phone: 719-276-1772

Fax: 719-276-1773

Email: sales@dewbridge.com

Thyssen Stearns, Inc.

3201 N. Sylvania Ave.
Ste.100E
Ft Worth, TX 76111
United States

Phone: 817-834-6984

Fax: 817-834-6985

Email: sales@thyssen-stearns.com

2. Apron and airfield lighting

Honeywell

21111 North 19th Ave. (N19A5)
Phoenix, AZ 85027
United States

Phone: 602-436-5307

Fax: 602-436-5300

Email: sales@honeywell.com

Venture Lighting International

32000 Aurora Rd.
Solon, OH 44139-2814
United States

Phone: 216-248-0600

Fax: 216-349-7171

Email: salesinfo@venturelightingintn.com

ADB Siemens

PO Box 30829
977 Gahanna Parkway
Columbus, OH 43230-0829
United States

Phone: 614-861-1304

Fax: 614-864-2069

Email: adb.siemens.com

3. Navigational Aids

Airport Systems International

11300 West 89th Street
Overland Park, KS 66214-1176
United States

Phone: 913-495-2609

Fax: 913-492-0870

Email: jwharton@airportstemsinternational.com

Advanced Navigation & Positioning Corporation

11 Third Street
Hood River, OR 97031
United States

Phone: 800-228-1857

Fax: 541-386-2124

Email: sales@anpc.com

New Bedford Panoramex Corporation

1037 West Ninth Street
Upland, CA

United States

Phone: 909-982-9806

Fax: 909-982-9810

Email: sales@nbpcorp.com

4. Ground Service and cargo handling equipment

Trowin Industries, Inc.

800 Wisconsin St Bldg 15

P.O. Box 1778

Eau Claire, WI 54703

United States

Phone: 715-839-7966

Fax: 715-833-2181

Email: info@trowin.com

Airport Group International

330 N. Brand Blvd. Suite 300

Glendale, CA 91203-2308

United States

Phone: 818-409-7500

Fax: 818-409-7979

Email: sales@airportgroupinternational.com

Rapistan Systems

507 Plymouth Ave NE

Grand Rapids, MI 49505-6098

United States

Phone: (616) 451-6525

Fax: (616) 451-6425

Email: esterland@rapistan.com

5. Preconditioned air and 400 HX power

INET Airport Systems

1871 South Chris Lane

Anaheim, CA 92805

United States

Phone: 714-978-8484

Fax: 714-978-8460

Email: retupack@inetas.com

Aviation Ground Equipment Corporation

53 Hanse Avenue
Freeport, NY 11520d States

Phone: 516-546-0003

Fax: 516-546-0198

Email: Sales@AviationGroundEquip.com

Hobart Ground Power

1177 Trade Road East
Troy, OH 45373-2479
United States

Phone: 937-332-5549

Fax: 937-332-5335

Email: salesinfo@hobart.com

6. Aircraft docking guidance systems

RLG International

12964 Moorpark St.
Studio City, CA 91604
United States

Phone: 213-872-1738

Fax: 818-990-6841

Email: rlgaugenmaier@rlg.com

PDI Ground Support Systems, Inc.

5905 Grant Avenue
Cleveland, OH 44105-5609
United States

Phone: 216-271-7344

Fax: 216-271-7550

Honeywell Inc.,

5353 West Bell Road

Phoenix, AZ 85308-9000
United States

Phone: 602-822-4536

Fax: 602-822-4777

Email: systems@honeywell.com [wttp:www.honeywell.com](http://www.honeywell.com)

7. Hydrant refueling systems

Determan Brownie, Inc.

1241 72nd Avenue N.E.
Minneapolis, MN 55432
United States

Phone: 763-571-1744

Fax: 763-571-1789

Email: krisssm@dertman.com or sales@determan.com

Applied Technology, Inc.

3125 Sterling Circle West Suite 107
Bolder, CO 80301
United States

Phone: 303-444-3590 x21

Fax: 303-444-8736

Email: danderson@ap-tech.com

James A. Staley Co.

5 Bowen Ct.
Carmel, NY 10512
United States

Phone: 845-878-3344

Fax: 845-878-3429

Email: test.equipment@staleyco.com

8. Airport ground support equipment

Taylor-Dunn Manufacturing Co.

2114 West Ball Road
Anaheim, CA 92804
United States

Phone: 714-956-4040

Fax: 714-956-3131

Email: contact@taylor-dunn.com

Radiant Aviation Services

40 Centre Drive
Orchard Park, NY 14127-4102
United States

Phone: 716-662-0022

Fax: 716-662-0033

Email: sales@radiantenergycorp.com

Charlatte of America

600 Mountain Lane, P.O. Box 968
Bluefield, Virginia 24605
United States

Phone: 276-326-1510

Fax: 276-326-1602

Email: equipmentsales@charlattius.com

9. Baggage conveyors

BAE Automated Systems, Inc.,

2525 Carter Drive
Carrollton, TX 75006
United States

Phone: 972-389-6242

Fax: 972-389-6490

Email: sales@bai-inc.com John D. Gude, <http://www.bai-inc.com>

Airport Group International

330 N. Brand Blvd. Suite 300
Glendale, CA 91203-2308
United States

Phone: 818-409-7500

Fax: 818-409-7979

Email: info@airportgroupinternational.com

G & T Conveyor Company, Inc.

476 Southridge Industrial Dr.
Tavares, FL 32778
United States

Phone: 352-343-1500

Fax: 352-343-5077

Email: sales@gtconveyor.com

10. Escalators/elevators

Otis Elevator, Inc.

10 Farm Springs
Farmington, CT 06031
United States

Phone: 860-676-6000

Fax: 860-676-5111

Email: sales@otis.com <http://www.otis.com>

Stanley Elevator Company, Inc.,

Nine Henry Clay Drive
Merrimack, NH 03054
United States

Phone: 603-882-6918

Fax: 603-882-8818

Email: palcorn@stanleyelevator.com <http://www.stanleyelevator.com>

Elevator Systems, Inc.,

207 Lawrence Avenue
Inwood, NY 11096
United States

Phone: 516-239-4044

Fax: 516-239-5793

Email: infor@elesys.com, <http://www.elesys.com>

11. Flight Information Display Systems (FIDS) and PA systems

International Display Systems

3131 South Dixie
Dayton, OH 45439
United States

Phone: 303-858-1000

Fax: 303-858-1100

Email: ids-inc@msn.com Robert Keelor

Clarity Visual Systems

9025 SW Hillman Court, #3122
Wilsonville, OR 97070
United States

Phone: 503-570-0443

Fax: 503-582-8570

Email: info@clarityvisual.com

Com-Net Software Specialists

8905 Castleberry Road
Apex, NC 27502
United States

Phone: 919-362-6122

Email: sales@com-net.com

12. Security surveillance systems

Siemens America Building Technologies, Inc.,

1000 Deerfield Parkway
Buffalo Grove, IL 60089
United States

Phone: 847-215-1050

Fax: 847-215-8326

Email: sales@siemens.com <http://www.siemens.com>

World Institute for Security Enhancement

Post Office Box 4646
Miami Lakes, FL 33014-0646
United States

Phone: 305-825-0088 305-766-0170

Fax: 954-447-5184

Email: securitytraining@pobox.com

ACCESS

1011 U. S. Hwy 22 East
Mountainside, NJ 07092
United States

Phone: 908-789-8700 X 222 877-949-6700 X 222

Email: info@access-controlled.com

13. Security screening services

ADT Security Services Inc.,

3601 Eisenhower Ave. Fl-3
Alexandria, VA 22304-6425
United States

Phone: 703-317-4203

Fax: 703-317-4265

Email: <http://www.adt.com>

World Institute for Security Enhancement

Post Office Box 4646
Miami Lakes, FL 33014-0646
United States

Phone: 305-825-0088 305-766-0170

Fax: 954-447-5184

Email: securitytraining@pobox.com

Lockheed & Covenant Security Solutions

9231 Corporate Boulevard
Rockville, MD 20850
United States

Phone: 301-640-30416

FAX: 301-640-2144

Email: security_services@lmco.com

14. Rescue & fire fighting equipment

Oshkosh Truck Corporation

2307 Oregon Street

Oshkosh, WI 54901-7000
United States

Phone: 414-235-9151

Fax: 920-832-3208

Email : info@oshkosh.com

Horton Emergency Vehicles

3800 McDowell Road
Grove City, OH 43123
United States

Phone: 614-539-8181

Fax: 614-539-8165

Email : sales@horton.com

American Emergency Vehicles

165 American Way
Jefferson, NC 28640
United States

Phone: 336-982-9824

Fax: 336-982-9826

Email: <http://www.AEV.com> info@AEV.com

15. Snow/Ice-Removal Equipment

Schmidt Engineering & Equipment, Inc.

1905 South Moorland Road
New Berlin, WI 53151
United States

Phone: 262-784-6066 800-788-6066

Fax: 262-784-6720

Email: sales@see-worldwide.com

Clariant Corporation

P.O. Box 866
Mt. Holly, NC 28120
United States

Phone: 704-822-2184

Fax: 704-822-2193

Email: bryan.mccreary@clariant.com

Radiant Aviation Services, Inc.

P.O. Box 717
Getzville, NY 14068-0717
United States

Phone: 716-662-0022

Fax: 716-662-0033

Email: sales@radiantenergycorp.com

16. Waste water treatment

AAROTEC Infrastructure Group

401 Ponderosa Trail
Bunker Hill WV 25413
United States

Phone: 304-821-1001

Fax: 703-255-3703

Email: aarotec@aarotec.com <http://www.aarotec.com>

Bio-Systems International

1238 E. Inman Parkway
Beloit, WI 53511
United States

Phone: 608-365-9550

Fax: 608-365-9467

Email : info@biobugs.com, <http://www.BIOBUGS.com>

Straughan Environmental Services Inc.,

3905 National Dr., Suite 105
Burtonsville, MD 20866-1100
United States

Phone: 301-989-3265

Fax: 301-989-3271

Email: estraughan@sesenviron.com Eileen Straughan

17. Cargo handler/developer

Aviation Facilities Company Inc.,

7600 Colshire Drive, Suite 240

McLean, VA 22102
United States

Phone: 703-902-2900

Fax: 703-902-2901

Email: fchambers@afcpom.com Francis X. Chambers Jr.,

Airport Group International

330 N. Brand Blvd. Suite 300
Glendale, CA 91203-2308
United States

Phone: 818-409-7500

Fax: 818-409-7979

Email : info@airportgroupinternational.com

The LZA Group

641 Avenues of America
New York, NY 10011
United States

Phone: 212-741-1300

Fax: 212-989-2040

Email: <http://www.lzagroup.com> agutman@lzagroup.com

18. Ground transportation equipment

Aviation Ground Equipment Corp.

53 Hanse Avenue
Freeport, NY 11520
United States

Phone: 516-546-0003

Fax: 516-546-0198

Email: info@aviationgroundequipment.com

Oshkosh Truck Corporation

2307 Oregon Street
Oshkosh, WI 54901-7000
United States

Phone: 414-235-9151

Fax: 920-832-3208

Email : sales@oshkosh.com

ShuttlePort, an ATC/Vancon Company

1 Mid America Plaza, Suite 401
Oakbrook Terrance, IL 60181-4704

Phone: 630-571-7070

Fax: 630-571-3969

Email: fjreiter@vanderamamobility.com Fredric J. Kreiter

19. Terminal Building HVAC Systems

York International Corporation

631 Richland Ave
York, PA 17405
United States

Phone: 717-771-7890

Fax: 717-771-7381

Email: Commercial sales : sales@york.com <http://www.york.com>

The Trane Company

Lynn Haven, Florida
United States

Phone: 301.984.2400

Email: <http://www.trane.com/commercial/systems>

Carrier Corporation

Carrier Parkway, P.O. Box 4008
Syracuse, NY 13221
United States

Phone: 315-432-3977

Fax: 315-433-4957

Email : carrier.utc.com <http://www.commercial.carrier.com>

20. Terminal or Airport Facilities Equipment

→ Furnishings

Partners & Thompson Inc.,

41 Keyland Ct.
Bohemia, NY 11716-2617
United States

Phone: 516-589-7337

Fax: 516-589-7339

Email: info@kusch.com <http://www.kusch.com>

Hobart Corporation

701 So. Ridge Ave.
Troy, OH 45374-0001
United States

Phone: 937-332-3000

Fax: 937-332-2585

Email : <http://www.hobart.com>

Falcon Products Inc.,

9387 Diehlman Industrial Dr.
St. Louis, MO 63132
United States

Phone: 314-991-9200

Fax: 314-991-9227

Email: info@falcon.com <http://www.falcon.com>

→ **Roofing**

Advanced Coating Systems, Inc.

645 Molly Lane
Ste 130
Woodstock, GA 30189
United States

Phone: 800-587-3758 678-445-0040

Fax: 678-445-0399

Email: sales@acsiusa.com

Carlisle Corporation

P.O. Box 7000
Carlisle, PA 17013
United States

Phone: 704-501-1100

Fax: 704-501-1190

Email: info@carlisle.com <http://www.carlisle.com>

Atlas Roofing Corporation

2000 Riveredge Parkway, Suite 800
Atlanta, GA 30328

United States

Phone: 770-952-1442

Email: <http://www.atlasroofing.com>

→ **Flooring**

ICA

1280 North Winchester
Olathe, KS 66061
United States

Phone: 913-780-0770

Email: rcain@insulcorp.com

Interface Flooring Systems, Inc.,

P.O. Box 15030
LanGrange, GA 30241
United States

Phone: 706-882-1891

Fax: 706-884-8340

Email : info@interfaceflooring.com

Armstrong World Industries

2500 Columbia Ave
Lancaster, PA 17603
United States

Phone: 717-397-0611

Fax: 877-276-7876

Email: flooring@armstrong.com [Http://www.armstrongworld.com](http://www.armstrongworld.com)

→ **Curtain walls**

Walls + Forms, Inc.

850 Northlake Drive
Coppell, TX 75019
United States

Phone: 972-745-0800

Fax: 972-304-8402

Email: dwedde@wallsforms.com

H.H. Robertson Company

450 19th Street

Ambridge, PA 15003
United States

Phone: 412-299-8074

Fax: 412-299-8402

Email: sales@hhrobertson.com <http://www.hhrobertson.com>

ICA

1280 North Winchester
Olathe, KS 66061
United States

Phone: 913-780-0770

Email: rcain@insulcorp.com

→ **Doors and door controls**

Door Engineering & Manufacturing

400 Cherry Street
Olathe, KS 66061
United States

Phone: 913-780-0770

Email: rcain@insulcorp.com

Cottonwood Welding & Manufacturing, Inc.

3940 Oak Park Cr.
Rochester, MN 55904
United States

Phone: 507-282-1583

Fax: 507-423-5609

Email: sales@hydroswing.com <http://www.hydroswing.com>

Agile Access Control, Inc.

1999 S. Bascom Ave., Ste 700
Campbell, CA 95008
United States

Phone: 866-539-2668 703-968-7300

Fax: 703-832-8729

Email: sales@agileaccesscontrol.com

→ **Automated Building Systems**

ElectroCom Automation L.P.

P.O. Box 95080
Arlington, Texas 76005-1080
United States

Phone: 817-695-7584

Fax: 817-695-3015

Email: <http://www.electrocomautomation.com> sales@electrocomautomation.com

Agile Access Control, Inc.

1999 S. Bascom Ave., Ste 700
Campbell, CA 95008
United States

Phone: 866-539-2668 703-968-7300

Fax: 703-832-8729

Email: sales@agileaccesscontrol.com

Sentry Technology Corporation

350 Wireless Blvd.
Hauppauge, NY 11788
United States

Phone: 516-881-2084

Email: <http://www.sentrytechnology.com> products@sentrytechnology.com

→ **Cladding**

Starnet International Corporation

200 Hope Street
Longwood, FL 32750
United States

Phone: 407-830-1199

Fax: 407-830-1817

Email: info@starnetint.com

Reynolds Metal Company

201 Isabella St.
Pittsburgh, PA 15212-5858
United States

Phone: 412-553-4545

Fax: 412-553-4498

Email: <http://www.alcoa.com>

Lawrence Metal Products

P. O. Box 400-M
260 Spur Drive South
Bay Shore, NY 11706-3917
United States

Phone: 516-666-0300

Fax: 516-666-0336

Email: <http://www.lawrencemetal.com>, sales@lawrencemetal.com

→ **Closed circuit TV**

Javelin Electronics

19831 Magellan Drive
Torrance, CA 90502
United States

Phone: 877-219-6757

Email: sales@javelin-tech.com <http://www.javelin-tech.com>

PI Vision

4370 L.B. McLeod Road
Maitland, FL 32811
United States

Phone: 407-540-1252

Email: bobd@pi-vision.com

INFINOVA

51 Stouts Lane
Monmouth Junction, NJ 08852
United States

Phone: 1-732-355-9100

Fax: 1-732-355-9101

Email: sales@infinova.net

→ **Signs**

Daktronics, Inc.,

331 32 Avenue
Brookings, SD 57006-
United States

Phone: 800-843-5843

Fax: 605-697-4700

Email: <http://www.daktronics.com> info@daktronics.com

Clarity Visual Systems

9025 SW Hillman Court, #3122
Wilsonville, OR 97070
United States

Phone: 503-570-0443

Fax: 503-582-8570

Email: sales@clarityvisual.com

NEC-Mitsubishi Electronics Display of America

500 Park Blvd
Suite 1100
Itasca, IL 60143
United States

Phone:

Email: sales@NEC.com

→ **Gates**

Master-Halco, Security Solutions Group

4000 W. Metropolitan Dr., Suite 400
Orange, CA 92868
United States

Phone: 800-989-4526

Email: SecuritySolutions@MasterHalcoSecurity.com

Hy-Security Gate Operators

408 North 35th Street
Seattle, WA 98103
United States

Phone: 206-632-0538

Fax: 206-632-2404

Email: <http://www.ly-securitygateoperators.com> Fred H. Witters

Transpo Industries, Inc.

20 Jones Street
New Rochelle, NY 10801
United States

Phone: 914-636-1000

Fax: 914-636-1282

Email: info@transpo.com

→ **Suspension ceilings**

ICA

1280 North Winchester
Olathe, KS 66061
United States

Phone: 913-780-0770

Email: rcain@insulcorp.com

Armstrong World Industries

2500 Columbia Ave
Lancaster, PA 17603
United States

Phone: 717-397-0611

Fax: 877-276-7876

Email : ceilings@armstrong.com

Acoustic Ceiling Products LLC

P.O. Box 1581
Appleton, WI 54912-1581
United States

Phone: 920-735-3751

Fax: 920-734-9786

Email: sales@acpideas.com [Http://www.acpideas.com](http://www.acpideas.com)

→ **skylites**

Bristolite Skylites

401 East Goetz Ave.,
Santa Anna, CA 92707
United States

Phone: 714-540-8950

Email : skylites@bristolite.com

American Skylites, Inc.

525 113th Street
Arlington, TX 76011

United States

Phone: 817-633-4666

Fax: 817-633-4616

Email: www.americanskylites.com ksuttles@americanskylites.com

Crystalite Inc.

3307 Cedar Street
Everett, WA 98201
United States

Phone: 800-666-6065

Fax: 425-258-6734

E-Mail: info@crystaliteinc.com <http://www.crystaliteinc.com>

→ **Fire alarms, sprinkler systems**

Simplex/Grimmel Systems

22712 Commerce Center Ct.
Dulles, VA 20166
United States

Phone: 703-996-0782

Fax: 703-996-8202

Email : sales@simplex/grimmelsystems.com

Icon Service Company

20016 State Road
Cerritos, Ca 90703
United States

Phone: 562-809-3066

Fax: 562-865-5711

Email : <http://www.Iconserviceco.com>

Honeywell Inc.,

5353 West Bell Road
Phoenix, AZ 85308-9000
United States

Phone: 602-822-4536

Fax: 602-822-4777

Email: systems@honeywell.com <http://www.honeywell.com>

21. Equipment Integration, Purchasing, Sales and Installation

AAROTEC Equipment Company

401 Ponderosa Trail
Bunker Hill, WV 25413
United States

Phone: 304-821-1001

E-mail: aarotec@aarotec.com <http://www.aarotec.com>

LIST OF POTENTIAL AIRPORT MANAGEMENT CONCESSIONAIRES FROM THE UNITED STATES OR AFFILIATE US OFFICES

Aecon Group Inc.

Core airports: n.a.

Participations: Quito

Contacts:

John Beck, President
 Bill Pearson, Executive Vice President
 Tel: 416-754-8735
 Fax: 416-754-1988
 Cell: 416-434-6291
bpearson@aecon.com
aecon@aecon.com
www.aecon.com

Airport Group International (AGI)

Division of TBI plc Group

Participations: Belfast Int'l (UK): 100% owned by TBI
 Los Angeles International Airport: services contract
 San Francisco International Airport: services contract
 San Jose (CA) International Airport: services contract
 San Jose (Costa Rica) International Airport: management contract
 Bolivia (La Paz, Cochabamba, Santa Cruz): management contract
 Cardiff Int'l (UK): 100% owned by TBI
 London Luton (UK): 71% TBI ownership
 Orlando – Sanford (USA): TBI ownership
 Rochester (NY) International Airport: services contract
 Atlanta-Hartsfield International Airport: management assistance
 Shreveport (LA) Regional Airport: services contract
 Stockholm-Skavsta (Sweden): TBI ownership

Contacts:

(AGI): 330 N. Brand Boulevard, Suite 300
 Glendale, California 91203-2308
 USA
 Mac McGowan
 Tel: (818) 409 7500
 Fax: (818) 409 7979
airportservices@airportgroup.com
 (TBI): 159 New Bond Street
 London W1Y 9PA
 UK
 (44) 207 408 7300 (T)
 (44) 207 408 7321 (F)

Alterra Partners

Bechtel Enterprises International and Singapore Changi Airport Enterprise Ltd.



Participations: London Luton (UK): 10%
 Lima – Jorge Chavez Airport

Contacts: Paul Unruh, President & Chief Operating Officer
 Bechtel Enterprises International
 50 California Street, Suite 2200
 P.O. Box 193965
 San Francisco, CA 94119
 USA
 Phone: +1 415 768 4452

Mark Nielson
dvlpmt@bechtel.com
 Jaime Guillen, Chief Executive Officer
 Tony Gollin, Senior Vice President
aegollin@alterra-partners.com
 Alterra Partners
 11 Pilgrim Street
 London EC4V 6RN
 United Kingdom
 Tel: (44) 207 651 7693
 Edificio Montes Urales III
 Montes Urales 505, Piso 2
 Col. Lomas de Chapultepec
 Mexico, D.F. 11000
 Phone: +525 201 3579
 One Temasek Avenue
 N° 23-00 Millenia Tower
 Singapore 039192
 Phone: +65 541 2292
Alterra Partners Costa Rica S.A.
 Global Park
 650 metros al este de Plaza Real Cariari
 La Aurora, Heredia
 Costa Rica,
 Phone: +506 209-5600
 Fax: +506 209-5656

Bechtel Enterprises International (affiliated with Alterra Partners)

See Alterra Partners

British Airports Authority (BAA) plc.

Core airports: London – Heathrow
 London – Gatwick
 London – Stanstead
 Prestwick (Scotland)

Participations: Pacific airports group (Melbourne, etc. – Australia): 15%
 Naples: 65%
 Boston – Logan: retail concession management



Indianapolis: management contract
Pittsburgh: retail management
Oman
Contacts: Mike Hodgkinson, Chief Executive Officer
 Tel: (44) 207 834 9449
For Europe and the rest of the world
 BAA plc
 5th floor South Roof Office Block
 Gatwick Airport
 West Sussex
 United Kingdom
 RH6 ONP
Sandy Lightfoot - International Retail Director
 Telephone: (44) 1293 502 114
sandy_lightfoot@baa.co.uk
Duncan Tolson - Business Development Director, International Retail
 Telephone: (44) 1293 503 762
duncan_tolson@baa.co.uk
For the Americas
 BAA Pittsburgh Inc.
 PO Box 12318
 Pittsburgh International Airport
 Pittsburgh PA 15230
Mark Knight - Regional Director, BAA USA
 Telephone: (1 412) 472 5191
m_knight@baausa.com

Houston Airport System Airport Development Corporation

Core airports: Houston – Bush Int’l
 Hobby Field
 Ellington Field
Participations: Quito
Contacts: Hoyt Brown, Deputy Director of Marketing, HAS
 Tina Sceppi, assistant
 Houston Airport System
 16930 JFK Boulevard
 Houston, Texas 77032
 Tel. 281-233-3000
 Fax: 281 233 1859

San Francisco International Airport

Core airports: San Francisco International
Contacts: John Payne, Chief Marketing Officer
 P.O. Box 8097
 San Francisco, CA 94128
airportervices@sanfranciscointernational.com

